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Five Hydrologic and Landscape Databases for Selected National Wildlife Refuges in the Southeastern United States

Open-File Report 2017–1018

U.S. Department of the Interior
U.S. Geological Survey

Cover. Bluff Lake at Okefenokee National Wildlife Refuge. Photograph by Alan M. Cressler, U.S. Geological Survey.

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Executive Summary

This report serves as metadata and a user guide for five out of six hydrologic and landscape databases developed by the U.S. Geological Survey, in cooperation with the U.S. Fish and Wildlife Service, to describe data-collection, data-reduction, and data-analysis methods used to construct the databases and provides statistical and graphical descriptions of the databases. Six hydrologic and landscape databases were developed: (1) the Cache River and White River National Wildlife Refuges (NWRs) and contributing watersheds in Arkansas, Missouri, and Oklahoma, (2) the Cahaba River NWR and contributing watersheds in Alabama, (3) the Caloosahatchee and J.N. "Ding" Darling NWRs and contributing watersheds in Florida, (4) the Clarks River NWR and contributing watersheds in Kentucky, Tennessee, and Mississippi, (5) the Lower Suwannee NWR and contributing watersheds in Georgia and Florida, and (6) the Okefenokee NWR and contributing watersheds in Georgia and Florida. Each database is composed of a set of ASCII files, Microsoft Access files, and Microsoft Excel files. The databases were developed as an assessment and evaluation tool for use in examining NWR-specific hydrologic patterns and trends as related to water availability and water quality for NWR ecosystems, habitats, and target species. The databases include hydrologic time-series data, summary statistics on landscape and hydrologic time-series data, and hydroecological metrics that can be used to assess NWR hydrologic conditions and the availability of aquatic and riparian habitat. Landscape data that describe the NWR physiographic setting and the locations of hydrologic data-collection stations were compiled and mapped. Categories of landscape data include land cover, soil hydrologic characteristics, physiographic features, geographic and hydrographic boundaries, hydrographic features, and regional runoff estimates. The geographic extent of each database covers an area within which human activities, climatic variation, and hydrologic processes can potentially affect the hydrologic regime of the NWRs and adjacent areas.

The hydrologic and landscape database for the Cache and White River NWRs and contributing watersheds in Arkansas, Missouri, and Oklahoma has been described and documented in detail (Buell and others, 2012). This report serves as a companion to the Buell and others (2012) report to describe and document the five subsequent hydrologic and landscape databases that were developed: Chapter A—the Cahaba River NWR and contributing watersheds in Alabama, Chapter B—the Caloosahatchee and J.N. "Ding" Darling NWRs and contributing watersheds in Florida, Chapter C—the Clarks River NWR and contributing watersheds in Kentucky, Tennessee, and Mississippi, Chapter D—the Lower Suwannee NWR and contributing watersheds in Georgia and Florida, and Chapter E—the Okefenokee NWR and contributing watersheds in Georgia and Florida.

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Conversion Factors

U.S. customary units to International System of Units

Multiply	By	To obtain
	Length	
inch (in.)	25.4	millimeter (mm)
mile (mi)	1.609	kilometer (km)
	Area	
acre	0.4047	hectare (ha)
square mile (mi^2)	2.590	square kilometer (km^2)

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$°F = (1.8 \times °C) + 32.$$

Temperature in degrees Fahrenheit (°F) may be converted to degrees Celsius (°C) as follows:

$$°C = (°F - 32) / 1.8.$$

Datum

Vertical coordinate information is referenced to the National Geodetic Vertical Datum of 1929 (NGDV 29), except where indicated.

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83), except where indicated.

Abbreviations

ADR annual data report

ASCII American Standard Code for Information Interchange

AU accounting unit

BFI baseflow index

CU cataloging unit

EFC environmental-flow component

EPA U.S. Environmental Protection Agency

ESRI	Environmental Systems Research Institute
FAER	Fisheries: Aquatic and Endangered Resources (Program)
FDOT	Florida Department of Transportation
GIS	geographic information system
Hdwtrs	headwaters
HSG	hydrologic soil group
HUC	hydrologic unit code
HUC10	10-digit hydrologic unit code
HUC12	12-digit hydrologic unit code
IHA	Indicators of Hydrologic Alteration
in/yr	inch per year
LCCR	Land Cover Change Retrofit (product)
LCV5	log base-ten percentiles, coefficient of variation of the set of every 5th percentile
MAF	master address file
NAD 27	North American Datum of 1927
NAVD 88	North American Vertical Datum of 1988
NGVD 29	National Geodetic Datum of 1929
NLCD	National Land Cover Database
NOAA	National Oceanic and Atmospheric Administration
NWIS	National Water Information System
NWISWeb	National Water Information System Web (database)
NWR	National Wildlife Refuge
PDF	portable document format
RBFI	Richards-Baker Flashiness Index
S&T	Status and Trends (Program)
SAS	Statistical Analysis System
SFWMD	South Florida Water Management District
STATSGO	State Soil Geographic (Database)
TIGER	Topologically Integrated Geographic Encoding and Referencing (Database)
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WRIA	water resource inventory and assessment

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Part I. Overview and User Guide

Introduction

Historically, little emphasis has been placed on the characterization of National Wildlife Refuge (NWR) hydrologic environments in the Southeastern United States because of a plentiful water supply and lack of perceived stress on NWR aquatic resources. Severe droughts and floods, and the increased competition for a limited water supply as a result of human and wildlife habitat uses, have highlighted the need for hydrologic characterization. The U.S. Fish and Wildlife Service (USFWS) has prioritized NWRs in the Southeastern United States on the basis of the need for hydrologic characterization (quantity, timing, duration, and diversion of flows) as a tool for NWR ecological assessment and resource management. Historic hydrologic characterization and the relation of the present hydrologic regime to reference conditions are requirements for identifying NWR hydrologic stressors and providing the framework for modeling the potential effects of changes in the hydrologic regime on aquatic and riparian habitat (Buell and others, 2009). Water availability risk factors in the Southeastern United States include changes in land use, climate, and population growth, which can increase water demand (Ingram and others, 2013; Melillo and others, 2014). In addition, NWR focus has been within NWR boundaries, although hydrologic changes both within and outside of the refuge boundary affect the NWR hydrology. Hydrologic data, statistical reductions of these data, and Indicators of Hydrologic Alteration (IHA) metrics that provide information on the magnitude, frequency, duration, timing, and rate of change of water quality and hydrologic streamflow events within refuge boundaries and adjacent areas can provide useful management tools for meeting NWR objectives. These data are essential for monitoring changes in the hydrologic regime that could place NWR resources at risk and empowering USFWS managers to make informed decisions to protect NWRs. To this end, six hydrologic and landscape databases were developed by the U.S. Geological Survey (USGS), in cooperation with the USFWS, to provide a framework for hydrologic and landscape characterization and assessment: (1) the Cache River and White River NWRs and contributing watersheds in Arkansas, Missouri, and Oklahoma, (2) the Cahaba River NWR and contributing watersheds in Alabama, (3) the Caloosahatchee and J.N. “Ding” Darling NWRs and contributing watersheds in Florida, (4) the Clarks River NWR and contributing watersheds in Kentucky, Tennessee, and Mississippi, (5) the Lower Suwannee NWR and contributing watersheds in Georgia and Florida, and (6) the Okefenokee NWR and contributing watersheds in Georgia and Florida. The eight selected NWRs are located in USFWS Region 4 of the Southeastern United States and are intended to be used in a pilot study and as a possible prototype for national-scale assessment of water availability and water quality for NWRs.

The hydrologic and landscape database for the Cache and White River NWRs and contributing watersheds in Arkansas, Missouri, and Oklahoma has been described and documented in detail (Buell and others, 2012). The current report serves as a companion to the Buell and others (2012) report to describe and document the five subsequent hydrologic and landscape databases that were developed: Chapter A—the Cahaba River NWR and contributing watersheds in Alabama, Chapter B—the Caloosahatchee and J.N. “Ding” Darling NWRs and contributing watersheds in Florida, Chapter C—the Clarks River NWR and contributing watersheds in Kentucky, Tennessee, and Mississippi, Chapter D—the Lower Suwannee NWR and contributing watersheds in Georgia and Florida, and Chapter E—the Okefenokee NWR and contributing watersheds in Georgia and Florida (fig. 1; table 1). Each database serves as an assessment and evaluation tool that can be used to examine NWR-specific hydrologic patterns and trends as related to water availability and water quality for NWR ecosystems, habitats, and target species.

In 2010, the USFWS began a comprehensive national water resource inventory and assessment (WRIA) for all NWRs in the NWR system with the goal of providing a database of water quantity and quality, legal water rights, infrastructure, and water-related needs information. The WRIA will provide resource managers a baseline from which to assess the effects of population growth and climate change on the availability of water resources needed to meet NWR management and preservation goals (Morse, 2011; U.S. Fish and Wildlife Service, 2012). Although the USFWS NWR hydrologic and landscape databases, developed and described in this report, are not included in the USFWS WRIA, the database design, content, and intent for use are consistent with and support the goals of the inventory program and could provide useful contributions to the program. The hydrologic and landscape databases for NWRs support the goals of two program areas of the USGS ecosystems science strategy: (1) Fisheries: Aquatic and Endangered Resources (FAER) Program and (2) Status and Trends (S&T) Program (U.S. Geological Survey, 2007a, b). Hydrologic characterization and assessment of NWR aquatic and riparian environments provide a baseline for the FAER program goals of understanding the habitat requirements of aquatic biota and developing a framework for the management, conservation, and restoration of aquatic resources. The NWR hydrologic baseline is also a critical component of the S&T goal of long-term ecosystem monitoring because it provides long-term trends necessary for future comparison.

Data and Methods

The following methods and descriptions apply to all databases included in this report unless otherwise stated.

Database Geographic Extent

Database geographic extent is based on the concept of contributing watersheds, defined by the 12-digit USGS hydrologic unit codes (HUCs) as the spatial framework (table 2; Seaber and others, 1994; U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013). The contributing watersheds include hydrologic features that have direct and measurable influence on NWR hydrology as well as features that are not directly linked to the NWR hydrology but indirectly affect the NWR(s). For example, reservoir operations, discharges, withdrawals, diversions, and dredging all have the potential to either directly or indirectly affect the NWRs. The contributing watershed area is the smallest set of contiguous HUCs that include the NWR area(s) and areas with hydrologic and landscape features that influence NWR hydrology. Contributing HUCs are not split below the relevant scale, so there may be sections of one or more contributing HUCs that are not hydrologically connected to the NWR(s). Although the geographic NWR-proximal areas within the contributing watershed area likely are more hydrologically connected than geographically peripheral areas, activities throughout the entire contributing watershed area all have the potential to either directly or indirectly affect the refuges.

Data and Data Sources—What data are included in the databases?

Hydrologic and landscape databases were constructed from Federal, State, and (or) regional government data sources. Data were compiled from the best available data at the time of database construction. Many types of surface-water and groundwater data were compiled (table 3*A*). Hydrologic data primarily are from the USGS National Water Information System (NWIS) database (U.S. Geological Survey, 1998), but some databases also include data from the U.S. Army Corps of Engineers (USACE), South Florida Water Management District, Tennessee Valley Authority, and Georgia Department of Transportation. Gaging stations were selected within or near the geographic extent of each database and limited to those stations that were upstream from the NWR, downstream from the NWR, within NWR boundaries, or along nearby tributary streams and rivers that are hydrologically connected, to provide hydrologically relevant data. Gage height and discharge values were compiled for the gaging stations selected. Observation well stations were selected in addition to gaging stations for the hydrologic and landscape database for the Okefenokee NWR and contributing watersheds. Continuous water-level values were compiled for the observation wells selected. If available, continuous water-quality data were compiled for selected stations.

Specific data and information for USGS gaging station and observation well sites have been published in a series of annual or multiple-year water-data reports since 1888. These data were published through the 1961 water year, primarily in water-supply and irrigation papers, but also in annual reports to the Director of the USGS, bulletins, and circulars. The water year is defined as October 1 through September 30 of the current year (the year in which the period ends). Commencing with the 1962 water year, the water-data report series was established as the publication format for basic data dissemination. These reports were state-based through the 2005 water year; beginning with the 2006 water year, a national-report series was established: Annual Data Reports (ADRs). ADRs contain the data tables and summary plots for all continuous-record data collected in a water year at a site. The reports also contain tables of any periodic data collected, including field measurements and water-quality, sediment, radiological, and biological analyses. ADRs were published through the 2013 water year, and subsequent water year summaries are available through the USGS NWIS Web database (NWISWeb; http://waterdata.usgs.gov/nwis/). To retrieve available digital copies of published data records, visit http://wdr.water.usgs.gov/.

Landscape spatial data that describe the NWR environmental setting and the locations of hydrologic data-collection stations were compiled and mapped in report figures (table 3*B*;

figs. A1–3, A6–8, B1–3, B6–8, C1–3, C6–8, D1–3, D6–8, E1–3, E6–8). Landscape statistical summary data for ecoregions, land cover, population, and soils are included in each database. NWR boundaries are the land-acquisition boundaries approved by the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service, 2011). County boundaries are a feature set in the high-resolution 2010 Topologically Integrated Geographic Encoding and Referencing (TIGER)/Line Shapefiles in the U.S. Census Bureau's master address file (MAF)/TIGER database (U.S. Census Bureau, 2011). The Esri ArcGIS dissolve tool was used to obtain state boundaries from county boundaries. Both datasets were clipped to the National Oceanic and Atmospheric Administration (NOAA) medium-resolution shoreline (National Oceanic and Atmospheric Administration, 2011). The 12-digit HUC watershed boundary datasets were obtained from U.S. Department of Agriculture (2011). Larger hydrologic unit boundaries were aggregated from the 12-digit HUC datasets. U.S. Environmental Protection Agency (EPA) Level III and Level IV ecoregions provide a physiographic framework for each database (U.S. Environmental Protection Agency, 2011). Hydrography layers include flowline, water body, and area features from the high-resolution National Hydrography Dataset (U.S. Geological Survey, 2011). Regional runoff numbers are derived from a digitized version of the average annual runoff map for the United States for 1951–80 (Gebert and others, 1987).

Land-cover data were retrieved from the National Land Cover Database (NLCD) and include the 1992 NLCD (Vogelmann and others, 2001), the 2001 NLCD (Homer and others, 2007), and the NLCD 1992–2001 Land Cover Change Retrofit (LCCR) product (Fry and others, 2009). The classification models used for the 1992 and 2001 datasets changed for some of the categories, so direct comparisons of the datasets cannot be made without incurring some level of error at large map scales. For this reason, the 1992–2001 NLCD–LCCR dataset was developed to facilitate a more accurate comparison at a modified Anderson-level-1 classification developed for the 2001 NLCD (Anderson and others, 1976; Homer and others, 2007): 1, water; 2, urban; 3, barren; 4, forest; 5, grassland; 6, agriculture; and 7, wetland. The 1992–2001 NLCD–LCCR has 48 change categories, 7 with stable land cover (no change), and 42 potential categories indicating land-cover change from each category to one of the other 6 categories (Fry and others, 2009). Errors generated by direct comparison are reduced at smaller map scales (broader areas).

Soil characteristics are State Soil Geographic (STATSGO)-derived taxonomic soil order, hydric classification, and hydrologic soil groups (HSG; U.S. Department of Agriculture, 1994; Wolock, 1997; Soil Survey Staff, 2011). The HSGs used in this analysis have been aggregated to the soil map unit. Hydrologic soil groups A through D follow a progression from low to high runoff potential or, conversely, high to low infiltration. Soils in HSG A have low runoff potential (water is freely transmitted through the soil), soils in HSG B have moderately low runoff potential (water transmission through the soil is unimpeded, soils in HSG C have moderately high runoff potential (water transmission through the soil is somewhat restricted), and soils in HSG D have high runoff potential (water transmission through the soil is restricted or very restricted). Soils with mixed HSG classification have more variable runoff potential on a local scale compared with soils that fall within a single HSG classification.

Data Processing and Reduction

Hydrologic and landscape data processing, statistical reduction of hydrologic data, most table generation, and plot generation were done with custom Statistical Analysis System (SAS) computer programs (SAS Institute Inc., 2015). IHA software (The Nature Conservancy, 2009) was used for IHA data reduction. Spatial Geographic Information System (GIS) data processing, statistical reduction and spatial analysis of GIS data, and most figure generation were done with Esri ArcGIS software. Database tabular data are provided in ASCII, Microsoft Access, and Microsoft Excel formats.

Statistical summary tables were provided in each database (organized as Microsoft Access tables) and include the basic univariate descriptive statistics, percentiles, spread and ratio measures based on the 10th, 20th, 25th, 50th, 75th, 80th, and 90th percentiles (Richards, 1989), and the coefficient of variation of the set of every 5th log base-ten percentile (5th, 10th, 15th, … , 85th, 90th, 95th percentiles [n=19]; Richards, 1989). The coefficient of variation statistic is, along with the mean, standard deviation, and coefficient of skew of these same percentiles, also part of the statistical characterization of the standard duration curve for gage height and discharge (U.S. Geological Survey, 2015, p. 240). Each table also includes the fraction of the summary time interval represented by daily-values data; for example, in the annual-summary tables, a value of 0.85 means that 85 percent of that year has daily values. These fractions, or data-completeness measures, are used to determine how much data are used in some of the statistical analyses and summary plots. For example, some annual statistics were only computed for years with data-completeness measures of 1.

Graphical summary plots were included in each database for each station as one- or two-page Adobe portable document format (PDF) files. There are as many as eight possible plots for each station-parameter combination, depending on how much data were available, with plots labeled as A1–A4 on page one and A5–A8 on page two of each plot file. Plots were generated for discharge, gage height, and any available water-quality data versus time step. Mean-daily values were plotted in both arithmetic and log-10 space if all values were positive. If a station record had values less than or equal to zero, only arithmetic plots were created. For each station, plot A1 is the mean-daily-values hydrograph for the period of record. Plot A2 is a boxplot of the mean-daily values on a calendar-year annual time step for greater-than-90-percent complete years. Plot A3 is a boxplot on a calendar-year decadal time step for greater-than-90-percent complete decades. Plot A4 is a boxplot on a period-of-record monthly time step for complete years and, therefore, is a summary of the long-term monthly seasonality. Plot A5 shows the 75–25, 80–20, and 90–10 spread measures, plot A6 shows the 75–25, 80–20, and 90–10 ratio measures, and plot A7 shows the log base-ten percentiles with the coefficient of variation of the set of every 5th percentile (LCV5) and Richards-Baker Flashiness Index (RBFI) values. Plots A5–A7 each use a calendar-year annual time step for complete years. Plot A8 is a line plot of the 10th, 25th, 50th, 75th, and 90th percentiles on a period-of-record daily time step for complete calendar years and, therefore, is a summary of the long-term daily seasonality. Following correct calculation of percentiles, plot A8 is generated for stations that have at least two complete years of record with percentiles plotted on the basis of the number of complete years of record: 50th percentile, >1 year; 25th and 75th percentiles, >4 years; and 10th and 90th percentiles, >10 complete years of record. Percentiles with insufficient data were not calculated. Percentiles calculated for summary statistics were also handled in this manner. For cross reference with the data, each plot lists the database table(s) that contain(s) the data being displayed and database field(s) being plotted.

The IHA software package and its application are described in detail in Buell and others (2012). The IHA analyses for databases described in the current report were done on complete standard water years grouped into one time period. Hydrologic parameter groups, environmental-flow component groups, and parameter and component definitions are provided in table 4. These results can be used to assess refuge hydrologic conditions and the availability of aquatic and riparian habitat. For example, temporal declines in minimum flow indicators or in the baseflow index (BFI) could indicate that upstream water withdrawals, upstream land-cover changes over time (e.g., from increased impervious surfaces), or precipitation declines could be altering the availability of streamflows to support current ecological communities. The timing of lowered flows is also important such as during fish spawning which might essentially eliminate the usefulness of a particular habitat for recruitment. Indicators of high flows—found in several IHA parameter and environmental-flow component groups—provide equally important information related to ecological communities. High-flow pulses are critical for some species such as plants that have adapted to niche within-stream and streamside habitats (e.g., cataract bogs or the like) that reduce competition from other plants not adapted to high current velocities. The imperiled shoals spiderlily (*Hymenocallis coronaria*) found within the Cahaba River NWR is an example of a plant species that is dependent on a stream habitat that is complete with stable low flows and routine flood pulses to maintain its population.

Land-cover data were clipped to the defined geographic extent, and zonal summations by NLCD land-cover category and land-cover-change category were done using the tabulate-area tool in Esri's ArcGIS Spatial Analyst extension. Land-cover category percentages were calculated for hydrologic unit and NWR areas and are provided in each database. Hydrologic soil group percentages were calculated for hydrologic unit and NWR areas and are provided in each database. Percentages of the EPA Level III and Level IV ecoregions were calculated for hydrologic unit and NWR boundaries by overlapping the ecoregion dataset with the hydrologic unit and NWR boundary dataset.

User Guide

Obtaining and Accessing Data in the Databases and Necessary Software Requirements

The databases described and documented in this report are available online at the USGS ScienceBase Web site on the project landing page (Buell and others, 2017). To obtain a copy of the databases, go to the project landing page and scroll down to "Child Items." Each database has its own Child Item Web page. Select the database Child Item of interest and click on the link. On the Child Item Web page, scroll down to "Attached Items" and click on the database zip file to download. Save the zip file to a desired directory location, right click on the zip file, and use the "Extract All…" function to extract the database documents.

Data accessibility requires Microsoft Office 2007+ software for full use of the Microsoft Access and Excel files. Users without access to Microsoft Office 2007+ software can download and install the free Microsoft Excel Viewer that allows the user to read, view, print, and export Microsoft Excel 97+ workbooks (Microsoft, 2015). Microsoft does not provide a reader for Microsoft Access; however, the free office-productivity suite OpenOffice.org provides read and write access to Microsoft Access and Microsoft Excel files (OpenOffice.org, 2015).

Database Directory Structure—Data Organization Basics

Each hydrologic and landscape database is organized into three directories: (1) data, (2) iha, and (3) plots_pdf. The data directory contains tabular raw data and statistics in a set of Microsoft Access 2007, ASCII, and Microsoft Excel 2007 files. The iha directory contains Microsoft Excel files with results of (IHA) computations. The plots_pdf directory contains Adobe PDF files of plots summarizing hydrologic data stored in the data directory. See Part II for further description of files for each database.

Roadmap to Part II of This Report

Part II of this report is divided into five chapters (Chapters A through E) that each describe one of the NWR databases in detail. Chapter A describes the Cahaba River NWR and contributing watersheds in Alabama; Chapter B describes the Caloosahatchee and J.N. "Ding" Darling NWRs and contributing watersheds in Florida; Chapter C describes the Clarks River NWR and contributing watersheds in Kentucky, Tennessee, and Mississippi; Chapter D describes the Lower Suwannee NWR and contributing watersheds in Georgia and Florida; and Chapter E describes the Okefenokee NWR and contributing watersheds in Georgia and Florida (fig. 1; table 1).

Each chapter includes a set of tables and figures to summarize the contents (data and files) available in the corresponding database. The set of tables and figures in each chapter follow a similar format, which is outlined in table 5*A*–*B*.

Data Relevance to Refuge Management Concerns

These databases have been designed to provide information that can be used to explore potential issues related to the refuges. For example, a refuge manager concerned about the impacts of flow releases from Lake Okeechobee on water quality at Caloosahatchee and J.N. “Ding” Darling NWRs can refer to “Chapter B. Hydrologic and Landscape Database for the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges and Contributing Watersheds in Southern Florida” and the related database for Chapter B. Issues of environmental concern identified at these refuges include the effects of nutrient-rich releases from Lake Okeechobee on water quality at Caloosahatchee NWR and maintaining estuarine salinity within an acceptable range at J.N. “Ding” Darling NWR (table B1). In this scenario, referring to figure B1, the refuge manager or his consultant sees that a number of gaging stations are located along the Caloosahatchee River between Lake Okeechobee and J.N. “Ding” Darling NWR on the Gulf Coast, and referring to table B2*B*, the specific parameters and available period of record can be identified for each gage. The manager sees that two approximately co-located gaging stations located a short distance upstream from Caloosahatchee NWR (USGS gaging stations 02292900 and 02292901) have overlapping periods of record collectively extending from 1963 to 2012 and that gage height, discharge, water temperature, and specific conductance data (which could serve as a proxy for nutrient concentrations) are available for portions of this time. The manager also notes that USGS gaging stations 02293205 and 263144082010400, located about 6 miles downstream from Caloosahatchee NWR and near the mouth of the Caloosahatchee River, respectively, each have partial salinity data for 2007 to 2010. Referring to table B7, the refuge manager uses the summary data plots to quickly explore long-term and seasonal patterns in the parameters of interest at these locations. For more detailed analysis, the manager or his consultant would refer to table B3*A* to identify the database or worksheet files containing the raw data, descriptive statistics, or IHA metrics for the stations and parameters of particular interest, and to table B3*B* for definitions of specific data fields within each database or worksheet.

References Cited in Part I

Anderson, J.R., Hardy, E.E., Roach, J.T., and Witmer, R.E., 1976, A land use and land cover classification system for use with remote sensor data: U.S. Geological Survey Professional Paper 964, 28 p.

Buell, G.R., Calhoun, D.L., and Wehmeyer, L.L., 2009, Hydrologic and land-use/land-cover metrics used in ecological assessments of six U.S. Fish and Wildlife Service National Wildlife Refuges in the Southeastern U.S.A., *in* Proceedings of the 2009 Georgia Water Resources Conference, April 27–29, 2009, Athens, Ga., 8 p.

Buell, G.R., Gurley, L.N., Calhoun, D.L., and Hunt, A.M., 2017, Five hydrologic and landscape databases for select National Wildlife Refuges in Southeastern United States: U.S. Geological Survey data release, accessed February 17, 2017, at https://doi.org/10.5066/F7416V4.

Buell, G.R., Wehmeyer, L.L., and Calhoun, D.L., 2012, Hydrologic and landscape database for the Cache and White River National Wildlife Refuges and contributing watersheds in Arkansas, Missouri, and Oklahoma: U.S. Geological Survey Open-File Report 2012–1026, 79 p.

Fry, J.A., Coan, M.J., Homer, C.G., Meyer, D.K., and Wickham, J.D., 2009, Completion of the National Land Cover Database (NLCD) 1992–2001 Land Cover Change Retrofit product: U.S. Geological Survey Open-File Report 2008–1379, 18 p., accessed March 23, 2015, at http://www.mrlc.gov/nlcdrlc.php.

Gebert, W.A., Graczyk, D.J., and Krug, W.R., 1987, Average annual runoff in the United States, 1951–80: U.S. Geological Survey Hydrologic Investigations Atlas HA–710, scale 1:7,500,000, accessed March 21, 2011, at https://pubs.er.usgs.gov/publication/ha710.

Homer, C., Dewitz, J., Fry, J., Coan, M., Hossain, N., Larson, C., Herold, N., McKerrow, A., VanDriel, J.N., and Wickham, J., 2007, Completion of the 2001 National Land Cover Database for the Conterminous United States, Photogrammetric Engineering and Remote Sensing: U.S. Geological Survey National Land Cover Database 2001 (NLCD 2001), v. 73, no. 4, p. 337–341, accessed March 23, 2015, at http://www.mrlc.gov/nlcd2001.php.

Ingram, K., Dow, K., Carter, L., and Anderson, J., eds., 2013, Climate of the Southeast United States—Variability, change, impacts, and vulnerability: Washington D.C., Island Press, 341 p. [Also available at http://cakex.org/virtual-library/climate-southeast-united-states-variability-change-impacts-and-vulnerability.]

Melillo, J.M., Richmond, T.C., and Yohe, G.W., 2014, Highlights of climate change impacts in the United States—The Third National Climate Assessment: U.S. Global Change Research Program, 148 p. [Also available at http://nca2014.globalchange.gov/downloads.]

Microsoft, 2015, Microsoft Download Center—Excel Viewer, accessed March 25, 2015, at http://www.microsoft.com/en-us/download/details.aspx?id=10.

Morse, Susan, 2011, Water resources survey gets underway, in U.S. Fish and Wildlife Service, Refuge update, National Wildlife Refuge system: U.S. Fish and Wildlife Service, v. 8, no. 1, p. 3, accessed March 1, 2011, at https://www.fws.gov/refuges/RefugeUpdate/pdfs/refUp_JanFeb_2011.pdf.

National Oceanic and Atmospheric Administration, 2011, NOAA's coastal geospatial data project: GIS files—Download, accessed February 14, 2011, at http://coastalgeospatial.noaa.gov/data_gis.html.

OpenOffice.org, 2015, OpenOffice.org—The free and open productivity suite: Apache OpenOffice, accessed September 29, 2015, at http://www.openoffice.org/.

Richards, R.P., 1989, Measures of flow variability for Great Lakes tributaries: Environmental Monitoring and Assessment, v. 13, accessed November 30, 2016, at (https://www.ncbi.nlm.nih.gov/pubmed/24243183.

Richter, B.D., Baumgartner, J.V., Powell, J., and Braun, D.P., 1996, A method for assessing hydrologic alteration within ecosystems: Conservation Biology, v. 10, p. 1163–1174.

SAS Institute Inc., 2015, SAS product documentation, Cary, N.C.: SAS Institute Inc., accessed March 25, 2015, at http://support.sas.com/documentation/index.html.

Seaber, P.R., Kapinos, F.P., and Knapp, G.L., 1994, Hydrologic unit maps: U.S. Geological Survey Water-Supply Paper 2294, 66 p.

Soil Survey Staff, 2011, U.S. general soil map (STATSGO2): U.S. Department of Agriculture, Natural Resources Conservation Service, accessed March 1, 2011, at http://soils.usda.gov/survey/geography/statsgo/.

The Nature Conservancy, 2009, Indicators of hydrologic alteration, Version 7.1, User's manual: The Nature Conservancy with rPurview LLC-Ted Rybicki, Totten Software Design, Smythe Scientific Software, 81 p., accessed April 1, 2015, at http://www.conservationgateway.org/ConservationPractices/Freshwater/EnvironmentalFlows/MethodsandTools/IndicatorsofHydrologicAlteration/Documents/IHAV7.pdf.

U.S. Census Bureau, 2011, 2010 Census TIGER/Line Shapefiles, accessed February 14, 2011, at http://www.census.gov/geo/www/tiger/tgrshp2010/tgrshp2010.html.

U.S. Department of Agriculture, 1994 State soil geographic (STATSGO) data base—Data use information: Natural Resources Conservation Service, National Soil Survey Center, Miscellaneous Publication Number 1492, 35 p.

U.S. Department of Agriculture, 2011, Watershed boundary dataset (WBD): Natural Resources Conservation Service, accessed February 11, 2011, at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/water/watersheds/.

U.S. Environmental Protection Agency, 2011, Level III and IV ecoregions of the continental United States: Western Ecology Division, accessed November 30, 2016, at https://catalog.data.gov/dataset/u-s-level-iii-and-iv-ecoregions-u-s-epa.

U.S. Fish and Wildlife Service, 2011, USFWS national cadastral data, National Wildlife Refuge and hatchery boundaries: Geospatial Services, Informational Resources and Technology Management, Cadastral Data Working Group, accessed March 1, 2011, at http://www.fws.gov/GIS/data/CadastralDB/index_cadastral.html.

U.S. Fish and Wildlife Service, 2012, Water Resource Inventory and Assessment (WRIA) effort, Natural Resource Program Center, accessed March 13, 2015, at http://www.fws.gov/refuges/NaturalResourcePC/pdfs/FY2012_NRPC_WRIA_Fact_Sheet.pdf.

U.S. Geological Survey, 1998, National Water Information System (NWIS): U.S. Geological Survey Fact Sheet FS–027–98, 2 p., accessed March 24, 2015, at http://pubs.usgs.gov/fs/FS-027-98/.

U.S. Geological Survey, 2007a, Facing tomorrow's challenges—U.S. Geological Survey science in the decade 2007–2017: U.S. Geological Survey Circular 1309, 81 p., accessed March 13, 2015, at http://pubs.usgs.gov/circ/2007/1309/.

U.S. Geological Survey, 2007b, Facing tomorrow's challenges—U.S. Geological Survey science in the decade 2007–2017—Understanding ecosystems and predicting ecosystem change: U.S. Geological Survey Fact Sheet 2007–3107, 2 p., accessed March 13, 2015, at http://pubs.usgs.gov/fs/2007/3107/.

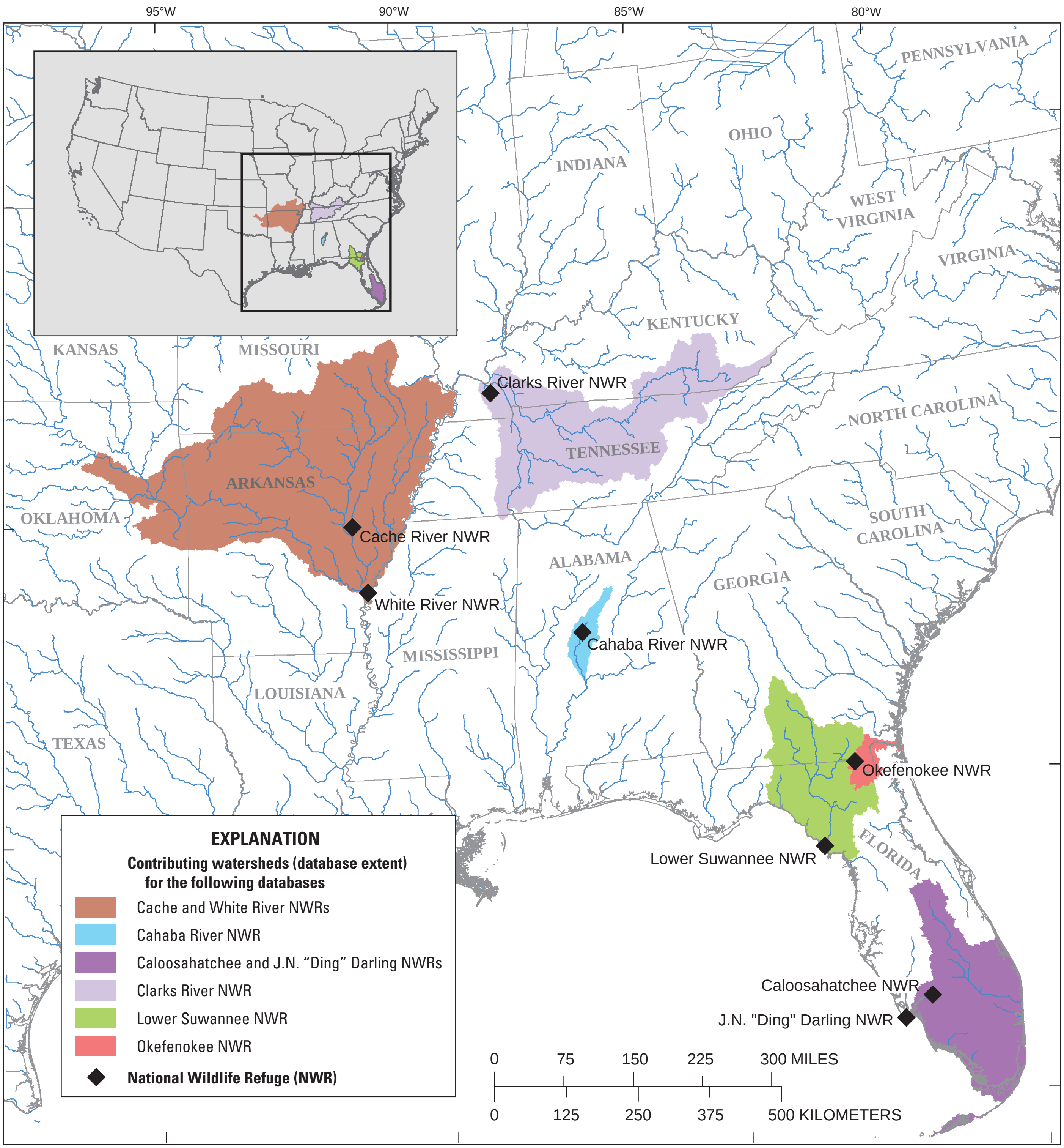
U.S. Geological Survey, 2011, National hydrography dataset, accessed February 14, 2011, at http://nhd.usgs.gov/.

U.S. Geological Survey, 2015, User's manual for the National Water Information System of the U.S. Geological Survey—Automated Data Processing System (ADAPS), version 5.1, 479 p., accessed August 6, 2015, at http://nwis.usgs.gov/currentdocs/adaps/adaps.book.html.

U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013, Federal Standards and Procedures for the National Watershed Boundary Dataset (WBD) (4th ed.): U.S. Geological Survey Techniques and Methods, book 11, chap. A3, 77 p.

Vogelmann, J.E., Howard, S.M., Yang, Limin, Larson, C.R., Wylie, B.K., and Van Driel, J.N., 2001, Completion of the 1990s National Land Cover Data Set for the conterminous United States from Landsat thematic mapper data and ancillary data sources, Photogrammetric Engineering and Remote Sensing, v. 67, p. 650–662, accessed March 23, 2015, at http://www.mrlc.gov/nlcd1992.php.

Wolock, D.M., 1997, STATSGO soil characteristics for the conterminous United States: U.S. Geological Survey Open-File Report 97–656, accessed March 23, 2015, at http://water.usgs.gov/GIS/metadata/usgswrd/XML/muid.xml.



Base modified from U.S. Geological Survey digital data, various scales

Figure 1. Location of contributing watersheds (database extents) for the Cache and White River National Wildlife Refuges (NWRs), Cahaba River NWR, Caloosahatchee and J.N. "Ding" Darling NWRs, Clarks River NWR, Lower Suwannee NWR, and Okefenokee NWR.

Table 1. Database characteristics, including database name, associated National Wildlife Refuge(s), locality, year of database compilation, and report.

[NWR, National Wildlife Refuge]

Database name	National Wildlife Refuge(s)	Locality	Year of database compilation
Hydrologic and landscape database for the Cache and White River NWRs and contributing watersheds[1]	Cache River NWR and White River NWR	Arkansas, Missouri, and Oklahoma	2011
Hydrologic and landscape database for the Cahaba River NWR and contributing watersheds	Cahaba River NWR	Alabama	2011
Hydrologic and landscape database for the Caloosahatchee and J.N. "Ding" Darling NWRs and contributing watersheds	Caloosahatchee NWR and J.N. "Ding" Darling NWR	Florida	2013
Hydrologic and landscape database for the Clarks River NWR and contributing watersheds	Clarks River NWR	Kentucky, Tennessee, and Mississippi	2012
Hydrologic and landscape database for the Lower Suwannee NWR and contributing watersheds	Lower Suwannee NWR	Georgia and Florida	2012
Hydrologic and landscape database for the Okefenokee NWR and contributing watersheds	Okefenokee NWR	Georgia and Florida	2014

[1]Described and documented in Buell and others (2012).

Table 2. Hierarchy and naming convention for hydrologic units used throughout this report and associated databases.

[From Seaber and others, 1994; U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013]

Number of digits	Name
2	Region
4	Subregion
6	Accounting unit
8	Cataloging unit
10	10-digit hydrologic unit
12	12-digit hydrologic unit

Table 3*A*. Types and sources of hydrologic data compiled for each database.

[Source: GADOT, Georgia Department of Transportation; TVA, Tennessee Valley Authority; SFWMD, South Florida Water Management District; USACE, U.S. Army Corps of Engineers; USGS, U.S. Geological Survey; NAVD 88, North American Vertical Datum of 1988]

Data type	National Wildlife Refuge (source)				
	Cahaba River (USGS)	Caloosahatchee and J.N. "Ding" Darling (USGS, USACE, SFWMD)	Clarks River (USGS, USACE, TVA)	Lower Suwannee (USGS, GADOT)	Okefenokee (USGS)
Surface-water data					
Gage height	X	X	X	X	X
Elevation above NAVD 88					X
Discharge	X	X	X	X	X
Water temperature	X	X	X	X	X
Specific conductivity	X	X	X	X	
Dissolved oxygen	X		X		
Precipitation		X			X
Salinity		X		X	
Suspended-sediment concentration			X		
Suspended-sediment discharge			X		
pH			X		
Turbidity			X		
Stream velocity					X
Groundwater data					
Elevation above NAVD 88					X
Depth to water level					X

Table 3*B*. Types and sources of landscape and spatial data compiled and mapped for this report.

[Source: USFWS, U.S. Fish and Wildlife Service; USCB, U.S. Census Bureau; NOAA, National Oceanic and Atmospheric Administration; USDA, U.S. Department of Agriculture; EPA, U.S. Environmental Protection Agency; MRLC, Multi-Resolution Land Characteristics Consortium; NHD, National Hydrography Dataset; NLCD, National Land Cover Database; STATSGO, State Soil Geographic [database]]

Data type	Data-source agency[a]
Boundaries	
Refuge	USFWS
State	USCB, NOAA
County	USCB
City	USCB
Hydrologic unit	USDA
Ecoregions	EPA
Hydrography (NHD)	
Flowlines	USGS
Water bodies	USGS
Water areas	USGS
Runoff	USGS
Site locations	USGS[b]
Land use/land cover and soils (NLCD)	
1992	MRLC
2001	MRLC
1992–2001 change	MRLC
Soils (STATSGO)	USDA

[a]Source consistent for all databases, unless otherwise noted.

[b]Site location data also taken from South Florida Water Management District for the database for the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuge and contributing watersheds.

Table 4. Indicators of Hydrologic Alteration (IHA) hydrologic-parameter groups, environmental-flow component groups, and parameter and component definitions used in IHA analyses.

[IHA parameter-group definitions, environmental-flow-component group definitions, and parameter and component definitions listed in Richter and others (1996) and The Nature Conservancy (2009); parameter group 1, magnitude of monthly water conditions; parameter group 2, magnitude and duration of annual extreme water conditions; parameter group 3, timing of annual extreme water conditions; parameter group 4, frequency and duration of high and low pulses; parameter group 5, rate and frequency of water-condition changes; environmental-flow component (EFC) group 1, monthly low flows; EFC group 2, extreme low flows; EFC group 3, high-flow pulses; EFC group 4, small floods; EFC group 5, large floods; all analyses are done on a water-year basis (October 1, previous calendar year, through September 30, current calendar year)]

Parameter group/ EFC group	Parameter/ component name	Parameter/component definition
	Hydrologic parameter groups	
Parameter group 1	October	Water-year annual monthly median value for October
	November	Water-year annual monthly median value for November
	December	Water-year annual monthly median value for December
	January	Water-year annual monthly median value for January
	February	Water-year annual monthly median value for February
	March	Water-year annual monthly median value for March
	April	Water-year annual monthly median value for April
	May	Water-year annual monthly median value for May
	June	Water-year annual monthly median value for June
	July	Water-year annual monthly median value for July
	August	Water-year annual monthly median value for August
	September	Water-year annual monthly median value for September
Parameter group 2	1-day minimum	Water-year annual minimum 1-day mean value
	3-day minimum	Water-year annual minimum 3-day mean value
	7-day minimum	Water-year annual minimum 7-day mean value
	30-day minimum	Water-year annual minimum 30-day mean value
	90-day minimum	Water-year annual minimum 90-day mean value
	1-day maximum	Water-year annual maximum 1-day mean value
	3-day maximum	Water-year annual maximum 3-day mean value
	7-day maximum	Water-year annual maximum 7-day mean value
	30-day maximum	Water-year annual maximum 30-day mean value
	90-day maximum	Water-year annual maximum 90-day mean value
	Number of zero days	Water-year annual number of zero-flow days
	Base-flow index	Water-year annual minimum 7-day mean value/Water-year annual mean value
Parameter group 3	Date of minimum	Julian date of water-year annual minimum 1-day mean value
	Date of maximum	Julian date of water-year annual maximum 1-day mean value
Parameter group 4[a]	Low-pulse count	Water-year annual number of low pulses
	Low-pulse duration	Water-year annual median duration of low pulses
	High-pulse count	Water-year annual number of high pulses
	High-pulse duration	Water-year annual median duration of high pulses
Parameter group 5	Rise rate	Water-year annual median positive difference in mean-daily values
	Fall rate	Water-year annual median negative difference in mean-daily values
	Number of reversals	Water-year annual number of hydrologic reversals (hydrograph sign changes)

Table 4. Indicators of Hydrologic Alteration (IHA) hydrologic-parameter groups, environmental-flow component groups, and parameter and component definitions used in IHA analyses.—Continued

[IHA parameter-group definitions, environmental-flow-component group definitions, and parameter and component definitions listed in Richter and others (1996) and The Nature Conservancy (2009); parameter group 1, magnitude of monthly water conditions; parameter group 2, magnitude and duration of annual extreme water conditions; parameter group 3, timing of annual extreme water conditions; parameter group 4, frequency and duration of high and low pulses; parameter group 5, rate and frequency of water-condition changes; environmental-flow component (EFC) group 1, monthly low flows; EFC group 2, extreme low flows; EFC group 3, high-flow pulses; EFC group 4, small floods; EFC group 5, large floods; all analyses are done on a water-year basis (October 1, previous calendar year, through September 30, current calendar year)]

Parameter group/ EFC group	Parameter/ component name	Parameter/component definition
	Environmental-flow-component groups	
EFC group 1[b]	October low flow	Water-year annual median value of October low flows
	November low flow	Water-year annual median value of November low flows
	December low flow	Water-year annual median value of December low flows
	January low flow	Water-year annual median value of January low flows
	February low flow	Water-year annual median value of February low flows
	March low flow	Water-year annual median value of March low flows
	April low flow	Water-year annual median value of April low flows
	May low flow	Water-year annual median value of May low flows
	June low flow	Water-year annual median value of June low flows
	July low flow	Water-year annual median value of July low flows
	August low Flow	Water-year annual median value of August low flows
	September low flow	Water-year annual median value of September low flows
EFC group 2[c]	Extreme low-flow duration	Water-year annual median duration of an extreme low-flow event
	Extreme low-flow peak	Water-year annual median minimum value during an extreme low-flow event
	Extreme low-flow timing	Water-year annual median Julian date of minimum value during an extreme low-flow event
	Extreme low-flow frequency	Water-year annual number of extreme low-flow events
EFC group 3[d]	High-flow pulse duration	Water-year annual median duration of a high-flow pulse event
	High-flow pulse peak	Water-year annual median minimum value during a high-flow pulse event
	High-flow pulse timing	Water-year annual median Julian date of minimum value during a high-flow pulse event
	High-flow pulse frequency	Water-year annual number of high-flow pulse events
	High-flow pulse rise rate	Water-year annual median rise rate of high-flow pulse events—median value of the median positive difference in mean-daily values for each high-flow pulse event
	High-flow pulse fall rate	Water-year annual median fall rate of high-flow pulse events—median value of the median negative difference in mean-daily values for each high-flow pulse event
EFC group 4[e]	Small-flood duration	Water-year annual median duration of a small-flood event
	Small-flood peak	Water-year annual median minimum value during a small-flood event
	Small-flood timing	Water-year annual median Julian date of minimum value during a small-flood event
	Small-flood frequency	Water-year annual number of small-flood events
	Small-flood rise rate	Water-year annual median rise rate of small-flood events—median value of the median positive difference in mean-daily values for each small-flood event
	Small-flood fall rate	Water-year annual median fall rate of small-flood events—median value of the median negative difference in mean-daily values for each small-flood event

Table 4. Indicators of Hydrologic Alteration (IHA) hydrologic-parameter groups, environmental-flow component groups, and parameter and component definitions used in IHA analyses.—Continued

[IHA parameter-group definitions, environmental-flow-component group definitions, and parameter and component definitions listed in Richter and others (1996) and The Nature Conservancy (2009); parameter group 1, magnitude of monthly water conditions; parameter group 2, magnitude and duration of annual extreme water conditions; parameter group 3, timing of annual extreme water conditions; parameter group 4, frequency and duration of high and low pulses; parameter group 5, rate and frequency of water-condition changes; environmental-flow component (EFC) group 1, monthly low flows; EFC group 2, extreme low flows; EFC group 3, high-flow pulses; EFC group 4, small floods; EFC group 5, large floods; all analyses are done on a water-year basis (October 1, previous calendar year, through September 30, current calendar year)]

Parameter group/ EFC group	Parameter/ component name	Parameter/component definition
Environmental-flow-component groups—Continued		
EFC group 5[f]	Large-flood duration	Water-year annual median duration of a large-flood event
	Large-flood peak	Water-year annual median minimum value during a large-flood event
	Large-flood timing	Water-year annual median Julian date of minimum value during a large-flood event
	Large-flood frequency	Water-year annual number of large-flood events
	Large-flood rise rate	Water-year annual median rise rate of large-flood events—median value of the median positive difference in mean-daily values for each large-flood event
	Large-flood fall rate	Water-year annual median fall rate of large-flood events—median value of the median negative difference in mean-daily values for each large-flood event

[a] The low-pulse threshold is the 50th percentile of the mean-daily flows minus 25 percent. If the low-pulse threshold is zero, for any given day, the value for that day is reset to the 25th percentile of the mean-daily flows. The high-pulse threshold is the 50th percentile of the mean-daily flows plus 25 percent.

[b] The low-flow threshold is the median value (50th percentile) of the mean-daily flows. All values less than this threshold are classified as low flows. Additionally, mean-daily values between the 50th and 75th percentiles—low-flow and high-flow thresholds—are also classified as low flows if a daily value within this range does not meet the filtering criteria for a high-flow value (reference footnote d).

[c] The extreme low-flow threshold is the 10th percentile of the mean-daily low flows. All values less than this threshold are classified as extreme low flows.

[d] High-flow pulses are mean-daily values that have been classified as high flows but not classified as either small floods or large floods. The initial high-flow classification is based on the high-flow threshold of the 75th percentile of the mean-daily flows. All values greater than this threshold value are classified as high flows. Additionally, mean-daily values between the 50th and 75th percentiles—low-flow and high-flow thresholds—are also classified as high flows if a daily value exceeds the high-flow start-rate threshold (more than 25 percent greater than the value for the preceding day), is on the ascending limb of a high-flow event (either greater than or equal to the high-flow value for the preceding day or above the high-flow end-rate threshold—less than 10 percent less than the value for the preceding day), or is on the descending limb of a high-flow event and has not exceeded the high-flow end-rate threshold (more than 10 percent less than the value for the preceding day).

[e] Small floods are high-flow values that have period-of-record recurrence interval greater than 2 years and less than or equal to 10 years.

[f] Large floods are high-flow values that have a recurrence interval greater than 10 years.

Table 5*A*. Set of tables in each chapter.

[NWR, National Wildlife Refuge]

Table number[a]	Table description
X1	NWR Management priorites and environmental concerns
X2*A*	Station characteristics (for chapter E, station characteristics are described in tables E2*A* and E2*B*)
X2*B*	Station period of record (for chapter E, station period of record is described in tables E2*C* and E2*D*)
X3*A*	Database files, tables, and worksheet descriptions
X3*B*	Database field names and definitions
X4*A*	Summary statistics for gage height measurements by water year
X4*B*	Summary statistics for gage height measurements by calendar year
X5*A*	Summary statistics for discharge measurements by water year
X5*B*	Summary statistics for discharge measurements by calendar year
X6*A*	Summary statistics for water quality measurements by water year
X6*B*	Summary statistics for water quality measurements by calendar year
X7	Graphical summary files
X8	Land-cover percentages 1992
X9	Land-cover percentages 2001
X10	Land-cover change percentages 1992–2001

[a]Table number listed where X represents chapter letter.

Table 5*B*. Set of figures in each chapter.

Figure number[a]	Figure description
X1	Location map(s)
X2	Ecoregion and mean annual runoff map(s)
X3	Soil group maps
X4	Period of record diagram(s) for mean daily gage height
X5	Period of record diagram(s) for mean daily discharge
X6	Land-cover map(s) 1992
X7	Land-cover map(s) 2001
X8	Land-cover-change map(s) 1992–2001

[a]Figure number listed where X represents chapter letter.

Part II. Databases

Chapter A. Hydrologic and Landscape Database for the Cahaba River National Wildlife Refuge and Contributing Watersheds in Alabama

Introduction

This chapter, along with the information provided in Part I of this report, describes and documents the development, use, and context of a hydrologic and landscape database for the Cahaba River National Wildlife Refuge (NWR) and contributing watersheds in Alabama (fig. A1). NWR-management objectives for the Cahaba River NWR (table A1; U.S. Fish and Wildlife Service, 2007; Thom and others, 2013) include protection and management of a biologically unique corridor of the Cahaba River, habitat for five federally endangered or threatened species: the Cahaba shiner (*Notropis cahabae*), goldline darter (*Percina aurolineata*), round rocksnail (*Leptoxis ampla*), cylindrical lioplax (*Lioplax cyclostomaformis*) snail, and the largest known stand of the imperial shoals lily (Cahaba lily [*Hymenocallis coronaria*]). In addition, restoration of the native longleaf pine (*Pinus palustris*) and removal of the planted loblolly pine (*Pinus taeda*) are important management objectives. The development and implementation of environmental education programs with emphasis on ecosystem management and stewardship are also an important NWR objective.

NWR Setting and Environmental Issues

The Cahaba River NWR was established in 2002 primarily to conserve, protect, and restore native species and their habitat, prioritize and establish general public recreational uses, and promote awareness of the NWR. The NWR is located in Bibb County, Alabama, and is managed out of Anniston, Alabama. It presently includes 3,681 acres with an approved acquisition area of 7,600 acres for future growth. The NWR is hilly and becomes steep along rivers and streams. Most of the NWR is covered with loblolly pine plantations and hardwood-mixed pine forest. Aquatic and wetland biodiversity in the area includes 131 fish species and 118 snail species (U.S. Fish and Wildlife Service, 2007; Thom and others, 2013).

Environmental issues threatening the Cahaba River NWR primarily concern water quality and quantity. Water quality is threatened by upstream urbanization and industry that result in excess sediment loads, nutrient loads, and sources of pollution. Coal, oil, and gas development near the refuge also affect water quality. Hydrologic flow alteration from dam construction and stream channelization change flow characteristics. Water quantity is affected by in-stream withdrawals for the city of Birmingham, Ala., from the Black Warrior River and effluent discharge into the Cahaba River. Further, water withdrawals are expected to increase with projected population growth, and potential long-term climate changes may also stress water quality and quantity in the future. In addition, the natural frequency of fires has declined and caused fire-dependent species to decrease. For example, the native longleaf pine population has significantly decreased. The establishment of a fire maintenance plan is important for restoration and management of native species (U.S. Fish and Wildlife Service, 2007; Thom and others, 2013). The data compiled for this database can be used to begin addressing these issues. For example, historical and current water-quality data set context and provide a foundation for future water-quality monitoring as urban and industrial areas continue to grow upstream from the Cahaba NWR. Historic and current discharge and gage height data provide U.S. Fish and Wildlife Service (USFWS) managers with a frame of reference to evaluate the impacts of hydrologic alteration caused by dam construction, stream channelization, and effluent discharge.

Physiographic Setting

The contributing watershed area for the Cahaba River NWR, as defined in this report, is the hydrologic cataloging unit (CU) (8-digit hydrologic unit) 03150202, Cahaba, located within the hydrologic subregion (4-digit hydrologic unit) 0315, Alabama (fig. A1) (Seaber and others, 1994; U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013). The drainage area of the Cahaba CU is 1,824 square miles.

The Cahaba River NWR is located in the central part of the Cahaba CU within the Ridge and Valley U.S. Environmental Protection Agency (EPA) Level III ecoregion (fig. A2) (U.S. Environmental Protection Agency, 2011). The Cahaba CU is predominantly split between the Ridge and Valley Level III ecoregion in the north and the Southeastern Plains Level III ecoregion in the south. Small sections of the Southwestern

Appalachians and Piedmont Level III ecoregions are located on the west and east sides of the Cahaba CU, respectively. Mean-annual precipitation for the Cahaba CU ranges from 52 to 57 inches per year (in/yr) based on 1981–2010 climate normals (PRISM Climate Group, 2012). Mean-annual runoff for the period 1951–80 (Gebert and others, 1987) ranges from 20 in/yr in the southern part of the Cahaba CU to 28 in/yr in the northwestern part of the Cahaba CU. Figures A3*A–D* show the distribution of hydrologic soil groups (HSG) A through D for the forty 12-digit hydrologic units (HUC12) in the contributing watershed area as areal percentages of each HUC12.

Data and Database Files

Hydrologic and Landscape Data

Twelve gaging stations were selected to be included in the hydrologic and landscape database for the Cahaba River NWR and contributing watersheds (fig. A1; tables A2*A–B* [tables A2–A10 are at the end of the chapter]). Continuous hydrologic data collected at these stations include gage height, discharge, water temperature, specific conductivity, and dissolved oxygen. Station characteristics are presented in table A2*A*, and station periods of record for available continuous data from each site are presented in table A2*B*. Two stations have daily record for discharge only, 8 stations have daily record for both discharge and gage height, 1 station has daily record for discharge, gage height, and water temperature, and 1 station has daily record for discharge, gage height, water temperature, specific conductance, and dissolved oxygen (table A2*B*). Gaging station locations, station-description data, and hydrologic data included in this database were retrieved from the U.S. Geological Survey (USGS) National Water Information System (NWISWeb) database (U.S. Geological Survey, 2002, 2011).

Tabular and spatial landscape data were compiled. Categories of tabular landscape data summarized in Microsoft Excel files in the database include ecoregions, land cover, population, and soils data. Spatial data mapped in this report include ecoregions, land cover, soils, geographic and hydrologic boundaries, hydrography, and site locations.

Database Files

Database files are organized into three directories: (1) data, (2) iha, and (3) plots_pdf. The data directory contains three subdirectories: (1) access, (2) ascii, and (3) excel. The access subdirectory contains two Microsoft Access files with raw hydrologic data (chb_tabular_hydrostats_raw.accdb) and statistical summary data (chb_tabular_hydrostats.accdb). The raw data are aggregated by calendar year (January 1 through December 31) and water year (October 1 through September 30) for annual summaries, and also by calendar decade, calendar year and month, calendar month of the period of record, and Julian day over the period of record for both calendar and water years. The long-term (period of record) monthly and daily summary data are for complete years only. The long-term monthly summary data are based on both mean-daily values and monthly mean values. The ascii subdirectory contains raw NWISWeb data files that follow the naming convention sSSSSSSSS[dv,pk]_rdb, where SSSSSSSS is the USGS station identification number, dv is daily value, and pk is peak value. The excel subdirectory contains four Microsoft Excel files summarizing ecoregion (chb_eco34.xlsx), land cover (chb_nlcd.xlsx), population (chb_pop_census.xlsx), and soils (chb_sgo_hsg.xlsx) data. The iha directory contains Microsoft Excel files with Indicators of Hydrologic Alteration (IHA) outputs for each station and parameter combination in which IHA computations were completed. The files follow the naming convention sSSSSSSSS_iha_[gmn,qmn].xlsx, where SSSSSSSS is the USGS station identification number, gmn is mean-daily gage height, and qmn is mean-daily discharge. In addition, an IHA summary workbook (regional_iha_chb.xlsx) is included that contains the data for three stations: the two closest stations upstream from the Cahaba NWR (02423555 and 02423630) and the Cahaba River station farthest upstream from the Cahaba NWR (02423380). The plots_pdf directory contains Adobe portable document file (PDF) plot files. A list of database Microsoft Access and Microsoft Excel files, table and worksheet names, and table and worksheet descriptions is included in table A3*A*. A list of database field names, field types, and field definitions is included in table A3*B*. Periods of record for mean-daily gage height and mean-daily discharge data used in IHA analyses are shown in figures A4 and A5, respectively.

Database Summary Data

This section includes statistical and graphical summaries of the hydrologic data and IHA summary data, and zonal summaries of the National Land Cover Database (NLCD) land-cover and land-cover-change data. The summary data describe the data in the database, provide a context for hydrologic analysis, and can help database users determine which data are suitable for answering specific NWR hydrologic questions related to environmental issues discussed above.

Hydrologic Statistical and Graphical Summary

A station-level summary of the hydrologic data by both water year and calendar year is presented in tables A4–A6. The primary purpose of these summary tables is to provide database users with information on the quantity and quality of available data, facilitate comparisons between stations, and provide a benchmark for evaluating current hydrologic conditions within the context of the long-term record. Tables A4*A* (water year) and A4*B* (calendar year) summarize the mean-annual and mean-daily gage-height values for each gaging station. The mean, minimum, and maximum values and the 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles are given for mean-annual gage height; and the minimum and maximum and the same percentiles are also given for mean-daily gage height. The water or calendar year is indicated for the minimum and maximum values for mean-annual and mean-daily gage height. Tables A5*A* (water year) and A5*B* (calendar year) present the same statistics for discharge (with the addition of long-term yield). Tables A6*A* and A6*B* present the same statistics for selected water-quality parameters. Table A7 lists the graphical summary plots available for each gaging station. Plot files are located in the plots_pdf directory of the database. See Part I of this report for a detailed description of plot files.

Interstation Comparison of Indicators of Hydrologic Alteration

The IHA summary data for three stations are included in a separate Microsoft Excel workbook as a regional analysis (regional_iha_chb.xlsx). The stations selected for regional analysis are the two closest stations upstream from the Cahaba NWR (02423555 and 02423630) and the Cahaba River station farthest upstream from the Cahaba NWR (02423380). The IHA output has been reorganized in this workbook to facilitate interstation comparisons. The regional IHA workbook contains the following worksheets: 5 each for the 1-, 3-, 7-, 30-, and 90-day minimum and maximum values, 1 with the baseflow-index values, 1 with a plot of the 75th–25th percentile spread measure, a summary worksheet, and 1 for each station with the complete IHA analysis for that station included. This reorganization facilitates interstation comparison by compiling all of the IHA results into one place.

Landscape GIS Layers

Figures A6–A8 and tables A8–A10 present the land-cover and land-use data for the geographic extent based on the 1992 NLCD (Vogelmann and others, 2001), 2001 NLCD (Homer and others, 2007), and 1992–2001 NLCD-Land Cover Change Retrofit (LCCR) product (Fry and others, 2009) datasets. Land-cover and land-use percentages derived from the 1992 NLCD and 2001 NLCD data are summarized by 10- and 12-digit hydrologic units and NWR boundary in tables A8 and A9. The land-cover change percentages derived from 1992–2001 NLCD-LCCR are presented in table A10.

Summary

This chapter, along with methods described in Part I of this report, documents the development, use, and context of a hydrologic and landscape database for the Cahaba River National Wildlife Refuge (NWR) and contributing watersheds in Alabama. The contributing watersheds include those within the Cahaba hydrologic cataloging unit (CU) (03150202) with total drainage area of 1,824 square miles. The NWR is located in the central part of the Cahaba CU, within the Ridge and Valley U.S. Environmental Protection Agency Level III ecoregion. Activities throughout this geographic extent, particularly upstream urban development, dam construction and stream channelization, and increased effluent discharge into the Cahaba River from the city of Birmingham, Alabama, all have potential to either directly or indirectly affect the NWR. The contents of this database are useful for assessing these environmental issues to inform management decisions.

References Cited in Part II, Chapter A

Anderson, J.R., Hardy, E.E., Roach, J.T., and Witmer, R.E., 1976, A land use and land cover classification system for use with remote sensor data: U.S. Geological Survey Professional Paper 964, 28 p.

Baker, D.B., Richards, Peter, Loftus, T.T., and Kramer, J.W., 2004, A new flashiness index: characteristics and applications to midwestern rivers and streams: Journal of the American Water Resources Association , v. 40, p. 503–522.

Buell, G.R., Calhoun, D.L., and Wehmeyer, L.L., 2009, Hydrologic and land-use/land-cover metrics used in ecological assessments of six U.S. Fish and Wildlife Service National Wildlife Refuges in the Southeastern U.S.A., *in* Proceedings of the 2009 Georgia Water Resources Conference, April 27–29, 2009, Athens, Ga., 8 p.

Fry, J.A., Coan, M.J., Homer, C.G., Meyer, D.K., and Wickham, J.D., 2009, Completion of the National Land Cover Database (NLCD) 1992–2001 Land Cover Change Retrofit product: U.S. Geological Survey Open-File Report 2008–1379, 18 p., accessed March 23, 2015, at http://www.mrlc.gov/nlcdrlc.php.

Gebert, W.A., Graczyk, D.J., and Krug, W.R., 1987, Average annual runoff in the United States, 1951–80: U.S. Geological Survey Hydrologic Investigations Atlas HA–710, scale 1:7,500,000, accessed March 21, 2011, at https://pubs.er.usgs.gov/publication/ha710.

Homer, C., Dewitz, J., Fry, J., Coan, M., Hossain, N., Larson, C., Herold, N., McKerrow, A., VanDriel, J.N., and Wickham, J., 2007, Completion of the 2001 National Land Cover Database for the Conterminous United States, Photogrammetric Engineering and Remote Sensing: U.S. Geological Survey National Land Cover Database 2001 (NLCD 2001), v. 73, no. 4, p. 337–341, accessed March 23, 2015, at http://www.mrlc.gov/nlcd2001.php.

PRISM Climate Group [Oregon State University], 2012, United States average annual precipitation, 1981–2010 (4km; BIL), accessed March 10, 2015, at http://prism.oregonstate.edu.

Richter, B.D., Baumgartner, J.V., Powell, J., and Braun, D.P., 1996, A method for assessing hydrologic alteration within ecosystems: Conservation Biology, v. 10, p. 1163–1174.

Seaber, P.R., Kapinos, F.P., and Knapp, G.L., 1994, Hydrologic unit maps: U.S. Geological Survey Water-Supply Paper 2294, 66 p.

The Nature Conservancy, 2009, Indicators of hydrologic alteration, Version 7.1, User's manual: The Nature Conservancy with rPurview LLC-Ted Rybicki, Totten Software Design, Smythe Scientific Software, 81 p., accessed April 1, 2015, at http://www.conservationgateway.org/ConservationPractices/Freshwater/EnvironmentalFlows/MethodsandTools/IndicatorsofHydrologicAlteration/Documents/IHAV7.pdf.

Thom, T.A., Burns, R.E., Faustini, J., and Hunt, K.J., 2013, Water Resource Inventory and Assessment (WRIA)—Cahaba River National Wildlife Refuge, Bibb County, Alabama: U.S. Fish and Wildlife Service, Southeast Region, 102 p. plus appendixes. [Also available at http://ecos.fws.gov/ServCatFiles/reference/holding/23554.]

U.S. Department of Agriculture, 1994, State soil geographic (STATSGO) data base—Data use information: Natural Resources Conservation Service, National Soil Survey Center, Miscellaneous Publication Number 1492, 35 p.

U.S. Department of Agriculture, 2009, Hydrologic soil groups, Chapter 7 *in* National Engineering Handbook, Part 630, Hydrology: Natural Resources Conservation Service, 210-VI-NEH, 13 p., accessed March 12, 2015, at http://policy.nrcs.usda.gov/.

U.S. Environmental Protection Agency, 2011, Level III and IV ecoregions of the continental United States: Western Ecology Division, accessed November 30, 2016, at https://catalog.data.gov/dataset/u-s-level-iii-and-iv-ecoregions-u-s-epa.

U.S. Fish and Wildlife Service, 2007, Cahaba River National Wildlife Refuge habitat management plan, accessed March 17, 2015, at http://www.fws.gov/cahabariver/pdf/Cahaba%20River%20HMP-Final.pdf.

U.S. Geological Survey, 2002, NWISWeb—New site for the Nation's water data: U.S. Geological Survey Fact Sheet FS–128–02, 2 p., accessed March 24, 2015, at http://pubs.usgs.gov/fs/fs-128-02/.

U.S. Geological Survey, 2011, USGS water data for the Nation, National Water Information System, Web database (NWISWeb), accessed February 11, 2011, at http://waterdata.usgs.gov/usa/nwis/nwis.

U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013, Federal Standards and Procedures for the National Watershed Boundary Dataset (WBD) (4th ed.): U.S. Geological Survey Techniques and Methods, book 11, chap. A3, 77 p.

Vogelmann, J.E., Howard, S.M., Yang, Limin, Larson, C.R., Wylie, B.K., and Van Driel, J.N., 2001, Completion of the 1990s National Land Cover Data Set for the conterminous United States from Landsat thematic mapper data and ancillary data sources, Photogrammetric Engineering and Remote Sensing, v. 67, p. 650–662, accessed March 23, 2015, at http://www.mrlc.gov/nlcd1992.php.

Wolock, D.M., 1997, STATSGO soil characteristics for the conterminous United States: U.S. Geological Survey Open-File Report 97–656, accessed March 23, 2015, at http://water.usgs.gov/GIS/metadata/usgswrd/XML/muid.xml.

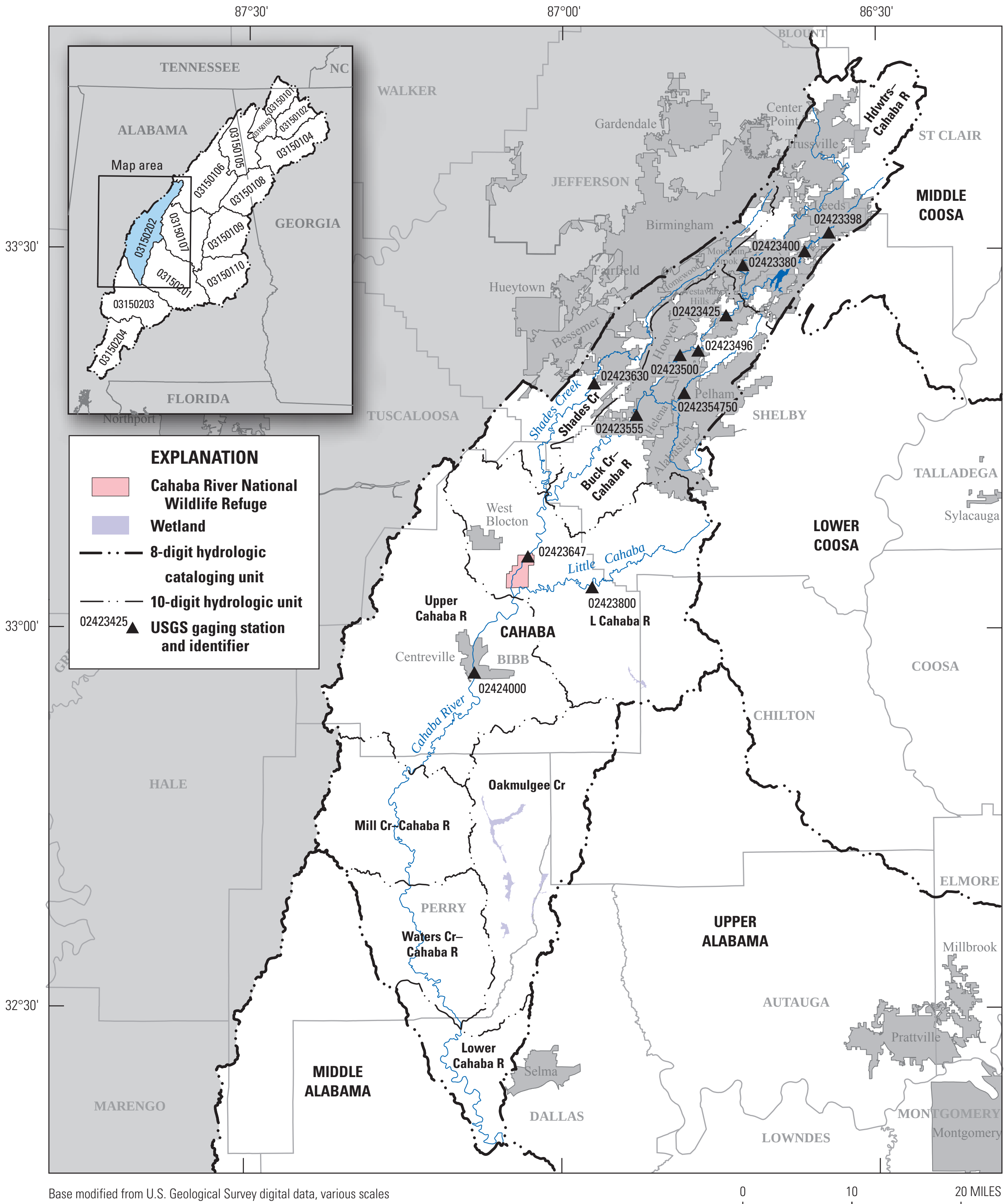


Figure A1. Location of the Cahaba River National Wildlife Refuge (NWR) and vicinity with major contributing watersheds, waterways, and gaging stations in Alabama. Map inset shows the hydrologic cataloging unit (8-digit hydrologic unit code 03150202, Cahaba) that defines the contributing watershed area for the Cahaba River NWR within the hydrologic subregion (4-digit hydrologic unit code 0315, Alabama). [USGS, U.S. Geological Survey]

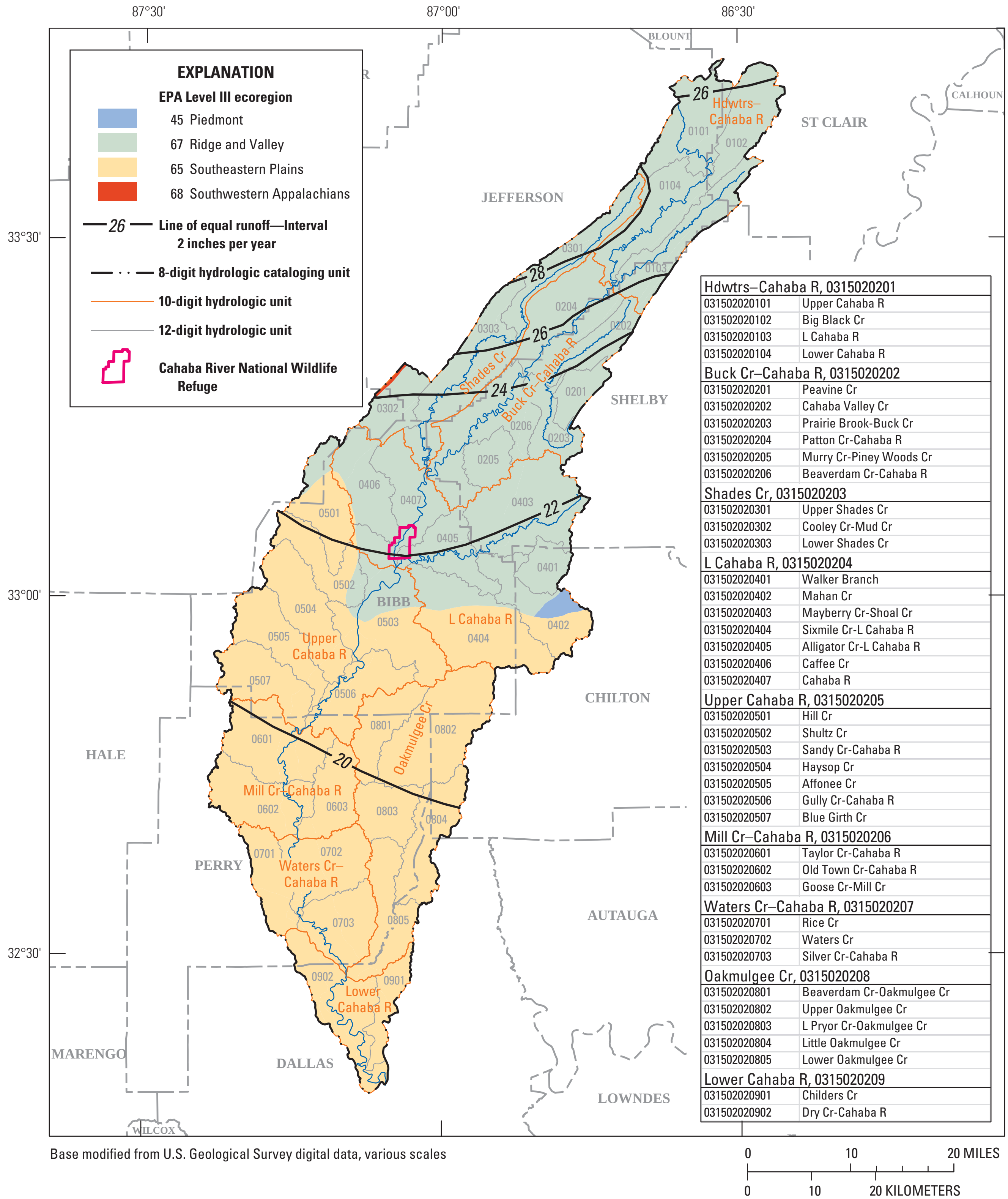


Figure A2. Location of the Cahaba River National Wildlife Refuge, Cahaba (03150202) hydrologic cataloging unit, 10-digit and 12-digit hydrologic units, lines of equal mean-annual runoff for the period 1951–80 (Gebert and others, 1987), and U.S. Environmental Protection Agency (EPA) Level III ecoregions in the Cahaba River watershed (U.S. Environmental Protection Agency, 2011).

A

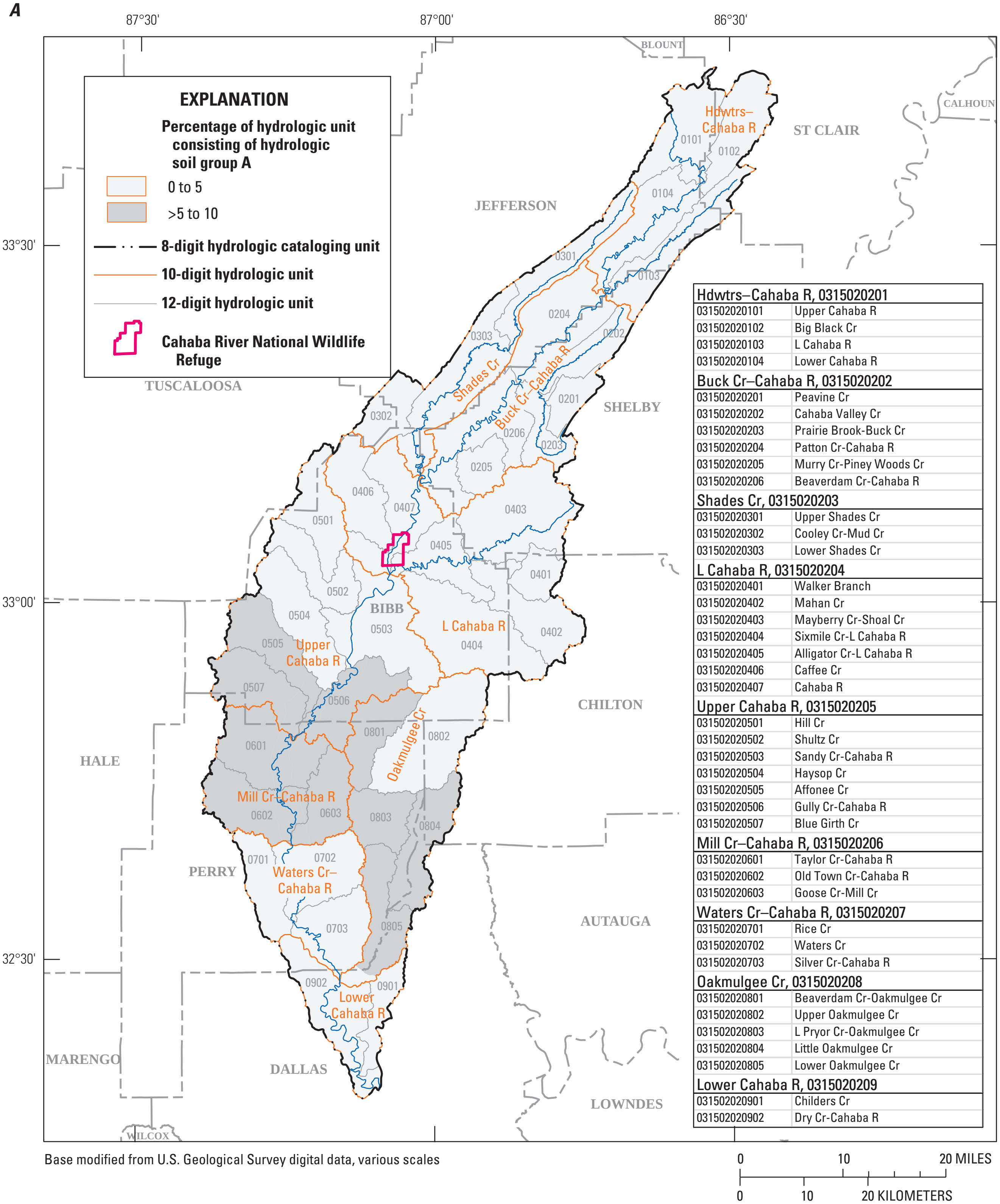


Figure A3. Maps showing percentage of U.S. Department of Agriculture hydrologic soil group (HSG) shown by 12-digit hydrologic unit in the Cahaba cataloging unit (03150202) for *A*, HSG A; soils in HSG A have low runoff potential: water is freely transmitted through the soil, *B*, HSG B; soils in HSG B have moderately low runoff potential: water transmission through the soil is unimpeded, *C*, HSG C; soils in HSG C have moderately high runoff potential: water transmission through the soil is somewhat restricted, and *D*, HSG D; soils in HSG D have high runoff potential: water transmission through the soil is restricted or very restricted (U.S. Department of Agriculture, 2009).

B

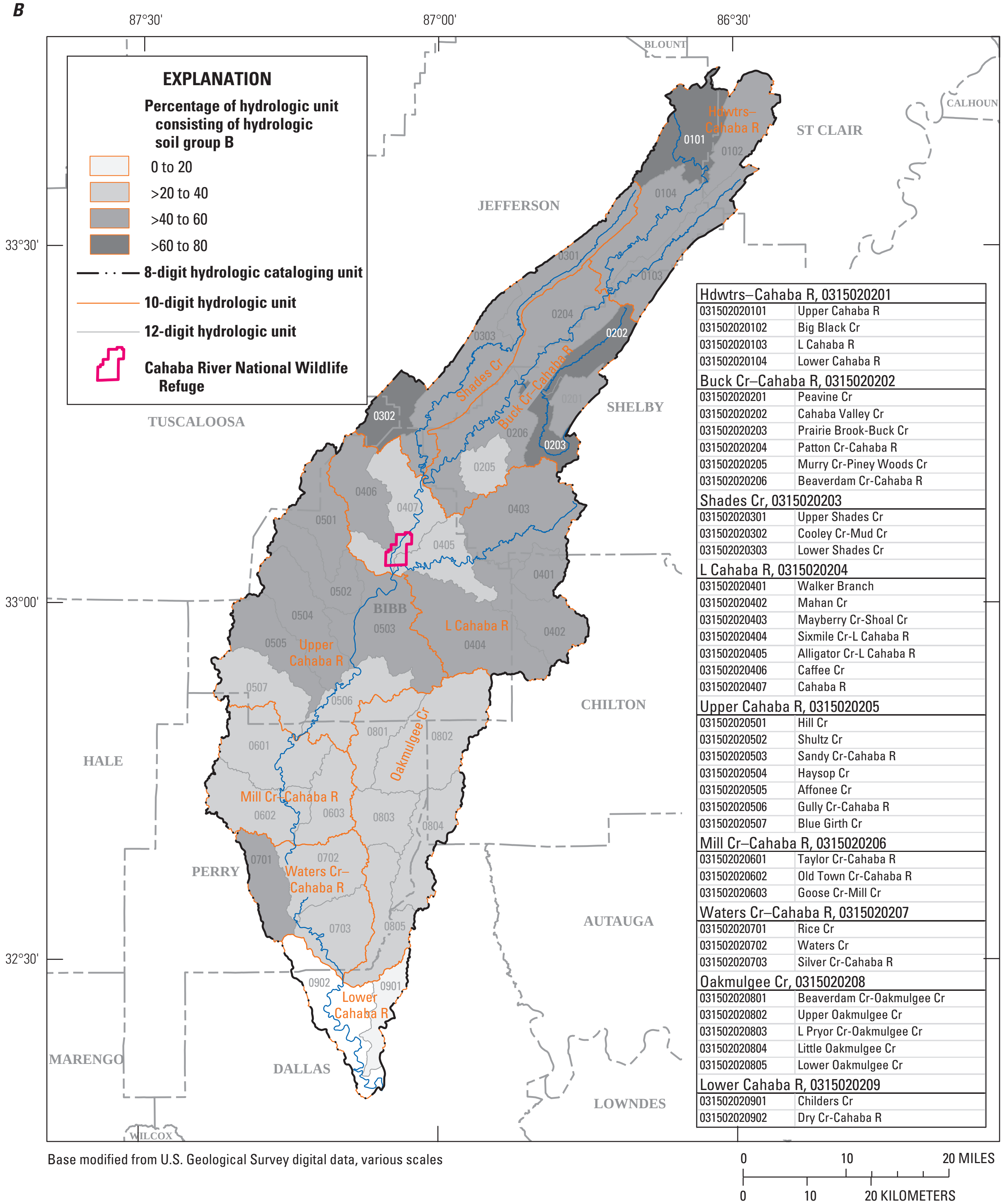
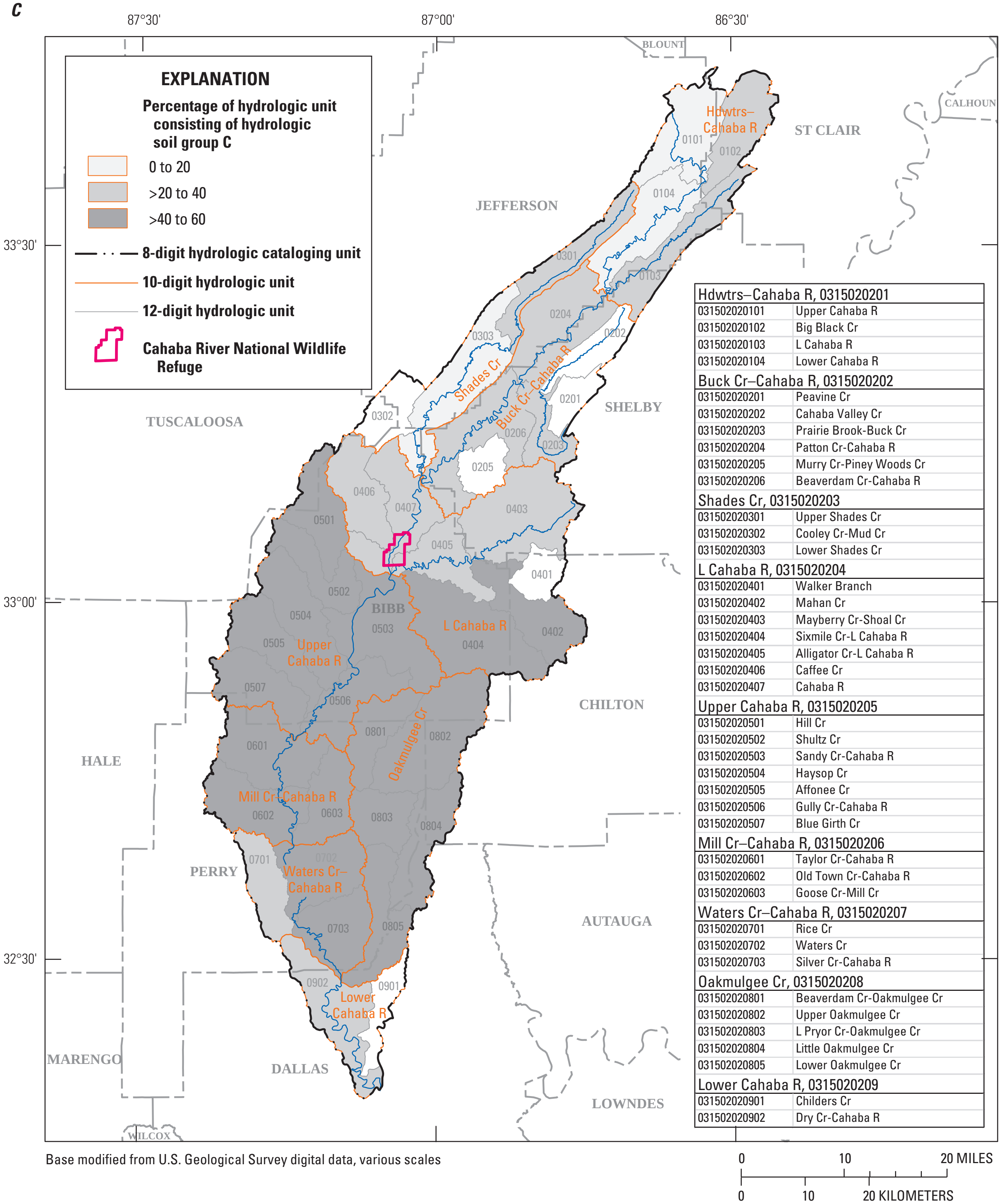


Figure A3. Maps showing percentage of U.S. Department of Agriculture hydrologic soil group (HSG) shown by 12-digit hydrologic unit in the Cahaba cataloging unit (03150202) for *A*, HSG A; soils in HSG A have low runoff potential: water is freely transmitted through the soil, *B*, HSG B; soils in HSG B have moderately low runoff potential: water transmission through the soil is unimpeded, *C*, HSG C; soils in HSG C have moderately high runoff potential: water transmission through the soil is somewhat restricted, and *D*, HSG D; soils in HSG D have high runoff potential: water transmission through the soil is restricted or very restricted (U.S. Department of Agriculture, 2009).—Continued

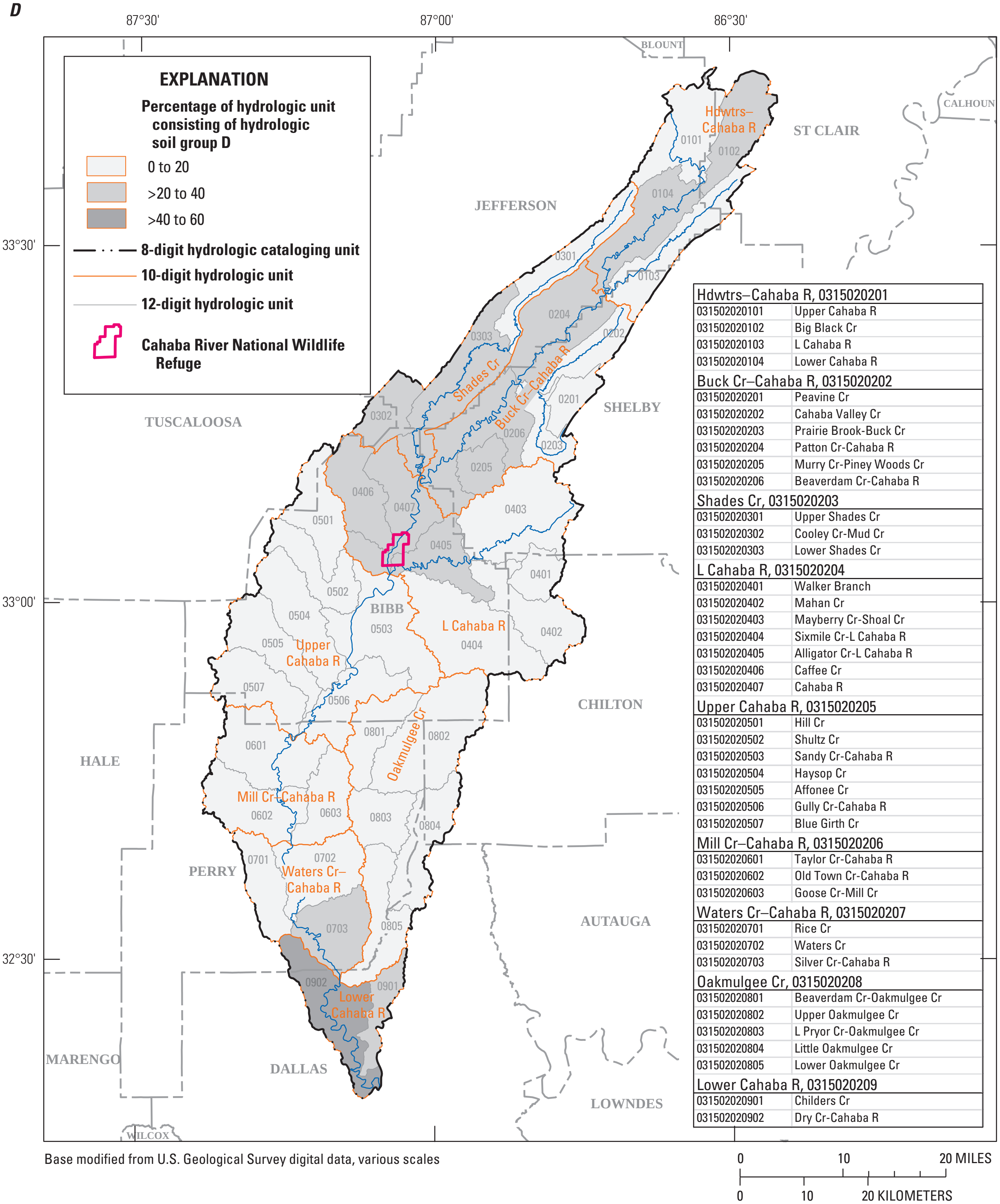
C



Hdwtrs–Cahaba R, 0315020201	
031502020101	Upper Cahaba R
031502020102	Big Black Cr
031502020103	L Cahaba R
031502020104	Lower Cahaba R
Buck Cr–Cahaba R, 0315020202	
031502020201	Peavine Cr
031502020202	Cahaba Valley Cr
031502020203	Prairie Brook-Buck Cr
031502020204	Patton Cr-Cahaba R
031502020205	Murry Cr-Piney Woods Cr
031502020206	Beaverdam Cr-Cahaba R
Shades Cr, 0315020203	
031502020301	Upper Shades Cr
031502020302	Cooley Cr-Mud Cr
031502020303	Lower Shades Cr
L Cahaba R, 0315020204	
031502020401	Walker Branch
031502020402	Mahan Cr
031502020403	Mayberry Cr-Shoal Cr
031502020404	Sixmile Cr-L Cahaba R
031502020405	Alligator Cr-L Cahaba R
031502020406	Caffee Cr
031502020407	Cahaba R
Upper Cahaba R, 0315020205	
031502020501	Hill Cr
031502020502	Shultz Cr
031502020503	Sandy Cr-Cahaba R
031502020504	Haysop Cr
031502020505	Affonee Cr
031502020506	Gully Cr-Cahaba R
031502020507	Blue Girth Cr
Mill Cr–Cahaba R, 0315020206	
031502020601	Taylor Cr-Cahaba R
031502020602	Old Town Cr-Cahaba R
031502020603	Goose Cr-Mill Cr
Waters Cr–Cahaba R, 0315020207	
031502020701	Rice Cr
031502020702	Waters Cr
031502020703	Silver Cr-Cahaba R
Oakmulgee Cr, 0315020208	
031502020801	Beaverdam Cr-Oakmulgee Cr
031502020802	Upper Oakmulgee Cr
031502020803	L Pryor Cr-Oakmulgee Cr
031502020804	Little Oakmulgee Cr
031502020805	Lower Oakmulgee Cr
Lower Cahaba R, 0315020209	
031502020901	Childers Cr
031502020902	Dry Cr-Cahaba R

Figure A3. Maps showing percentage of U.S. Department of Agriculture hydrologic soil group (HSG) shown by 12-digit hydrologic unit in the Cahaba cataloging unit (03150202) for *A*, HSG A; soils in HSG A have low runoff potential: water is freely transmitted through the soil, *B*, HSG B; soils in HSG B have moderately low runoff potential: water transmission through the soil is unimpeded, *C*, HSG C; soils in HSG C have moderately high runoff potential: water transmission through the soil is somewhat restricted, and *D*, HSG D; soils in HSG D have high runoff potential: water transmission through the soil is restricted or very restricted (U.S. Department of Agriculture, 2009).—Continued

D



Hdwtrs–Cahaba R, 0315020201	
031502020101	Upper Cahaba R
031502020102	Big Black Cr
031502020103	L Cahaba R
031502020104	Lower Cahaba R
Buck Cr–Cahaba R, 0315020202	
031502020201	Peavine Cr
031502020202	Cahaba Valley Cr
031502020203	Prairie Brook-Buck Cr
031502020204	Patton Cr-Cahaba R
031502020205	Murry Cr-Piney Woods Cr
031502020206	Beaverdam Cr-Cahaba R
Shades Cr, 0315020203	
031502020301	Upper Shades Cr
031502020302	Cooley Cr-Mud Cr
031502020303	Lower Shades Cr
L Cahaba R, 0315020204	
031502020401	Walker Branch
031502020402	Mahan Cr
031502020403	Mayberry Cr-Shoal Cr
031502020404	Sixmile Cr-L Cahaba R
031502020405	Alligator Cr-L Cahaba R
031502020406	Caffee Cr
031502020407	Cahaba R
Upper Cahaba R, 0315020205	
031502020501	Hill Cr
031502020502	Shultz Cr
031502020503	Sandy Cr-Cahaba R
031502020504	Haysop Cr
031502020505	Affonee Cr
031502020506	Gully Cr-Cahaba R
031502020507	Blue Girth Cr
Mill Cr–Cahaba R, 0315020206	
031502020601	Taylor Cr-Cahaba R
031502020602	Old Town Cr-Cahaba R
031502020603	Goose Cr-Mill Cr
Waters Cr–Cahaba R, 0315020207	
031502020701	Rice Cr
031502020702	Waters Cr
031502020703	Silver Cr-Cahaba R
Oakmulgee Cr, 0315020208	
031502020801	Beaverdam Cr-Oakmulgee Cr
031502020802	Upper Oakmulgee Cr
031502020803	L Pryor Cr-Oakmulgee Cr
031502020804	Little Oakmulgee Cr
031502020805	Lower Oakmulgee Cr
Lower Cahaba R, 0315020209	
031502020901	Childers Cr
031502020902	Dry Cr-Cahaba R

Figure A3. Maps showing percentage of U.S. Department of Agriculture hydrologic soil group (HSG) shown by 12-digit hydrologic unit in the Cahaba cataloging unit (03150202) for *A*, HSG A; soils in HSG A have low runoff potential: water is freely transmitted through the soil, *B*, HSG B; soils in HSG B have moderately low runoff potential: water transmission through the soil is unimpeded, *C*, HSG C; soils in HSG C have moderately high runoff potential: water transmission through the soil is somewhat restricted, and *D*, HSG D; soils in HSG D have high runoff potential: water transmission through the soil is restricted or very restricted (U.S. Department of Agriculture, 2009).—Continued

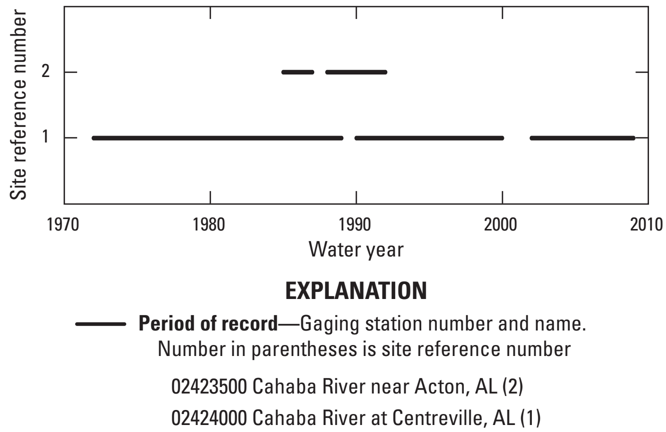


Figure A4. Periods of record for mean-daily gage-height data used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds of the Cahaba River National Wildlife Refuge, Alabama. Locations of gaging stations are shown in figure A1.

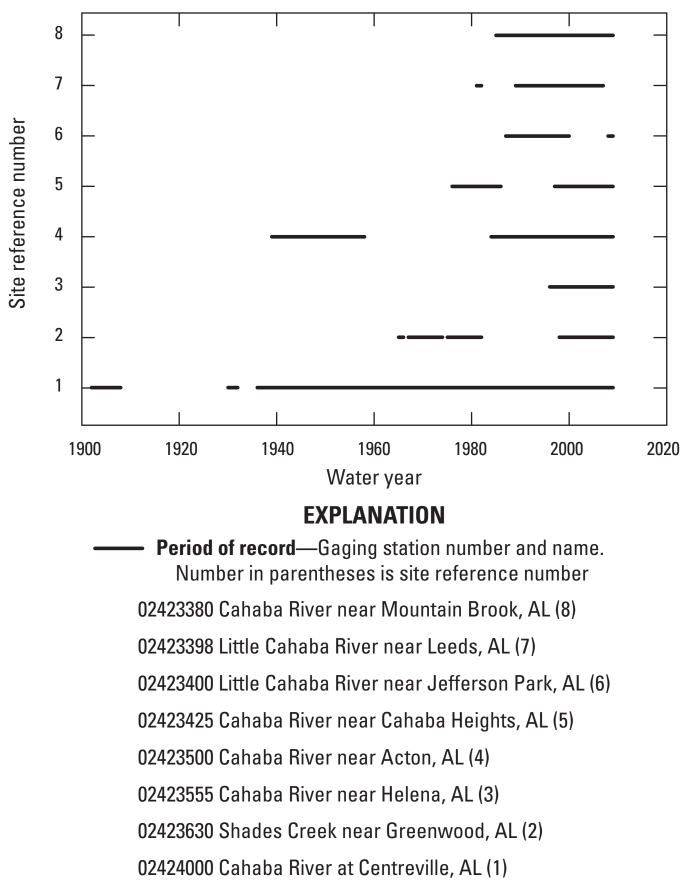


Figure A5. Periods of record for mean-daily discharge data used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds of the Cahaba River National Wildlife Refuge, Alabama. Locations of gaging stations are shown in figure A1.

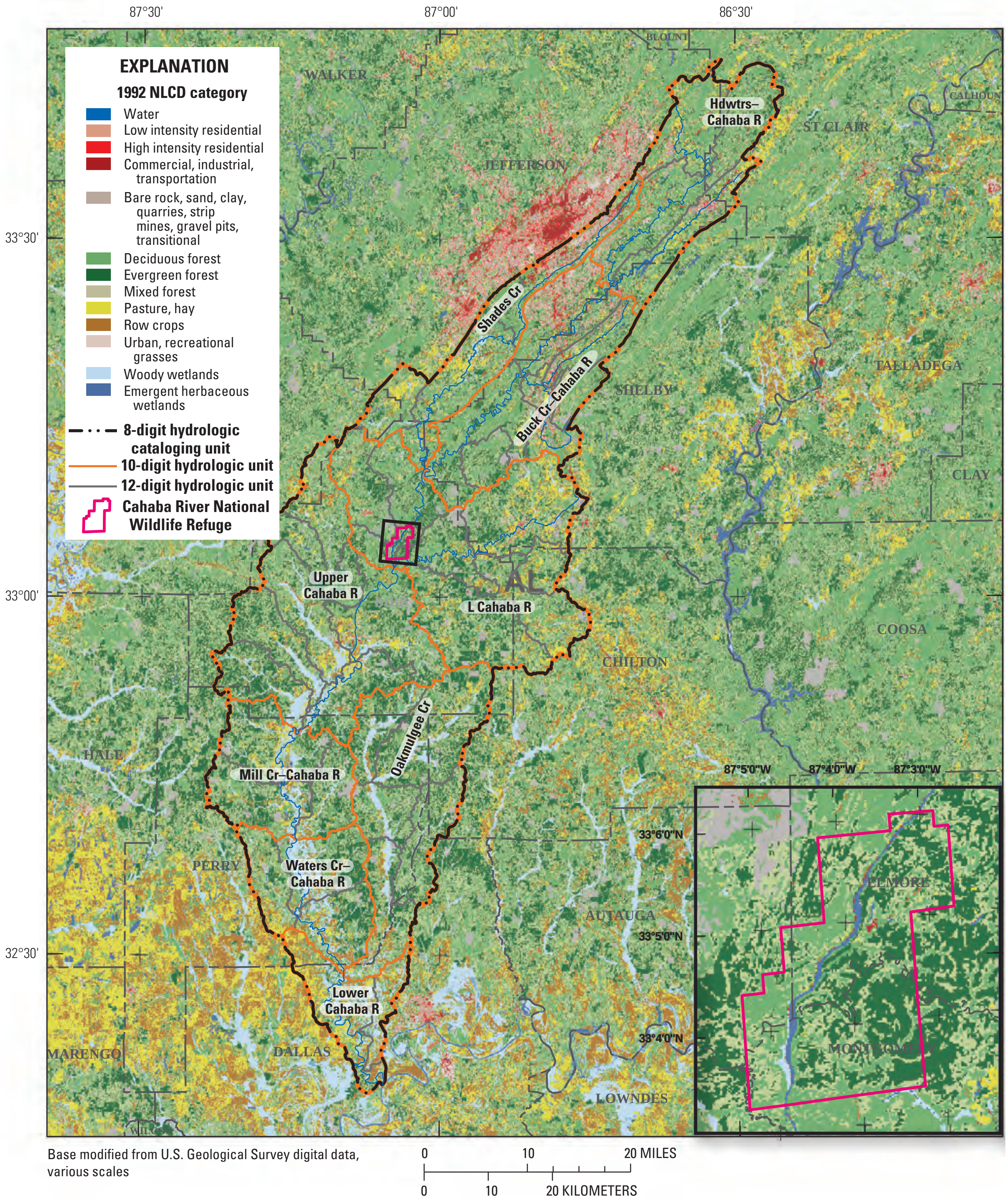


Figure A6. Land cover for 1992 for the Cahaba cataloging unit (03150202) (land-cover data source: 1992 National Land Cover Database [NLCD; Vogelmann and others, 2001]).

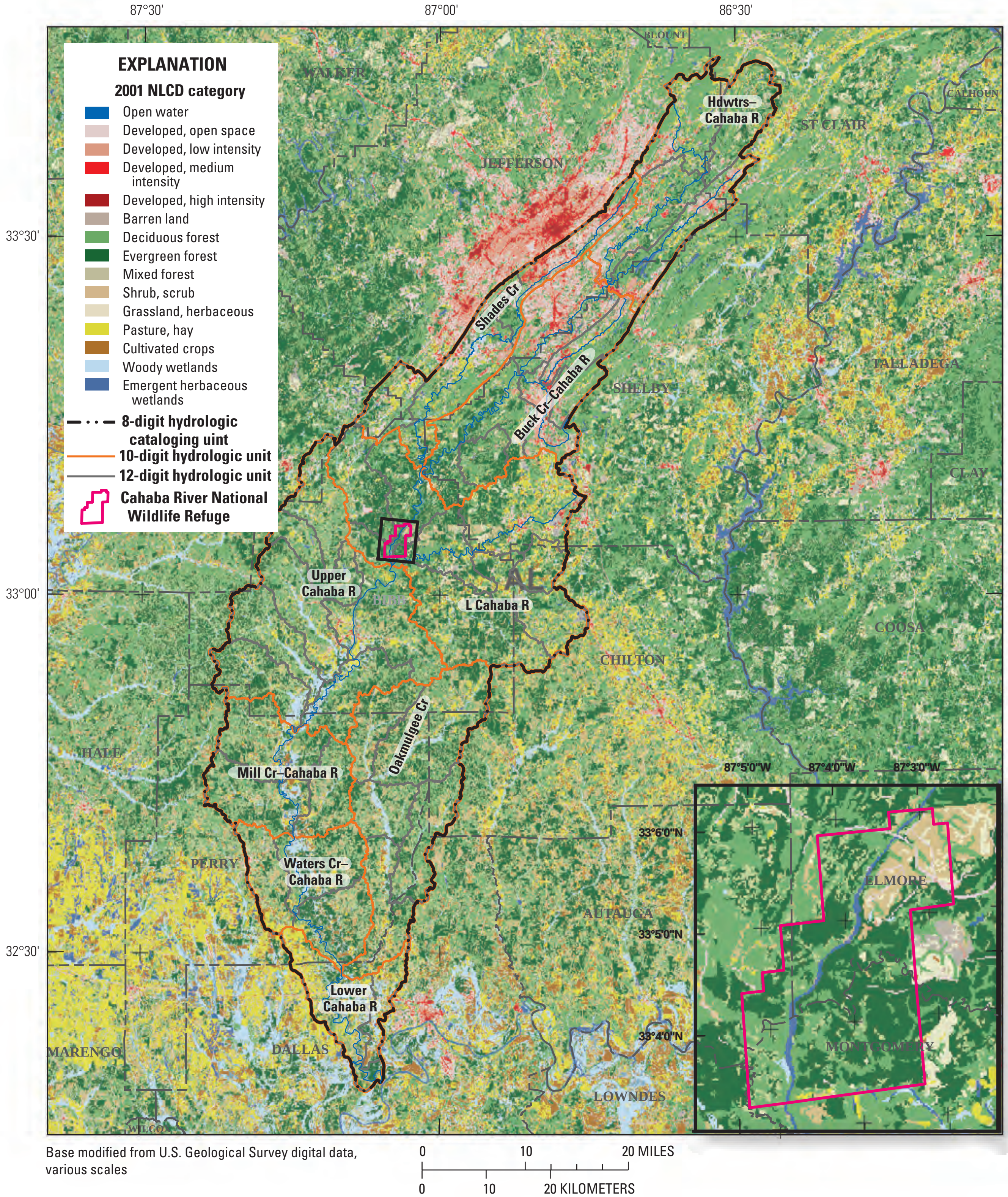


Figure A7. Land cover for 2001 for the Cahaba cataloging unit (03150202) (land-cover data source: 2001 National Land Cover Database [NLCD; Homer and others, 2007]).

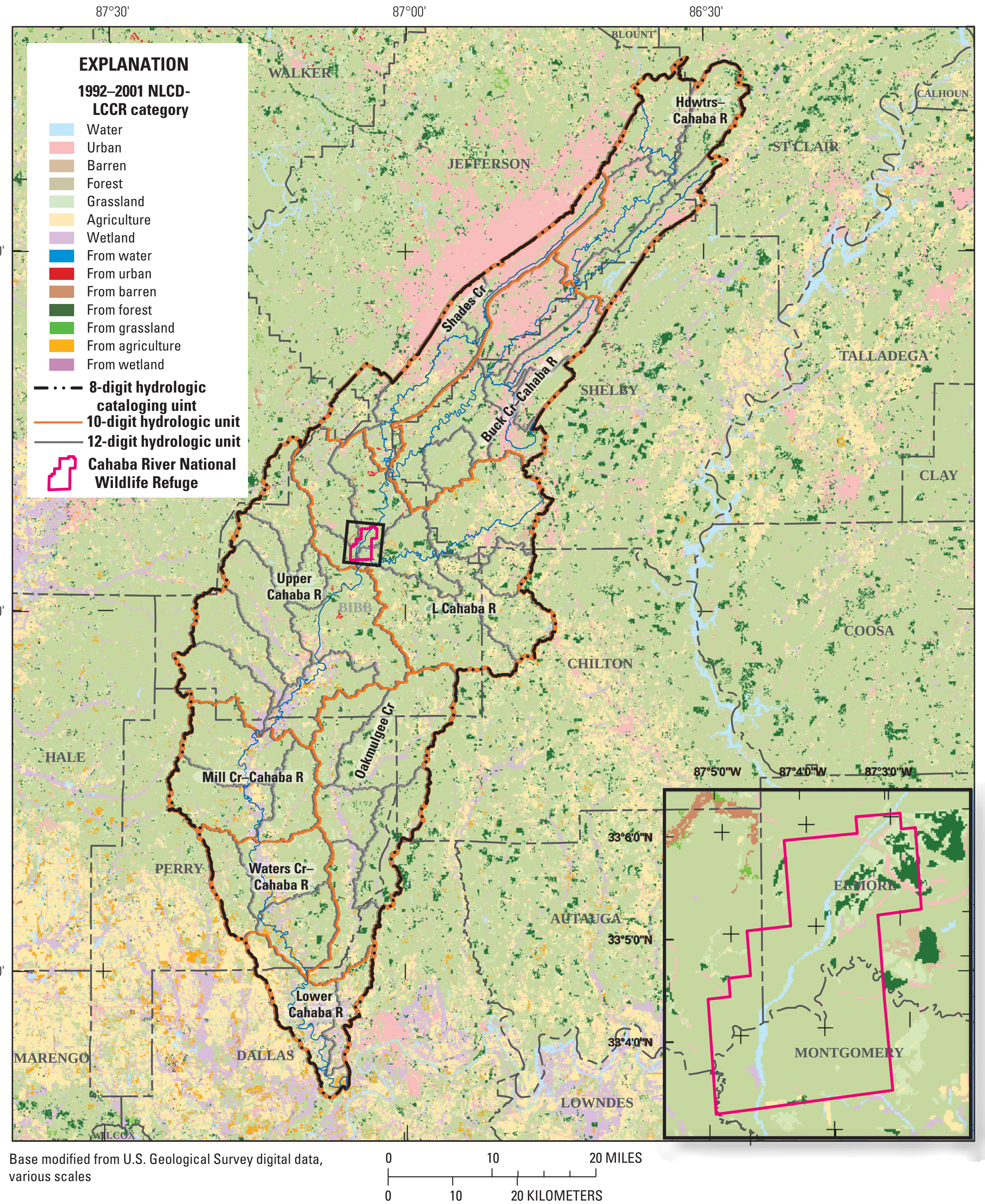


Figure A8. Land-cover change for the period from 1992 to 2001 for the Cahaba cataloging unit (03150202) (land-cover data source: National Land Cover Database [NLCD] 1992–2001 Land Cover Change Retrofit [LCCR] product [Fry and others, 2009]).

Table A–1. Management objectives and environmental issues for the Cahaba River National Wildlife Refuge, Alabama.

[Note: Environmental issues do not correspond to management objectives]

Refuge management objectives[a, b]	Environmental issues[a, b, c]
Protection and management of a biologically unique river corridor	Degradation of water-quality and biological communities from rapid upstream urban development and industrial discharge (e.g., excess sediment and nutrient loads, pollution)
Protection and management of habitat for five federally listed species	Hydrologic alteration as a result of urbanization (e.g., dam construction, stream channelization, water withdrawals and discharge from wastewater treatment facilities)
Protection and management of largest known stand of the imperial shoals lily (Cahaba lily)	Changes in flow characteristics, including increased baseflow from Birmingham, Ala., withdrawals from Black Warrior River and discharge into the Cahaba River, and increase of future withdrawals due to population growth
Restoration of native longleaf pine and removal of planted loblolly pine (prescribed burning)	Potential long-term water-quality and quantity impacts of climate change
Development and implementation of environmental education programs	Impacts of coal, oil, and gas development on water quality
Management of terrestrial and aquatic invasive species	

[a]U.S. Fish and Wildlife Service, 2007.

[b]Thom and others, 2013.

[c]Buell and others, 2009.

Table A–2*A*. Station characteristics for gaging stations in the contributing watersheds of the Cahaba River National Wildlife Refuge and vicinity, Alabama.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure A1. USGS 10-digit hydrologic units, and 10-digit hydrologic unit codes, listed as subheadings and shown in figure A1. dms, latitude and longitude coordinates in degrees, minutes, and seconds are referenced to the horizontal datum NAD 27. Gage location in relation to the refuge property: us, upstream; usds, upstream and downstream (on refuge property); ds, downstream; adj, on an adjacent, hydrologically connected river or stream. ft, foot; mi^2, square mile; NGVD 29, National Geodetic Vertical Datum of 1929]

USGS station number	Station name	County and State	Latitude and longitude (dms)	12-digit hydrologic unit[a]	Drainage area (mi^2)	Datum of gage[b] (ft)	Gage location
			Headwaters-Cahaba River (0315020201)				
02423380	Cahaba R near Mountain Brook, AL	Jefferson, AL	332854N 0864246W	031502020104	140	443.85	us
02423398	Little Cahaba R near Leeds, AL	Jefferson, AL	333127N 0863432W	031502020103	19.4	586.84	us
02423400	Little Cahaba R near Jefferson Park, AL	Jefferson, AL	332959N 0863651W	031502020103	24.4	556.43	us
			Buck Creek-Cahaba River (0315020202)				
02423425	Cahaba R near Cahaba Heights, AL	Shelby, AL	332456N 0864423W	031502020204	201	410.00	us
02423496	Cahaba R near Hoover, AL	Jefferson, AL	332209N 0864703W	031502020204	226	379.56	us
02423500	Cahaba R near Acton, AL	Jefferson, AL	332148N 0864847W	031502020204	230	375.00	us
0242354750	Cahaba Valley Cr (Cross Cr Rd) near Pelham, AL	Shelby, AL	331848N 0864823W	031502020202	25.6	*440.00*	us
02423555	Cahaba R near Helena, AL	Shelby, AL	331704N 0865257W	031502020206	335	403.67	us
			Shades Creek (0315020203)				
02423630	Shades Cr near Greenwood, AL	Jefferson, AL	331934N 0865659W	031502020303	72.3	480.37	us
			Little Cahaba River (0315020204)				
02423647	Cahaba R near West Blocton, AL	Bibb, AL	330553N 0870317W	031502020407	593	240.00	usds
02423800	Little Cahaba R near Brierfield, AL	Bibb, AL	330327N 0865710W	031502020405	147	325.00	adj
			Upper Cahaba River (0315020205)				
02424000	Cahaba R at Centreville, AL	Bibb, AL	325642N 0870821W	031502020503	1,027	180.74	ds

[a]The 8-digit hydrologic units were developed by the U.S. Geological Survey as a standardized set of hydrologic boundaries and numerical codes for the river-basin units of the United States (Seaber and others, 1994). The 8-digit hydrologic unit code encompasses four levels of subdivision: region (2-digit), subregion (4-digit), accounting unit (6-digit), and cataloging unit (8-digit). Two more levels of subdivision, the 10-digit and 12-digit hydrologic units, were added to the coding scheme when the Watershed Boundary Dataset was developed (U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013).

[b]Datum-of-gage values in roman (or normal) font were determined from levels run to established elevation benchmarks; those in italicized font were determined from USGS 1:24,000-scale topographic maps. All datum-of-gage values are referenced to the vertical datum NGVD 29.

Table A–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Cahaba River National Wildlife Refuge and vicinity, Alabama.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure A1. USGS 10-digit hydrologic units, and 10-digit hydrologic unit codes, listed as subheadings and also shown in figure A1. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31]

USGS station number	Station name	Parameter	Water-year record		Calendar-year record	
			Period of record[a]	Record completeness[a]	Period of record[a]	Record completeness[a]
		Headwaters-Cahaba River (0315020201)				
02423380	Cahaba R near Mountain Brook, AL	Gage height	1981–2009	13, 14–0.88	1980–2009	12, 17–0.85
		Discharge[b]	1981–2009	25, 2–0.90	1980–2009	24, 4–0.87
02423398	Little Cahaba R near Leeds, AL	Gage height	1976–2007	12, 18–0.84	1976–2006	11, 18–0.87
		Discharge[b]	1981–2007	19, 2–0.73	1980–2006	18, 3–0.73
		Water temperature	1988–2007	7, 13–0.89	1988–2006	8, 11–0.94
		Specific conductance	1988–2007	6, 14–0.89	1988–2006	8, 11–0.93
		Dissolved oxygen	1988–2007	2, 18–0.85	1988–2006	2, 17–0.90
02423400	Little Cahaba R near Jefferson Park, AL	Gage height	1986–2009	8, 10–0.64	1986–2009	7, 11–0.64
		Discharge[b]	1986–2009	14, 4–0.66	1986–2009	14, 4–0.66
		Buck Creek-Cahaba River (0315020202)				
02423425	Cahaba R near Cahaba Heights, AL	Gage height	1975–2009	3, 25–0.64	1975–2009	2, 25–0.64
		Discharge[b]	1975–2009	22, 3–0.66	1975–2009	21, 4–0.66
02423496	Cahaba R near Hoover, AL	Gage height	1988–2009	8, 14–0.95	1988–2009	8, 14–0.95
		Discharge	1988–2009	20, 2–0.97	1988–2009	20, 2–0.97
		Water temperature	1989–2009	7, 14–0.95	1988–2009	8, 14–0.91
02423500	Cahaba R near Acton, AL	Gage height[b]	1984–2009	8, 18–0.95	1983–2009	9, 18–0.91
		Discharge[b]	1939–2009	44, 1–0.63	1938–2009	43, 4–0.62
0242354750	Cahaba Valley Cr (Cross Cr Rd) near Pelham, AL	Gage height	1999–2009	7, 4–0.97	1998–2009	6, 6–0.89
		Discharge	1999–2009	10, 1–0.98	1998–2009	10, 2–0.90
02423555	Cahaba R near Helena, AL	Gage height	1996–2009	1, 13–0.94	1995–2009	1, 14–0.88
		Discharge[b]	1996–2009	13, 1–0.99	1995–2009	13, 2–0.92
		Shades Creek (0315020203)				
02423630	Shades Cr near Greenwood, AL	Gage height	1986–2009	3, 12–0.53	1986–2009	2, 14–0.53
		Discharge[b]	1965–2009	26, 1–0.60	1964–2009	23, 8–0.58
		Little Cahaba River (0315020204)				
02423647	Cahaba R near West Blocton, AL	Discharge	1976–1984	9, 0–1.00	1975–1984	8, 2–0.90
02423800	Little Cahaba R near Brierfield, AL	Discharge	1958–1970	12, 1–0.99	1957–1970	12, 2–0.92
		Upper Cahaba River (0315020205)				
02424000	Cahaba R at Centreville, AL	Gage height[b]	1972–2009	30, 8–0.99	1971–2009	31, 8–0.96
		Discharge[b]	1901–2009	81, 6–0.77	1901–2009	81, 6–0.77

[a]Period shown is for indicated type of year and includes gaps if data collection was discontinuous. Record completeness: number of complete water or calendar years, number of partial-record water or calendar years—fraction of total record length with mean-daily values. The fraction-of-total-record-length calculation is based on complete beginning and ending water or calendar years as well as complete intervening years. Therefore, the fraction-of-total-record-length numbers may be different for water years when compared to calendar years.

[b]Indicators of Hydrologic Alteration (IHA) analysis was performed for these parameters. Periods of record for IHA analyses shown in figure A4 (gage height) and figure A5 (discharge).

Table A–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for the Cahaba River National Wildlife Refuge contributing watersheds and vicinity, Alabama.

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; STATSGO, State Soil Geographic (Database); USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
		Raw data[b]
chb_tabular_hydrostats_raw.accdb	chb001	Raw data—mean-daily values for gage height and discharge; sum-daily values for precipitation, for gaging stations in the contributing watersheds of the Cahaba River NWR
		Descriptive statistics, spread measures, and ratio measures[b]
chb_tabular_hydrostats.accdb	chb[***var***]01	Mean-daily values for parameter ***var***
	chb[***var***]cy02	Calendar-year statistics for mean-daily values for parameter ***var***
	chb[***var***]cd02	Calendar-decade statistics for mean-daily values for parameter ***var***
	chb[***var***]cym02	Calendar-year-month statistics for mean-daily values for parameter ***var***
	chb[***var***]wy02	Water-year statistics for mean-daily values for parameter ***var***
	chb[***var***]mo02	Period-of-record monthly statistics metrics, based on mean-daily values, for parameter ***var***, complete calendar years
	chb[***var***]mom02	Period-of-record monthly statistics metrics, based on annual monthly means of mean-daily values, for parameter ***var***, complete calendar years
	chb[***var***]jc02	Period-of-record calendar-year-julian-day statistics, based on mean-daily values, for parameter ***var***, complete calendar years
	chb[***var***]jw02	Period-of-record water-year-julian-day statistics, based on mean-daily values, for parameter ***var***, complete calendar years
		IHA metrics[c]
regional_iha_chb.xlsx[d]	1_day_min	Minimum 1-day mean of mean-daily values
	3_day_min	Minimum 3-day mean of mean-daily values
	7_day_min	Minimum 7-day mean of mean-daily values
	30_day_min	Minimum 30-day mean of mean-daily values
	90_day_min	Minimum 90-day mean of mean-daily values
	1_day_max	Maximum 1-day mean of mean-daily values
	3_day_max	Maximum 3-day mean of mean-daily values
	7_day_max	Maximum 7-day mean of mean-daily values
	30_day_max	Maximum 30-day mean of mean-daily values
	90_day_max	Maximum 90-day mean of mean-daily values
	baseflow	Baseflow index: 7-day mean minimum discharge/mean-annual discharge
	qmn7525s	75th–25th percentile spread measure for mean-daily values
	summary	IHA period-of-record summary data for IHA parameter groups and environmental-flow components: summary data include the 10th, 25th, 50th, 75th, and 90th percentiles and the 75th–25th percentile spread measure
	02423380	Complete IHA analysis for USGS 02423380, Cahaba R nr Mountain Brook, AL
	02423555	Complete IHA analysis for USGS 02423555, Cahaba R near Helena, AL
	02423630	Complete IHA analysis for USGS 02423630, Shades Cr nr Greenwood, AL

Table A–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for the Cahaba River National Wildlife Refuge contributing watersheds and vicinity, Alabama.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; STATSGO, State Soil Geographic (Database); USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
	IHA metrics[c]—Continued	
s***SSSSSSSS***_iha_[***var***].xlsx	ann	Water-year annual values for all IHA parameter groups and EFC groups, for parameter ***var***, gaging station ***SSSSSSSS***e (parameter definitions given in table A4)
	sco	IHA scorecard: period-of-record summary data, median values and coefficients of dispersion for IHA parameter groups and EFC groups, for parameter ***var***, gaging station ***SSSSSSSS***e
	lsq	Linear-regression models for IHA parameter groups and EFC groups with water year, for parameter ***var***, gaging station ***SSSSSSSS***e
	pct	IHA period-of-record summary data for IHA parameter groups and EFC groups: summary data include the 10th, 25th, 50th, 75th, and 90th percentiles and the 75th–25th percentile spread measure, for parameter ***var***, gaging station ***SSSSSSSS***e
	daily_efcs	Mean-daily values coded with IHA EFC groups, period of record, for parameter ***var***, gaging station ***SSSSSSSS***e
	msg	IHA conditional information messages concerning data quality as related to the IHA analysis, gaging station ***SSSSSSSS***e
	Geospatial data summaries	
chb_nlcd.xlsx	chb_nlcd92_ h1012rfg_pct	Land-cover percentages for hydrologic subregions and cataloging units (contributing-watershed area for the Cahaba River NWR) and refuge acquisition areas based on 1992 NLCD level 2 categories (Vogelmann and others, 2001)
	chb_nlcd01_ h1012rfg_pct	Land-cover percentages for hydrologic subregions and cataloging units (contributing-watershed area for the Cahaba River NWR) and refuge acquisition areas based on 2001 NLCD level 2 categories (Homer and others, 2007)
	chb_lcc9201_ h1012rfg_pct	Land-cover-change percentages for hydrologic subregions and cataloging units (contributing-watershed area for the Cahaba River NWR) and refuge acquisition areas based on 1992-2001 NLCD-LCCR Anderson level 1 categories (Fry and others, 2009; Anderson and others, 1976)
chb_sgo_hsg.xlsx	chb_sgo_hsg_pct	STATSGO database HSGs A through D percentages for hydrologic subregions and cataloging units (contributing-watershed area for the Cahaba River NWR) and refuge acquisition areas (U.S. Department of Agriculture, 1994, 2009; Wolock, 1997)

Table A–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for the Cahaba River National Wildlife Refuge contributing watersheds and vicinity, Alabama.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; STATSGO, State Soil Geographic (Database); USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
	Geospatial data summaries—Coninued	
chb_eco34.xlsx	chb_eco4huc_12_pct	EPA Level IV ecoregion percentages for hydrologic subregions (contributing-watershed area for the Cahaba River NWR) (U.S. Environmental Protection Agency, 2011)
	chb_eco3huc_12_pct	EPA Level III ecoregion percentages for hydrologic subregions (contributing-watershed area for the Cahaba River NWR) (U.S. Environmental Protection Agency, 2011)
	chb_eco4huc_10_pct	EPA Level IV ecoregion percentages for hydrologic cataloging units (contributing-watershed area for the Cahaba River NWR) (U.S. Environmental Protection Agency, 2011)
	chb_eco3huc_10_pct	EPA Level III ecoregion percentages for hydrologic cataloging units (contributing-watershed area for the Cahaba River NWR) (U.S. Environmental Protection Agency, 2011)
chb_pop_census.xlsx	tblChbPop01	U.S. Census Bureau county-level population data, 1930–2010 (U.S. Census Bureau, 2011)
	pop_pct_chg	Descriptive statistics for percent population change, 1930–1970, and 1970–2010

[a]In the file/table/worksheet name, ***var*** refers to the hydrologic parameter, where ***var=gmn***, gage height, in feet; ***qmn***, discharge, in cubic feet per second; ***tmn***, water temperature, in degrees Celsius; ***kmn***, specific conductance, in microsiemens per centimeter; ***omn***, dissolved oxygen, in milligrams per liter; all parameters are mean-daily values.

[b]Field names, field types, and field definitions given in table A3*B*.

[c]IHA parameter-groups, EFC groups, EFCs, and parameter definitions listed in table A4 (Richter and others, 1996; The Nature Conservancy, 2009).

[d]IHA regional analysis restricted to USGS gaging stations 02423380, 02423555, 02423630. Gaging-station information presented in tables A2*A* and A2*B*.

[e]IHA analysis of mean-daily gage-height record for USGS gaging stations 02423500 and 02424000; IHA analysis of mean-daily discharge record for USGS gaging stations 02423380, 02423398, 02423400, 02423425, 02423500, 02423630, 02423555, and 02424000. Gaging-station characteristics, parameters, and periods of record given in tables A2*A* and A2*B*.

Table A–3*B*. Database field names, field types, and field definitions for Microsoft Acess and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Cahaba River National Wildlife Refuge contributing watersheds and vicinity, Alabama.

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/ worksheet(s)[a,b]	Field type	Field definition[a]
		Raw data[c]	
agency_cd	chb001	text	USGS collecting-agency code
datetime	chb001	date/time	Calendar date of daily value
Disch_mn	chb001	double precision	Mean-daily discharge, in ft^3/s
Disch_mn_cd	chb001	text	Mean-daily discharge, data-value qualification code[d]
do_min	chb001	double precision	Minimum-daily dissolved oxygen, in mg/L
do_min_cd	chb001	text	Minimum-daily dissolved oxygen, data-value qualification code[d]
do_mn	chb001	double precision	Mean-daily dissolved oxygen, in mg/L
do_mn_cd	chb001	text	Mean-daily dissolved oxygen, data-value qualification code[d]
do_mx	chb001	double precision	Maximum-daily dissolved oxygen, in mg/L
do_mx_cd	chb001	text	Maximum-daily dissolved oxygen, data-value qualification code[d]
GHt_mn	chb001	double precision	Mean-daily gage height, in ft
GHt_mn_cd	chb001	text	Mean-daily gage height, data-value qualification code[d]
site_no	chb001	text	USGS station identification number
spc_min	chb001	double precision	Minimum-daily specific conductance, in µS/cm
spc_min_cd	chb001	text	Minimum-daily specific conductance, data-value qualification code[d]
spc_mn	chb001	double precision	Mean-daily specific conductance, in µS/cm
spc_mn_cd	chb001	text	Mean-daily specific conductance, data-value qualification code[d]
spc_mx	chb001	double precision	Maximum-daily specific conductance, in µS/cm
spc_mx_cd	chb001	text	Maximum-daily specific conductance, data-value qualification code[d]
WTemp_min	chb001	double precision	Minimum-daily water temperature, in °C
WTemp_min_cd	chb001	text	Minimum-daily water temperature, data-value qualification code[d]
WTemp_mn	chb001	double precision	Mean-daily water temperature, in °C
WTemp_mn_cd	chb001	text	Mean-daily water temperature, data-value qualification code[d]
WTemp_mx	chb001	double precision	Maximum-daily water temperature, in °C
WTemp_mx_cd	chb001	text	Maximum-daily water temperature, data-value qualification code[d]
		Descriptive statistics, spread measures, ratio measures[e]	
[***var***]	chb[***var***]01	double precision	Mean-daily value for parameter ***var***
[***var***]_10	all tables (-chb[***var***]01)	double precision	10th percentile of mean-daily values, parameter ***var***
[***var***]_20	all tables (-chb[***var***]01)	double precision	20th percentile of mean-daily values, parameter ***var***
[***var***]_25	all tables (-chb[***var***]01)	double precision	25th percentile of mean-daily values, parameter ***var***
[***var***]_50	all tables (-chb[***var***]01)	double precision	50th percentile (median) of mean-daily values, parameter ***var***

Table A–3*B*. Database field names, field types, and field definitions for Microsoft Acess and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Cahaba River National Wildlife Refuge contributing watersheds and vicinity, Alabama.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/ worksheet(s)[a,b]	Field type	Field definition[a]
Descriptive statistics, spread measures, ratio measures[e]—Continued			
[***var***]_75	all tables (-chb[***var***]01)	double precision	75th percentile of mean-daily values, parameter ***var***
[***var***]_80	all tables (-chb[***var***]01)	double precision	80th percentile of mean-daily values, parameter ***var***
[***var***]_90	all tables (-chb[***var***]01)	double precision	90th percentile of mean-daily values, parameter ***var***
[***var***]_cdf	chb[***var***]cd02	double precision	Calendar-decade fraction represented by mean-daily values, parameter ***var***
[***var***]_cmf	chb[***var***]cym02	double precision	Calendar-month fraction represented by mean-daily values, parameter ***var***
[***var***]_cv	all tables (-chb[***var***]01)	double precision	Coefficient of variation of mean-daily values, parameter ***var***
[***var***]_cy_n	chb[***var***]mo02	double precision	Number of complete calendar years in the long-term monthly record for parameter ***var***
[***var***]_cyf	chb[***var***]cy02; chb[***var***]cym02	double precision	Calendar-year fraction represented by mean-daily values, parameter ***var***
[***var***]_mi	all tables (-chb[***var***]01)	double precision	Minimum of mean-daily values, parameter ***var***
[***var***]_mn	all tables (-chb[***var***]01)	double precision	Mean of mean-daily values, parameter ***var***
[***var***]_mx	all tables (-chb[***var***]01)	double precision	Maximum of mean-daily values, parameter ***var***
[***var***]_n	all tables (-chb[***var***]01)	long integer	Number of mean-daily values, parameter ***var***
[***var***]_nm	all tables (-chb[***var***]01)	long integer	Number of missing values of mean-daily values, parameter ***var***
[***var***]_ny	chb[***var***]cd02	double precision	Number of calendar years in each calendar decade, including fractional years, represented by mean-daily values, parameter ***var***
[***var***]_sd	all tables (-chb[***var***]01)	double precision	Standard deviation of mean-daily values, parameter ***var***
[***var***]_va	all tables (-chb[***var***]01)	double precision	Variance of mean-daily values, parameter ***var***
[***var***]_wyf	chb[***var***]wy02	double precision	Water-year fraction represented by mean-daily values, parameter ***var***
[***var***]7525r	all tables (-chb[***var***]01)	double precision	75th–25th percentile ratio measure of mean-daily values, parameter ***var***: p75/p25
[***var***]7525s	all tables (-chb[***var***]01)	double precision	75th–25th percentile spread measure of mean-daily values, parameter ***var***: (p75–p25)/p50
[***var***]8020r	all tables (-chb[***var***]01)	double precision	80th–20th percentile ratio measure of mean-daily values, parameter ***var***: p80/p20
[***var***]8020s	all tables (-chb[***var***]01)	double precision	80th–20th percentile spread measure of mean-daily values, parameter ***var***: (p80–p20)/p50

Table A–3*B*. Database field names, field types, and field definitions for Microsoft Acess and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Cahaba River National Wildlife Refuge contributing watersheds and vicinity, Alabama.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/ worksheet(s)[a,b]	Field type	Field definition[a]
Descriptive statistics, spread measures, ratio measures[e]—Continued			
[***var***]9010r	all tables (-chb[***var***]01)	double precision	90th–10th percentile ratio measure of mean-daily values, parameter ***var***: p90/p10
[***var***]9010s	all tables (-chb[***var***]01)	double precision	90th–10th percentile spread measure of mean-daily values, parameter ***var***: (p90–p10)/p50
cnty	chb[***var***]01	text	FIPS county code
da	all tables	double precision	Drainage area of gaged watershed, in mi^2
date	chb[***var***]01	date/time	Date, mm/dd/yyyy format
day	chb[***var***]01	long integer	Calendar day
decade	chb[***var***]01; chb[***var***]cd02	long integer	Calendar decade
jday_c	chb[***var***]01; chb[***var***]jc02	long integer	Calendar-year Julian day
jday_w	chb[***var***]01; chb[***var***]jw02	long integer	Water-year Julian day
l[***var***]	chb[***var***]01	double precision	Log-10 mean-daily value for parameter ***var***
l[***var***]_cv	all tables (-chb[***var***]01)	double precision	Coefficient of variation of every 5th percentile of log-10 parameter ***var***
latdec	chb[***var***]01	double precision	Decimal latitude of gaging station, NAD 83
londec	chb[***var***]01	double precision	Decimal longitude of gaging station, NAD 83
lsalt	chb[***var***]01	double precision	Land-surface altitude of gage, NGVD 29, in ft
month	chb[***var***]01; chb[***var***]cym02; chb[***var***]mo02; chb[***var***]mom02	long integer	Calendar month
month_nd	chb[***var***]mo02; chb[***var***]cym02	double precision	Number of days in the calendar month
qmn_y50	all qmn tables (-chbqmn01)	double precision	Median discharge yield, in $ft^3/s/mi$
qmn_ymn	all qmn tables (-chbqmn01)	double precision	Mean discharge yield, in $ft^3/s/mi$
sname	chb[***var***]01	text	USGS station name
staid	all tables	text	USGS station identification number
wyear	chb[***var***]01; chb[***var***]wy02	long integer	Water year
year	chb[***var***]01; chb[***var***]cy02; chb[***var***]cym02	long integer	Calendar year

Table A–3*B*. Database field names, field types, and field definitions for Microsoft Acess and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Cahaba River National Wildlife Refuge contributing watersheds and vicinity, Alabama.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/ worksheet(s)[a,b]	Field type	Field definition[a]
Geospatial data summaries[f]			
AREA	tblChbPop01	double precision	County area, in m^2
chb_statecty	tblChbPop01	long integer	Numeric FIPS code
CNTYNAME	tblChbPop01	text	County name
hga_pct	chb_sgo_hsg_pct	double precision	Percentage of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG A[g]
hgb_pct	chb_sgo_hsg_pct	double precision	Percentage of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG B[g]
hgc_pct	chb_sgo_hsg_pct	double precision	Percentage of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG C[g]
hgd_pct	chb_sgo_hsg_pct	double precision	Percentage of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG D[g]
huc_chg_pct	chb_lcc9201_ h1012rfg_pct	double precision	Areal percentage of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover/land-use classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
huc10	all worksheets (-pop_pct_chg, -tblChbPop01)	text	10-digit hydrologic unit code[h]
huc10_l3_pct	chb_eco3huc_10_pct	double precision	Percentage of indicated U.S. Environmental Protection Agency Level III ecoregion in each 10-digit hydrologic unit
huc10_l4_pct	chb_eco4huc_10_pct	double precision	Percentage of indicated U.S. Environmental Protection Agency Level IV ecoregion in each 10-digit hydrologic unit
huc10_name	chb_eco4huc_12_pct, chb_eco3huc_12_pct, chb_eco4huc_10_pct, chb_eco3huc_10_pct	text	10-digit hydrologic unit name[h]
huc12	all worksheets (-chb_eco4huc_10_pct, -chb_eco3huc_10_pct, -pop_pct_chg, -tblChbPop01)	text	12-digit hydrologic unit code[h]
huc12_l3_pct	chb_eco3huc_12_pct	double precision	Percentage of indicated U.S. Environmental Protection Agency Level III ecoregion in each 12-digit hydrologic unit
huc12_l4_pct	chb_eco4huc_12_pct	double precision	Percentage of indicated U.S. Environmental Protection Agency Level IV ecoregion in each 12-digit hydrologic unit
huc12_name	chb_eco4huc_12_pct, chb_eco3huc_12_pct	text	12-digit hydrologic unit name[h]
mass_bal	chb_lcc9201_ h1012rfg_pct	double precision	Sum-check for land-cover/land-use change net gain/loss percentages

Table A–3*B*. Database field names, field types, and field definitions for Microsoft Acess and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Cahaba River National Wildlife Refuge contributing watersheds and vicinity, Alabama.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/ worksheet(s)[a,b]	Field type	Field definition[a]
Geospatial data summaries[f]—Continued			
net_1	chb_lcc9201_ h1012rfg_pct	double precision	Net percentage gain or loss of water within the area of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover/land-use classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_2	chb_lcc9201_ h1012rfg_pct	double precision	Net percentage gain or loss of urban land within the area of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover/land-use classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_3	chb_lcc9201_ h1012rfg_pct	double precision	Net percentage gain or loss of barren land within the area of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover/land-use classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_4	chb_lcc9201_ h1012rfg_pct	double precision	Net percentage gain or loss of forest within the area of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover/land-use classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_5	chb_lcc9201_ h1012rfg_pct	double precision	Net percentage gain or loss of grassland within the area of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover/land-use classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_6	chb_lcc9201_ h1012rfg_pct	double precision	Net percentage gain or loss of agricultural land within the area of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover/land-use classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_7	chb_lcc9201_ h1012rfg_pct	double precision	Net percentage gain or loss of wetland within the area of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover/land-use classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
nwr	chb_nlcd92_ h1012rfg_pct, chb_nlcd01_ h1012rfg_pct, chb_lcc9201_ h1012rfg_pct, chb_sgo_hsg_pct	text	U.S. Fish and Wildlife Service National Wildlife Refuge name
pct_11	chb_nlcd92_ h1012rfg_pct, chb_nlcd01_ h1012rfg_pct	double precision	Percent open water—all areas of open water, generally with less than 25% cover of vegetation or soil (1992, 2001)[i,j]

Table A–3*B*. Database field names, field types, and field definitions for Microsoft Acess and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Cahaba River National Wildlife Refuge contributing watersheds and vicinity, Alabama.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/ worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
pct_21	chb_nlcd92_ h1012rfg_pct, chb_nlcd01_ h1012rfg_pct	double precision	Percent developed—low-intensity residential (1992)[i]; Developed, open space—includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes (2001)[j]
pct_22	chb_nlcd92_ h1012rfg_pct, chb_nlcd01_ h1012rfg_pct	double precision	Percent developed—high-intensity residential (1992)[i]; Developed, low intensity—includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20–49 percent of total cover. These areas most commonly include single-family housing units (2001)[j]
pct_23	chb_nlcd92_ h1012rfg_pct, chb_nlcd01_ h1012rfg_pct	double precision	Percent developed—commercial/industrial/transportation (1992)[i]; Developed, medium intensity—includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50–79 percent of the total cover. These areas most commonly include single-family housing units (2001)[j]
pct_24	chb_nlcd01_ h1012rfg_pct	double precision	Developed, high intensity—includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to 100 percent of the total cover (2001)[j]
pct_31	chb_nlcd92_ h1012rfg_pct, chb_nlcd01_ h1012rfg_pct	double precision	Barren—bare rock/sand/clay (1992)[i]; Barren land (rock/sand/clay)—barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover (2001)[j]
pct_32	chb_nlcd92_ h1012rfg_pct	double precision	Barren—quarries/strip mines/gravel pits (1992)[i]; Unconsolidated shore[k]—unconsolidated material such as silt, sand, or gravel that is subject to inundation and redistribution due to the action of water. Characterized by substrates lacking vegetation except for pioneering plants that become established during brief periods when growing conditions are favorable. Erosion and deposition by waves and currents produce a number of landforms representing this class (2001)[j]
pct_33	chb_nlcd92_ h1012rfg_pct	double precision	Barren—transitional (1992)[i]
pct_41	chb_nlcd92_ h1012rfg_pct, chb_nlcd01_ h1012rfg_pct	double precision	Vegetated, natural forested upland—deciduous forest (1992)[i]; Deciduous forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change (2001)[j]
pct_42	chb_nlcd92_ h1012rfg_pct, chb_nlcd01_ h1012rfg_pct	double precision	Vegetated, natural forested upland—evergreen forest (1992)[i]; Evergreen forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75 percent of the tree species maintain their leaves all year. Canopy is never without green foliage (2001)[k]

Table A–3*B*. Database field names, field types, and field definitions for Microsoft Acess and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Cahaba River National Wildlife Refuge contributing watersheds and vicinity, Alabama.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/ worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
pct_43	chb_nlcd92_ h1012rfg_pct, chb_nlcd01_ h1012rfg_pct	double precision	Vegetated, natural forested upland—mixed forest (1992)[i]; Mixed forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75 percent of total tree cover (2001)[j]
pct_52	chb_nlcd01_ h1012rfg_pct	double precision	Shrub/Scrub—Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions (2001)[j]
pct_71	chb_nlcd01_ h1012rfg_pct	double precision	Herbaceous upland—grasslands/herbaceous (1992)[i]; Grassland/herbaceous—areas dominated by grammanoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing (2001)[j]
pct_81	chb_nlcd92_ h1012rfg_pct, chb_nlcd01_ h1012rfg_pct	double precision	Herbaceous planted/cultivated—pasture/hay (1992)[i]; Pasture/hay—areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation (2001)[j]
pct_82	chb_nlcd92_ h1012rfg_pct, chb_nlcd01_ h1012rfg_pct	double precision	Herbaceous planted/cultivated—row crops (1992)[i]; Cultivated crops—areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled (2001)[j]
pct_85	chb_nlcd92_ h1012rfg_pct	double precision	Herbaceous planted/cultivated—urban/recreational grasses (1992)[i]
pct_90	chb_nlcd01_ h1012rfg_pct	double precision	Woody wetlands—areas where forest or shrubland vegetation accounts for greater than 20 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water (2001)[j]
pct_91	chb_nlcd92_ h1012rfg_pct	double precision	Wetlands—woody wetlands (1992)[i]
pct_92	chb_nlcd92_ h1012rfg_pct	double precision	Wetlands—emergent herbaceous wetlands (1992)[i]
pct_95	chb_nlcd01_ h1012rfg_pct	double precision	Emergent herbaceous wetlands—areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water (2001)[j]
pct_tot	chb_nlcd92_ h1012rfg_pct, chb_nlcd01_ h1012rfg_pct, chb_sgo_hsg_pct	double precision	Sum-check for land-cover/land-use percentages and percentages of hydrologic soil groupsh[l]
POP010130D	tblChbPop01	double precision	Resident population (April 1—complete count) 1930
POP010140D	tblChbPop01	double precision	Resident population (April 1—complete count) 1940

Table A–3*B*. Database field names, field types, and field definitions for Microsoft Acess and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Cahaba River National Wildlife Refuge contributing watersheds and vicinity, Alabama.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/ worksheet(s)[a,b]	Field type	Field definition[a]
			Geospatial data summaries[f]—Continued
POP010150D	tblChbPop01	double precision	Resident population (April 1—complete count) 1950
POP010160D	tblChbPop01	double precision	Resident population (April 1—complete count) 1960
POP010170D	tblChbPop01	double precision	Resident population (April 1—complete count) 1970
POP010180D	tblChbPop01	double precision	Resident population (April 1—complete count) 1980
POP010190D	tblChbPop01	double precision	Resident population (April 1—complete count) 1990
POP010200D	tblChbPop01	double precision	Resident population (April 1—complete count) 2000
POP010210D	tblChbPop01	double precision	Resident population (April 1—complete count) 2010
POP020170D	tblChbPop01	double precision	Resident population (April 1—revised) 1970
pop3070_neg	pop_pct_chg	double precision	Descriptive statistics for population decrease, 1930–1970
pop3070_pct	tblChbPop01	double precision	Percent change in population, 1930–1970
pop3070_pos	pop_pct_chg	double precision	Descriptive statistics for population increase, 1930–1970
pop7010_neg	pop_pct_chg	double precision	Descriptive statistics for population decrease, 1970–2010
pop7010_pct	tblChbPop01	double precision	Percent change in population, 1970–2010
pop7010_pos	pop_pct_chg	double precision	Descriptive statistics for population increase, 1970–2010
ST	tblChbPop01	text	Two-letter U.S. Postal Service state code
to_1_pct	chb_lcc9201_ h1012rfg_pct	double precision	Percentage of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to water[m]
to_2_pct	chb_lcc9201_ h1012rfg_pct	double precision	Percentage of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to urban[m]
to_3_pct	chb_lcc9201_ h1012rfg_pct	double precision	Percentage of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to barren[m]
to_4_pct	chb_lcc9201_ h1012rfg_pct	double precision	Percentage of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to forest[m]
to_5_pct	chb_lcc9201_ h1012rfg_pct	double precision	Percentage of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to grassland[m]
to_6_pct	chb_lcc9201_ h1012rfg_pct	double precision	Percentage of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to agriculture[m]
to_7_pct	chb_lcc9201_ h1012rfg_pct	double precision	Percentage of the 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to wetland[m]
to_tot_pct	chb_lcc9201_ h1012rfg_pct	double precision	Sum-check for land-cover/land-use change percentages

Table A–3*B*. Database field names, field types, and field definitions for Microsoft Acess and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Cahaba River National Wildlife Refuge contributing watersheds and vicinity, Alabama.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/ worksheet(s)[a,b]	Field type	Field definition[a]
Geospatial data summaries[f]—Continued			
us_l3code	chb_eco4huc_12_pct, chb_eco3huc_12_pct, chb_eco4huc_10_pct, chb_eco3huc_10_pct	double precision	U.S. Environmental Protection Agency Level III ecoregion code[n]
us_l3name	chb_eco4huc_12_pct, chb_eco3huc_12_pct, chb_eco4huc_10_pct, chb_eco3huc_10_pct	double precision	U.S. Environmental Protection Agency Level III ecoregion name[n]
us_l4code	chb_eco4huc_12_pct, chb_eco4huc_10_pct	double precision	U.S. Environmental Protection Agency Level IV ecoregion code[n]
us_l4name	chb_eco4huc_12_pct, chb_eco4huc_10_pct	double precision	U.S. Environmental Protection Agency Level IV ecoregion name[n]

[a]In the file/table/worksheet name, ***var*** refers to the hydrologic parameter, where ***var***=gmn, gage height, in feet; qmn, discharge, in cubic feet per second; tmn, water temperature, in degrees Celsius; kmn, specific conductance, in microsiemens per centimeter; omn, dissolved oxygen, in milligrams per liter; all parameters are mean-daily values.

[b]Arguments enclosed in square brackets in table/worksheet names represent separate tables/worksheets. For example, chb[***var***]01 refers to 2 tables/worksheets—chbgmn1 and chbqmn1, if ***var***=gmn, qmn. “All tables” or “all worksheets” with one or more table/worksheet names in parentheses indicates that the table/worksheet reference(s) in parentheses is(are) excluded for the listed field. Tables refer to Microsoft Access files, worksheets refer to Microsoft Excel files.

[c]Raw-data file: chb_tabular_hydrostats_raw.accdb (Microsoft Access).

[d]Data-value qualification codes, USGS NWISWeb database (U.S. Geological Survey, 2002, 2011): Eqp—equipment malfunction, A—approved for publication-processing and review completed, P—provisional data subject to revision, 1—daily value is write-protected without any remark code to be printed, e—value has been estimated.

[e]Descriptive-statistics, spread-measures, and ratio-measures file: chb_tabular_hydrostats.accdb (Microsoft Access).

[f]Geospatial data summaries files: chb_nlcd.xlsx, chb_sgo_hsg.xlsx, chb_eco34.xlsx, chb_pop_census.xlsx (Microsoft Excel).

[g]U.S. Department of Agriculture, 2009.

[h]Seaber and others, 1994; U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013.

[i]Vogelmann and others, 2001.

[j]Homer and others, 2007.

[k]Coastal NLCD class only.

[l]Percentages of hydrologic soil groups A through D in 10-digit and 12-digit hydrologic units do not necessarily add up to 100 percent because, in some cases, there are STATSGO soil map-unit classifications that include multiple hydrologic soil groups (U.S. Department of Agriculture, 2009). Data for multiple-group map units are not included in the analysis.

[m]Fry and others, 2009.

[n]U.S. Environmental Protection Agency, 2011.

Table A–4*A*. Summary descriptive statistics and percentiles for gage height by water year for gaging stations in the contributing watersheds of the Cahaba River National Wildlife Refuge and vicinity, Alabama.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure A1. USGS 10-digit hydrologic units, and 10-digit hydrologic unit codes, listed as subheadings and also shown in figure A1. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile; water year, October 1, preceding calendar year, through September 30, current calendar year]

USGS station number	River name	Period of record[a]	Mean-annual gage height,[b] in feet			Mean-daily gage height,[b] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[c] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Headwaters-Cahaba River (0315020201)														
02423380	Cahaba River	1981–2009 (13)	1.31	0.90 (1986)	1.65 (1997)	0.37 (2000)	12.60 (2000)	— (0.50)	1.04 (0.57)	1.20 (0.73)	1.37 (1.12)	1.42 (1.55)	1.61 (2.15)	— (2.86)
02423398	Little Cahaba River	1976–2007 (12)	0.97	0.69 (2000)	1.20 (2003)	0.37 (2000)	8.95 (2000)	— (0.50)	0.80 (0.54)	0.88 (0.63)	0.96 (0.80)	1.07 (1.05)	1.18 (1.47)	— (1.95)
02423400	Little Cahaba River	1986–2009 (8)	0.67	0.52 (1988)	0.78 (1989)	0.18 (1999)	4.30 (1989)	— (0.34)	— (0.37)	0.61 (0.44)	0.69 (0.58)	0.74 (0.78)	— (1.04)	— (1.28)
Buck Creek-Cahaba River (0315020202)														
02423425	Cahaba River	1975–2009 (3)	2.24	2.00 (1977)	2.52 (2003)	1.17 (1977)	24.45 (2003)	— (1.35)	— (1.41)	— (1.53)	2.19 (1.86)	— (2.41)	— (3.00)	— (3.73)
02423496	Cahaba River	1988–2009 (8)	4.53	4.20 (1994)	4.97 (1996)	2.44 (2001)	31.80 (1996)	— (2.71)	— (2.77)	4.29 (2.92)	4.52 (3.80)	4.73 (5.05)	— (6.92)	— (8.80)
02423500	Cahaba River	1984–2009 (8)	3.56	2.65 (1988)	4.01 (1997)	1.73 (1988)	31.52 (1990)	— (1.87)	— (1.94)	3.39 (2.09)	3.66 (2.78)	3.86 (4.03)	— (6.02)	— (7.98)
0242354750	Cahaba Valley Creek	1999–2009 (7)	2.59	2.39 (2000)	2.83 (2002)	2.07 (2007)	9.91 (2000)	— (2.16)	— (2.19)	2.46 (2.29)	2.62 (2.44)	2.69 (2.73)	— (3.12)	— (3.46)
02423555	Cahaba River	1996–2009 (1)	2.98	2.98 (1996)	2.98 (1996)	1.41 (1996)	26.91 (1996)	— (1.47)	— (1.51)	— (1.66)	— (2.15)	— (2.80)	— (4.43)	— (7.96)
Shades Creek (0315020203)														
02423630	Shades Creek	1986–2009 (3)	3.21	2.75 (2008)	3.50 (1998)	1.71 (2008)	13.27 (2001)	— (1.90)	— (1.99)	— (2.23)	3.37 (2.63)	— (3.44)	— (4.91)	— (6.59)
Upper Cahaba River (0315020205)														
02424000	Cahaba River	1972–2009 (30)	4.40	2.30 (1986)	6.02 (1983)	0.69 (2006)	33.33 (1990)	2.41 (1.41)	2.92 (1.71)	3.83 (2.25)	4.46 (3.33)	5.01 (5.19)	5.67 (8.04)	5.98 (10.92)

[a]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily gage height are based on complete water years. Year of minimum and maximum values for mean-annual and mean-daily gage-height numbers shown in parentheses.

[c]Percentiles listed for mean-annual and mean-daily gage height are based on complete water years.

Table A–4*B*. Summary descriptive statistics and percentiles for gage height by calendar year for gaging stations in the contributing watersheds of the Cahaba River National Wildlife Refuge and vicinity, Alabama.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure A1. USGS 10-digit hydrologic units, and 10-digit hydrologic unit codes, listed as subheadings and also shown in figure A1. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile; calendar year, January 1 through December 31]

USGS station number	River name	Period of record[a]	Mean-annual gage height,[b] in feet			Mean-daily gage height,[b] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[c] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Headwaters-Cahaba River (0315020201)														
02423380	Cahaba River	1980–2009 (12)	1.34	0.98 (1986)	1.67 (1997)	0.37 (2000)	12.60 (2000)	— (0.51)	1.05 (0.57)	1.20 (0.74)	1.28 (1.14)	1.50 (1.56)	1.65 (2.19)	— (2.89)
02423398	Little Cahaba River	1976–2006 (11)	0.92	0.69 (2000)	1.20 (1983)	0.37 (2000)	8.95 (2000)	— (0.49)	0.86 (0.52)	0.86 (0.61)	0.91 (0.77)	0.94 (1.00)	1.00 (1.37)	— (1.83)
02423400	Little Cahaba River	1986–2009 (7)	0.67	0.56 (1988)	0.81 (1989)	0.18 (1999)	4.30 (1989)	— (0.32)	— (0.36)	0.59 (0.44)	0.68 (0.58)	0.71 (0.78)	— (1.04)	— (1.28)
Buck Creek-Cahaba River (0315020202)														
02423425	Cahaba River	1975–2009 (2)	1.99	1.78 (2008)	2.20 (1977)	1.17 (1977)	19.72 (1977)	— (1.33)	— (1.36)	— (1.44)	1.99 (1.67)	— (2.12)	— (2.65)	— (3.22)
02423496	Cahaba River	1988–2009 (8)	4.46	4.10 (1993)	4.74 (1997)	2.55 (1996)	31.80 (1996)	— (2.70)	— (2.76)	4.27 (2.89)	4.53 (3.70)	4.63 (4.96)	— (6.81)	— (8.74)
02423500	Cahaba River	1983–2009 (9)	3.59	2.76 (1988)	4.05 (1997)	1.76 (1989)	31.52 (1990)	— (1.90)	— (1.95)	3.37 (2.08)	3.71 (2.73)	3.84 (4.03)	— (5.99)	— (7.99)
0242354750	Cahaba Valley Creek	1998–2009 (6)	2.58	2.37 (2000)	2.77 (2001)	2.07 (2007)	9.91 (2000)	— (2.16)	— (2.19)	2.48 (2.28)	2.60 (2.42)	2.68 (2.73)	— (3.16)	— (3.45)
02423555	Cahaba River	1995–2009 (1)	2.81	2.81 (2004)	2.81 (2004)	1.38 (2004)	26.74 (2004)	— (1.44)	— (1.47)	— (1.65)	— (1.96)	— (2.52)	— (4.49)	— (6.71)
Shades Creek (0315020203)														
02423630	Shades Creek	1986–2009 (2)	3.18	2.85 (2008)	3.51 (2001)	1.82 (2008)	13.27 (2001)	— (1.88)	— (1.95)	— (2.17)	3.18 (2.61)	— (3.45)	— (4.91)	— (6.57)
Upper Cahaba River (0315020205)														
02424000	Cahaba River	1971–2009 (31)	4.40	2.61 (1986)	6.30 (1983)	0.66 (2006)	33.33 (1990)	2.73 (1.39)	3.49 (1.66)	3.72 (2.23)	4.42 (3.31)	5.15 (5.19)	5.66 (8.04)	6.00 (11.05)

[a]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily gage height are based on complete calendar years. Year of minimum and maximum values for mean-annual and mean-daily gage-height numbers shown in parentheses.

[c]Percentiles listed for mean-annual and mean-daily gage height are based on complete calendar years.

Table A–5*A*. Summary descriptive statistics and percentiles for discharge by water year for gaging stations in the contributing watersheds of the Cahaba River National Wildlife Refuge and vicinity, Alabama.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure A1. USGS 10-digit hydrologic units, and 10-digit hydrologic unit codes, listed as subheadings and also shown in figure A1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile; ft^3/s, cubic feet per second; mi^2, square mile]

USGS station number	River name	Period of record[a]	Mean-annual discharge,[b] in ft^3/s			Mean-daily discharge,[b] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[e] in cubic feet per second						
			Mean (yield[c])	Min	Max	Min[d]	Max	5	10	25	50	75	90	95
Headwaters-Cahaba River (0315020201)														
02423380	Cahaba River	1981–2009 (25)	228 (1.63)	70 (1986)	434 (2003)	2.5 (1988)	17,600 (2003)	87 (9.9)	109 (14)	169 (30)	222 (95)	292 (233)	319 (488)	388 (820)
02423398	Little Cahaba River	1981–2007 (19)	40 (2.06)	24 (1992)	67 (2003)	3.9 (2001)	1,700 (2003)	— (7.6)	25 (8.8)	33 (12)	39 (21)	46 (38)	51 (73)	— (117)
02423400	Little Cahaba River	1986–2009 (14)	45 (1.84)	19 (1988)	66 (1996)	2.9 (2008)	1,670 (1999)	— (7.1)	28 (8.7)	42 (13)	45 (24)	54 (45)	60 (87)	— (140)
Buck Creek-Cahaba River (0315020202)														
02423425	Cahaba River	1975–2009 (22)	282 (1.40)	70 (2007)	508 (2003)	0.10 (1979)	19,300 (1979)	103 (3.1)	122 (4.5)	215 (11)	275 (72)	365 (282)	413 (655)	470 (1,080)
02423496	Cahaba River	1988–2009 (20)	352 (1.56)	100 (2007)	736 (2003)	1.5 (2001)	15,100 (2003)	— (6.0)	191 (8.6)	280 (18)	316 (98)	414 (338)	526 (843)	— (1,460)
02423500	Cahaba River	1939–2009 (44)	345 (1.50)	60 (1986)	839 (2003)	0 (1954)	18,900 (1943)	124 (3.7)	194 (9.0)	259 (24)	329 (89)	408 (333)	537 (841)	579 (1,400)
0242354750	Cahaba Valley Creek	1999–2009 (10)	39 (1.52)	19 (2007)	73 (2003)	2.7 (2000)	1,410 (2000)	— (5.5)	— (6.7)	28 (9.9)	35 (18)	39 (39)	— (83)	— (124)
02423555	Cahaba River	1996–2009 (13)	565 (1.69)	186 (2007)	1,080 (2003)	20 (2001)	17,400 (2000)	— (37)	300 (48)	467 (75)	500 (208)	676 (566)	827 (1,340)	— (2,140)
Shades Creek (0315020203)														
02423630	Shades Creek	1965–2009 (26)	136 (1.88)	53 (2007)	219 (2003)	0.37 (2001)	8,510 (1979)	80 (7.4)	82 (13)	111 (26)	140 (50)	163 (120)	188 (287)	193 (496)
Little Cahaba River (0315020204)														
02423647	Cahaba River	1976–1984 (9)	1190 (2.01)	542 (1981)	1,590 (1983)	46 (1982)	35,100 (1976)	— (81)	— (100)	1,080 (160)	1,300 (418)	1,420 (1,150)	— (2,610)	— (4,550)
02423800	Little Cahaba River	1958–1970 (12)	193 (1.31)	124 (1967)	256 (1961)	40 (1960)	8,940 (1961)	— (51)	149 (56)	169 (70)	186 (102)	224 (189)	250 (347)	— (532)
Upper Cahaba River (0315020205)														
02424000	Cahaba River	1901–2009 (81)	1570 (1.53)	433 (1986)	2,820 (1949)	90 (1905)	71,700 (1961)	747 (200)	949 (237)	1,250 (350)	1,580 (702)	1,870 (1,580)	2,150 (3,230)	2,320 (5,340)

[a]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily discharge are based on complete water years. Year of minimum and maximum values for mean-annual and mean-daily discharge numbers shown in parentheses.

[c]Yield units are cubic feet per second per square mile. Yields are based on contributing drainage areas where given.

[d]Mean daily discharge of zero first occurred during the water year indicated but may subsequently have occurred in one or more years.

[e]Percentiles listed for mean-annual and mean-daily discharge are based on complete water years.

Table A–5*B*. Summary descriptive statistics and percentiles for discharge by calendar year for gaging stations in the contributing watersheds of the Cahaba River National Wildlife Refuge and vicinity, Alabama.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure A1. USGS 10-digit hydrologic units, and 10-digit hydrologic unit codes, listed as subheadings and also shown in figure A1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. ft^3/s, cubic feet per second; mi^2, square mile]

USGS station number	River name	Period of record[a]	Mean-annual discharge,[b] in ft^3/s			Mean-daily discharge,[b] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[e] in cubic feet per second						
			Mean (yield[c])	Min	Max	Min[d]	Max	5	10	25	50	75	90	95
Headwaters-Cahaba River (0315020201)														
02423380	Cahaba River	1980–2009 (24)	232 (1.66)	70 (2007)	348 (2003)	2.5 (1987)	17,600 (2003)	100 (9.7)	142 (14)	183 (31)	233 (98)	292 (237)	323 (493)	323 (842)
02423398	Little Cahaba River	1980–2006 (18)	40 (2.06)	27 (2000)	56 (2003)	3.9 (2000)	1,700 (2003)	— (7.8)	31 (9.0)	35 (12)	41 (22)	45 (39)	48 (75)	— (122)
02423400	Little Cahaba River	1986–2009 (14)	45 (1.84)	24 (1988)	62 (1997)	2.8 (2008)	1,670 (1999)	— (7.2)	32 (8.8)	39 (13)	44 (24)	55 (45)	56 (87)	— (141)
Buck Creek-Cahaba River (0315020202)														
02423425	Cahaba River	1975–2009 (21)	285 (1.42)	61 (2007)	496 (1983)	0.10 (1978)	19,300 (1979)	104 (3.1)	139 (4.4)	215 (10)	305 (70)	363 (289)	398 (664)	471 (1,100)
02423496	Cahaba River	1988–2009 (20)	352 (1.56)	83 (2007)	569 (2003)	1.5 (2000)	15,100 (2003)	— (5.9)	211 (8.5)	284 (17)	363 (98)	426 (337)	460 (842)	— (1,460)
02423500	Cahaba River	1938–2009 (43)	342 (1.49)	103 (2007)	647 (2003)	0 (1953)	18,900 (1942)	140 (4.2)	190 (10)	251 (25)	327 (90)	439 (332)	495 (837)	533 (1,390)
0242354750	Cahaba Valley Creek	1998–2009 (10)	39 (1.52)	15 (2007)	62 (2003)	2.7 (2000)	1,410 (2000)	— (5.4)	— (6.5)	29 (9.9)	41 (18)	48 (40)	— (83)	— (125)
02423555	Cahaba River	1995–2009 (13)	551 (1.64)	150 (2007)	876 (2003)	20 (2000)	17,400 (2000)	— (37)	334 (47)	458 (72)	613 (201)	640 (555)	726 (1,310)	— (2,090)
Shades Creek (0315020203)														
02423630	Shades Creek	1964–2009 (23)	137 (1.89)	41 (2007)	202 (1979)	0.37 (2000)	8,510 (1979)	89 (6.6)	101 (11)	111 (25)	135 (50)	163 (119)	180 (290)	198 (500)
Little Cahaba River (0315020204)														
02423647	Cahaba River	1975–1984 (8)	1220 (2.06)	514 (1981)	1,780 (1983)	46 (1981)	35,100 (1976)	— (78)	— (97)	1,030 (155)	1,310 (402)	1,400 (1,130)	— (2,680)	— (4,740)
02423800	Little Cahaba River	1957–1970 (12)	194 (1.32)	140 (1960)	303 (1961)	40 (1960)	8,940 (1961)	— (51)	157 (56)	163 (70)	186 (104)	211 (192)	245 (354)	— (542)
Upper Cahaba River (0315020205)														
02424000	Cahaba River	1901–2009 (81)	1560 (1.52)	459 (1904)	2,760 (1983)	90 (1904)	71,700 (1961)	738 (199)	952 (235)	1,230 (348)	1,580 (700)	1,870 (1,580)	2,200 (3,220)	2,330 (5,300)

[a]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily discharge are based on complete calendar years. Year of minimum and maximum values for mean-annual and mean-daily discharge numbers shown in parentheses.

[c]Yield units are cubic feet per second per square mile. Yields are based on contributing drainage areas where given.

[d]Mean daily discharge of zero first occurred during the calendar year indicated but may subsequently have occurred in one or more years.

[e]Percentiles listed for mean-annual and mean-daily discharge are based on complete calendar years.

Table A–6*A*. Summary descriptive statistics and percentiles for selected water-quality parameters by water year for gaging stations in the contributing watersheds of the Cahaba River National Wildlife Refuge and vicinity, Alabama.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure A1. USGS 10-digit hydrologic units, and 10-digit hydrologic unit codes, listed as subheadings and also shown in figure A1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual parameter value[b]			Mean-daily parameter value[b]		Percentiles of mean-annual parameter values and (mean-daily parameter values)[c]						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Water temperature, in degrees Celsius														
Headwaters-Cahaba River (0315020201)														
2423398	Little Cahaba River	1988–2007 (7)	17.4	16.6 (1994)	17.8 (1999)	6.5 (1994)	24.9 (1995)	— (10.1)	— (11.2)	17.2 (13.8)	17.5 (17.7)	17.6 (21.4)	— (22.8)	— (23.2)
Buck Creek-Cahaba River (0315020202)														
02423496	Cahaba River	1989–2009 (7)	18.1	17.3 (1997)	18.6 (2005)	3.4 (1992)	30.2 (2008)	— (7.5)	— (8.8)	17.5 (12.3)	18.2 (18.3)	18.6 (24.5)	— (26.7)	— (27.6)
Specific conductance, in microsiemens per centimeter at 25 degrees Celsius														
Headwaters-Cahaba River (0315020201)														
2423398	Little Cahaba River	1988–2007 (6)	365	347 (2003)	375 (1999)	118 (2005)	449 (2005)	— (260)	— (294)	359 (347)	369 (380)	373 (397)	— (414)	— (421)
Dissolved oxygen, in milligrams per liter														
Headwaters-Cahaba River (0315020201)														
2423398	Little Cahaba River	1988–2007 (2)	7.3	7.1 (1994)	7.5 (1995)	4.3 (1994)	12.7 (1994)	— (5.6)	— (5.8)	— (6.3)	7.3 (7.1)	— (8.2)	— (9.0)	— (9.7)

[a]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily parameter values are based on complete water years. Year of minimum and maximum parameter values for mean-annual and mean-daily parameter-value numbers shown in parentheses.

[c]Percentiles listed for mean-annual and mean-daily parameter values are based on complete water years.

Table A–6*B*. Summary descriptive statistics and percentiles for selected water-quality parameters by calendar year for gaging stations in the contributing watersheds of the Cahaba River National Wildlife Refuge and vicinity, Alabama.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure A1. USGS 10-digit hydrologic units, and 10-digit hydrologic unit codes, listed as subheadings and also shown in figure A1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual parameter value[b]			Mean-daily parameter value[b]		Percentiles of mean-annual parameter values and (mean-daily parameter values)[c]						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Water temperature, in degrees Celsius														
Headwaters-Cahaba R (0315020201)														
2423398	Little Cahaba River	1988–2006 (8)	17.2	16.9 (1993)	17.5 (2004)	5.6 (2000)	24.9 (1995)	— (9.8)	— (10.9)	17.0 (13.3)	17.2 (17.6)	17.4 (21.4)	— (22.8)	— (23.3)
Buck Creek-Cahaba River (0315020202)														
02423496	Cahaba River	1988–2009 (8)	18.1	17.2 (1997)	19.2 (1990)	1.3 (2001)	31.8 (1990)	— (7.4)	— (8.8)	17.5 (12.2)	17.9 (18.3)	18.6 (24.6)	— (26.8)	— (27.7)
Specific conductance, in microsiemens per centimeter at 25 degrees Celsius														
Headwaters-Cahaba R (0315020201)														
2423398	Little Cahaba River	1988–2006 (8)	364	340 (1998)	383 (1999)	118 (2004)	449 (2004)	— (259)	— (291)	359 (344)	365 (379)	371 (397)	— (414)	— (422)
Dissolved oxygen, in milligrams per liter														
Headwaters-Cahaba R (0315020201)														
2423398	Little Cahaba River	1988–2006 (2)	7.1	6.9 (1993)	7.3 (1994)	4.2 (1993)	12.7 (1994)	— (5.3)	— (5.6)	— (5.9)	7.1 (6.7)	— (8.2)	— (9.0)	— (9.7)

[a]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily parameter values are based on complete calendar years. Year of minimum and maximum parameter values for mean-annual and mean-daily parameter-value numbers shown in parentheses.

[c]Percentiles listed for mean-annual and mean-daily parameter values are based on complete calendar years.

Table A–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and dissolved oxygen data collected at gaging stations in the contributing watersheds of the Cahaba River National Wildlife Refuge and vicinity, Alabama.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure A1. USGS 10-digit hydrologic units, and 10-digit hydrologic unit codes, listed as subheadings and also shown in figure A1. Calendar year, January 1 through December 31]

USGS station number	Station name	Parameter	Plot frames[a–e]	File name[f]
		Headwaters-Cahaba River (0315020201)		
02423380	Cahaba R nr Mountain Brook, AL	Gage height	A1, A2, A4	s02423380gmn.p01ar.pdf
		Gage height	A1, A2, A4	s02423380gmn.p01lg.pdf
		Discharge	A1–A4; A5–A8	s02423380qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02423380qmn.p12lg.pdf
02423398	Little Cahaba R nr Leeds, AL	Gage height	A1, A2, A4	s02423398gmn.p01ar.pdf
		Gage height	A1, A2, A4	s02423398gmn.p01lg.pdf
		Discharge	A1–A4; A5–A7	s02423398qmn.p12ar.pdf
		Discharge	A1–A4; A5–A7	s02423398qmn.p12lg.pdf
		Water temperature	A1, A2, A4	s02423398tmn.p01ar.pdf
		Water temperature	A1, A2, A4	s02423398tmn.p01lg.pdf
		Specific conductance	A1, A2, A4	s02423398kmn.p01ar.pdf
		Specific conductance	A1, A2, A4	s02423398kmn.p01lg.pdf
		Dissolved oxygen	A1, A2, A4	s02423398omn.p01ar.pdf
		Dissolved oxygen	A1, A2, A4	s02423398omn.p01lg.pdf
02423400	Little Cahaba R nr Jefferson Park, AL	Gage height	A1, A2, A4	s02423400gmn.p01ar.pdf
		Gage height	A1, A2, A4	s02423400gmn.p01lg.pdf
		Discharge	A1–A4; A5–A7	s02423400qmn.p12ar.pdf
		Discharge	A1–A4; A5–A7	s02423400qmn.p12lg.pdf
		Buck Creek-Cahaba River (0315020202)		
02423425	Cahaba R nr Cahaba Heights, AL	Gage height	A1, A2, A4	s02423425gmn.p01ar.pdf
		Gage height	A1, A2, A4	s02423425gmn.p01lg.pdf
		Discharge	A1, A2, A4; A5–A8	s02423425qmn.p12ar.pdf
		Discharge	A1, A2, A4; A5–A8	s02423425qmn.p12]lg.pdf
02423496	Cahaba R nr Hoover, AL	Gage height	A1, A2, A4	s02423496gmn.p01ar.pdf
		Gage height	A1, A2, A4	s02423496gmn.p01lg.pdf
		Discharge	A1–A4; A5–A8	s02423496qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02423496qmn.p12lg.pdf
		Water temperature	A1, A2, A4	s02423496tmn.p01ar.pdf
		Water temperature	A1, A2, A4	s02423496tmn.p01lg.pdf
02423500	Cahaba R nr Acton, AL	Gage height	A1, A2, A4	s02423500gmn.p01ar.pdf
		Gage height	A1, A2, A4	s02423500gmn.p01lg.pdf
		Discharge	A1–A4; A5–A8	s02423500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02423500qmn.p12lg.pdf

Table A–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and dissolved oxygen data collected at gaging stations in the contributing watersheds of the Cahaba River National Wildlife Refuge and vicinity, Alabama.—Continued

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure A1. USGS 10-digit hydrologic units, and 10-digit hydrologic unit codes, listed as subheadings and also shown in figure A1. Calendar year, January 1 through December 31]

USGS station number	Station name	Parameter	Plot frames[a–e]	File name[f]
		Buck Creek-Cahaba River (0315020202)—Continued		
0242354750	Cahaba Valley Cr (Cross Cr Rd) nr Pelham, AL	Gage height	A1, A2, A4	s0242354750gmn.p01ar.pdf
		Gage height	A1, A2, A4	s0242354750gmn.p01lg.pdf
		Discharge	A1, A2, A4; A5–A7	s0242354750qmn.p12ar.pdf
		Discharge	A1, A2, A4; A5–A7	s0242354750qmn.p12lg.pdf
02423555	Cahaba R nr Helena, AL	Gage height	A1, A2, A4	s02423555gmn.p01ar.pdf
		Gage height	A1, A2, A4	s02423555gmn.p01lg.pdf
		Discharge	A1, A2, A4; A5–A7	s02423555qmn.p12ar.pdf
		Discharge	A1, A2, A4; A5–A7	s02423555qmn.p12lg.pdf
		Shades Creek (0315020203)		
02423630	Shades Cr nr Greenwood, AL	Gage height	A1, A2, A4	s02423630gmn.p01ar.pdf
		Gage height	A1, A2, A4	s02423630gmn.p01lg.pdf
		Discharge	A1, A2, A4; A5–A8	s02423630qmn.p12ar.pdf
		Discharge	A1, A2, A4; A5–A8	s02423630qmn.p12lg.pdf
		Little Cahaba River (0315020204)		
02423647	Cahaba R nr West Blocton, AL	Discharge	A1, A2, A4; A5–A7	s02423647qmn.p12ar.pdf
		Discharge	A1, A2, A4; A5–A7	s02423647qmn.p12lg.pdf
02423800	Little Cahaba R nr Brierfield, AL	Discharge	A1, A2, A4; A5–A7	s02423800qmn.p12ar.pdf
		Discharge	A1, A2, A4; A5–A7	s02423800qmn.p12lg.pdf
		Upper Cahaba River (0315020205)		
02424000	Cahaba R at Centreville, AL	Gage height	A1, A2, A4; A5–A8	s02424000gmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s02424000gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02424000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02424000qmn.p12lg.pdf

[a]A1, mean-daily values; A2, A3, A4, boxplot interpolation of mean-daily values, annual timestep (A2), decadal timestep (A3), monthly timestep, period-of-record (A4); A5, annual-distribution spread measures; A6, annual-distribution ratio measures; A7, annual distribution, log-coefficient of variation, set of every 5th percentile of mean-daily values for each complete calendar year; Richards-Baker flashiness index; A8, long-term daily seasonality.

[b]Percentile spread measures are calculated as the difference between the indicated percentiles divided by the median where 7525 = (p75–p25)/p50, 8020 = (p80–p20)/p50, and 9010 = (p90–p10)/p50.

[c]Percentile ratio measures are calculated as the ratios of the indicated percentiles where 7525 = p75/p25, 8020 = p80/p20, and 9010 = p90/p10.

[d]Richards-Baker flashiness index (Baker and others, 2004).

[e]Plots A2, A5–A7 complete calendar years only; plot A3, complete calendar decades only; plot A4, period-of-record monthly distributions for all complete calendar years; plot A8, period-of-record daily distributions for 20 or more complete calendar years.

[f]File-naming conventions: sSSSSSSSS***var***.p[01,12]***ps***.pdf; SSSSSSSS, USGS station identification number; ***var***: gmn, mean-daily gage height, in feet; qmn, mean-daily discharge, in cubic feet per second; tmn, mean-daily water temperature, in degrees Celsius; kmn, mean-daily specific conductance, in microsiemens per centimeter at 25 degrees Celsius; omn, mean-daily dissolved-oxygen concentration, in milligrams per liter; p[01,12], p01, plots A1–A4, p12, plots A1–A4, page 1, plots A5–A8, page 2; ***ps***, plot scale: ar, plots A1–A5, vertical axis arithmetic, plots A6–A8, vertical axis base-10 logarithmic; lg, plots A1–A8, base-10 logarithmic.

Table A–8. Land-cover percentages for the Cahaba River National Wildlife Refuge and contributing watersheds, Alabama, based on the 1992 National Land Cover Database.

[See figure A6 for map of 1992 land cover, 12-digit HUC names, and 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 1992 NLCD (Vogelmann and others, 2001); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of 1992 NLCD land-cover class[a]														
	11	21	22	23	31	32	33	41	42	43	81	82	85	91	92
Headwaters-Cahaba River (0315020201)															
031502020101	0.7	1.8	0.3	1.8	0.0	0.4	<0.1	45.4	9.7	26.2	9.1	3.2	0.8	0.5	<0.1
031502020102	0.4	0.8	<0.1	0.4	0.0	0.1	0.3	39.4	20.7	33.6	2.5	1.4	0.3	<0.1	<0.1
031502020103	2.9	3.1	0.8	2.0	0.0	0.9	<0.1	33.1	14.7	28.7	8.5	3.3	1.0	0.9	0.1
031502020104	0.9	4.3	0.5	1.6	0.0	0.3	0.7	41.8	14.0	30.0	2.4	2.2	1.2	<0.1	<0.1
Buck Creek-Cahaba River (0315020202)															
031502020201	0.3	1.7	0.1	2.3	0.0	0.0	2.9	44.7	10.6	29.8	5.2	1.8	0.5	0.2	<0.1
031502020202	1.3	6.2	1.2	2.8	0.0	0.5	0.1	34.2	14.9	27.3	7.5	3.0	0.9	0.2	<0.1
031502020203	0.7	6.8	1.4	4.3	0.0	4.1	0.5	32.4	9.4	25.2	9.7	3.5	1.7	0.2	<0.1
031502020204	1.0	16.3	3.9	2.8	0.0	0.4	0.1	24.0	14.5	28.1	3.6	2.9	2.5	<0.1	<0.1
031502020205	0.1	0.1	0.0	0.2	0.0	0.9	4.4	35.3	23.3	33.6	1.1	0.7	0.2	0.1	<0.1
031502020206	1.1	0.8	0.1	0.2	0.0	0.1	2.6	42.9	18.5	28.0	3.4	1.5	0.1	0.7	<0.1
Shades Creek (0315020203)															
031502020301	0.2	14.8	3.9	7.2	0.0	1.1	0.0	30.0	11.2	24.3	1.6	2.5	3.1	0.2	<0.1
031502020302	1.2	0.2	<0.1	0.5	0.0	0.2	0.2	34.4	11.6	26.7	15.7	5.1	0.4	3.7	0.1
031502020303	0.5	1.2	0.1	0.8	0.0	0.4	0.7	36.1	13.7	30.1	8.9	3.2	0.5	3.7	0.1
Little Cahaba River (0315020204)															
031502020401	0.2	0.2	<0.1	0.1	0.0	0.0	0.0	26.0	18.2	31.6	15.3	7.8	0.1	0.6	<0.1
031502020402	0.4	0.1	<0.1	0.2	0.0	1.1	1.4	29.9	14.2	30.5	12.6	8.5	0.1	0.9	<0.1
031502020403	0.4	1.0	0.1	0.4	0.0	2.6	1.4	21.8	20.0	29.9	15.2	5.3	0.5	1.2	<0.1
031502020404	0.1	<0.1	0.0	<0.1	0.0	0.0	4.4	20.7	31.9	32.5	5.5	4.5	<0.1	0.2	<0.1
031502020405	0.3	0.0	0.0	<0.1	0.0	0.6	7.2	25.8	28.5	28.0	4.4	4.5	0.0	0.5	0.0
031502020406	0.7	0.8	0.2	0.4	0.0	0.6	4.4	32.8	20.8	31.3	3.8	3.3	0.3	0.7	<0.1
031502020407	1.2	<0.1	0.0	0.1	0.0	0.0	3.1	35.8	27.0	29.6	1.0	0.9	<0.1	1.3	<0.1
Upper Cahaba River (0315020205)															
031502020501	0.1	<0.1	<0.1	0.1	0.0	0.3	0.9	28.3	18.4	38.7	4.7	5.3	<0.1	3.1	0.0
031502020502	1.0	<0.1	0.0	<0.1	0.0	<0.1	1.3	27.7	31.5	33.2	2.3	1.0	<0.1	1.9	0.1
031502020503	0.7	0.5	0.1	0.8	0.0	0.1	2.4	25.0	25.5	29.3	6.8	3.4	0.5	4.9	<0.1
031502020504	0.4	0.2	<0.1	1.0	0.0	0.0	1.0	24.4	16.7	30.3	8.2	3.3	0.2	13.8	0.6
031502020505	0.1	<0.1	0.0	0.1	0.0	0.0	0.4	16.2	32.9	34.2	4.1	2.3	<0.1	9.5	0.2
031502020506	1.3	<0.1	0.0	0.1	<0.1	0.0	2.0	15.3	35.2	26.4	4.7	2.1	0.0	12.6	0.2
031502020507	0.2	<0.1	0.0	<0.1	0.0	0.0	0.7	12.4	38.8	26.1	4.3	2.4	<0.1	15.1	0.1
Mill Creek-Cahaba River (0315020206)															
031502020601	1.1	<0.1	0.0	0.1	<0.1	0.0	2.8	15.5	29.3	28.5	7.1	3.6	0.0	11.7	0.3
031502020602	1.0	<0.1	0.0	0.1	0.1	0.0	4.5	17.7	27.9	29.6	5.3	3.7	0.0	9.6	0.6
031502020603	0.2	<0.1	0.0	<0.1	0.0	0.0	5.7	19.0	29.9	31.7	3.2	2.6	0.0	7.6	<0.1
Waters Creek-Cahaba River (0315020207)															
031502020701	0.2	0.6	0.1	0.2	0.0	0.0	0.8	23.5	16.1	32.7	11.6	9.8	0.4	3.9	0.2
031502020702	0.9	<0.1	0.0	<0.1	<0.1	0.0	2.5	20.8	24.9	21.1	2.5	5.3	0.0	21.7	0.2
031502020703	0.7	<0.1	0.0	<0.1	0.0	0.0	1.7	16.5	27.7	18.9	7.1	11.3	0.0	15.9	0.2

Table A–8. Land-cover percentages for the Cahaba River National Wildlife Refuge and contributing watersheds, Alabama, based on the 1992 National Land Cover Database.—Continued

[See figure A6 for map of 1992 land cover, 12-digit HUC names, and 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 1992 NLCD (Vogelmann and others, 2001); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of 1992 NLCD land-cover class[a]														
	11	21	22	23	31	32	33	41	42	43	81	82	85	91	92
Oakmulgee Creek (0315020208)															
031502020801	0.1	<0.1	0.0	<0.1	0.0	0.0	0.9	15.7	37.4	26.1	1.9	2.8	0.0	14.7	0.4
031502020802	0.1	<0.1	0.0	<0.1	0.0	0.0	3.6	17.7	32.5	31.3	3.9	2.9	<0.1	7.7	0.2
031502020803	<0.1	<0.1	0.0	<0.1	0.0	0.0	3.8	23.1	24.5	35.2	1.3	1.8	0.0	10.1	0.2
031502020804	<0.1	<0.1	0.0	<0.1	0.0	0.0	3.0	20.9	30.8	40.6	<0.1	0.4	0.0	3.4	0.1
031502020805	0.2	<0.1	0.0	0.1	<0.1	0.0	3.4	19.0	20.5	26.6	5.1	9.6	<0.1	14.8	0.5
Lower Cahaba River (0315020209)															
031502020901	0.8	0.3	<0.1	0.1	0.0	0.0	<0.1	18.7	3.8	12.4	16.7	21.0	0.6	23.0	2.4
031502020902	1.9	0.1	0.0	0.1	0.0	0.0	0.1	16.4	6.6	13.3	23.3	18.4	0.1	19.3	0.5
10-digit hydrologic unit															
0315020201	1.2	2.6	0.4	1.5	0.0	0.4	0.2	40.1	14.4	29.4	5.8	2.6	0.9	0.4	<0.1
0315020202	0.9	6.6	1.4	1.9	0.0	0.8	1.5	34.6	15.6	28.3	4.7	2.3	1.1	0.3	<0.1
0315020203	0.5	5.0	1.2	2.6	0.0	0.5	0.4	33.9	12.5	27.7	8.1	3.4	1.3	2.7	0.1
0315020204	0.5	0.4	0.1	0.2	0.0	0.9	3.2	26.6	23.9	30.6	8.1	4.7	0.2	0.8	<0.1
0315020205	0.5	0.1	<0.1	0.4	<0.1	0.1	1.3	21.6	27.8	30.9	5.3	2.9	0.1	8.7	0.2
0315020206	0.8	<0.1	0.0	0.1	<0.1	0.0	4.1	17.1	29.0	29.6	5.5	3.4	0.0	10.0	0.3
0315020207	0.6	0.2	<0.1	0.1	<0.1	0.0	1.8	20.0	23.5	23.4	6.5	8.6	0.1	14.9	0.2
0315020208	0.1	<0.1	0.0	<0.1	<0.1	0.0	3.1	19.0	29.6	32.0	2.9	3.5	<0.1	9.5	0.3
0315020209	1.6	0.1	<0.1	0.1	0.0	0.0	0.1	17.1	5.9	13.0	21.5	19.1	0.2	20.3	1.0
National Wildlife Refuge															
Cahaba River	3.2	<0.1	<0.1	0.4	<0.1	<0.1	0.1	29.9	35.0	29.8	0.5	0.3	<0.1	0.7	<0.1

[a]1992 NLCD class definitions:

11, open water
21, low-intensity residential
22, high-intensity residential
23, commercial, industrial, transportation
31, bare rock, sand, clay
32, quarries, strip mines, gravel pits
33, transitional
41, deciduous forest
42, evergreen forest
43, mixed forest
81, pasture, hay
82, row crops
85, urban, recreational grasses
91, woody wetlands
92, emergent herbaceous wetlands

Table A–9. Land-cover percentages for the Cahaba River National Wildlife Refuge and contributing watersheds, Alabama, based on the 2001 National Land Cover Database.

[See figure A7 for map of 2001 land cover, 12-digit HUC names, and 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 2001 NLCD (Homer and others, 2007); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of 2001 NLCD land-cover class[a]														
	11	21	22	23	24	31	41	42	43	52	71	81	82	90	95
Headwaters-Cahaba River (0315020201)															
031502020101	1.1	9.0	5.7	1.3	0.4	1.0	51.7	6.3	4.6	2.2	3.8	10.2	1.7	0.9	0.0
031502020102	0.6	4.6	0.5	<0.1	0.0	1.1	44.8	19.1	6.8	3.6	8.7	7.7	1.8	0.7	0.0
031502020103	3.5	13.2	9.4	3.5	0.6	0.8	40.4	10.5	4.9	1.5	2.7	6.8	1.4	0.7	0.0
031502020104	1.2	15.3	6.7	2.3	0.2	0.5	42.0	14.2	6.7	2.0	2.7	4.4	1.1	0.8	0.0
Buck Creek-Cahaba River (0315020202)															
031502020201	0.5	8.6	6.4	1.6	0.3	1.9	58.0	5.6	3.5	2.0	3.8	6.4	1.1	0.2	0.0
031502020202	1.7	17.1	10.8	4.0	1.2	0.1	43.0	8.5	4.4	0.7	1.5	5.3	1.3	0.4	0.0
031502020203	0.5	17.1	19.9	5.8	1.5	5.1	29.4	4.8	2.7	3.5	5.1	2.9	1.0	0.5	0.0
031502020204	1.2	29.5	22.2	6.5	1.4	0.1	21.1	7.9	4.7	0.7	1.0	2.4	0.7	0.6	0.0
031502020205	0.4	2.5	0.2	0.0	0.1	0.7	38.6	38.6	6.5	4.4	5.1	2.5	0.3	0.1	0.0
031502020206	1.2	4.9	2.2	0.2	<0.1	0.3	40.2	31.3	4.7	3.6	4.5	5.0	0.7	1.2	<0.1
Shades Creek (0315020203)															
031502020301	0.1	24.3	20.0	8.8	3.3	0.1	27.0	8.7	4.7	0.8	0.9	1.0	0.3	0.2	0.0
031502020302	1.8	12.2	1.3	1.0	0.2	0.4	33.7	16.8	6.3	5.3	3.0	12.8	0.9	4.3	<0.1
031502020303	0.8	14.4	3.9	2.0	0.3	0.2	41.0	13.0	5.1	2.7	2.4	9.5	1.2	3.6	<0.1
Little Cahaba River (0315020204)															
031502020401	0.5	4.4	0.3	<0.1	0.0	0.3	27.7	19.3	4.9	5.1	7.2	21.9	7.3	1.0	0.0
031502020402	1.3	4.1	0.7	0.1	<0.1	1.9	30.6	19.2	7.4	8.3	3.5	17.1	3.5	2.4	<0.1
031502020403	0.7	6.1	2.8	0.8	0.3	2.9	27.3	21.1	5.2	5.1	6.0	17.5	3.0	1.1	0.0
031502020404	0.4	3.5	0.2	<0.1	0.0	0.1	22.1	36.1	11.0	9.9	2.8	9.3	2.2	2.6	<0.1
031502020405	0.5	3.5	0.2	<0.1	0.0	1.3	29.0	32.8	5.6	8.5	8.1	7.8	2.1	0.5	<0.1
031502020406	1.0	6.3	0.6	0.2	<0.1	0.2	29.3	38.1	9.9	4.6	2.7	4.1	0.4	2.5	<0.1
031502020407	1.4	2.6	0.1	<0.1	0.0	0.5	31.0	43.5	6.8	6.0	5.2	1.6	0.2	1.1	<0.1
Upper Cahaba River (0315020205)															
031502020501	0.3	3.6	0.2	0.1	<0.1	0.8	35.8	19.6	18.8	9.1	1.6	6.0	0.8	3.2	<0.1
031502020502	1.3	2.2	<0.1	0.0	0.0	<0.1	28.3	35.0	17.3	9.9	1.1	2.9	0.2	1.7	<0.1
031502020503	1.0	4.8	0.8	0.5	0.1	0.1	31.6	24.3	13.4	8.7	1.9	9.4	0.8	2.6	<0.1
031502020504	0.7	4.1	0.8	0.2	<0.1	0.0	29.8	19.8	17.7	6.3	<0.1	9.2	1.1	10.2	0.1
031502020505	0.5	2.6	<0.1	<0.1	0.0	0.0	26.6	25.1	23.3	4.9	<0.1	5.1	0.3	11.5	<0.1
031502020506	1.9	2.3	<0.1	0.0	0.0	0.0	23.5	33.5	15.9	6.3	0.1	5.9	0.7	9.9	0.1
031502020507	0.6	2.6	0.1	<0.1	0.0	0.0	18.6	33.1	25.6	4.3	<0.1	3.9	0.6	10.5	<0.1
Mill Creek-Cahaba River (0315020206)															
031502020601	1.3	3.2	<0.1	<0.1	0.0	0.0	23.0	26.2	24.3	7.1	<0.1	4.1	4.2	6.6	<0.1
031502020602	0.8	3.2	<0.1	<0.1	0.0	0.0	22.5	28.9	22.4	7.0	<0.1	4.4	3.6	7.0	0.2
031502020603	0.2	3.4	<0.1	<0.1	0.0	<0.1	22.4	31.8	20.8	13.3	0.1	2.2	3.1	2.8	<0.1
Waters Creek-Cahaba River (0315020207)															
031502020701	0.4	6.0	0.5	0.2	<0.1	0.0	18.3	16.2	27.9	13.6	0.0	10.2	5.7	0.9	<0.1
031502020702	0.9	2.8	<0.1	<0.1	0.0	0.0	17.3	30.7	16.3	10.6	<0.1	4.6	3.4	13.2	0.1
031502020703	0.9	3.1	0.0	0.0	0.0	0.0	12.4	34.9	22.2	9.5	<0.1	4.5	5.0	7.3	<0.1

Table A–9. Land-cover percentages for the Cahaba River National Wildlife Refuge and contributing watersheds, Alabama, based on the 2001 National Land Cover Database.—Continued

[See figure A7 for map of 2001 land cover, 12-digit HUC names, and 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 2001 NLCD (Homer and others, 2007); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of 2001 NLCD land-cover class[a]														
	11	21	22	23	24	31	41	42	43	52	71	81	82	90	95
Oakmulgee Creek (0315020208)															
031502020801	0.3	3.3	<0.1	0.0	0.0	0.0	15.4	35.4	21.1	17.0	0.1	2.1	1.5	3.8	<0.1
031502020802	0.3	3.3	0.1	<0.1	0.0	0.0	25.2	28.4	17.5	12.8	0.1	6.3	1.5	4.5	<0.1
031502020803	<0.1	3.4	<0.1	0.0	0.0	0.0	26.8	23.5	22.3	13.4	<0.1	1.2	1.2	8.2	<0.1
031502020804	0.1	2.3	<0.1	0.0	0.0	0.0	37.2	23.3	19.2	12.0	0.1	1.5	0.6	3.6	<0.1
031502020805	0.4	4.0	<0.1	<0.1	<0.1	0.0	18.6	24.7	18.3	12.6	<0.1	8.9	4.7	7.6	0.1
Lower Cahaba River (0315020209)															
031502020901	1.0	6.3	0.9	0.2	<0.1	0.0	9.5	13.3	6.6	7.6	0.4	24.2	9.7	18.0	2.3
031502020902	2.5	4.7	0.4	<0.1	0.0	0.0	11.8	13.9	5.6	7.5	0.1	27.6	6.8	17.2	1.8
10-digit hydrologic unit															
0315020201	1.6	10.8	5.8	1.9	0.3	0.8	44.8	12.2	5.7	2.3	4.3	7.3	1.5	0.8	0.0
0315020202	1.1	14.9	11.2	3.2	0.8	1.0	35.2	17.2	4.5	2.4	3.2	3.9	0.8	0.7	<0.1
0315020203	0.8	16.9	8.1	3.8	1.2	0.2	35.4	12.5	5.2	2.7	2.1	7.6	0.9	2.7	<0.1
0315020204	0.8	4.4	0.9	0.2	0.1	1.2	27.5	30.6	7.6	7.0	4.7	10.9	2.3	1.7	<0.1
0315020205	0.9	3.4	0.3	0.2	<0.1	0.1	28.1	26.6	18.4	7.1	0.8	6.5	0.7	6.9	<0.1
0315020206	0.9	3.2	<0.1	<0.1	0.0	<0.1	22.7	28.5	22.8	8.5	<0.1	3.7	3.7	5.8	0.1
0315020207	0.8	3.8	0.1	0.1	<0.1	0.0	15.9	28.3	21.5	11.0	0.1	6.1	4.5	7.9	<0.1
0315020208	0.2	3.2	0.1	<0.1	<0.1	0.0	25.1	27.1	19.1	13.3	0.1	4.6	1.9	5.3	<0.1
0315020209	2.1	5.1	0.5	0.1	<0.1	0.0	11.2	13.7	5.9	7.5	0.2	26.7	7.5	17.4	2.0
National Wildlife Refuge															
Cahaba River	3.3	2.2	0.2	<0.1	<0.1	0.1	30.2	45.1	8.0	8.2	1.9	0.3	<0.1	0.5	<0.1

[a]2001 NLCD class definitions:

11, open water
21, developed, open space
22, developed, low intensity
23, developed, medium intensity
24, developed, high intensity
31, barren land
41, deciduous forest
42, evergreen forest
43, mixed forest
52, shrub, scrub
71, grassland, herbaceous
81, pasture, hay
82, cultivated crops
90, woody wetlands
95, emergent herbaceous wetlands

Table A–10. Land-cover-change percentages for the Cahaba River National Wildlife Refuge contributing watersheds, Alabama, from 1992 to 2001, based on the 1992–2001 National Land Cover Database-Land Cover Change Retrofit product.

[See figure A8 for map of 1992–2001 land-cover change, 12-digit HUC names, and 10-digit HUC names. Positive percent-net-change values indicate a net gain, negative percent-net-change values indicate a net loss. Abbreviations: HUC, hydrologic unit code; NLCD-LCCR, National Land Cover Database-Land Cover Change Retrofit product; 1992–2001 NLCD-LCCR (Fry and others, 2009); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of HUC/NWR with classification change[a]	Percentage of total HUC area changed in modified Anderson level 1 classifications, 2001[b,c]							Percentage net change from 1992 to 2001 in modified Anderson level 1 classifications[b,c]						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Headwaters-Cahaba River (0315020201)															
031502020101	4.2	0.3	30.8	11.4	1.1	26.1	30.3	0.0	0.3	30.8	11.4	–97.6	26.1	29.0	0.0
031502020102	6.8	0.1	5.9	3.3	3.5	63.9	23.4	0.0	0.1	5.9	3.3	–92.1	63.9	19.0	0.0
031502020103	4.3	0.2	58.9	9.4	3.2	14.2	14.0	0.0	0.2	58.9	9.4	–93.6	14.2	10.8	0.0
031502020104	4.0	0.2	52.4	4.5	0.4	23.2	19.3	0.0	0.2	52.4	4.5	–99.1	23.2	18.8	0.0
Buck Creek-Cahaba River (0315020202)															
031502020201	7.0	0.2	45.2	16.6	0.8	18.8	18.5	0.0	0.2	45.2	16.6	–98.4	18.8	17.7	0.0
031502020202	2.6	0.5	72.8	0.6	4.1	7.4	14.6	0.0	0.5	72.8	0.6	–91.1	7.4	9.7	0.0
031502020203	7.4	0.0	65.9	12.2	3.3	9.4	9.2	0.0	–0.5	65.9	12.2	–92.5	9.4	5.5	0.0
031502020204	4.4	0.0	88.3	0.2	0.0	3.6	7.9	0.0	0.0	88.3	0.2	–100.0	3.6	7.9	0.0
031502020205	3.2	0.0	3.9	4.8	56.2	22.7	12.4	0.0	0.0	3.9	4.8	15.0	22.7	–46.4	0.0
031502020206	3.8	0.0	28.6	3.0	9.2	38.4	20.6	0.1	0.0	19.2	3.0	–80.0	38.4	19.3	0.1
Shades Creek (0315020203)															
031502020301	2.2	0.0	87.6	1.4	1.9	4.9	4.3	0.0	0.0	87.6	1.4	–96.2	4.9	2.4	0.0
031502020302	7.0	0.3	46.1	1.2	6.7	23.8	22.0	0.0	0.3	43.8	0.5	–84.7	18.1	22.0	0.0
031502020303	4.2	0.1	40.7	2.8	15.5	17.7	22.0	1.2	0.1	25.2	2.8	–63.5	17.7	16.4	1.2
Little Cahaba River (0315020204)															
031502020401	8.3	0.0	2.8	2.2	1.3	53.6	40.1	0.0	0.0	2.8	2.2	–97.2	53.6	38.7	0.0
031502020402	6.5	3.5	4.3	9.5	10.5	37.7	34.4	0.1	3.3	4.3	9.5	–76.5	37.7	21.6	0.1
031502020403	5.2	0.0	18.8	4.6	7.2	49.5	19.9	0.0	0.0	18.8	4.6	–85.2	49.5	12.3	0.0
031502020404	6.1	0.8	5.3	<0.1	10.5	56.3	26.6	0.5	0.8	5.3	<0.1	–77.8	56.3	14.9	0.5
031502020405	9.9	0.0	4.2	2.3	9.4	73.7	10.4	0.0	0.0	4.2	2.3	–78.2	73.7	–1.9	0.0
031502020406	3.8	0.5	11.8	2.1	24.5	47.5	13.3	0.3	0.5	5.1	–10.1	–47.4	39.5	12.3	0.0
031502020407	6.2	0.5	3.4	3.0	23.9	57.9	11.2	0.1	0.5	–11.3	0.3	–51.0	52.8	8.8	–0.1
Upper Cahaba River (0315020205)															
031502020501	3.9	1.7	6.9	15.3	10.5	47.3	16.5	1.9	1.7	6.9	15.1	–71.0	45.1	4.5	–2.3
031502020502	2.7	1.8	6.0	0.3	12.2	61.7	17.2	0.8	1.8	6.0	0.3	–67.2	61.4	2.1	–4.5
031502020503	5.1	2.3	3.1	0.0	23.9	47.7	20.8	2.1	2.3	–6.8	0.0	–44.4	47.3	1.6	–0.1
031502020504	2.9	6.2	4.4	0.0	37.0	16.9	24.1	11.4	6.2	4.4	0.0	–3.7	16.9	–27.3	3.5
031502020505	1.7	5.5	2.6	0.0	51.9	19.4	9.4	11.3	5.5	2.6	0.0	24.2	19.4	–55.4	3.7
031502020506	3.9	24.5	1.3	0.0	36.8	25.5	7.1	4.9	24.1	1.3	0.0	–5.5	25.5	–43.1	–2.3
031502020507	1.5	0.8	2.9	0.0	47.5	31.5	16.8	0.5	0.8	2.9	0.0	0.9	31.5	–33.4	–2.8
Mill Creek-Cahaba River (0315020206)															
031502020601	2.4	12.5	3.5	0.0	46.8	20.1	11.8	5.4	12.4	3.5	0.0	12.1	20.1	–48.9	0.8
031502020602	2.9	3.4	3.3	0.0	40.5	24.2	22.8	5.7	3.0	3.3	0.0	–9.3	24.2	–25.5	4.3
031502020603	1.6	0.0	3.0	0.0	26.1	36.5	29.8	4.6	0.0	3.0	0.0	–45.4	36.5	1.3	4.6
Waters Creek-Cahaba River (0315020207)															
031502020701	3.6	4.0	3.7	0.0	51.5	30.4	9.8	0.5	4.0	3.7	0.0	21.2	30.4	–56.1	–3.3
031502020702	5.0	1.8	2.3	0.0	48.5	37.7	7.4	2.3	1.8	2.3	0.0	1.2	37.7	–44.7	1.7
031502020703	8.4	2.3	0.9	0.0	54.7	31.1	9.0	2.0	2.3	0.9	0.0	13.3	31.1	–49.2	1.6

Table A–10. Land-cover-change percentages for the Cahaba River National Wildlife Refuge contributing watersheds, Alabama, from 1992 to 2001, based on the 1992–2001 National Land Cover Database-Land Cover Change Retrofit product.—Continued

[See figure A8 for map of 1992–2001 land-cover change, 12-digit HUC names, and 10-digit HUC names. Positive percent-net-change values indicate a net gain, negative percent-net-change values indicate a net loss. Abbreviations: HUC, hydrologic unit code; NLCD-LCCR, National Land Cover Database-Land Cover Change Retrofit product; 1992–2001 NLCD-LCCR (Fry and others, 2009); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of HUC/NWR with classification change[a]	Percentage of total HUC area changed in modified Anderson level 1 classifications, 2001[b,c]							Percentage net change from 1992 to 2001 in modified Anderson level 1 classifications[b,c]						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Oakmulgee Creek (0315020208)															
031502020801	5.8	0.4	2.2	0.0	9.3	72.6	13.8	1.7	0.4	2.2	0.0	–79.0	72.6	2.0	1.7
031502020802	4.1	1.2	4.4	0.0	10.6	55.9	27.4	0.5	1.2	4.4	0.0	–75.8	55.9	13.7	0.5
031502020803	2.5	0.6	5.7	0.0	14.4	71.5	3.9	3.9	0.6	5.7	0.0	–66.4	71.5	–15.3	3.9
031502020804	7.7	0.1	5.9	0.0	2.3	79.1	12.7	0.0	0.1	5.9	0.0	–95.4	79.1	10.3	0.0
031502020805	6.2	0.9	4.8	0.0	29.7	44.8	18.4	1.4	0.9	4.8	0.0	–38.3	44.6	–13.5	1.4
Lower Cahaba River (0315020209)															
031502020901	6.1	0.7	3.6	0.0	56.3	14.3	22.1	3.1	0.7	3.6	0.0	15.9	10.4	–33.7	3.1
031502020902	6.4	7.6	4.0	0.0	58.0	8.6	13.0	8.8	7.3	4.0	0.0	32.2	5.4	–52.3	3.5
10-digit hydrologic unit															
0315020201	4.7	0.2	34.5	6.9	2.1	34.2	22.0	0.0	0.2	34.5	6.9	–95.4	34.2	19.5	0.0
0315020202	4.5	0.1	56.4	5.7	7.1	17.1	13.5	<0.1	>–0.1	54.1	5.7	–84.9	17.1	8.1	<0.1
0315020203	4.2	0.1	49.8	2.1	10.4	17.8	19.2	0.6	0.1	41.1	1.8	–75.7	15.9	16.2	0.6
0315020204	6.2	0.8	7.5	3.3	12.0	54.7	21.6	0.1	0.7	4.9	2.0	–74.4	53.4	13.2	0.1
0315020205	3.3	6.2	3.8	2.3	28.0	38.3	17.2	4.2	6.2	0.4	2.3	–31.3	37.8	–14.8	–0.6
0315020206	2.4	6.6	3.4	0.0	40.8	24.5	19.3	5.4	6.4	3.4	0.0	–6.2	24.5	–30.9	2.9
0315020207	5.8	2.4	1.8	0.0	52.1	33.2	8.6	1.8	2.4	1.8	0.0	10.6	33.2	–48.8	0.8
0315020208	5.2	0.7	4.7	0.0	12.5	63.7	17.6	1.0	0.7	4.7	0.0	–73.0	63.6	3.1	1.0
0315020209	6.3	5.8	3.9	0.0	57.5	10.1	15.4	7.3	5.6	3.9	0.0	28.0	6.7	–47.5	3.4
National Wildlife Refuge															
Cahaba River	4.5	1.6	11.0	0.0	0.0	86.0	1.3	0.0	1.6	11.0	0.0	–100.0	86.0	1.3	0.0

[a]Areal percentage of 30-meter cells that were reclassified between 1992 and 2001 using methods described in Fry and others (2009). The reclassified area is used as the base for comparison in presenting the Anderson level 1 classification and net-change percentages for 2001.

[b]Classifications modified from Anderson level 1 land-cover classifications (Anderson and others, 1976):

1, water
2, urban
3, barren
4, forest
5, grassland
6, agriculture
7, wetland

[c]Percentages given are of the portion of the HUC/NWR that changed classification between 1992 and 2001.

[d]The interpretation would be a conversion from the classification(s) with negative values to the classification(s) with positive values. For example, in the 5 percent of HUC 08020100 that changed classification between 1992 and 2001, primarily barren land and agricultural land were converted to open water. Note that the net gains in Anderson level 1 classification balance the net losses; however, the net gains/losses do not necessarily add to 100 percent.

Chapter B. Hydrologic and Landscape Database for the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges and Contributing Watersheds in Southern Florida

Introduction

This chapter, along with the information provided in Part I of this report, describes and documents the development, use, and context of a hydrologic and landscape database for the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges (NWR) and contributing watersheds in the Southern Florida hydrologic subregion (0309) (fig. B1). NWR-management objectives for the Caloosahatchee NWR and the J.N. “Ding” Darling NWR (table B1; U.S. Fish and Wildlife Service, 2010a, b; Buell and others, 2009) include the development and implementation of environmental education programs with emphasis on ecosystem management and stewardship. In addition, protection and management of mangrove communities, habitat for native and migratory birds, and habitat for endangered or threatened species such as the West Indian manatee (*Trichechus manatus*) are important objectives for both NWRs. Further management objectives for the Caloosahatchee NWR include protection of cultural and archaeological resources, and working with partners on Lake Okeechobee to optimize water quality, quantity, and timing of flows to support the Caloosahatchee and Charlotte Harbor estuarine ecosystems. Objectives specific to the J.N. “Ding” Darling NWR include management of two impoundments designed for fish and to control saltmarsh mosquitoes (*Aedes sollicitans*).

NWR Settings and Environmental Issues

The Caloosahatchee NWR was established in 1920 to preserve native birds and breeding grounds. The NWR is located in Lee County, Florida, within the city of Fort Myers, and is managed by the city of Sanibel, Florida. The Caloosahatchee NWR presently includes 10 acres with an approved acquisition area of 40 acres. The NWR is composed of four islands with mangrove shorelines and upland hardwood forests (U.S. Fish and Wildlife Service, 2010b).

The J.N. “Ding” Darling NWR was established in 1945 to protect and preserve the wildlife habitat of Sanibel Island. The NWR is located in Lee and Charlotte Counties, Florida, within the city of Fort Myers, and is managed by the city of Sanibel, Florida. The J.N. “Ding” Darling NWR presently includes 5,223 acres and is composed of a variety of vegetation types including mangrove swamps, saltwater ponds, tidal flats, and upland hardwoods forest (U.S. Fish and Wildlife Service, 2010b).

An environmental issue facing both refuges includes exotic, invasive, and nuisance species which threaten the native communities, such as the Brazilian pepper. Specifically, environmental issues threatening the Caloosahatchee NWR include potential habitat effects of the widening of Interstate 75 which passes over the NWR. Continual sediment dredging of the Caloosahatchee River for channelization threatens the size of the NWR boundary, because hydrological changes may erode shorelines of the NWR. Additionally, the release of nitrogen- and phosphorus-rich freshwater from Lake Okeechobee can affect aquatic flora and fauna by altering the water quality and saline balance in the Caloosahatchee estuary (U.S. Fish and Wildlife Service, 2010b). The timing, duration, and volume of these releases can be highly variable and are dependent upon water management decisions to control upstream conditions. An environmental issue facing the J.N. “Ding” Darling NWR is saline intrusion into the estuarine system (U.S. Fish and Wildlife Service, 2010b). This database is a useful tool for addressing some of these environmental issues. For example, many issues for both NWRs pertain to water quality. The historic and current water-quality data compilation characterizes the water-quality setting and provides a framework to evaluate water-quality conditions as they relate to construction on Interstate 75, releases from Lake Okeechobee, and salinity intrusion.

Physiographic Setting

The contributing watershed area for the Caloosahatchee and J.N. “Ding” Darling NWRs, as defined in this report, is the hydrologic subregion (4-digit hydrologic unit) 0309, Southern Florida (fig. B1) (Seaber and others, 1994; U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013). The drainage area of the Southern Florida subregion is 17,802 square miles.

The Caloosahatchee NWR is located in the west-central part of the Southern Florida subregion within the Southwestern Florida Flatwoods U.S. Environmental Protection Agency (EPA) Level IV ecoregion (fig. B2) (U.S. Environmental Protection Agency, 2011). The J.N. “Ding” Darling NWR is located west of the Southern Florida subregion, on Sanibel Island, Florida. The Southern Florida subregion is composed of seven Level IV ecoregions: Southwestern Florida Flatwoods, Central Florida Ridges/Uplands, Eastern Florida Flatwoods, Everglades, Big Cypress, Miami Ridge/Atlantic Coastal Strip, and Southern Coast and Islands. Mean-annual precipitation for the contributing-watershed area ranges from 38 to 62 inches per year (in/yr), based on 1981–2010 climate normals (PRISM Climate Group, 2012). Mean-annual runoff for the period 1951–80 (Gebert and others, 1987) ranges from 6 inches in/yr in the northern part of the Southern Florida subregion to 20 in/yr in the eastern part (fig. B2), a relatively strong regional gradient. Figures B3*A*–*E* show the distribution of hydrologic soil groups (HSG) A through D and mixed HSG for the 81 10-digit hydrologic units (HUC10) in the contributing-watershed area as areal percentages of each HUC10.

Data and Database Files

Hydrologic and Landscape Data

Forty-eight gaging stations were selected to be included in the hydrologic and landscape database for the Caloosahatchee and J.N. "Ding" Darling NWRs and contributing watersheds (fig. B1; tables B2*A*–*B* [tables B2–B15 are at the end of the chapter]). Continuous hydrologic data collected at these stations include gage height, discharge, water temperature, specific conductivity, precipitation, and salinity. Station characteristics are presented in table B2*A*, and station periods of record for available continuous data from each site are presented in table B2*B*. Three stations have daily record for gage height only, 2 stations have daily record for discharge only, and 36 stations have daily record for gage height and discharge. One station has daily record for gage height, discharge, and precipitation, 5 stations have daily record for gage height, discharge, and at least one type of water-quality data: two stations with daily record for specific conductivity, 2 stations with daily record for specific conductivity and water temperature, and 1 station with daily record for water temperature and salinity. One station has daily record for only water-quality data (temperature and salinity) (table B2*B*) Many stations have various types of gage height data (canal, downstream, headwater, headwater/culvert, headwater/pump, headwater/regional modeling dataset, lake, tailwater, tailwater/culvert, tailwater/pump, tailwater/regional modeling dataset, tailwater/weir, upstream, maximum, maximum/downstream, and (or) minimum/downstream), discharge data (culvert, pump, pump/regional modeling dataset, regional modeling dataset, weir, and (or) tidally filtered), salinity data (maximum near bottom, maximum near surface, minimum near bottom, and (or) minimum near surface), specific conductivity data (near bottom and (or) near surface), and (or) water temperature data (near bottom, near surface, maximum near bottom, maximum near surface, minimum near bottom, and (or) minimum near surface). Gaging stations are or were operated by the U.S. Geological Survey (USGS; 19 stations), by the USGS in cooperation with South Florida Water Management District (SFWMD; 20 stations), by the USGS in cooperation with both SFWMD and U.S. Army Corps of Engineers (USACE; 5 stations), and by SFWMD alone (4 stations).

Gaging station locations, station description data, and hydrologic data included in this database were retrieved from USGS National Water Information System (NWISWeb), SFWMD, and USACE (U.S. Geological Survey, 2002, 2011; South Florida Water Management District, 2013; U.S. Army Corps of Engineers, 2015).

Tabular and spatial landscape data were compiled. Categories of tabular landscape data summarized in Microsoft Excel files in the database include ecoregion, land cover, population, and soils data. Spatial data mapped in this report include ecoregions, land cover, soils, geographic and hydrologic boundaries, hydrography, and site locations.

Database Files

Database files are organized into three directories: (1) data, (2) iha, and (3) plots_pdf. The data directory contains three subdirectories: (1) access, (2) ascii, and (3) excel. The access subdirectory contains one Microsoft Access file with raw hydrologic data (okb_tabular_hydrostats_raw.accdb) and three Microsoft Access files with statistical summary data (okb_tabular_hydrostats01c.accdb, okb_tabular_hydrostats01w.accdb, and okb_tabular_hydrostats02.accdb). The raw data are aggregated by calendar year (January 1 through December 31) and water year (October 1 through September 30) for annual summaries, and also by calendar decade, calendar year and month, calendar month of the period of record, and Julian day over the period of record for both calendar and water years. The long-term (period of record) monthly and daily summary data are for complete years only. The long-term monthly summary data are based on both mean-daily values and monthly mean values. The ascii subdirectory contains raw data files obtained from NWISWeb (USGS data) and digital files obtained from SFWMD and USACE. The excel subdirectory contains four Microsoft Excel files summarizing ecoregion (okb_eco34.xlsx), land cover (okb_nlcd.xlsx), population (okb_pop_census.xlsx), and soils (okb_sgo_hsg.xlsx) data. The iha directory contains Microsoft Excel files with Indicators of Hydrologic Alteration (IHA) outputs for each station and parameter combination in which IHA computations were completed. The files follow the naming convention s***SSSSSSSS***_iha_***var***.xlsx, where ***SSSSSSSS*** is the station number and ***var*** is the parameter. In addition, 12 IHA summary workbooks are included that contain the data for gage height (7 files) and discharge (5 files). Data were compiled in this way for comparison. The plots_pdf directory contains Adobe portable document file (PDF) plot files. A list of the database Microsoft Access and Microsoft Excel files, table and worksheet names, and table and worksheet descriptions is included in table B3*A*. A list of database field names, field types, and field definitions is included in table B3*B*. Periods of record for mean-daily gage height and mean-daily discharge data used in IHA analyses are shown in figures B4 and B5, respectively.

Database Summary Data

This section includes statistical and graphical summaries of the hydrologic data and IHA summary data, and zonal summaries of the National Land Cover Database (NLCD) land-cover and land-cover-change data. The summary data describe the data in the database, provide a context for hydrologic analysis, and can help database users determine which data are suitable for answering specific NWR hydrologic questions related to environmental issues discussed above.

Hydrologic Statistical and Graphical Summary

A station-level summary of the hydrologic data by both water year and calendar year is presented in tables B4–B6. The primary purpose of these summary tables is to provide database users with information on the quantity and quality of available data, facilitate comparisons between stations, and provide a benchmark for evaluating current hydrologic conditions within the context of the long-term record. Tables B4*A* (water year) and B4*B* (calendar year) summarize the mean-annual and mean-daily gage-height values for each gaging station. The mean, minimum, and maximum values and the 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles are given for mean-annual gage height, and the minimum and maximum and the same percentiles are also given for mean-daily gage height. The water or calendar year is indicated for the minimum and maximum values for mean-annual and mean-daily gage height. Tables B5*A* (water year) and B5*B* (calendar year) present the same statistics for discharge (with the addition of long-term yield). Tables B6*A* and B6*B* present the same statistics for selected water-quality parameters. Table B7 lists the graphical summary plots available for each gaging station. Plot files are located in the plots_pdf directory of the database. See Part I of this report for a detailed description of plot files.

Interstation Comparison of Indicators of Hydrologic Alteration

For comparison among sites, IHA results are summarized in 12 separate Microsoft Excel workbooks as regional analyses for mean-daily gage height (regional_iha_gmn_okb.accdb), mean-daily gage height at headwater and tailwater gages (regional_iha_gmn-ht_everglades-caloosahatchee_okb.accdb, regional_iha_gmn-ht_kissimmee_okb.accdb, regional_iha_gmn-ht_n-okeechobee_okb.accdb, and regional_iha_gmn-ht_w-okeechobee_okb.accdb), mean-daily gage height for headwater and tailwater gages based on regional modeling datasets (regional_iha_gmn-ht-r_okb.accdb), miscellaneous other types of mean-daily gage height data (regional_iha_gmn-misc_okb.accdb), mean-daily discharge (regional_iha_qmn_caloosahatchee-se-florida_okb.accdb, regional_iha_qmn_everglades_okb.accdb, and regional_iha_qmn_kissimmee-nw-okeechobee_okb.accdb), mean-daily discharge based on regional modeling datasets (regional_iha_qmn-r_okb.accdb), and miscellaneous other types of mean-daily discharge data (regional_iha_qmn-misc_okb). The IHA output has been reorganized in these workbooks to facilitate interstation comparisons. The regional IHA workbooks contain the following worksheets: 5 each for the 1-, 3-, 7-, 30-, and 90-day minimum and maximum values, 1 with the baseflow-index values, 1 with a plot of the 75th–25th percentile spread measure, a summary worksheet, and 1 for each station with the complete IHA analysis for that station included. This reorganization facilitates interstation comparison by compiling all of the IHA results into one place.

Landscape GIS Layers

Figures B6–B8 and tables B8–B10 present the land-cover and land-use data for the geographic extent based on the 1992 NLCD (Vogelmann and others, 2001), 2001 NLCD (Homer and others, 2007), and 1992–2001 NLCD-Land Cover Change Retrofit (LCCR) (Fry and others, 2009) datasets. Land-cover and land-use percentages derived from the 1992 NLCD and 2001 NLCD data are summarized by 10-digit hydrologic unit, 8-digit hydrologic cataloging units, 4-digit hydrologic subregion, and NWR boundary in tables B8 and B9. The land-cover change percentages derived from 1992–2001 NLCD-LCCR are presented in table B10.

Summary

This chapter, along with methods described in Part I of this report, documents the development, use, and context of a hydrologic and landscape database for the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges (NWRs) and contributing watersheds in Florida. The contributing watersheds include the Southern Florida subregion (0309), with a total drainage area of 17,802 square miles. The Caloosahatchee NWR is located in the west-central part of the Southern Florida subregion within the Southwestern Florida Flatwoods U.S. Environmental Protection Agency Level IV ecoregion, and the J.N. “Ding” Darling NWR is located west of the Southern Florida subregion, on Sanibel Island, Florida. Activities throughout this geographic extent, particularly the widening of Interstate 75 over the Caloosahatchee NWR, sediment dredging of the Caloosahatchee River, managed flows from Lake Okeechobee that could alter saline balance and could include elevated nutrient levels, growth of invasive plants, and saline intrusion, all have potential to either directly or indirectly affect the NWRs. The contents of this database are useful for assessing these environmental issues to inform management decisions.

References Cited in Part II, Chapter B

Anderson, J.R., Hardy, E.E., Roach, J.T., and Witmer, R.E., 1976, A land use and land cover classification system for use with remote sensor data: U.S. Geological Survey Professional Paper 964, 28 p.

Baker, D.B., Richards, Peter, Loftus, T.T., and Kramer, J.W., 2004, A new flashiness index: characteristics and applications to midwestern rivers and streams: Journal of the American Water Resources Association , v. 40, p. 503–522.

Buell, G.R., Calhoun, D.L., and Wehmeyer, L.L., 2009, Hydrologic and land-use/land-cover metrics used in ecological assessments of six U.S. Fish and Wildlife Service National Wildlife Refuges in the Southeastern U.S.A., *in* Proceedings of the 2009 Georgia Water Resources Conference, April 27–29, 2009, Athens, Ga., 8 p.

Fry, J.A., Coan, M.J., Homer, C.G., Meyer, D.K., and Wickham, J.D., 2009, Completion of the National Land Cover Database (NLCD) 1992–2001 Land Cover Change Retrofit product: U.S. Geological Survey Open-File Report 2008–1379, 18 p., accessed March 23, 2015, at http://www.mrlc.gov/nlcdrlc.php.

Gebert, W.A., Graczyk, D.J., and Krug, W.R., 1987, Average annual runoff in the United States, 1951–80: U.S. Geological Survey Hydrologic Investigations Atlas HA–710, scale 1:7,500,000, accessed March 21, 2011, at https://pubs.er.usgs.gov/publication/ha710.

Homer, C., Dewitz, J., Fry, J., Coan, M., Hossain, N., Larson, C., Herold, N., McKerrow, A., VanDriel, J.N., and Wickham, J., 2007, Completion of the 2001 National Land Cover Database for the Conterminous United States, Photogrammetric Engineering and Remote Sensing: U.S. Geological Survey National Land Cover Database 2001 (NLCD 2001), v. 73, no. 4, p. 337–341, accessed March 23, 2015, at http://www.mrlc.gov/nlcd2001.php.

PRISM Climate Group [Oregon State University], 2012, United States average annual precipitation, 1981–2010 (4km; BIL), accessed March 10, 2015, at http://prism.oregonstate.edu.

Richter, B.D., Baumgartner, J.V., Powell, J., and Braun, D.P., 1996, A method for assessing hydrologic alteration within ecosystems: Conservation Biology, v. 10, p. 1163–1174.

Seaber, P.R., Kapinos, F.P., and Knapp, G.L., 1994, Hydrologic unit maps: U.S. Geological Survey Water-Supply Paper 2294, 66 p.

South Florida Water Management District, 2013, Monitoring point digital data, accessed March 24, 2015, at http://www.sfwmd.gov/gisapps/sfwmdxwebdc/dataview.asp?query=unq_id=1954.

The Nature Conservancy, 2009, Indicators of hydrologic alteration, Version 7.1, User's manual: The Nature Conservancy with rPurview LLC-Ted Rybicki, Totten Software Design, Smythe Scientific Software, 81 p., accessed April 1, 2015, at http://www.conservationgateway.org/ConservationPractices/Freshwater/EnvironmentalFlows/MethodsandTools/IndicatorsofHydrologicAlteration/Documents/IHAV7.pdf.

U.S. Army Corps of Engineers, 2015, Rivergages.com, Water levels of rivers and lakes, accessed March 26, 2015, at http://rivergages.mvr.usace.army.mil/WaterControl/new/layout.cfm.

U.S. Department of Agriculture, 2009, Hydrologic soil groups, Chapter 7 *in* National Engineering Handbook, Part 630, Hydrology: Natural Resources Conservation Service, 210-VI-NEH, 13 p., accessed March 12, 2015, at http://policy.nrcs.usda.gov/.

U.S. Department of Agriculture, 1994 State soil geographic (STATSGO) data base—Data use information: Natural Resources Conservation Service, National Soil Survey Center, Miscellaneous Publication Number 1492, 35 p.

U.S. Environmental Protection Agency, 2011, Level III and IV ecoregions of the continental United States: Western Ecology Division, accessed November 30, 2016, at https://catalog.data.gov/dataset/u-s-level-iii-and-iv-ecoregions-u-s-epa.

U.S. Fish and Wildlife Service, 2010a, "J.N. "Ding" Darling National Wildlife Refuge: U.S. Fish and Wildlife Service, 2 p. [Also available at http://www.fws.gov/southeast/pubs/facts/jndcon.pdf.]

U.S. Fish and Wildlife Service, 2010b, Pine Island, Matlacha Pass, Island Bay, and Caloosahatchee National Wildlife Refuges, Comprehensive conservation plan: U.S. Fish and Wildlife Service, Southeast Region, 254 p.

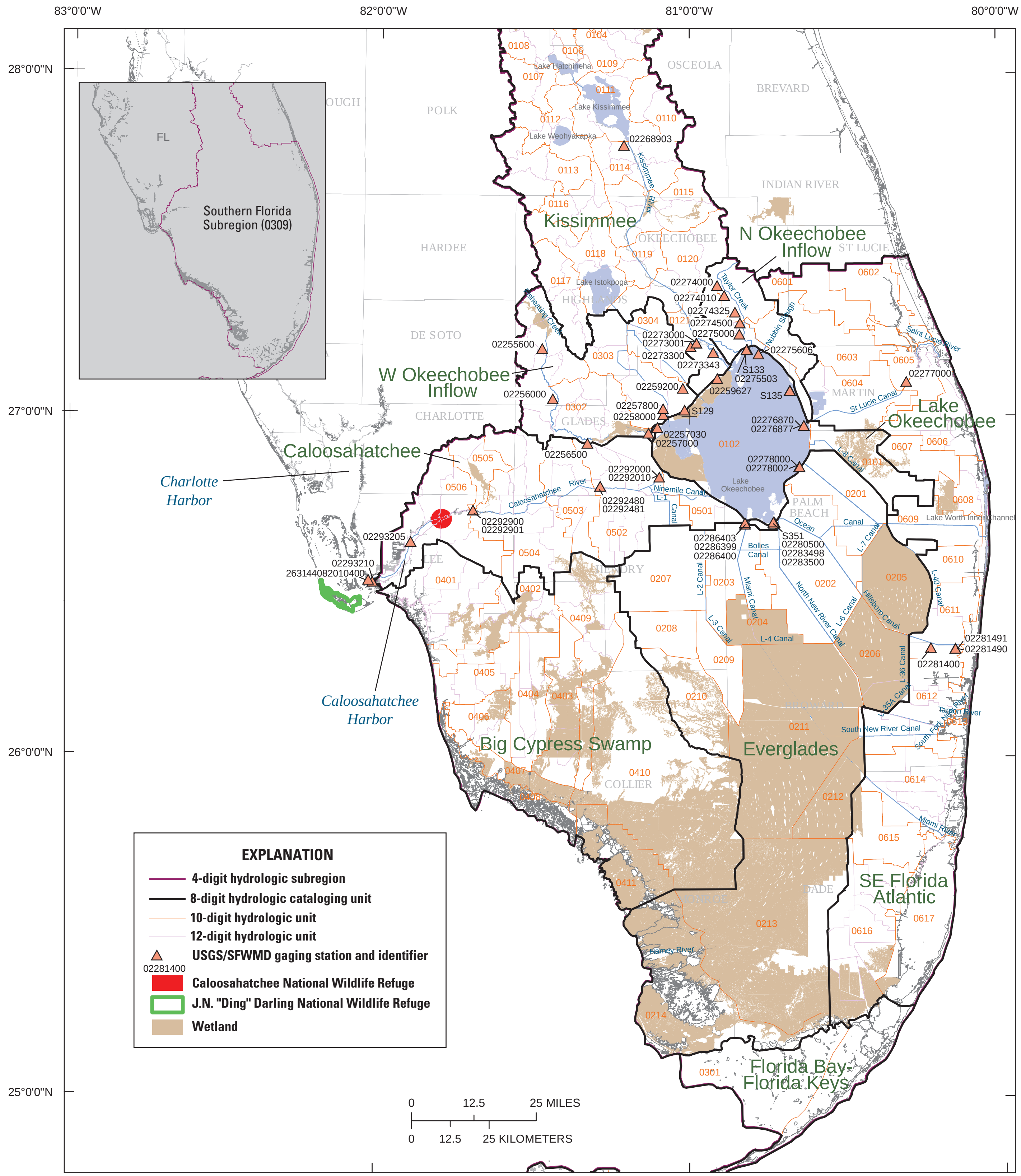
U.S. Geological Survey, 2002, NWISWeb—New site for the Nation's water data: U.S. Geological Survey Fact Sheet FS–128–02, 2 p., accessed March 24, 2015, at http://pubs.usgs.gov/fs/fs-128-02/.

U.S. Geological Survey, 2011, USGS water data for the Nation, National Water Information System, Web database (NWISWeb), accessed February 11, 2011, at http://waterdata.usgs.gov/usa/nwis/nwis.

U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013, Federal Standards and Procedures for the National Watershed Boundary Dataset (WBD) (4th ed.): U.S. Geological Survey Techniques and Methods, book 11, chap. A3, 77 p.

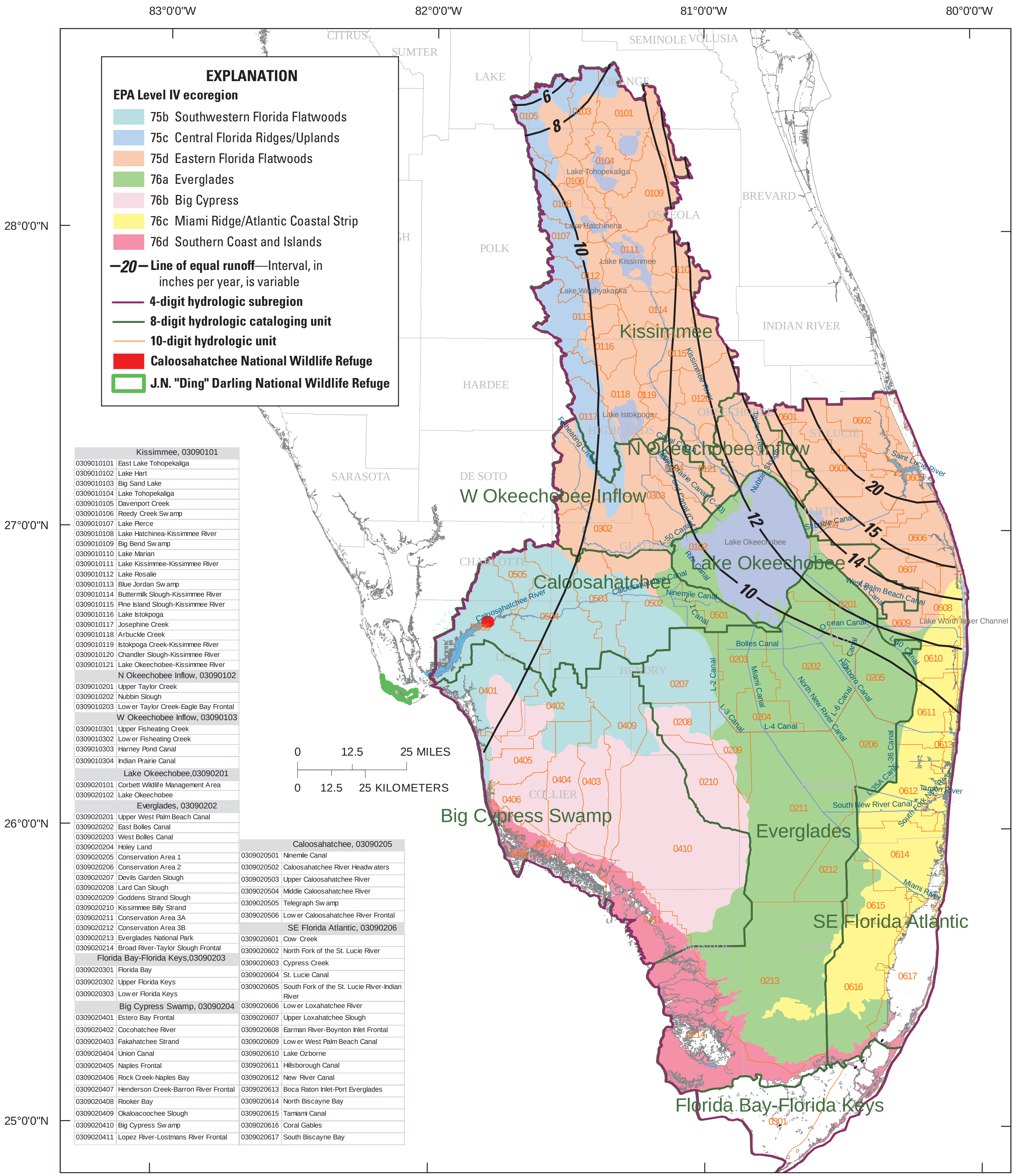
Vogelmann, J.E., Howard, S.M., Yang, Limin, Larson, C.R., Wylie, B.K., and Van Driel, J.N., 2001, Completion of the 1990s National Land Cover Data Set for the conterminous United States from Landsat thematic mapper data and ancillary data sources, Photogrammetric Engineering and Remote Sensing, v. 67, p. 650–662, accessed March 23, 2015, at http://www.mrlc.gov/nlcd1992.php.

Wolock, D.M., 1997, STATSGO soil characteristics for the conterminous United States: U.S. Geological Survey Open-File Report 97–656, accessed March 23, 2015, at http://water.usgs.gov/GIS/metadata/usgswrd/XML/muid.xml.



Base modified from U.S. Geological Survey digital data, various scales

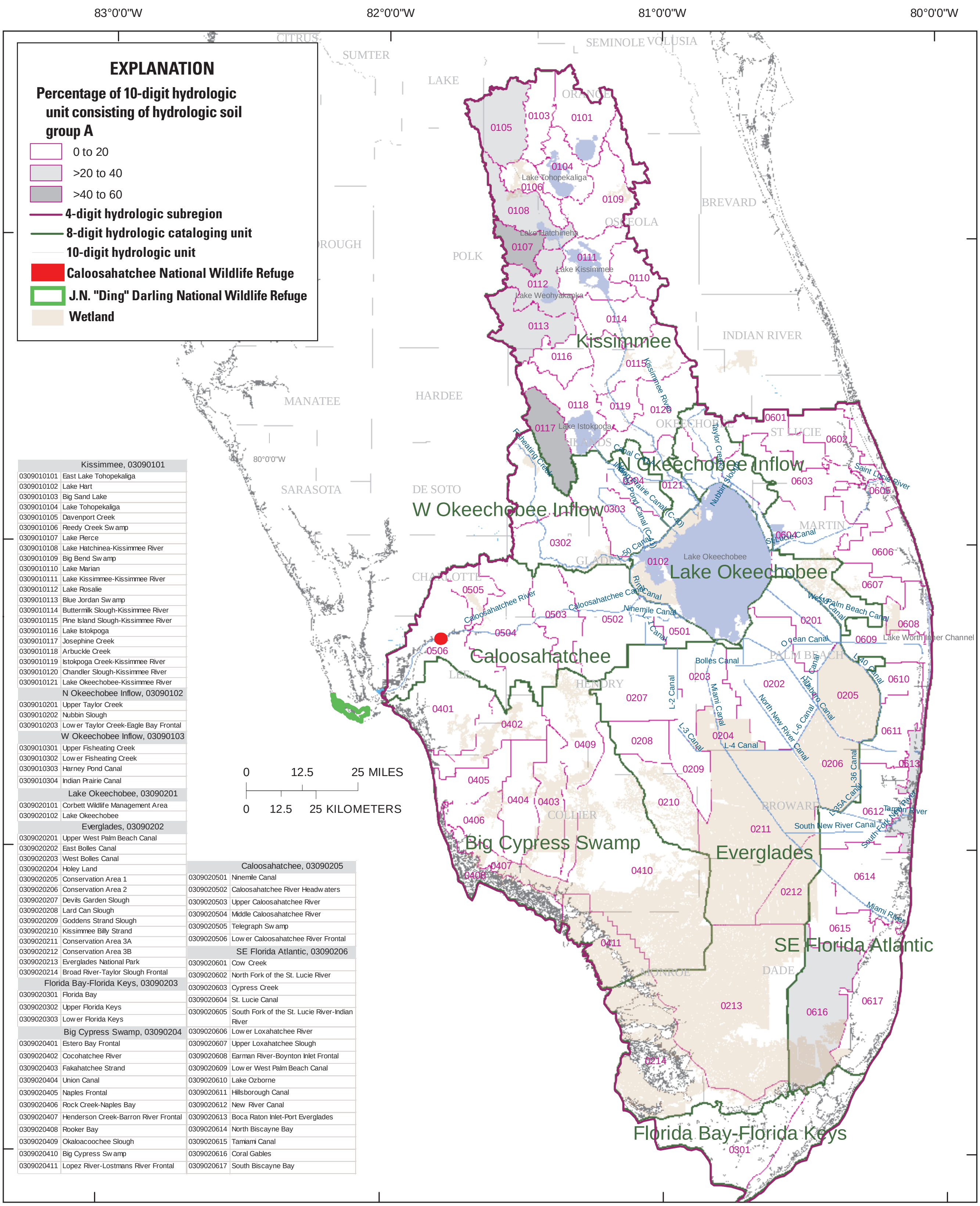
Figure B1. Location of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges (NWR) and vicinity with major contributing watersheds, waterways, and gaging stations in southern Florida. Map inset shows the hydrologic subregion (4-digit hydrologic unit) that defines the contributing watershed area for the Caloosahatchee and J.N. "Ding" Darling NWRs (0309, Southern Florida). [USGS, U.S. Geological Survey; SFWMD, South Florida Water Management District]



Base modified from U.S. Geological Survey digital data, various scales

Figure B2. Location of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, Southern Florida subregion (0309), 8-digit hydrologic cataloging units, 10-digit hydrologic units, lines of equal mean-annual runoff for the period 1951–80 (Gebert and others, 1987), and U.S. Environmental Protection Agency (EPA) Level IV ecoregions in the Southern Florida subregion (U.S. Environmental Protection Agency, 2011).

A

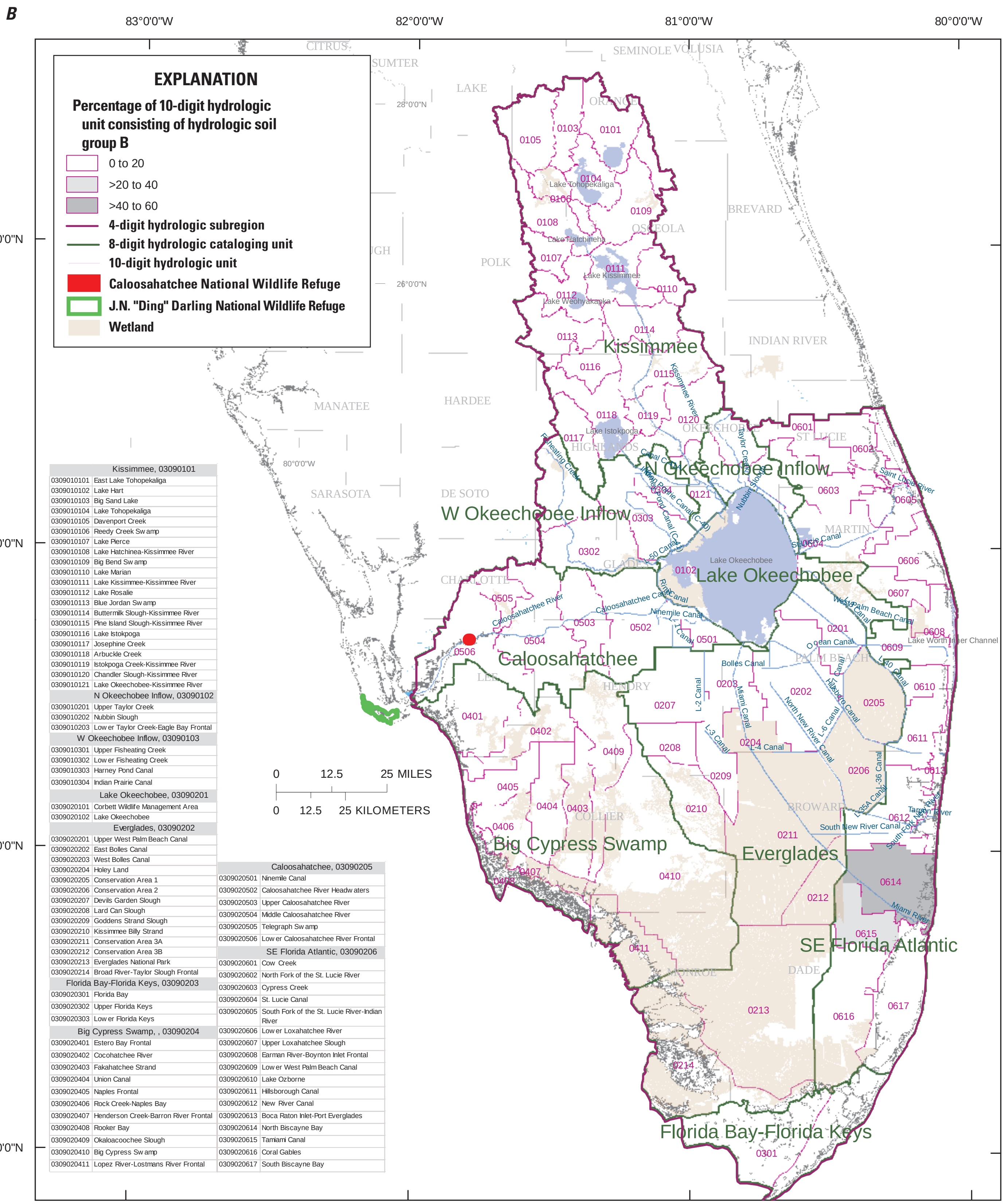


Kissimmee, 03090101	
0309010101	East Lake Tohopekaliga
0309010102	Lake Hart
0309010103	Big Sand Lake
0309010104	Lake Tohopekaliga
0309010105	Davenport Creek
0309010106	Reedy Creek Swamp
0309010107	Lake Pierce
0309010108	Lake Hatchinea-Kissimmee River
0309010109	Big Bend Swamp
0309010110	Lake Marian
0309010111	Lake Kissimmee-Kissimmee River
0309010112	Lake Rosalie
0309010113	Blue Jordan Swamp
0309010114	Buttermilk Slough-Kissimmee River
0309010115	Pine Island Slough-Kissimmee River
0309010116	Lake Istokpoga
0309010117	Josephine Creek
0309010118	Arbuckle Creek
0309010119	Istokpoga Creek-Kissimmee River
0309010120	Chandler Slough-Kissimmee River
0309010121	Lake Okeechobee-Kissimmee River
N Okeechobee Inflow, 03090102	
0309010201	Upper Taylor Creek
0309010202	Nubbin Slough
0309010203	Lower Taylor Creek-Eagle Bay Frontal
W Okeechobee Inflow, 03090103	
0309010301	Upper Fisheating Creek
0309010302	Lower Fisheating Creek
0309010303	Harney Pond Canal
0309010304	Indian Prairie Canal
Lake Okeechobee, 03090201	
0309020101	Corbett Wildlife Management Area
0309020102	Lake Okeechobee
Everglades, 03090202	
0309020201	Upper West Palm Beach Canal
0309020202	East Bolles Canal
0309020203	West Bolles Canal
0309020204	Holey Land
0309020205	Conservation Area 1
0309020206	Conservation Area 2
0309020207	Devils Garden Slough
0309020208	Lard Can Slough
0309020209	Goddens Strand Slough
0309020210	Kissimmee Billy Strand
0309020211	Conservation Area 3A
0309020212	Conservation Area 3B
0309020213	Everglades National Park
0309020214	Broad River-Taylor Slough Frontal
Florida Bay-Florida Keys, 03090203	
0309020301	Florida Bay
0309020302	Upper Florida Keys
0309020303	Lower Florida Keys
Big Cypress Swamp, 03090204	
0309020401	Estero Bay Frontal
0309020402	Cocohatchee River
0309020403	Fakahatchee Strand
0309020404	Union Canal
0309020405	Naples Frontal
0309020406	Rock Creek-Naples Bay
0309020407	Henderson Creek-Barron River Frontal
0309020408	Rooker Bay
0309020409	Okaloacoochee Slough
0309020410	Big Cypress Swamp
0309020411	Lopez River-Lostmans River Frontal

Caloosahatchee, 03090205	
0309020501	Ninemile Canal
0309020502	Caloosahatchee River Headwaters
0309020503	Upper Caloosahatchee River
0309020504	Middle Caloosahatchee River
0309020505	Telegraph Swamp
0309020506	Lower Caloosahatchee River Frontal
SE Florida Atlantic, 03090206	
0309020601	Cow Creek
0309020602	North Fork of the St. Lucie River
0309020603	Cypress Creek
0309020604	St. Lucie Canal
0309020605	South Fork of the St. Lucie River-Indian River
0309020606	Lower Loxahatchee River
0309020607	Upper Loxahatchee Slough
0309020608	Earman River-Boynton Inlet Frontal
0309020609	Lower West Palm Beach Canal
0309020610	Lake Ozborne
0309020611	Hillsborough Canal
0309020612	New River Canal
0309020613	Boca Raton Inlet-Port Everglades
0309020614	North Biscayne Bay
0309020615	Tamiami Canal
0309020616	Coral Gables
0309020617	South Biscayne Bay

Base modified from U.S. Geological Survey digital data, various scales

Figure B3. Percentage of U.S. Department of Agriculture hydrologic soil group (HSG) shown by 10-digit hydrologic unit in the Southern Florida subregion (0309) for *A*, HSG A; soils in HSG A have low runoff potential: water is freely transmitted through the soil, *B*, HSG B; soils in HSG B have moderately low runoff potential: water transmission through the soil is unimpeded, *C*, HSG C; soils in HSG C have moderately high runoff potential: water transmission through the soil is somewhat restricted, *D*, HSG D; soils in HSG D have high runoff potential: water transmission through the soil is restricted or very restricted, and *E*, mixed HSG; soils in mixed HSG have variable runoff potential: water transmission through the soil is more spatially variable on a local scale than in soils that fall within a single HSG classification (U.S. Department of Agriculture, 2009).



Base modified from U.S. Geological Survey digital data, various scales

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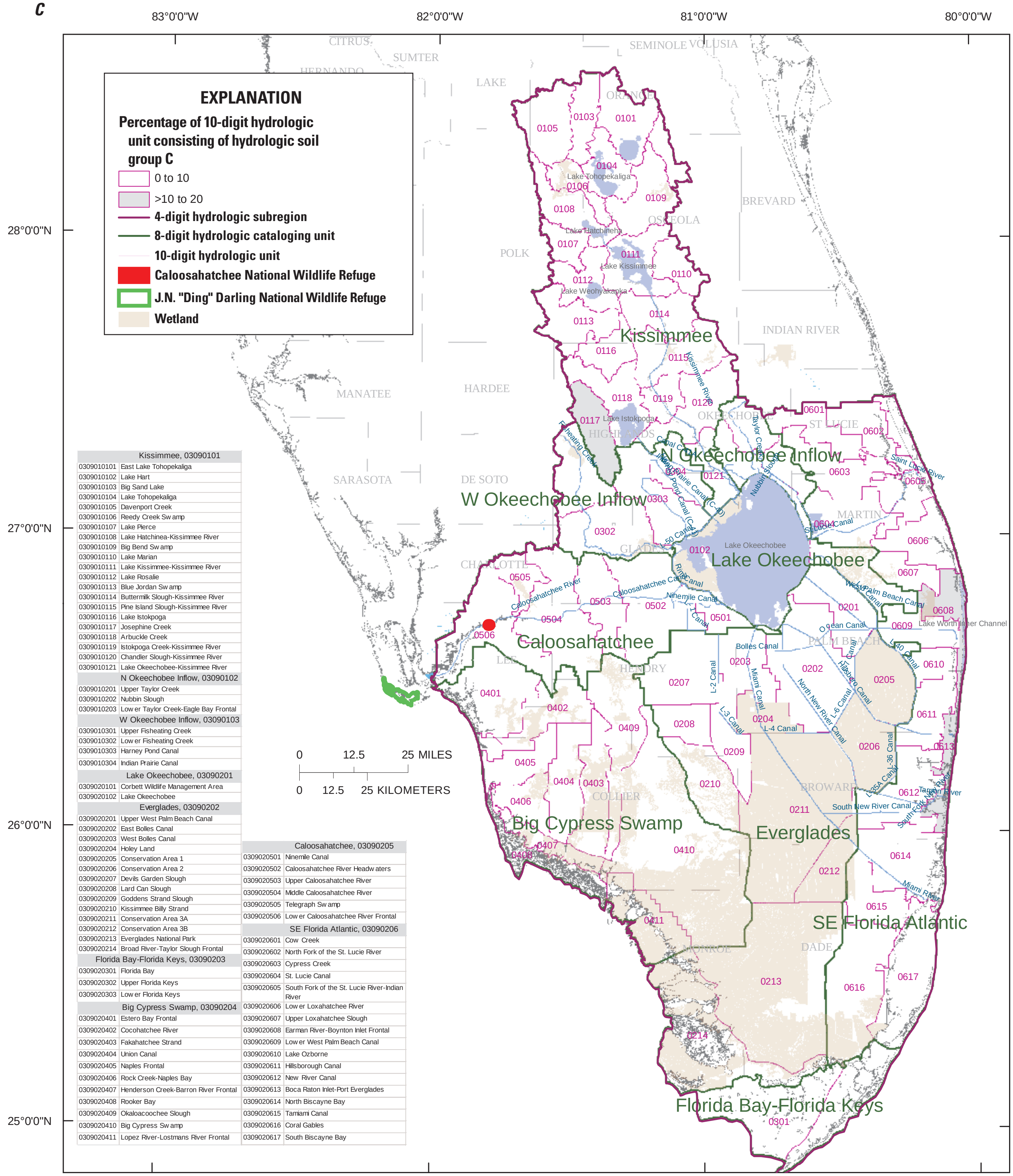
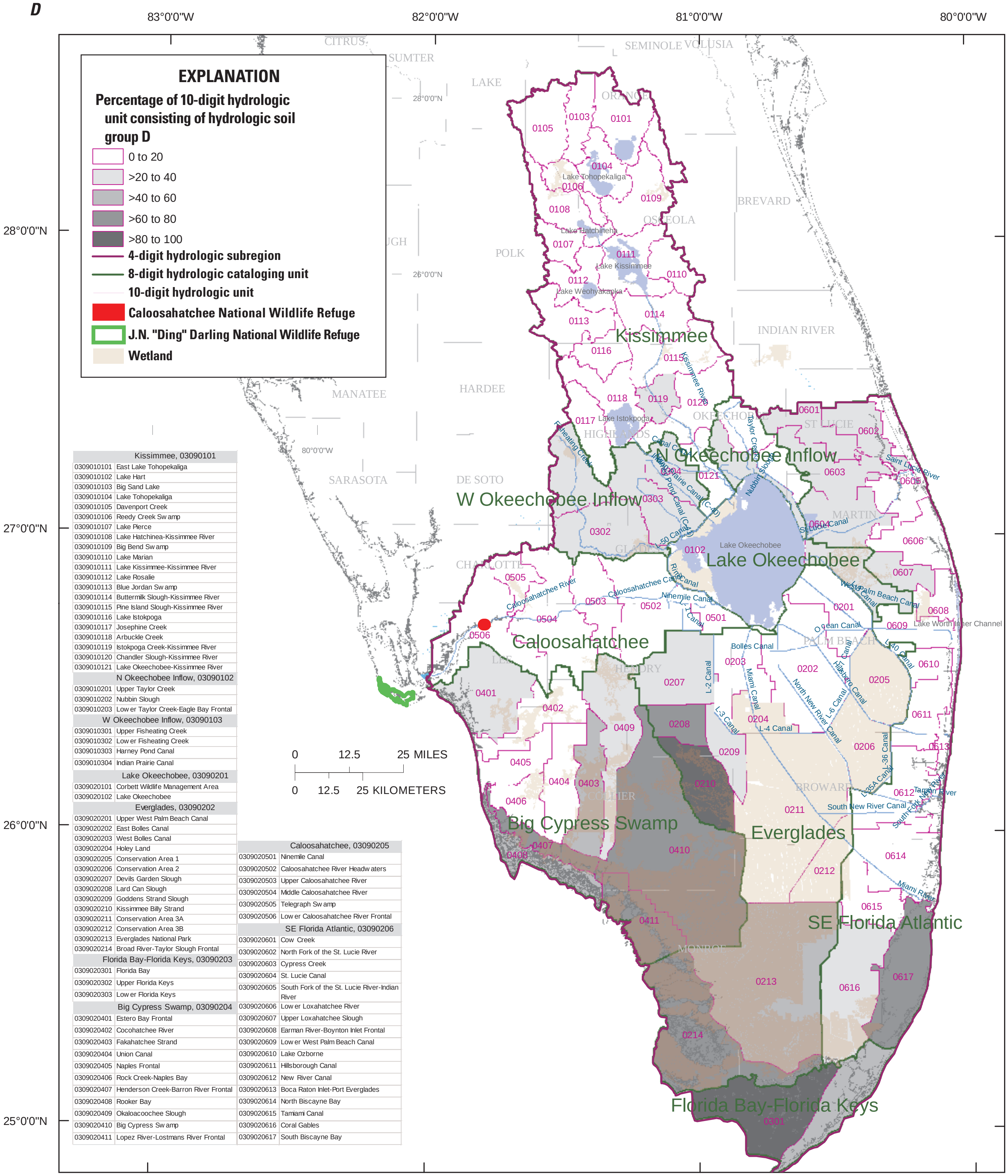
C



Base modified from U.S. Geological Survey digital data, various scales

Figure B3. Percentage of U.S. Department of Agriculture hydrologic soil group (HSG) shown by 10-digit hydrologic unit in the Southern Florida subregion (0309) for *A*, HSG A; soils in HSG A have low runoff potential: water is freely transmitted through the soil, *B*, HSG B; soils in HSG B have moderately low runoff potential: water transmission through the soil is unimpeded, *C*, HSG C; soils in HSG C have moderately high runoff potential: water transmission through the soil is somewhat restricted, *D*, HSG D; soils in HSG D have high runoff potential: water transmission through the soil is restricted or very restricted, and *E*, mixed HSG; soils in mixed HSG have variable runoff potential: water transmission through the soil is more spatially variable on a local scale than in soils that fall within a single HSG classification (U.S. Department of Agriculture, 2009).—Continued

D



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0309010102	Lake Hart
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0309010118	Arbuckle Creek
0309010119	Istokpoga Creek-Kissimmee River
0309010120	Chandler Slough-Kissimmee River
0309010121	Lake Okeechobee-Kissimmee River
N Okeechobee Inflow, 03090102	
0309010201	Upper Taylor Creek
0309010202	Nubbin Slough
0309010203	Low er Taylor Creek-Eagle Bay Frontal
W Okeechobee Inflow, 03090103	
0309010301	Upper Fisheating Creek
0309010302	Low er Fisheating Creek
0309010303	Harney Pond Canal
0309010304	Indian Prairie Canal
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0309020101	Corbett Wildlife Management Area
0309020102	Lake Okeechobee
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0309020201	Upper West Palm Beach Canal
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0309020205	Conservation Area 1
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0309020208	Lard Can Slough
0309020209	Goddens Strand Slough
0309020210	Kissimmee Billy Strand
0309020211	Conservation Area 3A
0309020212	Conservation Area 3B
0309020213	Everglades National Park
0309020214	Broad River-Taylor Slough Frontal
Florida Bay-Florida Keys, 03090203	
0309020301	Florida Bay
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0309020303	Low er Florida Keys
Big Cypress Swamp, 03090204	
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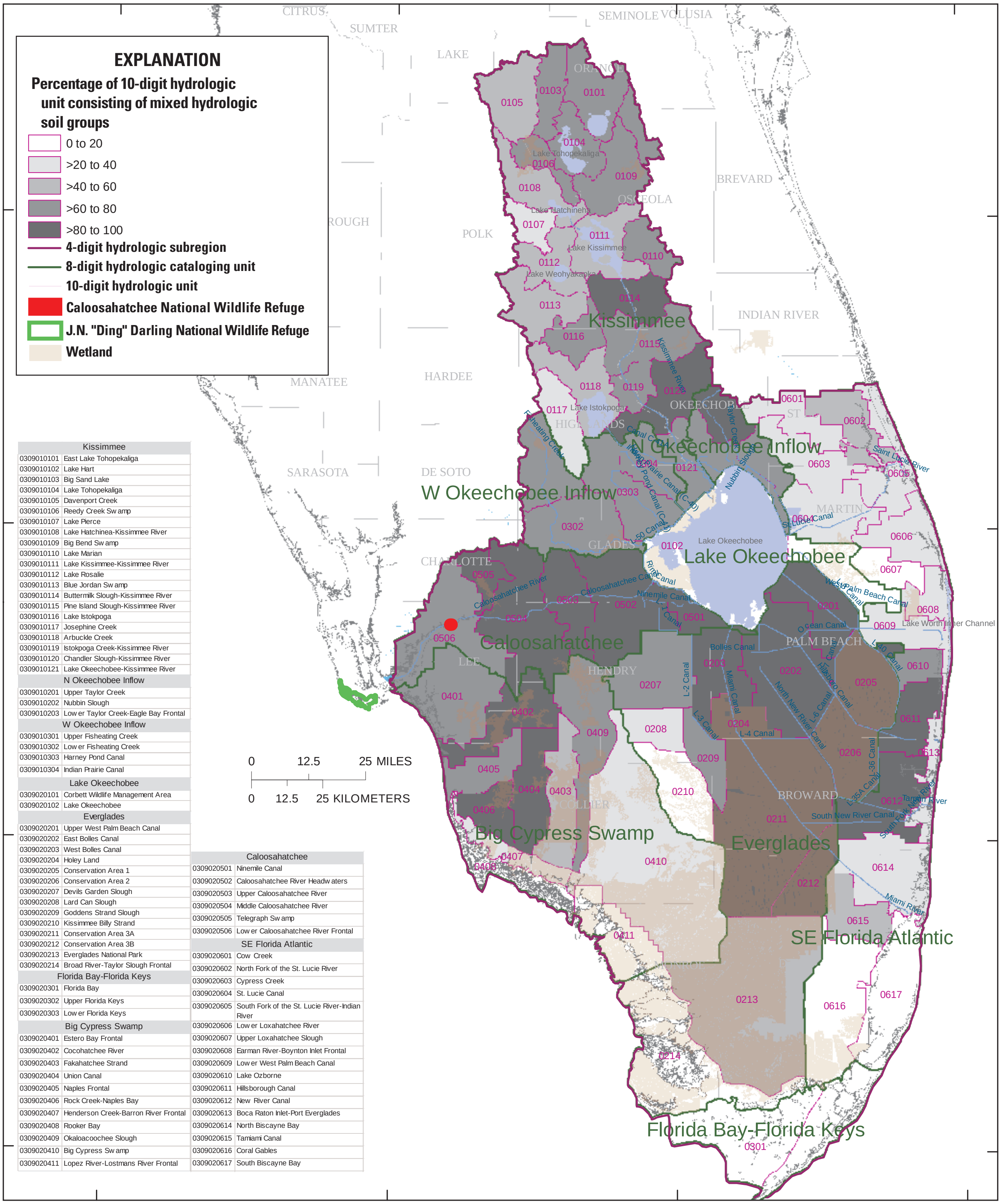
0309020402	Cocohatchee River
0309020403	Fakahatchee Strand
0309020404	Union Canal
0309020405	Naples Frontal
0309020406	Rock Creek-Naples Bay
0309020407	Henderson Creek-Barron River Frontal
0309020408	Rooker Bay
0309020409	Okaloacoochee Slough
0309020410	Big Cypress Sw amp
0309020411	Lopez River-Lostmans River Frontal

Caloosahatchee, 03090205	
0309020501	Ninemile Canal
0309020502	Caloosahatchee River Headw aters
0309020503	Upper Caloosahatchee River
0309020504	Middle Caloosahatchee River
0309020505	Telegraph Sw amp
0309020506	Low er Caloosahatchee River Frontal
SE Florida Atlantic, 03090206	
0309020601	Cow Creek
0309020602	North Fork of the St. Lucie River
0309020603	Cypress Creek
0309020604	St. Lucie Canal
0309020605	South Fork of the St. Lucie River-Indian River
0309020606	Low er Loxahatchee River
0309020607	Upper Loxahatchee Slough
0309020608	Earman River-Boynton Inlet Frontal
0309020609	Low er West Palm Beach Canal
0309020610	Lake Ozborne
0309020611	Hillsborough Canal
0309020612	New River Canal
0309020613	Boca Raton Inlet-Port Everglades
0309020614	North Biscayne Bay
0309020615	Tamiami Canal
0309020616	Coral Gables
0309020617	South Biscayne Bay

Base modified from U.S. Geological Survey digital data, various scales

Figure B3. Percentage of U.S. Department of Agriculture hydrologic soil group (HSG) shown by 10-digit hydrologic unit in the Southern Florida subregion (0309) for *A*, HSG A; soils in HSG A have low runoff potential: water is freely transmitted through the soil, *B*, HSG B; soils in HSG B have moderately low runoff potential: water transmission through the soil is unimpeded, *C*, HSG C; soils in HSG C have moderately high runoff potential: water transmission through the soil is somewhat restricted, *D*, HSG D; soils in HSG D have high runoff potential: water transmission through the soil is restricted or very restricted, and *E*, mixed HSG; soils in mixed HSG have variable runoff potential: water transmission through the soil is more spatially variable on a local scale than in soils that fall within a single HSG classification (U.S. Department of Agriculture, 2009).—Continued

E



Kissimmee	
0309010101	East Lake Tohopekaliga
0309010102	Lake Hart
0309010103	Big Sand Lake
0309010104	Lake Tohopekaliga
0309010105	Davenport Creek
0309010106	Reedy Creek Swamp
0309010107	Lake Pierce
0309010108	Lake Hatchinea-Kissimmee River
0309010109	Big Bend Swamp
0309010110	Lake Marian
0309010111	Lake Kissimmee-Kissimmee River
0309010112	Lake Rosalie
0309010113	Blue Jordan Swamp
0309010114	Buttermilk Slough-Kissimmee River
0309010115	Pine Island Slough-Kissimmee River
0309010116	Lake Istokpoga
0309010117	Josephine Creek
0309010118	Arbuckle Creek
0309010119	Istokpoga Creek-Kissimmee River
0309010120	Chandler Slough-Kissimmee River
0309010121	Lake Okeechobee-Kissimmee River
N Okeechobee Inflow	
0309010201	Upper Taylor Creek
0309010202	Nubbin Slough
0309010203	Lower Taylor Creek-Eagle Bay Frontal
W Okeechobee Inflow	
0309010301	Upper Fisheating Creek
0309010302	Lower Fisheating Creek
0309010303	Harney Pond Canal
0309010304	Indian Prairie Canal
Lake Okeechobee	
0309020101	Corbett Wildlife Management Area
0309020102	Lake Okeechobee
Everglades	
0309020201	Upper West Palm Beach Canal
0309020202	East Bolles Canal
0309020203	West Bolles Canal
0309020204	Holey Land
0309020205	Conservation Area 1
0309020206	Conservation Area 2
0309020207	Devils Garden Slough
0309020208	Lard Can Slough
0309020209	Goddens Strand Slough
0309020210	Kissimmee Billy Strand
0309020211	Conservation Area 3A
0309020212	Conservation Area 3B
0309020213	Everglades National Park
0309020214	Broad River-Taylor Slough Frontal
Florida Bay-Florida Keys	
0309020301	Florida Bay
0309020302	Upper Florida Keys
0309020303	Lower Florida Keys
Big Cypress Swamp	
0309020401	Estero Bay Frontal
0309020402	Cocohatchee River
0309020403	Fakahatchee Strand
0309020404	Union Canal
0309020405	Naples Frontal
0309020406	Rock Creek-Naples Bay
0309020407	Henderson Creek-Barron River Frontal
0309020408	Rooker Bay
0309020409	Okaloacoochee Slough
0309020410	Big Cypress Swamp
0309020411	Lopez River-Lostmans River Frontal

Caloosahatchee	
0309020501	Ninemile Canal
0309020502	Caloosahatchee River Headwaters
0309020503	Upper Caloosahatchee River
0309020504	Middle Caloosahatchee River
0309020505	Telegraph Swamp
0309020506	Lower Caloosahatchee River Frontal
SE Florida Atlantic	
0309020601	Cow Creek
0309020602	North Fork of the St. Lucie River
0309020603	Cypress Creek
0309020604	St. Lucie Canal
0309020605	South Fork of the St. Lucie River-Indian River
0309020606	Lower Loxahatchee River
0309020607	Upper Loxahatchee Slough
0309020608	Earman River-Boynton Inlet Frontal
0309020609	Lower West Palm Beach Canal
0309020610	Lake Ozborne
0309020611	Hillsborough Canal
0309020612	New River Canal
0309020613	Boca Raton Inlet-Port Everglades
0309020614	North Biscayne Bay
0309020615	Tamiami Canal
0309020616	Coral Gables
0309020617	South Biscayne Bay

Base modified from U.S. Geological Survey digital data, various scales

Figure B3. Percentage of U.S. Department of Agriculture hydrologic soil group (HSG) shown by 10-digit hydrologic unit in the Southern Florida subregion (0309) for *A*, HSG A; soils in HSG A have low runoff potential: water is freely transmitted through the soil, *B*, HSG B; soils in HSG B have moderately low runoff potential: water transmission through the soil is unimpeded, *C*, HSG C; soils in HSG C have moderately high runoff potential: water transmission through the soil is somewhat restricted, *D*, HSG D; soils in HSG D have high runoff potential: water transmission through the soil is restricted or very restricted, and *E*, mixed HSG; soils in mixed HSG have variable runoff potential: water transmission through the soil is more spatially variable on a local scale than in soils that fall within a single HSG classification (U.S. Department of Agriculture, 2009).—Continued

A

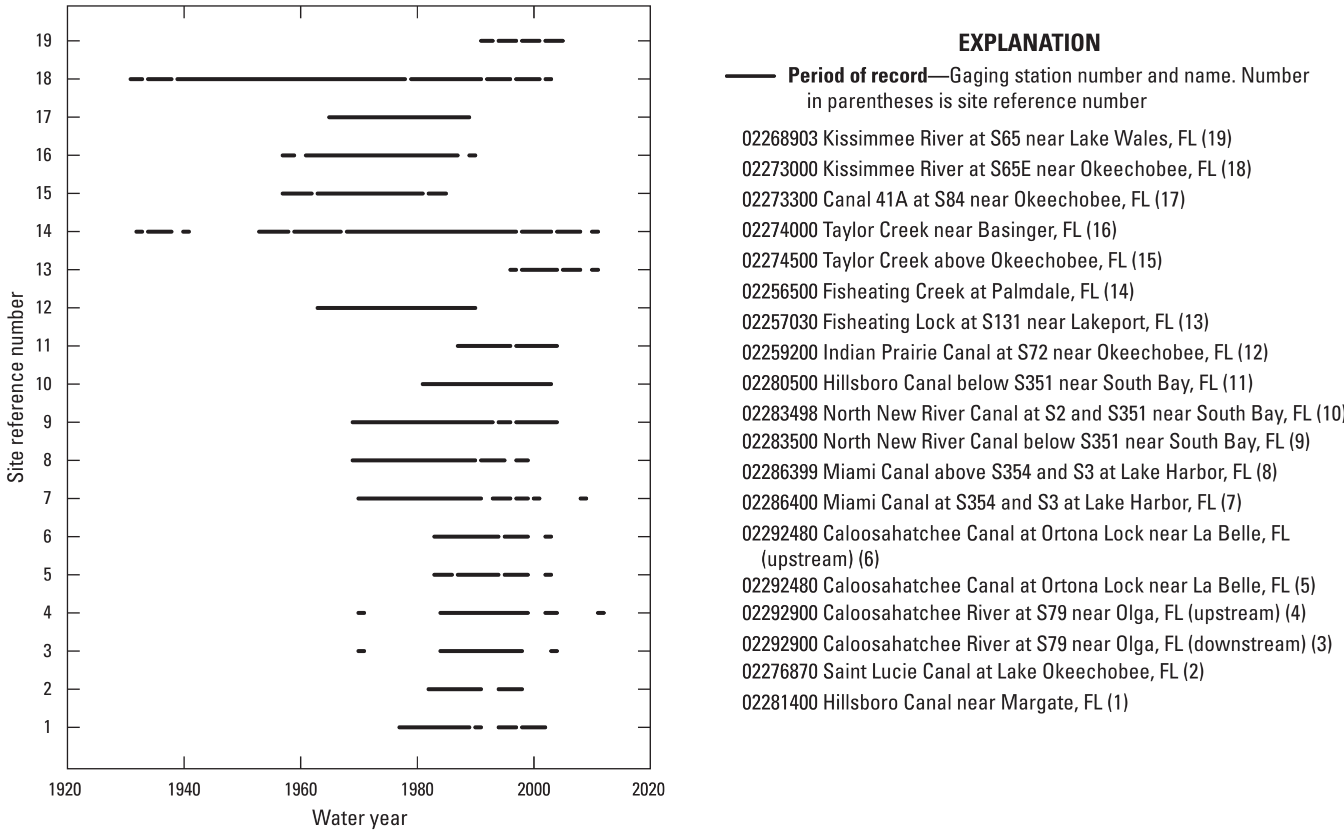
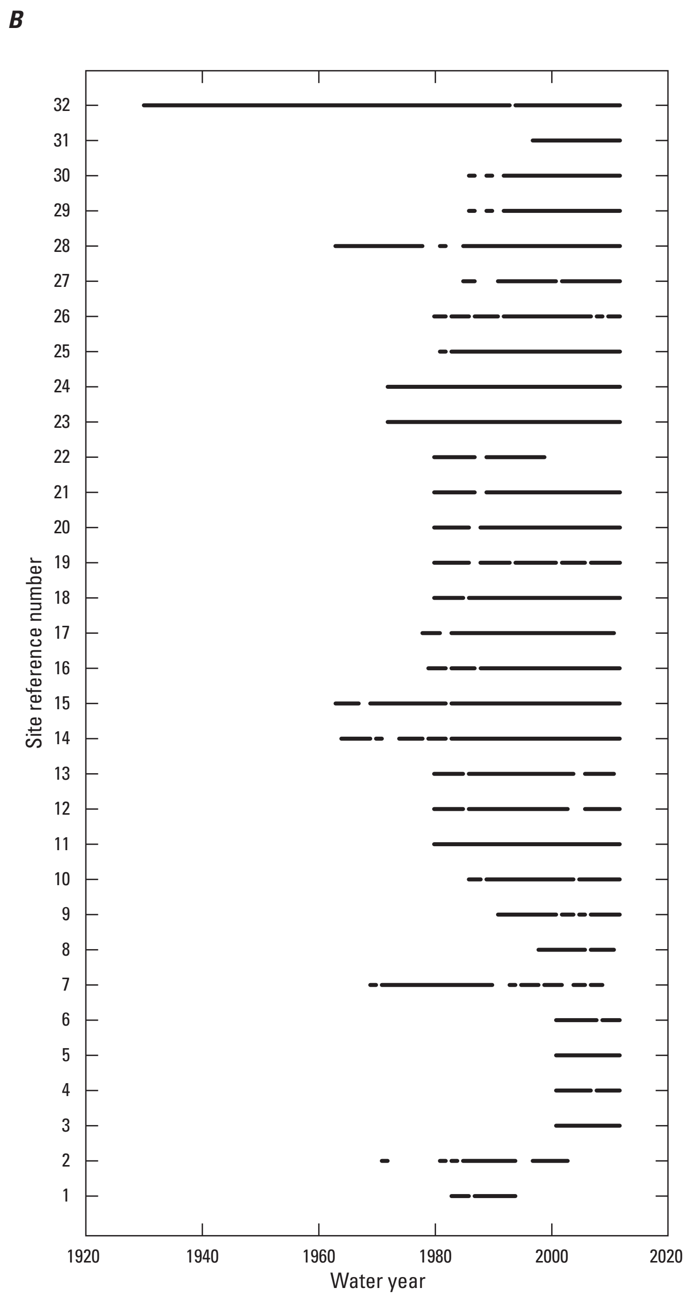


Figure B4. *A*, Periods of record for mean-daily gage-height data used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges, Florida. *B*, Periods of record for mean-daily gage-height data (headwater and tailwater gages) used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges, Florida. *C*, Periods of record for mean-daily gage-height data (headwater and tailwater gages, regional modeling datasets) used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges, Florida. *D*, Periods of record for mean-daily gage-height data (culvert, canal, and lake) used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges, Florida. Locations of gaging stations are shown in figure B1. [sfw, data source South Florida Water Management District].



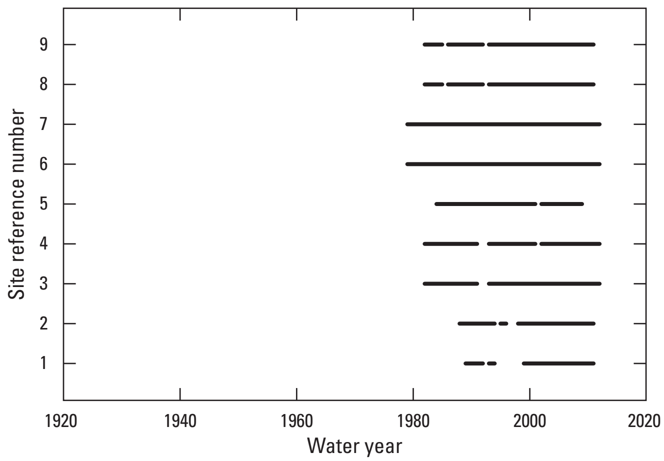
EXPLANATION

Period of record—Gaging station number and name. Number in parentheses is site reference number

02268903 (sfw) Kissimmee River at S65 near Lake Wales, FL (headwater) (32)
02268903 (sfw) Kissimmee River at S65 near Lake Wales, FL (tailwater) (31)
02273000 (sfw) Kissimmee River at S65E near Okeechobee, FL (headwater) (30)
02273001 (sfw) Kissimmee River below S65E near Okechobee, FL (tailwater) (29)
02273300 (sfw) Canal 41A at S84 near Okeechobee, FL (headwater) (28)
02273300 (sfw) Canal 41A at S84 near Okeechobee, FL (tailwater) (27)
02273343 (sfw) Kissimmee River below S154 near Okeechobee, FL (headwater) (26)
02273343 (sfw) Kissimmee River below S154 near Okeechobee, FL (tailwater) (25)
02275606 (sfw) Nubbin Slough near Sherman, FL (headwater) (24)
02275606 (sfw) Nubbin Slough near Sherman, FL (tailwater) (23)
S133 Pump from Northeast Shore to Lake Okeechobee, FL (headwater) (22)
S133 Pump from Northeast Shore to Lake Okeechobee, FL (tailwater) (21)
S135 Pump/culvert from Northeast Shore to Lake Okeechobee, FL (headwater) (20)
S135 Pump/culvert from Northeast Shore to Lake Okeechobee, FL (tailwater) (19)
02257030 (sfw) Fisheating Lock at S131 near Lakeport, FL (tailwater) (18)
02257800 (sfw) Harney Pond Canal at S71 near Lakeport, FL (headwater) (17)
02257800 (sfw) Harney Pond Canal at S71 near Lakeport, FL (tailwater) (16)
02259200 (sfw) Indian Prairie Canal at S72 near Okeechobee, FL (headwater) (15)
02259200 (sfw) Indian Prairie Canal at S72 near Okeechobee, FL (tailwater) (14)
02259627 (sfw) Buckhead Lock at S127 nr Okeechobee, FL (headwater) (13)
02259627 (sfw) Buckhead Lock at S127 nr Okeechobee, FL (tailwater) (12)
S129 Pump/spillway from NW Shore to Lake Okeechobee, FL (headwater) (11)
S129 Pump/spillway from NW Shore to Lake Okeechobee, FL (tailwater) (10)
02278000 (sfw) 1-West Palm Beach Canal at S352 at Canal Pt, FL (headwater) (9)
02278000 (sfw) 1-West Palm Beach Canal at S352 at Canal Pt, FL (tailwater) (8)
02278002 West Palm Beach Canal at S352 below Canal Pt, FL (tailwater) (7)
02286399 (sfw) Miami Canal above S354 and S3 at Lake Harbor, FL (headwater) (6)
02286399 (sfw) Miami Canal above S354 and S3 at Lake Harbor, FL (tailwater) (5)
S351 Spillway from Lake Okeechobee to Hillsboro Canal, FL (headwater) (4)
S351 Spillway from Lake Okeechobee to Hillsboro Canal, FL (tailwater) (3)
02292000 Caloosahatchee Canal at Moore Haven, FL (headwater) (2)
02292481 Caloosahatchee Canal below S78 near La Belle, FL (tailwater) (1)

Figure B4. *A*, Periods of record for mean-daily gage-height data used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, Florida. *B*, Periods of record for mean-daily gage-height data (headwater and tailwater gages) used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, Florida. *C*, Periods of record for mean-daily gage-height data (headwater and tailwater gages, regional modeling datasets) used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, Florida. *D*, Periods of record for mean-daily gage-height data (culvert, canal, and lake) used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, Florida. Locations of gaging stations are shown in figure B1. [sfw, data source South Florida Water Management District].—Continued

C

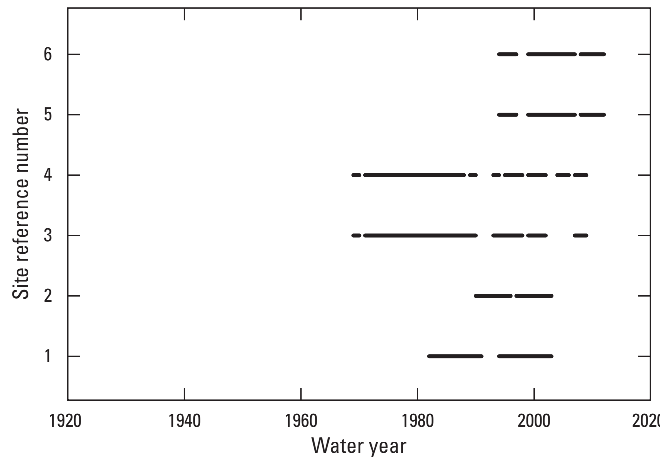


EXPLANATION

Period of record—Gaging station number and name. Number in parentheses is site reference number

02259627 (sfw) Buckhead Lock at S127 near Okeechobee, FL (headwater) (9)
02259627 (sfw) Buckhead Lock at S127 near Okeechobee, FL (tailwater) (8)
02278000 (sfw) 1-West Palm Beach Canal at S352 at Canal Pt, FL (headwater) (7)
02278000 (sfw) 1-West Palm Beach Canal at S352 at Canal Pt, FL (tailwater) (6)
02292900 (sfw) Caloosahatchee River at S79 near Olga, FL (headwater) (5)
02276870 (coe) Saint Lucie Canal at Lake Okeechobee, FL (headwater) (4)
02276870 (sfw) Saint Lucie Canal at Lake Okeechobee, FL (tailwater) (3)
02277000 (sfw) Saint Lucie Canal at Lock near Stuart, FL (headwater) (2)
02277000 (sfw) Saint Lucie Canal at Lock near Stuart, FL (tailwater) (1)

D



EXPLANATION

Period of record—Gaging station number and name. Number in parentheses is site reference number

02273343 (sfw) Kissimmee River below S154 near Okeechobee, FL (headwater, culvert) (6)
02273343 (sfw) Kissimmee River below S154 near Okeechobee, FL (tailwater, culvert) (5)
02278000 West Palm Beach Canal at S352 at Canal Point, FL (canal) (4)
02278000 West Palm Beach Canal at S352 at Canal Point, FL (lake) (3)
02283498 North New River Canal at S2 and S351 near South Bay, FL (canal) (2)
02276870 Saint Lucie Canal at Lake Okeechobee, FL (canal) (1)

Figure B4. *A*, Periods of record for mean-daily gage-height data used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, Florida. *B*, Periods of record for mean-daily gage-height data (headwater and tailwater gages) used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, Florida. *C*, Periods of record for mean-daily gage-height data (headwater and tailwater gages, regional modeling datasets) used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, Florida. *D*, Periods of record for mean-daily gage-height data (culvert, canal, and lake) used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, Florida. Locations of gaging stations are shown in figure B1. [sfw, data source South Florida Water Management District].—Continued

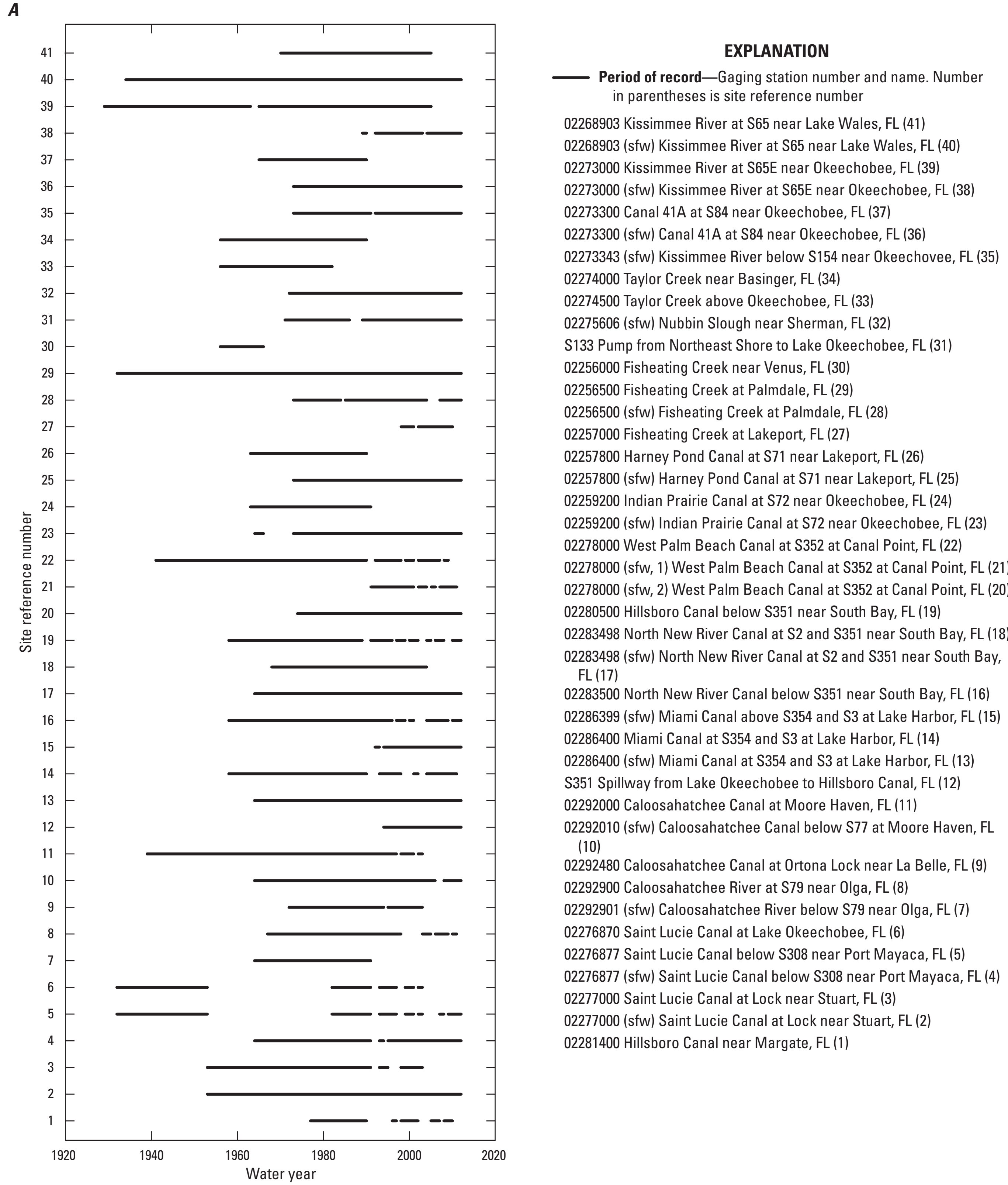
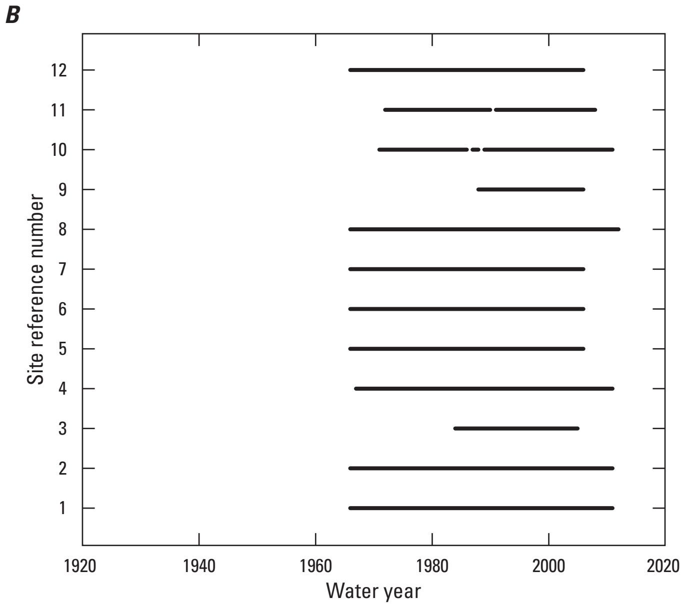


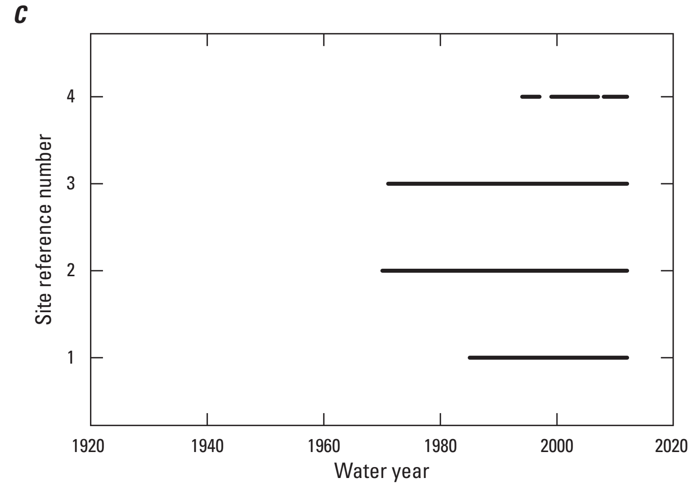
Figure B5. *A*, Periods of record for mean-daily discharge data used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, Florida. *B*, Periods of record for mean-daily discharge data (regional modeling datasets) used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, Florida. *C*, Periods of record for mean-daily discharge data (culvert and pump) used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, Florida. Locations of gaging stations are shown in figure B1. [sfw, data source South Florida Water Management District].



EXPLANATION

Period of record—Gaging station number and name. Number in parentheses is site reference number

02273000 (sfw) Kissimmee River at S65E near Okeechobee, FL (12)
02275606 (sfw) Nubbin Slough near Sherman, FL (11)
S133 Pump from Northeast Shore to Lake Okeechobee, FL (10)
S135 Pump/culvert from Northeast Shore to Lake Okeechobee, FL (9)
02278000 (sfw) 1-West Palm Beach Canal at S352 at Canal Point, FL (8)
02283498 (sfw) North New River Canal at S2 and S351 near South Bay, FL (7)
02286400 (sfw) Miami Canal at S354 and S3 at Lake Harbor, FL (6)
02292000 (sfw) Caloosahatchee Canal at Moore Haven, FL (5)
02292900 (sfw) Caloosahatchee River at S79 near Olga, FL (4)
02292901 (sfw) Caloosahatchee River below S79 near Olga, FL (3)
02276877 (sfw) Saint Lucie Canal below S308 near Port Mayaca, FL (2)
02277000 (sfw) Saint Lucie Canal at Lock near Stuart, FL (1)

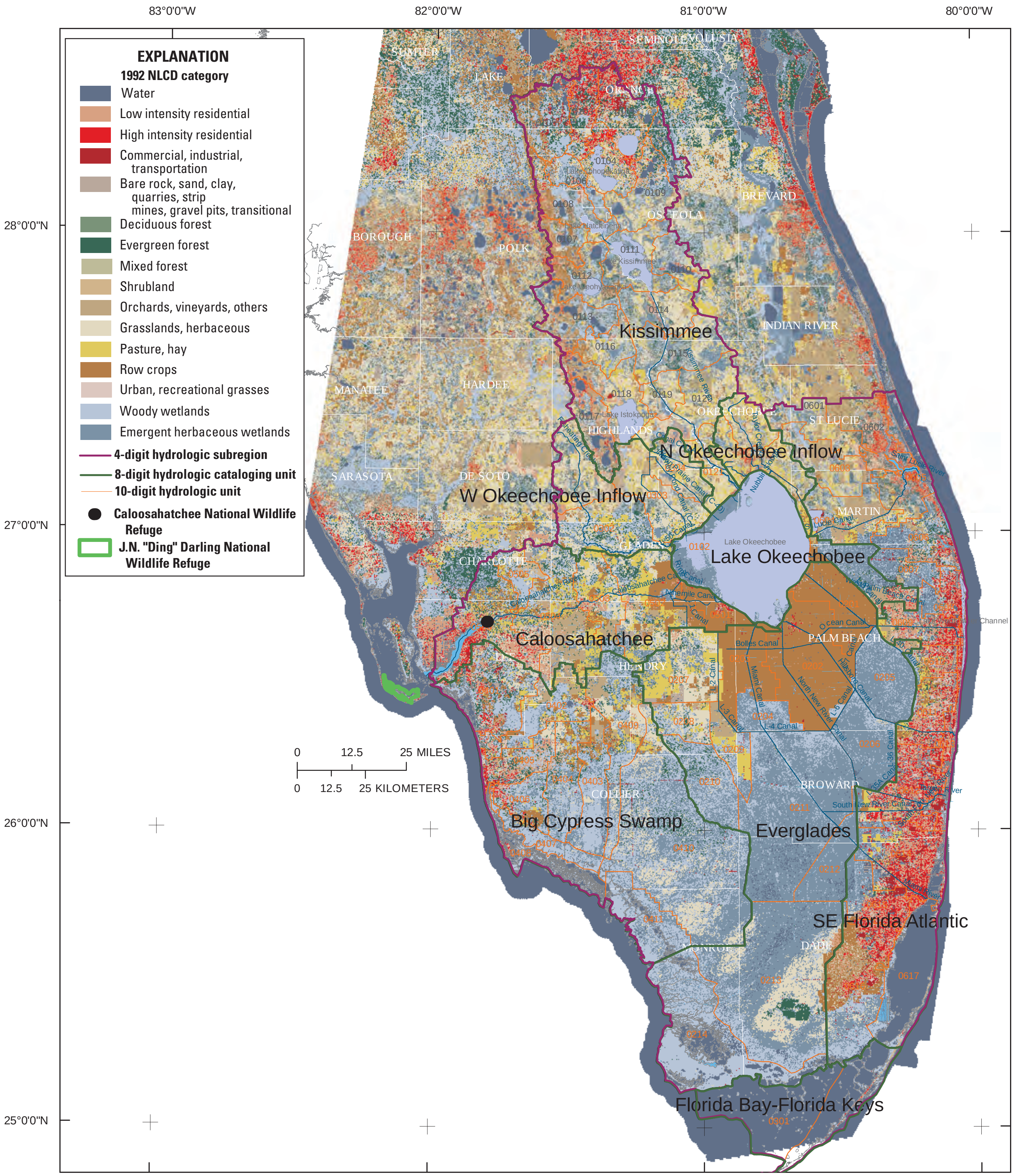


EXPLANATION

Period of record—Gaging station number and name. Number in parentheses is site reference number

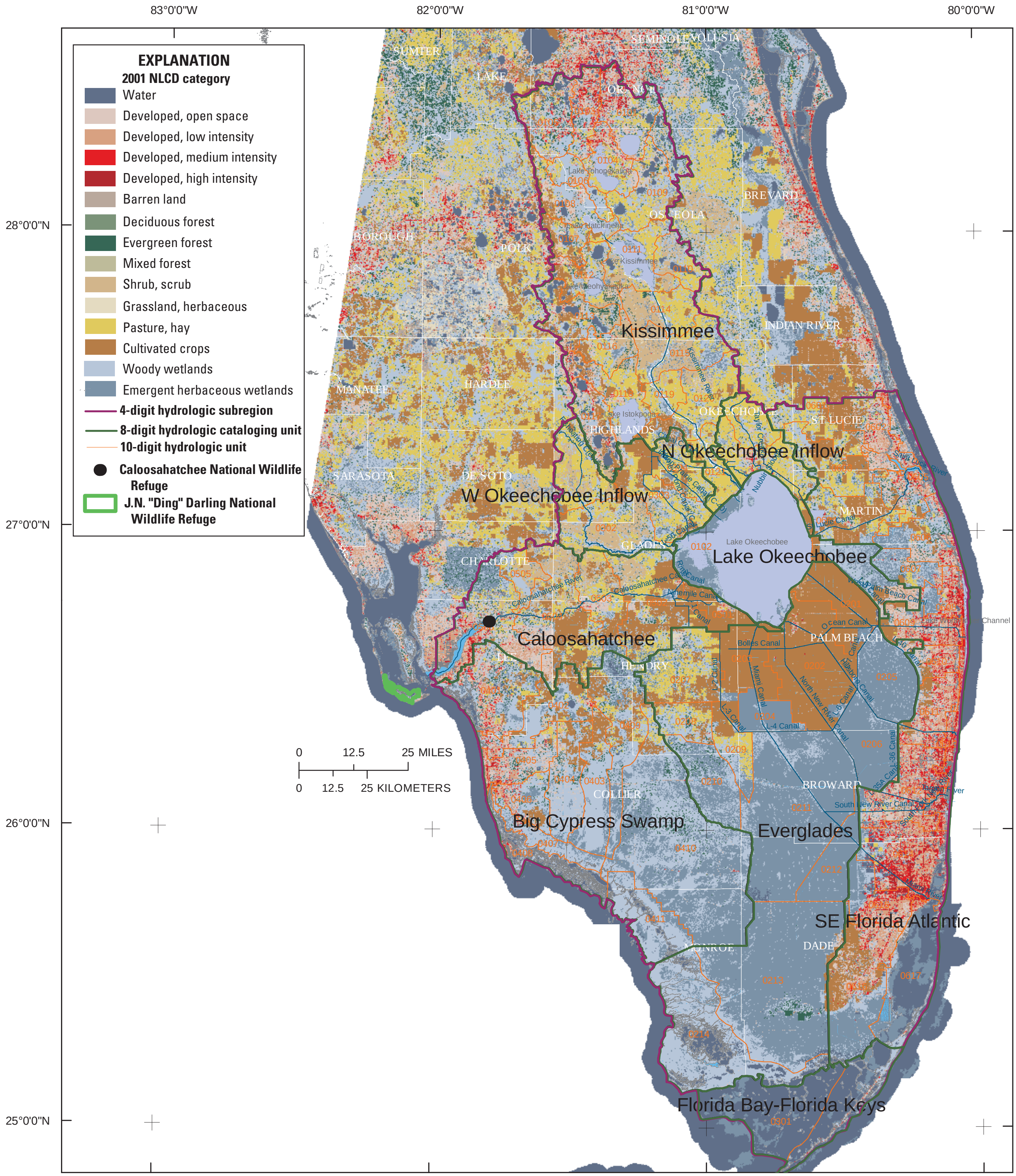
02273343 (sfw) Kissimmee River below S154 Okeechobee, FL (culvert) (4)
S135 Pump/culvert from Northeast Shore to Lake Okeechobee, FL (3)
02257030 (sfw) Fisheating Lock at S131 near Lakeport, FL (pump) (2)
S129 Pump/spillway from Northwest Shore to Lake Okeechobee, FL (1)

Figure B5. *A*, Periods of record for mean-daily discharge data used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges, Florida. *B*, Periods of record for mean-daily discharge data (regional modeling datasets) used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges, Florida. *C*, Periods of record for mean-daily discharge data (culvert and pump) used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges, Florida. Locations of gaging stations are shown in figure B1. [sfw, data source South Florida Water Management District].—Continued



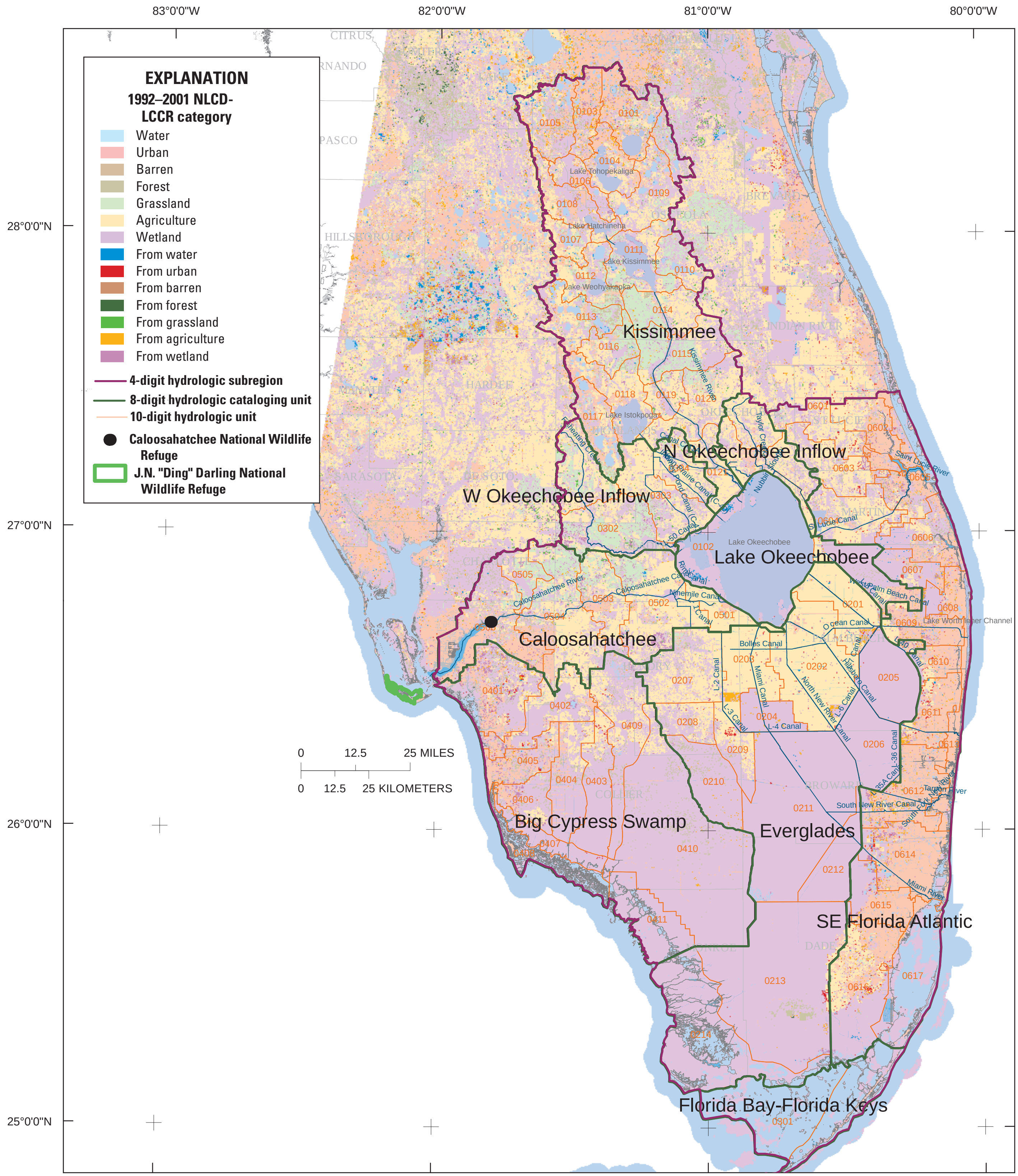
Base modified from U.S. Geological Survey digital data, various scales

Figure B6. Land cover for 1992 for the Southern Florida subregion (0309) (land-cover source: 1992 National Land Cover Database [NLCD; Vogelmann and others, 2001]).



Base modified from U.S. Geological Survey digital data, various scales

Figure B7. Land cover for 2001 for the Southern Florida subregion (0309) (land-cover source: 2001 National Land Cover Database [NLCD; Homer and others, 2007]).



Base modified from U.S. Geological Survey digital data, various scales

Figure B8. Land-cover change for the period 1992 to 2001 for the Southern Florida subregion (0309) (land-cover data source: National Land Cover Database [NLCD] 1992–2001 Land Cover Change Retrofit [LCCR] product [Fry and others, 2009]).

Table B–1. Management objectives and environmental issues for the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, Florida.

[Note: Environmental issues do not correspond to management objectives]

Refuge management objectives[a,b,c]	Environmental issues[a,b]
Caloosahatchee National Wildlife Refuge	
Work with partners on Lake Okeechobee regulation schedules to optimize water quality, quantity, and timing of flows to support the Caloosahatchee and Charlotte Harbor estuarine ecosystems	Potential habitat impacts with the Florida Department of Transportation widening project of Interstate 75 overhead the refuge
Protection of significant cultural and archeological resources	Brazilian pepper invasive
Protection of mangrove communities within the estuarine ecosystem	Sediment dredging
Protection of native bird preserve and breeding ground	Release of nurtient rich water from Lake Okeechobee
Protection and management of habitat for the endangered West Indian manatee	
Development and implementation of environmental education programs	
J.N. "Ding" Darling National Wildlife Refuge	
Protection and provision of suitable habitat for endangered and threatened species including the American crocodile, west Indian manatee, wood stork, eastern indigo snake, and bald eagle	Exotic, invasive, and nuisance species
Implementation of sound wildlife management techniques to provide feeding, nesting and roosting habitat for a wide diversity of shore birds, wading birds, waterfowl, raptors, and neo-tropical migratory species	Brazilian pepper invasive
Protection and management of the largest undeveloped mangrove ecosystems in the United States	Vegetation dieoff
Management of two impoundments designed for fish, habitat for migratory birds, and control of saltmarsh mosquitoes	Estuarine salt balance
Development and implementation of environmental education programs	

[a]U.S. Fish and Wildlife Service, 2010b.

[b]Buell and others, 2009.

[c]U.S. Fish and Wildlife Service, 2010a.

Table B–2*A*. Station characteristics for gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. dms, latitude and longitude coordinates in degrees, minutes, and seconds. Gage location in relation to the refuge property: us, upstream; ds, downstream; adj-us, on an upstream adjacent, hydrologically connected river or stream; nc, no hydrologic connection. Abbreviations: ft, foot; mi^2, square mile; SFWMD, South Florida Water Management District; USACE, U.S. Army Corps of Engineers]

USGS/ SFWMD station number	Station name	County and State	Latitude and longitude[a] (dms)	Drainage area[b] (mi^2)	Datum of gage[c] (ft)	Gage location
			Kissimmee (03090101)[d]			
02268903[e]	Kissimmee R at S65 nr Lake Wales, FL	Osceola, FL	274814N, 0811153W	1,607	—	adj-us
02273000[e]	Kissimmee R at S65E nr Okeechobee, FL	Okeechobee, FL	271332N, 0805746W	—	—	adj-us
02273001[e]	Kissimmee R bl S65E nr Okeechobee, FL	Okeechobee, FL	271332N, 0805746W	—	—	adj-us
02273300[e]	Canal 41A at S84 nr Okeechobee, FL	Highlands, FL	271255N, 0805855W	—	10.00	adj-us
02273343[e]	Kissimmee R bl S154 nr Okeechobee, FL	Okeechobee, FL	271152N, 0805430W	—	—	adj-us
			Northern Okeechobee Inflow (03090102)[d]			
02274000	Taylor Cr nr Basinger, FL	Okeechobee, FL	272339N, 0805344W	57	25.00	adj-us
02274010	Taylor Cr nr Okeechobee, FL	Okeechobee, FL	272154N, 0805222W	45	0.00	adj-us
02274325	Taylor Cr at Grassy Island nr Okeechobee, FL	Okeechobee, FL	*271859N, 0805018W*	59	—	adj-us
02274500	Taylor Cr ab Okeechobee, FL	Okeechobee, FL	271703N, 0804920W	99	8.22	adj-us
02275000	Taylor Cr at Okeechobee, FL	Okeechobee, FL	271505N, 0804928W	115	—	adj-us
02275503	Taylor Cr at HGS6 nr Okeechobee, FL	Okeechobee, FL	*271224N, 0804753W*	—	—	adj-us
02275606[e]	Nubbin Slough nr Sherman, FL	Okeechobee, FL	271136N, 0804545W	—	—	adj-us
S133[f]	S-133 pump from NE Shore to Lake Okeechobee, FL	Okeechobee, FL	*271222.166N, 0804803.204W* (h, hp, p, t, tp)[h] *271223.919N, 0804802.592W* (at pump station)	—	—	adj-us
S135[f]	S-135 (pump, culvert) from NE Shore to Lake Okeechobee, FL	Martin, FL	*270509.950N, 0803941.370W* (t)[h] *270510.570N, 0803939.280W* (h)[h] *270511.181N, 0803940.195W* (hp, tp)[h] *270511.350N, 0803940.580W* (p)[h] *270511.660N, 0803940.740W* (c)[h]	—	—	adj-us

Table B–2*A*. Station characteristics for gaging stations in the contributing watersheds of the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. dms, latitude and longitude coordinates in degrees, minutes, and seconds. Gage location in relation to the refuge property: us, upstream; ds, downstream; adj-us, on an upstream adjacent, hydrologically connected river or stream; nc, no hydrologic connection. Abbreviations: ft, foot; mi^2, square mile; SFWMD, South Florida Water Management District; USACE, U.S. Army Corps of Engineers]

USGS/ SFWMD station number	Station name	County and State	Latitude and longitude[a] (dms)	Drainage area[b] (mi^2)	Datum of gage[c] (ft)	Gage location
			Western Okeechobee Inflow (03090103)[d]			
02255600	Fisheating Cr nr Lake Placid, FL	Highlands, FL	271232N, 0812742W	60	—	adj-us
02256000	Fisheating Cr nr Venus, FL	Highlands, FL	270343N, 0812538W	188	—	adj-us
02256500[e]	Fisheating Cr at Palmdale, FL	Glades, FL	265556N, 0811854W	311	27.19	adj-us
02257000[e]	Fisheating Cr at Lakeport, FL	Glades, FL	265744N, 0810705W	—	—	adj-us
02257030[e]	Fisheating Lock at S131 nr Lakeport, FL	Glades, FL	265841N, 0810522W	—	—	adj-us
02257800	Harney Pond Canal at S71 nr Lakeport, FL	Glades, FL	270200N, 0810415W	—	—	adj-us
02258000	Harney Pond Canal nr Lakeport, FL	Glades, FL	270058N, 0810413W	—	—	adj-us
02259200[e]	Indian Prairie Canal at S72 nr Okeechobee, FL	Glades, FL	270535N, 0810025W	—	9.00	adj-us
02259627[e]	Buckhead Lock at S127 nr Okeechobee, FL	Glades, FL	270718N, 0805344W	—	—	adj-us
S129[f]	S-129 (pump, spillway) from NW Shore to Lake Okeechobee, FL	Glades, FL	*270147.190N, 810005.223W*	—	—	adj-us
			Everglades (03090202)[d]			
02278000[e]	West Palm Beach Canal at S352 at Canal Pt, FL	Palm Beach, FL	265150N, 0803755W	—	—	nc
02278002[e]	West Palm Beach Canal at S352 bl Canal Pt, FL	Palm Beach, FL	265145N, 0803750W	—	—	nc
02280500	Hillsboro Canal bl S351 nr South Bay, FL	Palm Beach, FL	264200N, 0804245W	—	—	nc
02283498[e]	N New R Canal at S2 and S351 nr South Bay, FL	Palm Beach, FL	264200N, 0804255W	—	—	nc
02283500	N New R Canal bl S351 nr South Bay, FL	Palm Beach, FL	264150N, 0804250W	—	—	nc
02286399[e]	Miami Canal ab S354 and S3 at Lake Harbor, FL	Palm Beach, FL	264155N, 0804825W	—	—	nc
02286400[e]	Miami Canal at S354 and S3 at Lake Harbor, FL	Palm Beach, FL	264142N, 0804825W	—	—	nc
02286403	Miami Canal at HGS3 and S3 syphon discharge at Lake Harbor, FL	Palm Beach, FL	264155N, 0804825W	—	—	nc
S351[g]	S-351 spillway from Lake Okeechobee to Hillsboro Canal, FL	Martin, FL	*264204.233N, 0804253.203W*	—	—	nc
			Caloosahatchee (03090205)[d]			
02292000[e,h]	Caloosahatchee Canal at Moore Haven, FL	Glades, FL	265000N, 0810500W	—	—	us
02292010[e]	Caloosahatchee Canal bl S-77 at Moore Haven, FL	Glades, FL	*265000N, 0810520W*	—	—	us
02292480[e,h]	Caloosahatchee Canal at Ortona Lock nr La Belle, FL	Glades, FL	264722N, 0811811W	—	—	us
02292481[e]	Caloosahatchee Canal bl S78 nr La Belle, FL	Glades, FL	264722N, 0811811W	—	—	us
02292900[e,h]	Caloosahatchee R at S-79 nr Olga, FL	Lee, FL	264325N, 0814155W	—	—	us
02292901[e]	Caloosahatchee R bl S-79 nr Olga, FL	Lee, FL	264324N, 0814155W	—	—	us
02293205	Caloosahatchee R at Channel Marker 52 nr Ft Myers, FL	Lee, FL	*263829N, 0815258W*	—	—	ds/us
02293210	Caloosahatchee R at Shell Point nr Iona, FL	Lee, FL	*263126N, 0820016W*	—	—	ds/us
263144-082010400	Caloosahatchee R at Punta Blanca nr Cape Coral, FL	Lee, FL	*263144.4N, 0820104W*	—	—	ds/us

Table B–2*A*. Station characteristics for gaging stations in the contributing watersheds of the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. dms, latitude and longitude coordinates in degrees, minutes, and seconds. Gage location in relation to the refuge property: us, upstream; ds, downstream; adj-us, on an upstream adjacent, hydrologically connected river or stream; nc, no hydrologic connection. Abbreviations: ft, foot; mi^2, square mile; SFWMD, South Florida Water Management District; USACE, U.S. Army Corps of Engineers]

USGS/ SFWMD station number	Station name	County and State	Latitude and longitude[a] (dms)	Drainage area[b] (mi^2)	Datum of gage[c] (ft)	Gage location
	SE Florida Atlantic (03090206)[d]					
02276870[e,h]	St Lucie Canal at Lake Okeechobee, FL	Martin, FL	265900N, 0803700W	—	—	nc
02276877[e]	St Lucie Canal bl S308 nr Port Mayaca, FL	Martin, FL	265900N, 0803700W	—	—	nc
02277000[e,h]	St Lucie Canal at Lock nr Stuart, FL	Martin, FL	270639N, 0801706W	—	—	nc
02281400	Hillsboro Canal nr Margate, FL	Broward, FL	261948N, 0801245W	—	—	nc
02281490	C2 Canal ab S4 nr Deerfield Beach, FL	Broward, FL	261939N, 0800802W	—	—	nc
02281491	C2 Canal bl S4 nr Deerfield Beach, FL	Broward, FL	261938N, 0800802W	—	—	nc

[a]Latitude and longitude coordinates in roman (or normal) font are referenced to NAD 27; those in italicized font are referenced to NAD 83. Unless multiple locations are given for a station, all data collected at the station are referenced to the one location.

[b] —, the drainage area is either indeterminate or not delineated.

[c]Datum-of-gage values referenced to NGVD 29; —, datum of gage not established.

[d]The 8-digit hydrologic units were developed by the U.S. Geological Survey as a standardized set of hydrologic boundaries and numerical codes for the river-basin units of the United States (Seaber and others, 1994). The 8-digit hydrologic unit code encompasses four levels of subdivision: region (2-digit), subregion (4-digit), accounting unit (6-digit), and cataloging unit (8-digit).

[e]Station operated in cooperation with SFWMD.

[f]Station operated by SFWMD.

[g]Data-collection location and type codes: c—culvert; h—headwater (measurement made upstream from dam); hp—headwater, pump (measurement made upstream from dam, with pumping); p—pump; t—tailwater (measurement made downstream from dam); tp—tailwater, pump (measurement made down-stream from dam, with pumping).

[h]Station operated in cooperation with USACE, Jacksonville District.

Table B–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey (USGS) hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS/SFWMD station number[a]	Station name	Parameter[e]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		Kissimmee (03090101)				
02268903	Kissimmee R at S65 nr Lake Wales, FL	Gage height[c]	1990–2004	11, 4, 0–0.98	1989–2004	9, 7, 0–0.92
		Discharge[c]	1970–2004	35, 0, 0–1.00	1969–2004	34, 2, 0–0.97
02268903sfw	Kissimmee R at S65 nr Lake Wales, FL	Gage height (headwater)[c]	1929–2012	81, 3, 0–0.99	1929–2012	81, 3, 0–0.99
		Gage height (tailwater)[c]	1986–2012	15, 6, 6–0.65	1985–2012	16, 5, 7–0.63
		Discharge[c]	1934–2012	78, 1, 0–1.00	1933–2012	78, 2, 0–0.99
02273000	Kissimmee R at S65E nr Okeechobee, FL	Gage height[c]	1930–2004	65, 10, 0–0.98	1930–2004	63, 12, 0–0.98
		Discharge[c]	1929–2004	74, 0, 2–0.97	1928–2004	72, 4, 1–0.96
02273000sfw	Kissimmee R at S65E nr Okeechobee, FL	Gage height (headwater)[c]	1986–2012	20, 7, 0–0.94	1985–2012	19, 9, 0–0.90
		Discharge[c]	1988–2012	20, 5, 0–0.96	1987–2012	19, 7, 0–0.93
		Discharge (regmod)[c]	1965–2006	40, 2, 0–0.98	1965–2005	41, 0, 0–1.00
		Gage height (tailwater)[c]	1985–2012	22, 6, 0–0.91	1985–2012	20, 8, 0–0.91
02273300	Canal 41A at S84 nr Okeechobee, FL	Gage height[c]	1964–1989	24, 2, 0–0.99	1963–1989	24, 3, 0–0.96
		Gage height, maximum	1987–1987	0, 1, 0–0.08	1987–1987	0, 1, 0–0.08
		Discharge[c]	1964–1989	25, 1, 0–0.99	1964–1989	25, 1, 0–0.99
02273300sfw	Canal 41A at S84 nr Okeechobee, FL	Gage height (headwater)[c]	1962–2012	43, 8, 0–0.99	1962–2012	44, 7, 0–0.99
		Gage height (tailwater)[c]	1984–2012	22, 6, 1–0.91	1983–2012	23, 5, 2–0.88
		Discharge[c]	1972–2012	39, 2, 0–0.99	1972–2012	40, 1, 0–0.99
02273343sfw	Kissimmee R bl S154 nr Okeechobee, FL	Gage height (headwater)[c]	1978–2012	27, 8, 0–0.96	1978–2012	27, 8, 0–0.96
		Gage height (tailwater)c	1978–2012	30, 5, 0–0.97	1978–2012	31, 4, 0–0.97
		Gage height (headwater, culvert)[c]	1979–2012	15, 7, 12–0.56	1978–2012	15, 8, 12–0.55
		Gage height (tailwater, culvert)[c]	1979–2012	15, 7, 12–0.56	1978–2012	15, 8, 12–0.55
		Discharge[c]	1972–2012	38, 3, 0–0.98	1972–2012	38, 3, 0–0.98
		Discharge (culvert)[c,d]	1981–2012	14, 4, 14–0.50	1981–2012	13, 5, 14–0.49

Table B–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey (USGS) hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS/SFWMD station number[a]	Station name	Parameter[e]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		Northern Okeechobee Inflow (03090102)				
02274000	Taylor Cr nr Basinger, FL	Gage height[c,d]	1955–1990	29, 7, 0–0.94	1955–1989	27, 8, 0–0.96
		Discharge[c]	1955–1989	34, 1, 0–0.98	1955–1989	33, 2, 0–0.98
02274010	Taylor Cr nr Okeechobee, FL	Gage height	2003–2012	6, 3, 1–0.81	2003–2011	5, 4, 0–0.90
		Discharge	2003–2011	8, 1, 0–0.91	2003–2011	7, 2, 0–0.91
		Precipitation	2007–2011	3, 2, 0–0.95	2006–2011	3, 3, 0–0.79
02274325	Taylor Cr at Grassy Island nr Okeechobee, FL	Gage height	2004–2011	4, 4, 0–0.87	2004–2011	3, 5, 0–0.87
		Discharge	2004–2011	6, 2, 0–0.89	2004–2011	5, 3, 0–0.89
02274500	Taylor Cr ab Okeechobee, FL	Gage height[c]	1955–1985	26, 5, 0–0.95	1955–1984	26, 4, 0–0.98
		Discharge[c]	1955–1982	26, 2, 0–0.95	1955–1981	26, 1, 0–0.98
02275000	Taylor Cr at Okeechobee, FL	Discharge	1932–1933	1, 1, 0–0.87	1932–1933	1, 1, 0–0.87
02275503	Taylor Cr at HGS6 nr Okeechobee, FL	Gage height	1992–2011	8, 12, 0–0.95	1991–2011	6, 15, 0–0.90
		Discharge	1992–2011	9, 11, 0–0.88	1992–2010	7, 12, 0–0.89
02275606	Nubbin Slough nr Sherman, FL	Gage height	1993–2011	4, 15, 0–0.94	1993–2011	3, 16, 0–0.94
		Discharge	2001–2011	3, 8, 0–0.96	2000–2011	2, 10, 0–0.88
02275606sfw	Nubbin Slough nr Sherman, FL	Gage height (headwater)[c]	1971–2012	40, 2, 0–0.97	1971–2012	40, 2, 0–0.97
		Gage height (tailwater)[c]	1971–2012	40, 2, 0–0.97	1971–2012	40, 2, 0–0.97
		Discharge[c,d]	1972–2012	40, 1, 0–1.00	1971–2012	40, 2, 0–0.97
		Discharge (regmod)[c,d]	1972–2008	35, 2, 0–0.99	1971–2008	35, 3, 0–0.97
S133	S-133 pump from NE Shore to Lake Okeechobee, FL	Gage height (headwater)[c]	1979–1999	17, 4, 0–0.96	1979–1999	17, 4, 0–0.96
		Gage height (tailwater)[c]	1979–2012	30, 4, 0–0.99	1979–2012	30, 4, 0–0.99
		Gage height (head-water, pump)	1984–1987	0, 4, 0–0.51	1984–1987	0, 4, 0–0.51
		Gage height (tail-water, pump)	1984–1987	0, 4, 0–0.60	1984–1987	0, 4, 0–0.60
		Discharge[c]	1970–2012	36, 5, 2–0.94	1970–2012	35, 5, 3–0.91
		Discharge (regmod)[c]	1970–2011	36, 4, 2–0.92	1970–2010	35, 3, 3–0.92
S135	S-135 (pump, culvert) from NE Shore to Lake Okeechobee, FL	Gage height (headwater)[c]	1979–2012	30, 4, 0–0.98	1979–2012	30, 4, 0–0.98
		Gage height (tailwater)[c]	1979–2012	27, 7, 0–0.97	1979–2012	27, 7, 0–0.97
		Gage height (head-water, pump)	1985–1999	2, 6, 7–0.28	1984–1998	2, 5, 8–0.28
		Gage height (tail-water, pump)	1984–1987	0, 4, 0–0.45	1984–1987	0, 4, 0–0.45

Table B–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

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USGS/SFWMD station number[a]	Station name	Parameter[e]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
Northern Okeechobee Inflow (03090102)—Continued						
S135—Continued	S-135 (pump, culvert) from NE Shore to Lake Okeechobee, FL	Discharge	1992–2011	6, 10, 4–0.75	1992–2011	6, 10, 4–0.74
		Discharge (pump)[c]	1971–2012	36, 3, 3–0.91	1970–2011	37, 2, 3–0.92
		Discharge (regmod)[c,d]	1987–2006	15, 3, 2–0.83	1987–2005	14, 2, 3–0.82
Western Okeechobee Inflow (03090103)						
02255600	Fisheating Cr nr Lake Placid, FL	Gage height	2003–2012	5, 3, 2–0.64	2003–2012	4, 6, 0–0.64
		Discharge	2003–2012	6, 2, 2–0.64	2003–2012	4, 6, 0–0.64
02256000	Fisheating Cr nr Venus, FL	Gage height	1955–1966	9, 3, 0–0.94	1955–1966	9, 3, 0–0.94
		Discharge[c]	1955–1966	10, 2, 0–0.95	1955–1966	10, 2, 0–0.95
02256500	Fisheating Cr at Palmdale, FL	Gage height[c,d]	1931–2011	57, 24, 0–0.98	1931–2011	55, 26, 0–0.98
		Discharge[c]	1931–2011	80, 1, 0–0.99	1931–2011	79, 2, 0–0.99
02256500sfw	Fisheating Cr at Palmdale, FL	Discharge[c]	1972–2012	35, 6, 0–0.98	1972–2012	37, 4, 0–0.98
02257000	Fisheating Cr at Lakeport, FL	Gage height	1993–2011	6, 11, 2–0.83	1993–2011	4, 15, 0–0.83
		Discharge[c,d]	1997–2011	11, 4, 0–0.94	1997–2011	11, 4, 0–0.94
02257030	Fisheating Lock at S131 nr Lakeport, FL	Gage height[c]	1993–2011	10, 8, 1–0.91	1993–2011	9, 10, 0–0.91
		Discharge	2001–2011	5, 5, 1–0.85	2001–2011	4, 6, 1–0.85
02257030sfw	Fisheating Lock at S131 nr Lakeport, FL	Gage height (tail-water)[c]	1979–2012	31, 3, 0–0.98	1979–2012	30, 4, 0–0.98
		Gage height (head-water, pump)	1984–1992	4, 4, 1–0.57	1984–1992	4, 3, 2–0.57
		Gage height (tail-water, pump)	1985–1992	3, 5, 0–0.72	1985–1992	3, 5, 0–0.72
		Discharge	1997–2012	8, 1, 7–0.55	1997–2012	9, 1, 6–0.60
		Discharge (pump)[c]	1969–2012	41, 2, 1–0.97	1969–2012	40, 1, 3–0.92
		Discharge (pump, regmod)	2001–2010	9, 1, 0–0.97	2001–2010	10, 0, 0–1.00
		Discharge (regmod)	2001–2011	5, 2, 4–0.55	2001–2010	7, 0, 3–0.70
02257800	Harney Pond Canal at S71 nr Lakeport, FL	Discharge[c]	1963–1999	27, 3, 7–0.77	1962–1999	26, 7, 5–0.75
02257800sfw	Harney Pond Canal at S71 nr Lakeport, FL	Gage height (head-water)[c]	1977–2012	33, 3, 0–0.99	1976–2012	34, 3, 0–0.96
		Gage height (tail-water)[c]	1977–2012	31, 5, 0–0.99	1976–2012	32, 5, 0–0.96
		Gage height (tail-water, weir)	2008–2012	3, 2, 0–0.78	2008–2012	3, 2, 0–0.78
		Discharge[c]	1972–2012	39, 2, 0–0.99	1972–2012	40, 1, 0–0.99
		Discharge (weir)	2008–2012	3, 2, 0–0.78	2008–2012	3, 2, 0–0.78
		Specific conductance	1990–1993	0, 2, 2–0.00	1990–1992	0, 2, 1–0.00

Table B–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

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USGS/SFWMD station number[a]	Station name	Parameter[e]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		Western Okeechobee Inflow (03090103)—Continued				
02258000	Harney Pond Canal nr Lakeport, FL	Gage height	1993–2012	8, 10, 2–0.82	1993–2011	6, 13, 0–0.86
		Discharge	1994–2011	2, 15, 1–0.77	1993–2011	3, 16, 0–0.73
02259200	Indian Prairie Canal at S72 nr Okeechobee, FL	Gage height[c]	1963–1989	27, 0, 0–1.00	1962–1989	26, 2, 0–0.96
		Discharge[c]	1963–1989	27, 0, 0–1.00	1962–1989	26, 2, 0–0.96
02259200sfw	Indian Prairie Canal at S72 nr Okeechobee, FL	Gage height (headwater)[c]	1961–2012	46, 6, 0–0.98	1961–2012	47, 5, 0–0.98
		Gage height (tailwater)[c]	1962–2012	42, 9, 0–0.98	1962–2012	42, 9, 0–0.98
		Discharge[c]	1962–2012	41, 10, 0–0.88	1962–2012	43, 7, 1–0.88
		Specific conductance	1990–1994	0, 5, 0–0.41	1990–1993	0, 4, 0–0.51
02259627	Buckhead Lock at S127 nr Okeechobee, FL	Gage height	1993–2011	9, 8, 2–0.84	1993–2011	8, 11, 0–0.84
		Discharge	2001–2009	5, 3, 1–0.84	2001–2009	4, 4, 1–0.84
02259627sfw	Buckhead Lock at S127 nr Okeechobee, FL	Gage height (headwater)[c]	1979–2012	28, 6, 0–0.98	1979–2012	27, 7, 0–0.98
		Gage height (tailwater)[c]	1979–2012	28, 6, 0–0.98	1979–2012	28, 6, 0–0.98
		Gage height (headwater, regmod)[c]	1981–2011	26, 5, 0–0.97	1981–2010	26, 4, 0–1.00
		Gage height (tailwater, regmod)[c]	1981–2011	26, 5, 0–0.96	1981–2010	26, 4, 0–0.99
S129	S-129 (pump, spillway) from NW Shore to Lake Okeechobee, FL	Gage height (headwater)[c]	1979–2012	31, 3, 0–0.99	1979–2012	31, 3, 0–0.99
		Gage height (tailwater)[c]	1983–2012	24, 6, 0–0.91	1983–2012	24, 6, 0–0.91
		Discharge	1986–2012	9, 6, 12–0.53	1986–2012	10, 6, 11–0.56
		Discharge (pump)[c]	1969–2012	25, 17, 2–0.94	1969–2012	25, 15, 4–0.89
		Discharge (pump, regmod)	2001–2010	8, 1, 1–0.87	2001–2010	9, 0, 1–0.90
		Discharge (regmod)	2001–2009	6, 1, 2–0.75	2001–2009	8, 0, 1–0.89
		Everglades (03090202)				
02278000	West Palm Beach Canal at S352 at Canal Pt, FL	Gage height (canal)[c]	1969–2008	30, 9, 1–0.96	1968–2008	26, 15, 0–0.94
		Gage height (lake)[c]	1969–2008	30, 9, 1–0.96	1968–2008	28, 13, 0–0.94
		Discharge[c,d]	1940–2007	62, 6, 0–1.00	1939–2007	64, 5, 0–0.99

Table B–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey (USGS) hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS/SFWMD station number[a]	Station name	Parameter[e]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		Everglades (03090202)—Continued				
02278000sfw_1	West Palm Beach Canal at S352 at Canal Pt, FL	Gage height (head-water)[c]	1990–2012	18, 5, 0–0.98	1989–2012	19, 5, 0–0.94
		Gage height (tail-water)[c]	1997–2012	12, 4, 0–0.95	1997–2012	12, 4, 0–0.95
		Gage height (head-water, regmod)[c]	1978–2012	33, 2, 0–0.97	1978–2011	34, 0, 0–1.00
		Gage height (tail-water, regmod)[c]	1978–2012	32, 3, 0–0.97	1978–2011	33, 1, 0–1.00
		Discharge[c,d]	1990–2012	17, 6, 0–0.98	1989–2012	18, 6, 0–0.94
		Discharge (regmod)[c,d]	1965–2012	46, 2, 0–0.98	1965–2011	47, 0, 0–1.00
02278000sfw_2	West Palm Beach Canal at S352 at Canal Pt, FL	Discharge[c,d]	1973–2012	38, 2, 0–0.98	1973–2012	39, 1, 0–0.98
02278002	West Palm Beach Canal at S352 bl Canal Pt, FL	Gage height (tail-water)[d]	1969–2009	30, 10, 1–0.94	1968–2009	28, 14, 0–0.92
02278002sfw	West Palm Beach Canal at S352 bl Canal Pt, FL	Gage height (tail-water)	1989–1997	7, 2, 0–0.93	1988–1997	8, 2, 0–0.84
02280500	Hillsboro Canal bl S351 nr South Bay, FL	Gage height[c]	1976–2012	16, 10, 11–0.65	1976–2012	15, 12, 10–0.65
		Discharge[c,d]	1957–2012	45, 10, 1–0.95	1957–2012	44, 11, 1–0.95
02283498	N New R Canal at S2 and S351 nr South Bay, FL	Gage height[c]	1981–2003	21, 2, 0–1.00	1980–2003	21, 3, 0–0.96
		Gage height (canal)[c]	1989–2003	12, 3, 0–1.00	1988–2003	13, 3, 0–0.94
		Discharge[c,d]	1968–2003	36, 0, 0–1.00	1967–2003	35, 2, 0–0.97
02283498sfw	N New R Canal at S2 and S351 nr South Bay, FL	Discharge[c,d]	1963–2012	48, 2, 0–0.99	1963–2012	49, 1, 0–0.99
		Discharge (regmod)[c,d]	1965–2006	40, 2, 0–0.98	1965–2005	41, 0, 0–1.00
02283500	N New R Canal bl S351 nr South Bay, FL	Gage height[c]	1969–2012	33, 11, 0–0.98	1968–2012	32, 13, 0–0.96
		Discharge[c,d]	1957–2012	48, 8, 0–0.98	1957–2012	47, 9, 0–0.98
02286399	Miami Canal ab S354 and S3 at Lake Harbor, FL	Gage height[c]	1969–1998	27, 3, 0–1.00	1968–1998	26, 5, 0–0.97
02286399sfw	Miami Canal ab S354 and S3 at Lake Harbor, FL	Gage height (head-water)[c]	2000–2012	10, 3, 0–0.95	2000–2012	10, 3, 0–0.95
		Gage height (tail-water)[c]	2000–2012	11, 2, 0–0.95	2000–2012	11, 2, 0–0.95
		Discharge[c,d]	1990–2012	18, 4, 1–0.92	1990–2012	19, 4, 0–0.96
02286400	Miami Canal at S354 and S3 at Lake Harbor, FL	Gage height[c]	1970–2012	28, 14, 1–0.96	1969–2012	28, 15, 1–0.94
		Discharge[c,d]	1958–2011	45, 9, 0–1.00	1957–2011	45, 10, 0–0.98

Table B–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey (USGS) hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS/SFWMD station number[a]	Station name	Parameter[e]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		Everglades (03090202)—Continued				
02286400sfw	Miami Canal at S354 and S3 at Lake Harbor, FL	Discharge[c,d]	1963–2012	48, 2, 0–0.99	1963–2012	49, 1, 0–0.99
		Discharge (regmod)[c,d]	1965–2006	40, 2, 0–0.98	1965–2005	41, 0, 0–1.00
02286403	Miami Canal at HGS3 and S3 syphon discharge at Lake Harbor, FL	Discharge	1984–1990	4, 3, 0–0.90	1984–1990	4, 3, 0–0.94
S351	S-351 spillway from Lake Okeechobee to Hillsboro Canal, FL	Gage height (head-water)[c]	2000–2012	10, 3, 0–0.95	2000–2012	10, 3, 0–0.95
		Gage height (tail-water)[c]	2000–2012	11, 2, 0–0.95	2000–2012	11, 2, 0–0.95
		Discharge[c,d]	1989–2012	17, 6, 1–0.93	1989–2012	18, 6, 0–0.98
		Caloosahatchee (03090205)				
02292000	Caloosahatchee Canal at Moore Haven, FL	Gage height (headwater)[c]	1970–2003	14, 11, 9–0.69	1970–2003	13, 13, 8–0.69
		Discharge[c,d]	1939–2003	62, 3, 0–1.00	1938–2003	62, 4, 0–0.98
02292000coe	Caloosahatchee Canal at Moore Haven, FL	Discharge	1996–2012	4, 13, 0–0.92	1996–2012	3, 14, 0–0.92
02292000sfw	Caloosahatchee Canal at Moore Haven, FL	Gage height (headwater)	1998–2003	4, 2, 0–0.86	1998–2003	4, 2, 0–0.86
		Discharge	1998–2003	3, 3, 0–0.86	1998–2003	2, 4, 0–0.86
		Discharge (regmod)[c,d]	1965–2006	40, 2, 0–0.98	1965–2005	41, 0, 0–1.00
02292010	Caloosahatchee Canal bl S-77 at Moore Haven, FL	Gage height	2008–2012	0, 5, 0–0.67	2008–2012	0, 4, 1–0.67
		Discharge	2008–2012	1, 4, 0–0.69	2008–2012	1, 3, 1–0.69
02292010sfw	Caloosahatchee Canal bl S-77 at Moore Haven, FL	Discharge[c,d]	1963–2012	46, 4, 0–0.99	1963–2012	47, 3, 0–0.99
02292480	Caloosahatchee Canal at Ortona Lock nr La Belle, FL	Gage height[c]	1982–2003	15, 7, 0–0.96	1982–2003	14, 8, 0–0.96
		Gage height (upstream)[c]	1983–2003	16, 5, 0–1.00	1982–2003	16, 6, 0–0.95
		Discharge[c]	1971–2003	28, 5, 0–0.98	1971–2003	28, 5, 0–0.98
02292480coe	Caloosahatchee Canal at Ortona Lock nr La Belle, FL	Discharge[d]	1996–2012	1, 16, 0–0.93	1996–2012	2, 15, 0–0.93
02292480sfw	Caloosahatchee Canal at Ortona Lock nr La Belle, FL	Gage height (headwater)	1998–2003	4, 2, 0–0.86	1998–2003	4, 2, 0–0.86
		Discharge	1998–2003	3, 3, 0–0.85	1998–2003	2, 4, 0–0.85
02292481	Caloosahatchee Canal bl S78 nr La Belle, FL	Gage height (tailwater)[c]	1982–1994	10, 3, 0–0.93	1982–1994	10, 3, 0–0.93
02292481sfw	Caloosahatchee Canal bl S78 nr La Belle, FL	Gage height (tailwater)	1998–2003	3, 3, 0–0.86	1998–2003	2, 4, 0–0.86
		Discharge (regmod)	2001–2010	8, 2, 0–0.93	2001–2010	9, 1, 0–0.93

Table B–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey (USGS) hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS/SFWMD station number[a]	Station name	Parameter[e]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		Caloosahatchee (03090205)—Continued				
02292900	Caloosahatchee R at S-79 nr Olga, FL	Gage height (upstream)[c]	1970–2012	19, 12, 12–0.68	1969–2012	16, 16, 12–0.67
		Gage height (downstream)[c,d]	1970–2003	16, 6, 12–0.63	1969–2003	13, 10, 12–0.61
		Gage height, minimum (downstream)[d]	2002–2012	3, 7, 1–0.86	2001–2012	1, 10, 1–0.79
		Gage height, maximum (downstream)[d]	2002–2012	3, 7, 1–0.86	2001–2012	1, 10, 1–0.79
		Discharge[c]	1966–2011	37, 9, 0–0.98	1966–2011	34, 12, 0–0.98
		Water temperature	1990–1997	0, 8, 0–0.62	1989–1997	1, 8, 0–0.55
		Specific conductance	1983–1992	0, 4, 6–0.17	1983–1992	0, 5, 5–0.17
02292900coe	Caloosahatchee R at S-79 nr Olga, FL	Discharge	1996–2012	4, 13, 0–0.94	1996–2012	3, 14, 0–0.94
02292900sfw	Caloosahatchee R at S-79 nr Olga, FL	Gage height (headwater)	1998–2003	2, 4, 0–0.85	1998–2003	1, 5, 0–0.85
		Gage height (headwater, regmod)[c,d]	1983–2009	24, 3, 0–0.97	1983–2009	24, 3, 0–0.97
		Discharge	1998–2003	0, 6, 0–0.78	1998–2003	0, 6, 0–0.78
		Discharge (regmod)[c]	1966–2011	44, 2, 0–0.97	1966–2010	44, 1, 0–0.99
02292901sfw	Caloosahatchee R bl S-79 nr Olga, FL	Gage height (tailwater)	1998–2003	2, 4, 0–0.85	1998–2003	1, 5, 0–0.85
		Discharge[c]	1963–1990	23, 1, 4–0.85	1963–1990	23, 0, 5–0.82
		Discharge (regmod)[c]	1983–2005	21, 2, 0–0.95	1983–2005	21, 2, 0–0.95
		Water temperature (near bottom)[c]	1992–2012	10, 11, 0–0.88	1992–2012	9, 12, 0–0.88
		Water temperature (near surface)	1992–2012	9, 12, 0–0.87	1992–2012	9, 12, 0–0.87
		Specific conductance (near bottom)	1992–2012	6, 15, 0–0.85	1992–2012	8, 13, 0–0.85
		Specific conductance (near surface)	1992–2012	5, 16, 0–0.82	1992–2012	5, 16, 0–0.82
02293205	Caloosahatchee R at Channel Marker 52 nr Ft Myers, FL	Gage height, minimum	2008–2012	0, 4, 1–0.78	2007–2012	0, 5, 1–0.65
		Gage height, maximum	2008–2012	0, 4, 1–0.78	2007–2012	0, 5, 1–0.65
		Discharge, tidally filtered	2008–2012	1, 3, 1–0.78	2007–2012	1, 4, 1–0.65
		Water temperature, minimum (near bottom)	2008–2010	0, 3, 0–0.97	2007–2010	0, 4, 0–0.73

Table B–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey (USGS) hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS/SFWMD station number[a]	Station name	Parameter[e]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
Caloosahatchee (03090205)—Continued						
02293205—Continued	Caloosahatchee R at Channel Marker 52 nr Ft Myers, FL	Water temperature, maximum (near bottom)	2008–2010	0, 3, 0–0.97	2007–2010	0, 4, 0–0.72
		Water temperature, minimum (near surface)	2008–2010	0, 3, 0–0.96	2007–2010	0, 4, 0–0.72
		Water temperature, maximum (near surface)	2008–2010	0, 3, 0–0.97	2007–2010	0, 4, 0–0.73
		Salinity, minimum (near bottom)	2008–2010	0, 3, 0–0.96	2007–2010	0, 4, 0–0.72
		Salinity, maximum (near bottom)	2008–2010	0, 3, 0–0.96	2007–2010	0, 4, 0–0.72
		Salinity, minimum (near surface)	2008–2010	0, 3, 0–0.95	2007–2010	0, 4, 0–0.71
		Salinity, maximum (near surface)	2008–2010	0, 3, 0–0.96	2007–2010	0, 4, 0–0.72
02293210	Caloosahatchee R at Shell Point nr Iona, FL	Gage height, minimum	2008–2012	2, 3, 0–0.76	2007–2012	2, 3, 1–0.63
		Gage height, maximum	2008–2012	1, 4, 0–0.76	2007–2012	2, 3, 1–0.63
		Discharge, tidally filtered	2008–2012	2, 3, 0–0.76	2007–2011	3, 2, 0–0.76
263144-082010400	Caloosahatchee R at Punta Blanca nr Cape Coral, FL	Water temperature, minimum (near bottom)	2008–2010	1, 2, 0–0.92	2007–2010	0, 4, 0–0.69
		Water temperature, maximum (near bottom)	2008–2010	1, 2, 0–0.93	2007–2010	0, 4, 0–0.70
		Water temperature, minimum (near surface)	2008–2010	0, 3, 0–0.86	2007–2010	0, 4, 0–0.65
		Water temperature, maximum (near surface)	2008–2010	1, 2, 0–0.89	2007–2010	0, 4, 0–0.67
		Salinity, minimum (near bottom)	2008–2010	1, 2, 0–0.92	2007–2010	0, 4, 0–0.69
		Salinity, maximum (near bottom)	2008–2010	1, 2, 0–0.92	2007–2010	0, 4, 0–0.69
		Salinity, minimum (near surface)	2008–2010	0, 3, 0–0.85	2008–2010	0, 3, 0–0.85
		Salinity, maximum (near surface)	2008–2010	1, 2, 0–0.84	2008–2010	0, 3, 0–0.84

Table B–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey (USGS) hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS/SFWMD station number[a]	Station name	Parameter[e]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		SE Florida Atlantic (03090206)				
02276870	St Lucie Canal at Lake Okeechobee, FL	Gage height[c]	1941–1998	13, 6, 39–0.31	1941–1998	13, 7, 38–0.31
		Gage height (canal)[c]	1982–2006	18, 7, 0–0.98	1981–2006	17, 9, 0–0.95
		Discharge[c,d]	1931–2006	36, 11, 29–0.61	1931–2006	35, 13, 28–0.61
02276870coe	St Lucie Canal at Lake Okeechobee, FL	Gage height (headwater)	1998–2003	3, 3, 0–0.81	1998–2003	3, 3, 0–0.81
		Gage height (head-water, regmod)[c]	1982–2012	27, 4, 0–0.97	1981–2011	27, 4, 0–0.97
		Discharge	1996–2012	4, 13, 0–0.93	1996–2012	4, 13, 0–0.93
02276870sfw	St Lucie Canal at Lake Okeechobee, FL	Gage height (tailwater)	1998–2003	4, 2, 0–0.81	1998–2003	4, 2, 0–0.81
		Gage height (tail-water, regmod)[c]	1982–2012	28, 3, 0–0.97	1981–2011	28, 3, 0–0.97
02276877	St Lucie Canal bl S308 nr Port Mayaca, FL	Gage height	1992–2012	6, 15, 0–0.87	1992–2012	6, 15, 0–0.87
		Discharge[c,d]	1931–2012	40, 13, 29–0.62	1931–2012	38, 16, 28–0.62
02276877sfw	St Lucie Canal bl S308 nr Port Mayaca, FL	Discharge[c,d]	1963–2012	45, 5, 0–0.98	1963–2012	46, 4, 0–0.98
		Discharge (regmod)[c,d]	1965–2011	45, 2, 0–0.98	1965–2010	46, 0, 0–1.00
02277000	St Lucie Canal at Lock nr Stu-art, FL	Gage height	1988–2003	9, 5, 2–0.87	1987–2003	6, 11, 0–0.82
		Gage height (downstream)	1988–2001	8, 6, 0–0.98	1987–2001	8, 7, 0–0.92
		Gage height, mini-mum (down-stream)	2002–2003	1, 1, 0–0.98	2001–2003	0, 3, 0–0.65
		Gage height, maxi-mum (down-stream)	2002–2003	1, 1, 0–0.98	2001–2003	0, 3, 0–0.65
		Discharge[c]	1953–2003	45, 6, 0–0.99	1952–2003	45, 7, 0–0.97
02277000coe	St Lucie Canal at Lock nr Stu-art, FL	Discharge	1996–2012	1, 14, 2–0.81	1996–2011	0, 16, 0–0.94
02277000sfw	St Lucie Canal at Lock nr Stu-art, FL	Gage height (headwater)	1998–2003	1, 5, 0–0.86	1998–2003	1, 5, 0–0.86
		Gage height (tailwater)	1998–2003	4, 2, 0–0.86	1998–2003	4, 2, 0–0.86
		Gage height (head-water, regmod)[c]	1988–2011	20, 4, 0–0.97	1987–2010	20, 4, 0–0.97
		Gage height (tail-water, regmod)[c,d]	1988–2011	16, 6, 2–0.83	1987–2010	17, 5, 2–0.83
		Dischargec	1953–2012	57, 2, 1–0.98	1952–2011	57, 2, 1–0.97
		Discharge (regmod)[c]	1965–2011	44, 2, 1–0.96	1965–2010	45, 0, 1–0.98

Table B–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey (USGS) hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS/SFWMD station number[a]	Station name	Parameter[e]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		SE Florida Atlantic (03090206)—Continued				
02281400	Hillsboro Canal nr Margate, FL	Gage height[c]	1976–2012	20, 17, 0–0.94	1975–2011	21, 16, 0–0.94
		Discharge[c,d]	1976–2012	22, 15, 0–0.94	1975–2011	20, 17, 0–0.94
02281490	C2 Canal ab S4 nr Deerfield Beach, FL	Gage height	1989–1993	0, 5, 0–0.74	1989–1993	0, 5, 0–0.74
		Discharge	1989–1993	0, 3, 2–0.38	1989–1993	0, 4, 1–0.38
02281491	C2 Canal bl S4 nr Deerfield Beach, FL	Gage height	1991–1993	0, 3, 0–0.95	1990–1993	1, 3, 0–0.71

[a]Station numbers with "coe" or "sfw" appended to the number are for stations operated in cooperation with either the U.S. Army Corps of Engineers (coe) or the South Florida Water Management District (sfw), and the data for these table rows were obtained from digital files of these agencies. Stations s129, s133, s135, and s351 are South Florida Water Management District stations.

[b]Period shown is for indicated type of year and includes gaps if data collection was discontinuous. Record completeness: number of complete-record, partial-record, and null-record water or calendar years—fraction of total record length with mean-daily values. The fraction-of-total-record-length calculation is based on complete beginning and ending water or calendar years as well as complete intervening years. Therefore, the fraction-of-total-record-length numbers may be different for water years when compared to calendar years.

[c]Indicators of Hydrologic Alteration (IHA) analysis was performed for these parameters. Periods of record for IHA analyses shown in figure B4 (gage height) and figure B5 (discharge). IHA analysis was only done for station-parameter combinations with a minimum of 10 complete water years of record.

[d]Negative parameter values set to zero for the IHA analysis—parameter distributions censored at zero and IHA results given for the positive portion of the distribution because the IHA software will not analyze negative values.

[e]Data-collection location and type codes: culvert; headwater (measurement made upstream from dam); headwater, culvert (measurement made upstream from dam at culvert; headwater, pump (measurement made upstream from dam, with pumping); pump; tailwater (measurement made downstream from dam); tailwater, pump (measurement made downstream from dam, with pumping).

Table B–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
		Raw data[b]
okb_tabular_hydrostats_raw.accdb	okb001_dv_[***agency***]	Raw data—mean-daily values for gage height, discharge, water temperature, and specific conductance; minimum-daily and maximum-daily values for gage height, water temperature, and salinity; sum-daily values for precipitation; for gaging stations in the contributing watersheds and vicinity of Caloosahatchee and J.N. “Ding” Darling NWRs
	okb001_usgs_pk	USGS peak-value data for gage height and discharge
		Descriptive statistics, spread measures, and ratio measures[b]
okb_tabular_hydrostats01c.accdb	okb[***var***]01c_[***agency***]	Daily values for parameter ***var***, calendar-year reference period
okb_tabular_hydrostats01w.accdb	okb[***var***]01w_[***agency***]	Daily values for parameter ***var***, water-year reference period
okb_tabular_hydrostats02.accdb	okbpkst02	Peak-value statistics for gage height and discharge
	okb[***var***]cy02	Calendar-year statistics for daily values for parameter ***var***
	okb[***var***]cd02	Calendar-decade statistics for daily values for parameter ***var***
	okb[***var***]cym02	Calendar-year-month statistics for daily values for parameter ***var***
	okb[***var***]wy02	Water-year statistics for daily values for parameter ***var***
	okb[***var***]mo02	Period-of-record monthly statistics metrics, based on daily values, for parameter ***var***, complete calendar years
	okb[***var***]mom02	Period-of-record monthly statistics metrics, based on annual monthly means of daily values, for parameter ***var***, complete calendar years
	okb[***var***]jc02	Period-of-record calendar-year-julian-day statistics, based on daily values, for parameter ***var***, complete calendar years
	okb[***var***]jw02	Period-of-record water-year-julian-day statistics, based on daily values, for parameter ***var***, complete calendar years
		IHA metrics[c]
regional_iha_***var***_[***subbasin***]_okb.xlsxd	1_day_min	Minimum 1-day mean of mean-daily values
	3_day_min	Minimum 3-day mean of mean-daily values
	7_day_min	Minimum 7-day mean of mean-daily values
	30_day_min	Minimum 30-day mean of mean-daily values
	90_day_min	Minimum 90-day mean of mean-daily values
	1_day_max	Maximum 1-day mean of mean-daily values
	3_day_max	Maximum 3-day mean of mean-daily values
	7_day_max	Maximum 7-day mean of mean-daily values
	30_day_max	Maximum 30-day mean of mean-daily values
	90_day_max	Maximum 90-day mean of mean-daily values
	baseflow	Baseflow index: 7-day mean minimum discharge/mean-annual discharge
	[***var***]7525s	75th–25th percentile spread measure for mean-daily values

Table B–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
	IHA metrics[c]—Continued	
regional_iha_***var***_[***subbasin***]_okb.xlsxd—Continued	summary	IHA period-of-record summary data for IHA parameter groups and environmental-flow components: summary data include the 10th, 25th, 50th, 75th, and 90th percentiles and the 75th-25th percentile spread measure
	02268903	Complete IHA analysis for USGS 02268903, Kissimmee R at S65 nr Lake Wales, FL (gage height, discharge)
	02268903sfw	Complete IHA analysis for USGS 02268903, Kissimmee R at S65 nr Lake Wales, FL (gage height (headwater) [SFWMD], gage height (tail-water) [SFWMD], discharge [SFWMD])
	02273000	Complete IHA analysis for USGS 02273000, Kissimmee R at S65E nr Okeechobee, FL (gage height, discharge)
	02273000sfw	Complete IHA analysis for USGS 02273000, Kissimmee R at S65E nr Okeechobee, FL (gage height (headwater) [SFWMD], discharge [SF-WMD], discharge (regmod) [SFWMD])
	02273001sfw	Complete IHA analysis for USGS 02273001, Kissimmee R bl S65E nr Okeechobee, FL (gage height, tailwater [SFWMD])
	02273300	Complete IHA analysis for USGS 02273300, Canal 41A at S84 nr Okeechobee, FL (gage height, discharge)
	02273300sfw	Complete IHA analysis for USGS 02273300, Canal 41A at S84 nr Okeechobee, FL (gage height (headwater) [SFWMD], gage height (tail-water) [SFWMD], discharge [SFWMD])
	02273343sfw	Complete IHA analysis for USGS 02273343, Kissimmee R bl S154 nr Okeechobee, FL (gage height (headwater) [SFWMD], gage height (tailwater) [SFWMD], gage height (headwater, culvert) [SFWMD], gage height (tailwater, culvert) [SFWMD], discharge [SFWMD], dis-charge (culvert) [SFWMD])
	02274000	Complete IHA analysis for USGS 02274000, Taylor Cr nr Basinger, FL (gage height, discharge)
	02274500	Complete IHA analysis for USGS 02274500, Taylor Cr ab Okeechobee, FL (gage height, discharge)
	02275606sfw	Complete IHA analysis for USGS 02275606, Nubbin Slough nr Sherman, FL (gage height (headwater) [SFWMD], gage height (tailwater) [SF-WMD], discharge [SFWMD], discharge (regmod) [SFWMD])
	S133	Complete IHA analysis for SFWMD S133, S-133 pump from NE Shore to Lake Okeechobee, FL (gage height (headwater), gage height (tailwa-ter), discharge, discharge (regmod))
	S135	Complete IHA analysis for SFWMD S135, S-135 (pump, culvert) from NE Shore to Lake Okeechobee, FL (gage height (headwater), gage height (tailwater), discharge (pump), discharge (regmod))
	02256000	Complete IHA analysis for USGS 02256000, Fisheating Cr nr Venus, FL (discharge)
	02256500	Complete IHA analysis for USGS 02256500, Fisheating Cr at Palmdale, FL (gage height, discharge)
	02256500sfw	Complete IHA analysis for USGS 02256500, Fisheating Cr at Palmdale, FL (discharge [SFWMD])

Table B–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
	IHA metrics[c]—Continued	
regional_iha_***var***_[***subbasin***]_okb.xlsxd—Continued	02257000	Complete IHA analysis for USGS 02257000, Fisheating Cr at Lakeport, FL (discharge)
	02257030	Complete IHA analysis for USGS 02257030, Fisheating Lock at S131 nr Lakeport, FL (gage height), discharge (pump) [SFWMD])
	02257030sfw	Complete IHA analysis for USGS 02257030, Fisheating Lock at S131 nr Lakeport, FL (gage height (tailwater) [SFWMD]
	02257800	Complete IHA analysis for USGS 02257800, Harney Pond Canal at S71 nr Lakeport, FL (discharge)
	02257800sfw	Complete IHA analysis for USGS 02257800, Harney Pond Canal at S71 nr Lakeport, FL (gage height (headwater) [SFWMD], gage height (tailwater) [SFWMD], discharge [SFWMD])
	02259200	Complete IHA analysis for USGS 02259200, Indian Prairie Canal at S72 nr Okeechobee, FL (gage height, discharge)
	02259200sfw	Complete IHA analysis for USGS 02259200, Indian Prairie Canal at S72 nr Okeechobee, FL (gage height (headwater) [SFWMD], gage height (tailwater) [SFWMD], discharge [SFWMD])
	02259627sfw	Complete IHA analysis for USGS 02259627, Buckhead Lock at S127 nr Okeechobee, FL (gage height (headwater) [SFWMD], gage height (tailwater) [SFWMD], gage height (headwater, regmod) [SFWMD], gage height (tailwater, regmod) [SFWMD])
	S129	Complete IHA analysis for SFWMD S129, S-129 (pump, spillway) from NW Shore to Lake Okeechobee, FL (gage height (headwater), gage height (tailwater), discharge (pump))
	02278000	Complete IHA analysis for USGS 02278000, West Palm Beach Canal at S352 at Canal Pt, FL (gage height (canal), gage height (lake), discharge)
	02278000sfw_1	Complete IHA analysis for USGS 02278000, West Palm Beach Canal at S352 at Canal Pt, FL (gage height (headwater) [SFWMD], gage height (tailwater) [SFWMD], gage height (headwater, regmod) [SFWMD], gage height (tailwater, regmod) [SFWMD], discharge [SFWMD], discharge (regmod) [SFWMD])
	02278000sfw_2	Complete IHA analysis for USGS 02278000, West Palm Beach Canal at S352 at Canal Pt, FL (discharge [SFWMD])
	02278002	Complete IHA analysis for USGS 02278002, West Palm Beach Canal bl S352 at Canal Pt, FL (gage height (tailwater) [SFWMD])
	02280500	Complete IHA analysis for USGS 02280500, Hillsboro Canal bl S351 nr South Bay, FL (gage height, discharge)
	02283498	Complete IHA analysis for USGS 02283498, N New R Canal at S2 and S351 nr South Bay, FL (gage height, gage height (canal), discharge)
	02283498sfw	Complete IHA analysis for USGS 02283498, N New R Canal at S2 and S351 nr South Bay, FL (discharge [SFWMD], discharge (regmod) [SFWMD])
	02283500	Complete IHA analysis for USGS 02283500, N New R Canal bl S351 nr South Bay, FL (gage height, discharge)
	02286399	Complete IHA analysis for USGS 02286399, Miami Canal ab S354 and S3 at Lake Harbor, FL (gage height)

Table B–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
	IHA metrics[c]—Continued	
regional_iha_***var***_[***subbasin***]_okb.xlsxd—Continued	02286399sfw	Complete IHA analysis for USGS 02286399, Miami Canal ab S354 and S3 at Lake Harbor, FL (gage height (headwater) [SFWMD], gage height (tailwater) [SFWMD], discharge [SFWMD])
	02286400	Complete IHA analysis for USGS 02286400, Miami Canal at S354 and S3 at Lake Harbor, FL (gage height, discharge)
	02286400sfw	Complete IHA analysis for USGS 02286400, Miami Canal at S354 and S3 at Lake Harbor, FL (discharge [SFWMD], discharge (regmod) [SFWMD])
	S351	Complete IHA analysis for SFWMD S351, S-351 spillway from Lake Okeechobee to Hillsboro Canal, FL (gage height (headwater), gage height (tailwater), discharge)
	02292000	Complete IHA analysis for USGS 02292000, Caloosahatchee Canal at Moore Haven, FL (gage height (headwater), discharge)
	02292000sfw	Complete IHA analysis for USGS 02292000, Caloosahatchee Canal at Moore Haven, FL (discharge (regmod) [SFWMD])
	02292010sfw	Complete IHA analysis for USGS 02292010, Caloosahatchee Canal bl S-77 at Moore Haven, FL (discharge [SFWMD])
	02292480	Complete IHA analysis for USGS 02292480, Caloosahatchee Canal at Ortona Lock nr La Belle, FL (gage height, gage height (upstream), discharge)
	02292481	Complete IHA analysis for USGS 02292481, Caloosahatchee Canal bl S-78 nr La Belle, FL (gage height (tailwater))
	02292900	Complete IHA analysis for USGS 02292900, Caloosahatchee R at S-79 nr Olga, FL (gage height (upstream), gage height (downstream), discharge)
	02292900sfw	Complete IHA analysis for USGS 02292900, Caloosahatchee R at S-79 nr Olga, FL (gage height (headwater, regmod) [SFWMD], discharge (regmod) [SFWMD])
	02292901sfw	Complete IHA analysis for USGS 02292901, Caloosahatchee R bl S-79 nr Olga, FL (discharge [SFWMD], discharge (regmod) [SFWMD]
	02276870	Complete IHA analysis for USGS 02276870, St Lucie Canal at Lake Okeechobee, FL (gage height, gage height (canal), discharge)
	02276870coe	Complete IHA analysis for USGS 02276870, St Lucie Canal at Lake Okeechobee, FL (gage height (headwater, regmod) [USCOE])
	02276870sfw	Complete IHA analysis for USGS 02276870, St Lucie Canal at Lake Okeechobee, FL (gage height (tailwater, regmod) [SFWMD])
	02276877	Complete IHA analysis for USGS 02276877, St Lucie Canal bl S308 nr Port Mayaca, FL (discharge)
	02276877sfw	Complete IHA analysis for USGS 02276877, St Lucie Canal bl S308 nr Port Mayaca, FL (discharge [SFWMD], discharge (regmod) [SFWMD])
	02277000	Complete IHA analysis for USGS 02277000, St Lucie Canal at Lake Okeechobee, FL (discharge)
	02277000sfw	Complete IHA analysis for USGS 02277000, St Lucie Canal at Lake Okeechobee, FL (gage height (headwater, regmod) [SFWMD], gage height (tailwater, regmod) [SFWMD], discharge [SFWMD], discharge (regmod) [SFWMD])
	02281400	Complete IHA analysis for USGS 02281400, St Lucie Canal at Lake Okeechobee, FL (gage height, discharge)

Table B–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
	IHA metrics[c]—Continued	
s***SSSSSSSS***_iha_[***var***].xlsx	ann	Water-year annual values for all IHA parameter groups and EFC groups, for parameter ***var***, gaging station ***SSSSSSSS*** (parameter definitions given in table B4)
	sco	IHA scorecard: period-of-record summary data, median values and coefficients of dispersion for IHA parameter groups and EFC groups, for parameter var, gaging station ***SSSSSSSS***
	lsq	Linear-regression models for IHA parameter groups and EFC groups with water year, for parameter var, gaging station ***SSSSSSSS***
	pct	IHA period-of-record summary data for IHA parameter groups and EFC groups: summary data include the 10th, 25th, 50th, 75th, and 90th percentiles and the 75th–25th percentile spread measure, for parameter ***var***, gaging station ***SSSSSSSS***
	daily_efcs	Daily values coded with IHA EFC groups, period of record, for parameter ***var***, gaging station ***SSSSSSSS***
	fdc	IHA flow-duration-curve table with data values and exceedence probabilities for the water-year period and for each month, for parameter ***var***, gaging station ***SSSSSSSS***
	msg	IHA conditional information messages concerning data quality as related to the IHA analysis, for parameter ***var***, gaging station ***SSSSSSSS***
	Geospatial data summaries	
okb_nlcd.xlsx	okb_nlcd92_h0412rfg_pct	Land-cover percentages for 12-digit and 10-digit hydrologic units, and hydrologic cataloging units, Southern Florida hydrologic subregion (0309, contributing-watershed area and vicinity for Caloosahatchee and J.N. "Ding" Darling NWRs) and refuge acquisition areas, based on 1992 NLCD level 2 categories (Vogelmann and others, 2001)
	okb_nlcd01_h0412rfg_pct	Land-cover percentages for 12-digit and 10-digit hydrologic units, and hydrologic cataloging units, Southern Florida hydrologic subregion (0309, contributing-watershed area and vicinity for Caloosahatchee and J.N. "Ding" Darling NWRs) and refuge acquisition areas, based on 2001 NLCD level 2 categories (Homer and others, 2007)
	okb_lcc9201_h0412rfg_pct	Land-cover-change percentages for 12-digit and 10-digit hydrologic units, and hydrologic cataloging units, Southern Florida hydrologic subregion (0309, contributing-watershed area and vicinity for Caloosahatchee and J.N. "Ding" Darling NWRs) and refuge acquisition areas, based on 1992-2001 NLCD-LCCR Anderson level 1 categories (Fry and others, 2009; Anderson and others, 1976)
okb_sgo_hsg.xlsx	okb_sgo_hsg_pct	STATSGO database HSGs A through D percentages for 10-digit hydrologic units and hydrologic cataloging units, Southern Florida hydrologic subregion (0309, contributing-watershed area and vicinity for Caloosahatchee and J.N. "Ding" Darling NWRs) and refuge acquisition areas (U.S. Department of Agriculture, 1994, 2009; Wolock, 1997)

Table B–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
	Geospatial data summaries—Continued	
okb_eco34.xlsx	okb_eco4huc_12_pct	EPA Level IV ecoregion percentages for 12-digit hydrologic units, Southern Florida hydrologic subregion (0309, contributing-watershed area and vicinity for Caloosahatchee and J.N. “Ding” Darling NWRs) (U.S. Environmental Protection Agency, 2011)
	okb_eco3huc_12_pct	EPA Level III ecoregion percentages for 12-digit hydrologic units, Southern Florida hydrologic subregion (0309, contributing-watershed area and vicinity for Caloosahatchee and J.N. “Ding” Darling NWRs) (U.S. Environmental Protection Agency, 2011)
	okb_eco4huc_10_pct	EPA Level IV ecoregion percentages for hydrologic subregions, Southern Florida hydrologic subregion (0309, contributing-watershed area and vicinity for Caloosahatchee and J.N. “Ding” Darling NWRs) (U.S. Environmental Protection Agency, 2011)
	okb_eco3huc_10_pct	EPA Level III ecoregion percentages for hydrologic subregions, Southern Florida hydrologic subregion (0309, contributing-watershed area and vicinity for Caloosahatchee and J.N. “Ding” Darling NWRs) (U.S. Environmental Protection Agency, 2011)
	okb_eco4huc_08_pct	EPA Level IV ecoregion percentages for hydrologic cataloging units, Southern Florida hydrologic subregion (0309, contributing-watershed area and vicinity for Caloosahatchee and J.N. “Ding” Darling NWRs) (U.S. Environmental Protection Agency, 2011)
	okb_eco3huc_08_pct	EPA Level III ecoregion percentages for hydrologic cataloging units, Southern Florida hydrologic subregion (0309, contributing-watershed area and vicinity for Caloosahatchee and J.N. “Ding” Darling NWRs) (U.S. Environmental Protection Agency, 2011)
okb_pop_census.xlsx	tblokbPop01	U.S. Census Bureau county-level population data, 1930–2010 (U.S. Census Bureau, 2011a)
okb_pop_census.xlsx	pop_pct_chg	Descriptive statistics for percent population change, 1930–1970, and 1970–2010

[a]In the file/table/worksheet name, var refers to the hydrologic parameter, where ***var=gmi, gmi_ds, gmn, gmn_cn, gmn_ds, gmn_h, gmn_hc, gmn_hp, gmn_hr, gmn_lk, gmn_t, gmn_tc, gmn_tp, gmn_tr, gmn_tw, gmn_us, gmx, gmx_ds,*** gage height, in feet; ***qmn, qmn_c, qmn_p, qmn_pr, qmn_r, qmn_tf, qmn_w,*** discharge, in cubic feet per second; ***tmi_bt, tmi_tp, tmn, tmn_bt, tmn_tp, tmx_bt, tmx_tp,*** water temperature, in degrees Celsius; ***kmn, kmn_bt, kmn_tp,*** specific conductance, in microsiemens per centimeter; ***smi_bt, smi_tp, smx_bt, smx_tp,*** salinity, in parts per thousand. Parameter short names include the daily-values statistic: mn, mean daily value, mi, minimum daily value, mx, maximum daily value. Variable qualifiers: ds, downstream; us, upstream; h, headwater; hc, headwater culvert; hp, headwater pump; hr, headwater regional modeling; t, tailwater; tc, tailwater culvert; tp, tailwater pump (gmn); tr, tailwater regional modeling; tw, tailwater weir; c, culvert; p, pump; pr, pump regional modeling; r, regional modeling; w, weir; bt, near bottom; tp, near surface (kmn, smi, smx, tmi, tmn, tmx); cn, canal; lk, lake; tf, tidally filtered. For the worksheets in iha-por_okb.xlsx, vargrp=gmn—gage height at location, upstream, and downstream; ***gmn-ht***—gage height, headwater and tailwater; ***gmn-ht-r***—gageheight, headwater and tailwater, regional-modeling dataset; ***qmn***—discharge at location; ***qmn-r***—discharge at location, regional-modeling dataset; ***gmn_misc***—gage height, headwater, tailwater, and culvert; ***qmn_misc***—discharge, culvert and pump. Agency acronyms in the file and(or) table/worksheet names (***agency***, in the file/table/worksheet name) indicate that the data have been subset to those agencies because of file-size limitations: usgs, USGS; usace, U.S. Army Corps of Engineers; sfwmd, South Florida Water Management District.

[b]Field names, field types, and field definitions given in table B3*B*.

[c]IHA parameter-groups, EFC groups, EFCs, and parameter definitions listed in table B4 (Richter and others, 1996; The Nature Conservancy, 2009).

[d]IHA regional analysis done for gaging stations and parameters indicated in table B2*B*. Gaging-station information presented in tables B2*A* and B2*B*. Some regional-analysis files are split by subbasin where ***subbasin=kissimmee***—03090101 (Kissimmee), ***n-okeechobee***—03090102 (Northern Okeechobee Inflow), ***w-okeechobee***—03090103 (Western Okeechobee Inflow), ***everglades***—03090202 (Everglades), ***caloosahatchee***—03090205 (Caloosahatchee), ***nw-okeechobee***—03090102 and 03090103 (Northern and Western Okeechobee Inflows).

Table B–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; ppt, part per thousand]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Raw data[c]	
agency_cd	okb001_dv_[***agency***]; okb001_usgs_pk	Text	USGS collecting-agency code
datetime	okb001_dv_[***agency***]; okb001_usgs_pk	Date/time	Calendar date of daily value
datetime_c	okb001_dv_[***agency***]; okb001_usgs_pk	Text	Calendar date of daily value, character date
disch_c_mn	okb001_dv_[***agency***]	Double precision	Mean-daily discharge (culvert), in ft^3/s
disch_c_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily discharge (culvert), data-value qualification code[d]
disch_c_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily discharge (culvert), SFWMD DBHYDRO time-series key
disch_mn	okb001_dv_[***agency***]	Double precision	Mean-daily discharge, in ft^3/s
disch_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily discharge, data-value qualification code[d]
disch_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily discharge, SFWMD DBHYDRO time-series key
disch_p_mn	okb001_dv_[***agency***]	Double precision	Mean-daily discharge (pump), in ft^3/s
disch_p_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily discharge (pump), data-value qualification code[d]
disch_p_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily discharge (pump), SFWMD DBHYDRO time-series key
disch_pr_mn	okb001_dv_[***agency***]	Double precision	Mean-daily discharge (pump, regmod), in ft^3/s
disch_pr_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily discharge (pump, regmod), data-value qualification code[d]
disch_pr_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily discharge (pump, regmod), SFWMD DBHYDRO time-series key
disch_r_mn	okb001_dv_[***agency***]	Double precision	Mean-daily discharge (regmod), in ft^3/s
disch_r_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily discharge (regmod), data-value qualification code[d]
disch_r_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily discharge (regmod), SFWMD DBHYDRO time-series key
disch_tf_mn	okb001_dv_[***agency***]	Double precision	Mean-daily discharge (tidally filtered), in ft^3/s
disch_tf_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily discharge (tidally filtered), data-value qualification code[d]
disch_w_mn	okb001_dv_[***agency***]	Double precision	Mean-daily discharge (weir), in ft^3/s
disch_w_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily discharge (weir), data-value qualification code[d]
disch_w_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily discharge (weir), SFWMD DBHYDRO time-series key
ght_cn_mn	okb001_dv_[***agency***]	Double precision	Mean-daily gage height (canal), in ft
ght_cn_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily gage height (canal), data-value qualification code[d]
ght_ds_mi	okb001_dv_[***agency***]	Double precision	Minimum-daily gage height (downstream), in ft
ght_ds_mi_cd	okb001_dv_[***agency***]	Text	Minimum-daily gage height (downstream), data-value qualification code[d]

Table B–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; ppt, part per thousand]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Raw data[c]—Continued	
ght_ds_mn	okb001_dv_[***agency***]	Double precision	Mean-daily gage height (downstream), in ft
ght_ds_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily gage height (downstream), data-value qualification code[d]
ght_ds_mx	okb001_dv_[***agency***]	Double precision	Maximum-daily gage height (downstream), in ft
ght_ds_mx_cd	okb001_dv_[***agency***]	Text	Maximum-daily gage height (downstream), data-value qualification code[d]
ght_h_mn	okb001_dv_[***agency***]	Double precision	Mean-daily gage height (headwater), in ft
ght_h_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily gage height (headwater), data-value qualification code[d]
ght_h_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily gage height (headwater), SFWMD DBHYDRO time-series key
ght_hc_mn	okb001_dv_[***agency***]	Double precision	Mean-daily gage height (headwater, culvert), in ft
ght_hc_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily gage height (headwater, culvert), data-value qualification code[d]
ght_hc_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily gage height (headwater, culvert), SFWMD DBHYDRO time-series key
ght_hp_mn	okb001_dv_[***agency***]	Double precision	Mean-daily gage height (headwater, pump), in ft
ght_hp_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily gage height (headwater, pump), data-value qualification code[d]
ght_hp_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily gage height (headwater, pump), SFWMD DBHYDRO time-series key
ght_hr_mn	okb001_dv_[***agency***]	Double precision	Mean-daily gage height (headwater, regmod), in ft
ght_hr_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily gage height (headwater, regmod), data-value qualification code[d]
ght_hr_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily gage height (headwater, regmod), SFWMD DBHYDRO time-series key
ght_lk_mn	okb001_dv_[***agency***]	Double precision	Mean-daily gage height (lake), in ft
ght_lk_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily gage height (lake), data-value qualification code[d]
ght_mi	okb001_dv_[***agency***]	Double precision	Minimum-daily gage height, in ft
ght_mi_cd	okb001_dv_[***agency***]	Text	Minimum-daily gage height, data-value qualification code[d]
ght_mn	okb001_dv_[***agency***]	Double precision	Mean-daily gage height, in ft
ght_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily gage height, data-value qualification code[d]
ght_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily gage height, SFWMD DBHYDRO time-series key
ght_mx	okb001_dv_[***agency***]	Double precision	Maximum-daily gage height, in ft
ght_mx_cd	okb001_dv_[***agency***]	Text	Maximum-daily gage height, data-value qualification code[d]
ght_t_mn	okb001_dv_[***agency***]	Double precision	Mean-daily gage height (tailwater), in ft
ght_t_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily gage height (tailwater), data-value qualification code[d]
ght_t_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily gage height (tailwater), SFWMD DBHYDRO time-series key

Table B–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; ppt, part per thousand]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Raw data[c]—Continued			
ght_tc_mn	okb001_dv_[***agency***]	Double precision	Mean-daily gage height (tailwater, culvert), in ft
ght_tc_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily gage height (tailwater, culvert), data-value qualification code[d]
ght_tc_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily gage height (tailwater, culvert), SFWMD DB-HYDRO time-series key
ght_tp_mn	okb001_dv_[***agency***]	Double precision	Mean-daily gage height (tailwater, pump), in ft
ght_tp_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily gage height (tailwater, pump), data-value qualification code[d]
ght_tp_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily gage height (tailwater, pump), SFWMD DB-HYDRO time-series key
ght_tr_mn	okb001_dv_[***agency***]	Double precision	Mean-daily gage height (tailwater, regmod), in ft
ght_tr_mn_cd	okb001_dv_[***agency***]	Text,	Mean-daily gage height (tailwater, regmod), data-value qualification code[d]
ght_tr_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily gage height (tailwater, regmod), SFWMD DB-HYDRO time-series key
ght_tw_mn	okb001_dv_[***agency***]	Double precision	Mean-daily gage height (tailwater, weir), in ft
ght_tw_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily gage height (tailwater, weir), data-value qualification code[d]
ght_tw_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily gage height (tailwater, weir), SFWMD DB-HYDRO time-series key
ght_us_mn	okb001_dv_[***agency***]	Double precision	Mean-daily gage height (upstream), in ft
ght_us_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily gage height (upstream), data-value qualification code[d]
pcp_sm	okb001_dv_[***agency***]	Double precision	Sum-daily precipitation, in inches
pcp_sm_cd	okb001_dv_[***agency***]	Text	Sum-daily precipitation, data-value qualification code[d]
salinity_bt_mi	okb001_dv_[***agency***]	Double precision	Minimum-daily salinity (near bottom), in ppt
salinity_bt_mi_cd	okb001_dv_[***agency***]	Text	Minimum-daily salinity (near bottom), data-value qualification code[d]
salinity_bt_mx	okb001_dv_[***agency***]	Double precision	Maximum-daily salinity (near bottom), in ppt
salinity_bt_mx_cd	okb001_dv_[***agency***]	Text	Maximum-daily salinity (near bottom), data-value qualification code[d]
salinity_tp_mi	okb001_dv_[***agency***]	Double precision	Minimum-daily salinity (near surface), in ppt
salinity_tp_mi_cd	okb001_dv_[***agency***]	Text	Minimum-daily salinity (near surface), data-value qualification code[d]
salinity_tp_mx	okb001_dv_[***agency***]	Double precision	Maximum-daily salinity (near surface), in ppt
salinity_tp_mx_cd	okb001_dv_[***agency***]	Text	Maximum-daily salinity (near surface), data-value qualification code[d]
site_no	okb001_dv_[***agency***]; okb001_usgs_pk	Text	USGS station identification number

Table B–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; ppt, part per thousand]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Raw data[c]—Continued			
site_no_sfw	okb001_dv_[***agency***]	Text	SFWMD station identification number
spc_bt_mn	okb001_dv_[***agency***]	Double precision	Mean-daily specific conductance (near bottom), in µS/cm
spc_bt_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily specific conductance (near bottom), data-value qualification code[d]
spc_bt_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily specific conductance (near bottom), SFWMD DBHYDRO time-series key
spc_mn	okb001_dv_[***agency***]	Double precision	Mean-daily specific conductance, in µS/cm
spc_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily specific conductance, data-value qualification code[d]
spc_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily specific conductance, SFWMD DBHYDRO time-series key
spc_tp_mn	okb001_dv_[***agency***]	Double precision	Mean-daily specific conductance (near surface), in µS/cm
spc_tp_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily specific conductance (near surface), data-value qualification code[d]
spc_tp_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily specific conductance (near surface), SFWMD DBHYDRO time-series key
wtemp_bt_mi	okb001_dv_[***agency***]	Double precision	Minimum-daily water temperature (near bottom), in °C
wtemp_bt_mi_cd	okb001_dv_[***agency***]	Text	Minimum-daily water temperature (near bottom), data-value qualification code[d]
wtemp_bt_mn	okb001_dv_[***agency***]	Double precision	Mean-daily water temperature (near bottom), in °C
wtemp_bt_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily water temperature (near bottom), data-value qualification code[d]
wtemp_bt_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily water temperature (near bottom), SFWMD DBHYDRO time-series key
wtemp_bt_mx	okb001_dv_[***agency***]	Double precision	Maximum-daily water temperature (near bottom), in °C
wtemp_bt_mx_cd	okb001_dv_[***agency***]	Text	Maximum-daily water temperature (near bottom), data-value qualification code[d]
wtemp_mn	okb001_dv_[***agency***]	Double precision	Mean-daily water temperature, in °C
wtemp_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily water temperature, data-value qualification code[d]
wtemp_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily water temperature, SFWMD DBHYDRO time-series key
wtemp_tp_mi	okb001_dv_[***agency***]	Double precision	Minimum-daily water temperature (near surface), in °C
wtemp_tp_mi_cd	okb001_dv_[***agency***]	Text	Minimum-daily water temperature (near surface), data-value qualification code[d]
wtemp_tp_mn	okb001_dv_[***agency***]	Double precision	Mean-daily water temperature (near surface), in °C
wtemp_tp_mn_cd	okb001_dv_[***agency***]	Text	Mean-daily water temperature (near surface), data-value qualification code[d]
wtemp_tp_mn_dbkey	okb001_dv_[***agency***]	Text	Mean-daily water temperature (near surface), SFWMD DBHYDRO time-series key
wtemp_tp_mx	okb001_dv_[***agency***]	Double precision	Maximum-daily water temperature (near surface), in °C
wtemp_tp_mx_cd	okb001_dv_[***agency***]	Text	Maximum-daily water temperature (near surface), data-value qualification code[d]

Table B–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; ppt, part per thousand]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
	Descriptive statistics, spread measures, ratio measures[e]		
[***var***]	okb[***var***]01[c,w]_[***agency***]	Double precision	Daily value for parameter ***var***
[***var***]_10	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	10th percentile of daily values, parameter ***var***
[***var***]_20	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	20th percentile of daily values, parameter ***var***
[***var***]_25	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	25th percentile of daily values, parameter ***var***
[***var***]_50	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	50th percentile (median) of daily values, parameter ***var***
[***var***]_75	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	75th percentile of daily values, parameter ***var***
[***var***]_80	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	80th percentile of daily values, parameter ***var***
[***var***]_90	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	90th percentile of daily values, parameter ***var***
[***var***]_cd	okb[***var***]01[c,w]_[***agency***]	Double precision	Daily value for parameter ***var***, data-value qualification code[d]
[***var***]_cdf	okb[***var***]cd02	Double precision	Calendar-decade fraction represented by daily values, parameter ***var***
[***var***]_cmf	okb[***var***]cym02	Double precision	Calendar-month fraction represented by daily values, parameter ***var***
[***var***]_cv	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	Coefficient of variation of daily values, parameter ***var***
nyr_rec	okb[***var***]mo02	Double precision	Number of complete calendar years in the long-term monthly record
[***var***]_cyf	okb[***var***]cy02; okb[***var***]cym02	Double precision	Calendar-year fraction represented by daily values, parameter ***var***
[***var***]_mi	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	Minimum of daily values, parameter ***var***
[***var***]_mn	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	Mean of daily values, parameter ***var***
[***var***]_mx	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	Maximum of daily values, parameter ***var***
[***var***]_n	all tables (-okb[***var***]01 [c,w]_[***agency***])	Long integer	Number of daily values, parameter ***var***
[***var***]_nm	all tables (-okb[***var***]01 [c,w]_[***agency***])	Long integer	Number of missing values of daily values, parameter ***var***
[***var***]_ny	okb[***var***]cd02	Double precision	Number of calendar years in each calendar decade, including fractional years, represented by daily values, parameter ***var***
[***var***]_sd	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	Standard deviation of daily values, parameter ***var***

Table B–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; ppt, part per thousand]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
	Descriptive statistics, spread measures, ratio measures[e]—Continued		
[***var***]_va	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	Variance of daily values, parameter ***var***
[***var***]_wyf	okb[***var***]wy02	Double precision	Water-year fraction represented by daily values, parameter ***var***
[***var***]7525r	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	75th–25th percentile ratio measure of daily values, parameter ***var***: p75/p25
[***var***]7525s	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	75th–25th percentile spread measure of daily values, parameter ***var***: (p75–p25)/p50
[***var***]8020r	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	80th–20th percentile ratio measure of daily values, parameter ***var***: p80 / p20
[***var***]8020s	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	80th–20th percentile spread measure of daily values, parameter ***var***: (p80–p20)/p50
[***var***]9010r	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	90th–10th percentile ratio measure of daily values, parameter ***var***: p90/p10
[***var***]9010s	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	90th–10th percentile spread measure of daily values, parameter ***var***: (p90–p10)/p50
agency_cd	okb[***var***]01[c,w]_[***agency***]	Text	USGS collecting-agency code
cdate	okb[***var***]01[c,w]_[***agency***]	Text	Character date, ***yyyymmdd*** format, added to preserve pre-1900 dates in Microsoft Excel files
cdt_bnd_mi	okb[***var***]01[c,w]_[***agency***]	Date/time	Calendar-year minimum-date boundary, January 1 of the first calendar year of record, ***mm/dd/yyyy*** format
cdt_bnd_mx	okb[***var***]01[c,w]_[***agency***]	Date/time	Calendar-year maximum-date boundary, December 31 of the last calendar year of record, ***mm/dd/yyyy*** format
cnty	okb[***var***]01[c,w]_[***agency***]	Text	FIPS county code
da	all tables (-okbpkst02)	Double precision	Drainage area of gaged watershed, in mi^2
date	okb[***var***]01[c,w]_[***agency***]	Date/time	Date, ***mm/dd/yyyy*** format
date_mi	okb[***var***]01[c,w]_[***agency***]	Date/time	Date of first daily value, ***mm/dd/yyyy*** format
date_mx	okb[***var***]01[c,w]_[***agency***]	Date/time	Date of last daily value, ***mm/dd/yyyy*** format
day	okb[***var***]01[c,w]_[***agency***]	Long integer	Calendar day
decade	okb[***var***]01[c,w]_[***agency***]; okb[***var***]cd02	Long integer	Calendar decade
jday_c	okb[***var***]01[c,w]_[***agency***]; okb[***var***]jc02	Long integer	Calendar-year Julian day
jday_w	okb[***var***]01[c,w]_[***agency***]; okb[***var***]jw02	Long integer	Water-year Julian day
l[***var***]	okb[***var***]01[c,w]_[***agency***]	Double precision	Log-10 daily value for parameter ***var***
l[***var***]_cv	all tables (-okb[***var***]01 [c,w]_[***agency***])	Double precision	Coefficient of variation of every 5th percentile of log-10 parameter ***var***
latdec	okb[***var***]01[c,w]_[***agency***]	Double precision	Decimal latitude of gaging station, NAD 83
londec	okb[***var***]01[c,w]_[***agency***]	Double precision	Decimal longitude of gaging station, NAD 83

Table B–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; ppt, part per thousand]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Descriptive statistics, spread measures, ratio measures[e]—Continued	
lsalt	okb[***var***]01[c,w]_[***agency***]	Double precision	Land-surface altitude of gage, NGVD 29, in ft
month	okb[***var***]01[c,w]_[***agency***]; okb[***var***]cym02; okb[***var***]mo02; okb[***var***]mom02	Long integer	Calendar month
month_nd	okb[***var***]mo02	Double precision	Number of days in the calendar month
qmn_y50	all ***qmn*** tables (-okb***qmn***01 [c,w]_[***agency***])	Double precision	Median discharge yield, in $ft^3/s/mi^2$
qmn_ymn	all ***qmn*** tables (-okb***qmn***01 [c,w]_[***agency***])	Double precision	Mean discharge yield, in $ft^3/s/mi^2$
sname	okb[***var***]01[c,w]_[***agency***]	Text	USGS station name
staid	all tables	Text	USGS station identification number
wdt1_bnd_mi	okb[***var***]01[c,w]_[***agency***]	Date/time	Water-year minimum-date boundary, October 1 of the first water year of record, calendar-year minimum minus one when month is January–September, ***mm/dd/yyyy*** format
wdt1_bnd_mx	okb[***var***]01[c,w]_[***agency***]	Date/time	Water-year maximum-date boundary, September 30 of the last water year of record, calendar-year minimum when month is January–September, ***mm/dd/yyyy*** format
wdt2_bnd_mi	okb[***var***]01[c,w]_[***agency***]	Date/time	Water-year minimum-date boundary, October 1 of the first water year of record, calendar-year minimum when month is October–December, ***mm/dd/yyyy*** format
wdt2_bnd_mx	okb[***var***]01[c,w]_[***agency***]	Date/time	Water-year maximum-date boundary, September 30 of the last water year of record, calendar-year minimum plus one when month is October–December, ***mm/dd/yyyy*** format
wyear	okb[***var***]01[c,w]_[***agency***]; okb[***var***]wy02	Long integer	Water year
year	okb[***var***]01[c,w]_[***agency***]; okb[***var***]cy02; okb[***var***]cym02	Long integer	Calendar year
		Geospatial data summaries[f]	
AREA	tblOkbPop01	Double precision	County area, in m^2
CNTYNAME	tblOkbPop01	Text	County name
okb_statecty	tblOkbPop01	Long integer	Numeric FIPS code
hga_pct	okb_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG A[g]
hgb_pct	okb_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG B[g]

Table B–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Geospatial data summaries[f]—Continued			
hgc_pct	okb_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG C[g]
hgd_pct	okb_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG D[g]
hgm_pct	ckr_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils that have mixed HSG classification[g]
huc_chg_pct	okb_lcc9201_h0412rfg_pct	Double precision	Areal percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
huc04	all worksheets (-okb_eco[3,4]huc[08,10,12]_pct, tblokbPop01, pop_pct_chg)	Text	Hydrologic subregion (4-digit hydrologic unit) code[h]
huc08	all worksheets (-tblokbPop01, pop_pct_chg)	Text	Hydrologic cataloging unit (8-digit hydrologic unit) code[h]
huc08_l3_pct	okb_eco3huc_08_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level III ecoregion in each hydrologic cataloging unit (8-digit hydrologic unit)
huc08_l4_pct	okb_eco4huc_08_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level IV ecoregion in each hydrologic cataloging unit (8-digit hydrologic unit)
huc08_name	okb_eco[3,4]huc[08,10,12]_pct	Text	Hydrologic cataloging unit (8-digit hydrologic unit) name[h]
huc10	all worksheets (-okb_eco4huc_08_pct, okb_eco3huc_08_pct, tblokbPop01, pop_pct_chg)	Text	10-digit hydrologic unit code[h]
huc10_l3_pct	okb_eco3huc_10_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level III ecoregion in each 10-digit hydrologic unit
huc10_l4_pct	okb_eco4huc_10_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level IV ecoregion in each 10-digit hydrologic unit
huc10_name	okb_eco[3,4]huc[10,12]_pct	Text	10-digit hydrologic unit name[h]
huc12	all worksheets (-okb_eco[3,4]huc_[08,10]_pct, okb_sgo_hsg_pct, tblokbPop01, pop_pct_chg)	Text	12-digit hydrologic unit code[h]

Table B–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
huc12_l3_pct	okb_eco3huc_12_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level III ecoregion in each 12-digit hydrologic unit
huc12_l4_pct	okb_eco4huc_12_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level IV ecoregion in each 12-digit hydrologic unit
huc12_name	okb_eco4huc_12_pct, okb_eco3huc_12_pct	Text	12-digit hydrologic unit name[h]
mass_bal	okb_lcc9201_h0412rfg_pct	Double precision	Sum-check for land-cover change net gain/loss percentages
net_1	okb_lcc9201_h0412rfg_pct	Double precision	Net percentage gain or loss of water within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_2	okb_lcc9201_h0412rfg_pct	Double precision	Net percentage gain or loss of urban land within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_3	okb_lcc9201_h0412rfg_pct	Double precision	Net percentage gain or loss of barren land within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_4	okb_lcc9201_h0412rfg_pct	Double precision	Net percentage gain or loss of forest within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_5	okb_lcc9201_h0412rfg_pct	Double precision	Net percentage gain or loss of grassland within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_6	okb_lcc9201_h0412rfg_pct	Double precision	Net percentage gain or loss of agricultural land within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs

Table B–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
	Geospatial data summaries[f]—Continued		
net_7	okb_lcc9201_h0412rfg_pct	Double precision	Net percentage gain or loss of wetland within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
nwr	okb_nlcd92_h0412rfg_pct, okb_nlcd01_h0412rfg_pct, okb_lcc9201_h0412rfg_pct, okb_sgo_hsg_pct	Text, length 60	U.S. Fish and Wildlife Service National Wildlife Refuge name
pct_11	okb_nlcd92_h0412rfg_pct, okb_nlcd01_h0412rfg_pct	Double precision	Percent open water - all areas of open water, generally with less than 25 percent cover of vegetation or soil (1992, 2001)[i,j]
pct_21	okb_nlcd92_h0412rfg_pct, okb_nlcd01_h0412rfg_pct	Double precision	Percent developed—low-intensity residential (1992)[i]; Developed, open space—includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes (2001)[j]
pct_22	okb_nlcd92_h0412rfg_pct, okb_nlcd01_h0412rfg_pct	Double precision	Percent developed—high-intensity residential (1992)[i]; Developed, low intensity—includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20–49 percent of total cover. These areas most commonly include single-family housing units (2001)[j]
pct_23	okb_nlcd92_h0412rfg_pct, okb_nlcd01_h0412rfg_pct	Double precision	Percent developed—commercial/industrial/transportation (1992)[i]; Developed, medium intensity—includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50–79 percent of the total cover. These areas most commonly include single-family housing units (2001)[j]
pct_24	okb_nlcd01_h0412rfg_pct	Double precision	Developed, high intensity—includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to 100 percent of the total cover (2001)[j]
pct_31	okb_nlcd92_h0412rfg_pct, okb_nlcd01_h0412rfg_pct	Double precision	Barren—bare rock/sand/clay (1992)[i]; Barren land (rock/sand/clay)—barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15 percent of total cover (2001)[j]

Table B–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Geospatial data summaries[f]—Continued			
pct_32	okb_nlcd92_h0412rfg_pct	Double precision	Barren—quarries/strip mines/gravel pits (1992)[i]; Unconsolidated shore[k]—unconsolidated material such as silt, sand, or gravel that is subject to inundation and redistribution due to the action of water. Characterized by substrates lacking vegetation except for pioneering plants that become established during brief periods when growing conditions are favorable. Erosion and deposition by waves and currents produce a number of landforms representing this class (2001)[j]
pct_33	okb_nlcd92_h0412rfg_pct	Double precision	Barren—transitional (1992)[i]
pct_41	okb_nlcd92_h0412rfg_pct	Double precision	Vegetated, natural forested upland—deciduous forest (1992)[i]; Deciduous forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change (2001)[j]
pct_42	okb_nlcd92_h0412rfg_pct, okb_nlcd01_h0412rfg_pct	Double precision	Vegetated, natural forested upland—evergreen forest (1992)[i]; Evergreen forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species maintain their leaves all year. Canopy is never without green foliage (2001)[j]
pct_43	okb_nlcd92_h0412rfg_pct	Double precision	Vegetated, natural forested upland - mixed forest (1992)[i]; Mixed forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. Neither deciduous nor evergreen species are greater than 75 percent of total tree cover (2001)[j]
pct_51	okb_nlcd92_h0412rfg_pct	Double precision	Shrubland—Areas characterized by natural or semi-natural wood vegetation with aerial stems, generally less than 6 meters tall, with individuals or clumps not touching to interlocking. Both evergreen and deciduous species of true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions are included (1992)[i]
pct_52	okb_nlcd01_h0412rfg_pct	Double precision	Shrub/Scrub—Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20 percent of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions (2001)[j]
pct_61	okb_nlcd92_h0412rfg_pct	Double precision	Orchards/Vineyards/Other—Orchards, vineyards, and other areas planted or maintained for the production of fruits, nuts, berries, or ornamentals (1992)[i]
pct_71	okb_nlcd92_h0412rfg_pct, okb_nlcd01_h0412rfg_pct	Double precision	Herbaceous upland—grasslands/herbaceous (1992)[i]; Grassland/herbaceous—areas dominated by grammanoid or herbaceous vegetation, generally greater than 80 percent of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing (2001)[j]

Table B–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
pct_81	okb_nlcd92_h0412rfg_pct, okb_nlcd01_h0412rfg_pct	Double precision	Herbaceous planted/cultivated—pasture/hay (1992)[i]; Pasture/hay—areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation (2001)[j]
pct_82	okb_nlcd92_h0412rfg_pct, okb_nlcd01_h0412rfg_pct	Double precision	Herbaceous planted/cultivated - row crops (1992)[i]; Cultivated crops—areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled (2001)[j]
pct_83	okb_nlcd92_h0412rfg_pct	Double precision	Small Grains—Areas used for the production of graminoid crops such as wheat, barley, oats, and rice (1992)[i]
pct_85	okb_nlcd92_h0412rfg_pct	Double precision	Herbaceous planted/cultivated—urban/recreational grasses (1992)[i]
pct_90	okb_nlcd01_h0412rfg_pct	Double precision	Woody wetlands—areas where forest or shrubland vegetation accounts for greater than 20 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water (2001)[j]
pct_91	okb_nlcd92_h0412rfg_pct	Double precision	Wetlands—woody wetlands (1992)[i]
pct_92	okb_nlcd92_h0412rfg_pct	Double precision	Wetlands—emergent herbaceous wetlands (1992)[i]
pct_95	okb_nlcd01_h0412rfg_pct	Double precision	Emergent herbaceous wetlands—areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water (2001)[j]
pct_tot	okb_nlcd92_h0412rfg_pct, okb_nlcd01_h0412rfg_pct, okb_sgo_hsg_pct	Double precision	Sum-check for land-cover percentages and percentages of hydrologic soil groups[h,l]
POP010130D	tblOkbPop01	Double precision	Resident population (April 1—complete count) 1930
POP010140D	tblOkbPop01	Double precision	Resident population (April 1—complete count) 1940
POP010150D	tblOkbPop01	Double precision	Resident population (April 1—complete count) 1950
POP010160D	tblOkbPop01	Double precision	Resident population (April 1—complete count) 1960
POP010170D	tblOkbPop01	Double precision	Resident population (April 1—complete count) 1970
POP010180D	tblOkbPop01	Double precision	Resident population (April 1—complete count) 1980
POP010190D	tblOkbPop01	Double precision	Resident population (April 1—complete count) 1990
POP010200D	tblOkbPop01	Double precision	Resident population (April 1—complete count) 2000
POP010210D	tblOkbPop01	Double precision	Resident population (April 1—complete count) 2010
POP020170D	tblOkbPop01	Double precision	Resident population (April 1—revised) 1970

Table B–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; ppt, part per thousand]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Geospatial data summaries[f]—Continued			
pop3070_neg	pop_pct_chg	Double precision	Descriptive statistics for population decrease, 1930–1970
pop3070_pct	tblOkbPop01	Double precision	Percent change in population, 1930–1970
pop3070_pos	pop_pct_chg	Double precision	Descriptive statistics for population increase, 1930–1970
pop7010_neg	pop_pct_chg	Double precision	Descriptive statistics for population decrease, 1970–2010
pop7010_pct	tblOkbPop01	Double precision	Percent change in population, 1970–2010
pop7010_pos	pop_pct_chg	Double precision	Descriptive statistics for population increase, 1970–2010
ST	tblOkbPop01	Text	Two-letter U.S. Postal Service state code
to_1_pct	okb_lcc9201_h0412rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to water[m]
to_2_pct	okb_lcc9201_h0412rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to urban[m]
to_3_pct	okb_lcc9201_h0412rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to barren[m]
to_4_pct	okb_lcc9201_h0412rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to forest[m]
to_5_pct	okb_lcc9201_h0412rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to grassland[m]
to_6_pct	okb_lcc9201_h0412rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to agriculture[m]
to_7_pct	okb_lcc9201_h0412rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to wetland[m]

Table B–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges, contributing watersheds, and vicinity, Florida.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record; cy, calendar year; wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; ppt, part per thousand]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
to_tot_pct	okb_lcc9201_h0412rfg_pct	Double precision	Sum-check for land-cover change percentages.
us_l3code	okb_eco[3,4]huc_[08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level III ecoregion code[n]
us_l3name	okb_eco[3,4]huc_[08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level III ecoregion name[n]
us_l4code	okb_eco4huc_[08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level IV ecoregion code[n]
us_l4name	okb_eco4huc_[08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level IV ecoregion name[n]

[a]In the file/table/worksheet name, ***var*** refers to the hydrologic parameter, where ***var=gmi, gmi_ds, gmn, gmn_cn, gmn_ds, gmn_h, gmn_hc, gmn_hp, gmn_hr, gmn_lk, gmn_t, gmn_tc, gmn_tp, gmn_tr, gmn_tw, gmn_us, gmx, gmx_ds***, gage height, in feet; ***qmn, qmn_c, qmn_p, qmn_pr, qmn_r, qmn_tf, qmn_w***, discharge, in cubic feet per second; ***tmi_bt, tmi_tp, tmn, tmn_bt, tmn_tp, tmx_bt, tmx_tp,*** water temperature, in degrees Celsius; ***kmn, kmn_bt, kmn_tp***, specific conductance, in microsiemens per centimeter; ***smi_bt, smi_tp, smx_bt, smx_tp***, salinity, in parts per thousand. Parameter short names include the daily-values statistic: mn, mean daily value, mi, minimum daily value, mx, maximum daily value. Variable qualifiers: ds, downstream; us, upstream; h, headwater; hc, headwater culvert; hp, headwater pump; hr, headwater regional modeling; t, tailwater; tc, tailwater culvert; tp, tailwater pump (gmn); tr, tailwater regional modeling; tw, tailwater weir; c, culvert; p, pump; pr, pump regional modeling; r, regional modeling; w, weir; bt, near bottom; tp, near surface (kmn, smi, smx, tmi, tmn, tmx); cn, canal; lk, lake; tf, tidally filtered. Agency acronyms in the file and(or) table/worksheet names (***agency***, in the file/table/worksheet name) indicate that the data have been subset to those agencies because of file-size limitations: usgs, USGS; usace, U.S. Army Corps of Engineers; sfwmd, South Florida Water Management District.

[b]Arguments enclosed in square brackets in table/worksheet names represent separate tables/worksheets. For example, okb[***var***]01 refers to 2 tables/worksheets—okbgmn1 and okbqmn1, if var=gmn, qmn. "All tables" or "all worksheets" with one or more table/worksheet names in parentheses indicates that the table/worksheet reference(s) in parentheses is(are) excluded for the listed field. Tables refer to Microsoft Access files, worksheets refer to Microsoft Excel files.

[c]Raw-data file: okb_tabular_hydrostats_raw.accdb (Microsoft Access).

[d]Data-value qualification codes, USGS NWISWeb database (U.S. Geological Survey, 2002, 2011): Eqp—equipment malfunction, A—approved for publication-processing and review completed, P—provisional data subject to revision, 1—daily value is write-protected without any remark code to be printed, e—value has been estimated. Data-value qualification codes, SFWMD DBHYDRO database (South Florida Water Management District, 2013): !—"normal" limits exceeded, <—less than, >—greater than, ?—questionable (do not use), A—accumulated (rainfall), C—instrument calibration occurred, E—estimated, I—inserted (estimated) during data processing, J—estimated (water quality), L—line-average, M—missing, N—not yet available, P—partial record or USGS provisional data, R—rainfall was observed (for evaporation data), S—original had more than 5 significant digits, T—trace of precipitation, U—uncertified by SFWMD (continuous-data series), V—verified, X—included in next amount marked 'A', Y—provisional use for regional-scale modeling, Z—not appropriate for regional-scale modeling.

[e]Descriptive-statistics, spread-measures, and ratio-measures files: okb_tabular_hydrostats[01c,01w,02].accdb (Microsoft Access).

[f]Geospatial data summaries files: okb_nlcd.xlsx, okb_sgo_hsg.xlsx, okb_eco34.xlsx, okb_pop_census.xlsx (Microsoft Excel).

[g]U.S. Department of Agriculture, 2009.

[h]Seaber and others, 1994; U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013.

[i]Vogelmann and others, 2001.

[j]Homer and others, 2007.

[k]Coastal NLCD class only.

[l]Percentages of hydrologic soil groups A through D in 4-digit and 8-digit hydrologic units do not necessarily add up to 100 percent because, in some cases, there are STATSGO soil map-unit classifications that include multiple hydrologic soil groups (U.S. Department of Agriculture, 2009). Data for multiple-group map units are not included in the analysis.

[m]Fry and others, 2009.

[n]U.S. Environmental Protection Agency, 2011.

Table B–4*A*. Summary descriptive statistics and percentiles for gage height by water year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit, the contributing watershed to the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges.

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey (USGS) hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Kissimmee (03090101)														
2268903	Kissimmee River	1990–2004 (11)	50.32	47.78 (1996)	51.06 (1992)	44.45 (1996)	53.09 (2003)	— (48.35)	49.64 (48.77)	50.36 (49.64)	50.56 (50.40)	50.92 (51.32)	50.98 (52.08)	— (52.28)
02268903sfw (headwater)	Kissimmee River	1929–2012 (81)	50.37	45.68 (1962)	53.47 (1960)	42.87 (1977)	56.64 (1954)	47.76 (46.90)	48.61 (48.10)	50.07 (49.28)	50.61 (50.49)	51.06 (51.56)	51.67 (52.48)	52.56 (53.09)
02268903sfw (tailwater)	Kissimmee River	1986–2012 (15)	46.30	45.50 (2001)	46.72 (1998)	44.24 (2007)	51.93 (2004)	— (45.19)	45.50 (46.06)	46.27 (46.21)	46.39 (46.33)	46.52 (46.41)	46.53 (46.50)	— (46.68)
2273000	Kissimmee River	1930–2004 (65)	21.39	15.33 (1964)	25.08 (1931)	13.27 (1964)	29.29 (1949)	16.63 (17.00)	20.61 (19.09)	20.97 (20.91)	21.10 (21.09)	21.79 (22.05)	24.06 (24.76)	24.56 (25.58)
02273000sfw (headwater)	Kissimmee River	1986–2012 (20)	21.03	20.57 (2007)	21.28 (1992)	18.79 (2004)	22.80 (2004)	— (20.50)	20.77 (20.85)	20.97 (20.95)	21.01 (21.05)	21.18 (21.19)	21.24 (21.28)	— (21.35)
02273001sfw (tailwater)	Kissimmee River	1985–2012 (22)	14.03	10.62 (2008)	16.40 (1995)	8.65 (2007)	18.55 (1996)	10.63 (9.94)	10.73 (10.65)	13.23 (12.82)	14.31 (14.39)	15.48 (15.50)	15.95 (16.28)	16.01 (16.91)
2273300	Canal 41A	1964–1989 (24)	14.19	12.96 (1985)	14.54 (1965)	8.27 (1972)	16.87 (1984)	13.18 (12.83)	13.97 (13.46)	14.18 (14.03)	14.29 (14.38)	14.37 (14.55)	14.45 (14.72)	14.45 (14.84)
02273300sfw (headwater)	Canal 41A	1962–2012 (43)	24.19	22.12 (2007)	24.75 (1999)	18.24 (1972)	25.87 (1964)	22.91 (22.26)	23.27 (23.07)	24.16 (24.01)	24.37 (24.48)	24.54 (24.71)	24.66 (24.89)	24.69 (25.00)
02273300sfw (tailwater)	Canal 41A	1984–2012 (22)	14.14	10.52 (2007)	16.38 (1995)	8.63 (2007)	18.56 (1996)	10.57 (10.02)	11.42 (11.44)	13.76 (13.03)	14.23 (14.46)	15.41 (15.47)	15.90 (16.21)	16.01 (16.86)
02273343sfw (headwater)	Kissim-mee River	1978–2012 (27)	20.68	16.87 (1989)	24.66 (1980)	13.59 (1997)	25.48 (1992)	17.46 (15.09)	17.79 (15.91)	18.84 (18.62)	21.06 (21.36)	22.06 (22.96)	23.24 (23.46)	23.79 (24.31)
02273343sfw	Kissim-mee River	1978–2012 (30)	13.98	10.50 (2007)	16.45 (1983)	8.51 (2007)	18.53 (1996)	10.53 (9.98)	11.03 (10.92)	13.04 (12.58)	14.16 (14.31)	15.43 (15.46)	15.93 (16.19)	16.33 (16.85)
02273343sfw (headwater, culvert)	Kissim-mee River	1979–2012 (15)	16.00	14.95 (2009)	16.91 (1995)	14.07 (2009)	18.86 (1995)	— (14.99)	15.43 (15.18)	15.80 (15.80)	16.03 (15.95)	16.20 (16.27)	16.65 (16.78)	— (17.14)
02273343sfw (tailwater, culvert)	Kissim-mee River	1979–2012 (15)	14.02	10.66 (2008)	16.44 (1995)	9.00 (2001)	18.61 (1996)	— (10.04)	10.71 (10.45)	13.10 (12.53)	14.39 (14.43)	15.42 (15.55)	16.11 (16.40)	— (16.99)
Northern Okeechobee Inflow (03090102)														
2274000	Taylor Creek	1955–1990 (29)	4.49	0.57 (1965)	5.99 (1979)	–1.33 (1965)	11.28 (1979)	1.53 (1.26)	1.72 (1.84)	3.31 (3.31)	5.28 (5.07)	5.66 (6.03)	5.95 (6.20)	5.98 (6.41)
02274010	Taylor Creek	2003–2012 (6)	22.95	22.57 (2006)	23.23 (2008)	21.52 (2006)	28.84 (2008)	— (21.95)	— (22.07)	22.68 (22.88)	23.03 (23.02)	23.14 (23.14)	— (23.38)	— (23.57)

Table B–4*A*. Summary descriptive statistics and percentiles for gage height by water year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit, the contributing watershed to the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges.—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey (USGS) hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Northern Okeechobee Inflow (03090102)—Continued														
02274325	Taylor Creek	2004–2011 (4)	17.75	17.24 (2006)	18.19 (2010)	15.76 (2006)	23.61 (2006)	— (16.51)	— (17.12)	— (17.38)	17.79 (17.64)	— (18.26)	— (18.34)	— (18.41)
2274500	Taylor Creek	1955–1985 (26)	7.31	3.32 (1961)	10.80 (1974)	2.68 (1961)	12.60 (1974)	3.76 (3.24)	3.79 (3.54)	4.70 (4.59)	6.35 (6.46)	10.68 (10.69)	10.76 (10.79)	10.78 (10.85)
02275503	Taylor Creek	1992–2011 (8)	14.38	11.52 (2011)	16.48 (1995)	9.49 (2011)	18.43 (1998)	— (10.80)	— (11.85)	13.58 (13.44)	14.07 (14.48)	15.85 (15.49)	— (16.86)	— (17.40)
02275606	Nubbin Slough	1993–2011 (4)	18.75	18.16 (2007)	19.23 (2009)	16.38 (2007)	19.75 (2007)	— (17.15)	— (17.53)	— (18.45)	18.80 (18.78)	— (19.46)	— (19.53)	— (19.56)
02275606sfw (headwater)	Nubbin Slough	1971–2012 (40)	18.96	17.68 (2001)	19.47 (1996)	15.95 (2001)	20.69 (1973)	18.18 (17.97)	18.39 (18.38)	18.73 (18.69)	19.05 (19.05)	19.22 (19.39)	19.40 (19.49)	19.45 (19.54)
02275606sfw (tailwater)	Nubbin Slough	1971–2012 (40)	14.13	10.63 (2008)	16.73 (1983)	8.76 (2008)	18.68 (1996)	10.69 (10.34)	11.71 (11.34)	13.29 (12.83)	14.11 (14.34)	15.59 (15.55)	16.14 (16.42)	16.38 (17.01)
s133 (head-water)	S-133	1979–1999 (17)	13.16	11.67 (1990)	13.75 (1980)	9.62 (1981)	14.97 (1996)	— (10.89)	11.78 (11.61)	12.76 (13.06)	13.52 (13.54)	13.61 (13.70)	13.69 (13.83)	— (13.90)
s133 (tail-water)	S-133	1979–2012 (30)	14.02	10.68 (2007)	16.49 (1983)	8.88 (2007)	18.56 (1996)	10.73 (10.21)	11.15 (10.82)	13.04 (12.45)	14.17 (14.34)	15.53 (15.59)	16.08 (16.41)	16.38 (17.09)
s135 (head-water)	S-135	1979–2012 (30)	12.98	10.56 (2007)	13.94 (1980)	8.65 (2007)	20.45 (1980)	11.08 (10.30)	11.51 (11.21)	12.78 (12.62)	13.39 (13.50)	13.61 (13.70)	13.69 (13.81)	13.75 (13.87)
s135 (tailwater)	S-135	1979–2012 (27)	14.20	10.58 (2007)	16.68 (1983)	8.67 (2007)	18.67 (1996)	10.95 (10.48)	11.32 (11.01)	13.03 (12.59)	14.39 (14.62)	15.63 (15.72)	16.36 (16.61)	16.59 (17.39)
s135 (head-water, pump)	S-135	1985–1999 (2)	13.24	12.78 (1989)	13.70 (1988)	11.16 (1989)	14.10 (1989)	— (11.39)	— (11.54)	— (13.14)	13.24 (13.62)	— (13.77)	— (13.84)	— (13.91)
Western Okeechobee Inflow (03090103)														
02255600	Fisheating Creek	2003–2012 (5)	72.89	72.35 (2011)	73.31 (2009)	71.78 (2008)	79.72 (2008)	— (71.85)	— (71.91)	72.83 (72.14)	72.92 (72.39)	73.03 (73.16)	— (74.57)	— (76.01)
2256000	Fisheating Creek	1955–1966 (9)	10.92	9.32 (1956)	11.99 (1960)	7.21 (1956)	16.63 (1960)	— (9.07)	— (9.62)	10.74 (10.03)	10.79 (10.72)	11.14 (11.78)	— (12.62)	— (13.24)
02256500	Fisheating Creek	1931–2011 (57)	3.00	1.20 (1981)	4.56 (1954)	–0.45 (2000)	8.41 (1954)	1.72 (0.47)	1.99 (0.77)	2.54 (1.45)	2.85 (2.63)	3.60 (4.65)	4.25 (5.49)	4.47 (5.93)
02257000	Fisheating Creek	1993–2011 (6)	14.59	12.04 (2007)	15.92 (2005)	9.96 (2007)	18.74 (2005)	— (11.53)	— (12.33)	14.17 (13.28)	14.85 (14.93)	15.74 (15.76)	— (16.64)	— (17.21)

Table B–4*A*. Summary descriptive statistics and percentiles for gage height by water year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit, the contributing watershed to the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges.—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey (USGS) hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Western Okeechobee Inflow (03090103)—Continued														
02257030	Fisheating Lock	1993–2011 (10)	14.48	11.53 (2007)	16.16 (1996)	9.56 (2007)	18.81 (1996)	— (10.71)	— (11.51)	14.11 (13.47)	14.84 (14.94)	15.74 (15.72)	— (16.56)	— (17.27)
02257030sfw (tailwater)	Fisheating Lock	1979–2012 (31)	14.38	11.44 (2008)	16.68 (1983)	9.56 (2008)	18.77 (1996)	11.60 (10.89)	12.13 (11.58)	13.37 (12.95)	14.61 (14.68)	15.76 (15.77)	16.18 (16.54)	16.58 (17.27)
02257030sfw (headwater, pump)	Fisheating Lock	1984–1992 (4)	13.07	12.80 (1989)	13.20 (1988)	11.40 (1989)	14.01 (1988)	— (12.16)	— (12.74)	— (12.98)	13.15 (13.14)	— (13.28)	— (13.41)	— (13.48)
02257030sfw (tailwater, pump)	Fisheating Lock	1985–1992 (3)	13.44	12.86 (1990)	14.02 (1991)	11.40 (1989)	15.97 (1989)	— (11.88)	— (12.36)	— (12.77)	13.43 (13.37)	— (14.13)	— (14.58)	— (14.94)
02257800sfw (headwater)	Harney Pond Canal	1977–2012 (33)	19.60	17.97 (1981)	20.05 (2000)	14.06 (1991)	22.14 (1987)	18.42 (18.28)	19.27 (18.89)	19.53 (19.51)	19.67 (19.79)	19.87 (19.98)	19.96 (20.04)	19.98 (20.09)
02257800sfw (tailwater)	Harney Pond Canal	1977–2012 (31)	14.32	10.85 (2008)	16.85 (1983)	9.09 (2001)	18.59 (1996)	10.85 (10.27)	11.58 (11.34)	13.40 (12.98)	14.40 (14.67)	15.79 (15.78)	16.37 (16.67)	16.41 (17.26)
02257800sfw (tailwater, weir)	Harney Pond Canal	2008–2012 (3)	12.91	11.57 (2011)	13.99 (2010)	9.69 (2011)	15.23 (2009)	— (10.33)	— (10.64)	— (11.77)	13.17 (13.39)	— (14.07)	— (14.50)	— (14.78)
02258000	Harney Pond Canal	1993–2012 (8)	14.44	11.63 (2011)	16.07 (1996)	9.76 (2011)	18.72 (1996)	— (11.07)	— (12.35)	14.06 (13.72)	14.39 (14.56)	15.46 (15.45)	— (16.08)	— (16.51)
2259200	Indian Prairie Canal	1963–1989 (27)	10.75	9.12 (1981)	11.69 (1988)	7.03 (1981)	13.44 (1971)	9.45 (8.76)	10.14 (9.28)	10.49 (10.06)	10.88 (11.01)	11.08 (11.61)	11.31 (11.81)	11.37 (11.92)
02259200sfw (headwater)	Indian Prairie Canal	1961–2012 (46)	19.72	10.76 (2001)	20.79 (1988)	9.02 (2001)	22.45 (1971)	16.77 (14.86)	18.59 (18.28)	19.72 (19.49)	20.18 (20.41)	20.53 (20.73)	20.65 (20.92)	20.69 (21.01)
02259200sfw (tailwater)	Indian Prairie Canal	1962–2012 (42)	14.25	10.71 (2007)	16.70 (1995)	0.00 (2003)	18.89 (1996)	11.80 (11.03)	12.37 (12.04)	13.54 (13.09)	14.13 (14.37)	15.48 (15.51)	16.13 (16.35)	16.23 (16.99)
02259627	Buckhead Lock	1993–2011 (9)	14.68	11.63 (2008)	16.52 (1995)	10.69 (2008)	18.42 (1998)	— (11.05)	— (11.94)	14.08 (13.90)	14.52 (14.95)	15.64 (15.66)	— (16.85)	— (17.36)
02259627sfw (headwater)	Buckhead Lock	1979–2012 (28)	13.10	11.49 (2001)	13.71 (1984)	10.23 (1981)	15.55 (2008)	11.65 (10.95)	11.95 (11.61)	12.87 (12.83)	13.44 (13.48)	13.60 (13.65)	13.64 (13.77)	13.68 (13.85)
02259627sfw (tailwater)	Buckhead Lock	1979–2012 (28)	14.15	11.10 (2001)	16.65 (1983)	9.30 (2011)	18.65 (1996)	11.51 (10.74)	11.52 (11.11)	12.89 (12.51)	14.20 (14.37)	15.62 (15.67)	16.25 (16.44)	16.52 (17.25)
02259627sfw (headwater, regmod)	Buckhead Lock	1981–2011 (26)	13.15	11.49 (2001)	13.71 (1984)	10.27 (2007)	15.55 (2008)	11.65 (11.07)	11.95 (11.81)	12.99 (12.98)	13.44 (13.50)	13.60 (13.65)	13.64 (13.78)	13.68 (13.85)

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USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Western Okeechobee Inflow (03090103)—Continued														
02259627sfw (tailwater, regmod)	Buckhead Lock	1981–2011 (26)	14.28	11.10 (2001)	16.65 (1983)	10.05 (2001)	18.65 (1996)	11.51 (10.91)	11.67 (11.31)	13.25 (12.78)	14.37 (14.54)	15.57 (15.72)	16.13 (16.45)	16.52 (17.17)
s129 (headwater)	S-129	1979–2012 (31)	12.93	11.01 (2008)	13.68 (1989)	9.78 (1981)	14.28 (1996)	11.32 (10.73)	11.93 (11.73)	12.95 (12.95)	13.16 (13.18)	13.27 (13.35)	13.32 (13.49)	13.48 (13.58)
s129 (tailwater)	S-129	1983–2012 (24)	14.26	11.47 (2008)	16.58 (1995)	9.80 (2008)	18.73 (1996)	11.51 (11.02)	11.88 (11.90)	13.38 (13.08)	14.46 (14.39)	15.47 (15.50)	16.13 (16.27)	16.15 (16.94)
Everglades (03090202)														
02278000 (canal)	West Palm Beach Canal	1969–2008 (30)	11.10	10.08 (2008)	12.22 (1969)	7.15 (1982)	14.25 (1999)	10.22 (9.60)	10.41 (9.94)	10.83 (10.53)	11.06 (11.14)	11.56 (11.71)	11.74 (12.22)	11.83 (12.48)
02278000 (lake)	West Palm Beach Canal	1969–2008 (30)	14.08	10.64 (2007)	16.67 (1983)	8.27 (2007)	18.66 (1996)	10.68 (10.24)	11.57 (11.11)	13.15 (12.87)	14.06 (14.28)	15.30 (15.53)	16.22 (16.47)	16.55 (17.12)
02278000sfw_1 (headwater)	West Palm Beach Canal	1990–2012 (18)	14.36	10.90 (2007)	16.38 (1995)	8.57 (2007)	18.75 (1998)	— (10.31)	10.91 (11.00)	13.44 (13.24)	14.57 (14.80)	15.80 (15.77)	16.24 (16.50)	— (17.18)
02278000sfw_1 (tailwater)	West Palm Beach Canal	1997–2012 (12)	10.81	10.38 (2008)	11.21 (1999)	8.17 (2001)	14.59 (1999)	— (9.62)	10.48 (9.84)	10.57 (10.29)	10.83 (10.78)	11.02 (11.30)	11.16 (11.76)	— (12.09)
02278000sfw_1 (headwater, regmod)	West Palm Beach Canal	1978–2012 (33)	14.29	10.79 (2001)	16.67 (1983)	8.57 (2007)	18.66 (1996)	10.90 (10.41)	11.74 (11.08)	13.27 (12.84)	14.51 (14.67)	15.73 (15.80)	16.19 (16.61)	16.55 (17.26)
02278000sfw_1 (tailwater, regmod)	West Palm Beach Canal	1978–2012 (32)	10.84	10.22 (2001)	11.56 (1979)	7.15 (1982)	14.31 (1992)	10.34 (9.51)	10.46 (9.80)	10.68 (10.33)	10.83 (10.88)	11.01 (11.37)	11.28 (11.77)	11.43 (12.05)
02278002 (tailwater)	West Palm Beach Canal	1969–2009 (30)	11.10	10.08 (2008)	12.22 (1969)	7.15 (1982)	14.25 (1999)	10.22 (9.60)	10.41 (9.94)	10.83 (10.53)	11.06 (11.14)	11.56 (11.71)	11.74 (12.22)	11.83 (12.48)
02278002sfw (tailwater)	West Palm Beach Canal	1989–1997 (7)	10.84	10.46 (1991)	11.15 (1992)	7.64 (1990)	14.34 (1992)	— (9.33)	— (9.65)	10.62 (10.28)	10.76 (10.93)	11.11 (11.46)	— (11.84)	— (12.09)
02280500	Hillsboro Canal	1976–2012 (16)	10.94	10.39 (2001)	11.28 (1989)	7.77 (1990)	12.78 (1988)	— (9.90)	10.55 (10.20)	10.86 (10.59)	10.93 (10.97)	11.10 (11.35)	11.25 (11.69)	— (11.92)
2283498	N New R Canal	1981–2003 (21)	14.38	10.91 (2001)	16.72 (1983)	6.13 (1982)	18.71 (1998)	11.91 (10.84)	12.38 (11.54)	13.27 (13.02)	14.53 (14.64)	15.68 (15.84)	16.22 (16.56)	16.57 (17.26)
02283498 (canal)	N New R Canal	1989–2003 (12)	10.88	10.36 (2001)	11.27 (1992)	7.71 (1990)	12.63 (1992)	— (9.72)	10.52 (10.08)	10.80 (10.50)	10.86 (10.92)	11.05 (11.33)	11.13 (11.67)	— (11.92)
02283500	N New R Canal	1969–2012 (33)	11.11	10.08 (1982)	12.08 (1969)	7.00 (1982)	13.24 (1986)	10.38 (9.97)	10.75 (10.25)	10.87 (10.68)	11.11 (11.13)	11.37 (11.59)	11.50 (12.03)	11.68 (12.24)

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USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Everglades (03090202)—Continued														
2286399	Miami Canal	1969–1998 (27)	14.38	12.38 (1971)	16.65 (1983)	9.53 (1981)	18.47 (1998)	12.38 (11.34)	12.39 (12.26)	13.49 (13.33)	14.06 (14.40)	15.60 (15.54)	16.19 (16.39)	16.26 (16.95)
02286399sfw (headwater)	Miami Canal	2000–2012 (10)	13.65	10.91 (2007)	15.86 (2005)	8.75 (2007)	18.26 (2005)	— (9.84)	— (10.35)	11.74 (12.20)	14.27 (14.03)	14.82 (15.32)	— (16.03)	— (16.61)
02286399sfw (tailwater)	Miami Canal	2000–2012 (11)	10.52	9.77 (2008)	10.99 (2002)	8.08 (2008)	12.73 (2005)	— (9.30)	10.25 (9.58)	10.28 (10.15)	10.52 (10.58)	10.79 (10.96)	10.90 (11.30)	— (11.47)
02286400	Miami Canal	1970–2012 (28)	11.11	9.60 (2008)	12.00 (1970)	7.76 (1982)	13.52 (1970)	9.83 (9.64)	10.58 (10.07)	11.00 (10.69)	11.18 (11.17)	11.43 (11.60)	11.51 (12.06)	11.66 (12.29)
s351 (head-water)	S-351	2000–2012 (10)	13.58	10.81 (2008)	15.81 (2005)	9.19 (2008)	18.17 (2005)	— (10.03)	— (10.30)	11.65 (12.01)	14.19 (14.01)	14.79 (15.29)	— (16.00)	— (16.54)
s351 (tailwater)	S-351	2000–2012 (11)	10.57	10.12 (2008)	10.89 (2002)	8.01 (2008)	12.40 (2002)	— (9.50)	10.30 (9.77)	10.39 (10.19)	10.58 (10.61)	10.84 (10.99)	10.87 (11.35)	— (11.51)
Caloosahatchee (03090205)														
02292000 (headwater)	Caloosa-hatchee Canal	1970–2003 (14)	13.48	11.09 (2002)	15.66 (1988)	9.70 (1981)	16.58 (1992)	— (10.79)	11.40 (11.04)	12.35 (12.07)	13.55 (13.64)	14.78 (15.06)	15.62 (15.88)	— (16.15)
02292000sfw (headwater)	Caloosa-hatchee Canal	1998–2003 (4)	13.60	10.84 (2001)	15.21 (1999)	8.78 (2001)	17.78 (2000)	— (9.70)	— (10.52)	— (11.79)	14.18 (14.19)	— (15.37)	— (16.14)	— (16.46)
2292480	Caloosa-hatchee Canal	1982–2003 (15)	3.06	2.95 (1997)	3.17 (1983)	2.54 (1998)	4.23 (1983)	— (2.80)	2.98 (2.86)	3.03 (2.95)	3.07 (3.05)	3.11 (3.16)	3.11 (3.27)	— (3.36)
02292480 (upstream)	Caloosa-hatchee Canal	1983–2003 (16)	11.10	10.93 (1990)	11.30 (1983)	10.20 (1990)	12.17 (1990)	— (10.72)	10.96 (10.84)	11.03 (10.97)	11.11 (11.11)	11.17 (11.24)	11.21 (11.37)	— (11.47)
02292480sfw (headwater)	Caloosa-hatchee Canal	1998–2003 (4)	10.93	10.50 (2001)	11.15 (2002)	8.79 (2001)	11.73 (2002)	— (9.73)	— (10.47)	— (10.87)	11.03 (11.03)	— (11.16)	— (11.31)	— (11.41)
02292481 (tailwater)	Caloosa-hatchee Canal	1982–1994 (10)	3.07	3.02 (1991)	3.17 (1983)	2.58 (1990)	4.23 (1983)	— (2.82)	— (2.88)	3.05 (2.96)	3.07 (3.07)	3.08 (3.17)	— (3.27)	— (3.33)
02292481sfw (tailwater)	Caloosa-hatchee Canal	1998–2003 (3)	2.96	2.94 (2000)	2.98 (2002)	2.18 (2002)	3.81 (1999)	— (2.75)	— (2.79)	— (2.87)	2.95 (2.95)	— (3.05)	— (3.12)	— (3.18)
02292900 (upstream)	Caloosa-hatchee Canal	1970–2012 (19)	3.16	2.92 (1970)	3.26 (1994)	2.15 (1970)	4.00 (1995)	— (2.89)	3.07 (2.96)	3.10 (3.06)	3.16 (3.16)	3.22 (3.27)	3.25 (3.36)	— (3.41)
02292900 (down-stream)	Caloosa-hatchee Canal	1970–2003 (16)	1.01	0.87 (1988)	1.26 (1995)	–1.12 (1996)	3.69 (1995)	— (0.22)	0.90 (0.43)	0.94 (0.74)	0.98 (1.03)	1.05 (1.28)	1.20 (1.52)	— (1.71)

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USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Caloosahatchee (03090205)—Continued														
02292900 (minimum, downstream)	Caloosa-hatchee Canal	2002–2012 (3)	0.35	0.28 (2002)	0.44 (2003)	–1.69 (2002)	2.01 (2003)	— (–0.43)	— (–0.24)	— (0.04)	0.33 (0.36)	— (0.65)	— (0.94)	— (1.17)
02292900 (maximum, downstream)	Caloosa-hatchee Canal	2002–2012 (3)	1.89	1.83 (2011)	1.99 (2003)	–0.31 (2002)	3.79 (2003)	— (0.96)	— (1.23)	— (1.57)	1.84 (1.92)	— (2.21)	— (2.50)	— (2.71)
02292900sfw (headwater)	Caloosa-hatchee Canal	1998–2003 (2)	3.12	3.10 (2000)	3.14 (2002)	2.65 (2000)	3.53 (2002)	— (2.91)	— (2.95)	— (3.02)	3.12 (3.11)	— (3.22)	— (3.31)	— (3.35)
02292900sfw (headwater, regmod)	Caloosa-hatchee Canal	1983–2009 (24)	1.69	0.87 (1988)	3.14 (2002)	–1.12 (1996)	3.94 (2004)	0.90 (0.34)	0.93 (0.57)	0.97 (0.90)	1.06 (1.27)	3.04 (2.98)	3.13 (3.19)	3.14 (3.27)
02292901sfw (tailwater)	Caloosa-hatchee Canal	1998–2003 (2)	1.07	1.06 (2002)	1.08 (2000)	–0.29 (2002)	2.61 (2000)	— (0.37)	— (0.49)	— (0.79)	1.07 (1.11)	— (1.34)	— (1.55)	— (1.69)
02293210 (minimum)	Caloosa-hatchee Canal	2008–2012 (2)	–1.16	–1.22 (2011)	–1.10 (2010)	–2.48 (2011)	–0.02 (2010)	— (–1.81)	— (–1.68)	— (–1.44)	–1.16 (–1.14)	— (–0.87)	— (–0.69)	— (–0.56)
02293210 (maximum)	Caloosa-hatchee Canal	2008–2012 (1)	0.56	0.56 (2010)	0.56 (2010)	–0.96 (2010)	1.55 (2010)	— (–0.15)	— (0.01)	— (0.33)	— (0.59)	— (0.84)	— (1.07)	— (1.16)
SE Florida Atlantic (03090206)														
2276870	St Lucie Canal	1941–1998 (13)	14.63	11.89 (1990)	16.71 (1983)	10.48 (1990)	18.70 (1996)	— (11.17)	12.43 (11.82)	13.88 (13.56)	14.57 (14.95)	16.12 (15.95)	16.56 (16.71)	— (17.37)
02276870 (canal)	St Lucie Canal	1982–2006 (18)	13.64	10.85 (2001)	14.79 (1998)	8.78 (2001)	18.03 (1998)	— (10.58)	11.65 (11.44)	13.47 (13.31)	14.09 (14.20)	14.39 (14.39)	14.78 (14.54)	— (14.67)
02276870coe (headwater)	St Lucie Canal	1998–2003 (3)	14.62	14.10 (2002)	15.27 (1999)	11.48 (2002)	18.09 (2000)	— (11.84)	— (12.00)	— (13.63)	14.50 (14.78)	— (15.72)	— (16.47)	— (16.90)
02276870coe (headwater, regmod)	St Lucie Canal	1982–2012 (27)	14.30	10.67 (2008)	16.71 (1983)	8.62 (2007)	18.70 (1996)	10.68 (10.32)	11.60 (11.23)	13.22 (13.02)	14.50 (14.65)	15.63 (15.74)	16.23 (16.52)	16.56 (17.21)
02276870sfw (tailwater)	St Lucie Canal	1998–2003 (4)	13.05	10.78 (2001)	14.14 (1999)	8.73 (2001)	17.12 (2000)	— (9.45)	— (10.28)	— (11.93)	13.63 (14.01)	— (14.29)	— (14.43)	— (14.52)
02276870sfw (tailwater, regmod)	St Lucie Canal	1982–2012 (28)	13.47	10.71 (2007)	14.79 (1998)	8.43 (2007)	18.03 (1998)	10.85 (10.07)	10.98 (10.84)	13.10 (12.66)	13.91 (14.16)	14.34 (14.39)	14.77 (14.55)	14.78 (14.70)
02276877	St Lucie Canal	1992–2012 (6)	13.35	10.85 (2001)	14.45 (1995)	8.78 (2001)	17.11 (2000)	— (9.97)	— (10.92)	13.27 (12.24)	13.69 (14.13)	14.14 (14.36)	— (14.54)	— (14.66)
2277000	St Lucie Canal	1988–2003 (9)	13.65	11.72 (1990)	14.29 (1993)	9.55 (1990)	16.95 (2000)	— (11.54)	— (12.03)	13.42 (12.96)	13.91 (14.16)	14.22 (14.35)	— (14.48)	— (14.56)

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			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
SE Florida Atlantic (03090206)—Continued														
02277000 (downstream)	St Lucie Canal	1988–2001 (8)	0.59	0.34 (1990)	0.79 (1998)	–0.83 (1990)	4.42 (2000)	— (–0.12)	— (0.01)	0.46 (0.22)	0.60 (0.50)	0.71 (0.85)	— (1.28)	— (1.61)
02277000 (minimum, downstream)	St Lucie Canal	2002–2003 (1)	–0.13	–0.13 (2002)	–0.13 (2002)	–1.18 (2002)	1.63 (2002)	— (–0.84)	— (–0.73)	— (–0.46)	— (–0.19)	— (0.19)	— (0.52)	— (0.73)
02277000 (maximum, downstream)	St Lucie Canal	2002–2003 (1)	1.41	1.41 (2002)	1.41 (2002)	0.21 (2002)	2.94 (2002)	— (0.62)	— (0.77)	— (1.07)	— (1.38)	— (1.73)	— (2.09)	— (2.30)
02277000sfw (headwater)	St Lucie Canal	1998–2003 (1)	10.91	10.91 (2001)	10.91 (2001)	8.87 (2001)	14.64 (2001)	— (9.24)	— (9.40)	— (9.88)	— (10.84)	— (11.93)	— (12.28)	— (13.36)
02277000sfw (tailwater)	St Lucie Canal	1998–2003 (4)	0.70	0.59 (2001)	0.82 (2000)	–0.38 (2001)	4.42 (2000)	— (0.01)	— (0.19)	— (0.39)	0.70 (0.59)	— (0.93)	— (1.37)	— (1.60)
02277000sfw (headwater, regmod)	St Lucie Canal	1988–2011 (20)	13.28	10.85 (2007)	14.30 (2003)	8.31 (2007)	16.95 (2000)	— (10.12)	11.01 (10.93)	12.99 (12.42)	13.87 (14.03)	14.17 (14.31)	14.27 (14.45)	— (14.51)
02277000sfw (tailwater, regmod)	St Lucie Canal	1988–2011 (16)	0.63	0.34 (1990)	1.01 (2005)	–1.01 (2007)	4.42 (2000)	— (–0.10)	0.37 (0.03)	0.57 (0.27)	0.64 (0.54)	0.72 (0.91)	0.82 (1.37)	— (1.68)
02281400	Hillsboro Canal	1976–2012 (20)	7.67	7.28 (1977)	8.05 (1999)	4.55 (1979)	11.40 (2000)	— (6.72)	7.38 (6.99)	7.53 (7.38)	7.64 (7.75)	7.83 (7.99)	7.96 (8.26)	— (8.44)

[a]Station numbers with "coe" or "sfw" appended to the number are for stations operated in cooperation with either the U.S. Army Corps of Engineers (coe) or the South Florida Water Management District (sfw), and the data for these table rows were obtained from digital files of these agencies. Stations s129, s133, s135, and s351 are South Florida Water Management District (SFWMD) stations. Unless indicated in parentheses under the station number, all gage-height values are mean-daily values at the gage location. Headwater and tailwater locations are indicated where there is a control structure (gate or lock). Upstream and downstream locations also are indicated relative to a control structure. Other locations indicated are canal, lake, culvert, and weir. Pump, headwater and tailwater locations relative to a control structure with a pump. Regmod, regional modeling dataset constructed by SFWMD for hydrologic studies.

[b]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[c]Statistics listed for mean-annual and mean-daily gage height are based on complete water years. Year of minimum and maximum values for mean-annual and mean-daily gage-height numbers shown in parentheses.

[d]Percentiles listed for mean-annual and mean-daily gage height are based on complete water years.

Table B–4*B*. Summary descriptive statistics and percentiles for gage height by calendar year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit, the contributing watershed to the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges.

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Kissimmee (03090101)														
2268903	Kissimmee River	1989–2004 (9)	50.34	48.45 (1996)	51.12 (1999)	44.45 (1996)	53.09 (2003)	— (46.96)	— (48.94)	50.27 (49.64)	50.61 (50.46)	50.86 (51.48)	— (52.08)	— (52.28)
02268903sfw (headwater)	Kissimmee River	1929–2012 (81)	50.38	45.80 (1962)	53.39 (1960)	42.87 (1977)	56.64 (1953)	48.05 (46.90)	48.56 (48.10)	49.75 (49.28)	50.63 (50.51)	51.06 (51.58)	51.68 (52.48)	52.17 (53.05)
02268903sfw (tailwater)	Kissimmee River	1985–2012 (16)	46.32	45.60 (2001)	46.65 (2004)	44.24 (2007)	51.98 (2011)	— (45.24)	45.65 (46.09)	46.18 (46.22)	46.41 (46.33)	46.50 (46.41)	46.64 (46.50)	— (46.69)
2273000	Kissimmee River	1930–2004 (63)	21.45	14.97 (1963)	25.92 (1930)	13.27 (1964)	29.29 (1948)	17.41 (16.91)	19.86 (19.00)	20.99 (20.91)	21.10 (21.10)	22.55 (22.40)	24.42 (24.92)	24.50 (25.73)
02273000sfw (headwater)	Kissimmee River	1985–2012 (19)	21.03	20.63 (2007)	21.30 (1997)	18.79 (2004)	22.80 (2004)	— (20.54)	20.66 (20.85)	20.96 (20.95)	20.97 (21.04)	21.18 (21.19)	21.27 (21.28)	— (21.35)
02273001sfw (tailwater)	Kissimmee River	1985–2012 (20)	14.05	10.02 (2007)	16.44 (1995)	8.65 (2007)	18.55 (1995)	— (9.84)	11.52 (10.45)	12.99 (12.77)	14.46 (14.48)	15.46 (15.54)	15.92 (16.33)	— (16.99)
2273300	Canal 41A	1963–1989 (24)	14.20	13.04 (1985)	14.71 (1964)	8.27 (1971)	16.87 (1984)	13.35 (12.83)	13.92 (13.47)	14.13 (14.03)	14.30 (14.39)	14.37 (14.57)	14.48 (14.74)	14.49 (14.85)
02273300sfw (headwater)	Canal 41A	1962–2012 (44)	24.19	21.71 (2007)	24.77 (1964)	18.24 (1971)	25.87 (1964)	23.08 (22.30)	23.57 (23.09)	24.11 (23.99)	24.35 (24.48)	24.50 (24.70)	24.70 (24.89)	24.71 (25.00)
02273300sfw (tailwater)	Canal 41A	1983–2012 (23)	14.11	9.93 (2007)	16.42 (1995)	8.63 (2007)	18.56 (1995)	11.49 (9.91)	11.51 (10.72)	13.16 (13.10)	14.18 (14.50)	15.42 (15.53)	15.91 (16.27)	16.15 (16.82)
02273343sfw (headwater)	Kissimmee River	1978–2012 (27)	20.83	16.06 (1996)	24.57 (1980)	13.59 (1996)	25.48 (1992)	17.63 (15.11)	18.10 (16.26)	19.07 (18.82)	21.05 (21.52)	22.59 (23.06)	23.39 (23.60)	24.42 (24.62)
02273343sfw	Kissimmee River	1978–2012 (31)	14.06	9.88 (2007)	16.38 (1995)	8.51 (2007)	18.53 (1995)	11.41 (10.05)	11.63 (10.95)	12.93 (12.68)	14.17 (14.43)	15.40 (15.53)	15.90 (16.27)	16.21 (16.98)
02273343sfw (headwater, culvert)	Kissimmee River	1978–2012 (15)	16.02	15.17 (2009)	16.90 (1994)	14.07 (2008)	18.86 (1994)	— (14.80)	15.29 (15.14)	15.78 (15.80)	16.02 (15.96)	16.27 (16.37)	16.84 (16.95)	— (17.29)
02273343sfw (tailwater, culvert)	Kissimmee River	1978–2012 (15)	14.06	11.42 (2011)	16.52 (1995)	9.00 (2001)	18.61 (1995)	— (10.07)	11.46 (10.75)	12.95 (12.58)	14.19 (14.39)	15.58 (15.50)	16.09 (16.70)	— (17.24)
Northern Okeechobee Inflow (03090102)														
2274000	Taylor Creek	1955–1989 (27)	4.55	1.24 (1964)	6.08 (1979)	–1.33 (1965)	11.28 (1979)	1.32 (1.22)	1.35 (1.78)	3.36 (3.36)	5.35 (5.48)	5.57 (6.04)	5.94 (6.22)	6.04 (6.43)
02274010	Taylor Creek	2003–2011 (5)	22.93	22.26 (2006)	23.21 (2008)	21.52 (2006)	28.84 (2008)	— (21.95)	— (22.05)	22.97 (22.86)	23.07 (23.03)	23.14 (23.12)	— (23.37)	— (23.57)

Table B–4*B*. Summary descriptive statistics and percentiles for gage height by calendar year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit, the contributing watershed to the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges.—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Northern Okeechobee Inflow (03090102)—Continued														
02274325	Taylor Creek	2004–2011 (3)	17.92	17.61 (2005)	18.12 (2010)	16.29 (2009)	23.61 (2005)	— (17.13)	— (17.28)	— (17.45)	18.01 (18.11)	— (18.28)	— (18.36)	— (18.43)
2274500	Taylor Creek	1955–1984 (26)	7.05	3.11 (1961)	10.80 (1974)	0.91 (1956)	12.60 (1974)	3.22 (3.07)	3.74 (3.33)	4.80 (4.32)	6.19 (6.13)	10.69 (10.68)	10.75 (10.79)	10.79 (10.85)
02275503	Taylor Creek	1991–2011 (6)	14.31	13.04 (2009)	16.18 (1998)	10.33 (2009)	18.43 (1998)	— (12.00)	— (12.32)	13.29 (13.31)	14.01 (14.25)	15.32 (15.31)	— (16.07)	— (16.86)
02275606	Nubbin Slough	1993–2011 (3)	18.84	18.36 (2007)	19.24 (2009)	16.38 (2007)	19.76 (2009)	— (17.15)	— (17.53)	— (18.44)	18.92 (19.07)	— (19.49)	— (19.55)	— (19.60)
02275606sfw (headwater)	Nubbin Slough	1971–2012 (40)	18.97	17.80 (2001)	19.50 (1991)	15.95 (2001)	20.69 (1973)	18.27 (17.99)	18.36 (18.40)	18.80 (18.70)	19.04 (19.06)	19.21 (19.39)	19.41 (19.49)	19.45 (19.55)
02275606sfw (tailwater)	Nubbin Slough	1971–2012 (40)	14.12	10.06 (2007)	16.54 (1995)	8.76 (2008)	18.68 (1995)	11.51 (10.34)	11.69 (11.32)	13.27 (12.81)	14.23 (14.34)	15.49 (15.55)	16.08 (16.42)	16.33 (17.01)
s133 (headwater)	S-133	1979–1999 (17)	13.15	11.46 (1981)	13.74 (1980)	9.62 (1981)	14.97 (1995)	— (10.89)	11.73 (11.61)	13.06 (13.06)	13.54 (13.53)	13.61 (13.70)	13.69 (13.82)	— (13.89)
s133 (tailwater)	S-133	1979–2012 (30)	13.99	10.12 (2007)	16.44 (1995)	8.88 (2007)	18.56 (1995)	11.47 (10.21)	11.52 (10.81)	13.04 (12.44)	14.13 (14.29)	15.42 (15.56)	16.00 (16.34)	16.25 (16.98)
s135 (headwater)	S-135	1979–2012 (30)	12.96	10.63 (2007)	13.80 (1980)	8.65 (2007)	14.82 (2004)	11.16 (10.28)	11.57 (11.19)	12.49 (12.59)	13.34 (13.49)	13.60 (13.69)	13.70 (13.81)	13.72 (13.86)
s135 (tailwater)	S-135	1979–2012 (27)	14.15	10.13 (2007)	16.57 (1995)	8.67 (2007)	18.67 (1995)	11.32 (10.48)	11.67 (10.98)	12.97 (12.53)	14.21 (14.48)	15.57 (15.71)	16.17 (16.56)	16.45 (17.27)
s135 (headwater, pump)	S-135	1984–1998 (2)	13.09	12.47 (1989)	13.70 (1988)	11.16 (1989)	14.10 (1988)	— (11.39)	— (11.54)	— (12.47)	13.09 (13.51)	— (13.75)	— (13.84)	— (13.90)
Western Okeechobee Inflow (03090103)														
02255600	Fisheating Creek	2003–2012 (4)	73.00	72.73 (2011)	73.18 (2008)	71.79 (2011)	79.72 (2008)	— (71.86)	— (71.92)	— (72.15)	73.04 (72.44)	— (73.33)	— (74.97)	— (76.22)
02256000[e,f]	Fisheating Creek	1955–1966 (9)	10.93	9.42 (1956)	11.89 (1960)	7.21 (1956)	16.63 (1960)	— (9.07)	— (9.62)	10.66 (10.05)	10.82 (10.72)	11.43 (11.77)	— (12.60)	— (13.21)
02256500	Fisheating Creek	1931–2011 (55)	2.98	1.17 (1981)	4.62 (1953)	–0.45 (2000)	8.41 (1953)	1.87 (0.47)	2.08 (0.75)	2.41 (1.43)	3.05 (2.59)	3.52 (4.65)	4.17 (5.49)	4.37 (5.91)
02257000	Fisheating Creek	1993–2011 (4)	15.21	13.97 (2010)	15.94 (2003)	11.94 (2010)	18.74 (2004)	— (12.83)	— (13.36)	— (14.35)	15.47 (15.36)	— (16.05)	— (16.90)	— (17.26)

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USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Western Okeechobee Inflow (03090103)—Continued														
02257030	Fisheating Lock	1993–2011 (9)	14.40	12.31 (2008)	16.29 (1998)	9.51 (2008)	18.61 (1998)	— (10.49)	— (11.07)	13.41 (13.43)	14.44 (14.87)	15.64 (15.62)	— (16.29)	— (16.88)
02257030sfw (tailwater)	Fisheating Lock	1979–2012 (30)	14.30	11.17 (2007)	16.62 (1995)	9.56 (2008)	18.77 (1995)	11.78 (10.87)	12.24 (11.54)	13.28 (12.85)	14.42 (14.57)	15.57 (15.69)	16.06 (16.48)	16.43 (17.17)
02257030sfw (headwater, pump)	Fisheating Lock	1984–1992 (4)	13.05	12.70 (1989)	13.20 (1988)	11.40 (1989)	14.01 (1988)	— (12.16)	— (12.56)	— (12.94)	13.15 (13.13)	— (13.28)	— (13.41)	— (13.48)
02257030sfw (tailwater, pump)	Fisheating Lock	1985–1992 (3)	13.42	12.84 (1989)	14.35 (1991)	11.40 (1989)	14.99 (1991)	— (11.88)	— (12.36)	— (12.77)	13.06 (13.37)	— (14.13)	— (14.60)	— (14.80)
02257800sfw (headwater)	Harney Pond Canal	1976–2012 (34)	19.59	17.96 (1981)	20.03 (2000)	14.06 (1991)	22.14 (1987)	18.57 (18.12)	19.08 (18.86)	19.46 (19.49)	19.67 (19.79)	19.89 (19.98)	19.96 (20.04)	19.99 (20.10)
02257800sfw (tailwater)	Harney Pond Canal	1976–2012 (32)	14.23	10.30 (2007)	16.61 (1983)	9.09 (2001)	18.59 (1995)	11.60 (10.29)	11.86 (11.35)	13.06 (12.90)	14.38 (14.52)	15.58 (15.65)	16.19 (16.52)	16.44 (17.11)
02257800sfw (tailwater, weir)	Harney Pond Canal	2008–2012 (3)	12.80	11.58 (2011)	13.79 (2010)	9.69 (2011)	15.19 (2010)	— (10.33)	— (10.64)	— (11.71)	13.01 (13.30)	— (13.85)	— (14.32)	— (14.53)
02258000	Harney Pond Canal	1993–2011 (6)	14.79	13.82 (2010)	15.53 (1999)	11.50 (2002)	17.95 (1999)	— (13.01)	— (13.37)	14.31 (13.90)	14.85 (14.78)	15.41 (15.58)	— (16.24)	— (17.13)
2259200	Indian Prairie Canal	1962–1989 (26)	10.73	9.21 (1981)	11.56 (1988)	7.03 (1980)	13.44 (1971)	9.65 (8.75)	10.14 (9.25)	10.56 (10.02)	10.83 (10.97)	11.07 (11.61)	11.28 (11.81)	11.36 (11.92)
02259200sfw (headwater)	Indian Prairie Canal	1961–2012 (47)	19.72	11.51 (2001)	20.77 (1995)	9.02 (2001)	22.45 (1971)	16.02 (14.91)	18.79 (18.26)	19.69 (19.47)	20.21 (20.41)	20.54 (20.73)	20.65 (20.92)	20.67 (21.02)
02259200sfw (tailwater)	Indian Prairie Canal	1962–2012 (42)	14.16	10.14 (2007)	16.75 (1995)	0.00 (2002)	18.89 (1995)	11.66 (11.02)	12.47 (11.98)	13.38 (12.99)	14.08 (14.31)	15.49 (15.45)	15.94 (16.24)	16.26 (16.86)
02259627	Buckhead Lock	1993–2011 (8)	15.02	12.46 (2008)	16.56 (1995)	10.69 (2008)	18.69 (1995)	— (11.05)	— (12.86)	14.21 (14.23)	15.41 (15.21)	15.95 (16.12)	— (17.06)	— (17.47)
02259627sfw (headwater)	Buckhead Lock	1979–2012 (27)	13.08	11.75 (1981)	13.70 (1988)	10.23 (1981)	15.55 (2008)	11.83 (10.94)	11.98 (11.57)	12.58 (12.76)	13.36 (13.48)	13.57 (13.64)	13.64 (13.77)	13.64 (13.85)
02259627sfw (tailwater)	Buckhead Lock	1979–2012 (28)	14.02	11.17 (2007)	16.55 (1995)	9.30 (2011)	18.65 (1995)	11.55 (10.74)	11.75 (11.11)	12.83 (12.44)	14.19 (14.21)	15.41 (15.50)	16.21 (16.33)	16.40 (17.12)
02259627sfw (headwater, regmod)	Buckhead Lock	1981–2010 (26)	13.10	11.75 (1981)	13.70 (1988)	10.23 (1981)	15.55 (2008)	11.83 (10.92)	11.98 (11.65)	12.61 (12.80)	13.37 (13.48)	13.57 (13.64)	13.64 (13.77)	13.64 (13.84)

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USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Western Okeechobee Inflow (03090103)—Continued														
02259627sfw (tailwater, regmod)	Buckhead Lock	1981–2010 (26)	14.15	11.17 (2007)	16.55 (1995)	10.05 (2001)	18.65 (1995)	11.75 (10.82)	11.82 (11.17)	13.09 (12.58)	14.23 (14.38)	15.46 (15.60)	16.21 (16.42)	16.40 (17.17)
s129 (headwater)	S-129	1979–2012 (31)	12.93	10.96 (2007)	13.63 (1989)	9.78 (1981)	14.28 (1995)	11.64 (10.73)	11.75 (11.73)	12.85 (12.94)	13.16 (13.18)	13.27 (13.35)	13.34 (13.49)	13.43 (13.58)
s129 (tailwater)	S-129	1983–2012 (24)	14.27	11.42 (2007)	16.63 (1995)	9.80 (2008)	18.73 (1995)	12.21 (11.02)	12.32 (11.89)	13.34 (13.14)	14.32 (14.37)	15.49 (15.51)	15.84 (16.26)	16.28 (16.90)
Everglades (03090202)														
02278000 (canal)	West Palm Beach Canal	1968–2008 (26)	11.11	10.20 (2001)	11.89 (1974)	7.15 (1981)	14.22 (1984)	10.45 (9.68)	10.59 (10.00)	10.83 (10.57)	11.05 (11.14)	11.52 (11.68)	11.61 (12.15)	11.73 (12.41)
02278000 (lake)	West Palm Beach Canal	1968–2008 (28)	14.13	10.06 (2007)	16.58 (1995)	8.27 (2007)	18.66 (1995)	11.52 (10.49)	11.67 (11.29)	13.35 (12.89)	14.05 (14.31)	15.47 (15.51)	16.13 (16.51)	16.43 (17.16)
02278000sfw_1 (headwater)	West Palm Beach Canal	1989–2012 (19)	14.12	10.32 (2007)	16.43 (1995)	8.57 (2007)	18.75 (1998)	— (10.33)	11.73 (10.88)	13.28 (12.55)	14.34 (14.39)	15.53 (15.68)	16.40 (16.42)	— (17.10)
02278000sfw_1 (tailwater)	West Palm Beach Canal	1997–2012 (12)	10.80	10.34 (2008)	11.15 (1999)	8.17 (2001)	14.59 (1998)	— (9.62)	10.45 (9.84)	10.60 (10.29)	10.77 (10.78)	11.11 (11.29)	11.12 (11.71)	— (12.06)
02278000sfw_1 (headwater, regmod)	West Palm Beach Canal	1978–2011 (34)	14.30	10.32 (2007)	16.58 (1995)	8.57 (2007)	18.66 (1995)	11.52 (10.42)	11.73 (11.13)	13.28 (12.90)	14.51 (14.68)	15.58 (15.79)	16.13 (16.59)	16.43 (17.24)
02278000sfw_1 (tailwater, regmod)	West Palm Beach Canal	1978–2011 (33)	10.84	10.20 (2001)	11.54 (1979)	7.15 (1981)	14.31 (1992)	10.34 (9.52)	10.55 (9.80)	10.61 (10.33)	10.84 (10.87)	11.00 (11.36)	11.21 (11.78)	11.46 (12.06)
02278002 (tailwater)	West Palm Beach Canal	1968–2009 (28)	11.07	10.20 (2001)	11.89 (1974)	7.15 (1981)	14.22 (1984)	10.45 (9.64)	10.49 (9.97)	10.69 (10.52)	11.01 (11.09)	11.49 (11.64)	11.61 (12.12)	11.73 (12.39)
02278002sfw (tailwater)	West Palm Beach Canal	1988–1997 (8)	10.89	10.56 (1990)	11.20 (1992)	7.64 (1990)	14.34 (1992)	— (9.37)	— (9.70)	10.62 (10.36)	10.97 (11.00)	11.11 (11.50)	— (11.85)	— (12.11)
02280500	Hillsboro Canal	1976–2012 (15)	10.94	10.39 (2001)	11.32 (1992)	7.77 (1990)	12.78 (1988)	— (9.88)	10.56 (10.18)	10.87 (10.58)	10.97 (10.97)	11.11 (11.37)	11.23 (11.72)	— (11.95)
2283498	N New R Canal	1980–2003 (21)	14.37	11.63 (2001)	16.48 (1983)	6.13 (1982)	18.71 (1998)	11.73 (10.84)	11.95 (11.54)	13.51 (13.02)	14.33 (14.70)	15.55 (15.79)	16.02 (16.49)	16.28 (17.15)
02283498 (canal)	N New R Canal	1988–2003 (13)	10.91	10.36 (2001)	11.35 (1992)	7.71 (1990)	12.73 (1989)	— (9.77)	10.54 (10.12)	10.83 (10.54)	10.96 (10.95)	11.03 (11.36)	11.22 (11.71)	— (11.96)
02283500	N New R Canal	1968–2012 (32)	11.11	10.35 (1981)	12.09 (1969)	7.00 (1981)	13.24 (1986)	10.37 (9.96)	10.54 (10.24)	10.88 (10.68)	11.14 (11.13)	11.36 (11.59)	11.45 (12.02)	11.63 (12.23)

Table B–4*B*. Summary descriptive statistics and percentiles for gage height by calendar year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit, the contributing watershed to the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges.—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
						Everglades (03090202)—Continued								
2286399	Miami Canal	1968–1998 (26)	14.34	11.67 (1981)	16.42 (1983)	9.53 (1981)	18.33 (1983)	12.46 (11.29)	12.51 (12.20)	13.46 (13.25)	14.23 (14.36)	15.48 (15.53)	16.00 (16.40)	16.13 (16.95)
02286399sfw (headwater)	Miami Canal	2000–2012 (10)	13.57	10.34 (2007)	15.91 (2003)	8.75 (2007)	18.26 (2004)	— (9.84)	— (10.32)	11.83 (12.10)	13.79 (13.93)	14.91 (15.32)	— (16.03)	— (16.61)
02286399sfw (tailwater)	Miami Canal	2000–2012 (11)	10.50	9.99 (2008)	11.02 (2002)	8.08 (2008)	12.73 (2005)	— (9.30)	10.07 (9.57)	10.28 (10.13)	10.45 (10.55)	10.77 (10.94)	10.84 (11.29)	— (11.46)
02286400	Miami Canal	1969–2012 (28)	11.11	9.81 (2008)	11.89 (1970)	7.76 (1981)	13.41 (1980)	10.10 (9.72)	10.41 (10.12)	10.97 (10.70)	11.18 (11.17)	11.38 (11.60)	11.56 (12.03)	11.70 (12.27)
s351 (headwater)	S-351	2000–2012 (10)	13.67	11.64 (2011)	15.88 (2003)	9.19 (2008)	18.17 (2004)	— (10.03)	— (10.35)	11.87 (12.24)	13.71 (14.03)	14.88 (15.29)	— (16.00)	— (16.54)
s351 (tailwater)	S-351	2000–2012 (11)	10.56	10.19 (2008)	10.89 (2002)	8.01 (2008)	12.40 (2002)	— (9.50)	10.25 (9.76)	10.33 (10.17)	10.52 (10.59)	10.80 (10.97)	10.84 (11.35)	— (11.51)
						Caloosahatchee (03090205)								
02292000 (headwater)	Caloosahatchee Canal	1970–2003 (13)	13.55	10.99 (2000)	15.63 (1988)	9.70 (1981)	16.58 (1991)	— (10.80)	11.07 (10.98)	11.96 (11.75)	14.15 (13.85)	14.84 (15.27)	15.57 (15.92)	— (16.16)
02292000sfw (headwater)	Caloosahatchee Canal	1998–2003 (4)	13.55	11.59 (2001)	15.39 (1999)	8.78 (2001)	17.78 (1999)	— (9.70)	— (10.52)	— (11.79)	13.61 (14.19)	— (15.15)	— (15.98)	— (16.44)
2292480	Caloosahatchee Canal	1982–2003 (14)	3.06	2.94 (1997)	3.15 (1983)	2.41 (2002)	4.23 (1983)	— (2.79)	2.96 (2.85)	3.02 (2.95)	3.06 (3.05)	3.11 (3.16)	3.13 (3.27)	— (3.33)
02292480 (upstream)	Caloosahatchee Canal	1982–2003 (16)	11.11	10.86 (1990)	11.33 (1983)	10.20 (1990)	12.17 (1990)	— (10.75)	11.01 (10.86)	11.06 (10.98)	11.10 (11.11)	11.16 (11.23)	11.20 (11.37)	— (11.46)
02292480sfw (headwater)	Caloosahatchee Canal	1998–2003 (4)	10.93	10.52 (2001)	11.12 (2002)	8.79 (2001)	11.73 (2002)	— (9.73)	— (10.47)	— (10.88)	11.04 (11.04)	— (11.17)	— (11.31)	— (11.41)
02292481 (tailwater)	Caloosahatchee Canal	1982–1994 (10)	3.07	3.02 (1985)	3.15 (1983)	2.58 (1990)	4.23 (1983)	— (2.81)	— (2.87)	3.04 (2.96)	3.06 (3.06)	3.11 (3.17)	— (3.27)	— (3.33)
02292481sfw (tailwater)	Caloosahatchee Canal	1998–2003 (2)	2.95	2.94 (1999)	2.95 (2002)	2.18 (2002)	3.81 (1999)	— (2.71)	— (2.77)	— (2.86)	2.95 (2.94)	— (3.03)	— (3.14)	— (3.20)
02292900 (upstream)	Caloosahatchee Canal	1969–2012 (16)	3.17	2.99 (1970)	3.25 (1992)	2.29 (1970)	4.00 (1995)	— (2.92)	3.09 (2.98)	3.13 (3.07)	3.18 (3.17)	3.22 (3.28)	3.25 (3.37)	— (3.42)
02292900 (downstream)	Caloosahatchee Canal	1969–2003 (13)	1.00	0.86 (1996)	1.27 (1995)	–1.12 (1996)	3.69 (1995)	— (0.22)	0.87 (0.42)	0.95 (0.74)	1.00 (1.02)	1.03 (1.27)	1.08 (1.50)	— (1.67)

Table B–4*B*. Summary descriptive statistics and percentiles for gage height by calendar year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit, the contributing watershed to the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges.—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Caloosahatchee (03090205)—Continued														
02292900 (minimum, downstream)	Caloosa-hatchee Canal	2001–2012 (1)	0.29	0.29 (2002)	0.29 (2002)	–1.69 (2002)	1.88 (2002)	— (–0.45)	— (–0.30)	— (–0.06)	— (0.33)	— (0.63)	— (0.88)	— (1.03)
02292900 (maximum, downstream)	Caloosa-hatchee Canal	2001–2012 (1)	1.84	1.84 (2002)	1.84 (2002)	–0.31 (2002)	3.53 (2002)	— (0.90)	— (1.08)	— (1.46)	— (1.89)	— (2.22)	— (2.47)	— (2.66)
02292900sfw (headwater)	Caloosa-hatchee Canal	1998–2003 (1)	3.12	3.12 (2002)	3.12 (2002)	2.72 (2002)	3.53 (2002)	— (2.90)	— (2.94)	— (3.01)	— (3.10)	— (3.21)	— (3.31)	— (3.38)
02292900sfw (headwater, regmod)	Caloosa-hatchee Canal	1983–2009 (24)	1.71	0.86 (1996)	3.22 (2001)	–1.12 (1996)	4.44 (2001)	0.87 (0.35)	0.88 (0.58)	0.98 (0.91)	1.06 (1.28)	3.08 (2.99)	3.12 (3.19)	3.14 (3.29)
02292901sfw (tailwater)	Caloosa-hatchee Canal	1998–2003 (1)	1.06	1.06 (2002)	1.06 (2002)	–0.29 (2002)	2.46 (2002)	— (0.31)	— (0.42)	— (0.69)	— (1.11)	— (1.41)	— (1.65)	— (1.79)
02293210 (minimum)	Caloosa-hatchee Canal	2007–2012 (2)	–1.22	–1.26 (2008)	–1.19 (2010)	–3.07 (2008)	0.61 (2008)	— (–1.96)	— (–1.78)	— (–1.50)	–1.22 (–1.22)	— (–0.90)	— (–0.70)	— (–0.58)
02293210 (maximum)	Caloosa-hatchee Canal	2007–2012 (2)	0.47	0.45 (2008)	0.48 (2010)	–1.38 (2008)	2.14 (2008)	— (–0.33)	— (–0.14)	— (0.16)	0.47 (0.50)	— (0.76)	— (1.07)	— (1.17)
SE Florida Atlantic (03090206)														
2276870	St Lucie Canal	1941–1998 (13)	14.68	11.95 (1990)	16.61 (1995)	10.48 (1990)	18.70 (1995)	— (11.20)	12.57 (12.02)	13.88 (13.56)	14.80 (15.04)	15.64 (15.97)	16.47 (16.72)	— (17.37)
02276870 (canal)	St Lucie Canal	1981–2006 (17)	13.66	11.50 (2001)	14.79 (1998)	8.78 (2001)	18.03 (1998)	— (10.72)	11.68 (11.51)	12.80 (13.29)	14.15 (14.19)	14.31 (14.39)	14.76 (14.53)	— (14.68)
02276870coe (headwater)	St Lucie Canal	1998–2003 (3)	14.31	13.13 (2000)	15.53 (1999)	11.04 (2000)	18.09 (1999)	— (11.67)	— (11.85)	— (12.72)	14.26 (14.65)	— (15.56)	— (16.28)	— (16.90)
02276870coe (headwater, regmod)	St Lucie Canal	1981–2011 (27)	14.25	10.10 (2007)	16.61 (1995)	8.62 (2007)	18.70 (1995)	11.58 (10.32)	11.76 (11.22)	13.13 (12.91)	14.30 (14.55)	15.61 (15.70)	16.24 (16.52)	16.47 (17.21)
02276870sfw (tailwater)	St Lucie Canal	1998–2003 (4)	13.05	11.43 (2001)	14.19 (1999)	8.73 (2001)	17.12 (1999)	— (9.45)	— (10.28)	— (11.93)	13.29 (14.02)	— (14.29)	— (14.44)	— (14.51)
02276870sfw (tailwater, regmod)	St Lucie Canal	1981–2011 (28)	13.48	10.25 (2007)	14.79 (1998)	8.43 (2007)	18.03 (1998)	11.50 (10.15)	11.60 (10.95)	12.74 (12.67)	13.99 (14.15)	14.30 (14.38)	14.62 (14.55)	14.76 (14.70)
02276877	St Lucie Canal	1992–2012 (6)	12.79	10.25 (2007)	14.82 (1998)	8.43 (2007)	18.00 (1998)	— (9.39)	— (9.75)	11.50 (11.09)	12.98 (13.63)	14.19 (14.28)	— (14.49)	— (14.65)
2277000	St Lucie Canal	1987–2003 (6)	13.52	11.72 (1990)	14.24 (1996)	9.55 (1990)	16.95 (1999)	— (11.13)	— (11.73)	12.80 (12.51)	14.07 (14.14)	14.22 (14.33)	— (14.47)	— (14.54)

Table B–4*B*. Summary descriptive statistics and percentiles for gage height by calendar year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit, the contributing watershed to the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges.—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
SE Florida Atlantic (03090206)—Continued														
02277000 (down-stream)	St Lucie Canal	1987–2001 (8)	0.59	0.33 (1989)	0.83 (1999)	–0.83 (1990)	4.42 (1999)	— (–0.15)	— (–0.03)	0.38 (0.20)	0.64 (0.49)	0.76 (0.87)	— (1.36)	— (1.73)
02277000sfw (headwater)	St Lucie Canal	1998–2003 (1)	11.56	11.56 (2001)	11.56 (2001)	8.87 (2001)	14.87 (2001)	— (9.24)	— (9.40)	— (9.88)	— (10.84)	— (14.08)	— (14.42)	— (14.50)
02277000sfw (tailwater)	St Lucie Canal	1998–2003 (4)	0.71	0.60 (2002)	0.88 (1999)	–0.38 (2001)	4.42 (1999)	— (0.01)	— (0.19)	— (0.39)	0.67 (0.60)	— (0.94)	— (1.37)	— (1.60)
02277000sfw (headwater, regmod)	St Lucie Canal	1987–2010 (20)	13.27	10.43 (2007)	14.28 (2003)	8.31 (2007)	16.95 (1999)	— (10.12)	11.64 (10.93)	12.67 (12.41)	13.71 (14.03)	14.22 (14.30)	14.26 (14.44)	— (14.51)
02277000sfw (tailwater, regmod)	St Lucie Canal	1987–2010 (17)	0.62	0.33 (1989)	1.03 (2005)	–1.01 (2006)	4.42 (1999)	— (–0.11)	0.37 (0.01)	0.52 (0.24)	0.65 (0.52)	0.70 (0.91)	0.88 (1.39)	— (1.71)
02281400	Hillsboro Canal	1975–2011 (21)	7.66	7.34 (1977)	8.03 (1999)	4.55 (1979)	11.40 (1999)	7.37 (6.75)	7.38 (7.00)	7.49 (7.36)	7.69 (7.73)	7.80 (7.97)	7.93 (8.23)	8.02 (8.41)
02281491	C2 Canal	1990–1993 (1)	9.08	9.08 (1992)	9.08 (1992)	7.42 (1992)	10.53 (1992)	— (7.91)	— (8.09)	— (8.79)	— (9.14)	— (9.46)	— (9.79)	— (10.01)

[a]Station numbers with "coe" or "sfw" appended to the number are for stations operated in cooperation with either the U.S. Army Corps of Engineers (coe) or the South Florida Water Management District (sfw), and the data for these table rows were obtained from digital files of these agencies. Stations s129, s133, s135, and s351 are South Florida Water Management District (SFWMD) stations. Unless indicated in parentheses under the station number, all gage-height values are mean-daily values at the gage location. Headwater and tailwater locations are indicated where there is a control structure (gate or lock). Upstream and downstream locations also are indicated relative to a control structure. Other locations indicated are, canal, lake, culvert, and weir. Pump, headwater and tailwater locations relative to a control structure with a pump. Regmod, regional modeling dataset constructed by SFWMD for hydrologic studies.

[b]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[c]Statistics listed for mean-annual and mean-daily gage height are based on complete calendar years. Year of minimum and maximum values for mean-annual and mean-daily gage-height numbers shown in parentheses.

[d]Percentiles listed for mean-annual and mean-daily gage height are based on complete calendar years.

Table B–5*A*. Summary descriptive statistics and percentiles for discharge by water year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit, the contributing watershed to the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges.

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey (USGS) hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value. ft^3/s, cubic feet per second; mi^2, square mile]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
						Kissimmee (03090101)								
2268903	Kissimmee River	1970–2004 (35)	988 (0.61)	21.0 (1981)	2,650 (2003)	0 (1970)	16,200 (2004)	170 (0)	284 (0)	516 (0)	906 (181)	1,250 (1,410)	1,720 (2,980)	2,500 (4,250)
02268903sfw	Kissimmee River	1934–2012 (78)	1,050 (0.66)	21.0 (1981)	3,220 (1960)	0 (1957)	11,600 (1998)	170 (0)	284 (0)	605 (143)	949 (660)	1,280 (1,380)	2,000 (2,690)	2,470 (3,810)
2273000	Kissimmee River	1929–2004 (74)	1,760 (—)	124 (1981)	5,580 (1960)	0 (1965)	25,100 (2004)	502 (1.40)	641 (57.0)	1,070 (376)	1,570 (1,210)	2,270 (2,280)	3,030 (4,150)	3,730 (6,000)
02273000sfw	Kissimmee River	1988–2012 (20)	1,450 (—)	156 (2007)	3,450 (1998)	0 (1989)	20,400 (2004)	— (0)	476 (0)	992 (118)	1,310 (597)	1,730 (1,890)	3,130 (3,890)	— (5,740)
02273000sfw (regmod)	Kissimmee River	1965–2006 (40)	1,470 (—)	124 (1981)	3,350 (2005)	0 (1967)	23,500 (1970)	433 (0)	559 (2.00)	795 (115)	1,460 (661)	1,880 (2,030)	2,870 (3,910)	3,260 (5,760)
2273300	Canal 41A	1964–1989 (25)	181 (—)	3.27 (1977)	506 (1970)	0 (1965)	4,080 (1970)	8.53 (0)	26.8 (0)	51.5 (0)	125 (0)	315 (175)	353 (606)	398 (1,070)
02273300sfw	Canal 41A	1972–2012 (39)	198 (—)	3.27 (1977)	681 (1998)	0 (1973)	4,580 (2006)	8.53 (0)	25.5 (0)	95.6 (0)	182 (0)	290 (196)	395 (636)	433 (1,080)
02273343sfw	Kissimmee River	1972–2012 (38)	33.1 (—)	0.00 (2007)	86.8 (1982)	0 (1974)	1,500 (2005)	0.73 (0)	6.28 (0)	17.8 (0)	26.0 (0)	50.8 (13.0)	77.1 (95.1)	83.3 (184)
02273343sfw (culvert)	Kissimmee River	1981–2012 (14)	3.25 (—)	0.46 (2002)	7.83 (1996)	–100 (1999)	136 (2008)	— (0)	0.88 (0)	1.18 (0)	2.71 (0)	4.48 (2.17)	7.74 (9.74)	— (17.5)
						Northern Okeechobee Inflow (03090102)								
2274000	Taylor Creek	1955–1989 (34)	13.9 (0.24)	2.05 (1977)	36.9 (1960)	0 (1956)	1,370 (1957)	2.42 (0)	2.62 (0.10)	7.13 (0.42)	12.1 (2.10)	19.4 (8.60)	24.9 (30.0)	34.3 (60.0)
02274010	Taylor Creek	2003–2011 (8)	28.5 (0.63)	9.34 (2007)	52.3 (2004)	–2.00 (2007)	1,510 (2008)	— (0.59)	— (1.20)	17.8 (3.30)	24.6 (6.90)	40.9 (17.0)	— (55.0)	— (108)
02274325	Taylor Creek	2004–2011 (6)	38.9 (0.66)	11.8 (2011)	64.9 (2008)	–7.80 (2011)	2,880 (2008)	— (–0.46)	— (0.80)	28.5 (4.20)	35.4 (11.0)	57.3 (25.0)	— (65.0)	— (136)
2274500	Taylor Creek	1955–1982 (26)	91.9 (0.93)	5.10 (1981)	246 (1960)	0 (1956)	6,070 (1957)	12.0 (0)	14.9 (0)	31.8 (3.80)	86.2 (14.0)	139 (65.0)	175 (243)	216 (459)
2275000	Taylor Creek	1932–1933 (1)	92.3 (0.80)	92.3 (1933)	92.3 (1933)	0 (1933)	1,620 (1933)	— (0.20)	— (0.20)	— (0.40)	— (5.40)	— (60.0)	— (228)	— (601)
02275503	Taylor Creek	1992–2011 (9)	2.37 (—)	–7.94 (2005)	19.0 (1995)	–136 (2007)	399 (2008)	— (–21.0)	— (–12.0)	–3.86 (–4.40)	0.95 (0)	1.70 (1.70)	— (23.0)	— (36.0)

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USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Northern Okeechobee Inflow (03090102)—Continued														
02275606	Nubbin Slough	2001–2011 (3)	124 (—)	87.3 (2010)	177 (2008)	–254 (2008)	5,770 (2008)	— (–94.0)	— (–59.0)	— (4.70)	109 (69.0)	— (160)	— (267)	— (407)
02275606sfw	Nubbin Slough	1972–2012 (40)	132 (—)	14.5 (2007)	315 (1979)	–117 (1998)	5,900 (2004)	19.2 (0)	52.9 (0)	85.8 (0)	132 (4.00)	157 (125)	215 (357)	254 (602)
02275606sfw (regmod)	Nubbin Slough	1972–2008 (35)	141 (—)	14.5 (2007)	315 (1979)	–117 (1998)	5,900 (2004)	22.3 (0)	75.5 (0)	103 (0)	133 (19.0)	186 (137)	218 (379)	291 (656)
s133	S-133	1970–2012 (36)	26.4 (—)	0.64 (2011)	71.5 (1983)	0 (1971)	753 (1979)	0.64 (0)	2.79 (0)	6.01 (0)	25.2 (0)	42.6 (0)	61.3 (128)	69.6 (210)
s133 (regmod)	S-133	1970–2011 (36)	26.9 (—)	0.64 (1972)	71.5 (1983)	0 (1971)	753 (1979)	0.70 (0)	3.00 (0)	8.01 (0)	25.2 (0)	42.6 (0)	61.3 (136)	69.6 (210)
s135	S-135	1992–2011 (6)	4.02 (—)	–2.68 (2005)	10.6 (1999)	–186 (2005)	377 (2001)	— (0)	— (0)	0.00 (0)	4.07 (0)	8.10 (0)	— (0)	— (30.0)
s135 (pump)	S-135	1971–2012 (36)	25.3 (—)	1.07 (1971)	69.3 (1980)	0 (1971)	602 (1980)	1.34 (0)	3.11 (0)	8.87 (0)	21.5 (0)	41.0 (0)	52.0 (131)	63.8 (175)
s135 (regmod)	S-135	1987–2006 (15)	–4.19 (—)	–36.8 (1999)	14.0 (2002)	–406 (1999)	221 (1988)	— (–22.0)	–13.0 (–0.65)	–4.92 (0)	–2.70 (0)	–0.00 (0)	0.79 (0)	— (0)
Western Okeechobee Inflow (03090103)														
02255600	Fisheating Creek	2003–2012 (6)	38.2 (0.64)	2.46 (2011)	60.6 (2008)	0 (2004)	1,080 (2004)	— (0)	— (0)	26.7 (0.28)	40.0 (1.90)	59.3 (14.0)	— (127)	— (261)
2256000	Fisheating Creek	1955–1966 (10)	140 (0.75)	1.10 (1956)	401 (1960)	0 (1956)	4,520 (1960)	— (0)	— (0)	66.4 (1.40)	94.3 (18.0)	197 (102)	— (358)	— (743)
02256500	Fisheating Creek	1931–2011 (80)	251 (0.81)	13.6 (1956)	671 (1960)	0 (1932)	30,500 (1952)	60.5 (0)	82.8 (0)	145 (4.20)	229 (37.0)	340 (233)	441 (701)	493 (1,160)
02256500sfw	Fisheating Creek	1972–2012 (35)	228 (0.73)	37.4 (2007)	649 (1998)	0 (1973)	8,030 (1974)	42.2 (0)	67.5 (0.01)	107 (4.70)	226 (29.0)	324 (210)	414 (694)	421 (1,080)
02257000	Fisheating Creek	1997–2011 (11)	389 (—)	59.2 (2007)	697 (1998)	–27.0 (2009)	5,030 (2006)	— (9.20)	106 (19.0)	238 (45.0)	428 (110)	560 (375)	617 (1,180)	— (1,910)
02257030	Fisheating Lock	2001–2011 (5)	0.70 (—)	–0.12 (2009)	1.89 (2002)	–28.0 (2007)	91.0 (2002)	— (–3.70)	— (–1.80)	0.12 (0)	0.65 (0)	0.95 (0)	— (2.00)	— (9.10)

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USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Western Okeechobee Inflow (03090103)—Continued														
02257030sfw	Fisheating Lock	1997–2012 (8)	1.86 (—)	0.40 (2004)	4.11 (2006)	0 (1997)	166 (2001)	— (0)	— (0)	0.52 (0)	1.95 (0)	2.72 (0)	— (0)	— (10.0)
02257030sfw (pump)	Fisheating Lock	1969–2012 (41)	9.33 (—)	0.23 (2007)	29.4 (2005)	0 (1970)	310 (2008)	0.36 (0)	1.25 (0)	2.82 (0)	8.09 (0)	12.7 (0)	20.5 (45.9)	22.1 (68.1)
02257030sfw (pump, regmod)	Fisheating Lock	2001–2010 (9)	13.0 (—)	0.23 (2007)	29.4 (2005)	0 (2002)	310 (2008)	— (0)	— (0)	6.76 (0)	11.7 (0)	20.5 (0)	— (57.2)	— (71.6)
02257030sfw (regmod)	Fisheating Lock	2001–2011 (5)	–0.11 (—)	–8.48 (2004)	4.11 (2006)	–62.0 (2004)	106 (2009)	— (0)	— (0)	0.40 (0)	0.64 (0)	2.80 (0)	— (0)	— (7.50)
2257800	Harney Pond Canal	1963–1999 (27)	201 (—)	43.4 (1981)	469 (1966)	0 (1963)	4,670 (1970)	48.1 (0)	57.5 (0)	99.1 (0)	155 (0)	301 (242)	435 (626)	449 (967)
02257800sfw	Harney Pond Canal	1972–2012 (39)	219 (—)	43.4 (1981)	449 (1979)	0 (1973)	4,100 (2008)	47.8 (0)	60.8 (0)	94.9 (0)	193 (1.11)	322 (263)	384 (701)	435 (1,040)
02257800sfw (weir)	Harney Pond Canal	2008–2012 (3)	63.8 (—)	6.21 (2010)	123 (2011)	–647 (2009)	2,650 (2010)	— (–521)	— (–433)	— (–171)	62.1 (56.9)	— (244)	— (514)	— (669)
02258000	Harney Pond Canal	1994–2011 (2)	400 (—)	393 (2002)	408 (2003)	–254 (2002)	2,610 (2003)	— (–45.0)	— (–12.0)	— (70.0)	400 (233)	— (586)	— (1,060)	— (1,420)
2259200	Indian Prairie Canal	1963–1989 (27)	42.3 (—)	0.20 (1985)	115 (1968)	0 (1963)	2,130 (1970)	4.32 (0)	7.04 (0)	17.7 (0)	28.2 (0)	63.0 (0)	89.4 (124)	115 (250)
02259200sfw	Indian Prairie Canal	1962–2012 (41)	53.3 (—)	0.20 (1985)	143 (1990)	0 (1964)	3,280 (1990)	7.04 (0)	11.3 (0)	24.4 (0)	47.6 (0)	76.0 (42.9)	114 (167)	116 (282)
2259627	Buck-head Lock	2001–2009 (5)	–0.19 (—)	–1.50 (2006)	0.75 (2003)	–41.0 (2003)	63.0 (2005)	— (–8.00)	— (–4.90)	–0.42 (–1.70)	–0.06 (0)	0.27 (0.73)	— (4.80)	— (8.30)
s129	S-129	1986–2012 (9)	–46.8 (—)	–229 (1994)	1.35 (2009)	–453 (1994)	95.3 (2009)	— (–278)	— (–218)	–0.82 (0)	0.60 (0)	0.86 (0)	— (0.13)	— (2.67)
s129 (pump)	S-129	1969–2012 (25)	16.1 (—)	1.93 (1989)	31.6 (1988)	0 (1985)	483 (2008)	2.47 (0)	3.53 (0)	9.12 (0)	14.3 (0)	24.4 (0)	27.8 (70.3)	31.6 (94.3)
s129 (pump, regmod)	S-129	2001–2010 (8)	19.2 (—)	13.5 (2008)	27.8 (2006)	0 (2002)	483 (2008)	— (0)	— (0)	14.3 (0)	17.2 (0)	24.8 (0)	— (79.2)	— (96.7)
s129 (regmod)	S-129	2001–2009 (6)	0.20 (—)	–0.29 (2002)	1.35 (2009)	–23.1 (2002)	95.3 (2009)	— (0)	— (0)	–0.14 (0)	–0.01 (0)	0.26 (0)	— (0)	— (0)

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USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Everglades (03090202)														
2278000	West Palm Beach Canal	1940–2007 (62)	171 (—)	–20.8 (1962)	376 (2003)	–1,760 (1942)	1,610 (1960)	17.4 (–156)	53.1 (0)	89.3 (0)	168 (59.0)	234 (359)	296 (557)	333 (717)
02278000sfw_1	West Palm Beach Canal	1990–2012 (17)	178 (—)	–0.08 (2008)	361 (2003)	–466 (2000)	1,170 (2002)	— (0)	39.0 (0)	97.9 (0)	199 (0)	252 (314)	286 (658)	— (763)
02278000sfw_1 (regmod)	West Palm Beach Canal	1965–2012 (46)	153 (—)	26.9 (1988)	323 (1996)	–1,310 (1982)	1,590 (1966)	50.2 (0)	56.2 (0)	88.8 (0)	134 (0)	228 (280)	272 (550)	286 (728)
02278000sfw_2	West Palm Beach Canal	1973–2012 (38)	154 (—)	26.9 (1988)	376 (2003)	–1,310 (1982)	1,410 (1976)	34.2 (0)	53.1 (0)	75.0 (0)	125 (0)	234 (251)	286 (562)	323 (746)
02280500	Hillsboro Canal	1957–2012 (45)	25.6 (—)	–207 (1960)	288 (2000)	–1,720 (1981)	948 (1966)	–107 (–494)	–81.1 (–326)	–38.5 (–122)	12.5 (32.0)	77.0 (203)	184 (374)	198 (492)
2283498	N New R Canal	1968–2003 (36)	159 (—)	–296 (1982)	715 (1989)	–4,030 (2001)	3,440 (1985)	–198 (–1,200)	–168 (–562)	17.9 (0)	142 (0)	296 (511)	445 (1,130)	688 (1,420)
02283498sfw	N New R Canal	1963–2012 (48)	172 (—)	–296 (1982)	715 (1989)	–4,030 (2001)	3,440 (1985)	–193 (–1,080)	–146 (–441)	40.7 (0)	170 (0)	312 (507)	400 (1,100)	603 (1,390)
02283498sfw (regmod)	N New R Canal	1965–2006 (40)	172 (—)	–296 (1982)	715 (1989)	–4,030 (2001)	3,440 (1985)	–198 (–1,200)	–157 (–559)	32.2 (0)	172 (0)	312 (538)	423 (1,150)	645 (1,440)
02283500	N New R Canal	1957–2012 (48)	115 (—)	–232 (1982)	501 (1992)	–3,460 (1982)	2,920 (1985)	–112 (–778)	–105 (–369)	29.5 (–49.0)	116 (114)	212 (351)	280 (676)	403 (916)
02286399sfw	Miami Canal	1990–2012 (18)	162 (—)	44.3 (2001)	330 (1992)	–74.3 (2000)	1,680 (2005)	— (0)	59.7 (0)	99.5 (0)	144 (0)	240 (203)	253 (600)	— (893)
02286400	Miami Canal	1958–2011 (45)	85.0 (—)	–290 (1960)	487 (1993)	–2,790 (1970)	2,280 (1966)	–135 (–667)	–80.5 (–303)	29.1 (0)	87.6 (15.0)	174 (249)	255 (550)	279 (841)
02286400sfw	Miami Canal	1963–2012 (48)	124 (—)	–132 (1968)	488 (1993)	–2,790 (1970)	2,280 (1966)	–77.9 (–485)	–57.9 (–19.0)	55.5 (0)	116 (0)	233 (262)	263 (611)	306 (901)
02286400sfw (regmod)	Miami Canal	1965–2006 (40)	122 (—)	–132 (1968)	488 (1993)	–2,790 (1970)	2,280 (1966)	–96.7 (–550)	–59.5 (–66.0)	55.5 (0)	116 (0.75)	233 (264)	266 (633)	312 (922)
2286403	Miami Canal	1984–1990 (4)	163 (—)	58.3 (1986)	232 (1989)	–101 (1989)	967 (1988)	— (0)	— (0)	— (0)	181 (0)	— (284)	— (599)	— (763)
s351	S-351	1989–2012 (17)	286 (—)	62.4 (2001)	514 (1996)	–52.5 (2000)	2,100 (1995)	— (0)	100 (0)	186 (0)	308 (0)	344 (461)	435 (1,050)	— (1,340)

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USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Caloosahatchee (03090205)														
2292000	Caloosa- hatchee Canal	1939– 2003 (62)	874 (—)	10.0 (1951)	3,710 (1970)	–4,410 (1982)	8,290 (1970)	29.0 (0)	73.6 (5.00)	149 (5.00)	431 (10.0)	1,460 (688)	2,170 (3,690)	2,530 (4,450)
02292000coe	Caloosa- hatchee Canal	1996– 2012 (4)	824 (—)	194 (1999)	1,700 (2003)	0 (1997)	8,020 (2003)	— (0)	— (0)	— (0)	700 (150)	— (856)	— (3,160)	— (4,490)
02292000sfw	Caloosa- hatchee Canal	1998– 2003 (3)	596 (—)	189 (1999)	1,120 (2000)	0 (1999)	5,860 (2000)	— (0)	— (0)	— (0)	475 (48.9)	— (711)	— (1,790)	— (3,340)
02292000sfw (regmod)	Caloosa- hatchee Canal	1965– 2006 (40)	802 (—)	23.1 (2001)	3,710 (1970)	–4,410 (1982)	8,960 (2005)	89.1 (0)	109 (0)	144 (5.00)	304 (5.00)	1,150 (533)	2,250 (3,370)	2,980 (4,740)
02292010	Caloosa- hatchee Canal	2008– 2012 (1)	414 (—)	414 (2009)	414 (2009)	–1,410 (2009)	2,350 (2009)	— (–106)	— (–62.0)	— (30.0)	— (314)	— (711)	— (1,050)	— (1,300)
02292010sfw	Caloosa- hatchee Canal	1963– 2012 (46)	737 (—)	23.1 (2001)	3,710 (1970)	–4,410 (1982)	8,960 (2005)	73.6 (0)	107 (0)	147 (5.00)	270 (10.0)	1,010 (504)	2,200 (3,060)	2,810 (4,620)
2292480	Caloosa- hatchee Canal	1971– 2003 (28)	921 (—)	113 (1981)	3,060 (1995)	0 (1972)	9,720 (1974)	144 (5.70)	220 (9.20)	314 (16.0)	624 (199)	1,310 (817)	2,610 (2,980)	2,640 (4,940)
02292480coe	Caloosa- hatchee Canal	1996– 2012 (1)	320 (—)	320 (1997)	320 (1997)	0 (1997)	3,670 (1997)	— (0)	— (0)	— (0)	— (129)	— (464)	— (902)	— (1,260)
02292480sfw	Caloosa- hatchee Canal	1998– 2003 (3)	1,130 (—)	760 (1999)	1,460 (2000)	18.6 (2000)	7,980 (2000)	— (66.4)	— (90.0)	— (220)	1,180 (519)	— (1,290)	— (3,440)	— (4,850)
02292481sfw (regmod)	Caloosa- hatchee Canal	2001– 2010 (8)	1,410 (—)	107 (2007)	3,840 (2005)	–445 (2009)	9,370 (2006)	— (2.26)	— (6.09)	517 (37.8)	1,120 (446)	2,020 (1,680)	— (4,920)	— (6,640)
02292900	Caloosa- hatchee Canal	1966– 2011 (37)	1,620 (—)	149 (2007)	5,200 (1970)	0 (1981)	21,600 (2006)	296 (0)	467 (7.90)	778 (13.0)	1,340 (488)	2,110 (2,130)	3,360 (5,270)	4,190 (7,180)
02292900coe	Caloosa- hatchee Canal	1996– 2012 (4)	2,570 (—)	1,500 (1999)	3,490 (1998)	0 (1998)	15,800 (2003)	— (0)	— (0)	— (333)	2,640 (1,410)	— (3,690)	— (6,860)	— (9,260)
02292900sfw (regmod)	Caloosa- hatchee Canal	1966– 2011 (44)	1,730 (—)	149 (2007)	5,200 (1970)	0 (1981)	21,600 (2006)	385 (0)	526 (5.70)	833 (14.0)	1,420 (550)	2,160 (2,290)	3,630 (5,540)	4,190 (7,570)
02292901sfw	Caloosa- hatchee Canal	1963– 1990 (23)	1,320 (—)	222 (1990)	3,960 (1983)	0 (1964)	17,300 (1982)	244 (0)	296 (0)	526 (10.0)	1,050 (311)	1,720 (1,700)	2,930 (4,070)	3,220 (6,290)
02292901sfw (regmod)	Caloosa- hatchee Canal	1983– 2005 (21)	1,790 (—)	629 (1990)	4,190 (1995)	0 (1985)	15,500 (1992)	663 (0)	809 (4.90)	1,180 (20.0)	1,480 (785)	1,990 (2,520)	3,360 (5,210)	3,630 (7,070)
02293205 (tidally filetered)	Caloosa- hatchee Canal	2008– 2012 (1)	428 (—)	428 (2011)	428 (2011)	–3,900 (2011)	8,620 (2011)	— (–2,890)	— (–2,280)	— (–1,230)	— (311)	— (1,760)	— (3,370)	— (4,200)
02293210 (tidally filtered)	Caloosa- hatchee Canal	2008– 2012 (2)	1,400 (—)	944 (2009)	1,860 (2010)	–10,100 (2010)	12,400 (2010)	— (–3,780)	— (–2,660)	— (–786)	1,400 (1,270)	— (3,600)	— (5,370)	— (6,910)

Table B–5*A*. Summary descriptive statistics and percentiles for discharge by water year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit, the contributing watershed to the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges.—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey (USGS) hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value. ft^3/s, cubic feet per second; mi^2, square mile]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
SE Florida Atlantic (03090206)														
2276870	St Lucie Canal	1931–2006 (36)	898 (—)	–49.6 (1986)	3,510 (1948)	–4,280 (1985)	8,150 (1983)	–25.3 (–141)	10.0 (0)	163 (10.0)	506 (185)	1,320 (860)	2,290 (3,690)	3,100 (4,630)
02276870coe	St Lucie Canal	1996–2012 (4)	335 (—)	25.2 (1999)	695 (2003)	–1,360 (2000)	4,460 (2003)	— (–470)	— (–125)	— (0)	310 (85.0)	— (429)	— (1,280)	— (1,990)
02276877	St Lucie Canal	1931–2012 (40)	821 (—)	–49.6 (1986)	3,510 (1948)	–4,280 (1985)	8,150 (1983)	–25.1 (–214)	7.01 (0)	118 (10.0)	433 (161)	1,230 (700)	2,260 (3,500)	2,710 (4,560)
02276877sfw	St Lucie Canal	1963–2012 (45)	337 (—)	–174 (1965)	2,050 (1970)	–4,280 (1985)	8,150 (1983)	–156 (–544)	–90.9 (–272)	–35.3 (–33.0)	116 (15.6)	480 (285)	1,120 (1,250)	1,510 (2,280)
02276877sfw (regmod)	St Lucie Canal	1965–2011 (45)	341 (—)	–218 (1972)	2,040 (1970)	–4,280 (1985)	9,630 (1970)	–107 (–675)	–93.2 (–349)	–25.3 (0)	116 (20.0)	480 (293)	1,130 (1,240)	1,510 (2,460)
2277000	St Lucie Canal	1953–2003 (45)	728 (—)	10.0 (1962)	4,150 (1954)	4.00 (1976)	11,500 (1970)	14.2 (10.0)	14.6 (10.0)	35.6 (12.0)	216 (25.0)	835 (250)	2,270 (2,470)	2,910 (6,090)
02277000coe	St Lucie Canal	1996–2012 (1)	163 (—)	163 (1999)	163 (1999)	0 (1999)	5,660 (1999)	— (0)	— (0)	— (0)	— (0)	— (240)	— (438)	— (582)
02277000sfw	St Lucie Canal	1953–2012 (57)	705 (—)	0.78 (2011)	4,140 (1954)	0 (1953)	11,500 (1970)	10.0 (0)	14.6 (10.0)	57.3 (12.0)	289 (33.0)	897 (314)	2,150 (2,410)	2,910 (5,630)
02277000sfw (regmod)	St Lucie Canal	1965–2011 (44)	514 (—)	14.2 (1976)	2,450 (1970)	0 (2004)	11,500 (1970)	16.0 (0)	23.6 (12.0)	78.1 (18.0)	302 (35.0)	643 (310)	1,550 (1,520)	1,700 (2,740)
02281400	Hillsboro Canal	1976–2012 (22)	213 (—)	103 (1977)	351 (2000)	–247 (1979)	1,300 (2000)	127 (26.0)	143 (48.0)	157 (86.0)	209 (148)	235 (275)	321 (522)	322 (619)

[a]Station numbers with "coe" or "sfw" appended to the number are for stations operated in cooperation with either the U.S. Army Corps of Engineers (coe) or the South Florida Water Management District (sfw), and the data for these table rows were obtained from digital files of these agencies. Stations s129, s133, s135, and s351 are South Florida Water Management District (SFWMD) stations. Where indicated, culvert, pump, and weir are discharge–control structures. Regmod, regional modeling dataset constructed by SFWMD for hydrologic studies.

[b]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[c]Statistics listed for mean–annual and mean–daily discharge are based on complete water years. Year of minimum and maximum values for mean–annual and mean–daily discharge numbers shown in parentheses.

[d]Yield units are cubic feet per second per square mile. Yields are based on contributing drainage areas where given. —, the drainage area either is indeterminate or not delineated; yield not calculated.

[e]Mean daily discharge of zero first occurred during the water year indicated but may subsequently have occurred in one or more additional years.

[f]Percentiles listed for mean–annual and mean–daily discharge are based on complete water years. —, too few values to compute the indicated percentile.

Table B–5*B*. Summary descriptive statistics and percentiles for discharge by calendar year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit, the contributing watershed to the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges.—(

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value. ft^3/s, cubic feet per second; mi^2, square mile]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
						Kissimmee (03090101)								
2268903	Kissimmee River	1969–2004 (34)	949 (0.59)	10.9 (1981)	2,360 (2003)	0 (1970)	13,600 (2003)	175 (0)	275 (0)	559 (0)	858 (151)	1,150 (1,380)	1,750 (2,900)	2,010 (4,160)
02268903sfw	Kissimmee River	1933–2012 (78)	1,050 (0.66)	11.0 (1981)	3,340 (1960)	0 (1956)	11,600 (1998)	175 (0)	402 (0)	625 (143)	925 (657)	1,280 (1,370)	2,010 (2,690)	2,340 (3,810)
2273000	Kissimmee River	1928–2004 (72)	1,760 (—)	109 (1981)	5,870 (1960)	0 (1965)	23,500 (1969)	517 (1.20)	708 (53.0)	1,060 (390)	1,650 (1,210)	2,210 (2,280)	2,800 (4,170)	4,130 (5,960)
02273000sfw	Kissimmee River	1987–2012 (19)	1,550 (—)	242 (2007)	3,110 (2005)	0 (1992)	20,400 (2004)	— (0)	411 (0)	1,150 (132)	1,350 (651)	2,290 (2,030)	2,720 (4,170)	— (6,120)
02273000sfw (regmod)	Kissimmee River	1965–2005 (41)	1,480 (—)	109 (1981)	3,210 (2005)	0 (1965)	23,500 (1969)	418 (0)	579 (2.00)	904 (119)	1,340 (698)	2,060 (2,020)	2,580 (3,890)	2,690 (5,740)
2273300	Canal 41A	1964–1989 (25)	185 (—)	5.50 (1977)	615 (1969)	0 (1964)	4,080 (1969)	8.53 (0)	42.1 (0)	78.6 (0)	129 (0)	292 (182)	362 (621)	379 (1,080)
02273300sfw	Canal 41A	1972–2012 (40)	198 (—)	5.50 (1977)	558 (1998)	0 (1972)	4,580 (2005)	17.9 (0)	45.0 (0)	90.8 (0)	178 (0)	290 (196)	377 (637)	443 (1,080)
02273343sfw	Kissimmee River	1972–2012 (38)	33.3 (—)	0.12 (2007)	110 (1999)	0 (1974)	1,500 (2004)	0.26 (0)	2.11 (0)	9.44 (0)	29.1 (0)	52.1 (14.5)	74.2 (95.7)	109 (183)
02273343sfw (culvert)	Kissimmee River	1981–2012 (13)	3.13 (—)	0.22 (2002)	6.72 (2003)	–2.40 (2010)	136 (2008)	— (0)	0.40 (0)	1.73 (0)	2.67 (0)	4.61 (1.98)	5.74 (8.96)	— (18.1)
						Northern Okeechobee Inflow (03090102)								
2274000	Taylor Creek	1955–1989 (33)	14.2 (0.25)	0.53 (1961)	37.7 (1979)	0 (1956)	1,370 (1956)	2.36 (0)	3.13 (0.10)	7.52 (0.48)	13.9 (2.20)	19.3 (8.90)	24.5 (31.0)	30.6 (61.0)
02274010	Taylor Creek	2003–2011 (7)	29.7 (0.65)	12.0 (2006)	53.0 (2005)	–2.00 (2007)	1,510 (2008)	— (0.85)	— (1.40)	15.4 (3.40)	23.5 (6.80)	50.8 (17.0)	— (54.0)	— (118)
02274325	Taylor Creek	2004–2011 (5)	43.9 (0.75)	23.1 (2007)	75.0 (2005)	–7.10 (2008)	2,880 (2008)	— (0.62)	— (2.60)	27.4 (6.80)	32.3 (13.0)	61.7 (27.0)	— (68.0)	— (148)
2274500	Taylor Creek	1955–1981 (26)	91.8 (0.93)	4.36 (1961)	228 (1960)	0 (1956)	6,070 (1956)	4.68 (0)	7.36 (0)	35.5 (3.70)	87.4 (14.0)	129 (65.0)	187 (243)	224 (459)
2275000	Taylor Creek	1932–1933 (1)	56.4 (0.49)	56.4 (1932)	56.4 (1932)	0 (1932)	932 (1932)	— (0)	— (0.10)	— (0.80)	— (5.80)	— (42.0)	— (216)	— (309)
02275503	Taylor Creek	1992–2010 (7)	5.88 (—)	–6.20 (2002)	18.6 (1996)	–136 (2007)	399 (2008)	— (–29.0)	— (–14.0)	0.39 (0)	2.43 (0)	13.5 (15.0)	— (28.0)	— (54.0)

Table B–5*B*. Summary descriptive statistics and percentiles for discharge by calendar year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit, the contributing watershed to the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges.—Continued

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USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft³/s			Mean-daily discharge,[c] in ft³/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Northern Okeechobee Inflow (03090102)—Continued														
02275606	Nubbin Slough	2000–2011 (2)	137 (—)	97.0 (2009)	177 (2008)	–254 (2008)	5,770 (2008)	— (–103)	— (–64.0)	— (8.20)	137 (88.0)	— (172)	— (261)	— (390)
02275606sfw	Nubbin Slough	1971–2012 (40)	134 (—)	21.5 (2000)	301 (1979)	–117 (1998)	5,900 (2004)	26.8 (0)	42.7 (0)	86.4 (0)	123 (7.00)	181 (126)	234 (362)	261 (608)
02275606sfw (regmod)	Nubbin Slough	1971–2008 (35)	142 (—)	21.5 (2000)	301 (1979)	–117 (1998)	5,900 (2004)	24.2 (0)	35.8 (0)	95.5 (0)	125 (20.2)	209 (137)	255 (379)	267 (656)
s133	S-133	1970–2012 (35)	27.2 (—)	0.54 (2009)	74.9 (1995)	0 (1971)	753 (1979)	0.57 (0)	1.31 (0)	5.03 (0)	21.4 (0)	46.7 (0)	61.1 (136)	73.2 (211)
s133 (regmod)	S-133	1970–2010 (35)	27.9 (—)	0.54 (2009)	74.9 (1995)	0 (1971)	753 (1979)	0.57 (0)	1.31 (0)	6.37 (0)	22.2 (0)	46.7 (0)	61.1 (141)	73.2 (212)
s135	S-135	1992–2011 (6)	1.46 (—)	–2.70 (1994)	8.10 (2001)	–186 (2005)	377 (2001)	— (0)	— (0)	–2.68 (0)	–0.98 (0)	8.02 (0)	— (0)	— (14.8)
s135 (pump)	S-135	1970–2011 (37)	24.4 (—)	0.03 (2011)	84.2 (1979)	0 (1970)	602 (1979)	0.06 (0)	0.69 (0)	7.31 (0)	17.5 (0)	32.7 (0)	66.4 (126)	68.6 (174)
s135 (regmod)	S-135	1987–2005 (14)	–4.42 (—)	–31.6 (1999)	13.7 (2002)	–406 (1999)	221 (1988)	— (–25.0)	–18.3 (–1.90)	–4.84 (0)	–2.48 (0)	–0.00 (0)	0.79 (0)	— (0)
Western Okeechobee Inflow (03090103)														
02255600	Fisheating Creek	2003–2012 (4)	37.1 (0.62)	9.30 (2011)	62.3 (2008)	0 (2008)	796 (2008)	— (0)	— (0.11)	— (0.35)	38.4 (2.20)	— (19.0)	— (99.0)	— (246)
2256000	Fisheating Creek	1955–1966 (10)	144 (0.77)	4.82 (1956)	355 (1960)	0 (1956)	4,520 (1960)	— (0)	— (0)	45.5 (1.80)	119 (20.0)	168 (108)	— (371)	— (754)
02256500	Fisheating Creek	1931–2011 (79)	253 (0.81)	23.1 (2000)	734 (1953)	0 (1932)	30,500 (1951)	39.0 (0)	62.0 (0)	127 (4.40)	238 (38.0)	347 (236)	432 (711)	581 (1,170)
02256500sfw	Fisheating Creek	1972–2012 (37)	233 (0.75)	22.8 (2000)	590 (1998)	0 (1972)	8,030 (1974)	38.9 (0)	51.1 (0.07)	118 (5.00)	216 (32.0)	319 (216)	428 (701)	458 (1,100)
02257000	Fisheating Creek	1997–2011 (11)	397 (—)	44.9 (2007)	706 (1998)	–30.0 (2010)	5,030 (2006)	— (13.0)	145 (24.0)	253 (48.0)	444 (118)	527 (388)	564 (1,200)	— (1,970)
02257030	Fisheating Lock	2001–2011 (4)	0.59 (—)	–0.12 (2009)	1.64 (2002)	–27.0 (2002)	91.0 (2002)	— (–3.70)	— (–2.10)	— (0)	0.43 (0)	— (0)	— (1.10)	— (4.80)

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USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft³/s			Mean-daily discharge,[c] in ft³/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Western Okeechobee Inflow (03090103)—Continued														
02257030sfw	Fisheating Lock	1997–2012 (9)	1.65 (—)	0.06 (2010)	4.11 (2006)	0 (1997)	166 (2001)	— (0)	— (0)	0.40 (0)	1.87 (0)	2.65 (0)	— (0)	— (7.50)
02257030sfw (pump)	Fisheating Lock	1969–2012 (40)	9.83 (—)	0.23 (2007)	38.8 (2005)	0 (1969)	310 (2008)	0.98 (0)	1.24 (0)	4.06 (0)	8.06 (0)	14.4 (0)	19.3 (47.8)	22.0 (69.9)
02257030sfw (pump, regmod)g	Fisheating Lock	2001–2010 (10)	12.2 (—)	0.23 (2007)	38.8 (2005)	0 (2001)	310 (2008)	— (0)	— (0)	6.44 (0)	11.0 (0)	14.5 (0)	— (55.1)	— (70.6)
02257030sfw (regmod)	Fisheating Lock	2001–2010 (7)	–0.15 (—)	–8.48 (2004)	4.11 (2006)	–62.0 (2004)	106 (2009)	— (0)	— (0)	–0.58 (0)	0.40 (0)	2.80 (0)	— (0)	— (0)
2257800	Harney Pond Canal	1962–1999 (26)	206 (—)	43.4 (1981)	464 (1979)	0 (1963)	4,670 (1970)	66.1 (0)	75.0 (0)	114 (0)	158 (0)	272 (250)	417 (637)	422 (977)
02257800sfw	Harney Pond Canal	1972–2012 (40)	217 (—)	39.9 (2000)	464 (1979)	0 (1972)	4,100 (2008)	45.5 (0)	68.0 (0)	122 (0)	201 (0.63)	319 (261)	411 (697)	441 (1,040)
02257800sfw (weir)	Harney Pond Canal	2008–2012 (3)	89.4 (—)	12.0 (2009)	234 (2011)	–647 (2009)	2,650 (2010)	— (–520)	— (–410)	— (–132)	22.3 (74.1)	— (275)	— (512)	— (750)
02258000	Harney Pond Canal	1993–2011 (3)	279 (—)	141 (2010)	397 (2002)	–254 (2002)	4,130 (2001)	— (–98.0)	— (–42.0)	— (3.30)	300 (89.0)	— (382)	— (889)	— (1,270)
2259200	Indian Prairie Canal	1962–1989 (26)	42.6 (—)	0.20 (1985)	119 (1968)	0 (1963)	2,130 (1969)	5.98 (0)	7.04 (0)	14.9 (0)	31.5 (0)	59.8 (0)	98.4 (122)	99.2 (255)
02259200sfw	Indian Prairie Canal	1962–2012 (43)	52.7 (—)	0.20 (1985)	147 (2004)	0 (1963)	3,280 (1990)	7.04 (0)	10.4 (0)	20.8 (0)	43.6 (0)	82.1 (40.2)	105 (163)	120 (276)
2259627	Buckhead Lock	2001–2009 (4)	0.02 (—)	–1.18 (2005)	1.12 (2003)	–41.0 (2002)	40.0 (2003)	— (–5.50)	— (–3.65)	— (–1.70)	0.08 (0)	— (0.56)	— (4.50)	— (7.00)
s129	S-129	1986–2012 (10)	–46.6 (—)	–221 (1997)	1.35 (2009)	–499 (1997)	95.3 (2009)	— (–310)	— (–230)	–70.5 (0)	0.27 (0)	0.88 (0)	— (0.01)	— (2.52)
s129 (pump)	S-129	1969–2012 (25)	16.8 (—)	2.60 (1985)	33.1 (2005)	0 (1984)	483 (2008)	2.75 (0)	7.88 (0)	11.9 (0)	16.6 (0)	21.4 (0)	26.2 (72.4)	32.8 (96.7)
s129 (pump, regmod)	S-129	2001–2010 (9)	17.9 (—)	11.2 (2001)	33.1 (2005)	0 (2001)	483 (2008)	— (0)	— (0)	12.8 (0)	16.6 (0)	18.8 (0)	— (75.9)	— (95.2)
s129 (regmod)	S-129	2001–2009 (8)	–0.62 (—)	–6.16 (2001)	1.35 (2009)	–431 (2001)	95.3 (2009)	— (0)	— (0)	–0.21 (0)	–0.01 (0)	0.13 (0)	— (0)	— (0)

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USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Everglades (03090202)														
2278000	West Palm Beach Canal	1939–2007 (64)	170 (—)	–74.1 (1947)	486 (2002)	–1,760 (1942)	1,610 (1959)	38.4 (–154)	58.5 (0)	87.1 (0)	175 (57.0)	232 (357)	310 (552)	329 (713)
02278000sfw_1	West Palm Beach Canal	1989–2012 (18)	175 (—)	31.7 (2008)	452 (2002)	–763 (1990)	1,170 (2002)	— (0)	35.4 (0)	80.1 (0)	187 (0)	234 (307)	297 (650)	— (748)
02278000sfw_1 (regmod)	West Palm Beach Canal	1965–2011 (47)	155 (—)	31.0 (1971)	408 (2002)	–1,310 (1982)	1,590 (1966)	58.5 (0)	61.5 (0)	79.3 (0)	135 (0)	216 (282)	266 (554)	305 (731)
02278000sfw_2	West Palm Beach Canal	1973–2012 (39)	153 (—)	38.4 (1991)	481 (2002)	–1,310 (1982)	1,410 (1976)	58.5 (0)	61.5 (0)	78.9 (0)	123 (0)	222 (250)	270 (557)	335 (742)
02280500	Hillsboro Canal	1957–2012 (44)	24.9 (—)	–198 (1959)	250 (2000)	–1,720 (1981)	1,210 (1999)	–146 (–498)	–83.1 (–329)	–46.8 (–124)	11.2 (31.0)	82.5 (204)	193 (375)	233 (488)
2283498	N New R Canal	1967–2003 (35)	153 (—)	–286 (1982)	682 (1992)	–4,030 (2000)	3,440 (1985)	–239 (–1,220)	–165 (–575)	–14.8 (0)	116 (0)	348 (504)	425 (1,120)	585 (1,410)
02283498sfw	N New R Canal	1963–2012 (49)	173 (—)	–286 (1982)	682 (1992)	–4,030 (2000)	3,440 (1985)	–196 (–1,070)	–136 (–433)	13.5 (0)	183 (0)	327 (508)	399 (1,090)	582 (1,380)
02283498sfw (regmod)	N New R Canal	1965–2005 (41)	172 (—)	–286 (1982)	682 (1992)	–4,030 (2000)	3,440 (1985)	–195 (–1,190)	–136 (–563)	4.59 (0)	168 (0)	348 (537)	399 (1,150)	582 (1,440)
02283500	N New R Canal	1957–2012 (47)	115 (—)	–218 (1982)	489 (1992)	–3,460 (1982)	2,920 (1985)	–120 (–782)	–81.7 (–371)	11.4 (–48.0)	90.6 (111)	236 (352)	341 (678)	352 (917)
02286399sfw	Miami Canal	1990–2012 (19)	153 (—)	18.5 (2001)	337 (1992)	–74.3 (2000)	1,680 (2005)	— (0)	21.6 (0)	86.2 (0)	145 (0)	246 (178)	267 (582)	— (864)
02286400	Miami Canal	1957–2011 (45)	85.0 (—)	–338 (1960)	479 (1993)	–2,790 (1970)	2,280 (1966)	–208 (–665)	–118 (–302)	8.42 (0)	92.7 (12.0)	209 (248)	266 (551)	273 (841)
02286400sfw	Miami Canal	1963–2012 (49)	124 (—)	–135 (2001)	480 (1993)	–2,790 (1970)	2,280 (1966)	–73.7 (–482)	–39.4 (–26.2)	46.1 (0)	121 (0)	223 (262)	272 (605)	321 (893)
02286400sfw (regmod)	Miami Canal	1965–2005 (41)	121 (—)	–135 (2001)	480 (1993)	–2,790 (1970)	2,280 (1966)	–73.7 (–549)	–39.4 (–80.0)	34.0 (0)	125 (0)	223 (265)	272 (624)	321 (918)
2286403	Miami Canal	1984–1990 (4)	162 (—)	66.7 (1986)	277 (1988)	–101 (1989)	967 (1988)	— (0)	— (0)	— (0)	152 (0)	— (276)	— (599)	— (763)
s351	S-351	1989–2012 (18)	269 (—)	24.0 (2008)	500 (1996)	–52.5 (2000)	2,100 (1994)	— (0)	38.2 (0)	183 (0)	286 (0)	374 (403)	414 (1,010)	— (1,320)

Table B–5*B*. Summary descriptive statistics and percentiles for discharge by calendar year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit, the contributing watershed to the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges.—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value. ft^3/s, cubic feet per second; mi^2, square mile]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
						Caloosahatchee (03090205)								
2292000	Caloosa-hatchee Canal	1938–2003 (62)	877 (—)	9.07 (1962)	2,880 (1995)	–4,410 (1982)	8,290 (1970)	30.4 (0)	87.8 (5.00)	151 (5.00)	650 (10.0)	1,290 (701)	2,170 (3,690)	2,610 (4,450)
02292000coe	Caloosa-hatchee Canal	1996–2012 (3)	1,130 (—)	625 (2000)	1,950 (2003)	–272 (2000)	8,020 (2003)	— (0)	— (0)	— (0)	819 (422)	— (1,340)	— (4,290)	— (4,620)
02292000sfw	Caloosa-hatchee Canal	1998–2003 (2)	709 (—)	634 (2002)	784 (1999)	0 (1999)	5,860 (1999)	— (0)	— (0)	— (0)	709 (208)	— (856)	— (2,400)	— (3,900)
02292000sfw (regmod)	Caloosa-hatchee Canal	1965–2005 (41)	813 (—)	–17.5 (2001)	3,130 (2005)	–4,410 (1982)	8,960 (2004)	87.8 (0)	102 (0)	151 (5.00)	324 (5.00)	1,140 (541)	2,090 (3,410)	2,610 (4,760)
02292010	Caloosa-hatchee Canal	2008–2012 (1)	360 (—)	360 (2009)	360 (2009)	–1,410 (2009)	2,350 (2009)	— (–134)	— (–95.0)	— (0.37)	— (256)	— (629)	— (988)	— (1,260)
02292010sfw	Caloosa-hatchee Canal	1963–2012 (47)	744 (—)	–46.3 (2011)	3,130 (2005)	–4,410 (1982)	8,960 (2004)	35.6 (0)	87.8 (0)	149 (5.00)	310 (10.0)	1,120 (502)	2,090 (3,120)	2,610 (4,620)
2292480	Caloosa-hatchee Canal	1971–2003 (28)	922 (—)	114 (1981)	3,280 (1995)	0 (1972)	9,720 (1974)	117 (6.00)	242 (9.40)	322 (16.0)	604 (200)	1,340 (837)	2,460 (2,940)	2,610 (4,940)
02292480coe	Caloosa-hatchee Canal	1996–2012 (2)	2,200 (—)	401 (1997)	4,000 (2005)	0 (1997)	9,370 (2005)	— (0)	— (0)	— (140)	2,200 (906)	— (3,980)	— (6,690)	— (7,250)
02292480sfw	Caloosa-hatchee Canal	1998–2003 (2)	1,420 (—)	1,410 (2002)	1,430 (1999)	36.7 (2002)	7,980 (1999)	— (87.4)	— (119)	— (285)	1,420 (726)	— (2,060)	— (3,930)	— (5,240)
02292481sfw (regmod)	Caloosa-hatchee Canal	2001–2010 (9)	1,280 (—)	86.7 (2007)	4,010 (2005)	–445 (2009)	9,370 (2005)	— (2.02)	— (4.55)	520 (20.6)	688 (342)	1,730 (1,430)	— (4,590)	— (6,500)
02292900	Caloosa-hatchee Canal	1966–2011 (34)	1,600 (—)	131 (2007)	4,660 (1995)	0 (1981)	21,600 (2006)	298 (3.30)	560 (8.90)	675 (13.0)	1,290 (477)	2,150 (2,100)	3,570 (5,250)	3,860 (7,070)
02292900coe	Caloosa-hatchee Canal	1996–2012 (3)	2,500 (—)	1,950 (2010)	3,470 (1998)	0 (1998)	13,600 (1998)	— (0)	— (0)	— (316)	2,080 (1,320)	— (3,800)	— (6,540)	— (8,730)
02292900sfw (regmod)	Caloosa-hatchee Canal	1966–2010 (44)	1,720 (—)	131 (2007)	5,380 (2005)	0 (1981)	21,600 (2006)	469 (0)	576 (5.40)	827 (14.0)	1,290 (548)	2,180 (2,260)	3,610 (5,540)	3,860 (7,570)
02292901sfw	Caloosa-hatchee Canal	1963–1990 (23)	1,350 (—)	119 (1990)	3,860 (1983)	0 (1963)	17,300 (1982)	298 (0)	469 (0)	675 (11.0)	1,000 (374)	1,750 (1,700)	2,710 (4,070)	3,600 (6,290)
02292901sfw (regmod)	Caloosa-hatchee Canal	1983–2005 (21)	1,830 (—)	586 (1990)	4,660 (1995)	0 (1985)	15,500 (1992)	684 (0)	854 (4.60)	1,040 (20.0)	1,330 (798)	2,250 (2,580)	3,570 (5,360)	3,610 (7,280)

Table B–5*B*. Summary descriptive statistics and percentiles for discharge by calendar year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit, the contributing watershed to the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges.—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value. ft^3/s, cubic feet per second; mi^2, square mile]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
						Caloosahatchee (03090205)—Continued								
02293205 (tidally filtered)	Caloosa-hatchee Canal	2007–2012 (1)	1,810 (—)	1,810 (2008)	1,810 (2008)	–4,670 (2008)	26,000 (2008)	— (–2,370)	— (–1,680)	— (–239)	— (1,280)	— (2,970)	— (4,920)	— (6,850)
02293210 (tidally filtered)	Caloosa-hatchee Canal	2007–2011 (3)	1,150 (—)	537 (2009)	2,090 (2010)	–10,100 (2009)	25,700 (2008)	— (–4,080)	— (–2,960)	— (–1,200)	821 (773)	— (3,310)	— (5,380)	— (7,470)
						SE Florida Atlantic (03090206)								
2276870	St Lucie Canal	1931–2006 (35)	951 (—)	–99.8 (1985)	3,680 (1947)	–4,280 (1985)	8,150 (1983)	–85.0 (–170)	19.2 (0)	242 (10.0)	637 (204)	1,380 (983)	2,100 (3,850)	3,290 (4,740)
02276870coe	St Lucie Canal	1996–2012 (4)	341 (—)	73.4 (2000)	783 (2003)	–1,510 (2000)	4,460 (2003)	— (–811)	— (–303)	— (0)	253 (125)	— (488)	— (1,400)	— (2,050)
02276877	St Lucie Canal	1931–2012 (38)	883 (—)	–166 (2007)	3,680 (1947)	–4,280 (1985)	8,150 (1983)	–99.8 (–257)	10.0 (–9.00)	222 (10.0)	524 (184)	1,380 (824)	2,100 (3,670)	3,290 (4,650)
02276877sfw	St Lucie Canal	1963–2012 (46)	323 (—)	–216 (1967)	1,460 (1969)	–4,280 (1985)	8,150 (1983)	–166 (–544)	–99.9 (–282)	–43.2 (–40.6)	139 (14.6)	434 (272)	1,290 (1,190)	1,380 (2,280)
02276877sfw (regmod)	St Lucie Canal	1965–2010 (46)	332 (—)	–185 (1971)	1,460 (1998)	–4,280 (1985)	9,630 (1970)	–120 (–675)	–99.9 (–354)	–58.9 (0)	180 (19.5)	434 (290)	1,290 (1,200)	1,380 (2,430)
2277000	St Lucie Canal	1952–2003 (45)	725 (—)	10.0 (1956)	4,260 (1960)	4.00 (1976)	11,500 (1970)	10.0 (10.0)	14.4 (10.0)	25.4 (12.0)	261 (26.0)	1,180 (260)	2,020 (2,460)	3,290 (6,050)
02277000sfw	St Lucie Canal	1952–2011 (57)	687 (—)	0.16 (2011)	4,260 (1960)	0 (1953)	11,500 (1970)	10.0 (0)	14.4 (10.0)	50.9 (12.0)	260 (32.0)	999 (303)	1,760 (2,380)	3,280 (5,470)
02277000sfw (regmod)	St Lucie Canal	1965–2010 (45)	503 (—)	14.2 (1976)	1,760 (1995)	0 (2003)	11,500 (1970)	16.0 (0)	22.8 (12.0)	73.4 (18.0)	265 (35.0)	641 (299)	1,640 (1,490)	1,680 (2,660)
02281400	Hillsboro Canal	1975–2011 (20)	213 (—)	123 (1996)	405 (1999)	–247 (1979)	1,300 (1999)	— (25.0)	127 (47.0)	163 (88.0)	209 (150)	220 (272)	323 (517)	— (628)

[a]Station numbers with "coe" or "sfw" appended to the number are for stations operated in cooperation with either the U.S. Army Corps of Engineers (coe) or the South Florida Water Management District (sfw), and the data for these table rows were obtained from digital files of these agencies. Stations s129, s133, s135, and s351 are South Florida Water Management District (SFWMD) stations. Where indicated, culvert, pump, and weir are discharge-control structures. Regmod, regional modeling dataset constructed by SFWMD for hydrologic studies.

[b]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[c]Statistics listed for mean-annual and mean-daily discharge are based on complete calendar years. Year of minimum and maximum values for mean-annual and mean-daily discharge numbers shown in parentheses.

[d]Yield units are cubic feet per second per square mile. Yields are based on contributing drainage areas where given. —, the drainage area either is indeterminate or not delineated; yield not calculated.

[e]Mean daily discharge of zero first occurred during the calendar year indicated but may subsequently have occurred in one or more additional years.

[f]Percentiles listed for mean-annual and mean-daily discharge are based on complete calendar years. —, too few values to compute the indicated percentile.

Table B–6*A*. Summary descriptive statistics and percentiles for selected water-quality parameters by water year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit (03090205), the contributing watershed to the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges.

[Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual parameter value[b]			Mean-daily parameter value[b]		Percentiles of mean-annual parameter values and (mean-daily parameter values)[c]						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Water temperature, in degrees Celsius														
02292901sfw (near bottom)	Caloosa-hatchee Canal	1992–2012 (10)	25.3	24.6 (1996)	26.2 (2008)	15.3 (1996)	33.6 (1998)	— (18.0)	— (19.3)	25.0 (21.9)	25.3 (26.1)	25.7 (29.1)	— (30.1)	— (30.6)
02292901sfw (near surface)	Caloosa-hatchee Canal	1992–2012 (9)	25.3	24.1 (1996)	26.2 (2008)	14.0 (2010)	32.1 (1995)	— (17.5)	— (18.7)	25.2 (21.9)	25.4 (26.3)	25.5 (29.2)	— (29.9)	— (30.5)
263144-082010400 (minimum, near bottom)	Caloosa-hatchee Canal	2008–2010 (1)	24.1	24.1 (2010)	24.1 (2010)	8.7 (2010)	31.8 (2010)	— (14.5)	— (15.6)	— (19.3)	— (25.0)	— (29.2)	— (30.4)	— (30.9)
263144-082010400 (maximum, near bottom)	Caloosa-hatchee Canal	2008–2010 (1)	26.1	26.1 (2010)	26.1 (2010)	10.8 (2010)	34.7 (2010)	— (16.5)	— (17.8)	— (21.3)	— (27.3)	— (31.3)	— (32.5)	— (33.4)
263144-082010400 (maximum, near surface)	Caloosa-hatchee Canal	2008–2010 (1)	26.3	26.3 (2010)	26.3 (2010)	10.7 (2010)	34.7 (2010)	— (16.3)	— (17.7)	— (21.3)	— (27.6)	— (31.6)	— (32.8)	— (33.6)
Specific conductance, in microsiemens per centimeter at 25 degrees Celsius														
02292901sfw	Caloosa-hatchee Canal	1992–2012 (6)	3,680	711 (2005)	10,000 (2011)	257 (2006)	32,000 (2011)	— (344)	— (375)	1,140 (434)	2,160 (581)	5,830 (5,360)	— (10,900)	— (15,600)
02292901sfw	Caloosa-hatchee Canal	1992–2012 (5)	4,630	647 (2003)	9,050 (2011)	290 (2003)	30,900 (2011)	— (387)	— (411)	1,830 (492)	3,070 (834)	8,580 (7,850)	— (14,500)	— (17,300)
Salinity, in parts per thousand														
263144-082010400 (minimum, near bottom)	Caloosa-hatchee Canal	2008–2010 (1)	16.6	16.6 (2010)	16.6 (2010)	3.80 (2010)	29.0 (2010)	— (5.60)	— (7.50)	— (10.3)	— (15.0)	— (24.1)	— (26.1)	— (26.9)
263144-082010400 (maximum, near bottom)	Caloosa-hatchee Canal	2008–2010 (1)	25.5	25.5 (2010)	25.5 (2010)	13.8 (2010)	33.0 (2010)	— (18.7)	— (19.9)	— (22.8)	— (25.6)	— (28.7)	— (29.9)	— (30.6)
263144-082010400 (maximum, near surface)	Caloosa-hatchee Canal	2008–2010 (1)	23.0	23.0 (2010)	23.0 (2010)	9.50 (2010)	32.9 (2010)	— (13.1)	— (15.2)	— (18.2)	— (22.7)	— (28.5)	— (29.9)	— (30.4)

[a]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily parameter values are based on complete water years. Year of minimum and maximum parameter values for mean-annual and mean-daily parameter-value numbers shown in parentheses.

[c]Percentiles listed for mean-annual and mean-daily parameter values are based on complete water years.

Table B–6*B*. Summary descriptive statistics and percentiles for selected water-quality parameters by calendar year for gaging stations in the contributing watersheds of the Lake Okeechobee drainage, Southern Florida subregion (0309), including the Caloosahatchee hydrologic cataloging unit (03090205), the contributing watershed to the Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges.

[Major drainage boundaries and locations of gaging stations shown in figure B1. U.S. Geological Survey hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual parameter value[b]			Mean-daily parameter value[b]		Percentiles of mean-annual parameter values and (mean-daily parameter values)[c]						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Water temperature, in degrees Celsius														
02292900	Caloosahatchee Canal	1989–1997 (1)	25.3	25.3 (1993)	25.3 (1993)	17.6 (1993)	32.3 (1993)	— (19.2)	— (19.8)	— (22.2)	— (24.9)	— (29.2)	— (30.1)	— (30.4)
02292901sfw (near bottom)	Caloosahatchee Canal	1992–2012 (9)	25.4	24.7 (2005)	26.3 (2007)	15.3 (1996)	33.6 (1998)	— (18.2)	— (19.4)	24.9 (22.0)	25.6 (26.0)	25.6 (29.1)	— (30.1)	— (30.7)
02292901sfw (near surface)	Caloosahatchee Canal	1992–2012 (9)	25.1	24.4 (1996)	25.7 (1998)	14.0 (2010)	33.3 (1998)	— (17.6)	— (18.8)	24.8 (21.5)	25.0 (25.7)	25.6 (29.2)	— (30.1)	— (30.8)
Specific conductance, in microsiemens per centimeter at 25 degrees Celsius														
02292901sfw (near bottom)	Caloosahatchee Canal	1992–2012 (8)	4,610	637 (2005)	14,800 (2008)	219 (2008)	35,400 (2008)	— (348)	— (374)	819 (427)	3,130 (544)	6,740 (5,190)	— (16,200)	— (25,500)
02292901sfw (near surface)	Caloosahatchee Canal	1992–2012 (5)	6,810	852 (1998)	14,300 (2008)	227 (2008)	32,700 (2008)	— (419)	— (440)	4,450 (493)	6,210 (1,320)	8,230 (10,900)	— (22,600)	— (27,400)

[a]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily parameter values are based on complete calendar years. Year of minimum and maximum parameter values for mean-annual and mean-daily parameter-value numbers shown in parentheses.

[c]Percentiles listed for mean-annual and mean-daily parameter values are based on complete calendar years.

Table B–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure B1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS station[a] number	Station name	Parameter	Plot frames[b–f]	File name[g]
		Kissimmee (03090101)		
02268903	Kissimmee R at S65 nr Lake Wales, FL	Gage height	A1–A4; A5–A8	s02268903gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02268903gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02268903qmn.p12ar.pdf
02268903sfw	Kissimmee R at S65 nr Lake Wales, FL	Gage height (headwater)	A1–A4; A5–A8	s02268903sfwgmn_h.p12ar.pdf
		Gage height (headwater)	A1–A4; A5–A8	s02268903sfwgmn_h.p12lg.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02268903sfwgmn_t.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02268903sfwqmn.p12ar.pdf
02273000	Kissimmee R at S65E nr Okeechobee, FL	Gage height	A1–A4; A5–A8	s02273000gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02273000gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02273000qmn.p12ar.pdf
02273000sfw	Kissimmee R at S65E nr Okeechobee, FL	Gage height (headwater)	A1–A4; A5–A8	s02273000sfwgmn_h.p12ar.pdf
		Gage height (headwater)	A1–A4; A5–A8	s02273000sfwgmn_h.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02273000sfwqmn.p12ar.pdf
		Discharge (regmod)	A1–A4; A5–A8	s02273000sfwqmn_r.p12ar.pdf
02273001sfw	Kissimmee R bl S65E nr Okeechobee, FL	Gage height (tailwater)	A1–A4; A5–A8	s02273001sfwgmn_t.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02273001sfwgmn_t.p12lg.pdf
02273300	Canal 41A at S84 nr Okeechobee, FL	Gage height	A1–A4; A5–A8	s02273300gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02273300gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02273300qmn.p12ar.pdf
02273300sfw	Canal 41A at S84 nr Okeechobee, FL	Gage height (headwater)	A1–A4; A5–A8	s02273300sfwgmn_h.p12ar.pdf
		Gage height (headwater)	A1–A4; A5–A8	s02273300sfwgmn_h.p12lg.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02273300sfwgmn_t.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02273300sfwgmn_t.p12lg.pdf
		Discharge	A1–A4; A5, A7, A8	s02273300sfwqmn.p12ar.pdf
02273343sfw	Kissimmee R bl S154 nr Okeechobee, FL	Gage height (headwater)	A1–A4; A5–A8	s02273343sfwgmn_h.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02273343sfwgmn_t.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02273343sfwgmn_t.p12lg.pdf
		Gage height (headwater, culvert)	A1–A4; A5–A8	s02273343sfwgmn_hc.p12ar.pdf
		Gage height (headwater, culvert)	A1–A4; A5–A8	s02273343sfwgmn_hc.p12lg.pdf

Table B–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure B1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS station[a] number	Station name	Parameter	Plot frames[b–f]	File name[g]
		Kissimmee (03090101)—Continued		
02273343sfw—Continued	Kissimmee R bl S154 nr Okeechobee, FL	Gage height (tailwater, culvert)	A1–A4; A5–A8	s02273343sfwgmn_tc.p12ar.pdf
		Gage height (tailwater, culvert)	A1–A4; A5–A8	s02273343sfwgmn_tc.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02273343sfwqmn.p12ar.pdf
		Discharge (culvert)	A1–A4; A5, A7, A8	s02273343sfwqmn_c.p12ar.pdf
		Northern Okeechobee Inflow (03090102)		
02274000	Taylor Cr nr Basinger, FL	Gage height	A1–A4; A5–A8	s02274000gmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02274000qmn.p12ar.pdf
02274010	Taylor Cr nr Okeechobee, FL	Gage height	A1, A2, A4; A5–A8	s02274010gmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s02274010gmn.p12lg.pdf
		Discharge	A1, A2, A4; A5–A8	s02274010qmn.p12ar.pdf
02274325	Taylor Cr at Grassy Island nr Okeechobee, FL	Gage height	A1, A2, A4; A5–A8	s02274325gmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s02274325gmn.p12lg.pdf
		Discharge	A1, A2, A4; A5–A8	s02274325qmn.p12ar.pdf
02274500	Taylor Cr ab Okeechobee, FL	Gage height	A1–A4; A5–A8	s02274500gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02274500gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02274500qmn.p12ar.pdf
02275000	Taylor Cr at Okeechobee, FL	Discharge	A1, A2, A4	s02275000qmn.p01ar.pdf
02275503	Taylor Cr at HGS6 nr Okeechobee, FL	Gage height	A1–A4; A5–A8	s02275503gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02275503gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02275503qmn.p12ar.pdf
02275606	Nubbin Slough nr Sherman, FL	Gage height	A1–A4; A5–A8	s02275606gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02275606gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02275606qmn.p12ar.pdf
02275606sfw	Nubbin Slough nr Sherman, FL	Gage height (headwater)	A1–A4; A5–A8	s02275606sfwgmn_h.p12ar.pdf
		Gage height (headwater)	A1–A4; A5–A8	s02275606sfwgmn_h.p12lg.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02275606sfwgmn_t.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02275606sfwgmn_t.p12lg.pdf
		Discharge	A1–A4; A5, A7, A8	s02275606sfwqmn.p12ar.pdf
		Discharge (regmod)	A1–A4; A5, A7, A8	s02275606sfwqmn_r.p12ar.pdf
S133	S-133 pump from NE Shore to Lake Okeechobee, FL	Gage height (headwater)	A1–A4; A5–A8	ss133gmn_h.p12ar.pdf
		Gage height (headwater)	A1–A4; A5–A8	ss133gmn_h.p12lg.pdf
		Gage height (tailwater)	A1–A4; A5–A8	ss133gmn_t.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5–A8	ss133gmn_t.p12lg.pdf

Table B–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure B1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS station[a] number	Station name	Parameter	Plot frames[b–f]	File name[g]
		Northern Okeechobee Inflow (03090102)—Continued		
S133—Continued	S-133 pump from NE Shore to Lake Okeechobee, FL	Gage height (headwater, pump)	A1, A2, A4	ss133gmn_hp.p01ar.pdf
		Gage height (headwater, pump)	A1, A2, A4	ss133gmn_hp.p01lg.pdf
		Gage height (tailwater, pump)	A1, A2, A4	ss133gmn_tp.p01ar.pdf
		Gage height (tailwater, pump)	A1, A2, A4	ss133gmn_tp.p01lg.pdf
		Discharge	A1–A4; A7, A8	ss133qmn.p12ar.pdf
		Discharge (regmod)	A1–A4; A7, A8	ss133qmn_r.p12ar.pdf
S135	S-135 (pump, culvert) from NE Shore to Lake Okeechobee, FL	Gage height (headwater)	A1–A4; A5–A8	ss135gmn_h.p12ar.pdf
		Gage height (headwater)	A1–A4; A5–A8	ss135gmn_h.p12lg.pdf
		Gage height (tailwater)	A1–A4; A5–A8	ss135gmn_t.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5–A8	ss135gmn_t.p12lg.pdf
		Gage height (headwater, pump)	A1, A2, A4; A5–A8	ss135gmn_hp.p12ar.pdf
		Gage height (headwater, pump)	A1, A2, A4; A5–A8	ss135gmn_hp.p12lg.pdf
		Gage height (tailwater, pump)	A1, A2, A4	ss135gmn_tp.p01ar.pdf
		Gage height (tailwater, pump)	A1, A2, A4	ss135gmn_tp.p01lg.pdf
		Discharge	A1–A4; A7, A8	ss135qmn.p12ar.pdf
		Discharge (pump)	A1–A4; A7, A8	ss135qmn_p.p12ar.pdf
		Discharge (regmod)	A1–A4; A7, A8	ss135qmn_r.p12ar.pdf
		Western Okeechobee Inflow (03090103)		
02255600	Fisheating Cr nr Lake Placid, FL	Gage height	A1, A2, A4; A5–A8	s02255600gmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s02255600gmn.p12lg.pdf
		Discharge	A1, A2, A4; A5–A8	s02255600qmn.p12ar.pdf
02256000	Fisheating Cr nr Venus, FL	Gage height	A1, A2, A4; A5–A8	s02256000gmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s02256000gmn.p12lg.pdf
		Discharge	A1, A2, A4; A5–A8	s02256000qmn.p12ar.pdf
02256500	Fisheating Cr at Palmdale, FL	Gage height	A1–A4; A5–A8	s02256500gmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02256500qmn.p12ar.pdf
02256500sfw		Discharge	A1–A4; A5–A8	s02256500sfwqmn.p12ar.pdf
02257000	Fisheating Cr at Lakeport, FL	Gage height	A1, A2, A4; A5–A8	s02257000gmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s02257000gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02257000qmn.p12ar.pdf

Table B–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure B1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS station[a] number	Station name	Parameter	Plot frames[b–f]	File name[g]
Western Okeechobee Inflow (03090103)—Continued				
02257030	Fisheating Lock at S131 nr Lakeport, FL	Gage height	A1–A4; A5–A8	s02257030gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02257030gmn.p12lg.pdf
		Discharge	A1, A2, A4; A7, A8	s02257030qmn.p12ar.pdf
02257030sfw		Gage height (tailwater)	A1–A4; A5–A8	s02257030sfwgmn_t.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02257030sfwgmn_t.p12lg.pdf
		Gage height (headwater, pump)	A1, A2, A4; A5–A8	s02257030sfwgmn_hp.p12ar.pdf
		Gage height (headwater, pump)	A1, A2, A4; A5–A8	s02257030sfwgmn_hp.p12lg.pdf
		Gage height (tailwater, pump)	A1, A2, A4; A5–A8	s02257030sfwgmn_tp.p12ar.pdf
		Gage height (tailwater, pump)	A1, A2, A4; A5–A8	s02257030sfwgmn_tp.p12lg.pdf
		Discharge	A1–A4; A7, A8	s02257030sfwqmn.p12ar.pdf
		Discharge (pump)	A1–A4; A7, A8	s02257030sfwqmn_p.p12ar.pdf
		Discharge (pump, regmod)	A1, A2, A4; A7, A8	s02257030sfwqmn_pr.p12ar.pdf
		Discharge (regmod)	A1, A2, A4; A7, A8	s02257030sfwqmn_r.p12ar.pdf
02257800	Harney Pond Canal at S71 nr Lakeport, FL	Discharge	A1–A4; A5, A7, A8	s02257800qmn.p12ar.pdf
02257800sfw		Gage height (headwater)	A1–A4; A5–A8	s02257800sfwgmn_h.p12ar.pdf
		Gage height (headwater)	A1–A4; A5–A8	s02257800sfwgmn_h.p12lg.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02257800sfwgmn_t.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02257800sfwgmn_t.p12lg.pdf
		Gage height (tailwater, weir)	A1, A2, A4; A5–A8	s02257800sfwgmn_tw.p12ar.pdf
		Gage height (tailwater, weir)	A1, A2, A4; A5–A8	s02257800sfwgmn_tw.p12lg.pdf
		Discharge	A1–A4; A5, A7, A8	s02257800sfwqmn.p12ar.pdf
		Discharge (weir)	A1, A2, A4; A5, A7, A8	s02257800sfwqmn_w.p12ar.pdf
02258000	Harney Pond Canal nr Lakeport, FL	Gage height	A1, A2, A4; A5–A8	s02258000gmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s02258000gmn.p12lg.pdf
		Discharge	A1, A2, A4; A5–A8	s02258000qmn.p12ar.pdf

Table B–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

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USGS station[a] number	Station name	Parameter	Plot frames[b–f]	File name[g]
Western Okeechobee Inflow (03090103)—Continued				
02259200	Indian Prairie Canal at S72 nr Okeechobee, FL	Gage height	A1–A4; A5–A8	s02259200gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02259200gmn.p12lg.pdf
		Discharge	A1–A4; A7, A8	s02259200qmn.p12ar.pdf
02259200sfw		Gage height (headwater)	A1–A4; A5–A8	s02259200sfwgmn_h.p12ar.pdf
		Gage height (headwater)	A1–A4; A5–A8	s02259200sfwgmn_h.p12lg.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02259200sfwgmn_t.p12ar.pdf
		Discharge	A1–A4; A5, A7, A8	s02259200sfwqmn.p12ar.pdf
		Specific conductance	A1	s02259200sfwkmn.p01lg.pdf
02259627	Buckhead Lock at S127 nr Okeechobee, FL	Gage height	A1, A2, A4; A5–A8	s02259627gmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s02259627gmn.p12lg.pdf
		Discharge	A1, A2, A4; A5, A7, A8	s02259627qmn.p12ar.pdf
02259627sfw		Gage height (headwater)	A1–A4; A5–A8	s02259627sfwgmn_h.p12ar.pdf
		Gage height (headwater)	A1–A4; A5–A8	s02259627sfwgmn_h.p12lg.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02259627sfwgmn_t.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02259627sfwgmn_t.p12lg.pdf
		Gage height (headwater, regmod)	A1–A4; A5–A8	s02259627sfwgmn_hr.p12ar.pdf
		Gage height (headwater, regmod)	A1–A4; A5–A8	s02259627sfwgmn_hr.p12lg.pdf
		Gage height (tailwater, regmod)	A1–A4; A5–A8	s02259627sfwgmn_tr.p12ar.pdf
		Gage height (tailwater, regmod)	A1–A4; A5–A8	s02259627sfwgmn_tr.p12lg.pdf
S129	S-129 (pump, spillway) from NW Shore to Lake Okeechobee, FL	Gage height (headwater)	A1–A4; A5–A8	ss129gmn_h.p12ar.pdf
		Gage height (headwater)	A1–A4; A5, A6, A8	ss129gmn_h.p12lg.pdf
		Gage height (tailwater)	A1–A4; A5–A8	ss129gmn_t.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5, A6, A8	ss129gmn_t.p12lg.pdf
		Discharge	A1–A4; A5, A7, A8	ss129qmn.p12ar.pdf
		Discharge (pump)	A1–A4; A7, A8	ss129qmn_p.p12ar.pdf
		Discharge (pump, regmod)	A1, A2, A4; A7, A8	ss129qmn_pr.p12ar.pdf
		Discharge (regmod)	A1, A2, A4; A7, A8	ss129qmn_r.p12ar.pdf

Table B–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

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USGS station[a] number	Station name	Parameter	Plot frames[b–f]	File name[g]
		Everglades (03090202)		
02278000	West Palm Beach Canal at S352 at Canal Pt, FL	Gage height (canal)	A1–A4; A5–A8	s02278000gmn_cn.p12ar.pdf
		Gage height (canal)	A1–A4; A5–A8	s02278000gmn_cn.p12lg.pdf
		Gage height (lake)	A1–A4; A5–A8	s02278000gmn_lk.p12ar.pdf
		Gage height (lake)	A1–A4; A5–A8	s02278000gmn_lk.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02278000qmn.p12ar.pdf
02278000sfw_1		Gage height (headwater)	A1–A4; A5–A8	s02278000sfw_1gmn_h.p12ar.pdf
		Gage height (headwater)	A1–A4; A5–A8	s02278000sfw_1gmn_h.p12lg.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02278000sfw_1gmn_t.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02278000sfw_1gmn_t.p12lg.pdf
		Gage height (headwater, regmod)	A1–A4; A5–A8	s02278000sfw_1gmn_hr.p12ar.pdf
		Gage height (headwater, regmod)	A1–A4; A5–A8	s02278000sfw_1gmn_hr.p12lg.pdf
		Gage height (tailwater, regmod)	A1–A4; A5–A8	s02278000sfw_1gmn_tr.p12ar.pdf
		Gage height (tailwater, regmod)	A1–A4; A5–A8	s02278000sfw_1gmn_tr.p12lg.pdf
		Discharge	A1–A4; A5, A7, A8	s02278000sfw_1qmn.p12ar.pdf
		Discharge (regmod)	A1–A4; A5, A7, A8	s02278000sfw_1qmn_r.p12ar.pdf
02278000sfw_2		Discharge	A1–A4; A5, A7, A8	s02278000sfw_2qmn.p12ar.pdf
02278002	West Palm Beach Canal at S352 bl Canal Pt, FL	Gage height (tailwater)	A1–A4; A5–A8	s02278002gmn_t.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02278002gmn_t.p12lg.pdf
02278002sfw		Gage height (tailwater)	A1, A2, A4; A5–A8	s02278002sfwgmn_t.p12ar.pdf
		Gage height (tailwater)	A1, A2, A4; A5–A8	s02278002sfwgmn_t.p12lg.pdf
02280500	Hillsboro Canal bl S351 nr South Bay, FL	Gage height	A1–A4; A5–A8	s02280500gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02280500gmn.p12lg.pdf
02280500		Discharge	A1–A4; A5–A8	s02280500qmn.p12ar.pdf
02283498	N New R Canal at S2 and S351 nr South Bay, FL	Gage height	A1–A4; A5–A8	s02283498gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02283498gmn.p12lg.pdf

Table B–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

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USGS station[a] number	Station name	Parameter	Plot frames[b–f]	File name[g]
		Everglades (03090202)—Continued		
02283498—Continued	N New R Canal at S2 and S351 nr South Bay, FL	Gage height (canal)	A1–A4; A5–A8	s02283498gmn_cn.p12ar.pdf
		Gage height (canal)	A1–A4; A5–A8	s02283498gmn_cn.p12lg.pdf
		Discharge	A1–A4; A5, A7, A8	s02283498qmn.p12ar.pdf
02283498sfw		Discharge	A1–A4; A5, A7, A8	s02283498sfwqmn.p12ar.pdf
		Discharge (regmod)	A1–A4; A5, A7, A8	s02283498sfwqmn_r.p12ar.pdf
02283500	N New R Canal bl S351 nr South Bay, FL	Gage height	A1–A4; A5–A8	s02283500gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02283500gmn.p12lg.pdf
		Discharge	A1–A4; A5, A7, A8	s02283500qmn.p12ar.pdf
02286399	Miami Canal ab S354 and S3 at Lake Harbor, FL	Gage height	A1–A4; A5–A8	s02286399gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02286399gmn.p12lg.pdf
02286399sfw		Gage height (headwater)	A1–A4; A5–A8	s02286399sfwgmn_h.p12ar.pdf
		Gage height (headwater)	A1–A4; A5–A8	s02286399sfwgmn_h.p12lg.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02286399sfwgmn_t.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5–A8	s02286399sfwgmn_t.p12lg.pdf
		Discharge	A1–A4; A5, A7, A8	s02286399sfwqmn.p12ar.pdf
02286400	Miami Canal at S354 and S3 at Lake Harbor, FL	Gage height	A1–A4; A5–A8	s02286400gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02286400gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02286400qmn.p12ar.pdf
02286400sfw	Miami Canal at S354 and S3 at Lake Harbor, FL	Discharge	A1–A4; A5–A8	s02286400sfwqmn.p12ar.pdf
		Discharge (regmod)	A1–A4; A5–A8	s02286400sfwqmn_r.p12ar.pdf
02286403	Miami Canal at HGS3 and S3 syphon discharge at Lake Harbor, FL	Discharge	A1, A2, A4; A7, A8	s02286403qmn.p12ar.pdf
S351	S-351 spillway from Lake Okeechobee to Hillsboro Canal, FL	Gage height (headwater)	A1–A4; A5–A8	ss351gmn_h.p12ar.pdf
		Gage height (headwater)	A1–A4; A5–A8	ss351gmn_h.p12lg.pdf
		Gage height (tailwater)	A1–A4; A5–A8	ss351gmn_t.p12ar.pdf
		Gage height (tailwater)	A1–A4; A5–A8	ss351gmn_t.p12lg.pdf
		Discharge	A1–A4; A5, A7, A8	ss351qmn.p12ar.pdf

Table B–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure B1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS station[a] number	Station name	Parameter	Plot frames[b–f]	File name[g]
		Caloosahatchee (03090205)		
02292000	Caloosahatchee Canal at Moore Haven, FL	Gage height (headwater)	A1–A4; A5–A8	s02292000gmn_h.p12ar.pdf
		Gage height (headwater)	A1–A4; A5–A8	s02292000gmn_h.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02292000qmn.p12ar.pdf
02292000coe		Discharge	A1–A4; A5, A7, A8	s02292000coeqmn.p12ar.pdf
02292000sfw		Gage height (headwater)	A1, A2, A4; A5–A8	s02292000sfwgmn_h.p12ar.pdf
		Gage height (headwater)	A1, A2, A4; A5–A8	s02292000sfwgmn_h.p12lg.pdf
		Discharge	A1, A2, A4; A5, A7, A8	s02292000sfwqmn.p12ar.pdf
		Discharge (regmod)	A1–A4; A5–A8	s02292000sfwqmn_r.p12ar.pdf
02292010	Caloosahatchee Canal bl S-77 at Moore Haven, FL	Gage height	A1, A2, A4; A5–A7	s02292010gmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A7	s02292010gmn.p12lg.pdf
		Discharge	A1, A2, A4; A5, A7, A8	s02292010qmn.p12ar.pdf
02292010sfw		Discharge	A1–A4; A5–A8	s02292010sfwqmn.p12ar.pdf
02292480	Caloosahatchee Canal at Ortona Lock nr La Belle, FL	Gage height	A1–A4; A5–A8	s02292480gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02292480gmn.p12lg.pdf
		Gage height (upstream)	A1–A4; A5–A8	s02292480gmn_us.p12ar.pdf
		Gage height (upstream)	A1–A4; A5–A8	s02292480gmn_us.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02292480qmn.p12ar.pdf
02292480coe		Discharge	A1–A4; A5–A8	s02292480coeqmn.p12ar.pdf
02292480sfw		Gage height (headwater)	A1, A2, A4; A5–A8	s02292480sfwgmn_h.p12ar.pdf
		Gage height (headwater)	A1, A2, A4; A5–A8	s02292480sfwgmn_h.p12lg.pdf
		Discharge	A1, A2, A4; A5–A8	s02292480sfwqmn.p12ar.pdf
02292481	Caloosahatchee Canal bl S78 nr La Belle, FL	Gage height (tailwater)	A1, A2, A4; A5–A8	s02292481gmn_t.p12ar.pdf
		Gage height (tailwater)	A1, A2, A4; A5–A8	s02292481gmn_t.p12lg.pdf
02292481sfw		Gage height (tailwater)	A1, A2, A4; A5–A8	s02292481sfwgmn_t.p12ar.pdf
		Gage height (tailwater)	A1, A2, A4; A5–A8	s02292481sfwgmn_t.p12lg.pdf
		Discharge (regmod)	A1, A2, A4; A5–A8	s02292481sfwqmn_r.p12ar.pdf

Table B–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

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USGS station[a] number	Station name	Parameter	Plot frames[b–f]	File name[g]
		Caloosahatchee (03090205)—Continued		
02292900	Caloosahatchee R at S-79 nr Olga, FL	Gage height (upstream)	A1–A4; A5–A8	s02292900gmn_us.p12ar.pdf
		Gage height (upstream)	A1–A4; A5–A8	s02292900gmn_us.p12lg.pdf
		Gage height (downstream)	A1–A4; A5–A8	s02292900gmn_ds.p12ar.pdf
		Gage height, minimum (downstream)	A1, A2, A4; A5, A7, A8	s02292900gmi_ds.p12ar.pdf
		Gage height, maximum (downstream)	A1, A2, A4; A5–A7	s02292900gmx_ds.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02292900qmn.p12ar.pdf
		Water temperature	A1, A2, A4; A5-A7	s02292900tmn.p12ar.pdf
		Water temperature	A1, A2, A4; A5-A7	s02292900tmn.p12lg.pdf
02292900coe		Discharge	A1–A4; A5–A8	s02292900coeqmn.p12ar.pdf
02292900sfw		Gage height (headwater)	A1, A2, A4; A5–A7	s02292900sfwgmn_h.p12ar.pdf
		Gage height (headwater)	A1, A2, A4; A5–A7	s02292900sfwgmn_h.p12lg.pdf
		Gage height (headwater, regmod)	A1–A4; A5–A8	s02292900sfwgmn_hr.p12ar.pdf
		Discharge	A1, A2, A4; A5, A7	s02292900sfwqmn.p12ar.pdf
		Discharge (regmod)	A1–A4; A5–A8	s02292900sfwqmn_r.p12ar.pdf
02292901sfw	Caloosahatchee R bl S-79 nr Olga, FL	Gage height (tailwater)	A1, A2, A4; A5, A7	s02292901sfwgmn_t.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02292901sfwqmn.p12ar.pdf
		Discharge (regmod)	A1–A4; A5–A8	s02292901sfwqmn_r.p12ar.pdf
		Water temperature (near bottom)	A1–A4; A5–A8	s02292901sfwtmn_bt.p12ar.pdf
		Water temperature (near bottom)	A1–A4; A5–A8	s02292901sfwtmn_bt.p12lg.pdf
		Water temperature (near surface)	A1–A4; A5–A8	s02292901sfwtmn_tp.p12ar.pdf
		Water temperature (near surface)	A1–A4; A5–A8	s02292901sfwtmn_tp.p12lg.pdf
		Specific conductance (near bottom)	A1–A4; A5–A8	s02292901sfwkmn_bt.p12ar.pdf
		Specific conductance (near bottom)	A1–A4; A5–A8	s02292901sfwkmn_bt.p12lg.pdf
		Specific conductance (near surface)	A1–A4; A5–A8	s02292901sfwkmn_tp.p12ar.pdf
		Specific conductance (near surface)	A1–A4; A5–A8	s02292901sfwkmn_tp.p12lg.pdf

Table B–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure B1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS station[a] number	Station name	Parameter	Plot frames[b–f]	File name[g]
		Caloosahatchee (03090205)—Continued		
02293205	Caloosahatchee R at Channel Marker 52 nr Ft Myers, FL	Gage height, minimum	A1, A2, A4	s02293205gmi.p01ar.pdf
		Gage height, maximum	A1, A2, A4; A5, A7	s02293205gmx.p12ar.pdf
		Discharge, tidally filtered	A1, A2, A4; A5, A7	s02293205qmn_tf.p12ar.pdf
		Water temperature, minimum (near bottom)	A1, A2, A4; A5-A7	s02293205tmi_bt.p12ar.pdf
		Water temperature, minimum (near bottom)	A1, A2, A4; A5-A7	s02293205tmi_bt.p12lg.pdf
		Water temperature, maximum (near bottom)	A1, A2, A4; A5-A7	s02293205tmx_bt.p12ar.pdf
		Water temperature, maximum (near bottom)	A1, A2, A4; A5-A7	s02293205tmx_bt.p12lg.pdf
		Water temperature, minimum (near surface)	A1, A2, A4; A5-A7	s02293205tmi_tp.p12ar.pdf
		Water temperature, minimum (near surface)	A1, A2, A4; A5-A7	s02293205tmi_tp.p12lg.pdf
		Water temperature, maximum (near surface)	A1, A2, A4; A5-A7	s02293205tmx_tp.p12ar.pdf
		Water temperature, maximum (near surface)	A1, A2, A4; A5-A7	s02293205tmx_tp.p12lg.pdf
		Salinity, minimum (near bottom)	A1, A2, A4; A5-A7	s02293205smi_bt.p12ar.pdf
		Salinity, minimum (near bottom)	A1, A2, A4; A5-A7	s02293205smi_bt.p12lg.pdf
		Salinity, maximum (near bottom)	A1, A2, A4; A5-A7	s02293205smx_bt.p12ar.pdf
		Salinity, maximum (near bottom)	A1, A2, A4; A5-A7	s02293205smx_bt.p12lg.pdf
		Salinity, minimum (near surface)	A1, A2, A4	s02293205smi_tp.p01ar.pdf
		Salinity, maximum (near surface)	A1, A2, A4	s02293205smx_tp.p01ar.pdf
		Salinity, maximum (near surface)	A1, A2, A4	s02293205smx_tp.p01lg.pdf
02293210	Caloosahatchee R at Shell Point nr Iona, FL	Gage height, minimum	A1, A2, A4; A8	s02293210gmi.p12ar.pdf
		Gage height, maximum	A1, A2, A4; A5, A7, A8	s02293210gmx.p12ar.pdf
		Discharge, tidally filtered	A1, A2, A4; A5, A7, A8	s02293210qmn_tf.p12ar.pdf

Table B–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

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USGS station[a] number	Station name	Parameter	Plot frames[b–f]	File name[g]
		Caloosahatchee (03090205)—Continued		
263144-082010400	Caloosahatchee R at Punta Blanca nr Cape Coral, FL	Water temperature, minimum (near bottom)	A1, A2, A4; A5-A7	s263144082010400tmi_bt.p12ar.pdf
		Water temperature, minimum (near bottom)	A1, A2, A4; A5-A7	s263144082010400tmi_bt.p12lg.pdf
		Water temperature, maximum (near bottom)	A1, A2, A4; A5-A7	s263144082010400tmx_bt.p12ar.pdf
		Water temperature, maximum (near bottom)	A1, A2, A4; A5-A7	s263144082010400tmx_bt.p12lg.pdf
		Water temperature, minimum (near surface)	A1, A2, A4	s263144082010400tmi_tp.p01ar.pdf
		Water temperature, minimum (near surface)	A1, A2, A4	s263144082010400tmi_tp.p01lg.pdf
		Water temperature, maximum (near surface)	A1, A2, A4; A5-A7	s263144082010400tmx_tp.p12ar.pdf
		Water temperature, maximum (near surface)	A1, A2, A4; A5-A7	s263144082010400tmx_tp.p12lg.pdf
		Salinity, minimum (near bottom)	A1, A2, A4; A5-A7	s263144082010400smi_bt.p12ar.pdf
		Salinity, minimum (near bottom)	A1, A2, A4; A5-A7	s263144082010400smi_bt.p12lg.pdf
		Salinity, maximum (near bottom)	A1, A2, A4; A5-A7	s263144082010400smx_bt.p12ar.pdf
		Salinity, maximum (near bottom)	A1, A2, A4; A5-A7	s263144082010400smx_bt.p12lg.pdf
		Salinity, minimum (near surface)	A1, A2, A4	s263144082010400smi_tp.p01ar.pdf
		Salinity, minimum (near surface)	A1, A2, A4	s263144082010400smi_tp.p01lg.pdf
		Salinity, maximum (near surface)	A1, A2, A4	s263144082010400smx_tp.p01ar.pdf
		Salinity, maximum (near surface)	A1, A2, A4	s263144082010400smx_tp.p01lg.pdf
		SE Florida Atlantic (03090206)		
02276870	St Lucie Canal at Lake Okeechobee, FL	Gage height	A1, A2, A4; A5–A8	s02276870gmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s02276870gmn.p12lg.pdf
		Gage height (canal)	A1–A4; A5–A8	s02276870gmn_cn.p12ar.pdf
		Gage height (canal)	A1–A4; A5–A8	s02276870gmn_cn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02276870qmn.p12ar.pdf

Table B–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and vicinity, Southern Florida subregion (0309).—Continued

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USGS station[a] number	Station name	Parameter	Plot frames[b–f]	File name[g]
		SE Florida Atlantic (03090206)—Continued		
02276870coe—Continued	St Lucie Canal at Lake Okeechobee, FL	Gage height (headwater)	A1, A2, A4; A5–A8	s02276870coegmn_h.p12ar.pdf
		Gage height (headwater)	A1, A2, A4; A5–A8	s02276870coegmn_h.p12lg.pdf
		Gage height (headwater, regmod)	A1–A4; A5–A8	s02276870coegmn_hr.p12ar.pdf
		Gage height (headwater, regmod)	A1–A4; A5–A8	s02276870coegmn_hr.p12lg.pdf
		Discharge	A1–A4; A5, A7, A8	s02276870coeqmn.p12ar.pdf
02276870sfw		Gage height (tailwater)	A1, A2, A4; A5–A8	s02276870sfwgmn_t.p12ar.pdf
		Gage height (tailwater)	A1, A2, A4; A5–A8	s02276870sfwgmn_t.p12lg.pdf
		Gage height (tailwater, regmod)	A1–A4; A5–A8	s02276870sfwgmn_tr.p12ar.pdf
		Gage height (tailwater, regmod)	A1–A4; A5–A8	s02276870sfwgmn_tr.p12lg.pdf
02276877	St Lucie Canal bl S308 nr Port Mayaca, FL	Gage height	A1–A4; A5–A8	s02276877gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02276877gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02276877qmn.p12ar.pdf
02276877sfw		Discharge	A1–A4; A5–A8	s02276877sfwqmn.p12ar.pdf
		Discharge (regmod)	A1–A4; A5, A7, A8	s02276877sfwqmn_r.p12ar.pdf
02277000	St Lucie Canal at Lock nr Stuart, FL	Gage height	A1, A2, A4; A5–A8	s02277000gmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s02277000gmn.p12lg.pdf
		Gage height (downstream)	A1–A4; A5–A8	s02277000gmn_ds.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02277000qmn.p12ar.pdf
		Discharge	A1–A4; A6, A8	s02277000qmn.p12lg.pdf
02277000coe		Discharge	A1–A4; A5, A7	s02277000coeqmn.p12ar.pdf
02277000sfw		Gage height (headwater)	A1, A2, A4; A5–A7	s02277000sfwgmn_h.p12ar.pdf
		Gage height (headwater)	A1, A2, A4; A5–A7	s02277000sfwgmn_h.p12lg.pdf
		Gage height (tailwater)	A1, A2, A4; A5–A8	s02277000sfwgmn_t.p12ar.pdf
		Gage height (headwater, regmod)	A1–A4; A5–A8	s02277000sfwgmn_hr.p12ar.pdf
		Gage height (headwater, regmod)	A1–A4; A5–A8	s02277000sfwgmn_hr.p12lg.pdf

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[Stations in Caloosahatchee cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure B1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure B1. Calendar year, January 1 through December 31. regmod, dataset used for South Florida Water Management District (SFWMD) regional modeling studies]

USGS station[a] number	Station name	Parameter	Plot frames[b–f]	File name[g]
SE Florida Atlantic (03090206)—Continued				
02277000sfw—Continued	St Lucie Canal at Lock nr Stuart, FL	Gage height (tailwater, regmod)	A1–A4; A5–A8	s02277000sfwgmn_tr.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02277000sfwqmn.p12ar.pdf
		Discharge (regmod)	A1–A4; A5–A8	s02277000sfwqmn_r.p12ar.pdf
02281400	Hillsboro Canal nr Margate, FL	Gage height	A1–A4; A5–A8	s02281400gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02281400gmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02281400qmn.p12ar.pdf
02281490	C2 Canal ab S4 nr Deerfield Beach, FL	Gage height	A1, A2, A4	s02281490gmn.p01ar.pdf
		Gage height	A1, A2, A4	s02281490gmn.p01lg.pdf
		Discharge	A1	s02281490qmn.p01ar.pdf
02281491	C2 Canal bl S4 nr Deerfield Beach, FL	Gage height	A1, A2, A4; A5-A7	s02281491gmn.p12ar.pdf
		Gage height	A1, A2, A4; A5-A7	s02281491gmn.p12lg.pdf

[a]Station numbers with "coe" or "sfw" appended to the number are for stations operated in cooperation with either the U.S. Army Corps of Engineers (coe) or the South Florida Water Management District (sfw), and the data for these table rows are obtained from these agencies' digital files. Stations s129, s133, s135, and s351 are South Florida Water Management District stations.

[b]A1, mean-daily values; A2, A3, A4, boxplot interpolation of mean-daily values, annual time step (A2), decadal time step (A3), monthly time step, period-of-record (A4); A5, annual-distribution spread measures; A6, annual-distribution ratio measures; A7, annual distribution, log-coefficient of variation, set of every 5th percentile of mean-daily values for each complete calendar year; Richards-Baker flashiness index; A8, long-term daily seasonality.

[c]Percentile spread measures are calculated as the difference between the indicated percentiles divided by the median where 7525=(p75–p25)/p50, 8020=(p80–p20)/p50, and 9010=(p90–p10)/p50.

[d]Percentile ratio measures are calculated as the ratios of the indicated percentiles where 7525=p75/p25, 8020=p80/p20, and 9010=p90/p10.

[e]Richards-Baker flashiness index (Baker and others, 2004).

[f]Plots A2, A5–A7, greater than or equal to 90-percent-complete calendar years only; plot A3, greater than or equal to 90-percent-complete calendar decades only; plot A4, period-of-record monthly distributions for greater than or equal to 90-percent-complete calendar years only; plot A8, period-of-record daily distributions for 20 or more complete calendar years.

[g]File-naming conventions: sSSSSSSSS***var***.p[01,12]***ps***.pdf; SSSSSSSS, USGS station identification number; ***var***: gmn, mean-daily gage height, in feet; qmn, mean-daily discharge, in cubic feet per second; tmn, mean-daily water temperature, in degrees Celsius; kmn, mean-daily specific conductance, in microsiemens per centimeter at 25 degrees Celsius; omn, mean-daily dissolved-oxygen concentration, in milligrams per liter; p[01,12], p01, plots A1–A4, p12, plots A1–A4, page 1, plots A5–A8, page 2; ***ps***, plot scale: ar, plots A1–A5, vertical axis arithmetic, plots A6–A8, vertical axis base-10 logarithmic; lg, plots A1–A8, base-10 logarithmic.

Table B–8. Land-cover percentages for Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges and contributing watersheds, Florida, based on the 1992 National Land Cover Database.

[See figure B6 for map of 1992 land cover, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 1992 NLCD (Vogelmann and others, 2001); NWR, National Wildlife Refuge]

10-digit HUC, hydrologic cataloging unit, subregion, or NWR	Percentage of 1992 NLCD land-cover class[a]																	
	11	21	22	23	31	32	33	41	42	43	51	61	71	81	82	85	91	92
Kissimmee (03090101)																		
0309010101	15.8	13.3	7.3	8.0	0.3	<0.1	2.6	0.0	17.0	0.0	0.4	3.0	8.4	2.1	5.1	2.3	11.0	3.3
0309010102	10.8	2.8	<0.1	0.2	0.3	0.0	3.8	0.0	28.8	0.0	0.5	0.9	9.3	1.5	3.9	0.3	22.3	14.5
0309010103	6.8	18.8	12.5	14.2	0.1	<0.1	2.1	0.0	14.2	0.0	0.9	2.7	6.1	1.2	2.3	1.5	14.1	2.6
0309010104	22.7	12.6	6.9	1.6	0.2	0.0	0.5	0.0	7.5	0.0	0.1	3.2	18.6	6.8	3.4	1.2	8.9	5.8
0309010105	9.9	4.1	1.1	5.6	0.6	0.4	1.1	0.0	12.2	0.0	0.7	11.2	3.3	0.6	18.2	1.1	26.0	3.9
0309010106	2.0	5.5	0.6	0.4	0.5	1.6	1.5	0.0	6.9	0.0	0.7	2.0	14.8	3.1	5.7	0.0	36.4	18.4
0309010107	8.0	9.4	0.8	0.6	<0.1	0.0	1.3	0.0	7.7	0.0	0.4	10.9	11.1	2.9	24.2	0.6	17.2	4.9
0309010108	9.0	7.9	1.1	1.0	0.2	0.2	0.9	0.0	8.4	0.0	0.5	4.9	11.0	2.5	14.4	1.3	27.4	9.3
0309010109	9.7	4.9	0.7	0.3	0.2	0.0	1.2	0.0	9.2	0.0	0.8	4.4	24.9	7.3	4.0	<0.1	18.6	13.8
0309010110	7.6	1.4	1.2	<0.1	0.0	0.0	1.5	0.0	9.3	0.0	0.5	0.9	25.8	13.2	0.4	0.0	23.1	15.0
0309010111	23.1	<0.1	<0.1	<0.1	<0.1	0.0	2.1	0.0	8.3	0.0	0.6	1.1	18.7	6.0	3.2	0.0	17.4	19.5
0309010112	14.4	4.7	0.6	0.8	<0.1	0.0	3.0	0.0	11.0	0.0	0.9	9.2	12.0	3.4	14.7	0.4	19.2	5.6
0309010113	12.9	5.7	0.9	0.9	<0.1	0.0	3.7	0.0	9.6	0.0	0.6	12.6	10.2	2.0	8.1	0.0	25.3	7.5
0309010114	0.3	3.4	<0.1	0.8	<0.1	0.0	0.9	0.0	9.1	0.0	0.6	1.9	36.9	13.3	1.7	0.0	17.2	14.0
0309010115	0.6	0.2	0.0	0.2	<0.1	0.0	1.4	0.0	11.0	0.0	0.9	0.5	32.4	10.6	1.2	0.0	16.3	24.7
0309010116	0.2	0.5	<0.1	1.0	<0.1	0.0	1.3	0.0	9.3	0.0	1.1	3.9	25.4	14.6	5.8	0.7	27.1	9.0
0309010117	16.2	22.3	3.5	1.7	0.1	0.0	0.2	0.0	8.0	0.0	0.4	14.9	13.9	1.7	0.5	0.2	12.6	3.6
0309010118	21.2	8.6	1.0	1.4	<0.1	0.0	0.6	0.0	5.1	0.0	0.5	7.9	22.7	9.7	3.2	0.8	9.4	7.7
0309010119	0.6	2.7	<0.1	<0.1	<0.1	0.0	2.0	0.0	6.0	0.0	2.4	0.6	45.0	14.7	2.9	0.0	9.3	13.6
0309010120	1.3	2.6	<0.1	0.1	0.1	0.0	1.7	0.0	4.2	0.0	0.3	7.1	38.5	18.9	3.7	0.0	8.0	13.4
0309010121	1.5	0.6	0.3	0.3	0.2	0.0	<0.1	0.0	2.4	0.0	0.6	2.0	44.5	30.3	4.5	0.0	6.1	6.6
Northern Okeechobee Inflow (03090102)																		
0309010201	0.5	2.6	0.1	0.3	<0.1	0.0	<0.1	0.0	3.2	0.0	0.1	4.9	37.4	30.4	4.6	0.1	8.0	7.7
0309010202	0.7	3.9	0.1	0.5	<0.1	0.0	<0.1	0.0	5.3	0.0	0.1	4.6	30.9	29.2	3.0	0.0	11.5	10.1
0309010203	1.6	6.5	2.1	2.4	0.1	0.0	<0.1	0.0	3.2	0.0	0.2	3.6	25.4	34.1	6.4	<0.1	5.7	8.6
Western Okeechobee Inflow (03090103)																		
0309010301	0.3	7.8	<0.1	<0.1	0.2	<0.1	0.5	<0.1	8.3	<0.1	0.4	2.7	44.7	13.5	2.4	<0.1	8.8	10.2
0309010302	0.1	1.8	<0.1	0.1	<0.1	<0.1	0.2	<0.1	12.8	<0.1	0.9	2.3	24.5	13.1	2.5	<0.1	28.2	13.3
0309010303	0.5	2.5	<0.1	0.2	0.2	<0.1	2.2	<0.1	6.2	<0.1	1.1	7.0	42.5	17.8	2.2	<0.1	9.4	8.2
0309010304	0.7	6.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.4	<0.1	0.2	2.7	47.7	18.1	2.6	<0.1	5.0	10.6

Table B–8. Land-cover percentages for Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges and contributing watersheds, Florida, based on the 1992 National Land Cover Database.—Continued

[See figure B6 for map of 1992 land cover, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 1992 NLCD (Vogelmann and others, 2001); NWR, National Wildlife Refuge]

10-digit HUC, hydrologic cataloging unit, subregion, or NWR	Percentage of 1992 NLCD land-cover class[a]																	
	11	21	22	23	31	32	33	41	42	43	51	61	71	81	82	85	91	92
Lake Okeechobee (03090201)																		
0309020101	4.6	10.4	2.4	0.5	<0.1	0.0	<0.1	0.0	5.1	0.0	0.1	8.5	3.9	0.6	6.9	0.4	13.8	42.9
0309020102	77.6	<0.1	<0.1	<0.1	<0.1	0.0	<0.1	0.0	0.1	0.0	<0.1	<0.1	0.1	0.1	0.1	0.0	4.0	17.7
Everglades (03090202)																		
0309020201	0.9	0.8	0.2	0.5	<0.1	0.0	<0.1	0.0	<0.1	0.0	0.1	0.4	0.2	<0.1	95.9	<0.1	0.2	0.8
0309020202	0.7	0.9	0.3	0.6	<0.1	0.0	<0.1	0.0	<0.1	0.0	<0.1	0.0	<0.1	<0.1	95.2	<0.1	1.8	0.4
0309020203	0.5	0.3	0.0	0.2	<0.1	0.0	<0.1	0.0	<0.1	0.0	0.2	<0.1	0.4	3.8	93.3	0.0	0.3	0.9
0309020204	0.3	<0.1	0.0	0.2	<0.1	0.0	<0.1	0.0	<0.1	0.0	0.2	<0.1	<0.1	<0.1	2.7	0.0	40.1	56.2
0309020205	1.2	1.9	0.0	0.2	<0.1	0.0	<0.1	0.0	0.4	0.0	0.1	1.9	0.6	0.4	0.4	0.2	21.1	71.6
0309020206	3.5	0.2	0.3	0.2	<0.1	0.0	<0.1	0.0	<0.1	0.0	0.2	<0.1	0.6	<0.1	<0.1	0.0	16.1	78.5
0309020207	0.2	1.3	0.0	<0.1	<0.1	0.0	3.7	0.0	4.8	0.0	0.7	2.8	33.7	26.5	6.2	<0.1	4.5	15.4
0309020208	0.2	0.4	0.0	0.1	<0.1	0.0	3.1	0.0	6.7	0.0	0.2	4.6	35.9	11.5	1.8	0.0	24.3	11.2
0309020209	0.5	<0.1	<0.1	0.8	<0.1	0.0	<0.1	0.0	1.7	0.0	0.4	20.0	2.4	29.3	0.3	<0.1	23.0	21.5
0309020210	0.2	0.0	<0.1	0.2	<0.1	0.0	<0.1	0.0	6.9	0.0	<0.1	0.2	3.9	0.3	<0.1	0.0	47.0	41.1
0309020211	4.2	0.0	0.0	0.2	<0.1	0.0	<0.1	0.0	0.1	0.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	19.8	75.4
0309020212	3.4	<0.1	0.0	0.3	<0.1	0.0	<0.1	0.0	<0.1	0.0	<0.1	<0.1	<0.1	<0.1	<0.1	0.0	5.7	90.5
0309020213	4.3	0.5	0.0	0.2	<0.1	0.0	<0.1	0.0	2.9	0.0	<0.1	0.3	20.7	<0.1	1.9	0.0	17.2	52.0
0309020214	27.5	<0.1	0.0	<0.1	0.1	0.0	<0.1	0.0	<0.1	0.0	<0.1	<0.1	0.6	<0.1	<0.1	0.0	62.5	9.2
Florida Bay-Florida Keys (03090203)																		
0309020301	97.1	0.0	0.0	<0.1	<0.1	0.0	0.0	0.0	<0.1	0.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2.5	0.3
0309020302	83.3	0.9	1.2	0.4	0.6	0.0	<0.1	0.0	<0.1	0.0	1.3	<0.1	<0.1	0.0	0.0	<0.1	11.1	1.0
Big Cypress Swamp (03090204)																		
0309020401	8.7	8.7	3.8	4.3	0.4	0.8	0.3	0.0	11.4	0.0	1.3	2.0	8.4	2.9	6.7	2.5	29.1	8.8
0309020402	2.0	5.0	1.0	1.4	0.2	0.1	1.4	0.0	6.1	0.0	0.9	11.2	8.5	9.5	6.9	1.5	32.8	11.4
0309020403	0.3	0.2	<0.1	0.5	<0.1	<0.1	<0.1	0.0	3.5	0.0	0.1	5.3	4.6	0.9	8.2	<0.1	53.4	23.0
0309020404	0.4	2.6	0.0	0.6	<0.1	0.0	0.2	0.0	6.6	0.0	0.6	2.5	8.7	4.1	9.9	<0.1	41.6	22.0
0309020405	2.5	24.6	4.2	4.5	0.6	0.3	0.3	0.0	11.7	0.0	0.6	2.1	10.8	1.8	3.7	3.7	23.3	5.3
0309020406	0.9	5.5	3.6	2.0	<0.1	0.3	0.4	0.0	8.0	0.0	1.0	0.9	3.7	2.1	11.2	2.4	39.9	18.2
0309020407	4.8	1.1	0.7	1.2	0.1	0.0	<0.1	0.0	2.6	0.0	0.2	1.0	1.7	0.7	1.6	1.1	66.5	16.6
0309020408	54.2	2.3	1.1	1.0	0.6	0.0	<0.1	0.0	0.6	0.0	0.1	0.2	0.3	0.2	0.2	0.7	36.5	2.1
0309020409	0.6	0.4	<0.1	0.6	<0.1	<0.1	1.0	0.0	7.0	0.0	0.9	9.2	15.4	10.8	5.2	<0.1	27.1	21.7
0309020410	0.4	<0.1	<0.1	0.5	<0.1	0.0	0.2	0.0	3.6	0.0	0.2	0.2	17.2	0.7	0.4	<0.1	34.4	42.2
0309020411	13.1	<0.1	<0.1	<0.1	<0.1	0.0	<0.1	0.0	0.3	0.0	<0.1	<0.1	2.0	<0.1	0.0	<0.1	60.7	23.8

Table B–8. Land-cover percentages for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and contributing watersheds, Florida, based on the 1992 National Land Cover Database.—Continued

[See figure B6 for map of 1992 land cover, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 1992 NLCD (Vogelmann and others, 2001); NWR, National Wildlife Refuge]

10-digit HUC, hydrologic cataloging unit, subregion, or NWR	Percentage of 1992 NLCD land-cover class[a]																	
	11	21	22	23	31	32	33	41	42	43	51	61	71	81	82	85	91	92
Caloosahatchee (03090205)																		
0309020501	1.0	3.1	2.1	2.1	<0.1	0.0	0.1	0.0	<0.1	0.0	<0.1	<0.1	0.2	<0.1	87.0	0.5	1.3	2.4
0309020502	0.8	2.6	0.1	0.5	0.1	<0.1	2.1	0.0	8.4	0.0	1.1	4.2	14.0	21.9	26.7	0.1	7.6	9.8
0309020503	0.7	5.7	0.3	0.5	<0.1	0.0	0.6	0.0	9.0	0.0	0.8	7.9	19.9	21.3	8.9	0.2	15.8	8.3
0309020504	0.9	7.5	0.2	0.4	0.1	0.0	2.0	0.0	8.5	0.0	2.8	18.7	12.7	15.9	7.4	0.5	12.0	10.5
0309020505	0.3	<0.1	<0.1	<0.1	<0.1	0.0	0.5	0.0	8.1	0.0	15.4	0.8	9.8	7.8	8.3	0.0	43.3	5.6
0309020506	10.0	23.5	8.3	3.4	0.1	0.3	0.2	0.0	11.8	0.0	1.5	2.7	5.5	5.8	6.5	1.7	11.3	7.6
SE Florida Atlantic (03090206)																		
0309020601	1.5	6.8	<0.1	0.7	<0.1	0.0	<0.1	0.0	7.5	0.0	<0.1	12.9	26.2	15.1	2.2	0.7	11.2	14.9
0309020602	2.5	22.8	7.4	4.8	<0.1	<0.1	0.2	0.0	10.6	0.0	0.2	20.0	8.9	3.2	2.1	2.6	7.7	6.9
0309020603	1.9	8.3	0.0	0.7	<0.1	<0.1	<0.1	0.0	5.4	0.0	<0.1	20.5	23.6	12.6	2.4	0.1	10.9	13.4
0309020604	6.0	4.3	0.2	1.4	0.2	0.0	0.3	0.0	5.5	0.0	<0.1	29.1	12.9	11.9	2.8	<0.1	10.3	15.1
0309020605	26.0	13.0	5.4	4.1	0.2	0.0	0.7	0.0	9.9	0.0	0.3	4.1	7.7	4.9	0.6	2.3	10.1	10.8
0309020606	8.6	11.4	4.4	4.0	0.4	0.0	0.2	0.0	11.3	0.0	1.1	6.1	5.3	1.9	1.0	2.7	15.4	26.2
0309020607	10.5	2.4	1.0	3.4	<0.1	0.0	<0.1	0.0	5.3	0.0	0.2	4.3	3.6	0.1	0.2	1.8	18.4	48.8
0309020608	15.8	22.6	15.5	8.9	0.5	<0.1	<0.1	0.0	2.1	0.0	0.2	1.2	1.0	0.2	0.2	5.0	9.9	16.6
0309020609	3.1	33.6	10.7	6.0	0.1	<0.1	<0.1	<0.1	5.9	0.0	0.4	10.4	5.0	4.6	2.8	4.4	4.3	8.3
0309020610	4.4	27.4	9.4	6.2	0.3	0.0	1.7	0.0	5.5	0.0	0.2	4.3	3.0	9.2	7.0	4.9	5.6	10.9
0309020611	4.0	26.5	12.8	7.8	0.8	0.0	2.7	0.0	4.9	0.0	0.1	3.1	1.0	6.9	11.3	11.3	3.2	3.6
0309020612	4.4	31.7	22.5	10.6	0.3	<0.1	0.5	0.0	1.8	0.0	<0.1	3.1	1.6	4.5	2.3	6.5	2.1	8.0
0309020613	8.6	32.1	20.5	19.8	1.1	0.0	1.0	0.0	1.3	0.0	0.2	1.0	0.3	0.2	0.4	3.7	3.7	6.1
0309020614	12.6	22.5	18.8	14.0	1.8	0.4	1.0	0.0	1.3	0.0	0.1	0.7	0.7	5.4	0.7	3.0	4.5	12.2
0309020615	7.3	20.0	15.2	9.8	1.2	0.3	1.1	0.0	1.0	0.0	0.2	0.6	2.1	0.8	1.6	2.8	7.5	28.6
0309020616	3.7	11.9	7.2	4.7	0.2	<0.1	0.4	0.0	0.4	0.0	<0.1	7.7	6.9	<0.1	21.4	1.2	17.8	16.1
0309020617	77.8	2.1	1.8	0.8	0.2	0.0	0.1	0.0	0.2	0.0	1.4	0.3	0.4	0.1	0.7	0.6	9.0	4.5

Table B–8. Land-cover percentages for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and contributing watersheds, Florida, based on the 1992 National Land Cover Database.—Continued

[See figure B6 for map of 1992 land cover, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 1992 NLCD (Vogelmann and others, 2001); NWR, National Wildlife Refuge]

10-digit HUC, hydrologic cataloging unit, subregion, or NWR	Percentage of 1992 NLCD land-cover class[a]																	
	11	21	22	23	31	32	33	41	42	43	51	61	71	81	82	85	91	92
Hydrologic cataloging units																		
03090101	9.9	6.2	1.8	1.9	0.1	<0.1	1.6	<0.1	9.4	<0.1	0.6	5.4	20.7	7.9	6.0	0.5	17.2	10.5
03090102	1.0	4.5	0.9	1.2	<0.1	<0.1	<0.1	<0.1	3.8	<0.1	0.2	4.3	31.0	31.5	4.8	<0.1	8.1	8.7
03090103	0.4	4.2	<0.1	0.1	0.1	<0.1	0.8	<0.1	8.7	<0.1	0.7	3.8	38.2	15.4	2.4	<0.1	14.5	10.7
03090201	63.3	2.1	0.5	0.1	<0.1	<0.1	<0.1	<0.1	1.1	<0.1	<0.1	1.7	0.8	0.2	1.5	<0.1	5.9	22.6
03090202	5.4	0.4	<0.1	0.2	<0.1	<0.1	0.3	<0.1	1.4	<0.1	0.1	1.0	7.4	2.8	19.1	<0.1	21.1	40.5
03090203	92.1	0.3	0.4	0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	5.6	0.5
03090204	5.4	3.0	0.9	1.2	0.1	0.1	0.4	<0.1	5.3	<0.1	0.5	2.8	10.7	2.9	3.8	0.7	37.6	24.7
03090205	2.9	9.1	2.2	1.2	<0.1	<0.1	1.2	<0.1	8.7	<0.1	2.4	7.8	11.3	14.2	17.3	0.6	12.4	8.6
03090206	14.7	16.4	8.9	6.0	0.4	<0.1	0.6	<0.1	4.1	<0.1	0.3	7.5	6.3	4.4	4.5	2.9	9.3	13.7
Hydrologic subregion																		
0309	13.0	5.8	2.3	1.8	0.2	<0.1	0.6	<0.1	4.8	<0.1	0.5	4.0	11.6	5.8	9.0	0.8	18.5	21.2
National Wildlife Refuge																		
Caloosa-hatchee	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.9	0.0	11.6	2.3	2.3	2.3	0.0	0.0	34.9	11.6
J.N. "Ding" Darling	31.4	0.4	0.4	0.2	0.3	0.0	0.0	0.0	3.8	0.0	2.5	<0.1	0.5	0.0	0.0	<0.1	57.6	2.9

[a]1992 NLCD class definitions:
11, open water
21, low-intensity residential
22, high-intensity residential
23, commercial, industrial, transportation
31, bare rock, sand, clay
32, quarries, strip mines, gravel pits
33, transitional
41, deciduous forest
42, evergreen forest
43, mixed forest
51, shrubland
61, orchards, vineyards, other
71, grasslands, herbaceous
81, pasture, hay
82, row crops
85, urban, recreational grasses
91, woody wetlands
92, emergent herbaceous wetlands

Table B–9. Land-cover percentages for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and contributing watersheds, Florida, based on the 2001 National Land Cover Database.

[See figure B7 for map of 2001 land cover, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 2001 NLCD (Homer and others, 2007); NWR, National Wildlife Refuge]

10-digit HUC, hydrologic cataloging unit, subregion, or NWR	Percentage of 2001 NLCD land-cover class[a]												
	11	21	22	23	24	31	42	52	71	81	82	90	95
Kissimmee (03090101)													
0309010101	14.1	18.3	11.6	5.4	3.1	0.3	7.1	2.4	2.1	9.6	0.1	20.3	5.8
0309010102	9.2	4.1	0.3	<0.1	<0.1	<0.1	10.9	11.0	1.3	11.0	0.5	42.2	9.4
0309010103	5.1	20.7	21.7	12.8	3.7	0.2	5.2	0.5	1.0	4.0	0.0	21.0	4.2
0309010104	17.4	17.1	9.4	3.5	0.6	0.2	2.7	1.0	1.4	17.3	1.6	19.8	8.0
0309010105	7.5	12.2	7.0	3.6	1.0	0.8	8.4	1.7	2.7	9.3	8.1	32.2	5.3
0309010106	1.9	9.0	3.2	0.3	<0.1	0.7	3.3	0.6	1.2	18.1	0.6	58.6	2.6
0309010107	8.6	10.5	1.8	0.3	<0.1	0.4	3.7	6.9	3.3	12.3	29.4	20.4	2.3
0309010108	8.3	13.9	3.9	0.6	<0.1	1.0	3.9	1.8	2.3	11.4	12.4	36.0	4.3
0309010109	8.8	7.4	0.9	<0.1	<0.1	0.2	3.0	4.4	1.4	29.0	4.8	33.2	6.9
0309010110	8.1	1.7	0.5	<0.1	0.0	0.0	2.4	22.8	1.1	25.8	0.2	33.4	3.9
0309010111	25.6	1.5	0.3	<0.1	<0.1	<0.1	1.6	17.6	1.2	21.4	3.0	20.5	7.3
0309010112	14.2	9.6	2.0	0.4	0.1	0.3	7.4	12.8	2.6	11.2	16.3	20.2	2.9
0309010113	12.8	10.0	2.7	0.5	0.1	0.1	8.7	12.5	2.3	6.3	17.8	21.3	4.7
0309010114	0.1	2.0	0.3	<0.1	0.0	<0.1	2.1	33.9	1.0	35.9	2.5	16.3	5.9
0309010115	0.2	0.7	<0.1	<0.1	0.0	0.1	1.2	38.2	2.1	17.2	1.9	24.8	13.4
0309010116	<0.1	5.2	0.9	0.2	<0.1	0.2	6.6	31.2	3.2	16.1	8.1	23.2	5.1
0309010117	16.1	19.5	8.4	1.9	0.5	0.3	5.3	5.0	2.0	5.8	15.9	17.0	2.3
0309010118	20.8	11.0	3.6	0.9	0.2	0.2	2.8	3.9	2.2	21.3	12.8	15.4	5.0
0309010119	0.1	1.7	0.1	0.0	0.0	0.5	1.3	5.0	2.0	53.2	6.6	24.1	5.3
0309010120	0.3	3.3	0.3	<0.1	<0.1	<0.1	1.2	7.1	1.8	42.7	13.7	21.5	8.0
0309010121	1.1	2.4	0.8	<0.1	<0.1	<0.1	1.0	0.5	1.0	64.2	5.1	18.2	5.4
Northern Okeechobee Inflow (03090102)													
0309010201	0.1	4.0	0.3	<0.1	<0.1	<0.1	1.5	0.8	0.8	62.6	4.7	21.8	3.2
0309010202	<0.1	5.3	0.6	<0.1	<0.1	0.1	2.7	0.5	1.1	55.9	2.3	27.2	4.3
0309010203	0.9	8.9	4.2	1.1	0.3	<0.1	1.3	0.4	1.2	46.9	10.6	18.9	5.2
Western Okeechobee Inflow (03090103)													
0309010301	<0.1	2.5	0.5	<0.1	<0.1	0.1	2.3	17.6	1.6	46.5	6.0	20.4	2.5
0309010302	<0.1	1.9	0.2	<0.1	<0.1	<0.1	3.3	30.4	1.3	23.4	4.7	30.2	4.4
0309010303	0.2	2.6	0.9	0.1	<0.1	0.1	2.8	4.2	2.0	31.8	26.9	23.2	5.1
0309010304	0.1	2.2	0.2	<0.1	<0.1	<0.1	2.3	3.7	1.9	42.2	19.7	19.7	8.0

Table B–9. Land-cover percentages for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and contributing watersheds, Florida, based on the 2001 National Land Cover Database.—Continued

[See figure B7 for map of 2001 land cover, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 2001 NLCD (Homer and others, 2007); NWR, National Wildlife Refuge]

10-digit HUC, hydrologic cataloging unit, subregion, or NWR	Percentage of 2001 NLCD land-cover class[a]												
	11	21	22	23	24	31	42	52	71	81	82	90	95
Lake Okeechobee (03090201)													
0309020101	<0.1	12.8	6.5	0.2	<0.1	<0.1	2.5	<0.1	0.6	<0.1	15.0	38.9	23.1
0309020102	75.1	0.2	0.2	<0.1	<0.1	0.0	<0.1	<0.1	0.1	<0.1	<0.1	5.4	18.9
Everglades (03090202)													
0309020201	1.1	0.8	0.8	0.1	<0.1	0.3	0.0	<0.1	0.4	<0.1	90.9	1.0	4.5
0309020202	0.2	1.2	0.9	0.2	0.1	<0.1	<0.1	<0.1	0.2	<0.1	93.2	1.5	2.5
0309020203	<0.1	0.2	<0.1	<0.1	0.0	0.0	0.0	<0.1	0.4	0.3	93.7	1.9	3.3
0309020204	<0.1	<0.1	<0.1	0.0	0.0	0.0	<0.1	0.0	0.6	<0.1	0.3	7.2	91.8
0309020205	0.1	1.9	1.2	0.3	<0.1	0.2	<0.1	<0.1	0.5	<0.1	1.0	11.4	83.2
0309020206	0.2	0.2	0.5	<0.1	<0.1	0.0	<0.1	<0.1	<0.1	0.0	0.0	6.3	92.6
0309020207	<0.1	1.6	0.4	<0.1	0.0	<0.1	3.2	0.3	1.8	32.0	25.9	24.7	10.0
0309020208	<0.1	1.0	0.5	<0.1	<0.1	<0.1	4.7	0.3	0.6	22.9	20.4	45.0	4.5
0309020209	<0.1	0.9	0.3	<0.1	<0.1	<0.1	1.2	0.1	0.2	29.6	20.5	29.6	17.5
0309020210	<0.1	0.1	0.3	<0.1	0.0	<0.1	5.6	<0.1	<0.1	0.5	<0.1	42.4	51.0
0309020211	0.8	0.2	0.1	<0.1	<0.1	0.0	<0.1	<0.1	<0.1	<0.1	<0.1	12.0	86.8
0309020212	0.1	<0.1	<0.1	<0.1	0.0	0.0	<0.1	0.0	<0.1	0.0	0.0	2.4	97.3
0309020213	0.6	0.6	<0.1	<0.1	0.0	<0.1	1.4	<0.1	<0.1	<0.1	1.6	13.1	82.6
0309020214	22.7	<0.1	<0.1	<0.1	<0.1	<0.1	0.0	0.0	<0.1	0.0	0.0	69.0	8.3
Florida Bay-Florida Keys (03090203)													
0309020301	85.2	<0.1	<0.1	0.0	0.0	<0.1	0.0	0.0	<0.1	0.0	0.0	2.1	12.7
0309020302	72.1	1.6	1.8	1.6	0.2	<0.1	<0.1	0.0	<0.1	0.0	0.0	11.0	11.6
0309020303	60.1	1.5	1.8	1.7	0.5	<0.1	<0.1	<0.1	<0.1	0.0	0.0	10.6	23.7
Big Cypress Swamp (03090204)													
0309020401	7.0	11.3	11.8	4.6	1.0	0.8	6.4	0.3	1.3	5.5	5.9	35.1	8.9
0309020402	2.0	7.0	5.8	2.0	0.3	0.2	3.5	0.3	1.1	5.6	24.3	40.7	7.2
0309020403	0.1	1.1	0.5	<0.1	<0.1	<0.1	2.6	<0.1	0.1	1.2	13.2	67.1	14.0
0309020404	<0.1	8.4	1.9	<0.1	<0.1	<0.1	4.7	0.3	0.4	1.5	14.5	61.9	6.0
0309020405	1.8	24.7	21.1	6.4	1.5	0.6	7.3	0.6	0.8	3.5	1.2	29.0	1.5
0309020406	0.5	8.3	8.4	4.0	0.5	0.3	6.0	0.8	0.6	1.6	10.4	46.3	12.4
0309020407	2.2	2.4	2.4	1.4	0.4	<0.1	1.2	<0.1	0.1	<0.1	1.7	71.4	16.6
0309020408	46.7	0.9	4.0	2.4	0.3	0.3	<0.1	<0.1	<0.1	0.0	0.0	44.6	0.6
0309020409	1.5	1.1	0.5	<0.1	<0.1	<0.1	4.9	0.1	0.4	9.1	16.9	41.9	23.4
0309020410	<0.1	0.4	0.2	<0.1	<0.1	<0.1	2.7	<0.1	<0.1	1.0	1.2	46.1	48.4
0309020411	10.6	<0.1	<0.1	<0.1	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0	72.5	16.8

Table B–9. Land-cover percentages for Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges and contributing watersheds, Florida, based on the 2001 National Land Cover Database.—Continued

[See figure B7 for map of 2001 land cover, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 2001 NLCD (Homer and others, 2007); NWR, National Wildlife Refuge]

10-digit HUC, hydrologic cataloging unit, subregion, or NWR	Percentage of 2001 NLCD land-cover class[a]												
	11	21	22	23	24	31	42	52	71	81	82	90	95
Caloosahatchee (03090205)													
0309020501	0.5	4.8	3.9	0.6	0.3	<0.1	<0.1	<0.1	0.8	1.2	83.1	2.9	1.8
0309020502	0.5	2.8	1.1	<0.1	<0.1	0.1	2.4	7.7	1.3	19.9	40.8	17.6	5.9
0309020503	0.4	8.9	1.6	0.3	<0.1	<0.1	3.0	16.2	1.2	22.0	19.7	19.1	7.6
0309020504	0.5	9.4	2.8	0.1	<0.1	<0.1	3.0	14.2	1.7	14.7	29.3	19.4	4.9
0309020505	<0.1	0.3	<0.1	0.0	0.0	<0.1	2.4	32.7	0.7	17.8	3.0	35.0	8.1
0309020506	8.3	18.9	20.4	4.2	1.3	0.2	5.5	2.2	1.2	7.3	0.6	19.5	10.3
SE Florida Atlantic (03090206)													
0309020601	0.2	5.2	1.5	0.2	<0.1	0.2	2.5	1.3	1.1	33.0	23.1	26.4	5.2
0309020602	0.9	29.3	18.5	4.6	0.9	0.2	4.0	0.3	0.6	2.7	23.0	12.5	2.7
0309020603	0.5	5.0	0.7	<0.1	<0.1	<0.1	2.7	0.6	0.8	29.0	30.9	24.0	5.9
0309020604	4.9	4.1	1.3	0.2	<0.1	<0.1	2.4	0.6	1.2	17.1	38.1	22.8	7.2
0309020605	22.9	15.3	12.5	4.3	1.1	0.4	5.2	0.2	0.5	6.7	4.9	20.1	5.8
0309020606	3.2	15.9	12.2	4.2	0.5	0.3	6.6	0.2	0.4	2.6	7.3	30.4	16.3
0309020607	0.8	7.9	5.0	1.4	0.3	0.1	3.0	0.2	0.3	4.7	2.8	37.9	35.7
0309020608	11.0	11.5	24.7	19.0	4.5	0.9	0.4	<0.1	0.2	0.5	<0.1	12.4	14.6
0309020609	1.2	24.4	27.7	11.7	3.2	0.3	2.4	<0.1	0.5	0.3	14.1	9.5	4.8
0309020610	1.9	26.3	25.6	12.2	1.4	<0.1	1.6	<0.1	0.4	0.3	10.7	12.4	7.2
0309020611	2.3	26.2	32.4	13.3	1.2	0.1	1.2	0.2	0.3	0.2	12.8	7.0	2.7
0309020612	2.2	23.6	36.8	16.7	4.3	<0.1	0.6	0.3	0.3	1.0	0.7	6.8	6.8
0309020613	6.4	7.1	32.8	31.5	10.8	1.3	0.5	<0.1	0.3	0.0	0.0	7.0	2.0
0309020614	10.3	9.4	29.8	20.6	10.7	0.2	0.2	0.2	0.3	1.2	0.3	9.0	7.8
0309020615	5.7	13.6	24.6	11.7	5.3	0.2	0.3	<0.1	<0.1	<0.1	1.0	12.6	24.9
0309020616	3.3	11.5	12.8	2.8	0.7	0.2	0.1	0.6	0.3	<0.1	24.2	14.5	28.9
0309020617	50.9	1.7	2.7	1.3	0.3	<0.1	0.1	<0.1	<0.1	0.0	0.6	10.6	31.7

Table B–9. Land-cover percentages for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and contributing watersheds, Florida, based on the 2001 National Land Cover Database.—Continued

[See figure B7 for map of 2001 land cover, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 2001 NLCD (Homer and others, 2007); NWR, National Wildlife Refuge]

10-digit HUC, hydrologic cataloging unit, subregion, or NWR	Percentage of 2001 NLCD land-cover class[a]												
	11	21	22	23	24	31	42	52	71	81	82	90	95
Hydrologic cataloging units													
03090101	9.3	8.8	3.8	1.5	0.5	0.3	4.1	11.0	1.9	20.6	7.8	24.5	6.0
03090102	0.4	6.3	1.9	0.5	0.1	<0.1	1.7	0.6	1.1	54.7	6.3	22.2	4.3
03090103	0.1	2.3	0.5	<0.1	<0.1	<0.1	2.8	15.4	1.7	34.3	13.9	24.2	4.8
03090201	60.4	2.7	1.4	<0.1	<0.1	<0.1	0.5	<0.1	0.2	<0.1	3.0	12.0	19.7
03090202	3.1	0.6	0.3	<0.1	<0.1	<0.1	0.9	<0.1	0.2	3.3	20.7	19.6	51.2
03090203	72.6	1.0	1.2	1.1	0.2	<0.1	<0.1	<0.1	<0.1	0.0	0.0	7.7	16.1
03090204	4.4	4.2	3.5	1.3	0.3	0.2	3.5	0.2	0.4	2.7	7.0	48.6	23.9
03090205	2.3	9.1	6.2	1.1	0.3	0.1	3.2	10.2	1.3	14.5	26.1	18.8	6.7
03090206	9.9	13.1	16.9	8.3	2.6	0.2	1.8	0.3	0.4	5.3	11.9	15.4	13.9
Hydrologic subregion													
0309	12.2	5.7	4.9	2.1	0.6	0.1	2.2	3.4	0.7	9.2	12.6	23.4	22.7
National Wildlife Refuge													
Caloosa-hatchee	0.0	9.3	9.3	0.0	0.0	0.0	4.7	0.0	0.0	0.0	0.0	69.8	7.0
J.N. "Ding" Darling	22.5	2.1	1.4	0.4	<0.1	0.2	1.5	<0.1	0.3	0.0	0.0	63.9	7.6

[a]2001 NLCD class definitions:
11, open water
21, developed, open space
22, developed, low intensity
23, developed, medium intensity
24, developed, high intensity
31, barren land
42, evergreen forest
52, shrub, scrub
71, grasslands, herbaceous
81, pasture, hay
82, cultivated crops
90, woody wetlands
95, emergent herbaceous wetlands

Table B–10. Land-cover-change percentages for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and contributing watersheds, Florida, from 1992 to 2001, based on the 1992–2001 National Land Cover Database-Land Cover Change Retrofit product.

[See figure B8 for map of 1992–2001 land-cover change, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. Positive percent-net-change values indicate a net gain, negative percent-net-change values indicate a net loss. Abbreviations: HUC, hydrologic unit code; NLCD-LCCR, National Land Cover Database-Land Cover Change Retrofit product; 1992–2001 NLCD-LCCR (Fry and others, 2009); NWR, National Wildlife Refuge]

10-digit HUC, hydrologic cataloging unit, subregion, or NWR	Percentage of HUC/NWR with classification change[a]	Percentage of total HUC area changed in modified Anderson level 1 classifications, 2001[b,c]							Percentage net change from 1992 to 2001 in modified Anderson level 1 classifications[b,d]						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Kissimmee (03090101)															
0309010101	7.3	14.0	51.9	1.0	5.0	5.0	4.9	18.2	8.2	48.7	1.0	5.0	1.5	–45.3	–19.2
0309010102	2.9	1.8	10.0	0.0	20.3	11.6	26.7	29.5	–9.1	9.8	0.0	20.3	6.1	–14.3	–12.8
0309010103	12.2	4.3	77.8	0.6	1.2	1.6	0.5	14.0	1.7	77.1	0.6	1.2	0.4	–58.6	–22.4
0309010104	7.5	8.7	46.5	1.0	1.0	1.7	2.0	39.1	–16.5	46.0	1.0	1.0	0.4	–49.0	17.1
0309010105	8.4	2.3	51.2	0.8	10.7	6.0	6.9	22.1	–9.5	50.7	0.8	10.7	4.8	–57.2	–0.3
0309010106	3.7	8.1	27.4	0.5	1.0	2.5	40.1	20.5	4.5	26.1	0.5	1.0	–0.6	–0.3	–31.2
0309010107	2.0	12.4	10.1	2.8	2.7	9.2	40.0	22.7	1.9	5.1	2.8	2.7	–1.2	12.0	–23.3
0309010108	3.7	10.3	29.5	8.8	2.5	4.2	14.9	29.8	<0.1	28.3	8.8	2.5	2.0	–37.1	–4.5
0309010109	2.3	2.6	19.7	5.9	3.7	7.9	32.5	27.7	–9.3	18.6	5.9	3.7	–0.1	3.5	–22.3
0309010110	3.1	2.0	0.7	0.0	7.1	12.4	59.1	18.7	–1.7	0.5	0.0	7.1	–6.6	37.8	–37.1
0309010111	7.4	51.9	1.3	0.1	0.8	11.8	22.7	11.3	45.7	0.5	0.1	0.8	5.5	12.7	–65.2
0309010112	1.9	6.0	12.2	2.7	5.1	21.3	24.6	28.0	–15.1	9.8	2.7	5.1	13.0	>–0.1	–15.5
0309010113	3.0	8.5	11.3	0.5	5.9	11.0	22.8	40.2	–7.8	9.3	0.5	5.9	4.9	–18.1	5.4
0309010114	3.2	<0.1	1.3	0.1	2.1	26.0	64.4	6.1	–2.3	<0.1	0.1	2.1	2.7	53.4	–56.2
0309010115	3.2	0.1	0.6	1.0	0.9	41.3	39.4	16.6	–4.7	0.3	1.0	0.9	33.8	20.0	–51.3
0309010116	2.2	0.1	6.7	0.7	6.8	35.0	33.8	16.8	–6.4	5.5	0.7	6.8	26.2	2.5	–35.5
0309010117	2.6	12.3	30.9	0.3	3.5	11.8	27.2	14.0	5.9	28.6	0.3	3.5	7.2	–13.1	–32.3
0309010118	2.6	6.3	16.4	1.0	2.8	8.4	34.1	31.1	–17.3	15.4	1.0	2.8	3.9	12.3	–18.1
0309010119	7.5	0.0	0.9	3.5	0.1	10.7	69.6	15.1	–3.3	0.3	3.5	0.1	–9.0	51.1	–42.6
0309010120	4.1	1.5	3.8	<0.1	0.4	9.4	70.4	14.6	–1.6	1.9	<0.1	0.4	–7.7	56.3	–49.3
0309010121	1.8	0.4	4.5	0.0	0.7	2.3	73.1	19.0	–3.4	3.7	0.0	0.7	–5.6	56.9	–52.4
Northern Okeechobee Inflow (03090102)															
0309010201	2.1	4.8	7.9	0.9	1.2	4.6	57.3	23.4	0.2	7.5	0.9	1.2	–11.2	35.7	–34.2
0309010202	2.4	1.3	6.5	1.4	3.1	6.8	65.7	15.3	–1.1	0.3	1.4	3.1	3.8	50.5	–58.0
0309010203	3.8	5.5	15.5	0.4	0.3	2.7	64.0	11.5	0.8	9.5	0.4	0.3	0.6	50.0	–61.6
Western Okeechobee Inflow (03090103)															
0309010301	4.7	0.4	1.6	<0.1	1.4	12.1	71.7	12.7	–2.1	0.9	<0.1	1.4	–11.4	56.8	–45.7
0309010302	6.3	0.6	1.7	0.3	0.9	33.8	57.7	5.0	<0.1	1.3	0.3	0.9	20.5	51.7	–74.9
0309010303	3.6	0.9	3.6	0.7	0.2	11.2	76.3	7.0	–0.3	2.7	0.7	0.2	0.4	68.6	–72.3
0309010304	3.7	1.0	2.7	<0.1	0.2	6.0	71.8	18.3	–1.0	–1.3	0.0	0.2	–9.8	54.3	–42.5
Lake Okeechobee (03090201)															
0309020101	1.8	1.3	58.1	0.0	1.5	2.2	16.8	20.1	–3.5	51.7	0.0	1.5	2.2	–8.7	–43.3
0309020102	2.6	10.3	0.3	0.0	0.0	0.3	<0.1	89.1	–69.6	–1.4	0.0	0.0	>–0.1	–12.7	83.8

Table B–10. Land-cover-change percentages for Caloosahatchee and J.N. “Ding” Darling National Wildlife Refuges and contributing watersheds, Florida, from 1992 to 2001, based on the 1992–2001 National Land Cover Database-Land Cover Change Retrofit product.—Continued

[See figure B8 for map of 1992–2001 land-cover change, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. Positive percent-net-change values indicate a net gain, negative percent-net-change values indicate a net loss. Abbreviations: HUC, hydrologic unit code; NLCD-LCCR, National Land Cover Database-Land Cover Change Retrofit product; 1992–2001 NLCD-LCCR (Fry and others, 2009); NWR, National Wildlife Refuge]

10-digit HUC, hydrologic cataloging unit, subregion, or NWR	Percentage of HUC/NWR with classification change[a]	Percentage of total HUC area changed in modified Anderson level 1 classifications, 2001[b,c]							Percentage net change from 1992 to 2001 in modified Anderson level 1 classifications[b,d]						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Everglades (03090202)															
0309020201	4.5	21.4	1.7	1.4	0.0	1.7	33.7	40.0	17.5	–11.6	1.4	–0.6	1.7	–17.8	9.5
0309020202	2.4	6.3	4.5	0.2	0.0	1.7	57.4	29.9	–0.3	–13.3	0.2	–0.1	1.7	23.6	–11.8
0309020203	4.1	0.5	0.1	0.0	0.0	1.0	29.5	68.9	–0.5	–7.5	0.0	–0.1	0.9	–39.3	46.5
0309020204	2.0	0.0	0.0	0.0	0.0	14.9	1.1	84.0	0.0	–17.5	0.0	0.0	14.9	–71.4	74.0
0309020205	1.3	1.9	53.7	2.9	0.0	11.4	7.1	23.0	1.4	50.2	2.9	0.0	11.4	–47.8	–18.0
0309020206	0.2	15.9	8.5	0.0	0.0	2.4	0.0	73.3	8.2	–12.8	0.0	0.0	2.4	–52.7	54.9
0309020207	1.4	0.0	3.1	0.0	1.5	4.8	60.8	29.8	–2.0	–1.5	0.0	1.5	–0.9	34.5	–31.7
0309020208	2.0	0.0	6.7	1.0	1.0	3.8	77.6	9.9	–0.3	0.4	1.0	1.0	3.8	66.3	–72.2
0309020209	3.2	<0.1	1.0	0.0	0.5	0.7	72.7	25.1	–1.5	–58.2	0.0	0.4	0.7	52.8	5.8
0309020210	0.9	0.2	1.4	0.0	1.7	0.5	10.8	85.4	0.2	–2.6	0.0	1.7	0.5	–73.0	73.2
0309020211	0.3	8.4	1.6	0.0	0.2	0.5	0.0	89.3	–4.1	–6.7	0.0	0.2	0.5	–69.5	79.6
0309020212	<0.1	5.0	0.0	0.0	0.0	0.0	0.0	95.0	5.0	–95.0	0.0	0.0	0.0	0.0	90.0
0309020213	0.6	28.6	1.4	0.0	1.0	0.5	23.9	44.5	27.6	–43.4	0.0	–0.5	0.5	2.6	13.3
0309020214	0.2	41.3	0.0	0.4	0.0	0.0	0.0	58.3	4.4	–15.5	0.4	0.0	0.0	–27.5	38.1
Florida Bay-Florida Keys (03090203)															
0309020301	<0.1	1.8	0.0	0.0	0.0	0.0	0.0	98.2	–92.9	–3.8	0.0	0.0	0.0	–1.4	98.2
0309020302	0.3	2.7	1.1	0.0	0.0	0.0	0.0	96.3	–80.5	–11.6	0.0	0.0	0.0	–2.3	94.4
0309020303	0.9	22.0	0.8	0.8	0.0	0.0	0.0	76.4	–37.2	–30.1	0.8	0.0	0.0	–1.5	68.1
Big Cypress Swamp (03090204)															
0309020401	11.1	10.8	57.8	2.7	3.0	4.3	14.8	6.5	10.0	50.2	2.7	3.0	4.3	–6.0	–64.2
0309020402	5.3	13.6	48.2	0.4	1.1	2.2	28.6	5.9	12.8	38.1	0.4	1.1	2.2	17.0	–71.6
0309020403	1.4	5.3	4.3	0.1	1.0	1.2	77.4	10.7	5.3	–41.9	0.1	1.0	1.2	67.2	–32.9
0309020404	1.1	1.7	23.4	0.8	1.3	2.4	51.3	19.1	1.6	15.1	0.8	1.3	2.4	33.8	–55.1
0309020405	7.6	12.3	76.3	1.1	0.7	1.6	3.2	4.8	11.8	66.5	1.1	0.7	1.6	–12.7	–68.9
0309020406	5.7	5.6	62.4	1.6	<0.1	2.1	26.3	1.8	5.4	56.5	1.6	<0.1	2.1	20.9	–86.6
0309020407	2.6	4.4	54.4	1.3	0.9	3.6	21.4	14.1	4.3	45.7	1.3	0.9	3.6	10.3	–66.0
0309020408	1.0	55.4	18.6	12.3	0.1	2.9	0.0	10.7	46.1	9.9	12.3	0.1	2.9	–13.8	–57.6
0309020409	1.8	2.8	4.1	0.2	2.4	1.7	71.5	17.4	2.2	–16.0	0.2	2.4	1.6	54.7	–45.0
0309020410	0.3	0.3	4.3	0.1	11.2	0.5	24.7	58.9	0.3	0.1	0.1	11.2	0.5	–35.3	23.1
0309020411	0.2	23.5	1.5	0.0	0.0	0.0	0.0	75.0	1.0	–18.0	0.0	0.0	0.0	–42.3	59.3

Table B–10. Land-cover-change percentages for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and contributing watersheds, Florida, from 1992 to 2001, based on the 1992–2001 National Land Cover Database-Land Cover Change Retrofit product.—Continued

[See figure B8 for map of 1992–2001 land-cover change, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. Positive percent-net-change values indicate a net gain, negative percent-net-change values indicate a net loss. Abbreviations: HUC, hydrologic unit code; NLCD-LCCR, National Land Cover Database-Land Cover Change Retrofit product; 1992–2001 NLCD-LCCR (Fry and others, 2009); NWR, National Wildlife Refuge]

10-digit HUC, hydrologic cataloging unit, subregion, or NWR	Percentage of HUC/NWR with classification change[a]	Percentage of total HUC area changed in modified Anderson level 1 classifications, 2001[b,c]							Percentage net change from 1992 to 2001 in modified Anderson level 1 classifications[b,d]						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Caloosahatchee (03090205)															
0309020501	1.4	11.6	16.3	0.0	0.0	1.9	56.5	13.6	3.1	11.1	0.0	0.0	–3.4	34.9	–45.7
0309020502	4.8	2.5	3.2	1.0	1.0	16.9	60.6	14.9	–3.6	1.9	1.0	1.0	11.3	43.7	–55.4
0309020503	4.9	0.3	7.9	0.2	1.3	31.8	46.1	12.4	–0.6	7.5	0.2	1.3	18.4	27.1	–53.9
0309020504	3.6	1.0	14.0	0.2	2.6	19.6	42.3	20.3	–1.7	10.7	0.2	2.6	8.3	12.2	–32.3
0309020505	1.9	0.0	0.8	0.0	1.1	35.5	41.5	21.1	–4.4	0.4	0.0	1.1	31.8	20.6	–49.6
0309020506	4.3	6.1	66.5	1.5	3.1	3.4	6.0	13.5	2.5	63.1	1.5	3.1	1.7	–27.4	–44.4
SE Florida Atlantic (03090206)															
0309020601	5.1	1.6	13.4	1.6	1.0	4.4	69.3	8.7	–1.1	–8.5	1.6	1.0	1.4	60.8	–55.2
0309020602	5.2	1.9	64.9	0.4	2.3	1.5	20.1	8.9	1.3	55.4	0.4	2.3	1.5	–15.5	–45.3
0309020603	5.7	5.5	5.3	0.1	0.5	1.6	77.2	9.7	4.7	–12.1	0.1	0.5	1.4	69.3	–64.0
0309020604	4.0	14.3	4.7	0.3	0.7	2.1	70.7	7.2	13.7	–10.7	0.3	0.7	2.1	62.9	–69.0
0309020605	4.5	5.8	49.7	0.6	5.3	3.5	21.4	13.8	4.1	42.0	0.6	5.3	3.5	–6.1	–49.3
0309020606	4.7	2.1	59.9	0.6	4.4	1.5	15.7	15.7	–6.3	53.6	0.6	4.4	1.5	–11.4	–42.4
0309020607	5.3	5.4	51.6	0.1	0.7	0.8	25.4	16.0	–8.4	43.2	0.1	0.7	0.8	3.1	–39.5
0309020608	6.3	3.7	83.9	1.3	0.5	0.4	0.4	9.7	1.8	80.3	1.3	0.5	0.4	–56.4	–27.9
0309020609	9.0	4.1	80.3	0.8	1.2	1.0	8.1	4.6	3.4	76.3	0.8	1.2	1.0	–28.5	–54.1
0309020610	5.5	6.2	49.4	<0.1	0.6	0.8	23.4	19.6	1.7	17.1	<0.1	0.5	0.8	–10.7	–9.5
0309020611	8.3	7.5	59.8	0.7	0.2	0.8	23.4	7.6	1.7	38.2	0.7	0.1	0.8	–15.2	–26.4
0309020612	6.8	6.3	79.4	<0.1	0.2	1.3	0.8	12.1	3.3	72.4	<0.1	0.2	1.3	–53.9	–23.2
0309020613	1.2	8.5	69.4	1.5	0.6	1.2	0.0	18.9	0.9	60.6	1.5	0.4	1.2	–52.8	–11.8
0309020614	6.8	21.3	67.2	1.0	<0.1	1.4	0.6	8.4	19.0	58.5	1.0	>–0.1	1.4	–34.0	–45.8
0309020615	4.2	45.5	42.5	1.3	<0.1	0.2	3.2	7.3	42.2	27.0	1.3	<0.1	0.2	–28.4	–42.4
0309020616	4.9	9.3	31.9	1.6	<0.1	2.8	40.8	13.6	6.3	0.8	1.6	>–0.1	2.8	11.0	–22.5
0309020617	0.8	21.3	27.3	0.6	0.2	2.4	13.0	35.3	–1.2	4.2	0.6	0.2	2.4	–18.8	12.7

Table B–10. Land-cover-change percentages for Caloosahatchee and J.N. "Ding" Darling National Wildlife Refuges and contributing watersheds, Florida, from 1992 to 2001, based on the 1992–2001 National Land Cover Database-Land Cover Change Retrofit product.—Continued

[See figure B8 for map of 1992–2001 land-cover change, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. Positive percent-net-change values indicate a net gain, negative percent-net-change values indicate a net loss. Abbreviations: HUC, hydrologic unit code; NLCD-LCCR, National Land Cover Database-Land Cover Change Retrofit product; 1992–2001 NLCD-LCCR (Fry and others, 2009); NWR, National Wildlife Refuge]

10-digit HUC, hydrologic cataloging unit, subregion, or NWR	Percentage of HUC/NWR with classification change[a]	Percentage of total HUC area changed in modified Anderson level 1 classifications, 2001[b,c]							Percentage net change from 1992 to 2001 in modified Anderson level 1 classifications[b,d]						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Hydrologic cataloging units															
03090101	4.5	10.2	28.4	1.3	3.6	10.1	25.8	20.6	1.2	27.2	1.3	3.6	3.5	–11.2	–25.6
03090102	2.8	4.4	11.5	0.8	1.1	4.1	62.7	15.4	0.2	6.9	0.8	1.1	–1.7	46.5	–53.9
03090103	4.7	0.7	2.2	0.3	0.8	20.2	66.9	9.0	–0.6	1.2	0.3	0.8	4.8	56.9	–63.4
03090201	2.4	9.0	8.7	0.0	0.2	0.5	2.5	79.0	–60.0	6.3	0.0	0.2	0.3	–12.1	65.2
03090202	1.2	9.2	5.1	0.5	0.3	2.6	37.0	45.4	5.5	–12.9	0.5	<0.1	2.2	–7.9	12.5
03090203	0.4	17.1	0.8	0.6	0.0	0.0	0.0	81.5	–48.6	–25.2	0.6	0.0	0.0	–1.7	74.8
03090204	2.7	10.3	49.7	1.8	2.2	2.9	23.5	9.5	9.5	39.4	1.8	2.2	2.9	5.6	–61.4
03090205	4.0	2.9	22.7	0.7	2.0	16.6	39.5	15.6	–1.0	20.5	0.7	2.0	9.5	14.7	–46.3
03090206	5.1	9.8	52.1	0.8	1.0	1.7	23.8	10.8	6.4	38.1	0.8	0.9	1.5	–8.5	–39.2
Hydrologic subregion															
0309	3.1	8.5	32.4	0.9	1.8	6.7	29.7	19.9	1.2	24.2	0.9	1.7	3.2	0.6	–31.8
National Wildlife Refuge															
Caloosahatchee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
J.N. "Ding" Darling	1.8	63.7	13.4	2.1	0.0	0.0	0.0	20.8	59.5	0.5	2.1	0.0	0.0	–24.4	–37.7

[a]Areal percentage of 30-meter cells that were reclassified between 1992 and 2001 using methods described in Fry and others (2009). The reclassified area is used as the base for comparison in presenting the modified Anderson Level 1 classification and net-change percentages for 2001.

[b]Classifications modified from Anderson level 1 land-cover classifications (Anderson and others, 1976):
- 1, water
- 2, urban
- 3, barren
- 4, forest
- 5, grassland
- 6, agriculture
- 7, wetland

[c]Percentages given are of the portion of the HUC/NWR that changed classification between 1992 and 2001.

[d]The interpretation would be a conversion from the classification(s) with negative values to the classification(s) with positive values. For example, in the 12.2 percent of HUC 0309010103 that changed classification between 1992 and 2001, primarily agricultural land or wetland was converted to urban land. The net gains in modified Anderson level 1 classification balance the net losses.

Chapter C. Hydrologic and Landscape Database for the Clarks River National Wildlife Refuge and Contributing Watersheds in Kentucky, Tennessee, and Mississippi

Introduction

This chapter, along with the information provided in Part I of this report, describes and documents the development, use, and context of a hydrologic and landscape database for the Clarks River National Wildlife Refuge (NWR) and contributing watersheds in parts of Kentucky, Tennessee, and Mississippi (figs. C1*A*, *B*). NWR-management objectives for the Clarks River NWR (table C1; U.S. Fish and Wildlife Service, 2012) include protection, enhancement, and management of a valuable bottomland hardwood forest and wetland, provision of adequate wetland habitat for migratory birds, and reforestation of frequently flooded farm fields. In addition, the NWR has implemented a cooperative farming program in agriculture and pasture fields that are acquired by the NWR. Development of environmental education programs with emphasis on conservation issues and human impact on the environment is also an important NWR objective.

NWR Setting and Environmental Issues

The Clarks River NWR was established in 1997 primarily to conserve and protect the bottomland hardwood ecosystem that benefits migratory songbirds, waterfowl, and other species. The NWR is located in Graves, Marshall, and McCraken Counties, Kentucky, and is managed out of Benton, Kentucky. It presently includes 8,634 acres with an approved acquisition area of 19,605 acres for future growth. Most of the NWR is covered with forest and agriculture lands (U.S. Fish and Wildlife Service, 2012).

Environmental issues pertinent for Clarks River NWR include wetland loss due to deforestation for agriculture activities, hydrologic alteration as a result of road and dam construction, river obstructions due to lock and levees, water-quality impairment from upland buffers that are disconnected or missing, and climate change altering the vegetation community (U.S. Fish and Wildlife Service, 2012). Deforestation for agriculture activities and the drying of wetlands (through draining or filling) have contributed to wetland loss. The loss of wetlands places greater stress on the remaining wetlands to store and purify water and to provide habitat for native and migratory birds. Hydrologic alterations as a result of road and dam construction have transformed the character and functions of rivers and wetlands leading to flooding, water pollution, and loss of habitat. Currently, access to the NWR is limited. There is a need to strategically purchase land close to roads within the acquisition boundary to provide access to the public. The purchase of these lands will benefit the protection and restoration of upland wetland habitats, which are critical to filter pollutants (U.S. Fish and Wildlife Service, 2012). Data compiled in this database provide a foundation for addressing these environmental issues. For example, hydrologic data in this database encompass historic and current discharge and gage height measurements which are necessary to evaluate past and future hydrologic alteration caused by upstream road and dam construction. Historical and current water-quality data provide U.S. Fish and Wildlife Service (USFWS) managers a frame of reference to assess water-quality impairment caused by disconnected or missing riparian buffers.

Physiographic Setting

The contributing watersheds for the Clarks River NWR, as defined in this report, include two hydrologic subregions (4-digit hydrologic units): Lower Tennessee (0604) and Cumberland (0513). The two hydrologic subregions are composed of three hydrologic accounting units (AU; 6-digit hydrologic units): Lower Tennessee (060400), Upper Cumberland (051301), and Lower Cumberland (051302) (figs. C1*A*, *B*) (Seaber and others, 1994; U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013). The drainage area of the Lower Tennessee, Upper and Lower Cumberland hydrologic AUs is 26,001 square miles.

The Clarks River NWR is located in the southwestern part of Kentucky and is bisected by the Loess Plains and Wabash-Ohio Bottomland U.S. Environmental Protection Agency (EPA) Level IV ecoregions (fig. C2*A*) (U.S. Environmental Protection Agency, 2011). The entire contributing watershed area is diverse and encompasses 21 different Level IV ecoregions. Mean-annual precipitation for the contributing-watershed area ranges from 47 to 73 inches per year (in/yr), based on 1981–2010 climate normals (PRISM Climate Group, 2012). Mean-annual runoff for the entire contributing watershed area for the period 1951–80 (Gebert and others, 1987) ranges from 18 in/yr in the northern parts of the Lower Tennessee and Lower Cumberland AUs to 30 in/yr in the southern part of the Upper Cumberland AU. Figures C3*A*–*J* show the distribution of the hydrologic soil groups (HSGs) A through D and mixed HSG for the 20 8-digit hydrologic cataloging units (CU) in the contributing-watershed area as areal percentages of each CU.

Data and Database Files

Hydrologic and Landscape Data

Fifty-three gaging stations were selected to be included in the hydrologic and landscape database for the Clarks River NWR and contributing watersheds (fig. C1; tables C2*A*, *B* [tables C2–C15 are at the end of the chapter]). Continuous hydrologic data collected at these stations include gage height, discharge, water temperature, specific conductivity, dissolved oxygen, suspended sediment concentration, suspended sediment discharge, pH, and turbidity. Station characteristics are presented in table C2*A*, and station periods of record for available continuous data from each site are presented in table C2*B*. Five stations listed in table C2*A* have only annual peak data (no mean-daily data) and therefore do not appear in table C2*B*. Forty-four stations have daily record for discharge, and 27 stations have daily record for gage height. Seven stations have daily record for suspended sediment concentration, and 6 stations have daily record for suspended sediment discharge. Three stations have daily record for water temperature, 3 stations have daily record for specific conductivity, 1 station has daily record for pH, and 1 station has daily record for turbidity (table C2*B*). Gaging station locations, station-description data, and hydrologic data included in this database were primarily retrieved from the U.S. Geological Survey (USGS) National Water Information System (NWISWeb) database (U.S. Geological Survey, 2002, 2011), but also retrieved from U.S. Army Corps of Engineers and the Tennessee Valley Authority as indicated in table C2*B*.

Tabular and spatial landscape data were compiled. Categories of tabular landscape data summarized in Microsoft Excel files in the database include ecoregions, land cover, population, and soils data. Spatial data mapped in this report include ecoregions, land cover, soils, geographic and hydrologic boundaries, hydrography, and site locations.

Database Files

Database files are organized into three directories: (1) data, (2) iha, and (3) plots_pdf. The data directory contains three subdirectories: (1) access, (2) ascii, and (3) excel. The access subdirectory contains six Microsoft Access files with raw hydrologic data that follow the naming convention ckr_tabular_hydrostats_raw_***source***_[***dv,pk***].accdb, where ***source*** indicates the source of the data and is either tva for Tennessee Valley Authority, usace for U.S. Army Corps of Engineers, or usgs01, usgs02, or usgs03 for U.S. Geological Survey, ***dv*** is daily values, and ***pk*** is peak values. Raw data retrieved from the USGS are split into three Microsoft Access files because of file size restrictions. There are also nine Microsoft Access files with statistical summary data that follow the naming convention ckr_tabular_hydrostats01[***c,w***]_***source***.accdb and ckr_tabular_hydrostats02.accdb, where ***c*** is calendar year, ***w*** is water year, and ***source*** indicates the source of the data and is either tva for Tennessee Valley Authority, usace for U.S. Army Corps of Engineers, or usgs01 or usgs02 for U.S. Geological Survey. Statistical summary of raw data retrieved from the USGS is split into two Microsoft Access files because of file size restrictions. The raw data are aggregated by calendar year (January 1 through December 31) and water year (October 1 through September 30) for annual summaries, and also by calendar decade, calendar year and month, calendar month of the period of record, and Julian day over the period of record for both calendar and water years. The long-term (period of record) monthly and daily summary data are for complete years only. The long-term monthly summary data are based on both mean-daily values and monthly mean values. The ascii subdirectory contains raw NWISWeb data files that follow the naming convention s***SSSSSSSS***[***dv,pk***]_rdb, where ***SSSSSSSS*** is the USGS station identification number, ***dv*** is daily value, and ***pk*** is peak value. The excel subdirectory contains four Microsoft Excel files summarizing ecoregion (ckr_eco34.xlsx), land cover (ckr_nlcd.xlsx), population (ckr_pop_census.xlsx), and soils (ckr_sgo_hsg.xlsx) data. The iha directory contains Microsoft Excel files with Indicators of Hydrologic Alteration (IHA) outputs for each station and parameter combination in which IHA computations were completed. The files are named s***SSSSSSSS***_iha_[***qmn,scmn,sdmn***].xlsx for IHA analyses completed on data retrieved from the USGS, where ***SSSSSSSS*** is the USGS station identification number, ***qmn*** is mean-daily discharge, ***scmn*** is mean-daily suspended sediment concentration, and ***sdmn*** is mean-daily suspended sediment discharge. For IHA analyses completed on data retrieved from agencies other than the USGS, files are named s***SSSSSSSS***[***coe,tva***]_iha_[***qmn,gmn,g0uv,g7uv,g8uv,gu7uv***], where ***SSSSSSSS*** is the USGS station identification number, ***coe*** is U.S. Army Corps of Engineers, ***tva*** is Tennessee Valley Authority, ***qmn*** is mean-daily discharge, ***gmn*** is mean-daily gage height, ***g0uv*** is gage height unit value at 0000, ***g7uv*** is the gage height unit value at 0700, ***g8uv*** is the gage height unit value at 0800, and ***gu7uv*** is the gage height headwater unit value at 0700. In addition, IHA summary workbooks are included for gage height (regional_iha_gmn_ckr.xlsx) and discharge (regional_iha_qmn_ckr.xlsx). The plots_pdf directory contains Adobe portable document file (PDF) plot files. A list of the database files, tables and worksheets, and table and worksheet descriptions is included in table C3*A*. A list of database field names, field types, and field definitions is included in table C3*B*. Periods of record for mean-daily gage height and mean-daily discharge data used in IHA analyses are shown in figures C4 and C5, respectively.

Database Summary Data

This section includes statistical and graphical summaries of the hydrologic data and IHA summary data, and zonal summaries of the National Land Cover Database (NLCD) land-cover and land-cover-change data. The summary data describe the data in the database, provide a context for hydrologic analysis, and can help database users determine which data are suitable for answering specific NWR hydrologic questions related to environmental issues discussed above.

Hydrologic Statistical and Graphical Summary

A station-level summary of the hydrologic data by both water year and calendar year is presented in tables C4–C6. The primary purpose of these summary tables is to provide database users with information on the quantity and quality of available data, facilitate comparisons between stations, and provide a benchmark for evaluating current hydrologic conditions within the context of the long-term record. Tables C4*A* (water year) and C4*B* (calendar year) summarize the mean-annual and mean-daily gage-height values for each gaging station. The mean, minimum, and maximum values and the 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles are given for mean-annual gage height, and the minimum and maximum and the same percentiles are also given for mean-daily gage height. The water or calendar year is indicated for the minimum and maximum values for mean-annual and mean-daily gage height. Tables C5*A* (water year) and C5*B* (calendar year) present the same statistics for discharge (with the addition of long-term yield). Tables C6*A* and C6*B* present the same statistics for selected water-quality parameters. Table C7 lists the graphical summary plots available for each gaging station. Plot files are located in the plots_pdf directory of the database. See Part I of this report for a detailed description of plot files.

Interstation Comparison of Indicators of Hydrologic Alteration

Selected IHA results are summarized in two separate Microsoft Excel workbooks as regional analyses for gage height (regional_iha_gmn_ckr.xlsx) and discharge (regional_iha_qmn_ckr.xlsx). Gage height data from six stations and discharge data from nine stations were selected for comparison. The IHA output has been reorganized in these workbooks to facilitate interstation comparisons. The regional IHA workbooks contain the following worksheets: 5 each for the 1-, 3-, 7-, 30-, and 90-day minimum and maximum values, 1 with the baseflow-index values, 1 with a plot of the 75th–25th percentile spread measure, a summary worksheet, and 1 for each station with the complete IHA analysis for that station included. This reorganization facilitates interstation comparison by compiling all of the IHA results into one place.

Landscape GIS Layers

Figures C6–C8 and tables C8–C10 present the land-cover and land-use data for the geographic extent based on the 1992 NLCD (Vogelmann and others, 2001), 2001 NLCD (Homer and others, 2007), and 1992–2001 NLCD-Land Cover Change Retrofit (LCCR) product (Fry and others, 2009) datasets. Land-cover and land-use percentages derived from the 1992 NLCD and 2001 NLCD data are summarized by hydrologic subregion, cataloging unit, and NWR in tables C8 and C9. The land-cover change percentages derived from 1992–2001 NLCD-LCCR data are presented in table C10.

Summary

This chapter, along with methods described in Part I of this report, documents the development, use, and context of a hydrologic and landscape database for the Clarks River National Wildlife Refuge (NWR) and contributing watersheds in Kentucky, Tennessee, and Mississippi. The contributing watersheds include those within the Lower Tennessee (0604) and Cumberland (0513) hydrologic subregions, with total drainage area of 26,000 square miles. The NWR is located in southwestern Kentucky, within parts of the Loess Plains and Wabash-Ohio Bottomland U.S. Environmental Protection Agency Level IV ecoregions. Activities throughout this geographic extent, particularly previous deforestation from agriculture activities, hydrologic alterations from road and dam construction, and climate change, all have or have the potential to either directly or indirectly affect the NWR. The contents of this database are useful for assessing these environmental issues to inform management decisions.

References Cited in Part II, Chapter C

Anderson, J.R., Hardy, E.E., Roach, J.T., and Witmer, R.E., 1976, A land use and land cover classification system for use with remote sensor data: U.S. Geological Survey Professional Paper 964, 28 p.

Baker, D.B., Richards, Peter, Loftus, T.T., and Kramer, J.W., 2004, A new flashiness index: characteristics and applications to midwestern rivers and streams: Journal of the American Water Resources Association , v. 40, p. 503–522.

Fry, J.A., Coan, M.J., Homer, C.G., Meyer, D.K., and Wickham, J.D., 2009, Completion of the National Land Cover Database (NLCD) 1992–2001 Land Cover Change Retrofit product: U.S. Geological Survey Open-File Report 2008–1379, 18 p., accessed March 23, 2015, at http://www.mrlc.gov/nlcdrlc.php.

Gebert, W.A., Graczyk, D.J., and Krug, W.R., 1987, Average annual runoff in the United States, 1951–80: U.S. Geological Survey Hydrologic Investigations Atlas HA–710, scale 1:7,500,000, accessed March 21, 2011, at https://pubs.er.usgs.gov/publication/ha710.

Homer, C., Dewitz, J., Fry, J., Coan, M., Hossain, N., Larson, C., Herold, N., McKerrow, A., VanDriel, J.N., and Wickham, J., 2007, Completion of the 2001 National Land Cover Database for the Conterminous United States, Photogrammetric Engineering and Remote Sensing: U.S. Geological Survey National Land Cover Database 2001 (NLCD 2001), v. 73, no. 4, p. 337–341, accessed March 23, 2015, at http://www.mrlc.gov/nlcd2001.php.

PRISM Climate Group [Oregon State University], 2012, United States average annual precipitation, 1981–2010 (4km; BIL), accessed March 10, 2015, at http://prism.oregonstate.edu.

Richter, B.D., Baumgartner, J.V., Powell, J., and Braun, D.P., 1996, A method for assessing hydrologic alteration within ecosystems: Conservation Biology, v. 10, p. 1163–1174.

Seaber, P.R., Kapinos, F.P., and Knapp, G.L., 1994, Hydrologic unit maps: U.S. Geological Survey Water-Supply Paper 2294, 66 p.

The Nature Conservancy, 2009, Indicators of hydrologic alteration, Version 7.1, User’s manual: The Nature Conservancy with rPurview LLC-Ted Rybicki, Totten Software Design, Smythe Scientific Software, 81 p., accessed April 1, 2015, at http://www.conservationgateway.org/ConservationPractices/Freshwater/EnvironmentalFlows/MethodsandTools/IndicatorsofHydrologicAlteration/Documents/IHAV7.pdf.

U.S. Department of Agriculture, 2009, Hydrologic soil groups, Chapter 7 *in* National Engineering Handbook, Part 630, Hydrology: Natural Resources Conservation Service, 210-VI-NEH, 13 p., accessed March 12, 2015, at http://policy.nrcs.usda.gov/.

U.S. Environmental Protection Agency, 2011, Level III and IV ecoregions of the continental United States: Western Ecology Division, accessed November 30, 2016, at https://catalog.data.gov/dataset/u-s-level-iii-and-iv-ecoregions-u-s-epa.

U.S. Fish and Wildlife Service, 2012, Clarks River National Wildlife Refuge, Comprehensive conservation plan: U.S. Fish and Wildlife Service, Southeast Region, 254 p.

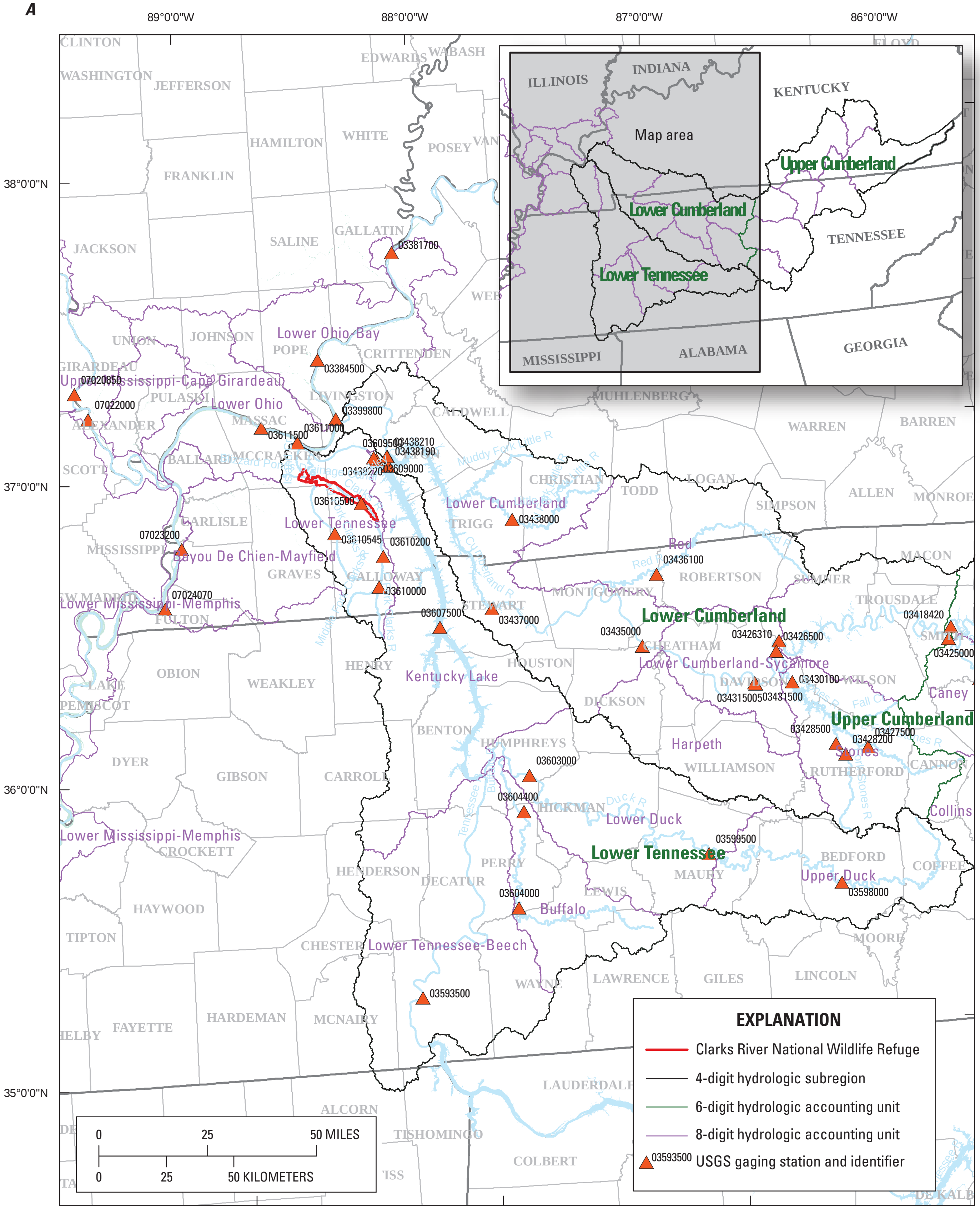
U.S. Geological Survey, 2002, NWISWeb—New site for the Nation’s water data: U.S. Geological Survey Fact Sheet FS–128–02, 2 p., accessed March 24, 2015, at http://pubs.usgs.gov/fs/fs-128-02/.

U.S. Geological Survey, 2011, USGS water data for the Nation, National Water Information System, Web database (NWISWeb), accessed February 11, 2011, at http://waterdata.usgs.gov/usa/nwis/nwis.

U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013, Federal Standards and Procedures for the National Watershed Boundary Dataset (WBD) (4th ed.): U.S. Geological Survey Techniques and Methods, book 11, chap. A3, 77 p.

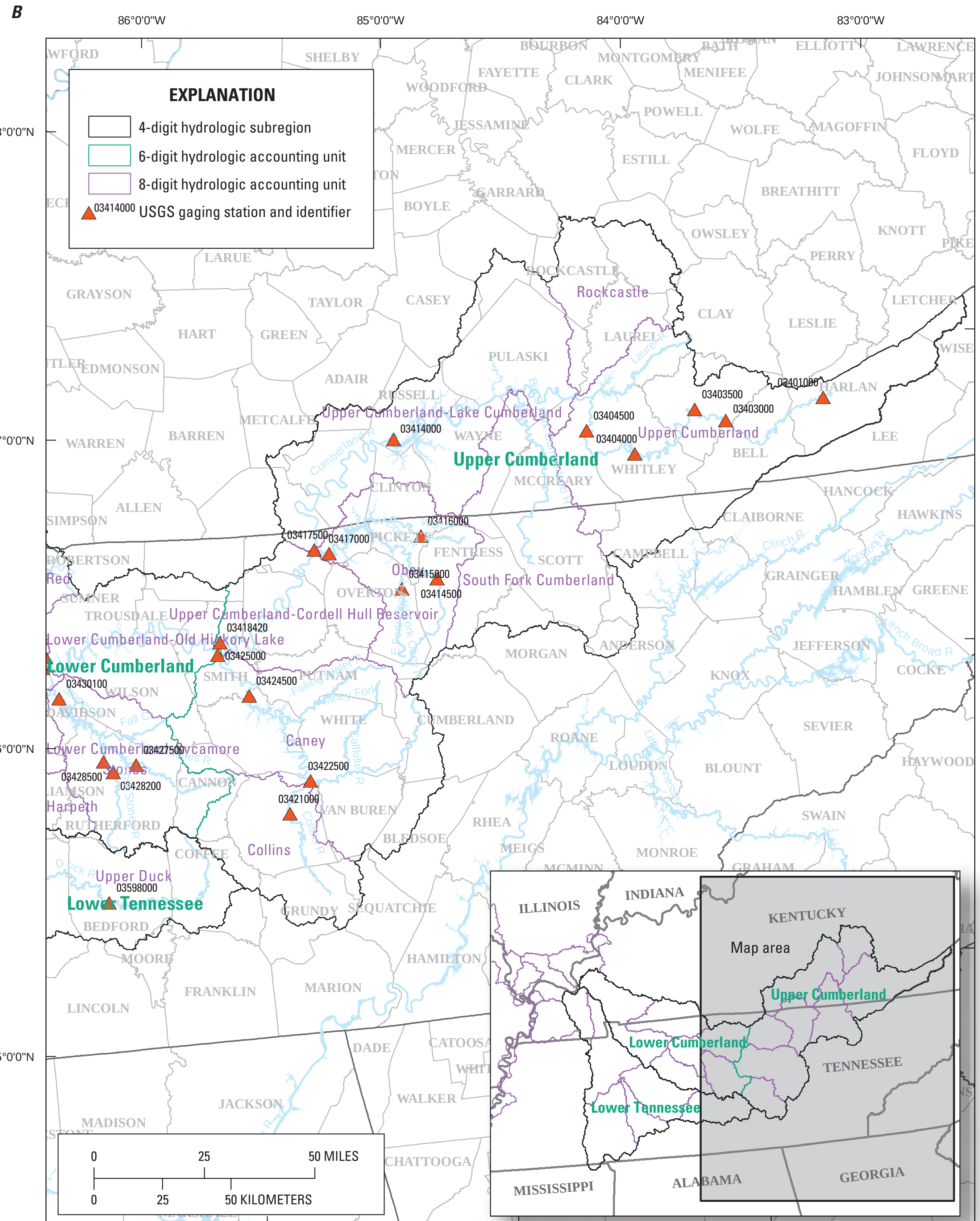
Vogelmann, J.E., Howard, S.M., Yang, Limin, Larson, C.R., Wylie, B.K., and Van Driel, J.N., 2001, Completion of the 1990s National Land Cover Data Set for the conterminous United States from Landsat thematic mapper data and ancillary data sources, Photogrammetric Engineering and Remote Sensing, v. 67, p. 650–662, accessed March 23, 2015, at http://www.mrlc.gov/nlcd1992.php.

A



Base modified from U.S. Geological Survey digital data, various scales

Figure C1. Location of the *A*, western reaches and *B*, eastern reaches of the contributing watershed area for Clarks River National Wildlife Refuge (NWR), with major contributing watersheds, waterways, and gaging stations in Kentucky, Tennessee, and Mississippi. Map insets show the hydrologic subregions (4-digit hydrologic units: Lower Tennessee [0604] and Cumberland [0513]) and hydrologic accounting units (6-digit hydrologic units: Lower Tennessee [060400], Upper Cumberland [051301], and Lower Cumberland [051302]) that define the entire contributing watershed area for the Clarks River NWR. [USGS, U.S. Geological Survey]



Base modified from U.S. Geological Survey digital data, various scales

Figure C1. Location of the *A*, western reaches and *B*, eastern reaches of the contributing watershed area for Clarks River National Wildlife Refuge (NWR), with major contributing watersheds, waterways, and gaging stations in Kentucky, Tennessee, and Mississippi. Map insets show the hydrologic subregions (4-digit hydrologic units: Lower Tennessee [0604] and Cumberland [0513]) and hydrologic accounting units (6-digit hydrologic units: Lower Tennessee [060400], Upper Cumberland [051301], and Lower Cumberland [051302]) that define the entire contributing watershed area for the Clarks River NWR. [USGS, U.S. Geological Survey]—Continued

A

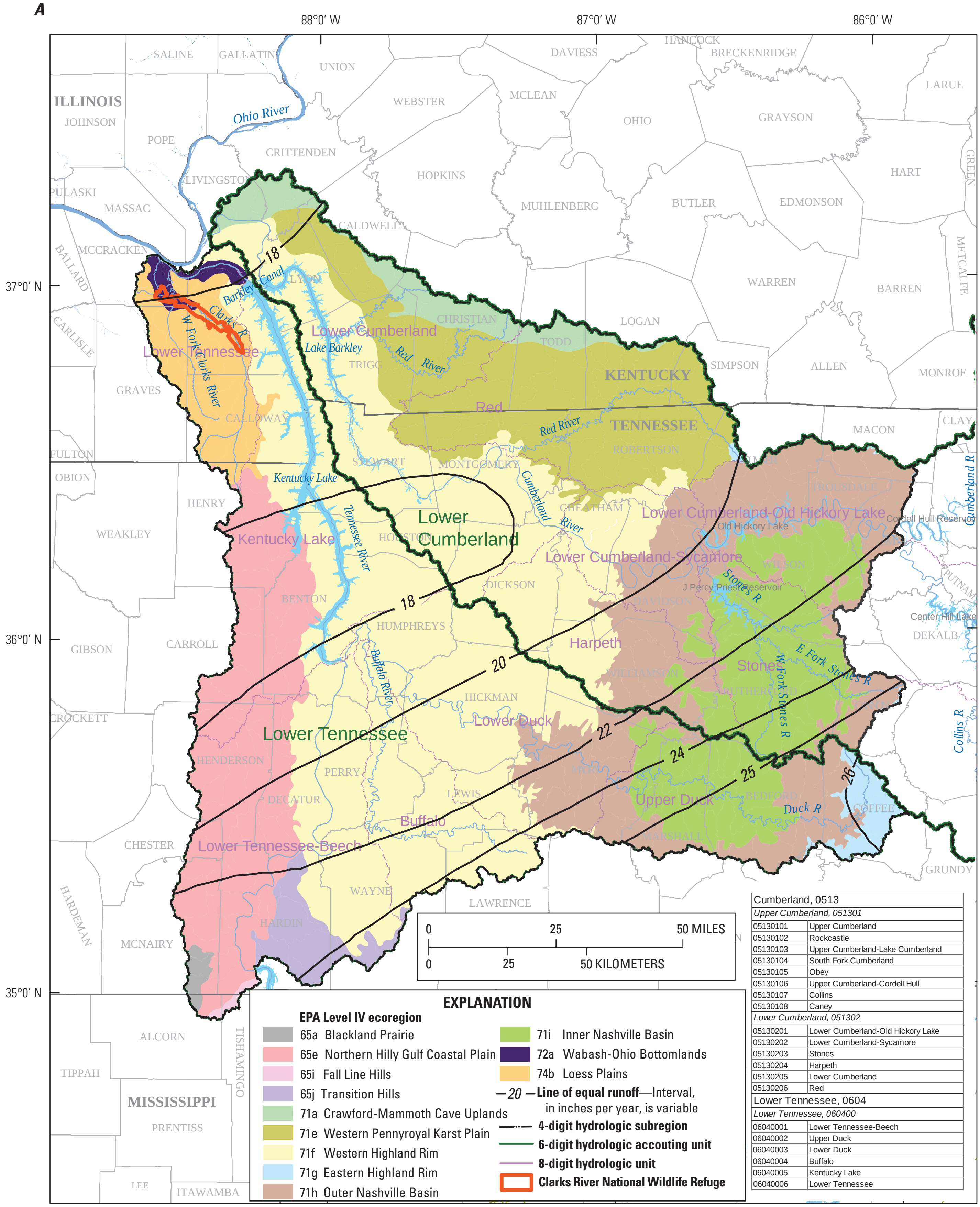
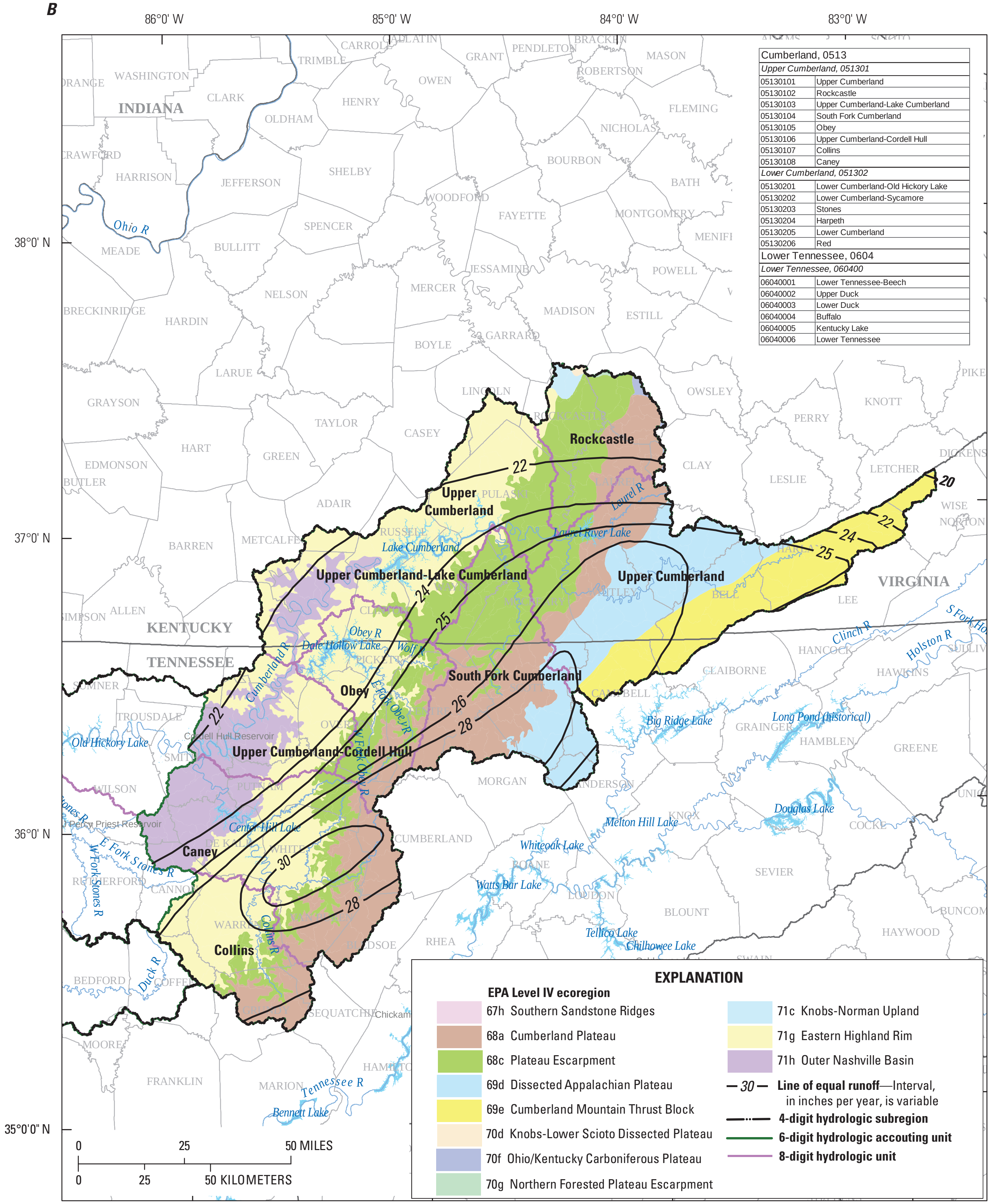


Figure C2. *A*, Location of Clarks River National Wildlife Refuge and western reaches of the contributing watershed area, including the Lower Tennessee (060400) and Lower Cumberland (051302) hydrologic accounting units, hydrologic cataloging units, lines of equal mean-annual runoff for the period 1951–80 (Gebert and others, 1987), and U.S. Environmental Protection Agency Level IV (EPA) ecoregions in the Clarks River watershed (U.S. Environmental Protection Agency, 2011).

B



Base modified from U.S. Geological Survey digital data, various scales

Figure C2. *B*, Location of the eastern reaches of the contributing watershed area for Clarks River National Wildlife Refuge, including the Upper Cumberland hydrologic accounting unit (051301), hydrologic cataloging units, lines of equal mean-annual runoff for the period 1951–80 (Gebert and others, 1987), and U.S. Environmental Protection Agency Level IV ecoregions (U.S. Environmental Protection Agency, 2011).—Continued

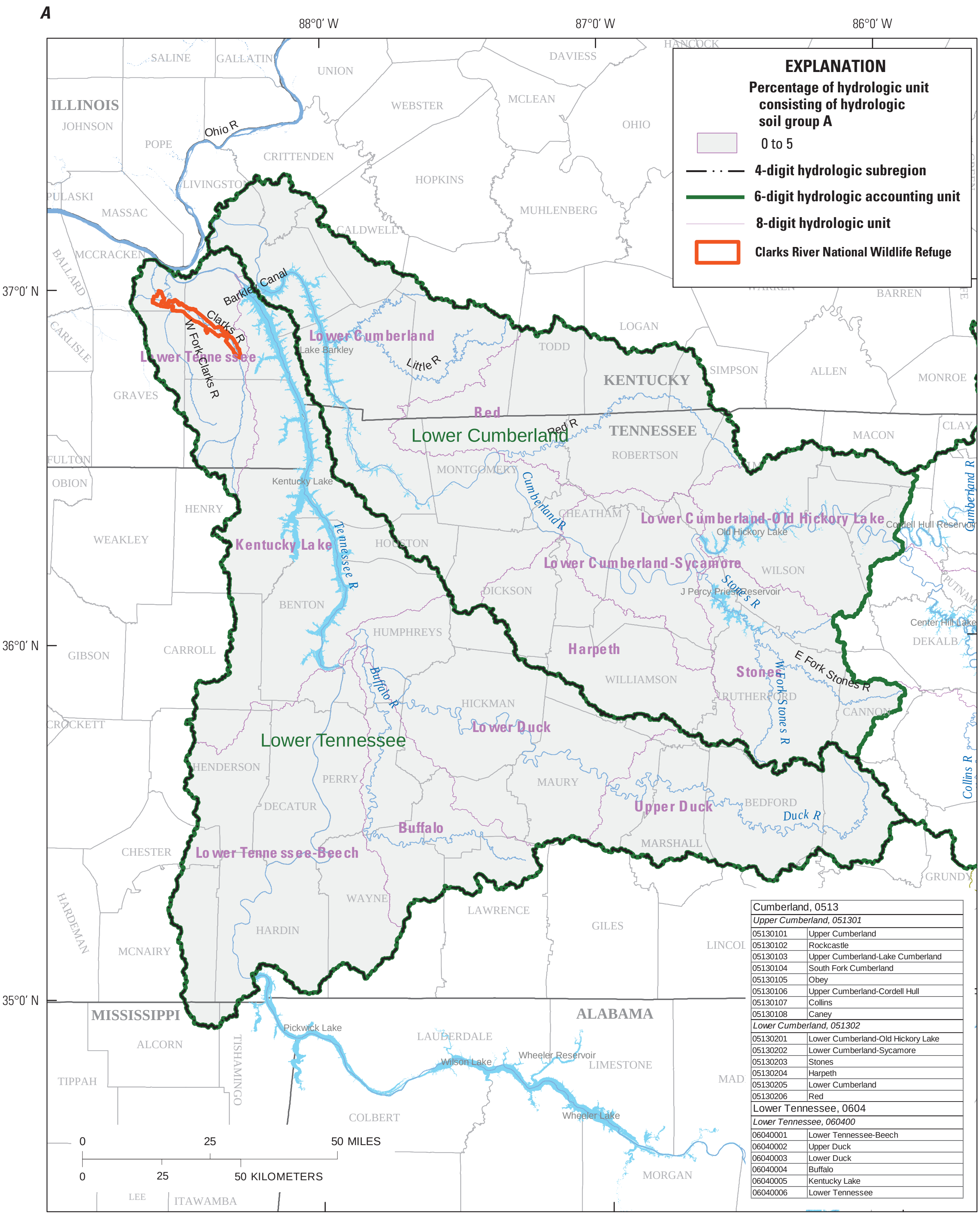


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Figure C3. *A*, Percentages of U.S. Department of Agriculture hydrologic soil group (HSG) A shown by hydrologic cataloging unit in the Lower Tennessee (060400) and Lower Cumberland (051302) hydrologic accounting units. Soils in HSG A have low runoff potential; water is freely transmitted through the soil (U.S. Department of Agriculture, 2009).

B

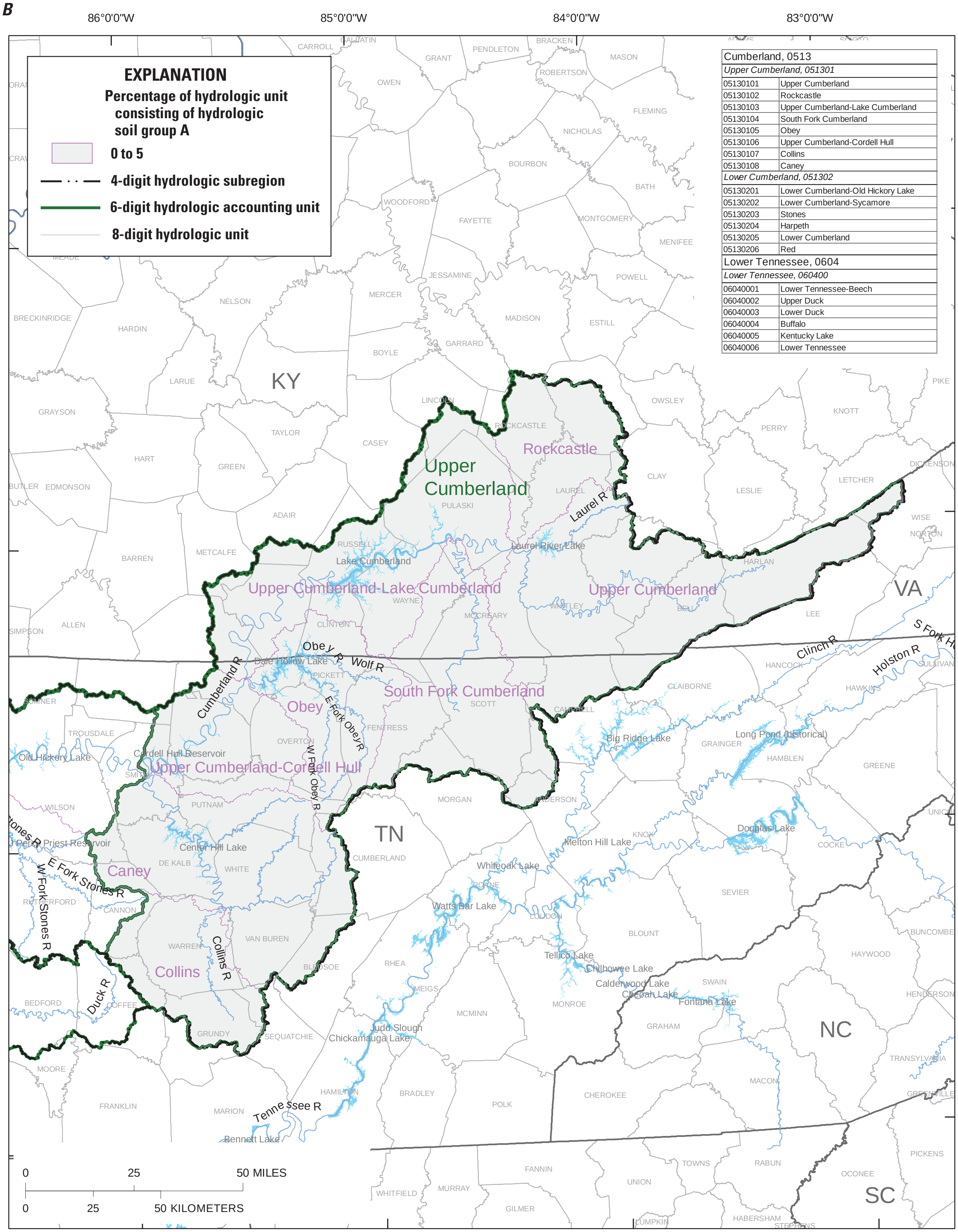

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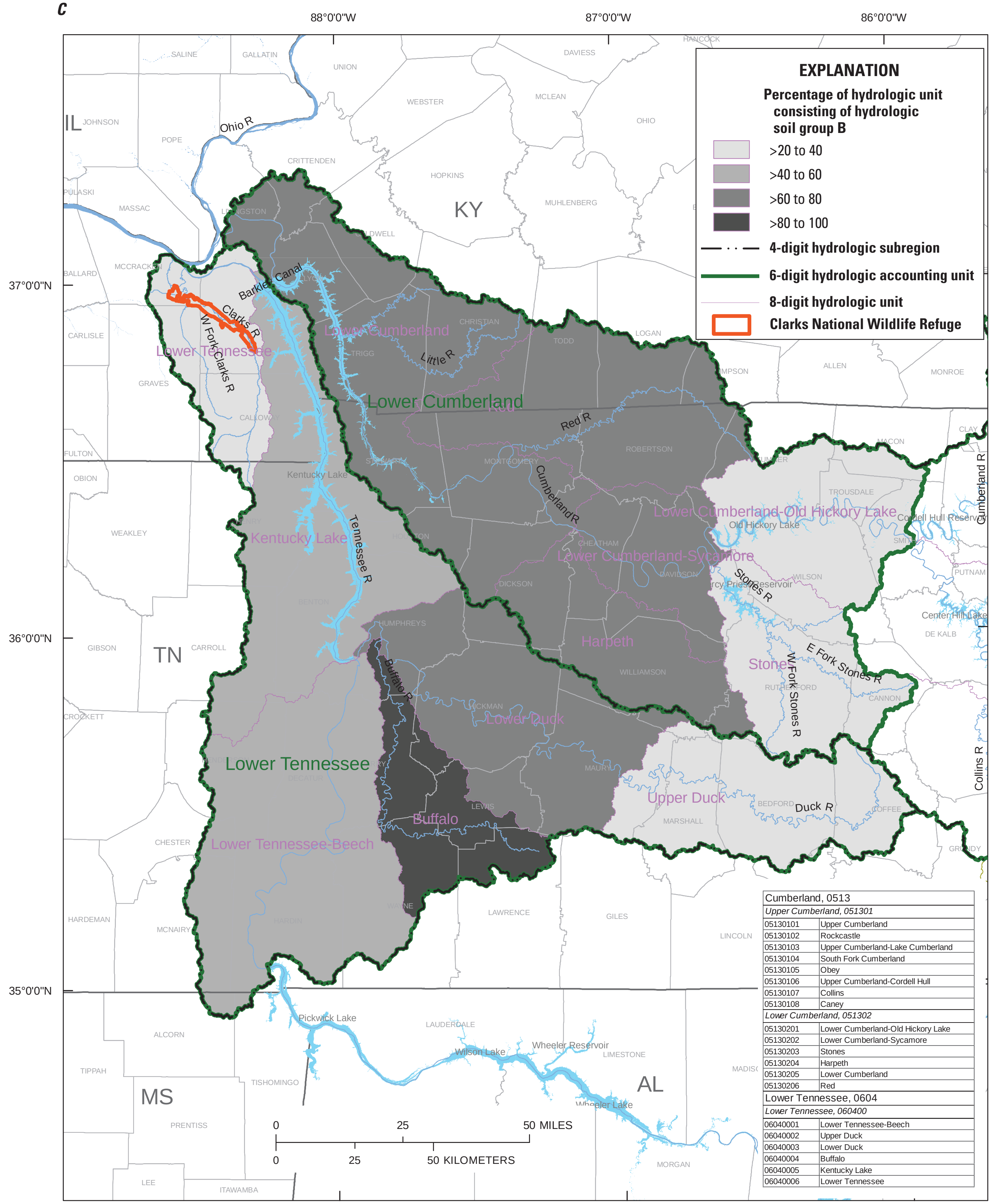
Figure C3. *B*, Percentages of U.S. Department of Agriculture hydrologic soil group (HSG) A shown by hydrologic cataloging unit in the Upper Cumberland hydrologic accounting unit (051301). Soils in HSG A have low runoff potential; water is freely transmitted through the soil (U.S. Department of Agriculture, 2009).—Continued

C



Base modified from U.S. Geological Survey digital data, various scales

Figure C3. *C*, Percentages of U.S. Department of Agriculture hydrologic soil group (HSG) B shown by hydrologic cataloging unit in the Lower Tennessee (060400) and Lower Cumberland (051302) hydrologic accounting units. Soils in HSG B have moderately low runoff potential; water transmission through the soil is unimpeded (U.S. Department of Agriculture, 2009).—Continued

D

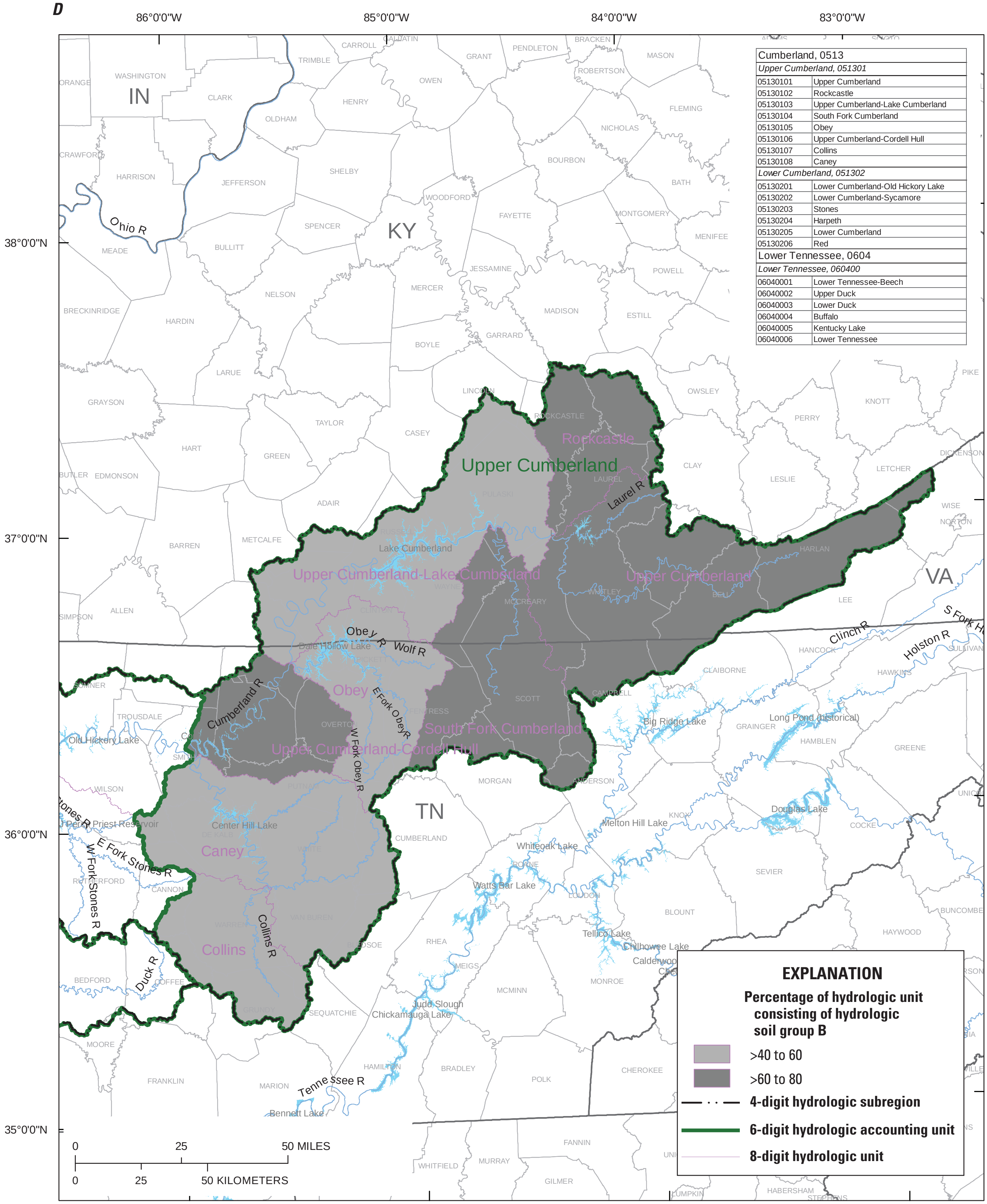


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Figure C3. *D*, Percentages of U.S. Department of Agriculture hydrologic soil group (HSG) B shown by hydrologic cataloging unit in the Upper Cumberland hydrologic accounting unit (051301). Soils in HSG B have moderately low runoff potential; water transmission through the soil is unimpeded (U.S. Department of Agriculture, 2009).—Continued

E

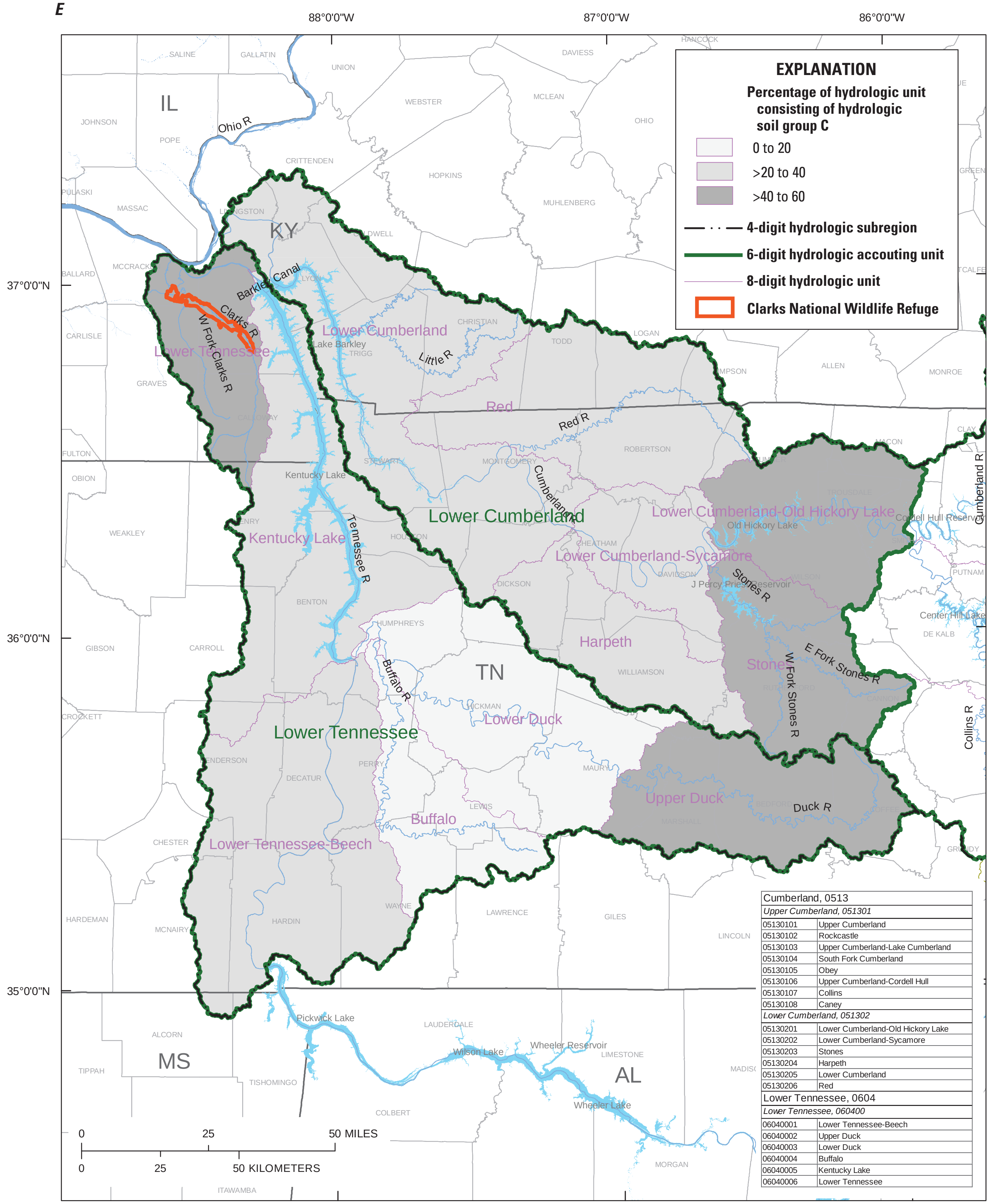

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Figure C3. *E*, Percentages of U.S. Department of Agriculture hydrologic soil group (HSG) C shown by hydrologic cataloging unit in the Lower Tennessee (060400) and Lower Cumberland (051302) hydrologic accounting units. Soils in HSG C have moderately high runoff potential; water transmission through the soil is somewhat restricted (U.S. Department of Agriculture, 2009).—Continued

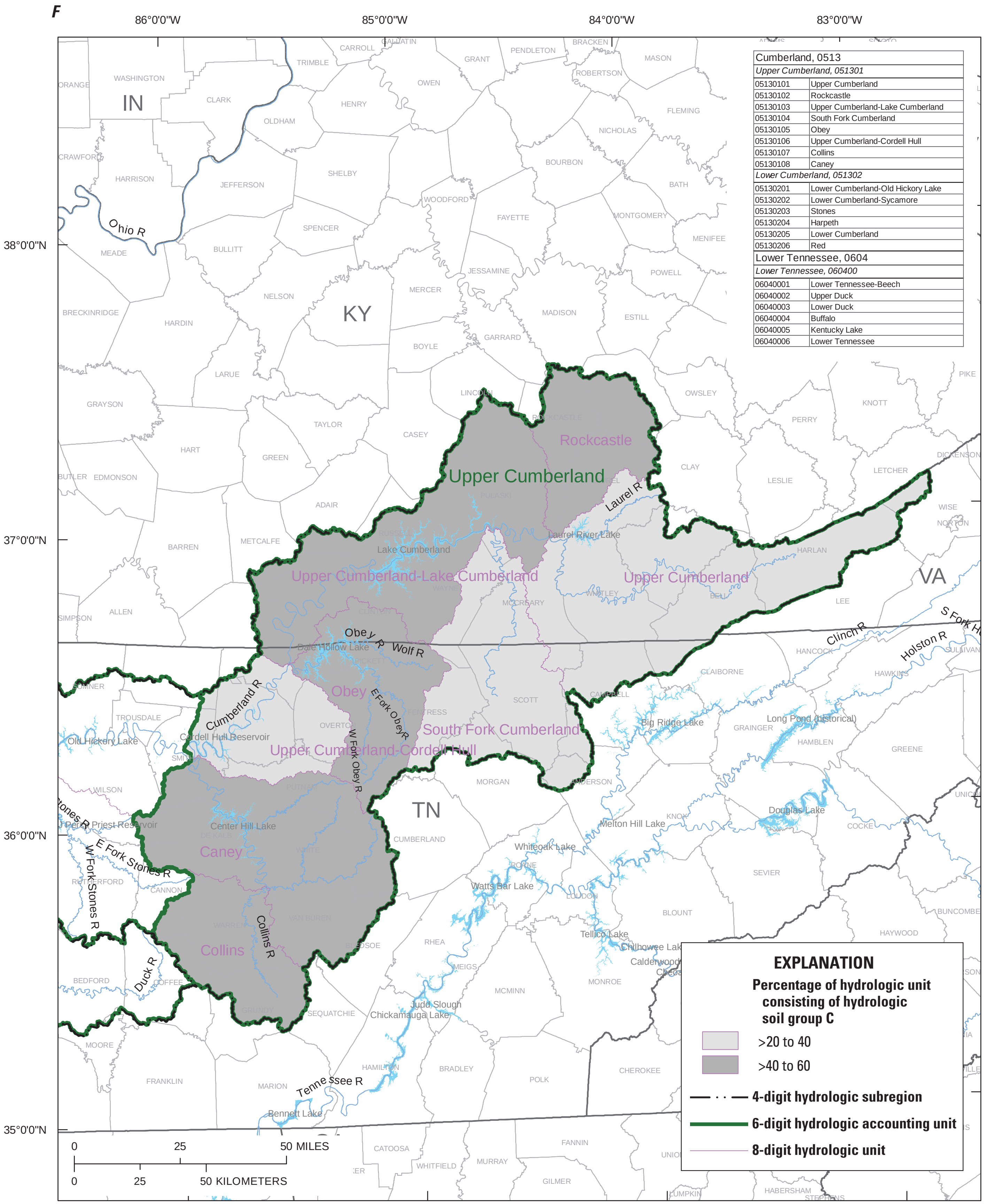

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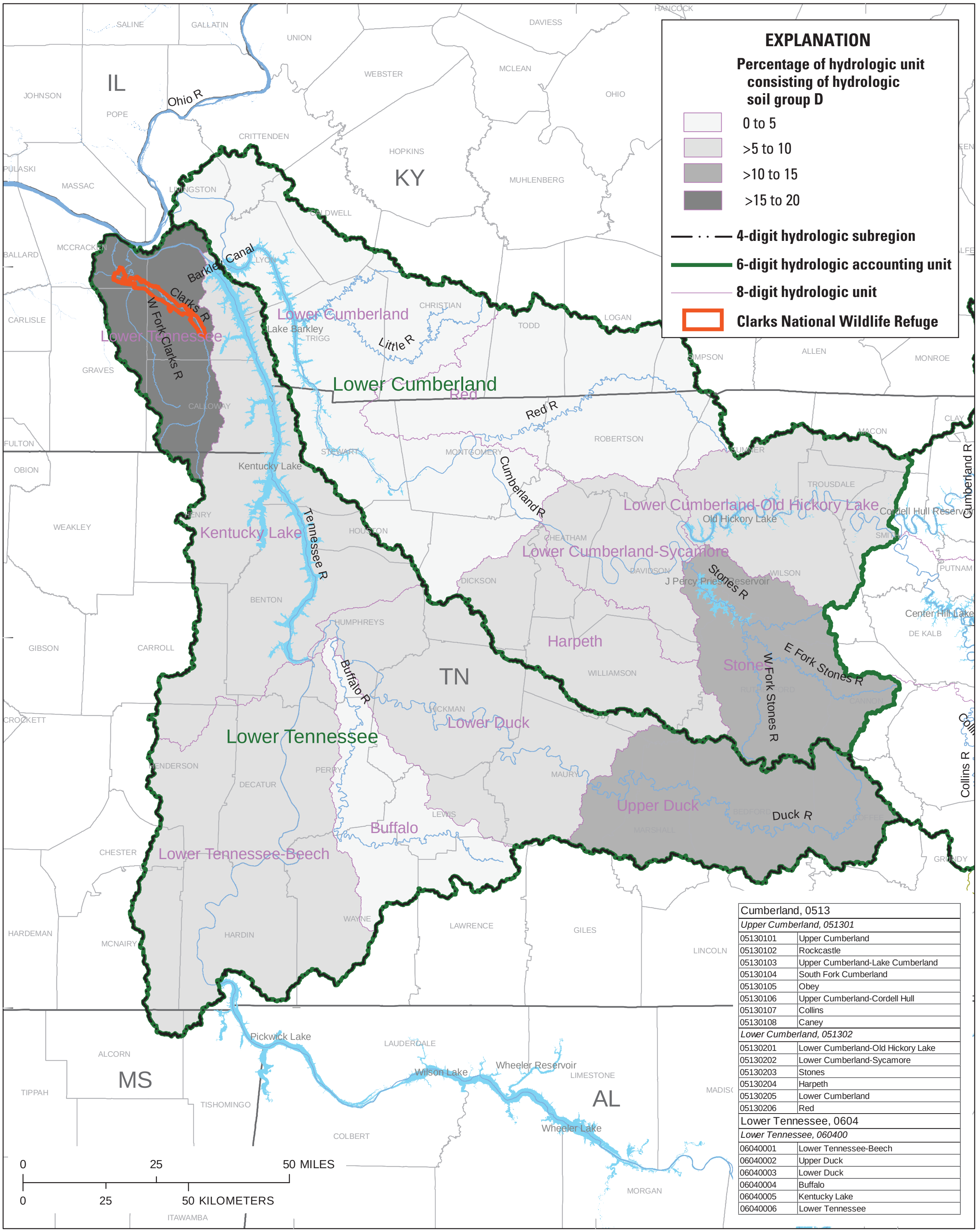
Figure C3. *F*, Percentages of U.S. Department of Agriculture hydrologic soil group (HSG) C shown by hydrologic cataloging unit in the Upper Cumberland hydrologic accounting unit (051301). Soils in HSG C have moderately high runoff potential; water transmission through the soil is somewhat restricted (U.S. Department of Agriculture, 2009).—Continued

G

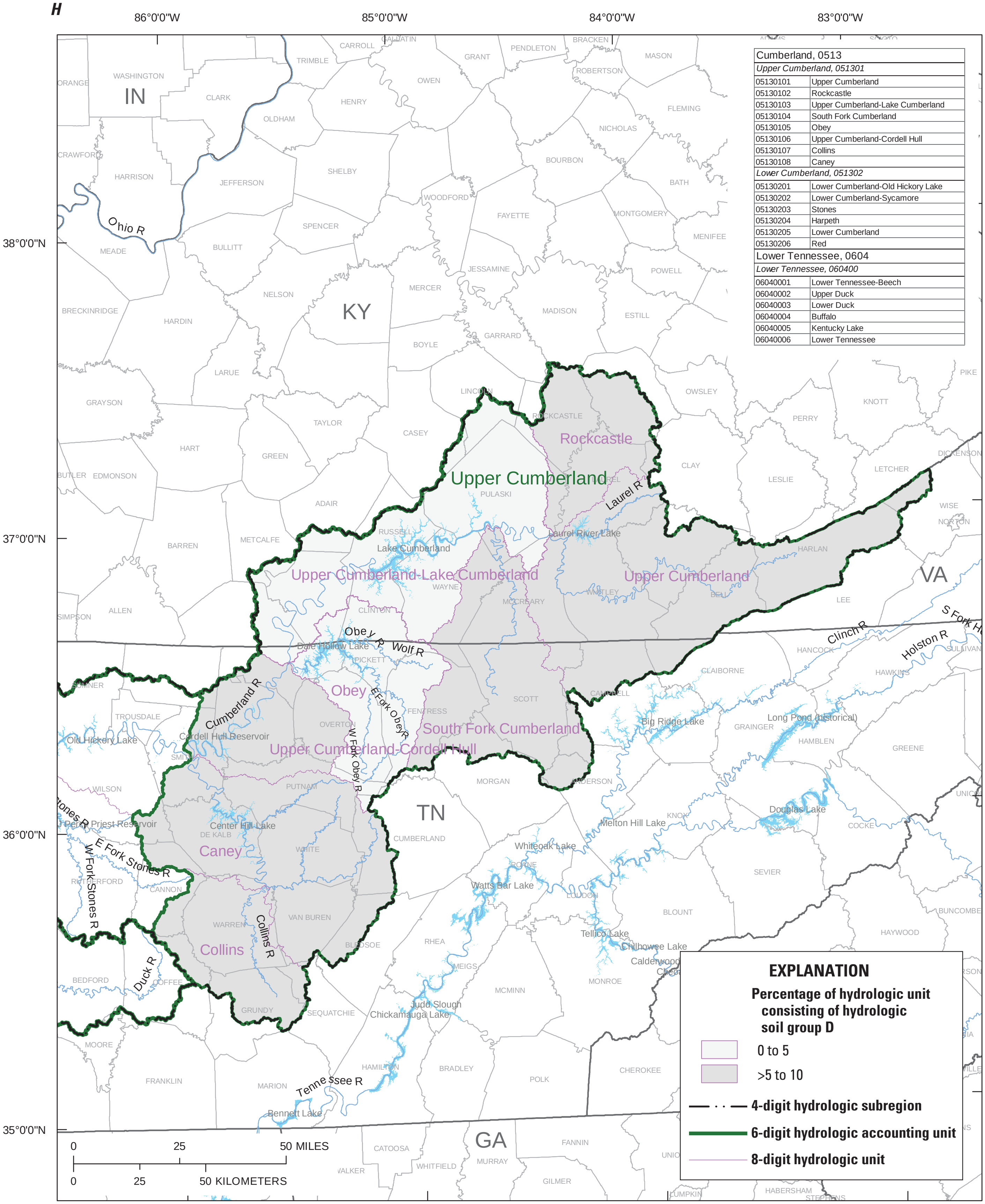


Cumberland, 0513	
Upper Cumberland, 051301	
05130101	Upper Cumberland
05130102	Rockcastle
05130103	Upper Cumberland-Lake Cumberland
05130104	South Fork Cumberland
05130105	Obey
05130106	Upper Cumberland-Cordell Hull
05130107	Collins
05130108	Caney
Lower Cumberland, 051302	
05130201	Lower Cumberland-Old Hickory Lake
05130202	Lower Cumberland-Sycamore
05130203	Stones
05130204	Harpeth
05130205	Lower Cumberland
05130206	Red
Lower Tennessee, 0604	
Lower Tennessee, 060400	
06040001	Lower Tennessee-Beech
06040002	Upper Duck
06040003	Lower Duck
06040004	Buffalo
06040005	Kentucky Lake
06040006	Lower Tennessee

Base modified from U.S. Geological Survey digital data, various scales

Figure C3. *G*, Percentages of U.S. Department of Agriculture hydrologic soil group (HSG) D shown by hydrologic cataloging unit in the Lower Tennessee (060400) and Lower Cumberland (051302) hydrologic accounting units. Soils in HSG D have high runoff potential; water transmission through the soil is restricted or very restricted (U.S. Department of Agriculture, 2009).—Continued

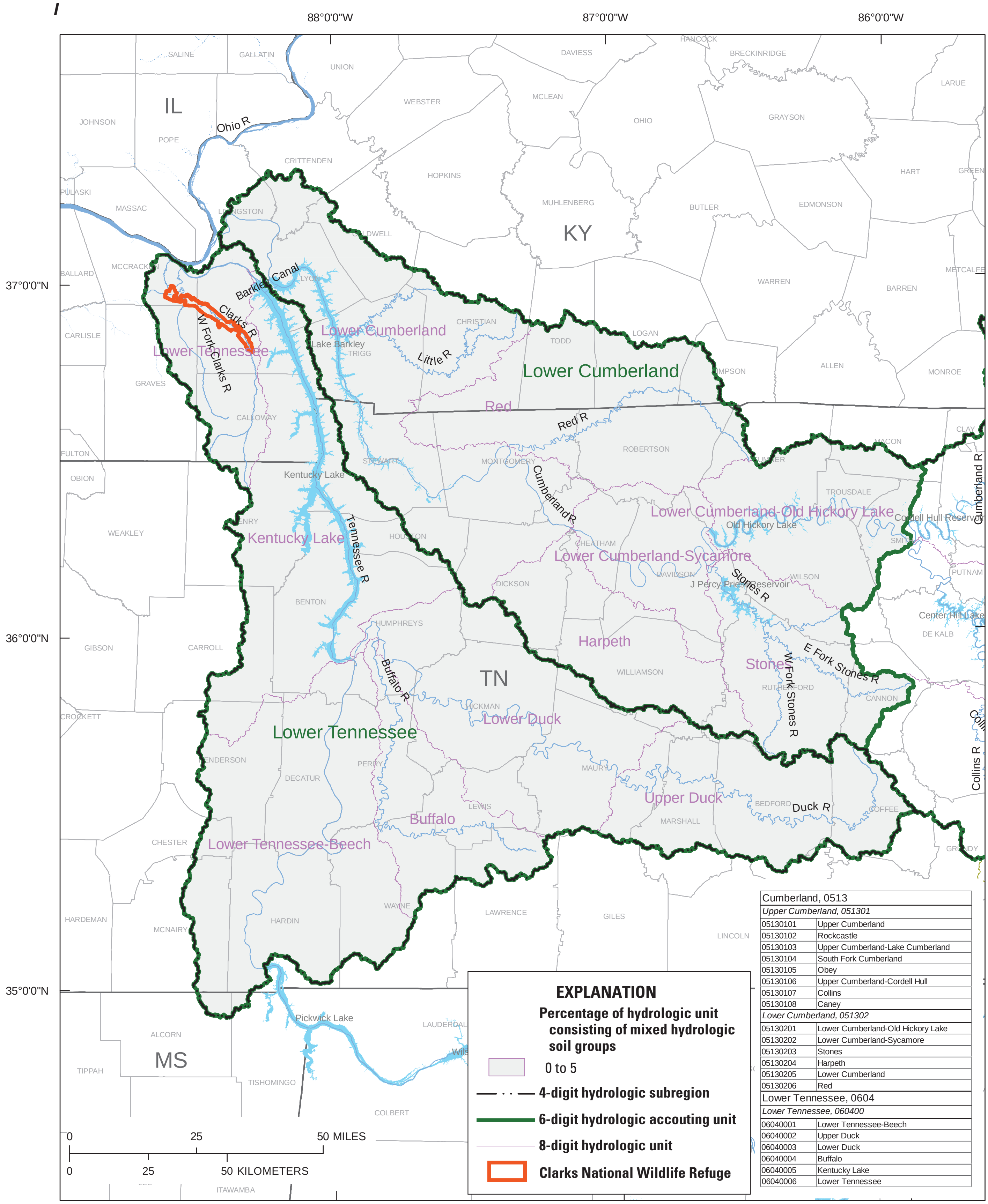
H



Base modified from U.S. Geological Survey digital data, various scales

Figure C3. *H*, Percentages of U.S. Department of Agriculture hydrologic soil group (HSG) D shown by hydrologic cataloging unit in the Upper Cumberland hydrologic accounting unit (051301). Soils in HSG D have high runoff potential; water transmission through the soil is restricted or very restricted (U.S. Department of Agriculture, 2009).—Continued

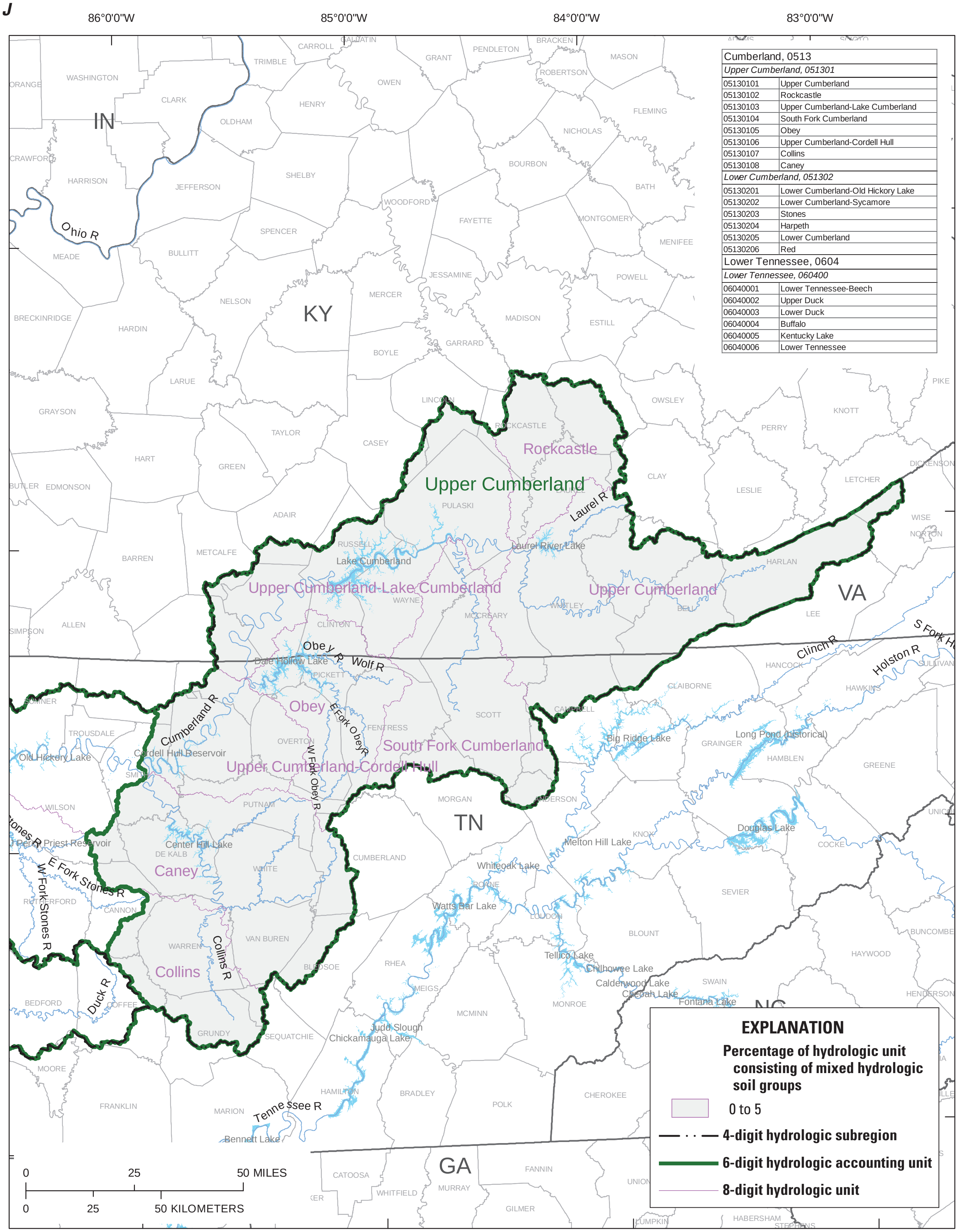
I



Base modified from U.S. Geological Survey digital data, various scales

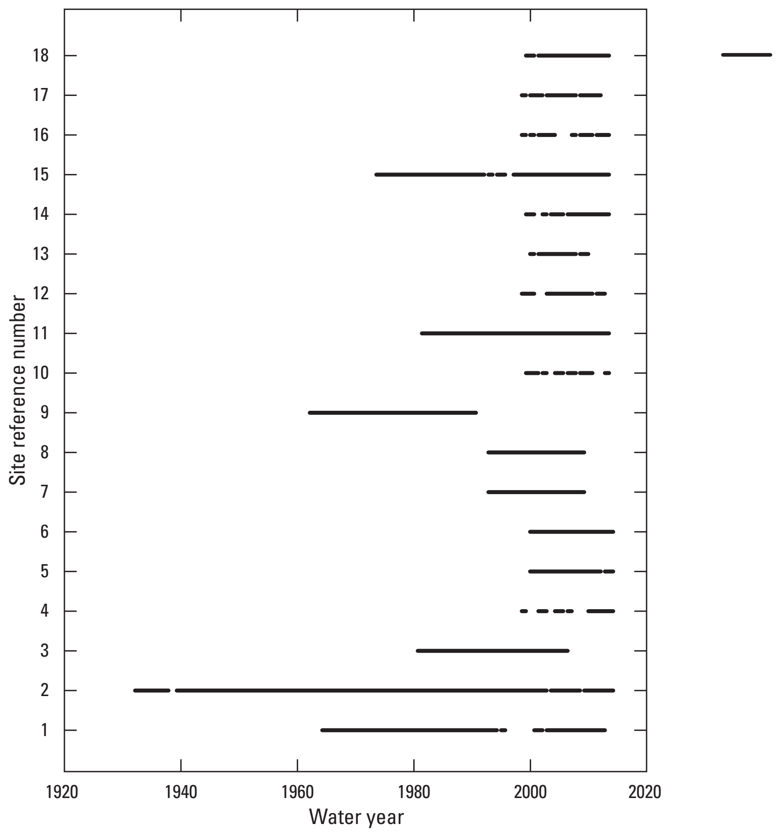
Figure C3. *I*, Percentages of U.S. Department of Agriculture hydrologic mixed hydrologic soil group (HSG) shown by hydrologic cataloging unit in the Lower Tennessee (060400) and Lower Cumberland (051302) hydrologic accounting units. Soils in mixed HSG have variable runoff potential; water transmission through the soil is more spatially variable on a local scale than in soils that fall within a single HSG classification (U.S. Department of Agriculture, 2009).—Continued

J



Base modified from U.S. Geological Survey digital data, various scales

Figure C3. *J*, Percentages of U.S. Department of Agriculture hydrologic mixed hydrologic soil group (HSG) shown by hydrologic cataloging unit in the Upper Cumberland hydrologic accounting unit (051301). Soils in mixed HSG have variable runoff potential; water transmission through the soil is more spatially variable on a local scale than in soils that fall within a single HSG classification (U.S. Department of Agriculture, 2009).—Continued



EXPLANATION

Period of record—Gaging station number and name. Number in parentheses is site reference number

03404000 (coe) Cumberland River at Williamsburg, KY (18)
03414500 (coe) East Fork Obey River near Jamestown, TN (17)
03425000 (coe) Cumberland River at Carthage, TN (16)
03426310 (coe) Cumberland River at Old Hickory Dam, TN (15)
03428200 (coe) West Fork Stones River at Murfreesboro, TN (14)
03428500 (coe) West Fork Stones River near Smyrna, TN (13)
03437000 (coe) Cumberland River at Dover, TN (12)
03438210 (tva) Lake Barkley near Grand Rivers, KY (11)
03436100 (coe) Red River Port Royal, TN (10)
03384500 (coe) Ohio River (Dam 51) at Golconda, IL (0000 reading) (9)
03399800 (coe) Ohio River (Smithland Dam) at Smithland, KY (0700 eading) (8)
03399800 (coe) Ohio River (Smithland Dam) at Smithland, KY (0700 reading, headwater) (7)
03609500 (tva) Tennessee River near Paducah, KY (6)
03438220 (tva) Cumberland River near Grand Rivers, KY (5)
03611000 (coe) Ohio River at Paducah, KY (4)
03611000 (coe) Ohio River at Paducah, KY (0700 reading) (3)
07020850 (coe) Mississippi River at Cape Girardeau, MO (0800 reading) (2)
07022000 (coe) Mississippi River at Thebes, IL (0800 reading) (1)

Figure C4. Periods of record for mean-daily and unit-value gage-height data used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of Clarks River National Wildlife Refuge, Kentucky, Tennessee, and Mississippi. Locations of gaging stations are shown in figure C1. [coe, data source U. S. Army Corps of Engineers; tva, data source Tennessee Valley Authority]

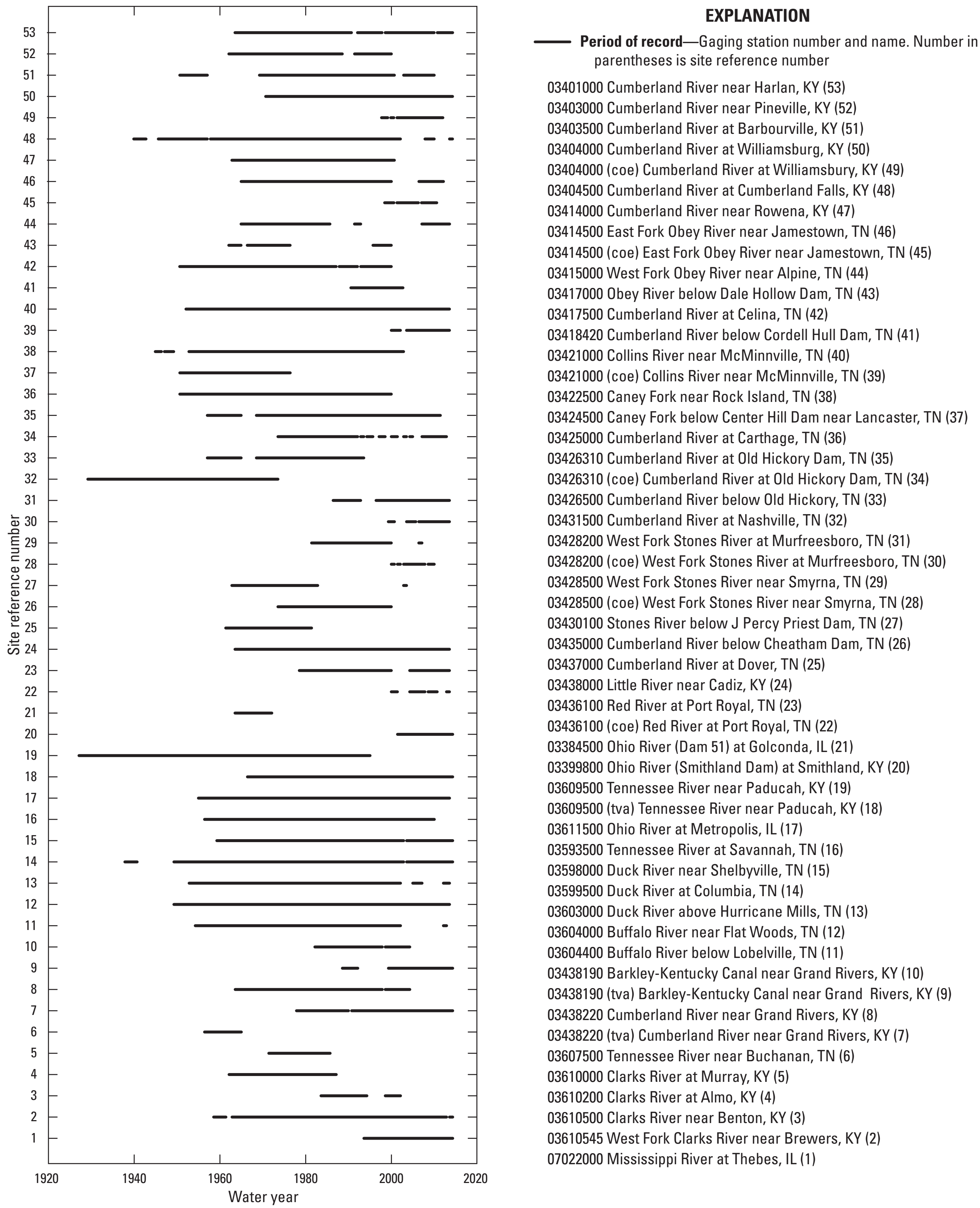
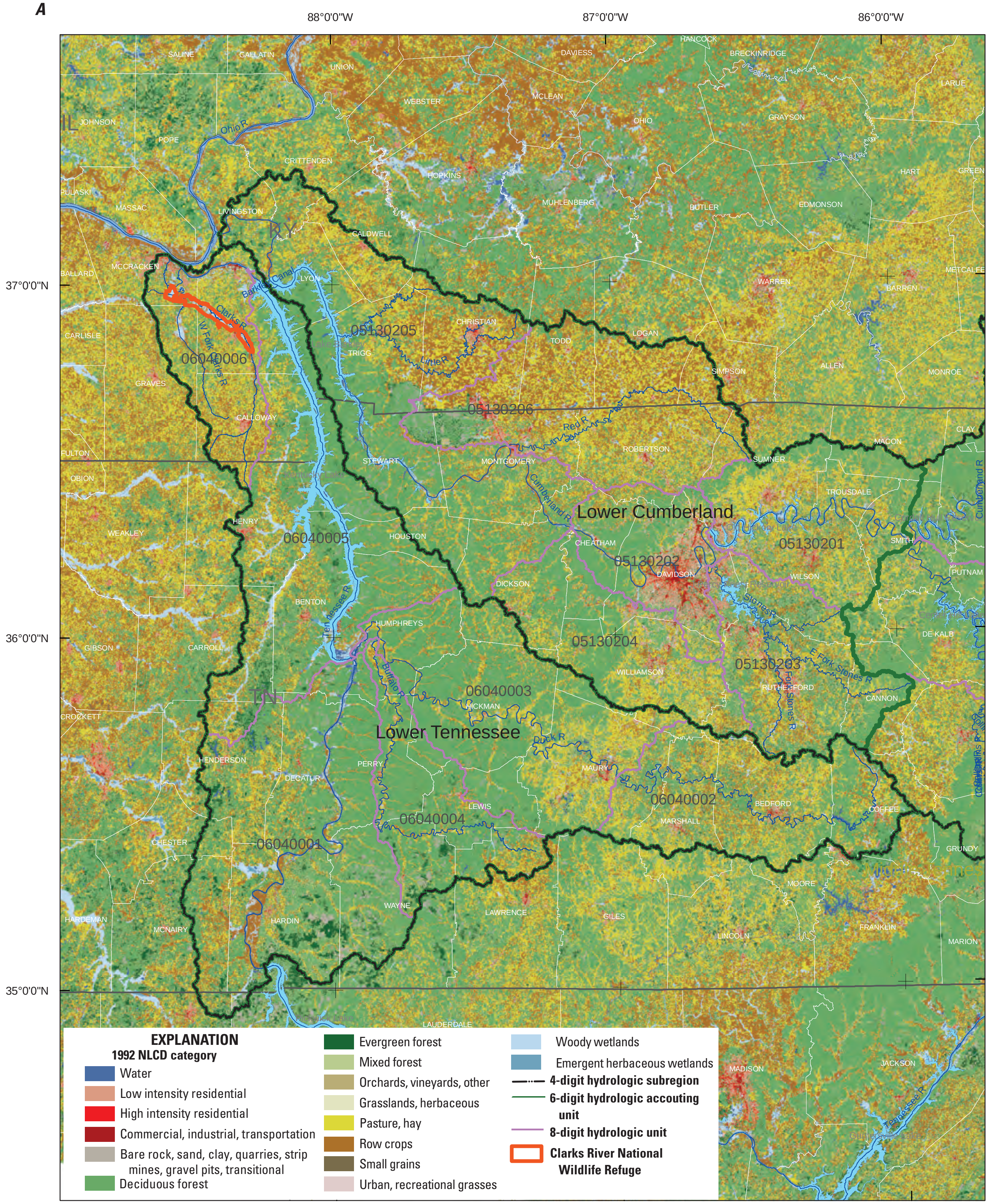


Figure C5. Periods of record for mean-daily discharge data used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of the Clarks River National Wildlife Refuge, Kentucky, Tennessee, and Mississippi. Locations of gaging stations are shown in figure C1. [coe, data source U. S. Army Corps of Engineers; tva, data source Tennessee Valley Authority]

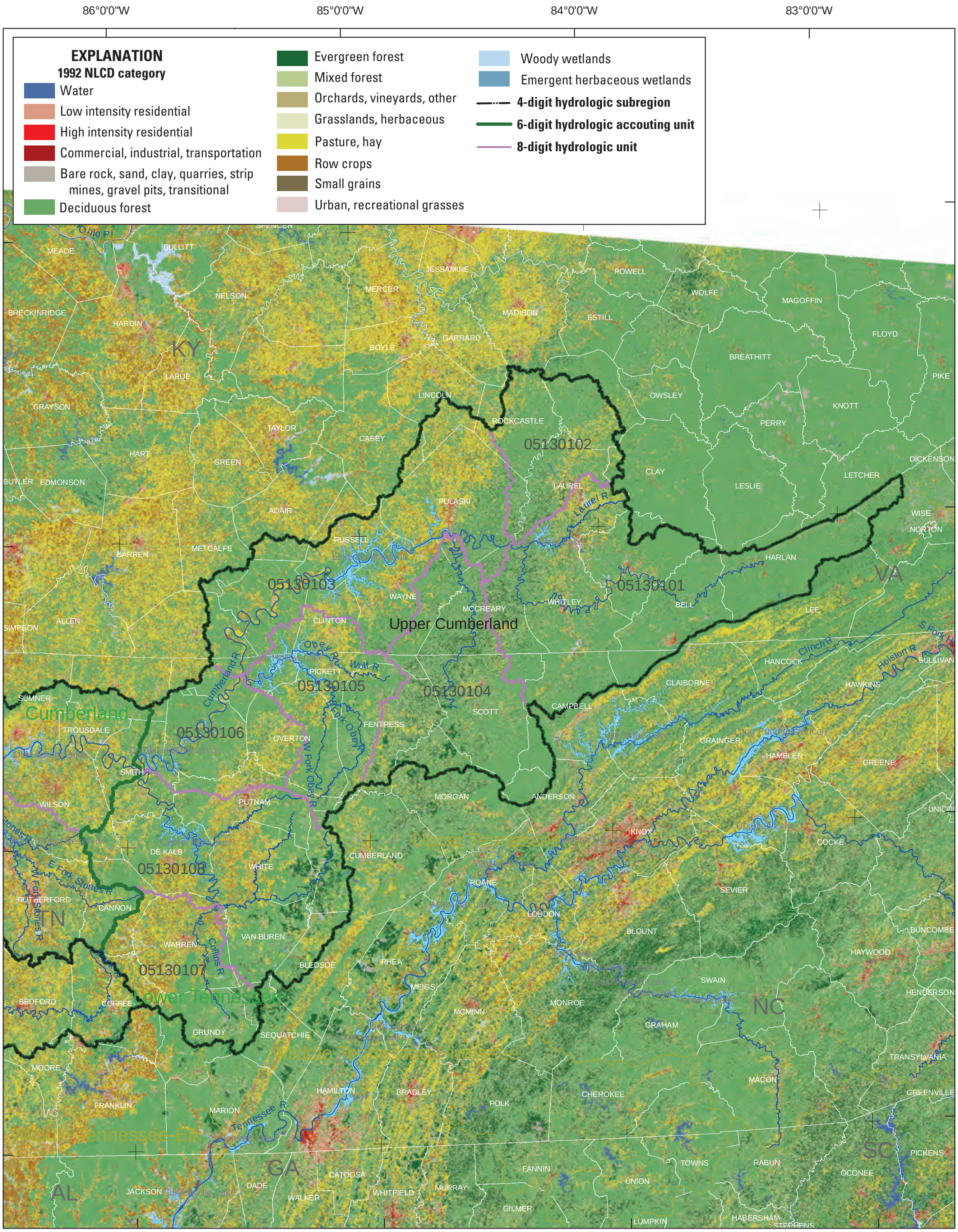
A



Base modified from U.S. Geological Survey digital data, various scales

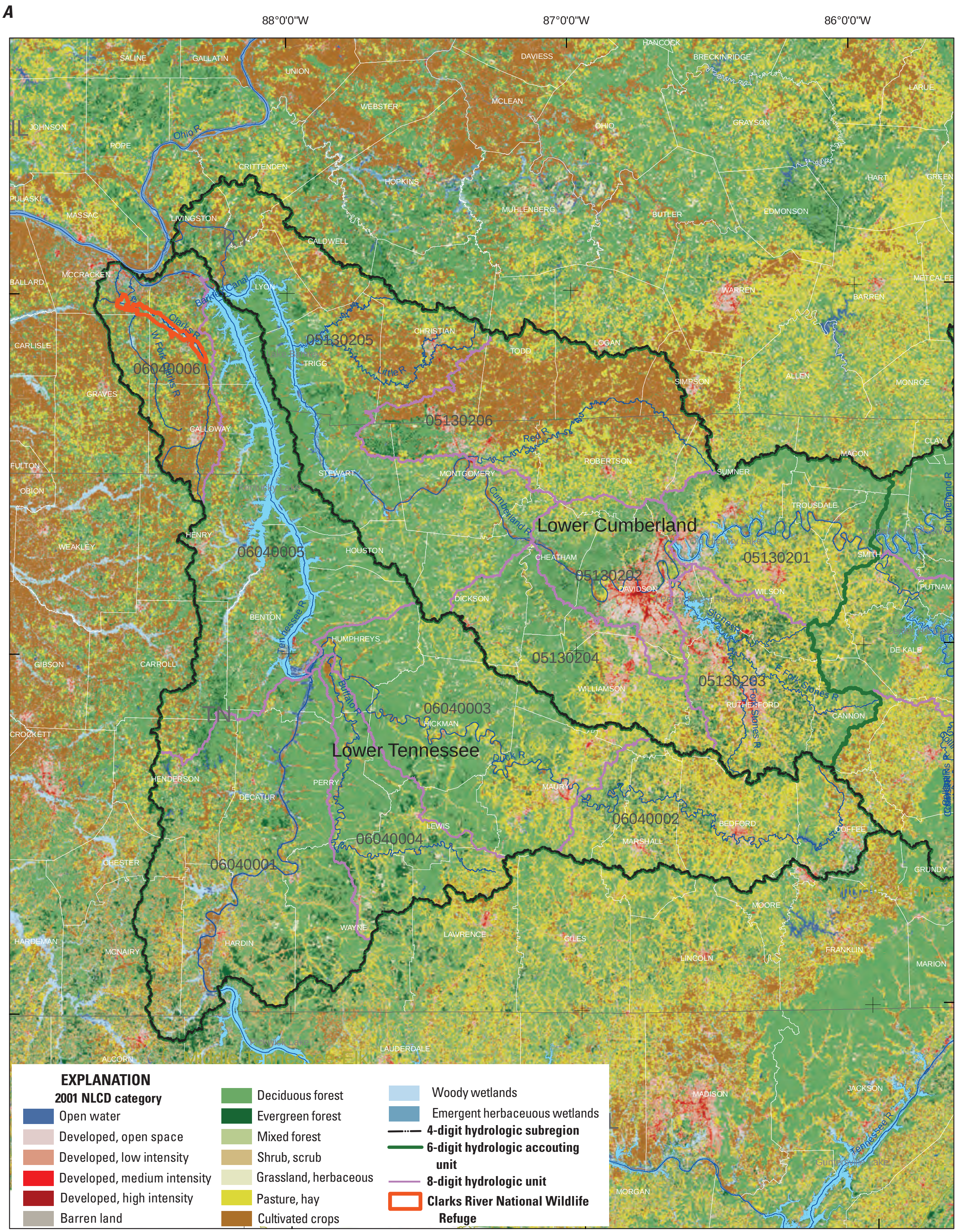
Figure C6. Land cover for 1992 for the *A*, Lower Tennessee (060400) and Lower Cumberland (051302) hydrologic accounting units, and *B*, Upper Cumberland hydrologic accounting unit (051301) (land-cover source: 1992 National Land Cover Database [NLCD; Vogelmann and others, 2001]).

B



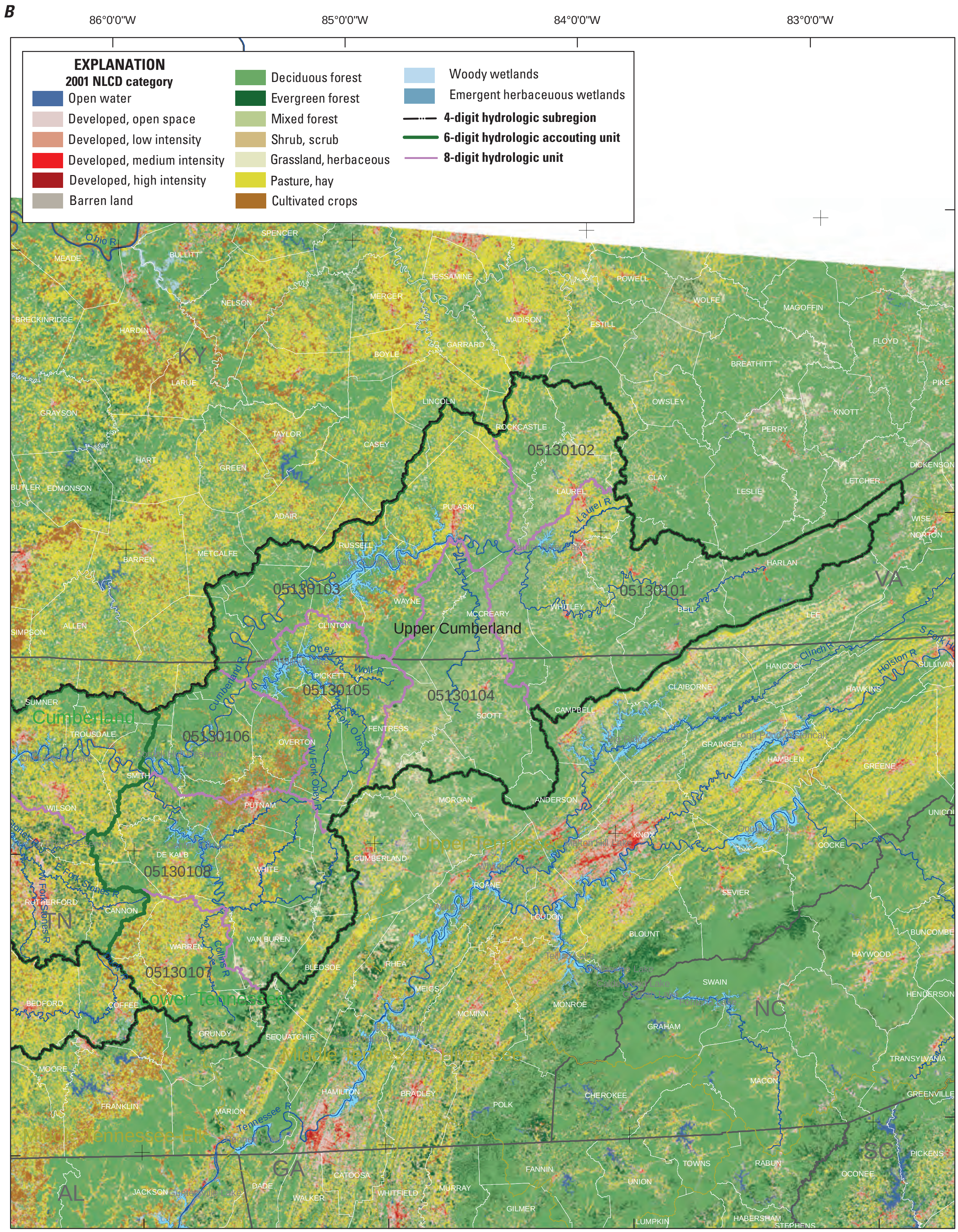
Base modified from U.S. Geological Survey digital data, various scales

Figure C6. Land cover for 1992 for the *A*, Lower Tennessee (060400) and Lower Cumberland (051302) hydrologic accounting units, and *B*, Upper Cumberland hydrologic accounting unit (051301) (land-cover source: 1992 National Land Cover Database [NLCD; Vogelmann and others, 2001]).—Continued



Base modified from U.S. Geological Survey digital data, various scales

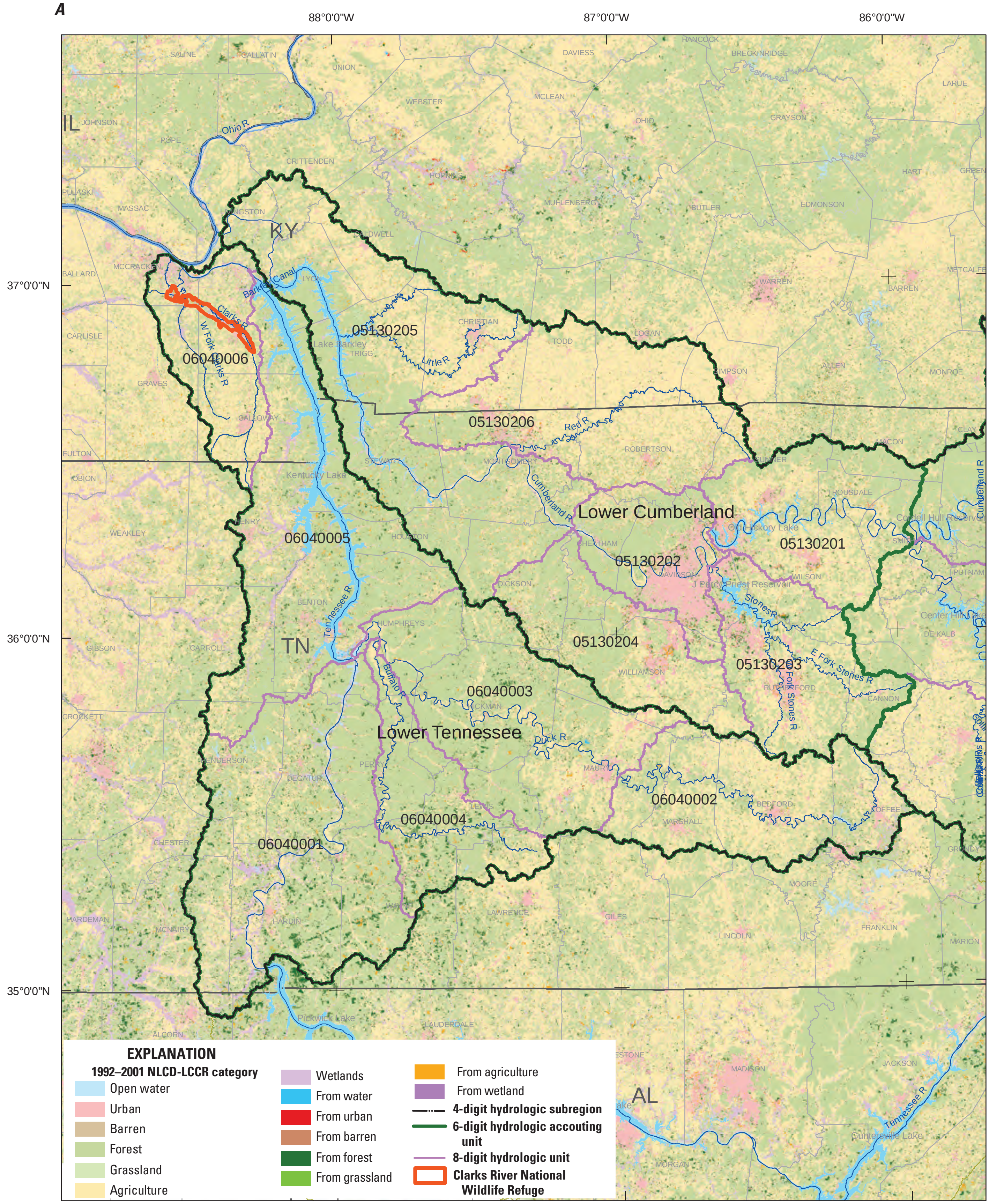
Figure C7. Land cover for 2001 for the *A*, Lower Tennessee (060400) and Lower Cumberland (051302) hydrologic accounting units, and *B*, Upper Cumberland hydrologic accounting unit (051301) (land-cover source: 2001 National Land Cover Database [NLCD; Homer and others, 2007]).



Base modified from U.S. Geological Survey digital data, various scales

Figure C7. Land cover for 2001 for the *A*, Lower Tennessee (060400) and Lower Cumberland (051302) hydrologic accounting units, and *B*, Upper Cumberland hydrologic accounting unit (051301) (land-cover source: 2001 National Land Cover Database [NLCD; Homer and others, 2007]).—Continued

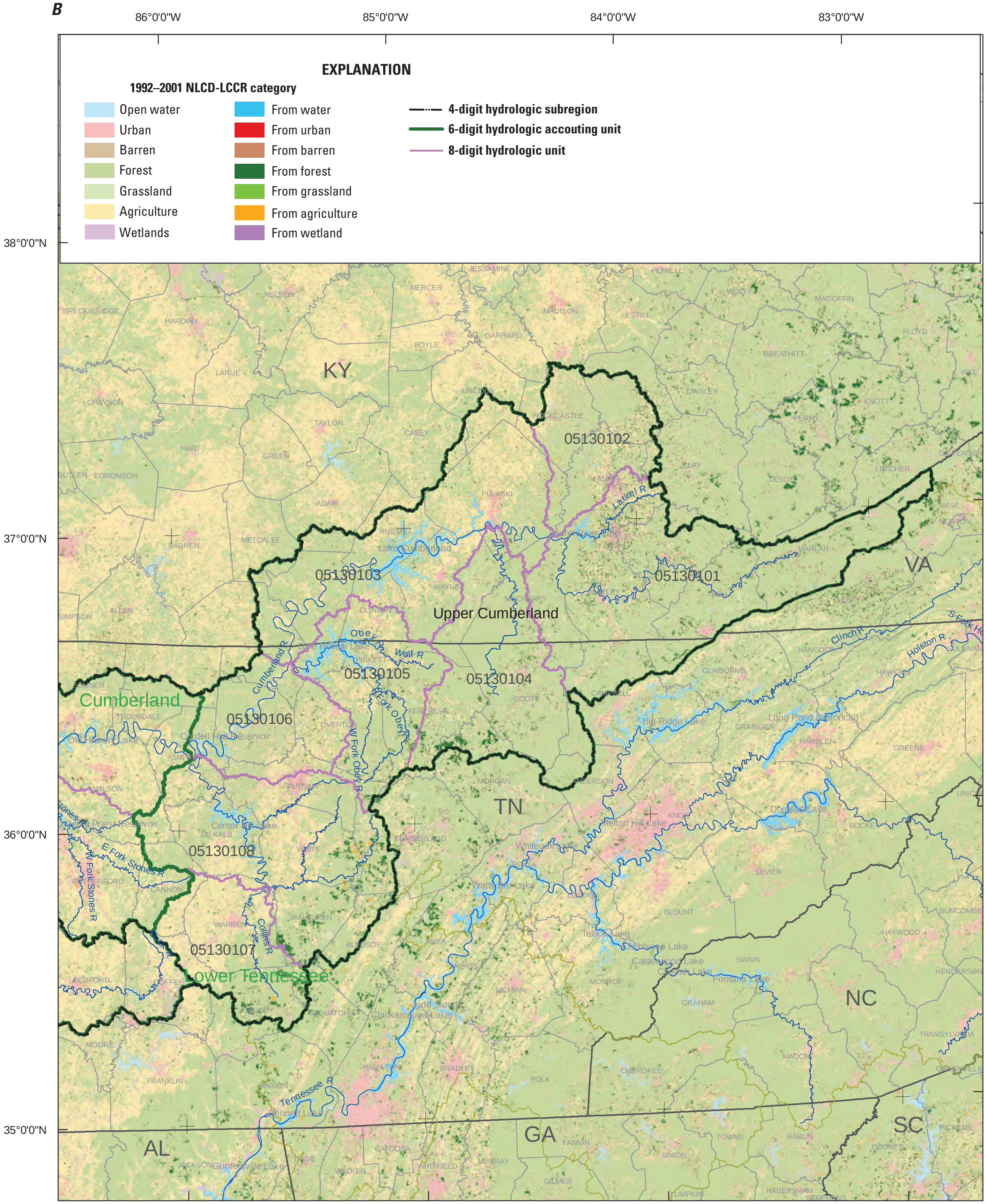
A



Base modified from U.S. Geological Survey digital data, various scales

Figure C8. Land-cover change for the period from 1992 to 2001 for the *A*, Lower Tennessee (060400) and Lower Cumberland (051302) hydrologic accounting units, and *B*, Upper Cumberland hydrologic accounting unit (051301) (land-cover source: National Land Cover Database [NLCD] 1992–2001 Land Cover Change Retrofit [LCCR] product [Fry and others, 2009]).

B



Base modified from U.S. Geological Survey digital data, various scales

Figure C8. Land-cover change for the period from 1992 to 2001 for the *A*, Lower Tennessee (060400) and Lower Cumberland (051302) hydrologic accounting units, and *B*, Upper Cumberland hydrologic accounting unit (051301) (land-cover source: National Land Cover Database [NLCD] 1992–2001 Land Cover Change Retrofit [LCCR] product [Fry and others, 2009]).—Continued

Table C–1. Management objectives and environmental issues for the Clarks River National Wildlife Refuge, Kentucky.

[Note: Environmental issues do not correspond to management objectives]

Refuge management objectives[a]	Environmental issues[a]
Protection, enhancement, and management of a valuable bottomland hardwood forest and wetland ecosystem	Wetland loss due to deforestation from agricultural activities
Cooperative farming program in agriculture and pasture fields converted decades ago that are still present within the refuge	Hydrologic alteration due to road construction and dam. Lock, and levee obstruction
Reforestation of frequently flooded farm fields	Water-quality issues where upland buffers along floodplains are disconnected or missing
Provision of adequate wetland habitat for migratory birds within the watershed	Climate change has the potential of altering the bottomland hardwoods to a grassland habitat; the switch in habitat would also have impacts on birds
Development and implementation of environmental education programs	

[a]U.S. Fish and Wildlife Service, 2012.

Table C–2*A*. Station characteristics for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY, station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1*A–B*. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1*A–B*. dms, latitude and longitude coordinates in degrees, minutes, and seconds. Gage location in relation to the refuge property: us, upstream; usds, upstream and downstream; ds, downstream; adj-us, on an upstream adjacent, hydrologically connected river or stream; adj-ds on a downstream adjacent, hydrologically connected river or stream. Abbreviations: ft, foot; mi^2, square mile; TVA, Tennessee Valley Authority; USACE, U.S. Army Corps of Engineers]

USGS station number	Station name	County and State	Latitude and longitude[a] (dms)	Drainage area[b] (mi^2)	Datum of gage[c] (ft)	Gage location
			Cumberland (0513)[d]			
			Upper Cumberland (05130101)[d]			
03401000[e]	Cumberland R nr Harlan, KY	Harlan, KY	365048N, 0832121W	374	1,140.10	adj-us
03403000	Cumberland R nr Pineville, KY	Bell County, KY	364848N, 0834558W	809	955.45	adj-us
03403500	Cumberland R at Barbourville, KY	Knox, KY	365144N, 0835315W	960	942.97	adj-us
03404000[e]	Cumberland R at Williamsburg, KY	Whitley, KY	364436N, 0840922W	1,607	891.52	adj-us
03404500[e]	Cumberland R at Cumberland Falls, KY	McCreary, KY	365014N, 0842036W	1,977	825.49	adj-us
			Upper Cumberland–Lake Cumberland (05130103)[d]			
03414000	Cumberland R nr Rowena, KY	Russell, KY	365302N, 0850822W	5,790	540.81	adj-us
			Obey (05130105)[d]			
03414500[e]	E Fork Obey R nr Jamestown, TN	Fentress, TN	362458N, 0850135W	202 (196)	680.30	adj-us
03415000	W Fork Obey R nr Alpine, TN	Overton, TN	362350.36N, 0851028.16W	115 (81.0)	684.28	adj-us
03416000[i]	Wolf R nr Byrdstown, TN	Pickett, TN	363337N, 0850423W	106	707.54	adj-us
03417000	Obey R below Dale Hollow Dam, TN	Clay, TN	363214N, 0852719W	936	500.00	adj-us
			Upper Cumberland–Cordell Hull (05130106)[d]			
03417500[e]	Cumberland R at Celina, TN	Clay, TN	363315N, 0853052W	7,307	489.00	adj-us
03418420	Cumberland R below Cordell Hull Dam, TN	Smith, TN	361712N, 0855627W	8,095	—	adj-us
			Collins (05130107)[d]			
03421000[e]	Collins R nr McMinnville, TN	Warren, TN	354229.57N, 0854354.67W	640	825.78	adj-us
			Caney (05130108)[d]			
03422500	Caney Fork nr Rock Island, TN	White, TN	354827.62N, 0853801.19W	1,678	647.09	adj-us
03424500	Caney Fork below Center Hill Dam nr Lancaster, TN	DeKalb, TN	360616N, 0855045W	2,183	469.00	adj-us
			Lower Cumberland–Old Hickory Lake (05130201)[d]			
03425000[e]	Cumberland R at Carthage, TN	Smith, TN	361453N, 0855719W	10,690	437.53	adj-us
			Lower Cumberland–Sycamore (05130202)[d]			
03426310[e]	Cumberland R at Old Hickory Dam, TN	Davidson, TN	361749.44N, 0863931.09W	11,673	*400.00*	adj-us
03426500	Cumberland R below Old Hickory, TN	Davidson, TN	361548.07N, 0864029.80W	11,735	380.00	adj-us
03431500	Cumberland R at Nashville, TN	Davidson, TN	360941.19N, 0864621.64W	12,856	368.17	adj-us
034315005[i]	Cumberland R (Woodland St) at Nashville, TN	Davidson, TN	361002N, 0864635W	12,860	—	adj-us

Table C–2*A*. Station characteristics for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY, station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1*A*–*B*. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1*A*–*B*. dms, latitude and longitude coordinates in degrees, minutes, and seconds. Gage location in relation to the refuge property: us, upstream; usds, upstream and downstream; ds, downstream; adj-us, on an upstream adjacent, hydrologically connected river or stream; adj-ds on a downstream adjacent, hydrologically connected river or stream. Abbreviations: ft, foot; mi^2, square mile; TVA, Tennessee Valley Authority; USACE, U.S. Army Corps of Engineers]

USGS station number	Station name	County and State	Latitude and longitude[a] (dms)	Drainage area[b] (mi^2)	Datum of gage[c] (ft)	Gage location
Cumberland (0513)[d]—Continued						
Stones (05130203)[d]						
03427500[i]	E Fork Stones R nr Lascassas, TN	Rutherford, TN	355506N, 0862002W	262	507.88	adj-us
03428200[e]	W Fork Stones R at Murfreesboro, TN	Rutherford, TN	355410N, 0862548W	177	514.95	adj-us
03428500[e]	W Fork Stones R nr Smyrna, TN	Rutherford, TN	355625.30N, 0862756.92W	237 (194)	500.00	adj-us
03430100	Stones R below J Percy Priest Dam, TN	Davison, TN	360929.52N, 0863712.43W	892	380.08	adj-us
Lower Cumberland (05130205)[d]						
03435000	Cumberland R below Cheatham Dam, TN	Cheatham, TN	361922.26N, 0871341.73W	14,163	350.00	adj-us
03437000[e]	Cumberland R at Dover, TN	Stewart, TN	362926N, 0875020W	16,437	300.00	adj-us
03438000[e]	Little R nr Cadiz, KY	Trigg, KY	364640N, 0874318W	244	391.45	adj-us
03438210[f]	Lake Barkley nr Grand Rivers, KY	Lyon, KY	370117N, 0881316W	17,598	—	adj-us
03438220[f]	Cumberland R nr Grand Rivers, KY	Lyon, KY	370118N, 0881323W	17,598	300.00	adj-us
Red (05130206)[d]						
03436100[e]	Red R at Port Royal, TN	Montgomery, TN	363314.42N, 0870831.09W	935	376.25	adj-us
Lower Ohio (0514)[d]						
Lower Ohio–Bay (05140203)[d]						
03381700	Ohio R at Old Shawneetown, IL-KY	Union, KY	*374131N, 0880800W*	141,000	*309.10*	adj-us
03384500[g]	Ohio R (Dam 51) at Golconda, IL	Pope, IL	372128N, 0882857W	143,900	294.60	adj-us
03399800[g]	Ohio R (Smithland Dam) at Smithland, KY	Pope, IL	370930N, 0882534W	144,000	289.28	adj-us
Lower Ohio (05140206)[d]						
03611500[g]	Ohio R at Metropolis, IL	Massac, IL	370851N, 0884427W	203,000	276.27	ds
Lower Tennessee (0604)[d]						
Lower Tennessee–Beech (06040001)[d]						
03593500	Tennessee R at Savannah, TN	Hardin, TN	351329N, 0881526W	33,140	350.06	adj-us
Upper Duck (06040002)[d]						
03598000	Duck R nr Shelbyville, TN	Bedford, TN	352849N, 0862957W	481	683.51	adj-us
Lower Duck (06040003)[d]						
03599500	Duck R at Columbia, TN	Maury, TN	353704.74N, 0870156.43W	1,208	535.33	adj-us
03603000	Duck R above Hurricane Mills, TN	Humphreys, TN	355548N, 0874435W	2,557	370.53	adj-us
Buffalo (06040004)[d]						
03604000	Buffalo R nr Flat Woods, TN	Perry, TN	352945N, 0874958W	447	513.58	adj-us
03604400	Buffalo R below Lobelville, TN	Perry, TN	354842.28N, 0874643.43W	702	405.25	adj-us

Table C–2*A*. Station characteristics for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY, station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1*A*–*B*. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1*A*–*B*. dms, latitude and longitude coordinates in degrees, minutes, and seconds. Gage location in relation to the refuge property: us, upstream; usds, upstream and downstream; ds, downstream; adj-us, on an upstream adjacent, hydrologically connected river or stream; adj-ds on a downstream adjacent, hydrologically connected river or stream. Abbreviations: ft, foot; mi^2, square mile; TVA, Tennessee Valley Authority; USACE, U.S. Army Corps of Engineers]

USGS station number	Station name	County and State	Latitude and longitude[a] (dms)	Drainage area[b] (mi^2)	Datum of gage[c] (ft)	Gage location
			Lower Tennessee (0604)[d]—Continued			
			Kentucky Lake (06040005)[d]			
03438190[f]	Barkley-Kentucky Canal nr Grand Rivers, KY	Lyon, KY	365923N, 0881317W	—	—	adj-us
03607500	Tennessee R nr Buchanan, TN	Henry, TN	362638N, 0880343W	39,730	303.00	adj-us
03609000[f]	Kentucky Lake at Gilbertsville, KY	Marshall, KY	370049N, 0881606W	40,200	—	adj-us
03609500[f]	Tennessee R nr Paducah, KY	Marshall, KY	370111N, 0881650W	40,200	286.35	adj-us
			Lower Tennessee (06040006)[d]			
03610000	Clarks R at Murray, KY	Calloway, KY	363534N, 0881800W	89.7	459.88	us
03610200	Clarks R at Almo, KY	Calloway, KY	364130N, 0881625W	134	413.46	us
03610500	Clarks R nr Benton, KY	Marshall, KY	365224N, 0882048W	227	344.53	usds
03610545	W Fork Clarks R nr Brewers, KY	Marshall, KY	364648N, 0882803W	68.7	370.05	us
03611000[g]	Ohio R at Paducah, KY	McCracken, KY	370522N, 0883540W	202,800	**286.30**	ds
			Upper Mississippi–Kaskaskia–Meramec (0714)[d]			
			Upper Mississippi-Cape Girardeau (07140105)[d]			
07020850[h]	Mississippi River at Cape Girardeau, MO	Cape Girardeau, MO	*371806.8N, 0893104.8W*	—	304.77	adj-ds
07022000[h]	Mississippi River at Thebes, IL	Alexander, IL	*371259.3N, 0892803.3W*	713,200	300.00	adj-ds
			Lower Mississippi–Hatchie (0801)[d]			
			Lower Mississippi–Memphis (08010100)[d]			
07024070[i]	Mississippi R at Hickman, KY	Fulton, KY	363422N, 0891156W	922,500	264.92	adj-ds
			Bayou De Chien–Mayfield (08010201)[d]			
07023200[i]	Mississippi R at Columbus, KY	Hickman, KY	364558N, 0890648W	921,900	266.59	adj-ds

[a]Latitude and longitude coordinates in roman (or normal) font are referenced to NAD 27; those in italicized font are referenced to NAD 83.

[b]Drainage areas in parentheses are shown when the contributing drainage area is less than the actual drainage area. —, the drainage area is either indeterminate or not delineated.

[c]Datum-of-gage values in roman (or normal) font are referenced to NGVD 29, those values in italicized font are referenced to NAVD 88, and those values in bold font are referenced to COE 1912. —, datum of gage not established.

[d]The 8-digit hydrologic units were developed by the U.S. Geological Survey as a standardized set of hydrologic boundaries and numerical codes for the river-basin units of the United States (Seaber and others, 1994). The 8-digit hydrologic unit code encompasses four levels of subdivision: region (2-digit), subregion (4-digit), accounting unit (6-digit), and cataloging unit (8-digit).

[e]Station operated in cooperation with USACE, Nashville District.

[f]Station operated in cooperation with TVA.

[g]Station operated in cooperation with USACE, Louisville District.

[h]Station operated in cooperation with USACE, St. Louis District.

[i]Only annual peak-value data available.

Table C–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY, station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1*A*–*B*. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure *A*–*B*. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31]

USGS station number[a]	Station name	Parameter	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		Cumberland (0513)				
		Upper Cumberland (05130101)				
03401000	Cumberland R nr Harlan, KY	Discharge[c]	1940–2011	67, 1, 4–0.94	1940–2011	63, 8, 1–0.94
03401000coe		Gage height	1987–1992	1, 5, 0–0.75	1987–1992	0, 6, 0–0.75
		Discharge	1991–1992	0, 2, 0–0.95	1990–1992	0, 3, 0–0.64
03403000	Cumberland R nr Pineville, KY	Discharge[c]	1938–1992	49, 2, 4–0.90	1938–1992	48, 4, 3–0.90
		Suspended-sediment concentration	1980–1989	3, 4, 3–0.64	1979–1989	2, 7, 2–0.58
		Suspended-sediment discharge	1987–1989	3, 0, 0–1.00	1986–1989	2, 2, 0–0.75
03403500	Cumberland R at Barbourville, KY	Discharge[c]	1923–2005	63, 2, 18–0.77	1922–2005	61, 6, 17–0.76
		Suspended-sediment concentration	1980–1992	6, 4, 3–0.71	1979–1992	5, 7, 2–0.66
		Suspended-sediment discharge	1987–1992	6, 0, 0–1.00	1986–1992	5, 2, 0–0.86
03404000	Cumberland R at Williamsburg, KY	Discharge[c]	1951–2011	61, 0, 0–1.00	1950–2011	60, 2, 0–0.98
		Suspended-sediment concentration	1954–1992	8, 5, 26–0.31	1953–1992	5, 12, 23–0.30
		Suspended-sediment discharge	1987–1992	6, 0, 0–1.00	1986–1992	5, 2, 0–0.86
03404000coe		Gage height[c]	1987–2011	19, 6, 0–0.91	1987–2011	20, 5, 0–0.91
		Discharge[c]	1989–2011	18, 5, 0–0.94	1989–2011	18, 5, 0–0.94
03404500	Cumberland R at Cumberland Falls, KY	Discharge[c]	1907–2011	86, 4, 15–0.83	1907–2011	81, 10, 14–0.83
		Suspended-sediment concentration	1981–1989	2, 4, 3–0.58	1981–1989	1, 6, 2–0.58
		Suspended-sediment discharge	1987–1989	3, 0, 0–1.00	1986–1989	2, 2, 0–0.75
03404500coe		Gage height	1987–1994	0, 8, 0–0.55	1987–1994	0, 8, 0–0.55
		Discharge	1989–1994	0, 5, 1–0.44	1989–1994	0, 6, 0–0.44
		Upper Cumberland–Lake Cumberland (05130103)				
03414000	Cumberland R nr Rowena, KY	Discharge[c]	1940–1992	53, 0, 0–1.00	1939–1992	52, 2, 0–0.98
		Obey (05130105)				
03414500	E Fork Obey R nr Jamestown, TN	Discharge[c]	1943–2008	57, 2, 7–0.89	1942–2008	56, 5, 6–0.88
03414500coe		Gage height[c]	1987–2011	16, 9, 0–0.92	1987–2011	16, 9, 0–0.92
		Discharge[c]	1987–2011	15, 10, 0–0.90	1987–2011	15, 10, 0–0.90
03415000	W Fork Obey R nr Alpine, TN	Discharge[c]	1943–2010	37, 2, 29–0.55	1942–2010	33, 8, 28–0.54
03417000	Obey R below Dale Hollow Dam, TN	Dischargec	1939–1991	24, 0, 29–0.45	1938–1991	21, 6, 27–0.44

Table C–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY, station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1*A*–*B*. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure *A*–*B*. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31]

USGS station number[a]	Station name	Parameter	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		Cumberland (0513)—Continued				
		Upper Cumberland–Cordell Hull (05130106)				
03417500	Cumberland R at Celina, TN	Gage height	2000–2011	0, 5, 7–0.41	1999–2011	0, 6, 7–0.38
		Discharge[c]	1923–1991	67, 2, 0–0.99	1922–1991	65, 5, 0–0.98
03417500coe	Cumberland R at Celina, TN	Gage height	1982–2011	8, 19, 3–0.79	1982–2011	9, 18, 3–0.79
		Discharge	1987–2011	7, 18, 0–0.89	1987–2011	6, 19, 0–0.89
03418420	Cumberland R below Cordell Hull Dam, TN	Discharge[c]	1981–1997	17, 0, 0–1.00	1980–1997	16, 2, 0–0.94
		Collins (05130107)				
03421000	Collins R nr McMinnville, TN	Discharge[c]	1925–2010	86, 0, 0–1.00	1924–2010	85, 2, 0–0.99
03421000coe	Collins R nr McMinnville, TN	Gage height	1982–2011	20, 6, 4–0.78	1982–2011	21, 5, 4–0.78
		Discharge[c]	1991–2011	17, 4, 0–0.96	1990–2011	18, 4, 0–0.92
		Caney (05130108)				
03422500	Caney Fork nr Rock Island, TN	Discharge[c]	1912–1999	75, 13, 0–0.95	1911–1999	77, 11, 1–0.94
03424500	Caney Fork below Center Hill Dam nr Lancaster, TN	Discharge[c]	1923–1958	36, 0, 0–1.00	1922–1958	35, 2, 0–0.97
		Lower Cumberland–Old Hickory Lake (05130201)				
03425000	Cumberland R at Carthage, TN	Discharge[c]	1923–1991	69, 0, 0–1.00	1922–1991	68, 2, 0–0.99
03425000coe	Cumberland R at Carthage, TN	Gage height[c]	1982–2011	13, 14, 3–0.79	1982–2011	12, 15, 3–0.79
		Discharge	1992–2011	7, 13, 0–0.95	1991–2011	7, 14, 0–0.91
		Lower Cumberland–Sycamore (05130202)				
03426310	Cumberland R at Old Hickory Dam, TN	Discharge[c]	1932–2007	71, 0, 5–0.93	1931–2007	69, 4, 4–0.92
03426310coe	Cumberland R at Old Hickory Dam, TN	Gage height[c]	1954–2011	52, 6, 0–0.97	1954–2011	51, 7, 0–0.97
		Discharge[c]	1954–2011	43, 15, 0–0.97	1954–2011	42, 16, 0–0.97
03426500	Cumberland R below Old Hickory, TN	Discharge[c]	1932–1982	46, 0, 5–0.90	1931–1982	44, 4, 4–0.88
03431500	Cumberland R at Nashville, TN	Discharge[c]	1893–2011	62, 1, 56–0.53	1892–2011	61, 4, 55–0.52
		Stones (05130203)				
03428200	W Fork Stones R at Murfreesboro, TN	Discharge[c]	1972–2010	33, 3, 3–0.88	1972–2010	33, 3, 3–0.88
		Water temperature	1986–2011	9, 17, 0–0.94	1986–2011	8, 18, 0–0.94
		Dissolved oxygen	1986–2011	3, 23, 0–0.89	1986–2011	2, 24, 0–0.89
		Specific conductance	1986–2011	9, 17, 0–0.95	1986–2011	8, 18, 0–0.95
03428200coe	W Fork Stones R at Murfreesboro, TN	Gage height[c]	1982–2011	16, 10, 4–0.75	1982–2011	17, 9, 4–0.75
		Discharge[c]	1989–2011	15, 8, 0–0.90	1989–2011	15, 8, 0–0.90

Table C–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY, station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1*A*–*B*. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure *A*–*B*. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31]

USGS station number[a]	Station name	Parameter	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
			Cumberland (0513)—Continued			
			Stones (05130203)—Continued			
03428500	W Fork Stones R nr Smyrna, TN	Discharge[c]	1966–2005	27, 6, 7–0.82	1965–2005	26, 9, 6–0.80
03428500coe	W Fork Stones R nr Smyrna, TN	Gage height[c]	1982–2006	12, 10, 3–0.72	1982–2005	12, 9, 3–0.75
		Discharge[c]	1989–2006	11, 7, 0–0.87	1989–2005	11, 6, 0–0.92
03430100	Stones R below J Percy Priest Dam, TN	Discharge[c]	1939–1996	29, 1, 28–0.51	1939–1996	27, 4, 27–0.51
			Lower Cumberland (05130205)			
03435000	Cumberland R below Cheatham Dam, TN	Discharge[c]	1955–1991	37, 0, 0–1.00	1954–1991	36, 2, 0–0.97
03437000	Cumberland R at Dover, TN	Discharge[c]	1938–1965	28, 0, 0–1.00	1937–1965	27, 2, 0–0.97
03437000coe		Gage height[c]	1982–2011	16, 11, 3–0.79	1982–2011	16, 11, 3–0.79
03438000	Little R nr Cadiz, KY	Discharge[c]	1940–2012	71, 2, 0–0.98	1940–2011	70, 2, 0–1.00
		Water temperature	2003–2005	0, 2, 1–0.46	2003–2004	0, 2, 0–0.69
		Dissolved oxygen	2003–2005	0, 2, 1–0.29	2003–2004	0, 2, 0–0.43
		Specific conductance	2003–2005	0, 2, 1–0.45	2003–2004	0, 2, 0–0.68
		pH	2003–2005	0, 2, 1–0.44	2003–2004	0, 2, 0–0.66
03438000coe	Little R nr Cadiz, KY	Gage height	1982–2011	7, 19, 4–0.76	1982–2011	8, 18, 4–0.76
		Discharge	1988–2011	7, 17, 0–0.87	1987–2011	8, 17, 0–0.83
03438210tva	Lake Barkley nr Grand Rivers, KY	Gage height[c]	1965–2012	46, 2, 0–0.98	1965–2012	47, 1, 0–0.98
03438220	Cumberland R nr Grand Rivers, KY	Discharge[c]	1940–1997	56, 1, 1–0.97	1940–1997	54, 4, 0–0.97
03438220tva	Cumberland R nr Grand Rivers, KY	Gage height[c]	1991–2012	19, 3, 0–0.96	1991–2012	20, 2, 0–0.96
			Red (05130206)			
03436100	Red R at Port Royal, TN	Discharge[c]	1961–2010	43, 3, 4–0.90	1961–2010	42, 5, 3–0.90
03436100coe	Red R at Port Royal, TN	Gage height[c]	1982–2011	12, 15, 3–0.78	1982–2011	13, 14, 3–0.78
		Discharge[c]	1989–2011	10, 13, 0–0.87	1989–2011	11, 12, 0–0.87
			Lower Ohio (0514)			
			Lower Ohio–Bay (05140203)			
03381700	Ohio R at Old Shawneetown, IL-KY	Gage height	2002–2012	1, 8, 2–0.76	2002–2012	1, 8, 2–0.76
		Discharge	2002–2012	8, 1, 2–0.79	2002–2012	7, 2, 2–0.79
03384500	Ohio R (Dam 51) at Golconda, IL	Discharge[c]	1941–1980	12, 27, 1–0.71	1940–1980	12, 29, 0–0.69
03384500coe	Ohio R (Dam 51) at Golconda, IL	Gage height	1988–2012	7, 18, 0–0.94	1987–2012	8, 18, 0–0.91
		Gage height, 0000 reading[c,d]	1938–1979	40, 2, 0–0.98	1938–1978	41, 0, 0–1.00
03399800	Ohio R (Smithland Dam) at Smithland, KY	Discharge[c]	1994–2011	18, 0, 0–1.00	1993–2011	17, 2, 0–0.95

Table C–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY, station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1*A*–*B*. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure *A*–*B*. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31]

USGS station number[a]	Station name	Parameter	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
Lower Ohio (0514)—Continued						
Lower Ohio–Bay (05140203)—Continued						
03399800coe	Ohio R (Smithland Dam) at Smithland, KY	Gage height	2003–2012	4, 6, 0–0.86	2003–2012	5, 5, 0–0.86
		Gage height, 0700 reading[c,d]	1981–2010	23, 7, 0–0.96	1981–2009	24, 5, 0–1.00
		Gage height (headwater)	2003–2012	5, 5, 0–0.86	2003–2012	5, 5, 0–0.86
		Gage height, 0700 reading (headwater)[c,d]	1981–2012	23, 9, 0–0.97	1981–2012	24, 8, 0–0.97
Lower Ohio (05140206)						
03611500	Ohio R at Metropolis, IL	Dischargec	1928–2010	82, 1, 0–0.99	1928–2010	81, 2, 0–0.99
03611500coe	Ohio R at Metropolis, IL	Gage height	2004–2012	6, 3, 0–0.87	2004–2012	6, 3, 0–0.87
Lower Tennessee (0604)						
Lower Tennessee–Beech (06040001)						
03593500	Tennessee R at Savannah, TN	Gage height	1987–2010	4, 16, 4–0.78	1986–2010	5, 17, 3–0.75
		Discharge[c]	1931–2006	75, 1, 0–0.99	1930–2006	74, 3, 0–0.98
		Suspended-sediment concentration	1935–1942	6, 2, 0–0.91	1934–1942	7, 2, 0–0.81
Upper Duck (06040002)						
03598000	Duck R nr Shelbyville, TN	Gage height	1996–2011	10, 6, 0–1.00	1995–2011	9, 8, 0–0.94
		Discharge[c]	1934–2011	76, 2, 0–0.99	1934–2011	75, 3, 0–0.99
		Water temperature	1977–2011	0, 3, 32–0.06	1976–2010	0, 4, 31–0.06
		Specific conductance	2005–2011	0, 1, 6–0.08	2005–2010	0, 1, 5–0.10
		Turbidity	2009–2011	0, 1, 2–0.14	2009–2010	0, 1, 0–0.21
Lower Duck (06040003)						
03599500	Duck R at Columbia, TN	Gage height	1996–2011	7, 9, 0–0.99	1995–2011	7, 10, 0–0.93
		Discharge[c]	1905–2011	94, 3, 10–0.89	1904–2011	93, 4, 11–0.89
03603000	Duck R above Hurricane Mills, TN	Discharge[c]	1925–2010	74, 8, 4–0.93	1925–2010	72, 11, 3–0.93
		Suspended-sediment concentration	1935–1966	3, 5, 24–0.19	1934–1965	4, 4, 24–0.19
		Suspended-sediment discharge	1935–1966	3, 5, 24–0.19	1934–1965	4, 4, 24–0.19

Table C–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY, station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1*A*–*B*. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure *A*–*B*. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31]

USGS station number[a]	Station name	Parameter	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		Lower Tennessee (0604)—Continued				
		Buffalo (06040004)				
03604000	Buffalo R nr Flat Woods, TN	Gage height	1998–2011	8, 5, 1–0.92	1997–2011	7, 7, 1–0.86
		Discharge[c]	1920–2010	90, 1, 0–0.99	1920–2010	89, 2, 0–0.99
03604400	Buffalo R below Lobelville, TN	Discharge[c]	1928–2009	68, 0, 14–0.83	1927–2009	66, 4, 13–0.82
		Kentucky Lake (06040005)				
03438190	Barkley-Kentucky Canal nr Grand Rivers, KY	Discharge[c,e]	1966–1997	30, 1, 1–0.95	1966–1997	28, 4, 0–0.95
03438190tva	Barkley-Kentucky Canal nr Grand Rivers, KY	Discharge[c,e]	1975–2012	26, 4, 8–0.74	1975–2012	28, 1, 9–0.74
		Discharge[c]	1960–2012	50, 3, 0–0.98	1960–2012	51, 2, 0–0.98
03607500	Tennessee R nr Buchanan, TN	Discharge[c]	1930–1942	12, 1, 0–0.94	1930–1942	11, 2, 0–0.94
03609000tva	Kentucky Lake at Gilbertsville, KY	Gage height	1944–2012	67, 2, 0–0.98	1944–2012	67, 2, 0–0.98
03609500	Tennessee R nr Paducah, KY	Dischargec	1890–1985	95, 1, 0–0.99	1889–1984	94, 2, 0–0.99
03609500tva	Tennessee R nr Paducah, KY	Gage height[c]	1991–2012	20, 2, 0–0.96	1991–2012	21, 1, 0–0.96
		Discharge[c]	1944–2012	67, 2, 0–0.98	1944–2012	67, 2, 0–0.98
		Lower Tennessee (06040006)				
03610000	Clarks R at Murray, KY	Discharge[c]	1952–1971	20, 0, 0–1.00	1951–1971	19, 2, 0–0.95
03610200	Clarks R at Almo, KY	Discharge[c]	1983–2011	29, 0, 0–1.00	1982–2011	28, 2, 0–0.97
03610500	Clarks R nr Benton, KY	Discharge[c]	1939–1973	35, 0, 0–1.00	1938–1973	34, 2, 0–0.97
03610545	W Fork Clarks R nr Brewers, KY	Discharge[c]	1969–1994	20, 1, 5–0.80	1968–1994	19, 4, 4–0.77
03611000coe	Ohio R at Paducah, KY	Gage height[c]	1988–2012	12, 13, 0–0.95	1987–2012	13, 13, 0–0.92
		Gage height, 0700 reading[c,d]	1965–2006	36, 6, 0–0.96	1964–2005	36, 6, 0–0.96

Table C–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY, station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1*A*–*B*. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure *A*–*B*. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31]

USGS station number[a]	Station name	Parameter	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
Upper Mississippi–Kaskaskia–Meramec (0714)						
Upper Mississippi-Cape Girardeau (07140105)						
07020850	Mississippi River at Cape Girardeau, MO	Gage height, 0800 reading[d]	1985–2012	4, 24, 0–0.93	1984–2011	1, 27, 0–0.93
07020850coe	Mississippi River at Cape Girardeau, MO	Gage height	2002–2011	5, 5, 0–0.85	2002–2010	4, 5, 0–0.94
		Gage height, 0800 reading[c,d]	1896–2012	111, 6, 0–0.98	1896–2011	111, 5, 0–0.99
07022000	Mississippi River at Thebes, IL	Gage height, 0800 reading[d]	1983–2012	9, 21, 0–0.95	1982–2012	7, 23, 1–0.92
		Discharge[c]	1933–2012	75, 3, 2–0.96	1933–2012	73, 5, 2–0.96
		Suspended-sediment concentration[c]	1983–2010	15, 13, 0–0.97	1982–2010	10, 19, 0–0.94
		Suspended-sediment discharge[c]	1983–2010	23, 5, 0–0.99	1982–2010	20, 9, 0–0.95
07022000coe	Mississippi River at Thebes, IL	Gage height	2002–2011	3, 7, 0–0.81	2002–2010	3, 6, 0–0.90
		Gage height, 0800 reading[c]	1941–2012	59, 13, 0–0.97	1941–2012	59, 13, 0–0.97

[a]Station numbers with “coe” or “tva” appended to the number are for stations operated in cooperation with either the U.S. Army Corps of Engineers (coe) or the Tennessee Valley Authority (tva), and the data for these table rows are obtained from these agencies’ digital files.

[b]Period shown is for indicated type of year and includes gaps if data collection was discontinuous. Record completeness: number of complete-record, partial-record, and null-record water or calendar years—fraction of total record length with mean-daily values. The fraction-of-total-record-length calculation is based on complete beginning and ending water or calendar years as well as complete intervening years. Therefore, the fraction-of-total-record-length numbers may be different for water years when compared to calendar years.

[c]Indicators of Hydrologic Alteration (IHA) analysis was performed for these parameters. Periods of record for IHA analyses shown in figure C4 (gage height) and figure C5 (discharge). IHA analysis was only done for station-parameter combinations with a minimum of ten complete water years of record.

[d]Unit values at indicated hour. All other parameters are mean-daily values.

[e]Negative discharge values set to zero for the IHA analysis—flow distributions censored at zero and IHA results given for the positive portion of the distribution because the IHA software will not analyze negative values.

Table C–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for the Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
	Raw data[b]	
ckr_tabular_hydrostats_raw_ [***agency***]_dv.accdb	ckr001_[***agency***]_dv	Raw data—mean-daily values for gage height, discharge, water-surface elevation, water temperature, dissolved oxygen, specific conductance, pH, suspended-sediment concentration, and suapended-sediment discharge; minimum-daily and maximum-daily values for gage height, discharge, water-surface elevation, water temperature, dissolved oxygen, specific conductance, and pH; sum-daily values for precipitation; median-daily values for turbidity; unit values for gage height; for gaging stations in the contributing watersheds and vicinity of Clarks River NWR
ckr_tabular_hydrostats_raw_ usgs01_pk.accdb	ckr001_usgs_pk	USGS peak-value data for gage height and discharge
	Descriptive statistics, spread measures, and ratio measuresb	
ckr_tabular_hydrostats01c_ [***agency***].accdb	ckr[***var***]01c_[***agency***]	Mean-daily values for parameter ***var***, calendar-year reference period
ckr_tabular_hydrostats01w_ [***agency***].accdb	ckr[***var***]01w_[***agency***]	Mean-daily values for parameter ***var***, water-year reference period
ckr_tabular_hydrostats02. accdb	ckrpkst02	Peak-value statistics for gage height and discharge
	ckr[***var***]cy02	Calendar-year statistics for mean-daily values for parameter ***var***
	ckr[***var***]cd02	Calendar-decade statistics for mean-daily values for parameter ***var***
	ckr[***var***]cym02	Calendar-year-month statistics for mean-daily values for parameter ***var***
	ckr[***var***]wy02	Water-year statistics for mean-daily values for parameter ***var***
	ckr[***var***]mo02	Period-of-record monthly statistics metrics, based on mean-daily values, for parameter ***var***, complete calendar years
	ckr[***var***]mom02	Period-of-record monthly statistics metrics, based on annual monthly means of mean-daily values, for parameter ***var***, complete calendar years
	ckr[***var***]jc02	Period-of-record calendar-year-julian-day statistics, based on mean-daily values, for parameter ***var***, complete calendar years
	ckr[***var***]jw02	Period-of-record water-year-julian-day statistics, based on mean-daily values, for parameter ***var***, complete calendar years
	IHA metrics[c]	
regional_iha_***var***_ckr.xlsxd	1_day_min	Minimum 1-day mean of mean-daily values
	3_day_min	Minimum 3-day mean of mean-daily values
	7_day_min	Minimum 7-day mean of mean-daily values
	30_day_min	Minimum 30-day mean of mean-daily values
	90_day_min	Minimum 90-day mean of mean-daily values
	1_day_max	Maximum 1-day mean of mean-daily values
	3_day_max	Maximum 3-day mean of mean-daily values
	7_day_max	Maximum 7-day mean of mean-daily values
	30_day_max	Maximum 30-day mean of mean-daily values
	90_day_max	Maximum 90-day mean of mean-daily values

Table C–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for the Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
	IHA metrics[c]—Continued	
regional_iha_***var***_ckr.xlsxd—Continued	baseflow	Baseflow index: 7-day mean minimum discharge / mean-annual discharge
	[***var***]7525s	75th-25th percentile spread measure for mean-daily values
	summary	IHA period-of-record summary data for IHA parameter groups and environmental-flow components: summary data include the 10th, 25th, 50th, 75th, and 90th percentiles and the 75th–25th percentile spread measure
	03384500	Complete IHA analysis for USGS 03384500, Ohio R (Dam 51) at Golconda, IL (discharge)
	03384500coe	Complete IHA analysis for USGS 03384500, Ohio R (Dam 51) at Golconda, IL (gage height, 0000 reading [USACE])
	03399800	Complete IHA analysis for USGS 03399800, Ohio R (Smithland Dam) at Smithland, KY (discharge)
	03399800coe	Complete IHA analysis for USGS 03399800, Ohio R (Smithland Dam) at Smithland, KY (gage height, 0700 reading [USACE])
	03399800coe_headwater	Complete IHA analysis for USGS 03399800, Ohio R (Smithland Dam) at Smithland, KY (gage height, 0700 reading [headwater, USACE])
	03609500	Complete IHA analysis for USGS 03609500, Tennessee R nr Paducah, KY (discharge)
	03609500tva	Complete IHA analysis for USGS 03609500, Tennessee R nr Paducah, KY (gage height [TVA]; discharge [TVA])
	03610000	Complete IHA analysis for USGS 03610000, Clarks R at Murray, KY (discharge)
	03610200	Complete IHA analysis for USGS 03610200, Clarks R at Almo, KY (discharge)
	03610500	Complete IHA analysis for USGS 03610500, Clarks R nr Benton, KY (discharge)
	03610545	Complete IHA analysis for USGS 03610545, W Fork Clarks R nr Brewers, KY (discharge)
	03611000coe	Complete IHA analysis for USGS 03611000, Ohio R at Paducah, KY (gage height [USACE])
	03611000coe_0700	Complete IHA analysis for USGS 03611000, Ohio R at Paducah, KY (gage height, 0700 reading [USACE])
	03611500	Complete IHA analysis for USGS 03611500, Ohio R at Metropolis, IL (discharge)
	07020850coe	Complete IHA analysis for USGS 07020850, Mississippi River at Cape Girardeau, MO (gage height, 0800 reading [USACE])
	07022000	Complete IHA analysis for USGS 07022000, Mississippi River at Thebes, IL (discharge)
	07022000coe	Complete IHA analysis for USGS 07022000, Mississippi River at Thebes, IL (gage height, 0800 reading [USACE])

Table C–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for the Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
	IHA metrics[c]—Continued	
s***SSSSSSSS***_iha_[***var***].xlsx	ann	Water-year annual values for all IHA parameter groups and EFC groups, for parameter ***var***, gaging station ***SSSSSSSS***e (parameter definitions given in table C4)
	sco	IHA scorecard: period-of-record summary data, median values and coefficients of dispersion for IHA parameter groups and EFC groups, for parameter ***var***, gaging station ***SSSSSSSS***e
	lsq	Linear-regression models for IHA parameter groups and EFC groups with water year, for parameter ***var***, gaging station ***SSSSSSSS***e
	pct	IHA period-of-record summary data for IHA parameter groups and EFC groups: summary data include the 10th, 25th, 50th, 75th, and 90th percentiles and the 75th-25th percentile spread measure, for parameter ***var***, gaging station ***SSSSSSSS***e
	daily_efcs	Mean-daily values coded with IHA EFC groups, period of record, for parameter ***var***, gaging station ***SSSSSSSS***e
	fdc	IHA flow-duration-curve table with data values and exceedence probabilities for the water-year period and for each month, for parameter ***var***, gaging station ***SSSSSSSS***e
	msg	IHA conditional information messages concerning data quality as related to the IHA analysis, for parameter ***var***, gaging station ***SSSSSSSS***e
	Geospatial data summaries	
ckr_nlcd.xlsx	ckr_nlcd92_h0408rfg_pct	Land-cover percentages for hydrologic subregions and cataloging units (contributing-watershed area for Clarks River NWR) and refuge acquisition areas based on 1992 NLCD level 2 categories (Vogelmann and others, 2001)
	ckr_nlcd01_h0408rfg_pct	Land-cover percentages for hydrologic subregions and cataloging units (contributing-watershed area for Clarks River NWR) and refuge acquisition areas based on 2001 NLCD level 2 categories (Homer and others, 2007)
	ckr_lcc9201_h0408rfg_pct	Land-cover-change percentages for hydrologic subregions and cataloging units (contributing-watershed area for Clarks River NWR) and refuge acquisition areas based on 1992–2001 NLCD-LCCR Anderson level 1 categories (Fry and others, 2009; Anderson and others, 1976)
ckr_sgo_hsg.xlsx	ckr_sgo_hsg_pct	STATSGO database HSGs A through D percentages for hydrologic subregions and cataloging units (contributing-watershed area for Clarks River NWR) and refuge acquisition areas (U.S. Department of Agriculture, 1994, 2009; Wolock, 1997)

Table C–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for the Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
Geospatial data summaries—Continued		
ckr_eco34.xlsx	ckr_eco4huc_12_pct	EPA Level IV ecoregion percentages for 12-digit hydrologic units (contributing-watershed area for Clarks River NWR) (U.S. Environmental Protection Agency, 2011)
	ckr_eco3huc_12_pct	EPA Level III ecoregion percentages for 12-digit hydrologic units (contributing-watershed area for Clarks River NWR) (U.S. Environmental Protection Agency, 2011)
	ckr_eco4huc_10_pct	EPA Level IV ecoregion percentages for hydrologic subregions (contributing-watershed area for Clarks River NWR) (U.S. Environmental Protection Agency, 2011)
	ckr_eco3huc_10_pct	EPA Level III ecoregion percentages for hydrologic subregions (contributing-watershed area for Clarks River NWR) (U.S. Environmental Protection Agency, 2011)
	ckr_eco4huc_08_pct	EPA Level IV ecoregion percentages for hydrologic cataloging units (contributing-watershed area for Clarks River NWR) (U.S. Environmental Protection Agency, 2011)
	ckr_eco3huc_08_pct	EPA Level III ecoregion percentages for hydrologic cataloging units (contributing-watershed area for Clarks River NWR) (U.S. Environmental Protection Agency, 2011)
ckr_pop_census.xlsx	tblCkrPop01	U.S. Census Bureau county-level population data, 1930–2010 (U.S. Census Bureau, 2011)
	pop_pct_chg	Descriptive statistics for percent population change, 1930–1970, and 1970–2010

[a]In the file/table/worksheet name, ***var*** refers to the hydrologic parameter, where ***var=gmn, gumn, g0uv, g7uv, gu7uv, g8uv,*** gage height, in feet; ***qmn***, discharge, in cubic feet per second; ***tmn***, water temperature, in degrees Celsius; ***omn***, dissolved oxygen, in milligrams per liter; ***kmn***, specific conductance, in microsiemens per centimeter; ***pmn***, pH, in standard units; ***tfmd***, turbidity, in formazin units; ***scmn***, suspended-sediment concentration, in milligrams per liter; ***sdmn***, suspended-sediment discharge, in tons per day; all parameters are mean-daily values except ***g0uv, g7uv, gu7uv, g8uv*** (unit values), and ***tfmd*** (median-daily values). Agency acronyms in the file and(or) table/worksheet names (***agency***, in the file/table/worksheet name) indicate that the data have been subset to those agencies because of file-size limitations: usgs01, USGS, station range 03381700–03418420; usgs02, USGS, station range 03421000–03438220; usgs03, USGS, station range 03593500–07022000; usace, U.S. Army Corps of Engineers; tva, Tennessee Valley Authority.

[b]Field names, field types, and field definitions given in table C3*B*.

[c]IHA parameter-groups, EFC groups, EFCs, and parameter definitions listed in table C4 (Richter and others, 1996; The Nature Conservancy, 2009).

[d]IHA regional analysis restricted to USGS gaging stations 03384500, 03384500coe, 03399800, 03399800coe, 03609500, 03609500tva, 03610000, 03610200, 03610500, 03610545, 03611000coe, 03611500, 07020850coe, 07022000, 07022000coe. Gaging-station information presented in tables C2*A* and C2*B*.

[e]IHA analysis of mean-daily gage-height record and mean-daily discharge record was done for gaging stations so indicated in table C2*B*.

Table C–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial summary files for the hydrologic and landscape database for Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record, cy, calendar year, wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Raw data[c]	
ag_dt	ckr001_[***agency***]_pk	Date/time	Date of maximum gage-height for water year (if not concurrent with peak)
ag_tm	ckr001_[***agency***]_pk	Date/time	Time of maximum gage-height for water year (if not concurrent with peak)
ag_gage_ht	ckr001_[***agency***]_pk	Double precision	Maximum gage height for water year in feet (if not concurrent with peak)
ag_gage_ht_cd	ckr001_[***agency***]_pk	Double precision	Maximum gage height code
agency_cd	ckr001_[***agency***]_[dv, pk]	Text	USGS collecting-agency code
datetime	ckr001_[***agency***]_[dv, pk]	Date/time	Calendar date of daily value
datetime_c	ckr001_[***agency***]_[dv, pk]	Text	Calendar date of daily value, character date
disch_mi	ckr001_[***agency***]_dv	Double precision	Minimum-daily discharge, in ft^3/s
disch_mi_cd	ckr001_[***agency***]_dv	Text	Minimum-daily discharge, data-value qualification code[d]
disch_mn	ckr001_[***agency***]_dv	Double precision	Mean-daily discharge, in ft^3/s
disch_mn_cd	ckr001_[***agency***]_dv	Text	Mean-daily discharge, data-value qualification code[d]
disch_mx	ckr001_[***agency***]_dv	Double precision	Maximum-daily discharge, in ft^3/s
disch_mx_cd	ckr001_[***agency***]_dv	Text	Maximum-daily discharge, data-value qualification code[d]
disch_uv	ckr001_[***agency***]_dv	Double precision	Unit-value discharge, in ft^3/s
disch_uv_cd	ckr001_[***agency***]_dv	Text	Unit-value discharge, data-value qualification code[d]
do_mi	ckr001_[***agency***]_dv	Double precision	Minimum-daily dissolved-oxygen concentration, in mg/L
do_mi_cd	ckr001_[***agency***]_dv	Text	Minimum-daily dissolved-oxygen concentration, data-value qualification code[d]
do_mn	ckr001_[***agency***]_dv	Double precision	Mean-daily dissolved-oxygen concentration, in mg/L
do_mn_cd	ckr001_[***agency***]_dv	Text	Mean-daily dissolved-oxygen concentration, data-value qualification code[d]
do_mx	ckr001_[***agency***]_dv	Double precision	Maximum-daily dissolved-oxygen concentration, in mg/L
do_mx_cd	ckr001_[***agency***]_dv	Text	Maximum-daily dissolved-oxygen concentration, data-value qualification code[d]
elev1929_mi	ckr001_[***agency***]_dv	Double precision	Minimum-daily elevation, referenced to NGVD 29, in ft
elev1929_mn	ckr001_[***agency***]_dv	Double precision	Mean-daily elevation, referenced to NGVD 29, in ft
elev1929_mn_df	ckr001_[***agency***]_dv	Double precision	Mean-daily elevation, day fraction (non-missing hourly values)
elev1929_mx	ckr001_[***agency***]_dv	Double precision	Maximum-daily elevation, referenced to NGVD 29, in ft
gage_ht	ckr001_[***agency***]_dv	Double precision	Gage height for the associated peak streamflow, in ft
gage_ht_cd	ckr001_[***agency***]_dv	Text	Gage height qualification code
ght_clg_u0	ckr001_[***agency***]_dv	Double precision	Unit-value gage height, corrected, 0000 reading, in ft
ght_mi	ckr001_[***agency***]_dv	Double precision	Minimum-daily gage height, in ft

Table C–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial summary files for the hydrologic and landscape database for Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record, cy, calendar year, wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Raw data[c]—Continued	
ght_mi_cd	ckr001_[***agency***]_dv	Text	Minimum-daily gage height, data-value qualification code[d]
ght_mn	ckr001_[***agency***]_dv	Double precision	Mean-daily gage height, in ft
ght_mn_cd	ckr001_[***agency***]_dv	Text	Mean-daily gage height, data-value qualification code[d]
ght_mn_df	ckr001_[***agency***]_dv	Double precision	Mean-daily gage height, day fraction (non-missing hourly values)
ght_mx	ckr001_[***agency***]_dv	Double precision	Maximum-daily gage height, in ft
ght_mx_cd	ckr001_[***agency***]_dv	Text	Maximum-daily gage height, data-value qualification code[d]
ght_sm	ckr001_[***agency***]_dv	Double precision	Sum-daily gage height, in ft
ght_sm_cd	ckr001_[***agency***]_dv	Text	Sum-daily gage height, data-value qualification code
ght_u0	ckr001_[***agency***]_dv	Double precision	Unit-value gage height, 0000 reading, in ft
ght_u7	ckr001_[***agency***]_dv	Double precision	Unit-value gage height, 0700 reading, in ft
ght_u8	ckr001_[***agency***]_dv	Double precision	Unit-value gage height, 0800 reading, in ft
ght_u8_cd	ckr001_[***agency***]_dv	Double precision	Unit-value gage height, 0800 reading, data-value qualification code[d]
ght_upr_mi	ckr001_[***agency***]_dv	Double precision	Minimum-daily gage height, headwater, in ft
ght_upr_mn	ckr001_[***agency***]_dv	Double precision	Mean-daily gage height, headwater, in ft
ght_upr_mn_df	ckr001_[***agency***]_dv	Double precision	Mean-daily gage height, headwater, day fraction (non-missing hourly values)
ght_upr_mx	ckr001_[***agency***]_dv	Double precision	Maximum-daily gage height, headwater, in ft
ght_upr_u7	ckr001_[***agency***]_dv	Double precision	Unit-value gage height, 0700 reading, headwater, in ft
pcp_sm	ckr001_[***agency***]_dv	Double precision	Sum-daily precipitation, in inches
pcp_sm_cd	ckr001_[***agency***]_dv	Text	Sum-daily precipitation, data-value qualification code[d]
pcp_sm_df	ckr001_[***agency***]_dv	Double precision	Sum-daily precipitation, day fraction (non-missing hourly values)
peak_dt	ckr001_[***agency***]_pk	Date/time	Date of peak streamflow
peak_tm	ckr001_[***agency***]_pk	Date/time	Time of peak streamflow
peak_va	ckr001_[***agency***]_pk	Double precision	Annual peak streamflow value, in ft^3/s
peak_cd	ckr001_[***agency***]_pk	Text	Peak discharge-qualification code
ph_mi	ckr001_[***agency***]_dv	Double precision	Minimum-daily pH, in standard units
ph_mi_cd	ckr001_[***agency***]_dv	Text	Minimum-daily pH, data-value qualification code[d]
ph_mn	ckr001_[***agency***]_dv	Double precision	Mean-daily pH, in standard units
ph_mn_cd	ckr001_[***agency***]_dv	Text	Mean-daily pH, data-value qualification code[d]
ph_mx	ckr001_[***agency***]_dv	Double precision	Maximum-daily pH, in standard units
ph_mx_cd	ckr001_[***agency***]_dv	Text	Maximum-daily pH, data-value qualification code[d]
site_no	ckr001_[***agency***]_[dv, pk]	Text	USGS station identification number
spc_mi	ckr001_[***agency***]_dv	Double precision	Minimum-daily specific conductance, in µS/cm
spc_mi_cd	ckr001_[***agency***]_dv	Text	Minimum-daily specific conductance, data-value qualification code[d]
spc_mn	ckr001_[***agency***]_dv	Double precision	Mean-daily specific conductance, in µS/cm

Table C–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial summary files for the hydrologic and landscape database for Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record, cy, calendar year, wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Raw data[c]—Continued	
spc_mn_cd	ckr001_[***agency***]_dv	Text	Mean-daily specific conductance, data-value qualification code[d]
spc_mx	ckr001_[***agency***]_dv	Text	Maximum-daily specific conductance, bottom, in µS/cm
spc_mx_cd	ckr001_[***agency***]_dv	Double precision	Maximum-daily specific conductance, bottom, data-value qualification code[d]
ssc_mn	ckr001_[***agency***]_dv	Double precision	Mean-daily suspended-sediment concentration, in mg/L
ssc_mn_cd	ckr001_[***agency***]_dv	Text	Mean-daily suspended-sediment concentration, data-value qualification code[d]
ssd_mn	ckr001_[***agency***]_dv	Double precision	Mean-daily suspended-sediment discharge, in tons/day
ssd_mn_cd	ckr001_[***agency***]_dv	Text	Mean-daily suspended-sediment discharge, data-value qualification code[d]
trbfnu_md	ckr001_[***agency***]_dv	Double precision	Median-daily turbidity, in formazin nephelometric turbidity units
trbfnu_md_cd	ckr001_[***agency***]_dv	Text	Median-daily turbidity, data-value qualification code[d]
uv_df	ckr001_[***agency***]_dv	Double precision	Mean-, minimum-, maximum-daily gage height, discharge, day fraction (non-missing hourly values)
wtemp_min	ckr001_[***agency***]_dv	Double precision	Minimum-daily water temperature, in °C
wtemp_min_cd	ckr001_[***agency***]_dv	Text	Minimum-daily water temperature, data-value qualification code[d]
wtemp_mn	ckr001_[***agency***]_dv	Double precision	Mean-daily water temperature, in °C
wtemp_mn_cd	ckr001_[***agency***]_dv	Text	Mean-daily water temperature, data-value qualification code[d]
wtemp_mx	ckr001_[***agency***]_dv	Double precision	Maximum-daily water temperature, in °C
wtemp_mx_cd	ckr001_[***agency***]_dv	Text	Maximum-daily water temperature, data-value qualification code[d]
year_last_pk	ckr001_[***agency***]_pk	Date/time	Peak streamflow reported is the highest since this year
		Descriptive statistics, spread measures, ratio measures[e]	
[***var***]	ckr[***var***]01[c,w]_[***agency***]	Double precision	Mean-daily value for parameter ***var***
[***var***]_10	all tables (-ckr[***var***]01[c,w]_[***agency***])	Double precision	10th percentile of mean-daily values, parameter ***var***
[***var***]_20	all tables (-ckr[***var***]01[c,w]_[***agency***])	Double precision	20th percentile of mean-daily values, parameter ***var***
[***var***]_25	all tables (-ckr[***var***]01[c,w]_[***agency***])	Double precision	25th percentile of mean-daily values, parameter ***var***
[***var***]_50	all tables (-ckr[***var***]01[c,w]_[***agency***])	Double precision	50th percentile (median) of mean-daily values, parameter ***var***
[***var***]_75	all tables (-ckr[***var***]01[c,w]_[***agency***])	Double precision	75th percentile of mean-daily values, parameter ***var***
[***var***]_80	all tables (-ckr[***var***]01[c,w]_[***agency***])	Double precision	80th percentile of mean-daily values, parameter ***var***
[***var***]_90	all tables (-ckr[***var***]01[c,w]_[***agency***])	Double precision	90th percentile of mean-daily values, parameter ***var***
[***var***]_cd	ckr[***var***]01[c,w]_[***agency***]	Double precision	Mean-daily value for parameter ***var***, data-value qualification code[d]

Table C–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial summary files for the hydrologic and landscape database for Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record, cy, calendar year, wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Descriptive statistics, spread measures, ratio measures[e]—Continued			
[***var***]_cdf	ckr[***var***]cd02	Double precision	Calendar-decade fraction represented by mean-daily values, parameter ***var***
[***var***]_cmf	ckr[***var***]cym02	Double precision	Calendar-month fraction represented by mean-daily values, parameter ***var***
[***var***]_cv	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Double precision	Coefficient of variation of mean-daily values, parameter ***var***
[***var***]_cy_n	ckr[***var***]mo02	Double precision	Number of complete calendar years in the long-term monthly record for parameter ***var***
[***var***]_cyf	ckr[***var***]cy02; ckr[***var***]cym02	Double precision	Calendar-year fraction represented by mean-daily values, parameter ***var***
[***var***]_mi	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Double precision	Minimum of mean-daily values, parameter ***var***
[***var***]_mn	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Double precision	Mean of mean-daily values, parameter ***var***
[***var***]_mx	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Double precision	Maximum of mean-daily values, parameter ***var***
[***var***]_n	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Long integer	Number of mean-daily values, parameter ***var***
[***var***]_nm	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Long integer	Number of missing values of mean-daily values, parameter ***var***
[***var***]_ny	ckr[***var***]cd02	Double precision	Number of calendar years in each calendar decade, including fractional years, represented by mean-daily values, parameter ***var***
[***var***]_sd	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Double precision	Standard deviation of mean-daily values, parameter ***var***
[***var***]_va	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Double precision	Variance of mean-daily values, parameter ***var***
[***var***]_wyf	ckr[***var***]wy02	Double precision	Water-year fraction represented by mean-daily values, parameter ***var***
[***var***]7525r	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Double precision	75th–25th percentile ratio measure of mean-daily values, parameter ***var***: p75/p25
[***var***]7525s	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Double precision	75th–25th percentile spread measure of mean-daily values, parameter ***var***: (p75–p25)/p50
[***var***]8020r	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Double precision	80th–20th percentile ratio measure of mean-daily values, parameter ***var***: p80/p20
[***var***]8020s	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Double precision	80th–20th percentile spread measure of mean-daily values, parameter ***var***: (p80–p20)/p50
[***var***]9010r	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Double precision	90th–10th percentile ratio measure of mean-daily values, parameter ***var***: p90/p10
[***var***]9010s	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Double precision	90th–10th percentile spread measure of mean-daily values, parameter ***var***: (p90–p10)/p50

Table C–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial summary files for the hydrologic and landscape database for Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record, cy, calendar year, wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft³/s, cubic foot per second; ft, foot; in, inch; mi², square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Descriptive statistics, spread measures, ratio measures[e]—Continued			
agency_cd	ckr[***var***]01[c,w]_[***agency***]	Text	Agency code
cdate	ckr[***var***]01[c,w]_[***agency***]	Text	Character date, yyyymmdd format, added to preserve pre-1900 dates in Microsoft Excel files
cdt_bnd_mi	ckr[***var***]01[c,w]_[***agency***]	Date/time	Calendar-year minimum-date boundary, January 1 of the first calendar year of record, ***mm/dd/yyyy*** format
cdt_bnd_mx	ckr[***var***]01[c,w]_[***agency***]	Date/time	Calendar-year maximum-date boundary, December 31 of the last calendar year of record, ***mm/dd/yyyy*** format
cnty	ckr[***var***]01[c,w]_[***agency***]	Text	FIPS county code
da	all tables (-ckrpkst02)	Double precision	Drainage area of gaged watershed, in mi²
date	ckr[***var***]01[c,w]_[***agency***]	Date/time	Date, ***mm/dd/yyyy*** format
date_mi	ckr[***var***]01[c,w]_[***agency***]	Date/time	Date of first daily value, ***mm/dd/yyyy*** format
date_mx	ckr[***var***]01[c,w]_[***agency***]	Date/time	Date of last daily value, ***mm/dd/yyyy*** format
day	ckr[***var***]01[c,w]_[***agency***]	Long integer	Calendar day
decade	ckr[***var***]01[c,w]_[***agency***]; ckr[***var***]cd02	Long integer	Calendar decade
jday_c	ckr[***var***]01[c,w]_[***agency***]; ckr[***var***]jc02	Long integer	Calendar-year Julian day
jday_w	ckr[***var***]01[c,w]_[***agency***]; ckr[***var***]jw02	Long integer	Water-year Julian day
l[***var***]	ckr[***var***]01[c,w]_[***agency***]	Double precision	Log-10 mean-daily value for parameter ***var***
l[***var***]_cv	all tables (-ckr[***var***]01 [c,w]_[***agency***])	Double precision	Coefficient of variation of every 5th percentile of log-10 parameter ***var***
latdec	ckr[***var***]01[c,w]_[***agency***]	Double precision	Decimal latitude of gaging station, NAD 83
londec	ckr[***var***]01[c,w]_[***agency***]	Double precision	Decimal longitude of gaging station, NAD 83
lsalt	ckr[***var***]01[c,w]_[***agency***]	Double precision	Land-surface altitude of gage, NGVD 29, in ft
month	ckr[***var***]01[c,w]_[***agency***]; ckr[***var***]cym02; ckr[***var***]mo02; ckr[***var***]mom02	Long integer	Calendar month
month_nd	ckr[***var***]mo02	Double precision	Number of days in the calendar month
qmn_y50	all qmn tables (-ckrqmn01 [c,w]_[***agency***])	Double precision	Median discharge yield, in ft³/s/mi
qmn_ymn	all qmn tables (-ckrqmn01 [c,w]_[***agency***])	Double precision	Mean discharge yield, in ft³/s/mi
sname	ckr[***var***]01[c,w]_[***agency***]	Text	USGS station name
staid	all tables	Text	USGS station identification number
wdt1_bnd_mi	ckr[***var***]01[c,w]_[***agency***]	Date/time	Water-year minimum-date boundary, October 1 of the first water year of record, calendar-year minimum minus one when month is January–September, ***mm/dd/yyyy*** format

Table C–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial summary files for the hydrologic and landscape database for Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record, cy, calendar year, wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Descriptive statistics, spread measures, ratio measures[e]—Continued	
wdt1_bnd_mx	ckr[***var***]01[c,w]_[***agency***]	Date/time	Water-year maximum-date boundary, September 30 of the last water year of record, calendar-year minimum when month is January–September, ***mm/dd/yyyy*** format
wdt2_bnd_mi	ckr[***var***]01[c,w]_[***agency***]	Date/time	Water-year minimum-date boundary, October 1 of the first water year of record, calendar-year minimum when month is October–December, ***mm/dd/yyyy*** format
wdt2_bnd_mx	ckr[***var***]01[c,w]_[***agency***]	Date/time	Water-year maximum-date boundary, September 30 of the last water year of record, calendar-year minimum plus one when month is October–December, ***mm/dd/yyyy*** format
wyear	ckr[***var***]01[c,w]_[***agency***]; ckr[***var***]wy02	Long integer	Water year
year	ckr[***var***]01[c,w]_[***agency***]; ckr[***var***]cy02; ckr[***var***]cym02	Long integer	Calendar year
		Geospatial data summaries[f]	
AREA	tblCkrPop01	Double precision	County area, in m^2
CNTYNAME	tblCkrPop01	Text	County name
ckr_statecty	tblCkrPop01	Long integer	Numeric FIPS code
hga_pct	ckr_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG A[g]
hgb_pct	ckr_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG B[g]
hgc_pct	ckr_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG C[g]
hgd_pct	ckr_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG D[g]
hgm_pct	ckr_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils that have mixed HSG classification[g]
huc_chg_pct	ckr_lcc9201_h0408rfg_pct	Double precision	Areal percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
huc04	all tables (-ckr_eco[3,4] huc[08,10,12]_pct, tblckrPop01, pop_pct_chg)	Text	Hydrologic subregion (4-digit hydrologic unit) code[h]

Table C–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial summary files for the hydrologic and landscape database for Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
huc08	all tables (-tblckrPop01, pop_pct_chg)	Text	Hydrologic cataloging unit (8-digit hydrologic unit) code[h]
huc08_l3_pct	ckr_eco3huc_08_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level III ecoregion in each hydrologic cataloging unit (8-digit hydrologic unit)
huc08_l4_pct	ckr_eco4huc_08_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level IV ecoregion in each hydrologic cataloging unit (8-digit hydrologic unit)
huc08_name	ckr_eco[3,4] huc[08,10,12]_pct	Text	Hydrologic cataloging unit (8-digit hydrologic unit) name[h]
huc10	all tables (-ckr_eco4huc_ 08_pct, ckr_eco3huc _08_pct, tblckrPop01, pop_pct_chg)	Text	10-digit hydrologic unit code[i]
huc10_l3_pct	ckr_eco3huc_10_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level III ecoregion in each 10-digit hydrologic unit
huc10_l4_pct	ckr_eco4huc_10_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level IV ecoregion in each 10-digit hydrologic unit
huc10_name	ckr_eco[3,4]huc[10,12]_pct	Text	10-digit hydrologic unit name[h]
huc12	all tables (-ckr_eco[3,4] huc_[08,10]_pct, tblckrPop01, pop_pct_chg)	Text	12-digit hydrologic unit code[h]
huc12_l3_pct	ckr_eco3huc_12_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level III ecoregion in each 12-digit hydrologic unit
huc12_l4_pct	ckr_eco4huc_12_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level IV ecoregion in each 12-digit hydrologic unit
huc12_name	ckr_eco4huc_12_pct, ckr_eco3huc_12_pct	Text	12-digit hydrologic unit name[h]
mass_bal	ckr_lcc9201_h0408rfg_pct	Double precision	Sum-check for land-cover change net gain/loss percentages
net_1	ckr_lcc9201_h0408rfg_pct	Double precision	Net percentage gain or loss of water within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_2	ckr_lcc9201_h0408rfg_pct	Double precision	Net percentage gain or loss of urban land within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs

Table C–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial summary files for the hydrologic and landscape database for Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record, cy, calendar year, wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
net_3	ckr_lcc9201_h0408rfg_pct	Double precision	Net percentage gain or loss of barren land within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_4	ckr_lcc9201_h0408rfg_pct	Double precision	Net percentage gain or loss of forest within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_5	ckr_lcc9201_h0408rfg_pct	Double precision	Net percentage gain or loss of grassland within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_6	ckr_lcc9201_h0408rfg_pct	Double precision	Net percentage gain or loss of agricultural land within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_7	ckr_lcc9201_h0408rfg_pct	Double precision	Net percentage gain or loss of wetland within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
nwr	ckr_nlcd92_h0408rfg_pct, ckr_nlcd01_h0408rfg_pct, ckr_lcc9201_h0408rfg_pct, ckr_sgo_hsg_pct	Text	U.S. Fish and Wildlife Service National Wildlife Refuge name
pct_11	ckr_nlcd92_h0408rfg_pct, ckr_nlcd01_h0408rfg_pct	Double precision	Percent open water—all areas of open water, generally with less than 25 percent cover of vegetation or soil (1992, 2001)[i,j]
pct_21	ckr_nlcd92_h0408rfg_pct, ckr_nlcd01_h0408rfg_pct	Double precision	Percent developed—low-intensity residential (1992)[i]; Developed, open space—includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes (2001)[j]
pct_22	ckr_nlcd92_h0408rfg_pct, ckr_nlcd01_h0408rfg_pct	Double precision	Percent developed—high-intensity residential (1992)[i]; Developed, low intensity—includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20–49 percent of total cover. These areas most commonly include single-family housing units (2001)[j]

Table C–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial summary files for the hydrologic and landscape database for Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
pct_23	ckr_nlcd92_h0408rfg_pct, ckr_nlcd01_h0408rfg_pct	Double precision	Percent developed—commercial/industrial/transportation (1992)[i]; Developed, medium intensity—includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50–79 percent of the total cover. These areas most commonly include single-family housing units (2001)[j]
pct_24	ckr_nlcd01_h0408rfg_pct	Double precision	Developed, high intensity—includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to 100 percent of the total cover (2001)[j]
pct_31	ckr_nlcd92_h0408rfg_pct, ckr_nlcd01_h0408rfg_pct	Double precision	Barren—bare rock/sand/clay (1992)[i]; Barren land (rock/sand/clay)—barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15 percent of total cover (2001)[j]
pct_32	ckr_nlcd92_h0408rfg_pct	Double precision	Barren—quarries/strip mines/gravel pits (1992)[i]; Unconsolidated shore[k]—unconsolidated material such as silt, sand, or gravel that is subject to inundation and redistribution due to the action of water. Characterized by substrates lacking vegetation except for pioneering plants that become established during brief periods when growing conditions are favorable. Erosion and deposition by waves and currents produce a number of landforms representing this class (2001)[j]
pct_33	ckr_nlcd92_h0408rfg_pct	Double precision	Barren—transitional (1992)[i]
pct_41	ckr_nlcd92_h0408rfg_pct, ckr_nlcd01_h0408rfg_pct	Double precision	Vegetated, natural forested upland—deciduous forest (1992)[i]; Deciduous forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change (2001)[j]
pct_42	ckr_nlcd92_h0408rfg_pct, ckr_nlcd01_h0408rfg_pct	Double precision	Vegetated, natural forested upland—evergreen forest (1992)[i]; Evergreen forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species maintain their leaves all year. Canopy is never without green foliage (2001)[j]
pct_43	ckr_nlcd92_h0408rfg_pct, ckr_nlcd01_h0408rfg_pct	Double precision	Vegetated, natural forested upland—mixed forest (1992)[i]; Mixed forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. Neither deciduous nor evergreen species are greater than 75 percent of total tree cover (2001)[j]
pct_52	ckr_nlcd01_h0408rfg_pct	Double precision	Shrub/Scrub—Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20 percent of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions (2001)[j]

Table C–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial summary files for the hydrologic and landscape database for Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
pct_71	ckr_nlcd92_h0408rfg_pct, ckr_nlcd01_h0408rfg_pct	Double precision	Herbaceous upland—grasslands/herbaceous (1992)[i]; Grassland/herbaceous—areas dominated by grammanoid or herbaceous vegetation, generally greater than 80 percent of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing (2001)[j]
pct_81	ckr_nlcd92_h0408rfg_pct, ckr_nlcd01_h0408rfg_pct	Double precision	Herbaceous planted/cultivated—pasture/hay (1992)[i]; Pasture/hay—areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation (2001)[j]
pct_82	ckr_nlcd92_h0408rfg_pct, ckr_nlcd01_h0408rfg_pct	Double precision	Herbaceous planted/cultivated—row crops (1992)[i]; Cultivated crops—areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled (2001)[j]
pct_83	ckr_nlcd92_h0408rfg_pct	Double precision	Small grains—areas used for the production of graminoid crops such as wheat, barley, oats, and rice (1992)[i]
pct_85	ckr_nlcd92_h0408rfg_pct	Double precision	Herbaceous planted/cultivated—urban/recreational grasses (1992)[i]
pct_90	ckr_nlcd01_h0408rfg_pct	Double precision	Woody wetlands—areas where forest or shrubland vegetation accounts for greater than 20 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water (2001)[j]
pct_91	ckr_nlcd92_h0408rfg_pct	Double precision	Wetlands—woody wetlands (1992)[i]
pct_92	ckr_nlcd92_h0408rfg_pct	Double precision	Wetlands—emergent herbaceous wetlands (1992)[i]
pct_95	ckr_nlcd01_h0408rfg_pct	Double precision	Emergent herbaceous wetlands—areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water (2001)[j]
pct_tot	ckr_nlcd92_h0408rfg_pct, ckr_nlcd01_h0408rfg_pct, ckr_sgo_hsg_pct	Double precision	Sum-check for land-cover percentages and percentages of hydrologic soil groups[h,l]
POP010130D	tblCkrPop01	Double precision	Resident population (April 1—complete count) 1930
POP010140D	tblCkrPop01	Double precision	Resident population (April 1—complete count) 1940
POP010150D	tblCkrPop01	Double precision	Resident population (April 1—complete count) 1950
POP010160D	tblCkrPop01	Double precision	Resident population (April 1—complete count) 1960
POP010170D	tblCkrPop01	Double precision	Resident population (April 1—complete count) 1970
POP010180D	tblCkrPop01	Double precision	Resident population (April 1—complete count) 1980
POP010190D	tblCkrPop01	Double precision	Resident population (April 1—complete count) 1990
POP010200D	tblCkrPop01	Double precision	Resident population (April 1—complete count) 2000
POP010210D	tblCkrPop01	Double precision	Resident population (April 1—complete count) 2010
POP020170D	tblCkrPop01	Double precision	Resident population (April 1—revised) 1970

Table C–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial summary files for the hydrologic and landscape database for Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Geospatial data summaries[f]—Continued			
pop3070_neg	pop_pct_chg	Double precision	Descriptive statistics for population decrease, 1930–1970
pop3070_pct	tblCkrPop01	Double precision	Percent change in population, 1930–1970
pop3070_pos	pop_pct_chg	Double precision	Descriptive statistics for population increase, 1930–1970
pop7010_neg	pop_pct_chg	Double precision	Descriptive statistics for population decrease, 1970–2010
pop7010_pct	tblCkrPop01	Double precision	Percent change in population, 1970–2010
pop7010_pos	pop_pct_chg	Double precision	Descriptive statistics for population increase, 1970–2010
ST	tblCkrPop01	Text	Two-letter U.S. Postal Service state code
to_1_pct	ckr_lcc9201_h0408rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area reclassified in the 2001 NLCD that was converted to water[m]
to_2_pct	ckr_lcc9201_h0408rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area reclassified in the 2001 NLCD that was converted to urban[m]
to_3_pct	ckr_lcc9201_h0408rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area reclassified in the 2001 NLCD that was converted to barren[m]
to_4_pct	ckr_lcc9201_h0408rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area reclassified in the 2001 NLCD that was converted to forest[m]
to_5_pct	ckr_lcc9201_h0408rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area reclassified in the 2001 NLCD that was converted to grassland[m]
to_6_pct	ckr_lcc9201_h0408rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area reclassified in the 2001 NLCD that was converted to agriculture[m]
to_7_pct	ckr_lcc9201_h0408rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area reclassified in the 2001 NLCD that was converted to wetland[m]

Table C–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial summary files for the hydrologic and landscape database for Clarks River National Wildlife Refuge contributing watersheds and vicinity, Kentucky, Tennessee, and Mississippi.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Specified period of analysis: por, period of record, cy, calendar year, wy, water year. Hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
to_tot_pct	ckr_lcc9201_h0408rfg_pct	Double precision	Sum-check for land-cover change percentages
us_l3code	ckr_eco3huc_[08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level III ecoregion code[n]
us_l3name	ckr_eco3huc_[08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level III ecoregion name[n]
us_l4code	ckr_eco[3,4]huc_ [08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level IV ecoregion code[n]
us_l4name	ckr_eco[3,4]huc_ [08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level IV ecoregion name[n]

[a]In the file/table/worksheet name, ***var*** refers to the hydrologic parameter, where ***var=pkg***, peak-value gage height, in feet; ***pkq***, peak-value discharge, in cubic feet per second; ***gmn, gumn, g0uv, g7uv, gu7uv, g8uv***, gage height, in feet; ***qmn***, discharge, in cubic feet per second; ***tmn***, water temperature, in degrees Celsius; ***omn***, dissolved oxygen, in milligrams per liter; ***kmn***, specific conductance, in microsiemens per centimeter; ***pmn***, pH, in standard units; ***scmn***, suspended-sediment concentration, in milligrams per liter; ***sdmn***, suspended-sediment discharge, in tons per day; ***tfmd***, turbidity, in formazin units; all parameters are mean-daily values except ***g0uv, g7uv, gu7uv, g8uv*** (unit values), and ***tfmd*** (median-daily values). Agency acronyms in the file and(or) table/worksheet names indicate that the data have been subset to those agencies because of file-size limitations: usgs01, USGS, station range 03381700–03418420; usgs02, USGS, station range 03421000–03438220; usgs03, USGS, station range 03593500–07022000; usace, U.S. Army Corps of Engineers; tva, Tennessee Valley Authority.

[b]Arguments enclosed in square brackets in table/worksheet names represent separate tables/worksheets. For example, ckr[***var***]01 refers to 2 tables/worksheets—ckrgmn1 and ckrqmn1, if ***var***=gmn, qmn. “All tables” with one or more table/worksheet names in parentheses indicates that the table/worksheet reference(s) in parentheses is(are) excluded for the listed field. Tables refer to Microsoft Access files, worksheets refer to Microsoft Excel files.

[c]Raw-data files: ckr_tabular_hydrostats_raw_***agency***.accdb (Microsoft Access), where ***agency*** refers to those listed in footnote a.

[d]Data-value qualification codes, USGS NWISWeb database (U.S. Geological Survey, 2002, 2011): Eqp—equipment malfunction, A—approved for publication-processing and review completed, P—provisional data subject to revision, 1—daily value is write-protected without any remark code to be printed, e—value has been estimated.

[e]Descriptive-statistics, spread-measures, and ratio-measures files: ckr_tabular_hydrostats01[c,w]_***agency***.accdb and ckr_tabular_hydrostats02.accdb (Microsoft Access), ***agency*** refers to those listed in footnote a.

[f]Geospatial data summaries files: ckr_nlcd.xlsx, ckr_sgo_hsg.xlsx, ckr_eco34.xlsx, ckr_pop_census.xlsx (Microsoft Excel).

[g]U.S. Department of Agriculture, 2009.

[h]Seaber and others, 1994; U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013.

[i]Vogelmann and others, 2001.

[j]Homer and others, 2007.

[k]Coastal NLCD class only.

[l]Percentages of hydrologic soil groups A through D in 4-digit and 8-digit hydrologic units do not necessarily add up to 100 percent because, in some cases, there are STATSGO soil map-unit classifications that include multiple hydrologic soil groups (U.S. Department of Agriculture, 2009). Data for multiple-group map units are not included in the analysis.

[m]Fry and others, 2009.

[n]U.S. Environmental Protection Agency, 2011.

Table C–4A. Summary descriptive statistics and percentiles for gage height by water year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
						Cumberland (0513)								
						Upper Cumberland (05130101)								
03401000coe	Cumberland River	1987–1992 (1)	3.05	3.05 (1990)	3.05 (1990)	0.62 (1990)	7.58 (1990)	— (2.03)	— (2.12)	— (2.43)	— (2.93)	— (3.49)	— (4.09)	— (4.61)
03404000coe	Cumberland River	1987–2011 (19)	5.63	4.06 (2008)	7.26 (1994)	2.12 (1999)	31.53 (1994)	— (2.44)	4.28 (2.62)	4.66 (3.19)	5.78 (4.56)	6.43 (6.63)	6.73 (9.38)	— (12.82)
						Obey (05130105)								
03414500coe	E Fork Obey River	1987–2011 (16)	2.40	1.85 (2008)	2.89 (1994)	0.84 (1990)	19.90 (2004)	— (1.03)	1.90 (1.11)	2.08 (1.33)	2.52 (2.08)	2.67 (2.92)	2.72 (3.90)	— (4.88)
						Upper Cumberland–Cordell Hull (05130106)								
03417500coe	Cumberland River	1982–2011 (8)	15.53	14.02 (2001)	17.12 (2004)	9.83 (2001)	35.94 (2010)	— (11.53)	— (11.93)	14.25 (13.53)	15.61 (15.74)	16.69 (16.93)	— (18.70)	— (19.73)
						Collins (05130107)								
03421000coe	Collins River	1982–2011 (20)	3.53	2.55 (2008)	4.42 (1997)	1.25 (1991)	36.44 (1991)	— (1.50)	2.72 (1.63)	3.22 (1.93)	3.52 (2.83)	3.86 (4.22)	4.19 (6.01)	— (7.69)
						Lower Cumberland–Old Hickory Lake (05130201)								
03425000coe	Cumberland River	1982–2011 (13)	11.7	8.64 (2008)	14.75 (1994)	2.10 (2008)	44.43 (2010)	— (7.26)	9.08 (7.80)	11.02 (8.53)	12.13 (10.32)	12.52 (13.62)	13.49 (17.33)	— (21.22)
						Lower Cumberland–Sycamore (05130202)								
03426310coe	Cumberland River	1954–2011 (52)	443.63	420.04 (1955)	445.19 (2009)	407.90 (1956)	450.80 (2010)	442.50 (442.87)	444.21 (443.80)	444.49 (444.36)	444.60 (444.62)	444.69 (444.85)	444.83 (445.05)	444.95 (445.25)
						Stones (05130203)								
03428200coe	W Fork Stones River	1982–2011 (16)	2.91	2.57 (1999)	3.19 (2003)	1.57 (1991)	18.18 (2002)	— (1.95)	2.61 (2.07)	2.80 (2.34)	2.94 (2.69)	3.04 (3.11)	3.11 (3.63)	— (4.38)
03428500coe	W Fork Stones River	1982–2006 (12)	3.60	3.11 (1992)	4.50 (1997)	0.51 (1995)	13.89 (2002)	— (1.89)	3.12 (2.09)	3.20 (2.55)	3.35 (3.67)	4.04 (4.34)	4.43 (4.98)	— (5.49)
						Lower Cumberland (05130205)								
03437000coe	Cumberland River	1982–2011 (16)	57.29	56.52 (2006)	58.14 (1997)	53.79 (2000)	68.00 (2008)	— (54.51)	56.54 (54.76)	56.93 (55.36)	57.28 (56.82)	57.54 (58.96)	58.04 (59.88)	— (61.50)
03438000coe	Little River	1982–2011 (7)	3.63	3.00 (2001)	4.21 (1991)	2.27 (2005)	18.28 (2005)	— (2.45)	— (2.52)	3.37 (2.73)	3.64 (3.20)	3.96 (4.05)	— (5.02)	— (5.97)
03438210tva	Lake Barkley	1965–2012 (46)	356.60	351.77 (1966)	358.06 (1973)	327.90 (1966)	372.47 (2011)	356.01 (354.08)	356.07 (354.30)	356.39 (354.84)	356.61 (356.05)	356.95 (358.43)	357.34 (359.39)	357.81 (360.00)
03438220tva	Cumberland River	1991–2012 (19)	313.05	307.19 (2000)	318.02 (1994)	300.00 (2008)	349.84 (2010)	— (302.52)	307.89 (303.08)	310.42 (305.06)	313.87 (310.45)	315.60 (318.65)	317.58 (326.85)	— (332.95)

Table C–4*A*. Summary descriptive statistics and percentiles for gage height by water year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Cumberland (0513)—Continued														
Red (05130206)														
03436100coe	Red River	1982– 2011 (12)	6.56	5.11 (2001)	7.89 (1991)	3.28 (2010)	48.65 (2010)	— (4.03)	5.45 (4.25)	6.16 (4.67)	6.64 (5.70)	7.09 (7.21)	7.24 (9.55)	— (11.91)
Lower Ohio (0514)														
Lower Ohio–Bay (05140203)														
03381700	Ohio River	2002– 2012 (1)	19.48	19.48 (2006)	19.48 (2006)	14.28 (2006)	37.98 (2006)	— (14.65)	— (15.03)	— (15.80)	— (18.13)	— (21.34)	— (26.16)	— (29.90)
03384500coe	Ohio River	1988– 2012 (7)	31.58	30.39 (2006)	33.53 (2011)	16.18 (2007)	56.87 (2011)	— (29.34)	— (29.48)	30.85 (29.70)	31.13 (30.10)	32.83 (31.28)	— (35.41)	— (40.99)
03384500coe (0000 reading)[e]	Ohio River	1938– 1979 (40)	20.99	16.01 (1941)	25.89 (1950)	7.80 (1942)	54.40 (1950)	17.17 (13.80)	18.47 (14.80)	19.50 (15.40)	20.78 (15.90)	22.47 (25.00)	24.61 (35.50)	25.24 (40.60)
03399800coe	Ohio River	2003– 2012 (4)	20.24	18.75 (2007)	22.09 (2011)	9.13 (2010)	54.84 (2011)	— (12.01)	— (12.26)	— (12.81)	20.07 (17.30)	— (25.45)	— (33.60)	— (39.05)
03399800coe (0700 reading)[e]	Ohio River	1981– 2010 (23)	20.36	15.61 (2000)	23.80 (1994)	9.20 (1999)	51.71 (1997)	15.96 (12.00)	16.17 (12.30)	18.41 (13.10)	21.42 (16.60)	22.48 (25.90)	23.23 (34.30)	23.39 (39.30)
03399800coe (headwater)	Ohio River	2003– 2012 (5)	13.08	12.37 (2006)	14.81 (2011)	11.89 (2011)	34.10 (2011)	— (12.11)	— (12.16)	12.63 (12.25)	12.79 (12.40)	12.79 (12.75)	— (13.25)	— (16.95)
03399800coe (headwater, 0700 reading)[e]	Ohio River	1981– 2012 (23)	13.08	12.40 (1992)	14.07 (1991)	11.00 (1982)	30.20 (1997)	12.46 (12.00)	12.51 (12.10)	12.67 (12.20)	12.92 (12.40)	13.45 (12.70)	13.85 (14.10)	14.05 (18.50)
Lower Ohio (05140206)														
03611500coe	Ohio River	2004– 2012 (6)	27.10	22.17 (2006)	30.78 (2010)	12.41 (2009)	61.76 (2011)	— (13.65)	— (14.31)	24.81 (17.80)	27.47 (25.33)	29.88 (33.92)	— (42.39)	— (47.59)
Lower Tennessee (0604)														
Lower Tennessee–Beech (06040001)														
03593500	Tennessee River	1987– 2010 (4)	9.67	8.06 (1988)	12.12 (2010)	4.36 (2009)	28.91 (2009)	— (5.05)	— (5.41)	— (6.86)	9.26 (8.71)	— (10.64)	— (15.13)	— (18.53)
Upper Duck (06040002)														
03598000	Duck River	1996– 2011 (10)	4.16	2.93 (2008)	5.11 (1997)	2.26 (2008)	29.06 (2002)	— (2.58)	— (2.68)	3.80 (3.04)	4.23 (3.32)	4.55 (4.50)	— (6.62)	— (8.12)
Lower Duck (06040003)														
03599500	Duck River	1996– 2011 (7)	5.34	3.75 (2000)	6.50 (1997)	1.58 (1999)	44.73 (2003)	— (1.69)	— (1.79)	4.53 (2.22)	5.33 (3.65)	6.39 (6.54)	— (10.17)	— (14.14)

Table C–4*A*. Summary descriptive statistics and percentiles for gage height by water year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Lower Tennessee (0604)—Continued														
Buffalo (06040004)														
03604000	Buffalo River	1998–2011 (8)	3.49	2.87 (2007)	4.24 (2003)	2.06 (2000)	23.03 (2003)	— (2.35)	— (2.45)	3.08 (2.71)	3.44 (3.16)	3.86 (3.81)	— (4.62)	— (5.60)
Kentucky Lake (06040005)														
03609000tva	Kentucky Lake	1944–2012 (67)	356.46	352.32 (1945)	358.13 (1973)	343.84 (1945)	372.44 (2011)	355.86 (354.01)	355.91 (354.22)	356.08 (354.71)	356.43 (355.90)	356.84 (358.24)	357.15 (359.26)	357.42 (359.70)
03609500tva	Tennessee River	1991–2012 (20)	308.80	303.85 (2000)	312.55 (1994)	298.27 (2008)	342.16 (2011)	— (300.98)	304.53 (301.45)	306.52 (302.19)	309.63 (304.55)	310.70 (313.55)	311.92 (322.49)	— (328.16)
Lower Tennessee (06040006)														
03611000coe	Ohio River	1988–2012 (12)	21.43	17.37 (2006)	25.04 (1994)	11.03 (2001)	55.00 (2011)	— (13.85)	17.83 (14.60)	19.73 (15.49)	21.81 (16.72)	23.13 (25.77)	24.04 (34.70)	— (40.93)
03611000coe (0700 reading)[e]	Ohio River	1965–2006 (36)	21.38	17.26 (2000)	27.10 (1973)	10.38 (1977)	51.70 (1997)	17.59 (13.99)	18.08 (14.78)	19.31 (15.47)	20.77 (16.40)	23.36 (25.98)	25.06 (35.00)	25.91 (39.51)
Upper Mississippi–Kaskaskia–Meramec (0714)														
Upper Mississippi-Cape Girardeau (07140105)														
07020850 (0800 reading)[e]	Mississippi River	1985–2012 (4)	20.91	13.60 (1988)	26.72 (2011)	4.41 (1988)	46.09 (2011)	— (6.36)	— (9.91)	— (14.38)	21.65 (20.14)	— (27.27)	— (33.45)	— (36.94)
07020850coe	Mississippi River	2002–2011 (5)	20.43	12.28 (2006)	28.86 (2010)	1.80 (2006)	42.26 (2008)	— (7.80)	— (8.61)	17.63 (12.29)	18.17 (19.39)	25.20 (27.49)	— (34.84)	— (36.88)
07020850coe (0800 reading)[e]	Mississippi River	1896–2012 (111)	17.38	8.51 (1934)	30.68 (1993)	0.60 (1909)	47.90 (1993)	10.83 (6.70)	11.92 (8.07)	13.83 (11.05)	17.01 (16.09)	20.80 (22.30)	22.98 (29.10)	25.20 (33.10)
07022000 (0800 reading)[e]	Mississippi River	1983–2012 (9)	21.62	16.91 (2005)	25.18 (2011)	5.11 (2005)	45.14 (2011)	— (10.06)	— (11.75)	21.33 (14.65)	22.17 (20.46)	23.47 (27.70)	— (34.25)	— (36.46)
07022000coe	Mississippi River	2002–2011 (3)	19.40	16.91 (2005)	24.11 (2008)	5.07 (2005)	40.90 (2008)	— (7.03)	— (8.39)	— (12.13)	17.18 (18.25)	— (25.11)	— (33.48)	— (35.88)
07022000coe (0800 reading)[e]	Mississippi River	1941–2012 (59)	17.78	10.17 (1964)	29.76 (1993)	1.75 (1964)	45.31 (1993)	10.97 (6.64)	11.60 (8.12)	14.99 (11.17)	17.18 (16.30)	20.71 (23.11)	22.83 (30.27)	24.34 (34.02)

[a]Station numbers with “coe” or “tva” appended to the number are for stations operated in cooperation with either the U.S. Army Corps of Engineers (coe) or the Tennessee Valley Authority (tva), and the data for these table rows are obtained from digital files of these agencies.

[b]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[c]Statistics listed for mean-annual and mean-daily gage height are based on complete water years. Year of minimum and maximum values for mean-annual and mean-daily gage-height numbers shown in parentheses.

[d]Percentiles listed for mean-annual and mean-daily gage height are based on complete water years.

[e]Statistics based on unit values at indicated hour. All other statistics based on mean-daily values.

Table C–4*B*. Summary descriptive statistics and percentiles for gage height by calendar year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31 Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Cumberland (0513)														
Upper Cumberland (05130101)														
03404000coe	Cumberland River	1987–2011 (20)	5.70	4.27 (2007)	7.43 (1989)	2.12 (1999)	31.53 (1994)	— (2.45)	4.38 (2.64)	4.80 (3.24)	5.47 (4.68)	6.72 (6.72)	6.97 (9.51)	— (12.98)
Obey (05130105)														
03414500coe	E Fork Obey River	1987–2011 (16)	2.35	1.82 (2007)	2.90 (2004)	0.80 (1987)	19.90 (2004)	— (1.01)	1.92 (1.08)	2.00 (1.31)	2.31 (2.01)	2.69 (2.87)	2.86 (3.84)	— (4.77)
Upper Cumberland–Cordell Hull (05130106)														
03417500coe	Cumberland River	1982–2011 (9)	15.62	14.11 (2001)	17.45 (2004)	9.61 (1987)	35.94 (2010)	— (11.57)	— (12.02)	14.61 (13.90)	15.01 (15.76)	16.90 (16.96)	— (18.76)	— (19.79)
Collins (05130107)														
03421000coe	Collins River	1982–2011 (21)	3.62	2.34 (2007)	4.63 (1989)	1.25 (1991)	36.44 (1990)	2.34 (1.50)	2.81 (1.63)	3.33 (1.94)	3.75 (2.85)	3.90 (4.25)	4.38 (6.13)	4.63 (7.79)
Lower Cumberland–Old Hickory Lake (05130201)														
03425000coe	Cumberland River	1982–2011 (12)	11.55	9.25 (2001)	14.64 (1994)	5.18 (2008)	44.43 (2010)	— (7.49)	9.48 (7.87)	9.81 (8.56)	11.50 (10.15)	13.04 (13.09)	13.29 (17.10)	— (20.55)
Lower Cumberland–Sycamore (05130202)														
03426310coe	Cumberland River	1954–2011 (51)	443.76	420.99 (1955)	445.10 (2009)	407.90 (1956)	450.80 (2010)	443.94 (442.98)	444.31 (443.84)	444.51 (444.37)	444.60 (444.63)	444.71 (444.85)	444.82 (445.05)	445.01 (445.25)
Stones (05130203)														
03428200coe	W Fork Stones River	1982–2011 (17)	2.90	2.57 (1999)	3.18 (2009)	1.57 (1991)	18.18 (2002)	— (1.92)	2.63 (2.04)	2.83 (2.33)	2.91 (2.69)	2.98 (3.11)	3.13 (3.63)	— (4.37)
03428500coe	W Fork Stones River	1982–2005 (12)	3.68	3.23 (1992)	4.41 (1997)	0.51 (1995)	13.89 (2002)	— (1.94)	3.26 (2.15)	3.31 (2.67)	3.49 (3.73)	4.18 (4.39)	4.38 (5.04)	— (5.53)
Lower Cumberland (05130205)														
03437000coe	Cumberland River	1982–2011 (16)	57.29	56.56 (2006)	58.04 (1991)	53.79 (1999)	68.00 (2008)	— (54.50)	56.57 (54.73)	56.91 (55.33)	57.42 (56.83)	57.61 (58.97)	57.83 (59.89)	— (61.50)
03438000coe	Little River	1982–2011 (8)	3.78	3.35 (2000)	4.44 (2009)	2.27 (2004)	16.25 (2002)	— (2.49)	— (2.57)	3.43 (2.82)	3.64 (3.46)	4.14 (4.26)	— (5.20)	— (6.12)
03438210tva	Lake Barkley	1965–2012 (47)	356.22	335.08 (1965)	357.95 (2011)	327.60 (1965)	372.47 (2011)	355.92 (354.00)	356.04 (354.25)	356.39 (354.80)	356.69 (356.00)	356.94 (358.40)	357.42 (359.37)	357.63 (360.00)
03438220tva	Cumberland River	1991–2012 (20)	313.15	307.98 (2007)	317.30 (1994)	300.00 (2008)	349.84 (2010)	— (302.62)	309.40 (303.20)	311.13 (305.20)	313.29 (310.65)	315.47 (318.88)	316.72 (326.94)	— (333.00)

Table C–4*B*. Summary descriptive statistics and percentiles for gage height by calendar year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31 Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Cumberland (0513)—Continued														
Red (05130206)														
03436100coe	Red River	1982–2011 (13)	6.64	5.75 (2001)	7.72 (1991)	3.21 (2010)	48.65 (2010)	— (3.97)	5.85 (4.22)	6.04 (4.72)	6.51 (5.74)	7.23 (7.27)	7.41 (9.75)	— (12.15)
Lower Ohio (0514)														
Lower Ohio–Bay (05140203)														
03381700	Ohio River	2002–2012 (1)	22.31	21.31 (2006)	23.30 (2008)	14.19 (2008)	48.33 (2008)	— (15.15)	— (15.61)	— (16.89)	— (20.16)	— (24.33)	— (29.19)	— (31.83)
03384500coe	Ohio River	1987–2012 (8)	31.86	30.78 (2006)	34.27 (2011)	16.18 (2007)	56.87 (2011)	— (29.34)	— (29.46)	30.94 (29.70)	31.31 (30.18)	32.67 (32.12)	— (36.67)	— (41.78)
03384500coe (0000 reading)[e]	Ohio River	1938–1978 (41)	21.03	16.11 (1941)	27.12 (1950)	7.80 (1942)	54.40 (1950)	18.45 (13.80)	18.86 (14.80)	19.44 (15.40)	20.67 (15.90)	22.33 (25.10)	24.33 (35.60)	24.40 (40.50)
03399800coe	Ohio River	2003–2012 (5)	20.68	17.79 (2006)	24.34 (2011)	9.13 (2010)	54.84 (2011)	— (12.05)	— (12.39)	19.14 (13.09)	20.78 (17.49)	21.35 (25.64)	— (34.91)	— (40.38)
03399800coe (0700 reading)[e]	Ohio River	1981–2009 (24)	20.35	15.97 (2000)	24.20 (1996)	9.20 (1998)	51.71 (1997)	16.35 (12.00)	16.37 (12.30)	17.75 (13.10)	21.13 (16.61)	22.33 (25.80)	23.62 (34.20)	23.94 (39.20)
03399800coe	Ohio River	2003–2012 (5)	13.33	12.36 (2006)	15.05 (2011)	11.61 (2011)	34.10 (2011)	— (12.10)	— (12.16)	12.65 (12.25)	12.87 (12.40)	13.75 (12.83)	— (14.48)	— (19.73)
03399800coe (0700 reading)[e]	Ohio River	1981–2012 (24)	13.05	12.13 (1981)	14.05 (1994)	8.00 (1981)	30.20 (1997)	12.33 (12.00)	12.51 (12.00)	12.58 (12.20)	12.96 (12.40)	13.51 (12.70)	13.83 (13.90)	13.84 (18.40)
Lower Ohio (05140206)														
03611500coe	Ohio River	2004–2012 (6)	27.58	23.15 (2007)	32.38 (2011)	12.41 (2008)	61.76 (2011)	— (13.68)	— (14.42)	24.49 (18.14)	27.98 (26.17)	29.49 (34.73)	— (43.01)	— (47.59)
Lower Tennessee (0604)														
Lower Tennessee–Beech (06040001)														
03593500	Tennessee River	1986–2010 (5)	10.49	8.86 (2008)	12.28 (2003)	4.36 (2008)	39.65 (2003)	— (5.05)	— (5.76)	9.51 (7.82)	9.87 (9.52)	11.93 (11.85)	— (15.46)	— (19.70)
Upper Duck (06040002)														
03598000	Duck River	1995–2011 (9)	4.23	3.14 (2008)	4.80 (2002)	2.26 (2008)	29.06 (2002)	— (2.61)	— (2.72)	3.93 (3.09)	4.23 (3.39)	4.77 (4.68)	— (6.69)	— (8.08)
Lower Duck (06040003)														
03599500	Duck River	1995–2011 (7)	5.21	4.11 (2000)	5.84 (1997)	1.58 (1999)	44.73 (2003)	— (1.69)	— (1.79)	4.54 (2.19)	5.58 (3.51)	5.82 (6.45)	— (9.89)	— (13.25)

Table C–4*B*. Summary descriptive statistics and percentiles for gage height by calendar year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31 Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual gage height,[c] in feet			Mean-daily gage height,[c] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Lower Tennessee (0604)—Continued														
Buffalo (06040004)														
03604000	Buffalo River	1997–2011 (7)	3.47	2.93 (2007)	4.09 (2003)	2.14 (2007)	23.03 (2003)	— (2.40)	— (2.47)	3.23 (2.72)	3.43 (3.15)	3.71 (3.79)	— (4.58)	— (5.49)
Kentucky Lake (06040005)														
03609000tva	Kentucky Lake	1944–2012 (67)	356.50	354.75 (1945)	357.87 (2011)	345.28 (1945)	372.44 (2011)	355.87 (354.03)	355.92 (354.23)	356.10 (354.73)	356.46 (355.91)	356.86 (358.24)	357.09 (359.26)	357.48 (359.70)
03609500tva	Tennessee River	1991–2012 (21)	308.97	304.11 (2000)	313.00 (2011)	298.27 (2007)	342.16 (2011)	305.31 (300.99)	305.88 (301.47)	306.43 (302.21)	309.78 (304.60)	311.12 (313.85)	312.23 (322.81)	312.36 (328.56)
Lower Tennessee (06040006)														
03611000coe	Ohio River	1987–2012 (13)	22.04	18.41 (2006)	25.87 (2011)	10.03 (1996)	55.00 (2011)	— (13.75)	18.80 (14.50)	19.67 (15.50)	22.85 (17.61)	23.47 (27.23)	24.32 (36.45)	— (41.14)
03611000coe (0700 reading)[e]	Ohio River	1964–2005 (36)	21.38	17.41 (2000)	26.41 (1979)	10.38 (1977)	51.70 (1997)	17.74 (13.99)	18.28 (14.78)	19.29 (15.46)	20.86 (16.40)	23.49 (25.99)	24.81 (35.00)	25.72 (39.51)
Upper Mississippi–Kaskaskia–Meramec (0714)														
Upper Mississippi–Cape Girardeau (07140105)														
07020850 (0800 reading)[e]	Mississippi River	1984–2011 (1)	18.57	11.97 (1988)	25.18 (1986)	2.93 (1988)	42.06 (1986)	— (16.34)	— (17.57)	— (20.40)	— (25.51)	— (28.29)	— (33.32)	— (35.56)
07020850coe	Mississippi River	2002–2010 (4)	19.49	12.36 (2006)	25.49 (2008)	1.80 (2006)	42.26 (2008)	— (7.58)	— (8.29)	— (11.10)	19.43 (16.86)	— (23.52)	— (30.07)	— (32.12)
07020850coe (0800 reading)[e]	Mississippi River	1896–2011 (111)	17.53	9.45 (1934)	32.50 (1993)	0.60 (1909)	47.90 (1993)	11.49 (6.70)	12.51 (8.06)	14.17 (11.00)	17.28 (16.00)	20.01 (22.10)	24.30 (28.80)	24.62 (32.89)
07022000 (0800 reading)[e]	Mississippi River	1982–2012 (7)	21.84	19.42 (1994)	23.73 (1998)	7.95 (1996)	44.10 (1983)	— (11.70)	— (12.69)	20.69 (15.01)	22.02 (21.26)	23.16 (29.34)	— (35.06)	— (37.13)
07022000coe	Mississippi River	2002–2010 (3)	19.15	14.97 (2005)	24.13 (2008)	3.83 (2005)	40.90 (2008)	— (6.81)	— (8.34)	— (11.98)	18.34 (17.58)	— (25.05)	— (33.48)	— (35.88)
07022000coe (0800 reading)[e]	Mississippi River	1941–2012 (59)	17.74	9.76 (1956)	31.39 (1993)	1.75 (1964)	45.31 (1993)	10.59 (6.64)	12.21 (8.12)	14.82 (11.17)	17.82 (16.27)	19.96 (23.01)	23.70 (30.15)	24.13 (33.89)

[a]Station numbers with "coe" or "tva" appended to the number are for stations operated in cooperation with either the U.S. Army Corps of Engineers (coe) or the Tennessee Valley Authority (tva), and the data for these table rows are obtained from digital files of these agencies.

[b]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[c]Statistics listed for mean-annual and mean-daily gage height are based on complete calendar years. Year of minimum and maximum values for mean-annual and mean-daily gage-height numbers shown in parentheses.

[d]Percentiles listed for mean-annual and mean-daily gage height are based on complete calendar years.

[e]Statistics based on unit values at indicated hour. All other statistics based on mean-daily values.

Table C–5*A*. Summary descriptive statistics and percentiles for discharge by water year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. ft^3/s, cubic feet per second]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Cumberland (0513)														
Upper Cumberland (05130101)														
03401000	Cumberland River	1940–2011 (67)	683 (1.83)	293 (1941)	1,130 (1994)	5.00 (1954)	33,900 (1977)	358 (39.0)	396 (57.0)	559 (119)	705 (338)	836 (793)	915 (1,510)	933 (2,290)
3403000	Cumberland River	1938–1992 (49)	1,390 (1.73)	654 (1941)	2,530 (1974)	6.20 (1954)	52,500 (1946)	755 (54.0)	784 (84.0)	1,090 (195)	1,420 (598)	1,580 (1,580)	1,890 (3,080)	2,000 (4,970)
3403500	Cumberland River	1923–2005 (63)	1,750 (1.83)	824 (1988)	3,010 (1974)	0.50 (1931)	47,200 (1977)	905 (68.0)	1,010 (103)	1,410 (242)	1,800 (787)	2,080 (1,910)	2,390 (4,060)	2,500 (6,990)
03404000	Cumberland River	1951–2011 (61)	2,670 (1.66)	1,150 (1988)	4,390 (1994)	6.10 (1954)	47,600 (1957)	1,330 (113)	1,490 (166)	2,060 (397)	2,780 (1,210)	3,190 (3,000)	3,600 (6,310)	3,830 (11,200)
03404000coe	Cumberland River	1989–2011 (18)	2,600 (1.62)	1,160 (2008)	4,420 (1994)	80.0 (1999)	39,600 (1994)	— (158)	1,320 (212)	1,710 (442)	2,840 (1,190)	3,170 (2,940)	3,680 (5,840)	— (9,790)
03404500	Cumberland River	1907–2011 (86)	3,230 (1.64)	1,320 (1988)	5,190 (1927)	4.00 (1954)	57,500 (1918)	1,650 (94.0)	1,900 (165)	2,690 (440)	3,240 (1,460)	3,930 (3,580)	4,410 (8,050)	4,680 (13,600)
Upper Cumberland–Lake Cumberland (05130103)														
3414000	Cumberland River	1940–1992 (53)	9,010 (1.56)	4,090 (1969)	13,900 (1952)	0 (1951)	156,000 (1946)	4,350 (251)	5,140 (775)	6,980 (2,480)	9,250 (6,190)	10,700 (12,400)	12,700 (21,500)	13,600 (27,400)
Obey (05130105)														
3414500	E Fork Obey River	1943–2008 (57)	411 (2.10)	190 (2008)	743 (1973)	3.60 (1948)	23,200 (1970)	221 (10.0)	238 (15.0)	297 (34.0)	420 (154)	470 (430)	596 (922)	624 (1,540)
03414500coe	E Fork Obey River	1987–2011 (15)	399 (2.04)	194 (2008)	674 (1994)	11.8 (1993)	19,800 (2004)	— (21.0)	225 (25.0)	236 (42.1)	430 (150)	480 (431)	553 (857)	— (1,320)
03415000	W Fork Obey River	1943–2010 (37)	155 (1.91)	81.7 (1966)	264 (1950)	2.30 (2009)	7,440 (1970)	82.4 (4.70)	84.1 (6.10)	117 (12.0)	163 (46.0)	187 (158)	205 (350)	215 (588)
3417000	Obey River	1939–1991 (24)	1,420 (1.52)	735 (1988)	2,170 (1950)	0 (1945)	35,600 (1939)	743 (0)	774 (0)	987 (78.0)	1,580 (840)	1,850 (2,250)	2,070 (3,650)	2,090 (5,070)
Upper Cumberland–Cordell Hull (05130106)														
3417500	Cumberland River	1923–1991 (67)	11,500 (1.59)	5,380 (1988)	18,300 (1973)	69.0 (1925)	142,000 (1927)	5,930 (540)	6,480 (1,170)	8,860 (3,240)	11,800 (7,700)	13,700 (15,200)	15,900 (26,900)	17,400 (35,000)
03417500coe	Cumberland River	1987–2011 (7)	9,560 (1.31)	4,030 (2001)	14,900 (2004)	0 (2000)	62,100 (2010)	— (487)	— (955)	4,680 (2,800)	11,200 (8,520)	14,400 (14,700)	— (19,800)	— (22,300)
3418420	Cumberland River	1981–1997 (17)	12,500 (1.55)	6,150 (1988)	19,500 (1994)	0 (1981)	85,200 (1984)	— (3,120)	6,970 (4,000)	10,500 (5,740)	13,400 (9,550)	14,400 (16,800)	16,800 (25,200)	— (32,200)

Table C–5*A*. Summary descriptive statistics and percentiles for discharge by water year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. ft^3/s, cubic feet per second]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Cumberland (0513)—Continued														
Collins (05130107)														
03421000	Collins River	1925–2010 (86)	1,170 (1.83)	409 (1931)	2,190 (1973)	37.0 (1962)	64,100 (1991)	511 (92.0)	680 (112)	950 (190)	1,170 (529)	1,360 (1,280)	1,630 (2,570)	1,790 (4,050)
03421000coe	Collins River	1991–2011 (17)	1,160 (1.82)	502 (2007)	1,950 (1994)	80.4 (2009)	41,600 (2002)	— (124)	528 (147)	977 (216)	1,150 (510)	1,390 (1,190)	1,670 (2,400)	— (3,870)
Caney (05130108)														
3422500	Caney Fork	1912–1999 (75)	3,120 (1.86)	1,110 (1981)	5,450 (1973)	25.0 (1951)	154,000 (1929)	1,490 (57.0)	2,080 (97.0)	2,570 (484)	3,120 (1,770)	3,490 (3,410)	4,210 (6,470)	4,870 (10,500)
3424500	Caney Fork	1923–1958 (36)	3,800 (1.74)	1,550 (1931)	5,760 (1929)	12.0 (1951)	154,000 (1929)	1,740 (74.0)	2,470 (265)	3,180 (624)	3,920 (2,030)	4,580 (4,360)	4,980 (9,180)	5,170 (12,700)
Lower Cumberland–Old Hickory Lake (05130201)														
3425000	Cumberland River	1923–1991 (69)	17,400 (1.63)	7,980 (1931)	27,700 (1973)	366 (1941)	204,000 (1927)	9,150 (1,300)	10,000 (2,280)	13,800 (5,380)	18,400 (11,400)	20,300 (22,600)	24,100 (39,800)	25,700 (53,600)
03425000coe	Cumberland River	1992–2011 (7)	17,000 (1.59)	8,800 (2006)	20,000 (2004)	0 (2004)	131,000 (2010)	— (4,180)	— (5,140)	15,100 (7,320)	18,700 (13,000)	19,800 (22,600)	— (34,700)	— (43,200)
Lower Cumberland–Sycamore (05130202)														
3426310	Cumberland River	1932–2007 (71)	18,500 (1.59)	8,660 (1941)	28,500 (1974)	86.0 (1936)	172,000 (1937)	10,100 (2,220)	10,700 (3,640)	14,600 (6,780)	19,400 (12,600)	22,300 (24,300)	25,500 (41,000)	28,300 (54,200)
03426310coe	Cumberland River	1954–2011 (43)	18,700 (1.61)	8,780 (1988)	27,400 (1973)	0 (1958)	146,000 (1975)	10,100 (3,250)	10,700 (4,600)	16,300 (7,810)	19,700 (13,900)	21,600 (24,700)	25,800 (39,500)	26,600 (49,600)
3426500	Cumberland River	1932–1982 (46)	19,100 (1.63)	8,660 (1941)	28,500 (1974)	86.0 (1936)	172,000 (1937)	10,500 (1,650)	11,200 (2,690)	14,900 (5,950)	20,000 (12,500)	22,300 (25,200)	27,100 (43,000)	28,300 (57,700)
03431500	Cumberland River	1893–2011 (62)	20,000 (0.16)	9,080 (1931)	34,900 (1920)	60.0 (1936)	203,000 (1927)	12,300 (1,120)	12,800 (1,630)	16,100 (3,400)	19,500 (10,100)	24,300 (25,200)	27,600 (53,000)	29,600 (78,300)
Stones (05130203)														
03428200	W Fork Stones River	1972–2010 (33)	298 (1.68)	76.0 (1981)	517 (1973)	4.70 (1981)	21,200 (1975)	134 (13.0)	164 (18.0)	235 (37.0)	289 (107)	369 (290)	459 (599)	491 (1,030)
03428200coe	W Fork Stones River	1989–2011 (15)	270 (1.52)	134 (2007)	372 (1991)	6.00 (1999)	13,300 (2010)	— (16.1)	164 (21.2)	214 (39.8)	274 (90.6)	329 (249)	372 (561)	— (944)
3428500	W Fork Stones River	1966–2005 (27)	435 (2.24)	127 (1981)	831 (1973)	0 (1983)	43,900 (1975)	155 (18.0)	212 (24.0)	330 (45.0)	407 (152)	570 (425)	691 (987)	753 (1,580)

Table C–5*A*. Summary descriptive statistics and percentiles for discharge by water year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. ft^3/s, cubic feet per second]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Cumberland (0513)—Continued														
Stones (05130203)—Continued														
03428500coe	W Fork Stones River	1989–2006 (11)	351 (1.81)	187 (2000)	592 (1997)	2.00 (1999)	19,600 (1999)	— (8.00)	234 (10.1)	235 (16.5)	335 (113)	471 (344)	503 (732)	— (1,230)
3430100	Stones River	1939–1996 (29)	1,360 (1.53)	521 (1941)	1,990 (1962)	0 (1996)	60,200 (1948)	670 (23.0)	912 (36.0)	1,190 (100)	1,390 (386)	1,620 (1,370)	1,740 (3,290)	1,930 (5,630)
Lower Cumberland (05130205)														
3435000	Cumberland River	1955–1991 (37)	23,400 (1.66)	10,800 (1988)	37,000 (1973)	700 (1970)	202,000 (1975)	11,100 (3,850)	12,900 (5,090)	18,600 (8,560)	23,800 (15,800)	26,600 (31,000)	33,700 (51,500)	35,700 (65,800)
3437000	Cumberland River	1938–1965 (28)	24,500 (1.49)	10,500 (1941)	39,600 (1950)	414 (1948)	199,000 (1962)	15,000 (1,630)	15,300 (2,770)	20,500 (6,260)	25,700 (14,300)	27,900 (32,600)	34,600 (59,900)	35,200 (83,900)
03438000	Little River	1940–2012 (71)	362 (1.48)	58.9 (1941)	757 (1997)	3.60 (1942)	24,300 (1997)	141 (22.0)	204 (29.0)	244 (51.0)	327 (150)	454 (406)	551 (832)	640 (1,290)
03438000coe	Little River	1988–2011 (7)	335 (1.37)	127 (2001)	534 (1991)	0 (2005)	10,000 (2005)	— (10.2)	— (15.2)	213 (42.3)	329 (131)	447 (381)	— (756)	— (1,210)
3438220	Cumberland River	1940–1997 (56)	32,800 (1.87)	10,900 (1941)	56,700 (1973)	0 (1964)	202,000 (1975)	15,600 (3,500)	18,400 (5,530)	24,200 (10,900)	31,800 (24,300)	40,500 (50,500)	48,000 (67,600)	52,700 (87,600)
03438220tva	Cumberland River	1960–2012 (50)	32,200 (1.83)	14,000 (1966)	51,500 (1973)	0 (1964)	265,000 (2010)	17,900 (6,170)	18,800 (7,740)	26,300 (13,000)	31,800 (26,000)	39,100 (47,900)	45,100 (59,800)	47,600 (79,200)
Red (05130206)														
03436100	Red River	1961–2010 (43)	1,320 (1.42)	514 (2000)	2,590 (1979)	49.0 (2008)	60,600 (2010)	632 (96.0)	745 (125)	904 (229)	1,290 (632)	1,750 (1,520)	1,970 (2,970)	2,060 (4,390)
03436100coe	Red River	1989–2011 (10)	1,210 (1.29)	516 (2001)	1,760 (2010)	8.21 (1999)	61,800 (2010)	— (50.9)	— (87.3)	1,000 (271)	1,230 (745)	1,510 (1,460)	— (2,580)	— (3,660)
Lower Ohio (0514)														
Lower Ohio–Bay (05140203)														
03381700	Ohio River	2002–2012 (8)	195,000 (1.39)	150,000 (2006)	241,000 (2004)	6,280 (2010)	955,000 (2005)	— (23,800)	— (34,000)	177,000 (79,000)	193,000 (171,000)	215,000 (286,000)	— (387,000)	— (454,000)
3384500	Ohio River	1941–1980 (12)	180,000 (1.26)	77,100 (1941)	274,000 (1950)	10,000 (1941)	1,010,000 (1945)	— (20,000)	119,000 (26,000)	144,000 (48,000)	188,000 (107,000)	210,000 (265,000)	240,000 (447,000)	— (559,000)
03399800	Ohio River	1994–2011 (18)	195,000 (1.36)	120,000 (2000)	251,000 (2011)	3,090 (1999)	1,170,000 (2011)	— (23,000)	129,000 (30,900)	157,000 (61,000)	200,000 (145,000)	233,000 (282,000)	246,000 (443,000)	— (546,000)

Table C–5*A*. Summary descriptive statistics and percentiles for discharge by water year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. ft^3/s, cubic feet per second]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Lower Ohio (0514)—Continued														
Lower Ohio (05140206)														
03611500	Ohio River	1928–2010 (82)	278,000 (1.37)	120,000 (1931)	436,000 (1979)	15,000 (1930)	1,850,000 (1937)	159,000 (53,400)	185,000 (68,200)	227,000 (104,000)	275,000 (195,000)	334,000 (388,000)	371,000 (634,000)	384,000 (769,000)
Lower Tennessee (0604)														
Lower Tennessee–Beech (06040001)														
3593500	Tennessee River	1931–2006 (75)	54,700 (1.65)	23,000 (1988)	86,500 (1973)	60.0 (1966)	495,000 (1973)	29,800 (14,600)	32,200 (19,400)	46,900 (28,200)	54,700 (40,600)	64,000 (63,200)	74,700 (107,000)	75,800 (151,000)
Upper Duck (06040002)														
03598000	Duck River	1934–2011 (76)	815 (1.69)	257 (1981)	1,720 (1973)	20.0 (1945)	45,900 (1948)	313 (87.0)	463 (111)	631 (177)	811 (296)	1,010 (796)	1,140 (1,860)	1,200 (2,960)
Lower Duck (06040003)														
03599500	Duck River	1905–2011 (94)	2,000 (1.66)	553 (1981)	4,360 (1973)	2.60 (1927)	61,100 (1973)	762 (97.0)	1,160 (142)	1,570 (244)	1,990 (687)	2,410 (2,010)	2,930 (4,780)	3,100 (8,230)
03603000	Duck River	1925–2010 (74)	4,090 (1.60)	1,440 (1941)	8,710 (1973)	236 (1932)	111,000 (1948)	1,760 (475)	2,440 (570)	3,220 (850)	3,970 (1,800)	4,900 (4,400)	6,070 (9,370)	6,410 (15,800)
Buffalo (06040004)														
03604000	Buffalo River	1920–2010 (90)	766 (1.71)	323 (1942)	1,580 (1973)	65.0 (1925)	75,800 (1991)	378 (155)	419 (180)	576 (242)	735 (402)	923 (760)	1,140 (1,420)	1,200 (2,240)
3604400	Buffalo River	1928–2009 (68)	1,200 (1.72)	523 (1941)	2,410 (1973)	142 (1932)	82,100 (1948)	614 (248)	722 (286)	892 (382)	1,130 (642)	1,450 (1,270)	1,820 (2,370)	1,870 (3,700)
Kentucky Lake (06040005)														
3438190	Barkley-Kentucky Canal	1966–1997 (30)	–7,420 (—)	–13,100 (1990)	–849 (1988)	–48,000 (1974)	58,200 (1984)	–11,200 (–26,600)	–10,800 (–22,800)	–8,920 (–15,600)	–7,930 (–7,190)	–5,590 (–108)	–4,230 (6,080)	–3,100 (11,500)
03438190tva	Barkley-Kentucky Canal	1975–2012 (26)	–4,750 (—)	–10,900 (2003)	3,160 (1979)	–53,000 (2003)	53,200 (1979)	–10,700 (–25,000)	–9,270 (–20,000)	–8,050 (–11,500)	–5,170 (–3,000)	–3,360 (0)	1,550 (7,000)	3,130 (13,100)
03607500	Tennessee River	1930–1942 (12)	56,900 (1.43)	32,900 (1941)	86,700 (1933)	8,850 (1932)	327,000 (1936)	— (14,700)	36,400 (17,800)	38,300 (23,000)	62,800 (33,500)	68,900 (67,200)	73,600 (130,000)	— (195,000)
03609500tva	Tennessee River	1944–2012 (67)	62,400 (1.55)	29,600 (1988)	98,700 (1973)	0 (1958)	439,000 (1948)	31,500 (18,200)	35,100 (23,000)	52,500 (31,000)	62,000 (42,400)	76,500 (65,800)	86,200 (134,000)	89,900 (185,000)
3609500	Tennessee River	1890–1985 (95)	64,500 (1.61)	31,900 (1904)	101,000 (1973)	60.0 (1961)	493,000 (1948)	33,900 (14,100)	44,600 (18,300)	55,900 (28,500)	65,500 (43,000)	74,200 (77,500)	83,900 (145,000)	90,300 (196,000)

Table C–5*A*. Summary descriptive statistics and percentiles for discharge by water year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. ft^3/s, cubic feet per second]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Lower Tennessee (0604)—Continued														
Lower Tennessee (06040006)														
3610000	Clarks River	1952–1971 (20)	88.6 (0.99)	28.1 (1963)	165 (1952)	0 (1952)	10,400 (1958)	— (0)	38.8 (0)	61.8 (1.00)	85.0 (6.80)	114 (32.0)	145 (131)	— (328)
03610200	Clarks River	1983–2011 (29)	178 (1.33)	69.8 (1987)	405 (2002)	1.40 (2009)	14,000 (1997)	89.6 (4.70)	105 (6.40)	127 (14.0)	148 (34.0)	227 (87.0)	263 (290)	367 (692)
3610500	Clarks River	1939–1973 (35)	278 (1.22)	27.4 (1941)	665 (1950)	1.90 (1945)	23,800 (1958)	106 (3.90)	117 (5.30)	200 (12.0)	262 (42.0)	339 (156)	455 (601)	559 (1,390)
3610545	W Fork Clarks River	1969–1994 (20)	91.5 (1.33)	25.6 (1977)	190 (1979)	1.10 (1982)	5,980 (1975)	— (4.30)	48.8 (5.80)	65.0 (10.0)	82.2 (24.0)	112 (60.0)	152 (180)	— (352)
Upper Mississippi–Kaskaskia–Meramec (0714)														
Upper Mississippi–Cape Girardeau (07140105)														
07022000	Mississippi River	1933–2012 (75)	210,000 (0.29)	71,700 (1934)	446,000 (1993)	24,700 (1940)	978,000 (1993)	107,000 (66,100)	121,000 (77,600)	160,000 (108,000)	203,000 (168,000)	254,000 (269,000)	290,000 (413,000)	336,000 (499,000)

[a]Station numbers with “coe” or “tva” appended to the number are for stations operated in cooperation with either the U.S. Army Corps of Engineers (coe) or the Tennessee Valley Authority (tva), and the data for these table rows are obtained from digital files of these agencies.

[b]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[c]Statistics listed for mean-annual and mean-daily discharge are based on complete water years. Year of minimum and maximum values for mean-annual and mean-daily discharge numbers shown in parentheses.

[d]Yield units are cubic feet per second per square mile. Yields are based on contributing drainage areas where given.

[e]Mean daily discharge of zero first occurred during the water year indicated but may subsequently have occurred in one or more years.

[f]Percentiles listed for mean-annual and mean-daily discharge are based on complete water years.

Table C–5*B*. Summary descriptive statistics and percentiles for discharge by calendar year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1, USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile; ft^3/s, cubic feet per second]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Cumberland (0513)														
Upper Cumberland (05130101)														
03401000	Cumberland River	1940–2011 (63)	686 (1.83)	303 (1941)	1,100 (1996)	5.00 (1953)	33,900 (1977)	421 (38.0)	442 (57.0)	542 (119)	660 (337)	801 (795)	911 (1,520)	965 (2,300)
3403000	Cumberland River	1938–1992 (48)	1,390 (1.72)	675 (1941)	2,250 (1972)	6.20 (1953)	52,500 (1946)	892 (54.0)	938 (84.0)	1,110 (192)	1,340 (594)	1,590 (1,570)	2,020 (3,070)	2,190 (4,970)
3403500	Cumberland River	1922–2005 (61)	1,770 (1.85)	720 (1930)	2,830 (1972)	0.50 (1930)	47,200 (1977)	1,040 (71.0)	1,100 (105)	1,390 (245)	1,740 (795)	2,130 (1,920)	2,450 (4,090)	2,690 (7,060)
03404000	Cumberland River	1950–2011 (60)	2,650 (1.65)	1,350 (2000)	4,230 (1972)	6.10 (1953)	47,600 (1957)	1,470 (113)	1,650 (165)	1,980 (391)	2,520 (1,200)	3,380 (2,990)	3,720 (6,260)	3,970 (11,000)
03404000coe	Cumberland River	1989–2011 (18)	2,570 (1.60)	1,340 (2000)	3,960 (1994)	80.0 (1999)	39,600 (1994)	— (158)	1,370 (212)	1,680 (432)	2,470 (1,180)	3,500 (2,920)	3,860 (5,810)	— (9,510)
03404500	Cumberland River	1907–2011 (81)	3,190 (1.61)	1,400 (1930)	4,960 (1972)	4.00 (1954)	57,500 (1918)	1,950 (90.0)	2,210 (158)	2,600 (428)	3,120 (1,440)	3,780 (3,570)	4,320 (7,920)	4,540 (13,400)
Upper Cumberland–Lake Cumberland (05130103)														
3414000	Cumberland River	1939–1992 (52)	9,060 (1.56)	4,430 (1941)	14,800 (1989)	0 (1950)	156,000 (1946)	4,860 (268)	5,810 (805)	7,290 (2,480)	8,760 (6,180)	10,400 (12,500)	13,100 (21,700)	13,800 (27,500)
Obey (05130105)														
3414500	E Fork Obey River	1942–2008 (56)	414 (2.05)	192 (2007)	692 (1975)	3.60 (1948)	23,200 (1969)	242 (10.0)	271 (15.0)	300 (34.0)	393 (156)	521 (434)	603 (922)	649 (1,530)
03414500coe	E Fork Obey River	1987–2011 (15)	393 (1.94)	195 (2007)	607 (2003)	11.8 (1993)	19,800 (2004)	— (20.1)	231 (24.7)	255 (41.9)	384 (149)	532 (426)	592 (846)	— (1,290)
03415000	W Fork Obey River	1942–2010 (33)	153 (1.33)	77.3 (2007)	255 (1950)	2.30 (2008)	7,440 (1969)	94.8 (4.60)	113 (5.90)	123 (12.0)	142 (45.0)	181 (159)	209 (350)	239 (586)
3417000	Obey River	1938–1991 (21)	1,420 (1.52)	737 (1988)	2,410 (1989)	0 (1945)	35,600 (1939)	836 (0)	878 (0)	1,030 (54.0)	1,280 (820)	1,760 (2,290)	2,020 (3,620)	2,310 (4,850)
Upper Cumberland–Cordell Hull (05130106)														
3417500	Cumber-land River	1922–1991 (65)	11,500 (1.58)	5,680 (1941)	18,200 (1973)	69.0 (1925)	142,000 (1926)	6,670 (549)	7,340 (1,170)	9,140 (3,200)	11,500 (7,660)	13,000 (15,100)	16,100 (26,800)	17,500 (35,200)
03417500coe	Cumber-land River	1987–2011 (6)	9,970 (1.37)	4,190 (2001)	15,800 (2004)	0 (2000)	62,100 (2010)	— (594)	— (1,170)	4,230 (3,300)	10,900 (8,730)	13,600 (14,800)	— (20,400)	— (23,100)
3418420	Cumberland River	1980–1997 (16)	12,400 (1.54)	6,660 (1988)	20,000 (1989)	344 (1981)	85,200 (1984)	— (3,310)	8,530 (4,050)	8,790 (5,790)	11,800 (9,570)	14,700 (16,500)	19,100 (24,500)	— (31,800)

Table C–5*B*. Summary descriptive statistics and percentiles for discharge by calendar year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

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USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Cumberland (0513)—Continued														
Collins (05130107)														
03421000	Collins River	1924–2010 (85)	1,170 (1.84)	398 (2007)	2,040 (1973)	37.0 (1961)	64,100 (1990)	638 (92.0)	744 (112)	914 (192)	1,130 (532)	1,400 (1,290)	1,690 (2,570)	1,750 (4,050)
03421000coe	Collins River	1990–2011 (18)	1,200 (1.89)	414 (2007)	1,980 (1994)	83.0 (2005)	41,600 (2002)	— (121)	636 (145)	930 (214)	1,240 (506)	1,480 (1,180)	1,700 (2,400)	— (3,850)
Caney (05130108)														
3422500	Caney Fork	1911–1999 (77)	3,160 (1.89)	1,470 (1981)	5,060 (1929)	25.0 (1951)	154,000 (1929)	1,680 (58.0)	2,100 (103)	2,470 (491)	3,120 (1,770)	3,820 (3,410)	4,420 (6,600)	4,650 (10,800)
3424500	Caney Fork	1922–1958 (35)	3,810 (1.75)	1,790 (1941)	5,960 (1929)	12.0 (1950)	154,000 (1929)	1,990 (74.0)	2,530 (266)	3,150 (631)	3,680 (2,040)	4,700 (4,360)	5,070 (9,180)	5,470 (12,700)
Lower Cumberland–Old Hickory Lake (05130201)														
3425000	Cumberland River	1922–1991 (68)	17,300 (1.62)	8,440 (1941)	27,700 (1989)	366 (1940)	204,000 (1926)	10,500 (1,330)	11,200 (2,300)	13,900 (5,360)	17,200 (11,400)	19,800 (22,500)	24,800 (39,500)	26,600 (53,100)
03425000coe	Cumberland River	1991–2011 (7)	14,700 (1.38)	9,150 (2001)	22,300 (2009)	0 (2004)	131,000 (2010)	— (3,280)	— (4,310)	9,850 (6,010)	11,800 (10,100)	22,100 (19,300)	— (32,000)	— (42,000)
Lower Cumberland–Sycamore (05130202)														
3426310	Cumberland River	1931–2007 (69)	18,700 (1.61)	9,050 (1941)	30,100 (1979)	86.0 (1936)	172,000 (1937)	10,600 (2,290)	12,300 (3,870)	15,000 (6,980)	18,700 (12,700)	21,500 (24,600)	27,200 (41,300)	28,100 (54,600)
03426310coe	Cumberland River	1954–2011 (42)	18,900 (1.62)	8,700 (2007)	28,800 (1989)	0 (1957)	146,000 (1975)	10,400 (3,170)	12,400 (4,570)	15,300 (7,810)	18,600 (14,000)	22,300 (25,100)	25,800 (40,000)	27,600 (50,000)
3426500	Cumberland River	1931–1982 (44)	19,200 (1.64)	9,050 (1941)	30,100 (1979)	86.0 (1936)	172,000 (1937)	12,500 (1,740)	12,600 (2,760)	16,000 (6,040)	19,000 (12,600)	21,400 (25,500)	27,200 (43,200)	28,100 (58,100)
03431500	Cumberland River	1892–2011 (61)	20,200 (0.16)	9,610 (1941)	29,700 (1950)	60.0 (1935)	203,000 (1927)	12,100 (1,140)	15,100 (1,630)	16,500 (3,390)	20,200 (10,100)	23,000 (25,400)	25,800 (53,300)	27,000 (79,000)
Stones (05130203)														
03428200	W Fork Stones River	1972–2010 (33)	292 (1.65)	101 (1981)	495 (1979)	4.70 (1980)	21,200 (1975)	137 (13.0)	167 (17.0)	217 (35.0)	282 (103)	358 (283)	482 (588)	494 (1,010)
03428200coe	W Fork Stones River	1989–2011 (15)	263 (1.48)	139 (2007)	363 (2002)	6.00 (1998)	13,300 (2010)	— (15.5)	158 (20.7)	190 (39.3)	274 (90.4)	346 (247)	355 (556)	— (921)
3428500	W Fork Stones River	1965–2005 (26)	435 (1.84)	162 (1981)	769 (1973)	0 (1983)	43,900 (1975)	172 (19.0)	235 (25.0)	343 (47.0)	393 (154)	552 (428)	720 (986)	747 (1,590)

Table C–5*B*. Summary descriptive statistics and percentiles for discharge by calendar year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1, USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile; ft^3/s, cubic feet per second]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Cumberland (0513)—Continued														
Stones (05130203)—Continued														
03428500coe	W Fork Stones River	1989–2005 (11)	369 (1.56)	198 (1992)	518 (1997)	2.00 (1999)	19,600 (1999)	— (8.54)	215 (10.7)	240 (18.4)	398 (121)	484 (367)	507 (757)	— (1,260)
3430100	Stones River	1939–1996 (27)	1,360 (1.53)	576 (1941)	2,190 (1951)	11.0 (1940)	60,200 (1948)	898 (25.0)	924 (40.0)	1,040 (100)	1,320 (370)	1,620 (1,330)	1,900 (3,310)	1,950 (5,840)
Lower Cumberland (05130205)														
3435000	Cumberland River	1954–1991 (36)	23,300 (1.65)	12,500 (1988)	38,400 (1989)	700 (1969)	202,000 (1975)	13,800 (3,860)	15,100 (5,090)	17,800 (8,550)	21,900 (15,800)	27,700 (30,800)	35,500 (50,600)	36,900 (65,000)
3437000	Cumberland River	1937–1965 (27)	24,400 (1.49)	10,900 (1941)	39,600 (1950)	414 (1947)	199,000 (1962)	16,600 (1,590)	17,100 (2,720)	20,300 (6,240)	24,500 (14,200)	26,700 (32,600)	33,800 (59,900)	33,800 (83,700)
03438000	Little River	1940–2011 (70)	360 (1.48)	61.4 (1941)	747 (1979)	3.60 (1941)	24,300 (1997)	176 (22.0)	209 (29.0)	261 (51.0)	336 (150)	454 (406)	556 (831)	599 (1,290)
03438000coe	Little River	1987–2011 (8)	374 (1.53)	211 (1992)	550 (2002)	0 (2004)	7,580 (2002)	— (12.9)	— (22.4)	241 (60.8)	377 (204)	496 (455)	— (838)	— (1,240)
3438220	Cumberland River	1940–1997 (54)	32,900 (1.87)	11,200 (1941)	57,800 (1979)	0 (1964)	202,000 (1975)	20,200 (3,580)	21,500 (5,660)	25,400 (11,100)	32,100 (24,200)	38,700 (50,200)	49,400 (67,900)	54,200 (88,200)
03438220tva	Cumberland River	1960–2012 (51)	32,300 (1.84)	13,900 (2007)	54,200 (1979)	0 (1964)	265,000 (2010)	18,900 (6,180)	20,200 (8,080)	24,800 (13,400)	32,600 (26,200)	38,700 (48,000)	46,000 (59,600)	47,000 (78,500)
Red (05130206)														
03436100	Red River	1961–2010 (42)	1,320 (1.42)	532 (2000)	2,810 (1979)	49.0 (2007)	56,600 (1975)	712 (96.0)	818 (125)	948 (231)	1,200 (637)	1,700 (1,530)	1,890 (2,980)	2,110 (4,410)
03436100coe	Red River	1989–2011 (11)	1,310 (1.41)	835 (2001)	1,890 (1991)	8.21 (1999)	61,800 (2010)	— (47.7)	857 (85.0)	946 (297)	1,350 (830)	1,640 (1,580)	1,680 (2,800)	— (4,040)
Lower Ohio (0514)														
Lower Ohio–Bay (05140203)														
03381700	Ohio River	2002–2012 (7)	198,000 (1.41)	156,000 (2007)	238,000 (2003)	8,580 (2009)	955,000 (2005)	— (23,800)	— (33,700)	171,000 (80,100)	198,000 (176,000)	235,000 (290,000)	— (390,000)	— (457,000)
3384500	Ohio River	1940–1980 (12)	189,000 (1.31)	76,800 (1941)	302,000 (1950)	10,000 (1941)	1,010,000 (1945)	— (22,000)	124,000 (28,000)	150,000 (55,000)	186,000 (120,000)	226,000 (276,000)	281,000 (448,000)	— (566,000)
03399800	Ohio River	1993–2011 (17)	190,000 (1.32)	131,000 (2000)	257,000 (1996)	3,090 (1999)	831,000 (1997)	— (22,600)	133,000 (30,400)	163,000 (59,900)	189,000 (145,000)	217,000 (279,000)	245,000 (433,000)	— (532,000)

Table C–5*B*. Summary descriptive statistics and percentiles for discharge by calendar year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1, USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile; ft^3/s, cubic feet per second]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
							Lower Ohio (0514)—Continued							
							Lower Ohio (05140206)							
03611500	Ohio River	1928–2010 (81)	278,000 (1.37)	118,000 (1941)	465,000 (1979)	15,000 (1930)	1,850,000 (1937)	170,000 (53,300)	196,000 (68,300)	230,000 (104,000)	273,000 (195,000)	324,000 (389,000)	368,000 (634,000)	399,000 (770,000)
							Lower Tennessee (0604)							
							Lower Tennessee–Beech (06040001)							
3593500	Tennessee River	1930–2006 (74)	54,900 (1.66)	25,300 (1988)	79,800 (1973)	60.0 (1966)	495,000 (1973)	31,500 (14,900)	36,100 (19,500)	46,100 (28,300)	53,000 (40,700)	65,800 (63,400)	74,200 (107,000)	76,800 (152,000)
							Upper Duck (06040002)							
03598000	Duck River	1934–2011 (75)	819 (1.70)	268 (1981)	1,570 (1973)	20.0 (1945)	45,900 (1948)	375 (87.0)	474 (111)	640 (176)	770 (298)	1,000 (806)	1,200 (1,870)	1,270 (2,970)
							Lower Duck (06040003)							
03599500	Duck River	1904–2011 (93)	2,010 (1.66)	659 (1981)	3,960 (1973)	2.60 (1927)	61,100 (1973)	1,060 (97.0)	1,220 (142)	1,540 (244)	1,890 (689)	2,490 (2,020)	2,870 (4,800)	3,190 (8,240)
03603000	Duck River	1925–2010 (72)	4,070 (1.59)	1,390 (1941)	7,620 (1973)	236 (1931)	111,000 (1948)	2,310 (470)	2,600 (568)	3,140 (844)	3,870 (1,800)	4,940 (4,410)	6,080 (9,320)	6,450 (15,700)
							Buffalo (06040004)							
03604000	Buffalo River	1920–2010 (89)	764 (1.71)	300 (1941)	1,460 (1973)	65.0 (1925)	75,800 (1991)	416 (155)	469 (180)	583 (242)	705 (401)	939 (760)	1,120 (1,420)	1,180 (2,240)
3604400	Buffalo River	1927–2009 (66)	1,200 (1.71)	451 (1941)	2,210 (1991)	142 (1931)	82,100 (1948)	695 (246)	752 (285)	902 (380)	1,080 (635)	1,450 (1,270)	1,760 (2,370)	1,840 (3,680)
							Kentucky Lake (06040005)							
3438190	Barkley-Kentucky Canal	1966–1997 (28)	–7,520 (—)	–12,100 (1992)	–2,820 (1968)	–48,000 (1974)	58,200 (1984)	–11,400 (–26,700)	–11,200 (–22,900)	–9,250 (–15,600)	–7,560 (–7,300)	–5,590 (–271)	–3,020 (6,060)	–2,870 (11,500)
03438190tva	Barkley-Kentucky Canal	1975–2012 (28)	–4,630 (—)	–12,100 (1992)	3,670 (2011)	–53,000 (2003)	53,200 (1978)	–10,500 (–25,000)	–10,300 (–20,000)	–8,050 (–11,300)	–5,320 (–2,690)	–288 (0)	1,900 (7,000)	2,550 (13,300)
3607500	Tennessee River	1930–1942 (11)	58,700 (1.48)	31,100 (1941)	82,800 (1932)	8,850 (1931)	327,000 (1936)	— (15,500)	41,600 (18,000)	41,700 (23,200)	63,800 (34,000)	71,900 (70,000)	72,000 (135,000)	— (202,000)
03609500tva	Tennessee River	1944–2012 (67)	62,500 (1.56)	26,200 (2007)	91,500 (1979)	0 (1958)	439,000 (1948)	35,200 (18,200)	38,700 (23,100)	49,800 (31,000)	61,100 (42,500)	75,200 (66,100)	89,300 (134,000)	90,500 (185,000)
3609500	Tennessee River	1889–1984 (94)	64,500 (1.61)	31,200 (1941)	94,400 (1973)	60.0 (1961)	493,000 (1948)	38,400 (14,100)	46,000 (18,300)	55,600 (28,400)	64,300 (43,000)	75,000 (77,600)	82,800 (146,000)	90,300 (196,000)

Table C–5*B*. Summary descriptive statistics and percentiles for discharge by calendar year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee River station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1, USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile; ft^3/s, cubic feet per second]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[f] in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Lower Tennessee (0604)														
Lower Tennessee (06040006)														
3610000	Clarks River	1951–1971 (19)	87.6 (0.98)	27.6 (1963)	205 (1957)	0 (1952)	10,400 (1957)	— (0)	36.4 (0)	68.5 (0.90)	83.7 (6.10)	109 (31.0)	139 (127)	— (323)
03610200	Clarks River	1982–2011 (28)	174 (1.30)	82.3 (1987)	294 (1989)	1.40 (2008)	14,000 (1997)	91.3 (4.60)	92.6 (6.20)	130 (14.0)	163 (34.0)	209 (87.0)	275 (288)	284 (671)
3610500	Clarks River	1938–1973 (34)	274 (1.21)	26.5 (1941)	639 (1950)	1.90 (1944)	23,800 (1957)	95.8 (3.90)	123 (5.20)	187 (12.0)	259 (42.0)	332 (152)	459 (590)	585 (1,380)
3610545	W Fork Clarks River	1968–1994 (19)	95.2 (1.39)	33.9 (1992)	167 (1975)	1.10 (1982)	7,000 (1989)	— (4.70)	41.4 (6.20)	66.6 (11.0)	82.2 (24.0)	141 (62.0)	160 (181)	— (358)
Upper Mississippi–Kaskaskia–Meramec (0714)														
Upper Mississippi–Cape Girardeau (07140105)														
07022000	Mississippi River	1933–2012 (73)	209,000 (0.29)	83,500 (1934)	465,000 (1993)	24,700 (1940)	978,000 (1993)	110,000 (67,700)	127,000 (78,400)	160,000 (109,000)	212,000 (167,000)	242,000 (269,000)	302,000 (411,000)	316,000 (496,000)

[a]Station numbers with “coe” or “tva” appended to the number are for stations operated in cooperation with either the U.S. Army Corps of Engineers (coe) or the Tennessee Valley Authority (tva), and the data for these table rows are obtained from these agencies’ digital files.

[b]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[c]Statistics listed for mean-annual and mean-daily discharge are based on complete calendar years. Year of minimum and maximum values for mean-annual and mean-daily discharge numbers shown in parentheses.

[d]Yield units are cubic feet per second per square mile. Yields are based on contributing drainage areas where given.

[e]Mean daily discharge of zero first occurred during the calendar year indicated but may subsequently have occurred in one or more years.

[f]Percentiles listed for mean-annual and mean-daily discharge are based on complete calendar years.

Table C–6*A*. Summary descriptive statistics and percentiles for selected water-quality parameters by water year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual parameter value[b]			Mean-daily parameter value[b]		Percentiles of mean-annual parameter values and (mean-daily parameter values)[c]						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Cumberland (0513)														
Stones (05130203)														
Water temperature, in degrees Celsius														
03428200	W Fork Stones River	1986–2011 (9)	17.4	16.9 (2009)	17.7 (2008)	0.9 (1990)	30.4 (1995)	— (6.0)	— (7.6)	17.1 (10.9)	17.5 (17.3)	17.6 (24.3)	— (27.0)	— (28.0)
Dissolved oxygen, in milligrams per liter														
03428200	W Fork Stones River	1986–2011 (3)	8.9	8.5 (1992)	9.1 (2009)	4.4 (1992)	14.4 (1995)	— (5.9)	— (6.3)	— (7.0)	9.0 (8.8)	— (10.6)	— (11.8)	— (12.7)
Specific conductance, in microsiemens per centimeter at 25 degrees Celsius														
03428200	W Fork Stones River	1986–2011 (9)	387	356 (1994)	433 (2008)	139 (2004)	545 (2006)	— (298)	— (327)	373 (357)	384 (385)	391 (419)	— (452)	— (474)
Cumberland (0513)														
Upper Cumberland (05130101)														
Suspended-sediment concentration, in milligrams per liter														
3403000	Cumberland River	1980–1989 (3)	78.8	46.4 (1988)	110 (1989)	0.60 (1987)	1,810 (1988)	— (4.00)	— (6.00)	— (12.0)	79.8 (24.0)	— (62.5)	— (191)	— (309)
3403500	Cumberland River	1980–1992 (6)	89.4	50.9 (1988)	129 (1989)	0.50 (1988)	2,420 (1991)	— (4.00)	— (6.00)	70.1 (11.0)	91.5 (27.0)	104 (76.5)	— (214)	— (388)
3404000	Cumberland River	1954–1992 (8)	75.5	42.2 (1988)	125 (1989)	0 (1992)	2,500 (1991)	— (2.00)	— (4.00)	49.3 (9.00)	78.6 (23.0)	90.6 (65.0)	— (180)	— (349)
3404500	Cumberland River	1981–1989 (2)	153	150 (1989)	156 (1987)	0.40 (1989)	3,500 (1989)	— (3.00)	— (4.00)	— (11.0)	153 (38.5)	— (171)	— (424)	— (688)
Suspended-sediment discharge, in tons per day														
3403000	Cumberland River	1987–1989 (3)	1,090	560 (1988)	1,860 (1989)	0.14 (1988)	136,000 (1989)	— (2.00)	— (3.10)	— (8.70)	856 (37.0)	— (197)	— (1,300)	— (4,310)
3403500	Cumberland River	1987–1992 (6)	1,380	595 (1988)	2,290 (1989)	0.14 (1988)	123,000 (1989)	— (2.30)	— (4.20)	899 (13.0)	1,310 (58.0)	1,910 (359)	— (2,200)	— (5,930)
3404000	Cumberland River	1987–1992 (6)	1,690	542 (1988)	3,220 (1989)	0.12 (1992)	111,000 (1989)	— (2.40)	— (4.70)	1,040 (17.0)	1,440 (83.0)	2,500 (480)	— (2,910)	— (8,810)
3404500	Cumberland River	1987–1989 (3)	3,040	347 (1988)	5,700 (1989)	0.04 (1988)	301,000 (1989)	— (0.99)	— (2.10)	— (7.65)	3,080 (76.0)	— (841)	— (5,360)	— (12,900)

Table C–6*A*. Summary descriptive statistics and percentiles for selected water-quality parameters by water year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual parameter value[b]			Mean-daily parameter value[b]		Percentiles of mean-annual parameter values and (mean-daily parameter values)[c]						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Lower Tennessee (0604)														
Lower Tennessee–Beech (06040001)														
Suspended-sediment concentration, in milligrams per liter														
3593500	Tennessee River	1935–1942 (6)	50.9	30.4 (1941)	79.9 (1936)	1.00 (1937)	770 (1940)	— (5.00)	— (8.00)	31.6 (15.0)	52.8 (30.0)	57.9 (62.0)	— (119)	— (165)
Lower Duck (06040003)														
Suspended-sediment concentration, in milligrams per liter														
3603000	Duck River	1935–1966 (3)	150	115 (1965)	188 (1937)	2.00 (1936)	3,300 (1937)	— (7.00)	— (11.0)	— (22.0)	146 (50.0)	— (130)	— (380)	— (650)
Suspended-sediment discharge, in tons per day														
3603000	Duck River	1935–1966 (3)	4,530	3,270 (1965)	6,430 (1937)	3.10 (1965)	174,000 (1936)	— (13.0)	— (24.0)	— (58.0)	3,880 (214)	— (1,230)	— (9,800)	— (26,000)
Upper Mississippi–Kaskaskia–Meramec (0714)														
Upper Mississippi-Cape Girardeau (07140105)														
Suspended-sediment concentration, in milligrams per liter														
07022000	Mississippi River	1983–2010 (15)	306	168 (2003)	484 (1993)	32.0 (1989)	3,150 (1985)	— (75.0)	216 (91.0)	235 (134)	276 (224)	406 (383)	450 (617)	— (829)
Suspended-sediment discharge, in tons per day														
07022000	Mississippi River	1983–2010 (23)	262,000	76,000 (2006)	611,000 (1993)	7,720 (1989)	6,280,000 (1985)	90,400 (22,400)	92,700 (30,200)	173,000 (47,300)	254,000 (109,000)	319,000 (329,000)	454,000 (699,000)	489,000 (1,010,000)

[a]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily parameter values are based on complete water years. Year of minimum and maximum parameter values for mean-annual and mean-daily parameter-value numbers shown in parentheses.

[c]Percentiles listed for mean-annual and mean-daily parameter values are based on complete water years.

Table C–6*B*. Summary descriptive statistics and percentiles for selected water-quality parameters by calendar year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual parameter value[b]			Mean-daily parameter value[b]		Percentiles of mean-annual parameter values and (mean-daily parameter values)[c]						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Cumberland (0513)														
Stones (05130203)														
Water temperature, in degrees Celsius														
03428200	W Fork Stones River	1986–2011 (8)	17.2	16.9 (1994)	17.7 (2005)	1.6 (1994)	30.4 (1995)	— (5.7)	— (7.4)	17.1 (10.9)	17.2 (17.0)	17.4 (24.3)	— (27.0)	— (28.0)
Dissolved oxygen, in milligrams per liter														
03428200	W Fork Stones River	1986–2011 (2)	9.3	9.2 (2009)	9.4 (1995)	5.0 (1995)	14.4 (1995)	— (6.1)	— (6.4)	— (7.3)	9.3 (9.4)	— (11.0)	— (12.3)	— (13.0)
Specific conductance, in microsiemens per centimeter at 25 degrees Celsius														
03428200	W Fork Stones River	1986–2011 (8)	388	350 (1994)	446 (2008)	137 (1999)	765 (2008)	— (298)	— (326)	372 (354)	384 (383)	395 (420)	— (450)	— (474)
Cumberland (0513)														
Upper Cumberland (05130101)														
Suspended-sediment concentration, in milligrams per liter														
3403000	Cumberland River	1979–1989 (2)	57.8	50.2 (1988)	65.3 (1987)	0.60 (1987)	1,810 (1987)	— (3.00)	— (5.00)	— (10.0)	57.8 (19.0)	— (42.0)	— (125)	— (243)
3403500	Cumberland River	1979–1992 (5)	92.5	54.6 (1988)	133 (1989)	0.50 (1988)	2,420 (1991)	— (4.00)	— (6.00)	73.9 (11.0)	90.6 (26.0)	111 (78.0)	— (222)	— (409)
3404000	Cumberland River	1953–1992 (5)	81.8	50.5 (1988)	127 (1989)	0.40 (1987)	2,500 (1991)	— (3.00)	— (5.00)	56.6 (10.0)	86.6 (24.0)	88.5 (71.0)	— (201)	— (368)
3404500	Cumberland River	1981–1989 (1)	114	114 (1987)	114 (1987)	0.10 (1987)	1,160 (1987)	— (0.40)	— (1.00)	— (4.00)	— (15.0)	— (112)	— (380)	— (553)
Suspended-sediment discharge, in tons per day														
3403000	Cumberland River	1986–1989 (2)	613	527 (1988)	699 (1987)	0.14 (1988)	63,100 (1988)	— (1.70)	— (2.30)	— (5.00)	613 (16.0)	— (91.0)	— (608)	— (1,850)
3403500	Cumberland River	1986–1992 (5)	1,520	572 (1988)	2,540 (1989)	0.14 (1988)	123,000 (1989)	— (2.10)	— (3.60)	848 (11.0)	1,530 (50.0)	2,100 (395)	— (2,440)	— (7,160)
3404000	Cumberland River	1986–1992 (5)	1,880	667 (1988)	3,420 (1989)	0.21 (1987)	111,000 (1989)	— (2.20)	— (4.20)	802 (14.0)	1,880 (78.0)	2,630 (516)	— (3,400)	— (9,850)
3404500	Cumberland River	1986–1989 (2)	1,350	774 (1988)	1,930 (1987)	0.04 (1987)	49,500 (1987)	— (0.59)	— (1.30)	— (3.90)	1,350 (29.0)	— (379)	— (2,830)	— (8,370)

Table C–6*B*. Summary descriptive statistics and percentiles for selected water-quality parameters by calendar year for gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual parameter value[b]			Mean-daily parameter value[b]		Percentiles of mean-annual parameter values and (mean-daily parameter values)[c]						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Lower Tennessee (0604)														
Lower Tennessee–Beech (06040001)														
Suspended-sediment concentration, in milligrams per liter														
3593500	Tennessee River	1934–1942 (7)	52.7	27.4 (1941)	86.8 (1936)	1.00 (1937)	770 (1940)	— (5.00)	— (8.00)	38.9 (16.0)	48.1 (32.0)	67.5 (66.0)	— (125)	— (169)
Lower Duck (06040003)														
Suspended-sediment concentration, in milligrams per liter														
3603000	Duck River	1934–1965 (4)	142	90.6 (1965)	179 (1936)	1.00 (1965)	3,300 (1937)	— (5.00)	— (9.00)	— (20.0)	150 (47.0)	— (125)	— (360)	— (645)
Suspended-sediment discharge, in tons per day														
3603000	Duck River	1934–1965 (4)	4,530	2,760 (1965)	5,950 (1937)	1.70 (1965)	246,000 (1935)	— (9.20)	— (17.0)	— (50.0)	4,700 (181)	— (1,070)	— (8,670)	— (24,400)
Upper Mississippi–Kaskaskia–Meramec (0714)														
Upper Mississippi-Cape Girardeau (07140105)														
Suspended-sediment concentration, in milligrams per liter														
07022000	Mississippi River	1982–2010 (10)	284	183 (2003)	409 (1992)	34.0 (1994)	2,610 (1992)	— (75.0)	— (93.0)	239 (134)	269 (204)	316 (352)	— (585)	— (781)
Suspended-sediment discharge, in tons per day														
07022000	Mississippi River	1982–2010 (20)	246,000	68,700 (2006)	529,000 (1993)	8,710 (1990)	3,410,000 (1992)	— (22,600)	95,700 (30,000)	165,000 (45,600)	266,000 (104,000)	307,000 (294,000)	349,000 (680,000)	— (980,000)

[a]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily parameter values are based on complete calendar years. Year of minimum and maximum parameter values for mean-annual and mean-daily parameter-value numbers shown in parentheses.

[c]Percentiles listed for mean-annual and mean-daily parameter values are based on complete calendar years.

Table C–7. Graphical summary files for plots of gage height, discharge, water temperature, dissolved-oxygen concentration, specific conductance, suspended-sediment concentration, and suspended-sediment discharge data collected at gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31]

USGS station number[a]	Station name	Parameter	Plot frames[b–f]	File name[g]
		Cumberland (0513)		
		Upper Cumberland (05130101)		
03401000	Cumberland R nr Harlan, KY	Discharge	A1–A4; A5–A8	s03401000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03401000qmn.p12lg.pdf
03401000coe	Cumberland R nr Harlan, KY	Gage height	A1, A2, A4	s03401000coegmn.p01ar.pdf
		Gage height	A1, A2, A4	s03401000coegmn.p01lg.pdf
		Discharge	A1, A2, A4	s03401000coeqmn.p01ar.pdf
		Discharge	A1, A2, A4	s03401000coeqmn.p01lg.pdf
03403000	Cumberland R nr Pineville, KY	Discharge	A1–A4; A5–A8	s03403000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03403000qmn.p12lg.pdf
		Suspended-sediment concentration	A1, A2, A4; A5–A8	s03403000scmn.p12ar.pdf
		Suspended-sediment concentration	A1, A2, A4; A5–A8	s03403000scmn.p12lg.pdf
		Suspended-sediment discharge	A1, A2, A4; A5–A8	s03403000sdmn.p12ar.pdf
		Suspended-sediment discharge	A1, A2, A4; A5–A8	s03403000sdmn.p12lg.pdf
03403500	Cumberland R at Barbourville, KY	Discharge	A1–A4; A5–A8	s03403500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03403500qmn.p12lg.pdf
		Suspended-sediment concentration	A1, A2, A4; A5–A8	s03403500scmn.p12ar.pdf
		Suspended-sediment concentration	A1, A2, A4; A5–A8	s03403500scmn.p12lg.pdf
		Suspended-sediment discharge	A1, A2, A4; A5–A8	s03403500sdmn.p12ar.pdf
		Suspended-sediment discharge	A1, A2, A4; A5–A8	s03403500sdmn.p12lg.pdf
03404000	Cumberland R at Williamsburg, KY	Discharge	A1–A4; A5–A8	s03404000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03404000qmn.p12lg.pdf
		Suspended-sediment concentration	A1, A2, A4; A5–A8	s03404000scmn.p12ar.pdf
		Suspended-sediment discharge	A1, A2, A4; A5–A8	s03404000sdmn.p12ar.pdf
		Suspended-sediment discharge	A1, A2, A4; A5–A8	s03404000sdmn.p12lg.pdf
03404000coe	Cumberland R at Williamsburg, KY	Gage height	A1–A4; A5–A8	s03404000coegmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03404000coegmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s03404000coeqmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03404000coeqmn.p12lg.pdf

Table C–7. Graphical summary files for plots of gage height, discharge, water temperature, dissolved-oxygen concentration, specific conductance, suspended-sediment concentration, and suspended-sediment discharge data collected at gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31]

USGS station number[a]	Station name	Parameter	Plot frames[b–f]	File name[g]
Cumberland (0513)—Continued				
Upper Cumberland (05130101)—Continued				
03404500	Cumberland R at Cumberland Falls, KY	Discharge	A1–A4; A5–A8	s03404500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03404500qmn.p12lg.pdf
		Suspended-sediment concentration	A1, A2, A4	s03404500scmn.p01ar.pdf
		Suspended-sediment concentration	A1, A2, A4	s03404500scmn.p01lg.pdf
		Suspended-sediment discharge	A1, A2, A4; A5–A8	s03404500sdmn.p12ar.pdf
		Suspended-sediment discharge	A1, A2, A4; A5–A8	s03404500sdmn.p12lg.pdf
Upper Cumberland–Lake Cumberland (05130103)				
03414000	Cumberland R nr Rowena, KY	Discharge	A1–A4; A5–A8	s03414000qmn.p12ar.pdf
Obey (05130105)				
03414500	E Fork Obey R nr Jamestown, TN	Discharge	A1–A4; A5–A8	s03414500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03414500qmn.p12lg.pdf
03414500coe	E Fork Obey R nr Jamestown, TN	Gage height	A1–A4; A5–A8	s03414500coegmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03414500coegmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s03414500coeqmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03414500coeqmn.p12lg.pdf
03415000	W Fork Obey R nr Alpine, TN	Discharge	A1–A4; A5–A8	s03415000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03415000qmn.p12lg.pdf
03417000	Obey R below Dale Hollow Dam, TN	Discharge	A1–A4; A5–A8	s03417000qmn.p12ar.pdf
Upper Cumberland–Cordell Hull (05130106)				
03417500	Cumberland R at Celina, TN	Gage height	A1, A2, A4	s03417500gmn.p01ar.pdf
		Gage height	A1, A2, A4	s03417500gmn.p01lg.pdf
		Discharge	A1–A4; A5–A8	s03417500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03417500qmn.p12lg.pdf
03417500coe	Cumberland R at Celina, TN	Gage height	A1–A4; A5–A8	s03417500coegmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03417500coegmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s03417500coeqmn.p12ar.pdf
03418420	Cumberland R below Cordell Hull Dam, TN	Discharge	A1–A4; A5–A8	s03418420qmn.p12ar.pdf
Collins (05130107)				
03421000	Collins R nr McMinnville, TN	Discharge	A1–A4; A5–A8	s03421000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03421000qmn.p12lg.pdf

Table C–7. Graphical summary files for plots of gage height, discharge, water temperature, dissolved-oxygen concentration, specific conductance, suspended-sediment concentration, and suspended-sediment discharge data collected at gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

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USGS station number[a]	Station name	Parameter	Plot frames[b–f]	File name[g]
		Cumberland (0513)—Continued		
		Collins (05130107)—Continued		
03421000coe	Collins R nr McMinnville, TN	Gage height	A1–A4; A5–A8	s03421000coegmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03421000coegmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s03421000coeqmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03421000coeqmn.p12lg.pdf
		Caney (05130108)		
03422500	Caney Fork nr Rock Island, TN	Discharge	A1–A4; A5–A8	s03422500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03422500qmn.p12lg.pdf
03424500	Caney Fork below Center Hill Dam nr Lancaster, TN	Discharge	A1–A4; A5–A8	s03424500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03424500qmn.p12lg.pdf
		Lower Cumberland–Old Hickory Lake (05130201)		
03425000	Cumberland R at Carthage, TN	Discharge	A1–A4; A5–A8	s03425000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03425000qmn.p12lg.pdf
03425000coe	Cumberland R at Carthage, TN	Gage height	A1–A4; A5–A8	s03425000coegmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03425000coeqmn.p12ar.pdf
		Lower Cumberland–Sycamore (05130202)		
03426310	Cumberland R at Old Hickory Dam, TN	Discharge	A1–A4; A5–A8	s03426310qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03426310qmn.p12lg.pdf
03426310coe	Cumberland R at Old Hickory Dam, TN	Discharge	A1–A4; A5–A8	s03426310coeqmn.p12ar.pdf
03426500	Cumberland R below Old Hickory, TN	Discharge	A1–A4; A5–A8	s03426500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03426500qmn.p12lg.pdf
03431500	Cumberland R at Nashville, TN	Discharge	A1–A4; A5–A8	s03431500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03431500qmn.p12lg.pdf
		Stones (05130203)		
03428200	W Fork Stones R at Murfreesboro, TN	Discharge	A1–A4; A5–A8	s03428200qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03428200qmn.p12lg.pdf
		Water temperature	A1–A4; A5–A8	s03428200tmn.p12ar.pdf
		Water temperature	A1–A4; A5–A8	s03428200tmn.p12lg.pdf
		Dissolved oxygen	A1–A4; A5–A8	s03428200omn.p12ar.pdf
		Dissolved oxygen	A1–A4; A5–A8	s03428200omn.p12lg.pdf
		Specific conductance	A1–A4; A5–A8	s03428200kmn.p12ar.pdf
		Specific conductance	A1–A4; A5–A8	s03428200kmn.p12lg.pdf

Table C–7. Graphical summary files for plots of gage height, discharge, water temperature, dissolved-oxygen concentration, specific conductance, suspended-sediment concentration, and suspended-sediment discharge data collected at gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

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USGS station number[a]	Station name	Parameter	Plot frames[b–f]	File name[g]
		Cumberland (0513)—Continued		
		Stones (05130203)—Continued		
03428200coe	W Fork Stones R at Murfreesboro, TN	Gage height	A1–A4; A5–A8	s03428200coegmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03428200coegmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s03428200coeqmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03428200coeqmn.p12lg.pdf
03428500	W Fork Stones R nr Smyrna, TN	Discharge	A1–A4; A5–A8	s03428500qmn.p12ar.pdf
03428500coe	W Fork Stones R nr Smyrna, TN	Gage height	A1–A4; A5–A8	s03428500coegmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03428500coegmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s03428500coeqmn.p12ar.pdf
03430100	Stones R below J Percy Priest Dam, TN	Discharge	A1–A4; A5–A8	s03430100qmn.p12ar.pdf
		Lower Cumberland (05130205)		
03435000	Cumberland R below Cheatham Dam, TN	Discharge	A1–A4; A5–A8	s03435000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03435000qmn.p12lg.pdf
03437000	Cumberland R at Dover, TN	Discharge	A1–A4; A5–A8	s03437000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03437000qmn.p12lg.pdf
03437000coe	Cumberland R at Dover, TN	Gage height	A1–A4; A5–A8	s03437000coegmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03437000coegmn.p12lg.pdf
03438000	Little R nr Cadiz, KY	Discharge	A1–A4; A5–A8	s03438000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03438000qmn.p12lg.pdf
03438000coe	Little R nr Cadiz, KY	Gage height	A1–A4; A5–A8	s03438000coegmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03438000coegmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s03438000coeqmn.p12ar.pdf
03438210tva	Lake Barkley nr Grand Rivers, KY	Gage height	A1–A4; A5–A8	s03438210tvagmn.p12ar.pdf
		Gage height	A1–A4; A5, A6, A8	s03438210tvagmn.p12lg.pdf
03438220	Cumberland R nr Grand Rivers, KY	Discharge	A1–A4; A5–A8	s03438220qmn.p12ar.pdf
03438220tva	Cumberland R nr Grand Rivers, KY	Gage height	A1–A4; A5–A8	s03438220tvagmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03438220tvagmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s03438220tvaqmn.p12ar.pdf
		Red (05130206)		
03436100	Red R at Port Royal, TN	Discharge	A1–A4; A5–A8	s03436100qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03436100qmn.p12lg.pdf
03436100coe	Red R at Port Royal, TN	Gage height	A1–A4; A5–A8	s03436100coegmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03436100coegmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s03436100coeqmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03436100coeqmn.p12lg.pdf

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[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31]

USGS station number[a]	Station name	Parameter	Plot frames[b–f]	File name[g]
		Lower Ohio (0514)		
		Lower Ohio–Bay (05140203)		
03381700	Ohio R at Old Shawneetown, IL-KY	Gage height	A1, A2, A4; A5–A8	s03381700gmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s03381700gmn.p12lg.pdf
		Discharge	A1, A2, A4; A5–A8	s03381700qmn.p12ar.pdf
		Discharge	A1, A2, A4; A5–A8	s03381700qmn.p12lg.pdf
03384500	Ohio R (Dam 51) at Golconda, IL	Discharge	A1–A4; A5–A8	s03384500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03384500qmn.p12lg.pdf
03384500coe	Ohio R (Dam 51) at Golconda, IL	Gage height	A1–A4; A5–A8	s03384500coegmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03384500coegmn.p12lg.pdf
		Gage height, 0000 reading	A1–A4; A5–A8	s03384500coeg0uv.p12ar.pdf
		Gage height, 0000 reading	A1–A4; A5–A8	s03384500coeg0uv.p12lg.pdf
03399800	Ohio R (Smithland Dam) at Smithland, KY	Discharge	A1–A4; A5–A8	s03399800qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03399800qmn.p12lg.pdf
03399800coe	Ohio R (Smithland Dam) at Smithland, KY	Gage height	A1, A2, A4; A5–A8	s03399800coegmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s03399800coegmn.p12lg.pdf
		Gage height, 0700 reading	A1–A4; A5–A8	s03399800coeg7uv.p12ar.pdf
		Gage height, 0700 reading	A1–A4; A5–A8	s03399800coeg7uv.p12lg.pdf
		Gage height (headwater)	A1, A2, A4; A5–A8	s03399800coegumn.p12ar.pdf
		Gage height (headwater)	A1, A2, A4; A5–A8	s03399800coegumn.p12lg.pdf
		Gage height (headwater), 0700 reading	A1–A4; A5–A8	s03399800coegu7uv.p12ar.pdf
		Gage height (headwater), 0700 reading	A1–A4; A5–A8	s03399800coegu7uv.p12lg.pdf
		Lower Ohio (05140206)		
03611500	Ohio R at Metropolis, IL	Discharge	A1–A4; A5–A8	s03611500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03611500qmn.p12lg.pdf
03611500coe	Ohio R at Metropolis, IL	Gage height	A1, A2, A4; A5–A8	s03611500coegmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03611500coegmn.p12lg.pdf

Table C–7. Graphical summary files for plots of gage height, discharge, water temperature, dissolved-oxygen concentration, specific conductance, suspended-sediment concentration, and suspended-sediment discharge data collected at gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31]

USGS station number[a]	Station name	Parameter	Plot frames[b–f]	File name[g]
		Lower Tennessee (0604)		
		Lower Tennessee–Beech (06040001)		
03593500	Tennessee R at Savannah, TN	Gage height	A1–A4; A5–A8	s03593500gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03593500gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s03593500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03593500qmn.p12lg.pdf
		Suspended-sediment concentration	A1, A2, A4; A5–A8	s03593500scmn.p12ar.pdf
		Suspended-sediment concentration	A1, A2, A4; A5–A8	s03593500scmn.p12lg.pdf
		Upper Duck (06040002)		
03598000	Duck R nr Shelbyville, TN	Gage height	A1–A4; A5–A8	s03598000gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03598000gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s03598000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03598000qmn.p12lg.pdf
		Lower Duck (06040003)		
03599500	Duck R at Columbia, TN	Gage height	A1–A4; A5–A8	s03599500gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03599500gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s03599500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03599500qmn.p12lg.pdf
03603000	Duck R above Hurricane Mills, TN	Discharge	A1–A4; A5–A8	s03603000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03603000qmn.p12lg.pdf
		Suspended-sediment concentration	A1, A2, A4; A5–A8	s03603000scmn.p12ar.pdf
		Suspended-sediment concentration	A1, A2, A4; A5–A8	s03603000scmn.p12lg.pdf
		Suspended-sediment discharge	A1, A2, A4; A5–A8	s03603000sdmn.p12ar.pdf
		Suspended-sediment discharge	A1, A2, A4; A5–A8	s03603000sdmn.p12lg.pdf
		Buffalo (06040004)		
03604000	Buffalo R nr Flat Woods, TN	Gage height	A1–A4; A5–A8	s03604000gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03604000gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s03604000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03604000qmn.p12lg.pdf
03604400	Buffalo R below Lobelville, TN	Discharge	A1–A4; A5–A8	s03604400qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03604400qmn.p12lg.pdf

Table C–7. Graphical summary files for plots of gage height, discharge, water temperature, dissolved-oxygen concentration, specific conductance, suspended-sediment concentration, and suspended-sediment discharge data collected at gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31]

USGS station number[a]	Station name	Parameter	Plot frames[b–f]	File name[g]
		Lower Tennessee (0604)—Continued		
		Kentucky Lake (06040005)		
03438190	Barkley-Kentucky Canal nr Grand Rivers, KY	Discharge	A1–A4; A7, A8	s03438190qmn.p12ar.pdf
03438190tva	Barkley-Kentucky Canal nr Grand Rivers, KY	Discharge	A1–A4; A7, A8	s03438190tvaqmn.p12ar.pdf
03607500	Tennessee R nr Buchanan, TN	Discharge	A1–A4; A5–A8	s03607500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03607500qmn.p12lg.pdf
03609000tva	Kentucky Lake at Gilbertsville, KY	Gage height	A1–A4; A5–A8	s03609000tvagmn.p12ar.pdf
		Gage height	A1–A4; A5, A6, A8	s03609000tvagmn.p12lg.pdf
03609500	Tennessee R nr Paducah, KY	Discharge	A1–A4; A5–A8	s03609500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03609500qmn.p12lg.pdf
03609500tva	Tennessee R nr Paducah, KY	Gage height	A1–A4; A5–A8	s03609500tvagmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03609500tvagmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s03609500tvaqmn.p12ar.pdf
		Lower Tennessee (06040006)		
03610000	Clarks R at Murray, KY	Discharge	A1–A4; A5–A8	s03610000qmn.p12ar.pdf
03610200	Clarks R at Almo, KY	Discharge	A1–A4; A5–A8	s03610200qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03610200qmn.p12lg.pdf
03610500	Clarks R nr Benton, KY	Discharge	A1–A4; A5–A8	s03610500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03610500qmn.p12lg.pdf
03610545	W Fork Clarks R nr Brewers, KY	Discharge	A1–A4; A5–A8	s03610545qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s03610545qmn.p12lg.pdf
03611000coe	Ohio R at Paducah, KY	Gage height	A1–A4; A5–A8	s03611000coegmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s03611000coegmn.p12lg.pdf
		Gage height, 0700 reading	A1–A4; A5–A8	s03611000coeg7uv.p12ar.pdf
		Gage height, 0700 reading	A1–A4; A5–A8	s03611000coeg7uv.p12lg.pdf
		Upper Mississippi–Kaskaskia–Meramec (0714)		
		Upper Mississippi-Cape Girardeau (07140105)		
07020850	Mississippi River at Cape Girardeau, MO	Gage height, 0800 reading	A1–A4; A5–A8	s07020850g8uv.p12ar.pdf
		Gage height, 0800 reading	A1–A4; A5–A8	s07020850g8uv.p12lg.pdf
07020850coe	Mississippi River at Cape Girardeau, MO	Gage height	A1, A2, A4; A5–A8	s07020850coegmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s07020850coegmn.p12lg.pdf
		Gage height, 0800 reading	A1–A4; A5–A8	s07020850coeg8uv.p12ar.pdf
		Gage height, 0800 reading	A1–A4; A5–A8	s07020850coeg8uv.p12lg.pdf

Table C–7. Graphical summary files for plots of gage height, discharge, water temperature, dissolved-oxygen concentration, specific conductance, suspended-sediment concentration, and suspended-sediment discharge data collected at gaging stations in the contributing watersheds of the Clarks River National Wildlife Refuge and vicinity, Kentucky and Tennessee.—Continued

[Stations in Lower Ohio–Bay, Lower Ohio, and Lower Tennessee cataloging units and Tennessee R nr Paducah, KY station in Kentucky Lake cataloging unit may be of most interest due to proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure C1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure C1. Calendar year, January 1 through December 31]

USGS station number[a]	Station name	Parameter	Plot frames[b–f]	File name[g]
Upper Mississippi–Kaskaskia–Meramec (0714)—Continued				
Upper Mississippi-Cape Girardeau (07140105)—Continued				
07022000	Mississippi River at Thebes, IL	Gage height, 0800 reading	A1–A4; A5–A8	s07022000g8uv.p12ar.pdf
		Gage height, 0800 reading	A1–A4; A5–A8	s07022000g8uv.p12lg.pdf
		Discharge	A1–A4; A5–A8	s07022000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s07022000qmn.p12lg.pdf
		Suspended-sediment concentration	A1–A4; A5–A8	s07022000scmn.p12ar.pdf
		Suspended-sediment concentration	A1–A4; A5–A8	s07022000scmn.p12lg.pdf
		Suspended-sediment discharge	A1–A4; A5–A8	s07022000sdmn.p12ar.pdf
		Suspended-sediment discharge	A1–A4; A5–A8	s07022000sdmn.p12lg.pdf
07022000coe	Mississippi River at Thebes, IL	Gage height	A1, A2, A4; A5–A8	s07022000coegmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s07022000coegmn.p12lg.pdf
		Gage height, 0800 reading	A1–A4; A5–A8	s07022000coeg8uv.p12ar.pdf
		Gage height, 0800 reading	A1–A4; A5–A8	s07022000coeg8uv.p12ar.pdf

[a]Station numbers with "coe" or "tva" appended to the number are for stations operated in cooperation with either the U.S. Army Corps of Engineers (coe) or the Tennessee Valley Authority (tva), and the data for these table rows were obtained from digital files of these agencies.

[b]A1, mean-daily values; A2, A3, A4, boxplot interpolation of mean-daily values, annual timestep (A2), decadal timestep (A3), monthly timestep, period-of-record (A4); A5, annual-distribution spread measures; A6, annual-distribution ratio measures; A7, annual distribution, log-coefficient of variation, set of every 5th percentile of mean-daily values for each complete calendar year; Richards-Baker flashiness index; A8, long-term daily seasonality.

[c]Percentile spread measures are calculated as the difference between the indicated percentiles divided by the median where 7525 = (p75–p25)/p50, 8020 = (p80–p20/ p50, and 9010 = (p90–p10)/p50.

[d]Percentile ratio measures are calculated as the ratios of the indicated percentiles where 7525 = p75/p25, 8020 = p80/p20, and 9010 = p90/p10.

[e]Richards-Baker flashiness index (Baker and others, 2004).

[f]Plots A2, A5–A7, greater than or equal to 90-percent-complete calendar years only; plot A3, greater than or equal to 90-percent-complete calendar decades only; plot A4, period-of-record monthly distributions for greater than or equal to 90-percent-complete calendar years only; plot A8, period-of-record daily distributions for complete calendar years only—50th percentile, n>1; 25th, 75th percentiles, n>4; 10th, 90th percentiles, n>10.

[g]File-naming conventions: s*SSSSSSSS**var*.p[01,12]***ps***.pdf; *SSSSSSSS*, USGS station identification number; ***var***: gmn, mean-daily gage height, in feet; qmn, mean-daily discharge, in cubic feet per second; tmn, mean-daily water temperature, in degrees Celsius; kmn, mean-daily specific conductance, in microsiemens per centimeter at 25 degrees Celsius; omn, mean-daily dissolved-oxygen concentration, in milligrams per liter; p[01,12], p01, plots A1–A4, p12, plots A1–A4, page 1, plots A5–A8, page 2; ***ps***, plot scale: ar, plots A1–A5, vertical axis arithmetic, plots A6–A8, vertical axis base-10 logarithmic; lg, plots A1–A8, base-10 logarithmic.

Table C–8. Land-cover percentages for Clarks River National Wildlife Refuge and contributing watersheds, Kentucky, Tennessee, and Mississippi, based on the 1992 National Land Cover Database.

[See figure C6 for map of 1992 land cover, HUC names, and subregion names. NLCD, National Land Cover Database; 1992 NLCD (Vogelmann and others, 2001); NWR, National Wildlife Refuge]

Hydrologic cataloging unit or subregion or NWR	Percentage of 1992 NLCD land-cover class[a]															
	11	21	22	23	31	32	33	41	42	43	81	82	83	85	91	92
Cumberland (0513)																
05130101	0.7	0.7	0.1	0.5	0.0	0.2	0.3	71.0	6.6	13.8	4.4	0.9	0.0	0.4	0.5	<0.1
05130102	0.4	0.3	<0.1	0.4	0.0	0.1	0.2	64.0	7.6	15.7	9.4	1.7	0.0	0.3	<0.1	<0.1
05130103	3.6	0.5	0.1	0.4	0.0	<0.1	0.1	52.5	4.4	11.1	20.3	5.9	0.0	0.7	0.4	<0.1
05130104	0.4	0.4	<0.1	0.2	0.0	<0.1	0.2	58.1	13.7	22.2	3.7	0.6	0.0	0.2	<0.1	<0.1
05130105	3.9	0.4	<0.1	0.2	<0.1	0.1	0.2	60.2	5.0	14.3	12.5	2.5	0.0	0.5	0.2	<0.1
05130106	1.9	0.7	0.1	0.4	0.0	<0.1	<0.1	61.8	5.0	11.8	14.4	2.9	0.0	0.7	0.2	<0.1
05130107	0.2	0.6	0.1	0.4	0.0	0.1	0.6	48.6	4.2	8.9	22.0	12.2	0.0	0.3	1.7	<0.1
05130108	1.6	0.6	0.1	0.5	<0.1	<0.1	0.4	53.9	7.7	13.1	16.1	5.0	0.0	0.7	0.2	<0.1
05130201	3.1	2.2	0.3	0.9	0.0	0.2	<0.1	36.6	4.4	13.4	27.1	9.4	0.0	1.5	0.7	0.2
05130202	1.3	9.9	2.5	4.3	0.0	0.1	0.2	43.2	4.2	12.8	11.5	5.9	0.0	3.5	0.6	<0.1
05130203	2.4	2.9	0.6	1.4	0.0	<0.1	0.1	35.5	6.4	16.2	20.7	10.8	0.0	1.6	1.1	0.1
05130204	0.4	1.9	0.2	0.9	0.0	0.1	0.2	50.0	2.5	9.9	23.5	8.8	0.0	1.5	0.1	<0.1
05130205	4.0	0.9	0.1	0.5	<0.1	0.1	0.6	47.7	1.4	4.0	22.6	16.7	0.0	0.4	0.9	0.1
05130206	0.3	1.2	0.3	0.9	0.0	<0.1	1.2	16.6	2.0	3.8	38.7	30.8	0.0	1.3	2.6	0.2
Lower Tennessee (0604)																
06040001	2.0	0.3	0.1	0.2	<0.1	0.1	2.1	53.1	7.3	9.0	12.5	10.6	0.0	0.1	2.4	0.3
06040002	0.6	0.8	0.2	0.7	0.0	0.1	0.1	39.2	3.6	11.3	27.6	14.2	0.0	0.4	1.2	0.1
06040003	0.7	0.6	0.1	0.5	<0.1	0.1	0.5	62.1	1.6	6.2	19.2	7.5	0.0	0.3	0.7	<0.1
06040004	0.5	0.4	0.1	0.3	0.0	<0.1	2.2	69.3	3.7	4.0	10.4	8.1	0.0	0.2	0.8	<0.1
06040005	9.9	0.6	0.1	0.4	0.1	0.1	1.0	53.5	3.8	4.7	13.1	8.9	<0.1	0.1	3.4	0.2
06040006	1.2	2.6	0.3	0.8	<0.1	0.0	0.1	23.8	1.3	3.8	37.9	21.6	0.0	0.4	6.1	<0.1
Hydrologic subregion																
0513	1.9	1.3	0.2	0.7	<0.1	0.1	0.4	50.9	5.3	11.7	17.5	8.6	0.0	0.8	0.7	0.1
0604	3.1	0.7	0.1	0.4	<0.1	0.1	1.1	51.9	4.0	6.9	18.1	10.9	<0.1	0.2	2.3	0.2
National Wildlife Refuge																
Clarks River	0.1	<0.1	0.0	<0.1	0.0	0.0	0.0	12.1	0.2	0.7	5.7	22.5	0.0	0.0	58.7	0.0

[a]1992 NLCD class definitions:

11, open water
21, low-intensity residential
22, high-intensity residential
23, commercial, industrial, transportation
31, bare rock, sand, clay
32, quarries, strip mines, gravel pits
33, transitional
41, deciduous forest
42, evergreen forest
43, mixed forest
81, pasture, hay
82, row crops
83, small grains
85, urban, recreational grasses
91, woody wetlands
92, emergent herbaceous wetlands

Table C–9. Land-cover percentages for Clarks River National Wildlife Refuge and contributing watersheds, Kentucky, Tennessee, and Mississippi, based on the 2001 National Land Cover Database.

[See figure C7 for map of 2001 land cover, HUC names, and hydrologic subregion names. NLCD, National Land Cover Database; 2001 NLCD (Homer and others, 2007); NWR, National Wildlife Refuge]

Hydrologic cataloging unit or subregion or NWR	Percentage of 2001 NLCD land-cover class[a]														
	11	21	22	23	24	31	41	42	43	52	71	81	82	90	95
Cumberland (0513)															
05130101	0.7	5.2	2.2	0.6	0.1	0.6	67.9	1.0	7.1	0.2	7.5	6.9	0.1	<0.1	0.0
05130102	0.4	5.0	2.1	0.4	0.1	0.3	56.7	0.7	10.4	0.4	8.3	15.4	0.1	<0.1	0.0
05130103	3.9	4.3	1.1	0.3	0.1	0.1	56.6	1.0	1.9	0.2	2.9	23.9	3.8	<0.1	<0.1
05130104	0.5	4.5	0.9	0.3	<0.1	0.4	62.4	1.9	15.8	0.3	7.5	5.2	0.1	0.1	0.0
05130105	4.5	4.4	1.3	0.2	<0.1	0.4	62.1	1.5	3.6	0.2	2.5	14.0	5.3	0.1	0.0
05130106	2.5	5.1	1.7	0.4	0.1	0.1	61.4	3.5	1.8	0.2	1.6	12.3	9.1	0.2	<0.1
05130107	0.3	4.4	1.1	0.3	0.1	0.3	39.2	3.8	3.7	3.1	2.2	30.2	9.9	1.5	<0.1
05130108	1.9	4.8	1.8	0.5	0.1	0.5	48.4	6.0	4.7	1.5	3.2	20.1	6.1	0.4	<0.1
05130201	3.4	6.5	2.1	0.6	0.3	0.1	38.0	5.0	3.3	1.5	2.0	33.0	3.9	0.2	<0.1
05130202	1.4	12.7	8.7	3.4	2.1	0.1	42.1	7.1	3.7	0.5	2.9	12.8	2.0	0.4	0.1
05130203	2.3	7.8	5.6	1.4	0.6	0.4	23.7	11.1	5.9	3.7	2.2	30.5	4.7	0.3	<0.1
05130204	0.3	6.3	2.7	0.8	0.2	0.1	48.6	5.2	3.0	0.9	3.4	25.5	2.7	0.2	0.1
05130205	3.8	3.7	0.5	0.2	0.1	0.1	53.2	2.8	0.1	0.1	3.2	14.9	15.9	1.3	0.2
05130206	0.2	7.0	1.3	0.5	0.2	0.1	23.0	2.3	0.2	0.0	0.8	23.4	40.7	0.2	<0.1
Lower Tennessee (0604)															
06040001	2.3	3.4	0.5	0.1	<0.1	0.1	50.0	7.3	2.7	6.6	1.5	11.7	9.4	3.9	0.5
06040002	0.7	5.6	1.4	0.3	0.1	0.1	28.8	5.2	4.9	2.5	1.6	40.7	6.9	1.1	<0.1
06040003	0.6	3.8	0.9	0.3	0.1	<0.1	62.7	2.9	0.9	0.6	3.8	20.2	2.9	0.3	<0.1
06040004	0.3	3.5	0.3	0.1	<0.1	0.1	63.7	5.6	0.9	1.9	2.9	15.5	4.6	0.6	<0.1
06040005	10.4	3.1	0.3	0.2	0.1	0.1	56.9	4.9	<0.1	0.3	2.6	8.0	8.9	4.0	0.3
06040006	1.1	5.6	1.6	0.6	0.4	<0.1	33.0	3.0	0.0	0.1	0.9	13.8	34.9	4.2	0.9
Hydrologic subregion															
0513	2.2	5.4	1.9	0.6	0.2	0.2	48.0	3.7	4.1	0.8	3.3	19.7	9.4	0.4	<0.1
0604	3.3	3.9	0.8	0.2	0.1	0.1	50.7	5.1	1.7	2.4	2.3	17.3	9.4	2.5	0.3
National Wildlife Refuge															
Clarks River	0.2	0.7	0.2	0.1	<0.1	0.0	42.3	1.1	0.0	0.6	<0.1	0.4	20.4	32.3	1.8

[a]2001 NLCD class definitions:

- 11, open water
- 21, developed, open space
- 22, developed, low intensity
- 23, developed, medium intensity
- 24, developed, high intensity
- 31, barren land
- 41, deciduous forest
- 42, evergreen forest
- 43, mixed forest
- 52, shrub, scrub
- 71, grasslands, herbaceous
- 81, pasture, hay
- 82, cultivated crops
- 90, woody wetlands
- 95, emergent herbaceous wetlands

Table C–10. Land-cover change percentages for Clarks River National Wildlife Refuge and contributing watersheds, Kentucky, Tennessee, and Mississippi, from 1992 to 2001, based on the 1992–2001 National Land Cover Database-Land Cover Change Retrofit product.

[See figure C8 for map of 1992–2001 land-cover change, hydrologic-accounting-unit names, and hydrologic subregion names. Positive percent-net-change values indicate a net gain, negative percent-net-change values indicate a net loss. Abbreviations: HUC, hydrologic unit code; NLCD-LCCR, National Land Cover Database-Land Cover Change Retrofit product; 1992–2001 NLCD-LCCR (Fry and others, 2009); NWR, National Wildlife Refuge]

Hydrologic cataloging unit or subregion or NWR	Percentage of HUC/NWR with classification change[a]	Percentage of total HUC area changed in modified Anderson level 1 classifications, 2001[b,c]							Percentage net change from 1992 to 2001 in modified Anderson level 1 classifications[b,d]						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Cumberland (0513)															
05130101	4.5	1.4	17.6	7.2	4.7	45.6	23.5	0.0	1.4	17.6	6.9	–88.8	44.3	18.6	0.0
05130102	4.2	0.9	14.8	3.5	14.2	32.8	33.8	<0.1	0.8	14.8	3.5	–57.0	32.7	5.1	<0.1
05130103	2.7	1.6	11.6	2.0	27.8	15.4	41.6	0.1	0.2	11.5	2.0	–34.8	15.4	5.7	0.1
05130104	3.8	0.6	11.8	5.5	1.9	67.4	12.7	<0.1	0.6	11.8	5.4	–95.0	67.3	9.9	<0.1
05130105	3.3	0.4	7.6	5.4	9.8	24.6	52.2	0.0	0.4	7.6	5.4	–79.1	24.6	41.1	0.0
05130106	2.2	0.1	8.3	0.4	16.4	9.1	65.5	0.1	0.1	8.3	0.4	–64.7	9.1	46.7	0.1
05130107	4.4	0.1	4.9	5.3	6.7	51.6	31.4	<0.1	0.1	4.9	5.3	–86.2	51.6	24.3	<0.1
05130108	4.4	0.1	7.9	7.2	11.8	45.7	27.1	<0.1	0.1	7.9	7.2	–74.8	45.7	13.8	<0.1
05130201	2.7	2.6	29.9	1.6	19.5	12.6	33.5	0.2	2.0	29.4	1.6	–40.8	12.6	–4.9	0.2
05130202	4.0	3.0	49.0	0.4	20.0	10.5	16.1	0.9	2.8	49.0	0.4	–41.1	10.5	–22.5	0.9
05130203	3.1	0.8	55.7	2.6	2.6	18.5	19.7	0.2	0.8	55.5	2.6	–68.3	18.5	–9.3	0.2
05130204	3.7	1.9	37.4	1.2	17.7	14.1	26.9	0.7	1.9	37.3	1.2	–41.0	14.1	–14.2	0.7
05130205	2.4	2.7	7.7	0.3	42.0	12.9	31.0	3.3	0.6	7.7	0.3	–3.0	12.9	–21.9	3.3
05130206	2.4	2.3	26.9	0.7	37.4	2.2	29.5	0.9	1.4	26.9	0.7	–6.1	2.2	–26.1	0.9
Lower Tennessee (0604)															
06040001	6.1	2.1	5.5	0.7	13.8	37.6	37.3	3.1	1.6	5.4	0.7	–68.4	37.1	20.7	2.9
06040002	2.0	1.0	15.3	1.2	8.6	25.3	48.2	0.2	1.0	15.1	1.2	–74.9	25.3	32.0	0.2
06040003	3.5	3.3	11.5	0.4	19.7	26.2	38.2	0.7	1.8	10.9	0.4	–51.9	26.2	11.8	0.7
06040004	5.5	1.0	5.7	0.6	14.7	39.5	37.8	0.8	0.8	5.3	0.6	–68.3	39.1	21.7	0.8
06040005	3.3	3.3	6.1	0.5	31.0	10.7	43.2	5.3	1.0	5.8	0.5	–28.1	10.7	4.8	5.3
06040006	2.2	4.4	10.7	0.4	36.1	2.4	38.6	7.3	4.2	10.5	0.4	–13.4	2.4	–11.3	7.2
Hydrologic subregion															
0513	3.4	1.3	18.1	3.9	15.8	31.0	29.4	0.5	0.9	18.0	3.9	–59.6	30.8	5.5	0.5
0604	4.0	2.4	7.6	0.6	18.8	28.3	39.5	2.8	1.5	7.4	0.6	–55.9	28.1	15.7	2.7
National Wildlife Refuge															
Clarks River	4.0	2.1	0.3	0.0	55.5	2.1	13.7	26.2	1.4	0.3	0.0	40.1	2.1	–70.1	26.2

[a]Areal percentage of 30-meter cells that were reclassified between 1992 and 2001 using methods described in Fry and others (2009). The reclassified area is used as the base for comparison in presenting the modified Anderson Level 1 classification and net-change percentages for 2001.

[b]Classifications modified from Anderson level 1 land-cover classifications (Anderson and others, 1976):

1, water 5, grassland
2, urban 6, agriculture
3, barren 7, wetland
4, forest

[c]Percentages given are of the portion of the HUC/NWR that changed classification between 1992 and 2001.

[d]The interpretation would be a conversion from the classification(s) with negative values to the classification(s) with positive values. For example, in the 6.1 percent of HUC 06040001 that changed classification between 1992 and 2001, primarily forest land was converted to either grassland or agriculture. The net gains in modified Anderson level 1 classification balance the net losses.

Chapter D. Hydrologic and Landscape Database for the Lower Suwannee National Wildlife Refuge and Contributing Watersheds in Georgia and Florida

Introduction

This chapter, along with the information provided in Part I of this report, describes and documents the development, use, and context of a hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge (NWR) and contributing watersheds in the hydrologic subregion, Suwannee, 0311 (fig. D1) in Georgia and Florida. NWR-management objectives for the Lower Suwannee NWR (table D1; Buell and others, 2009; U.S. Fish and Wildlife Service, undated[a].; Larry Woodward, U.S. Fish and Wildlife Service, written commun., November 19, 2014; U.S. Fish and Wildlife Service, undated[b]) include reforestation of native longleaf/wiregrass and mixed hardwood vegetation, and management of forest habitat with prescribed fires and wildfire control. Additionally, protection of habitat for threatened and endangered bird species, hunting management of deer and hog populations, and expansion of monitoring and research for wildlife habitat and populations are important objectives. Protection and maintenance of lower reaches of the Suwannee River ecosystem, water quality, and quantity are overall goals of the NWR. The NWR also offers opportunities for recreational activities and environmental education.

NWR Setting and Environmental Issues

The Lower Suwannee NWR was established in 1979 to protect the lower Suwannee River ecosystem. The NWR is located in Dixie and Levy Counties, Florida, and is managed out of Chiefland, Florida. It presently includes 52,935 acres; approximately 36,000 acres are wetlands, and the remaining area is uplands (Buell and others, 2009; Thom and others, 2015; U.S. Fish and Wildlife Service, undated[a]; Larry Woodward, U.S. Fish and Wildlife Service, written commun., November 19, 2014; U.S. Fish and Wildlife, undated[b]).

Environmental issues threatening the Lower Suwannee NWR include the negative effects of previous land management practices, such as commercial forestry and grazing, on natural water flow, exotic wildlife, and plant species, conversion of freshwater swamps to marshes, and impacts on water quality and quantity from water demand. In particular, groundwater withdrawals (especially during drought) and potential future climate-related impacts are of concern (Thom and others, 2015; Larry Woodward, U.S. Fish and Wildlife Service, written commun., November 19, 2014; U.S. Fish and Wildlife, undated[a]). Data compiled for this database are important for assessing these environmental issues because the data characterize the hydrologic and water-quality setting for the Lower Suwannee NWR. For example, discharge and gage height data set context for historical and current water availability and provide a foundation for future water demand scenarios.

Physiographic Setting

The contributing watershed area for the Lower Suwannee NWR, as defined in this report, is the hydrologic subregion (4-digit hydrologic unit), 0311, Suwannee (fig. D1) (Seaber and others, 1994; U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013). The drainage area of the Suwannee subregion is 13,519 square miles.

The Lower Suwannee NWR is located in the southern part of the Suwannee subregion and includes parts of the Big Bend Coastal Marsh and Gulf Coast Flatwoods U.S. Environmental Protection Agency (EPA) Level IV ecoregions (fig. D2; U.S. Environmental Protection Agency, 2011). The Suwannee subregion is composed of 11 Level IV ecoregions. Mean-annual precipitation for the contributing-watershed area ranges from 45 to 60 inches per year (in/yr) based on 1981–2010 climate normals (PRISM Climate Group, 2012). Mean-annual runoff for the period 1951–80 (Gebert and others, 1987) ranges from 8 in/yr in the southern part of the Suwannee subregion to 15 in/yr in both the eastern and western parts of the subregion. Figures D3*A*–*E* show the distribution of the hydrologic soil groups (HSGs) A through D and mixed HSG for the 70 10-digit hydrologic cataloging units (HUC10) in the contributing-watershed area as areal percentages of each HUC10.

Data and Database Files

Hydrologic and Landscape Data

Twenty-six gaging stations were selected to be included in the hydrologic and landscape database for the Lower Suwannee NWR and contributing watersheds (fig. D1; tables D2*A*, *B* [tables D2–D15 are at the end of the chapter]). Continuous hydrologic data collected at these stations include mean-daily values for gage height, discharge, water temperature, specific conductivity, and salinity. Station characteristics are presented in table D2*A*, and station periods of record for available continuous data from each site are presented in table D2*B*. Six stations have daily record for discharge only, 1 station has daily record for gage height only, 14 stations have daily record for both discharge and gage height, 4 stations have daily record for discharge, gage height, and at least one type of water-quality data (2 with temperature data, 1 with specific conductivity data, and 1 with temperature, specific conductivity, and salinity data), and 1 station has daily record for discharge, temperature, and salinity data (table D2*B*). Gaging station characteristics were retrieved from the U.S. Geological Survey (USGS) National Water Information System (NWISWeb) database (U.S. Geological Survey, 2002, 2011) and Georgia Department of Transportation, written commun., 2011. Hydrologic data were retrieved from USGS NWISWeb (U.S. Geological Survey, 2002, 2011).

Tabular and spatial landscape data were compiled. Categories of tabular landscape data summarized in Microsoft Excel files in the database include ecoregion, land cover, population, and soils data. Spatial data mapped in this report include ecoregions, land cover, soils, geographic and hydrologic boundaries, hydrography, and site locations.

Database Files

Database files are organized into three directories: (1) data, (2) iha, and (3) plots_pdf. The data directory contains three subdirectories: (1) access, (2) ascii, and (3) excel. The access subdirectory contains two Microsoft Access files with raw hydrologic data (lsr_tabular_hydrostats_raw.accdb) and statistical summary data (lsr_tabular_hydrostats.accdb). The raw data are aggregated by calendar year (January 1 through December 31) and water year (October 1 through September 30) for annual summaries, and also by calendar decade, calendar year and month, calendar month of the period of record, and Julian day of the period of record for both calendar and water years. The long-term (period of record) monthly and daily summary data are for complete years only. The long-term monthly summary data are based on both mean-daily values and monthly mean values. The ascii subdirectory contains raw NWISWeb data files that follow the naming convention sSSSSSSSSdv_rdb, where SSSSSSSS is the USGS station identification number and dv is daily value. The excel subdirectory contains four Microsoft Excel files summarizing ecoregion (lsr_eco34.xlsx), land cover (lsr_nlcd.xlsx), population (lsr_pop_census.xlsx), and soils (lsr_sgo_hsg.xlsx) data. The iha directory contains Microsoft Excel files with Indicators of Hydrologic Alteration (IHA) outputs for each station and parameter combination in which IHA computations were completed. The files follow the naming convention sSSSSSSSS_iha_[gmn,qmn].xlsx, where SSSSSSSS is the USGS station identification number, gmn is mean-daily gage height, and qmn is mean-daily discharge. In addition, two IHA summary workbooks are included that contain all IHA results for gage height data (regional_iha_gmn_lsr.xlsx) and discharge data (regional_iha_qmn_lsr.xlsx). The plots_pdf directory contains Adobe portable document file (PDF) plot files. A list of the database files, tables and worksheets, and table and worksheet descriptions is included in table D3*A*. A list of database field names, field types, and field definitions is included in table D3*B*. Periods of record for mean-daily gage height and mean-daily discharge data used in IHA analyses are shown in figures D4 and D5, respectively.

Database Summary Data

This section includes statistical and graphical summaries of the hydrologic data and IHA summary data, and zonal summaries of the National Land Cover Database (NLCD) land-cover and land-cover-change data. The summary data describe the data in the database, provide a context for hydrologic analysis, and can help database users determine which data are suitable for answering specific NWR hydrologic questions related to environmental issues discussed above.

Hydrologic Statistical and Graphical Summary

A station-level summary of the hydrologic data by both water year and calendar year is presented in tables D4–D6. The primary purpose of these summary tables is to provide database users with information on the quantity and quality of available data, facilitate comparisons between stations, and provide a benchmark for evaluating current hydrologic conditions within the context of the long-term record. Tables D4*A* (water year) and D4*B* (calendar year) summarize the mean-annual and mean-daily gage-height values for each gaging station. The mean, minimum, and maximum values and the 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles are given for mean-annual gage height, and the minimum and maximum and the same percentiles are also given for mean-daily gage height. The water or calendar year is indicated for the minimum and maximum values for mean-annual and mean-daily gage height. Tables D5*A* (water year) and D5*B* (calendar year) present the same statistics for discharge (with the addition of long-term yield). Tables D6*A* and D6*B* present the same statistics for selected water-quality parameters. Table D7 lists the graphical summary plots available for each gaging station. Plot files are located in the plots_pdf directory of the database. See Part I of this report for a detailed description of plot files.

Interstation Comparison of Indicators of Hydrologic Alteration

IHA results are summarized in two separate Microsoft Excel workbooks as regional analyses for gage height (regional_iha_gmn_lsr.xlsx) and discharge (regional_iha_qmn_lsr.xlsx). Data are presented in downstream order for comparison. The IHA output has been reorganized in these workbooks to facilitate interstation comparisons. The regional IHA workbooks contain the following worksheets: 5 each for the 1-, 3-, 7-, 30-, and 90-day minimum and maximum values, 1 with the baseflow-index values, 1 with a plot of the

75th–25th percentile spread measure, a summary worksheet, and 1 for each station with the complete IHA analysis for that station included. This reorganization facilitates interstation comparison by compiling all of the IHA results into one place.

Landscape GIS Layers

Figures D6–D8 and tables D8–D10 present the land-cover and land-use data for the geographic extent based on the 1992 NLCD (Vogelmann and others, 2001), 2001 NLCD (Homer and others, 2007), and 1992–2001 NLCD-Land Cover Change Retrofit (LCCR) product (Fry and others, 2009) datasets. Land-cover and land-use percentages derived from the 1992 NLCD and 2001 NLCD data are summarized by hydrologic cataloging unit, subregion, and NWR boundary in tables D8 and D9. The land-cover change percentages derived from 1992–2001 NLCD-LCCR are presented in table D10.

Summary

This chapter, along with methods described in Part I of this report, documents the development, use, and context of a hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge (NWR) and contributing watersheds in Florida and Georgia. The contributing watersheds include those within the Suwannee hydrologic subregion (0311) with total drainage area of 13,519 square miles. The NWR is located in the southern part of the Suwannee hydrologic subregion, within parts of the Big Bend Coastal Marsh and Gulf Coast Flatwoods U.S. Environmental Protection Agency Level IV ecoregions. Activities throughout this geographic extent, particularly impacts to water quality and quantity due to residential, commercial, and agricultural competition for water, all have potential to either directly or indirectly impact the NWR. The contents of this database are useful for assessing these environmental issues to inform management decisions.

References Cited in Part II, Chapter D

Anderson, J.R., Hardy, E.E., Roach, J.T., and Witmer, R.E., 1976, A land use and land cover classification system for use with remote sensor data: U.S. Geological Survey Professional Paper 964, 28 p.

Baker, D.B., Richards, Peter, Loftus, T.T., and Kramer, J.W., 2004, A new flashiness index: characteristics and applications to midwestern rivers and streams: Journal of the American Water Resources Association , v. 40, p. 503–522.

Buell, G.R., Calhoun, D.L., and Wehmeyer, L.L., 2009, Hydrologic and land-use/land-cover metrics used in ecological assessments of six U.S. Fish and Wildlife Service National Wildlife Refuges in the Southeastern U.S.A., *in* Proceedings of the 2009 Georgia Water Resources Conference, April 27–29, 2009, Athens, Ga., 8 p.

Fry, J.A., Coan, M.J., Homer, C.G., Meyer, D.K., and Wickham, J.D., 2009, Completion of the National Land Cover Database (NLCD) 1992–2001 Land Cover Change Retrofit product: U.S. Geological Survey Open-File Report 2008–1379, 18 p., accessed March 23, 2015, at http://www.mrlc.gov/nlcdrlc.php.

Gebert, W.A., Graczyk, D.J., and Krug, W.R., 1987, Average annual runoff in the United States, 1951–80: U.S. Geological Survey Hydrologic Investigations Atlas HA–710, scale 1:7,500,000, accessed March 21, 2011, at https://pubs.er.usgs.gov/publication/ha710.

Homer, C., Dewitz, J., Fry, J., Coan, M., Hossain, N., Larson, C., Herold, N., McKerrow, A., VanDriel, J.N., and Wickham, J., 2007, Completion of the 2001 National Land Cover Database for the Conterminous United States, Photogrammetric Engineering and Remote Sensing: U.S. Geological Survey National Land Cover Database 2001 (NLCD 2001), v. 73, no. 4, p. 337–341, accessed March 23, 2015, at http://www.mrlc.gov/nlcd2001.php.

PRISM Climate Group [Oregon State University], 2012, United States average annual precipitation, 1981–2010 (4km; BIL), accessed March 10, 2015, at http://prism.oregonstate.edu.

Richter, B.D., Baumgartner, J.V., Powell, J., and Braun, D.P., 1996, A method for assessing hydrologic alteration within ecosystems: Conservation Biology, v. 10, p. 1163–1174.

Seaber, P.R., Kapinos, F.P., and Knapp, G.L., 1994, Hydrologic unit maps: U.S. Geological Survey Water-Supply Paper 2294, 66 p.

The Nature Conservancy, 2009, Indicators of hydrologic alteration, Version 7.1, User's manual: The Nature Conservancy with rPurview LLC-Ted Rybicki, Totten Software Design, Smythe Scientific Software, 81 p., accessed April 1, 2015, at http://www.conservationgateway.org/ConservationPractices/Freshwater/EnvironmentalFlows/MethodsandTools/IndicatorsofHydrologicAlteration/Documents/IHAV7.pdf.

Thom, T.A., Hunt, K.J., and Faustini, J., 2015, Water Resource Inventory and Assessment (WRIA)—Lower Suwannee National Wildlife Refuge, Dixie and Levy Counties, Florida: U.S. Fish and Wildlife Service, Southeast Region, 151 p. plus appendixes. [Also available at http://ecos.fws.gov/ServCatFiles/reference/holding/44772.]

U.S. Census Bureau, 2011, 2010 Census TIGER/Line Shapefiles, accessed February 14, 2011, at http://www.census.gov/geo/www/tiger/tgrshp2010/tgrshp2010.html.

U.S. Department of Agriculture, 1994, State soil geographic (STATSGO) data base—Data use information: Natural Resources Conservation Service, National Soil Survey Center, Miscellaneous Publication Number 1492, 35 p.

U.S. Department of Agriculture, 2009, Hydrologic soil groups, Chapter 7 *in* National Engineering Handbook, Part 630, Hydrology: Natural Resources Conservation Service, 210-VI-NEH, 13 p., accessed March 12, 2015, at http://policy.nrcs.usda.gov/.

U.S. Environmental Protection Agency, 2011, Level III and IV ecoregions of the continental United States: Western Ecology Division, accessed November 30, 2016, at https://catalog.data.gov/dataset/u-s-level-iii-and-iv-ecoregions-u-s-epa.

U.S. Fish and Wildlife Service, undated[a], Lower Suwannee & Cedar Keys National Wildlife Refuges, Comprehensive conservation plans: U.S. Fish and Wildlife Service, 146 p.

U.S. Fish and Wildlife Service, undated[b], Lower Suwannee National Wildlife Refuge: U.S. Fish and Wildlife Service Fact Sheet, 2 p., accessed March 24, 2015, at http://www.fws.gov/southeast/pubs/facts/swecon.pdf.

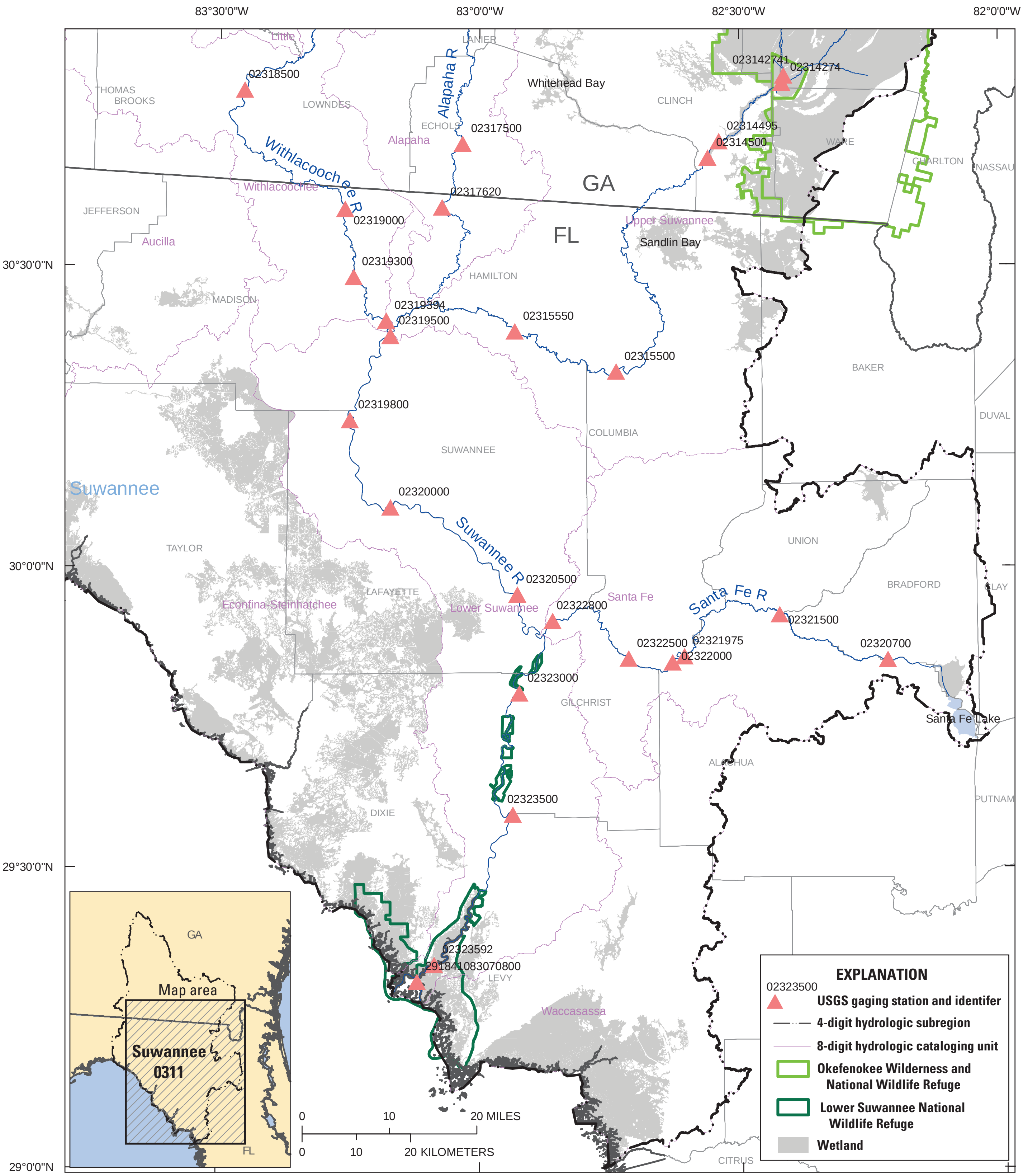
U.S. Geological Survey, 2002, NWISWeb—New site for the Nation's water data: U.S. Geological Survey Fact Sheet FS–128–02, 2 p., accessed March 24, 2015, at http://pubs.usgs.gov/fs/fs-128-02/.

U.S. Geological Survey, 2011, USGS water data for the Nation, National Water Information System, Web database (NWISWeb), accessed February 11, 2011, at http://waterdata.usgs.gov/usa/nwis/nwis.

U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013, Federal Standards and Procedures for the National Watershed Boundary Dataset (WBD) (4th ed.): U.S. Geological Survey Techniques and Methods, book 11, chap. A3, 77 p.

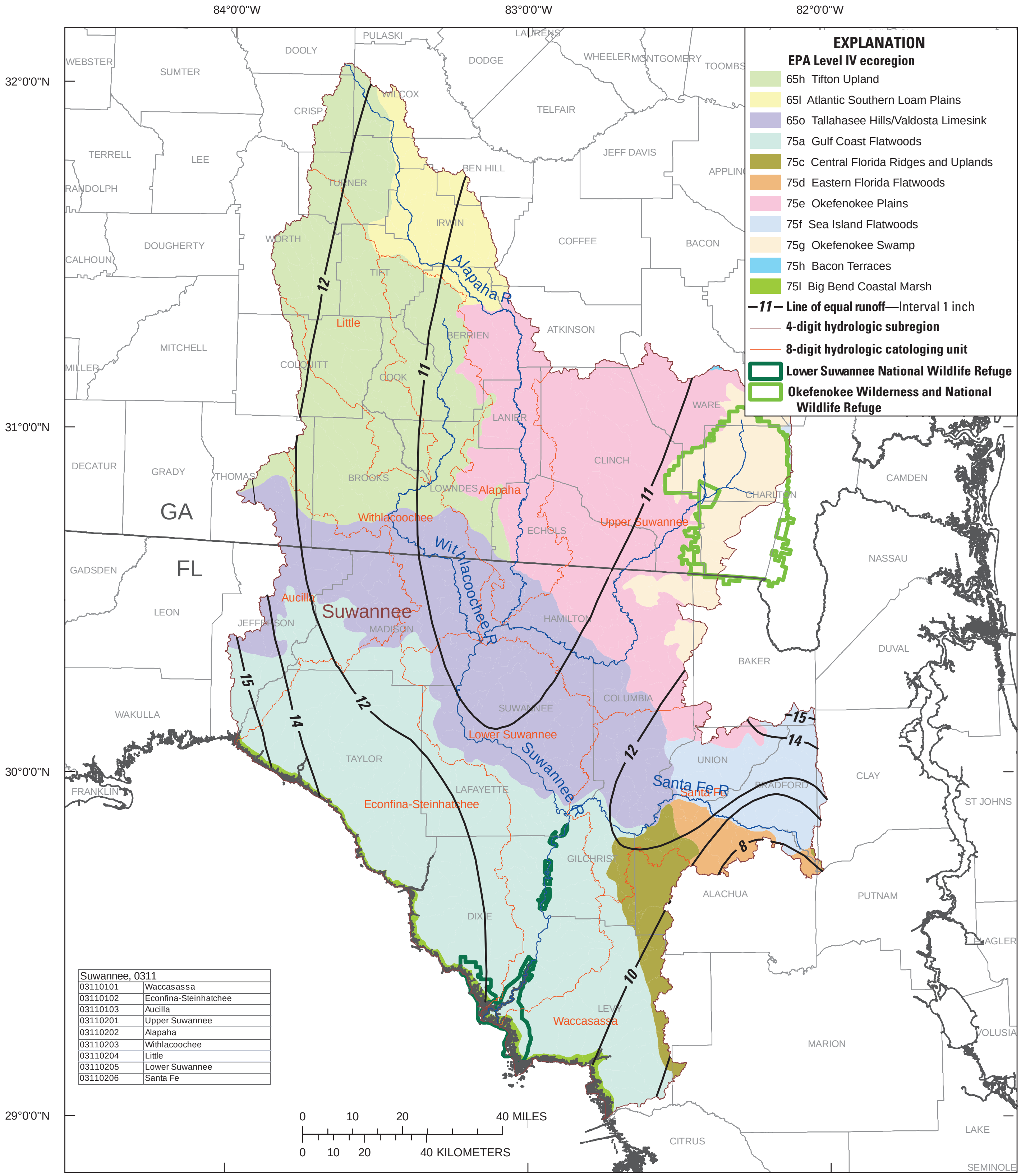
Vogelmann, J.E., Howard, S.M., Yang, Limin, Larson, C.R., Wylie, B.K., and Van Driel, J.N., 2001, Completion of the 1990s National Land Cover Data Set for the conterminous United States from Landsat thematic mapper data and ancillary data sources, Photogrammetric Engineering and Remote Sensing, v. 67, p. 650–662, accessed March 23, 2015, at http://www.mrlc.gov/nlcd1992.php.

Wolock, D.M., 1997, STATSGO soil characteristics for the conterminous United States: U.S. Geological Survey Open-File Report 97–656, accessed March 23, 2015, at http://water.usgs.gov/GIS/metadata/usgswrd/XML/muid.xml.



Base modified from U.S. Geological Survey digital data, various scales

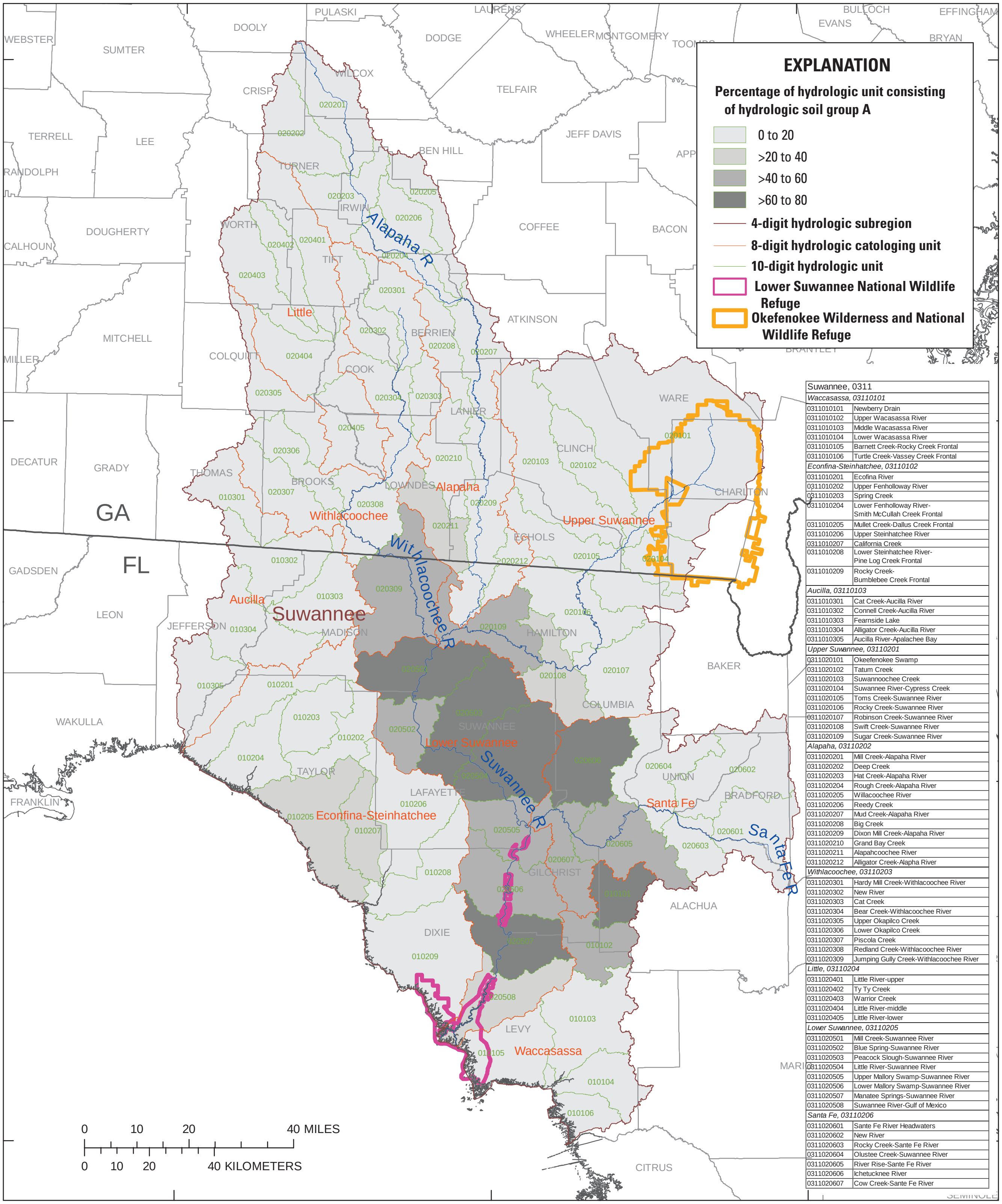
Figure D1. Location of the Lower Suwannee National Wildlife Refuge (NWR) and vicinity with major contributing watersheds, waterways, gaging stations, and the Okefenokee Wilderness and NWR in Georgia and Florida. Map inset, lower left, shows the hydrologic subregion (4-digit hydrologic unit) that defines the contributing watershed area for the Lower Suwannee NWR (Lower Suwannee, 0311). [USGS, U.S. Geological Survey]



Base modified from U.S. Geological Survey digital data, various scales

Figure D2. Location of the Lower Suwannee National Wildlife Refuge (NWR), Okefenokee Wilderness and NWR, Suwannee hydrologic subregion (0311), hydrologic cataloging units, lines of equal mean-annual runoff for the period 1951–80 (Gebert and others, 1987), and U.S. Environmental Protection Agency (EPA) Level IV ecoregions in the Suwanee River watershed (U.S. Environmental Protection Agency, 2011).

A



Suwannee, 0311	
Waccasassa, 03110101	
0311010101	Newberry Drain
0311010102	Upper Wacasassa River
0311010103	Middle Wacasassa River
0311010104	Lower Wacasassa River
0311010105	Barnett Creek-Rocky Creek Frontal
0311010106	Turtle Creek-Vassey Creek Frontal
Econfina-Steinhatchee, 03110102	
0311010201	Ecofina River
0311010202	Upper Fenholloway River
0311010203	Spring Creek
0311010204	Lower Fenholloway River-Smith McCullah Creek Frontal
0311010205	Mullet Creek-Dallus Creek Frontal
0311010206	Upper Steinhatchee River
0311010207	California Creek
0311010208	Lower Steinhatchee River-Pine Log Creek Frontal
0311010209	Rocky Creek-Bumblebee Creek Frontal
Aucilla, 03110103	
0311010301	Cat Creek-Aucilla River
0311010302	Connell Creek-Aucilla River
0311010303	Fearnside Lake
0311010304	Alligator Creek-Aucilla River
0311010305	Aucilla River-Apalachee Bay
Upper Suwannee, 03110201	
0311020101	Okeefenokee Swamp
0311020102	Tatum Creek
0311020103	Suwannoochee Creek
0311020104	Suwannee River-Cypress Creek
0311020105	Toms Creek-Suwannee River
0311020106	Rocky Creek-Suwannee River
0311020107	Robinson Creek-Suwannee River
0311020108	Swift Creek-Suwannee River
0311020109	Sugar Creek-Suwannee River
Alapaha, 03110202	
0311020201	Mill Creek-Alapaha River
0311020202	Deep Creek
0311020203	Hat Creek-Alapaha River
0311020204	Rough Creek-Alapaha River
0311020205	Willacoochee River
0311020206	Reedy Creek
0311020207	Mud Creek-Alapaha River
0311020208	Big Creek
0311020209	Dixon Mill Creek-Alapaha River
0311020210	Grand Bay Creek
0311020211	Alapahcoochee River
0311020212	Alligator Creek-Alapha River
Withlacoochee, 03110203	
0311020301	Hardy Mill Creek-Withlacoochee River
0311020302	New River
0311020303	Cat Creek
0311020304	Bear Creek-Withlacoochee River
0311020305	Upper Okapilco Creek
0311020306	Lower Okapilco Creek
0311020307	Piscola Creek
0311020308	Redland Creek-Withlacoochee River
0311020309	Jumping Gully Creek-Withlacoochee River
Little, 03110204	
0311020401	Little River-upper
0311020402	Ty Ty Creek
0311020403	Warrior Creek
0311020404	Little River-middle
0311020405	Little River-lower
Lower Suwannee, 03110205	
0311020501	Mill Creek-Suwannee River
0311020502	Blue Spring-Suwannee River
0311020503	Peacock Slough-Suwannee River
0311020504	Little River-Suwannee River
0311020505	Upper Mallory Swamp-Suwannee River
0311020506	Lower Mallory Swamp-Suwannee River
0311020507	Manatee Springs-Suwannee River
0311020508	Suwannee River-Gulf of Mexico
Santa Fe, 03110206	
0311020601	Sante Fe River Headwaters
0311020602	New River
0311020603	Rocky Creek-Sante Fe River
0311020604	Olustee Creek-Suwannee River
0311020605	River Rise-Sante Fe River
0311020606	Ichetucknee River
0311020607	Cow Creek-Sante Fe River

Base modified from U.S. Geological Survey digital data, various scales

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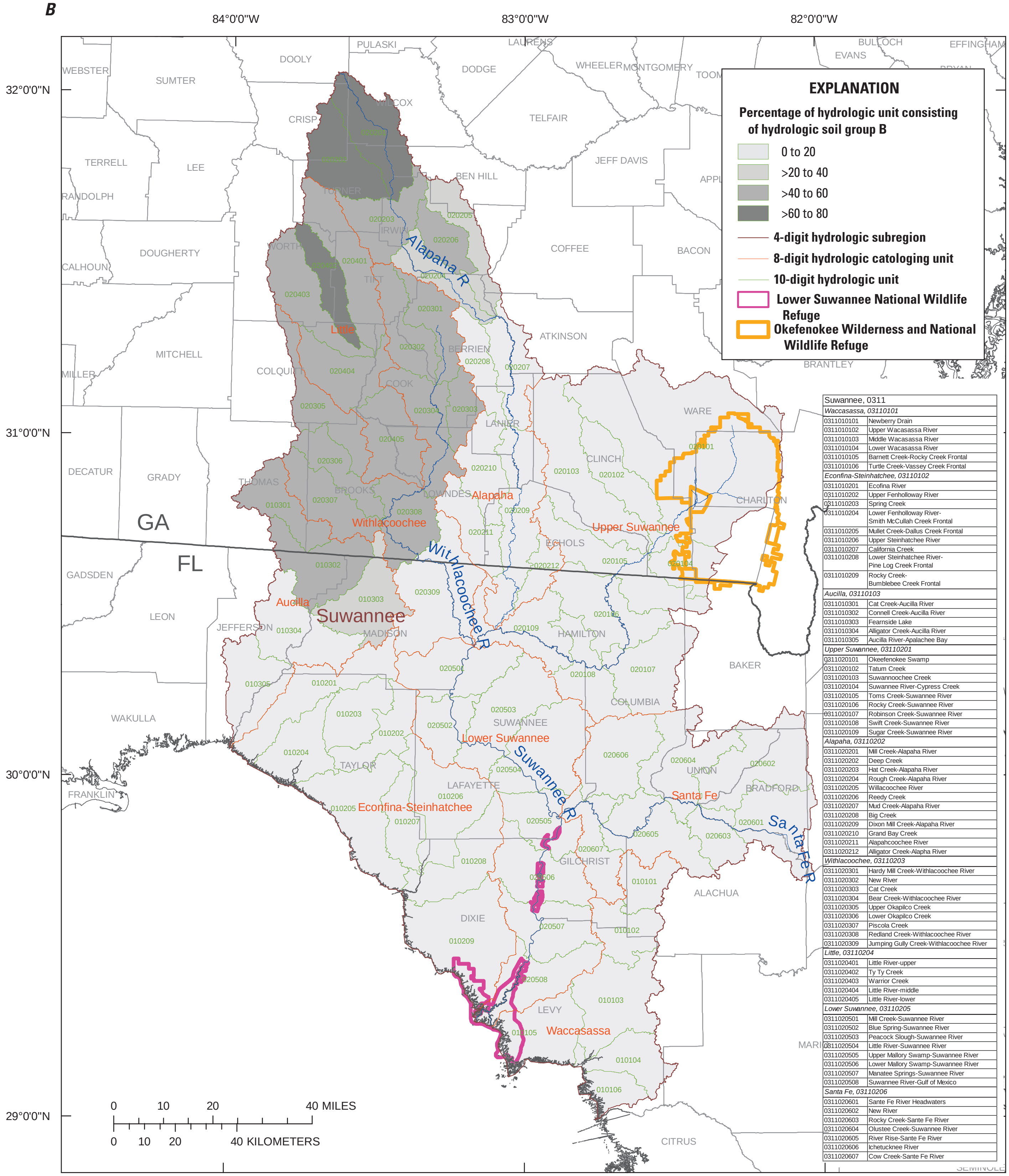
B



Suwannee, 0311	
Waccasassa, 03110101	
0311010101	Newberry Drain
0311010102	Upper Wacasassa River
0311010103	Middle Wacasassa River
0311010104	Lower Wacasassa River
0311010105	Barnett Creek-Rocky Creek Frontal
0311010106	Turtle Creek-Vassey Creek Frontal
Econfina-Steinhatchee, 03110102	
0311010201	Ecofina River
0311010202	Upper Fenholloway River
0311010203	Spring Creek
0311010204	Lower Fenholloway River-Smith McCullah Creek Frontal
0311010205	Mullet Creek-Dallus Creek Frontal
0311010206	Upper Steinhatchee River
0311010207	California Creek
0311010208	Lower Steinhatchee River-Pine Log Creek Frontal
0311010209	Rocky Creek-Bumblebee Creek Frontal
Aucilla, 03110103	
0311010301	Cat Creek-Aucilla River
0311010302	Connell Creek-Aucilla River
0311010303	Fearnside Lake
0311010304	Alligator Creek-Aucilla River
0311010305	Aucilla River-Apalachee Bay
Upper Suwannee, 03110201	
0311020101	Okeefenokee Swamp
0311020102	Tatum Creek
0311020103	Suwannoochee Creek
0311020104	Suwannee River-Cypress Creek
0311020105	Toms Creek-Suwannee River
0311020106	Rocky Creek-Suwannee River
0311020107	Robinson Creek-Suwannee River
0311020108	Swift Creek-Suwannee River
0311020109	Sugar Creek-Suwannee River
Alapaha, 03110202	
0311020201	Mill Creek-Alapaha River
0311020202	Deep Creek
0311020203	Hat Creek-Alapaha River
0311020204	Rough Creek-Alapaha River
0311020205	Willacoochee River
0311020206	Reedy Creek
0311020207	Mud Creek-Alapaha River
0311020208	Big Creek
0311020209	Dixon Mill Creek-Alapaha River
0311020210	Grand Bay Creek
0311020211	Alapahcoochee River
0311020212	Alligator Creek-Alapha River
Withlacoochee, 03110203	
0311020301	Hardy Mill Creek-Withlacoochee River
0311020302	New River
0311020303	Cat Creek
0311020304	Bear Creek-Withlacoochee River
0311020305	Upper Okapilco Creek
0311020306	Lower Okapilco Creek
0311020307	Piscola Creek
0311020308	Redland Creek-Withlacoochee River
0311020309	Jumping Gully Creek-Withlacoochee River
Little, 03110204	
0311020401	Little River-upper
0311020402	Ty Ty Creek
0311020403	Warrior Creek
0311020404	Little River-middle
0311020405	Little River-lower
Lower Suwannee, 03110205	
0311020501	Mill Creek-Suwannee River
0311020502	Blue Spring-Suwannee River
0311020503	Peacock Slough-Suwannee River
0311020504	Little River-Suwannee River
0311020505	Upper Mallory Swamp-Suwannee River
0311020506	Lower Mallory Swamp-Suwannee River
0311020507	Manatee Springs-Suwannee River
0311020508	Suwannee River-Gulf of Mexico
Santa Fe, 03110206	
0311020601	Sante Fe River Headwaters
0311020602	New River
0311020603	Rocky Creek-Sante Fe River
0311020604	Olustee Creek-Suwannee River
0311020605	River Rise-Sante Fe River
0311020606	Ichetucknee River
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Base modified from U.S. Geological Survey digital data, various scales

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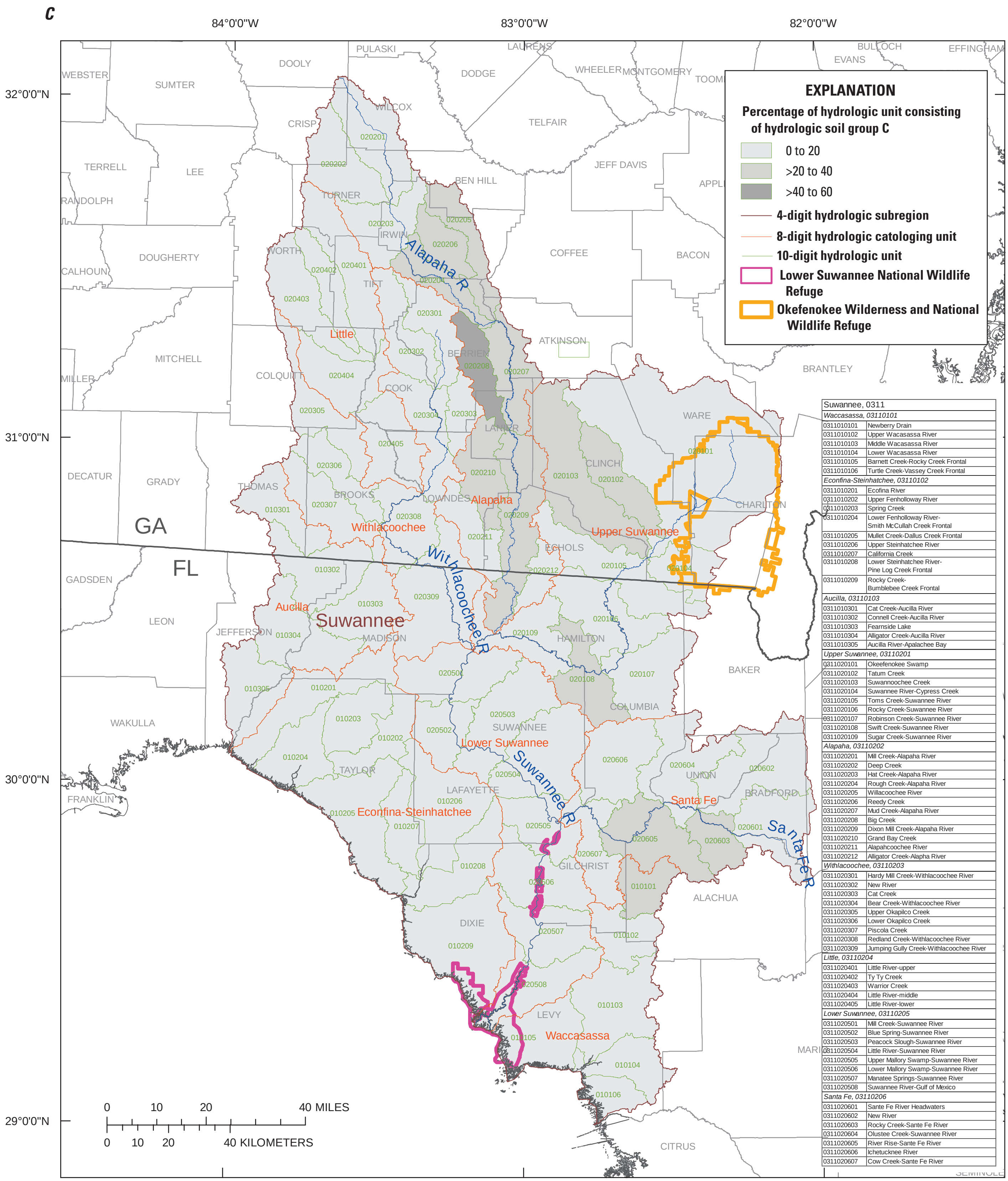

Base modified from U.S. Geological Survey digital data, various scales

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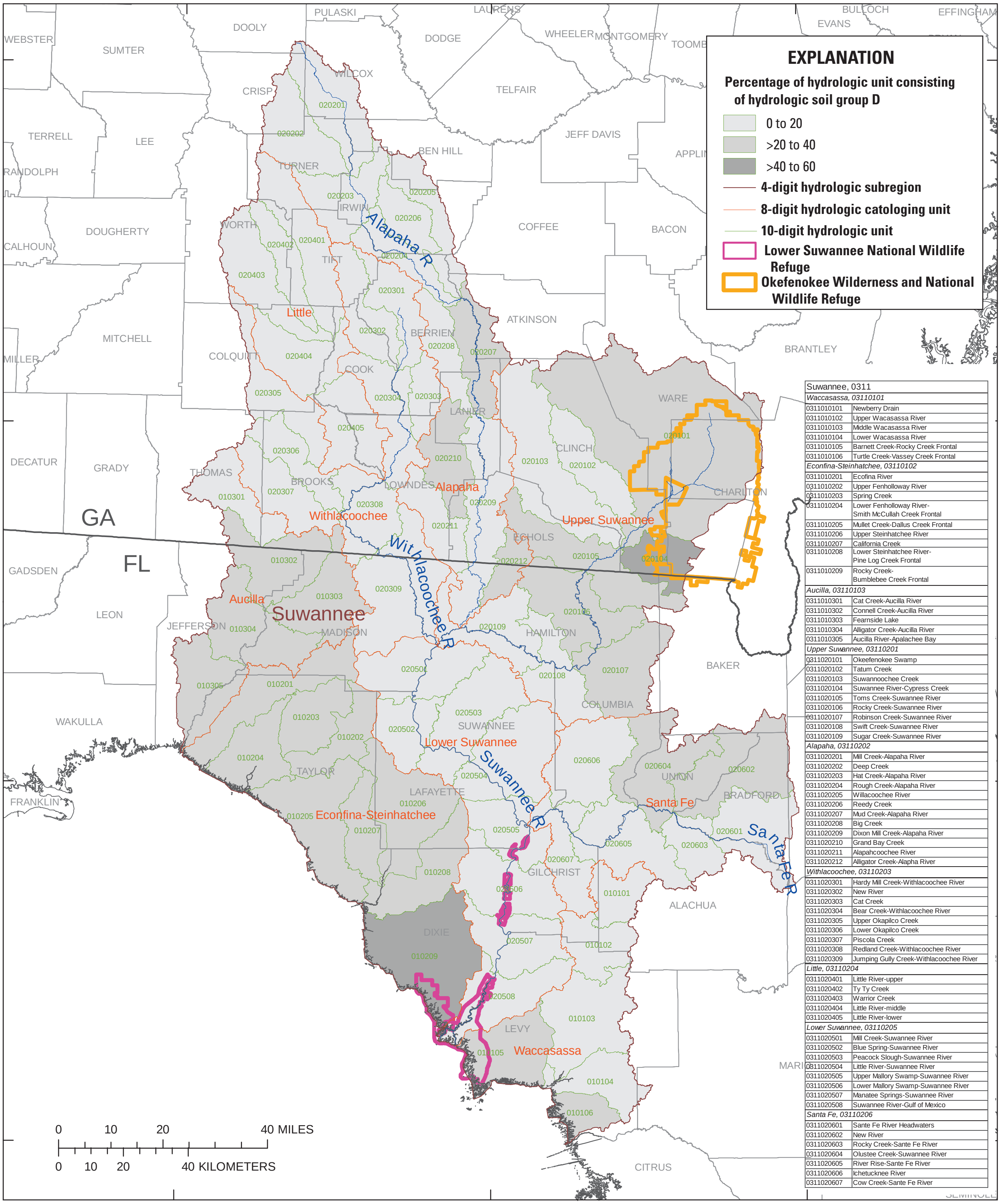
D



Suwannee, 0311	
Waccasassa, 03110101	
0311010101	Newberry Drain
0311010102	Upper Wacasassa River
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0311010106	Turtle Creek-Vassey Creek Frontal
Econfina-Steinhatchee, 03110102	
0311010201	Ecofina River
0311010202	Upper Fenholloway River
0311010203	Spring Creek
0311010204	Lower Fenholloway River-Smith McCullah Creek Frontal
0311010205	Mullet Creek-Dallus Creek Frontal
0311010206	Upper Steinhatchee River
0311010207	California Creek
0311010208	Lower Steinhatchee River-Pine Log Creek Frontal
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Aucilla, 03110103	
0311010301	Cat Creek-Aucilla River
0311010302	Connell Creek-Aucilla River
0311010303	Fearnside Lake
0311010304	Alligator Creek-Aucilla River
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0311020101	Okeefenokee Swamp
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0311020108	Swift Creek-Suwannee River
0311020109	Sugar Creek-Suwannee River
Alapaha, 03110202	
0311020201	Mill Creek-Alapaha River
0311020202	Deep Creek
0311020203	Hat Creek-Alapaha River
0311020204	Rough Creek-Alapaha River
0311020205	Willacoochee River
0311020206	Reedy Creek
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0311020209	Dixon Mill Creek-Alapaha River
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0311020211	Alapahcoochee River
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0311020301	Hardy Mill Creek-Withlacoochee River
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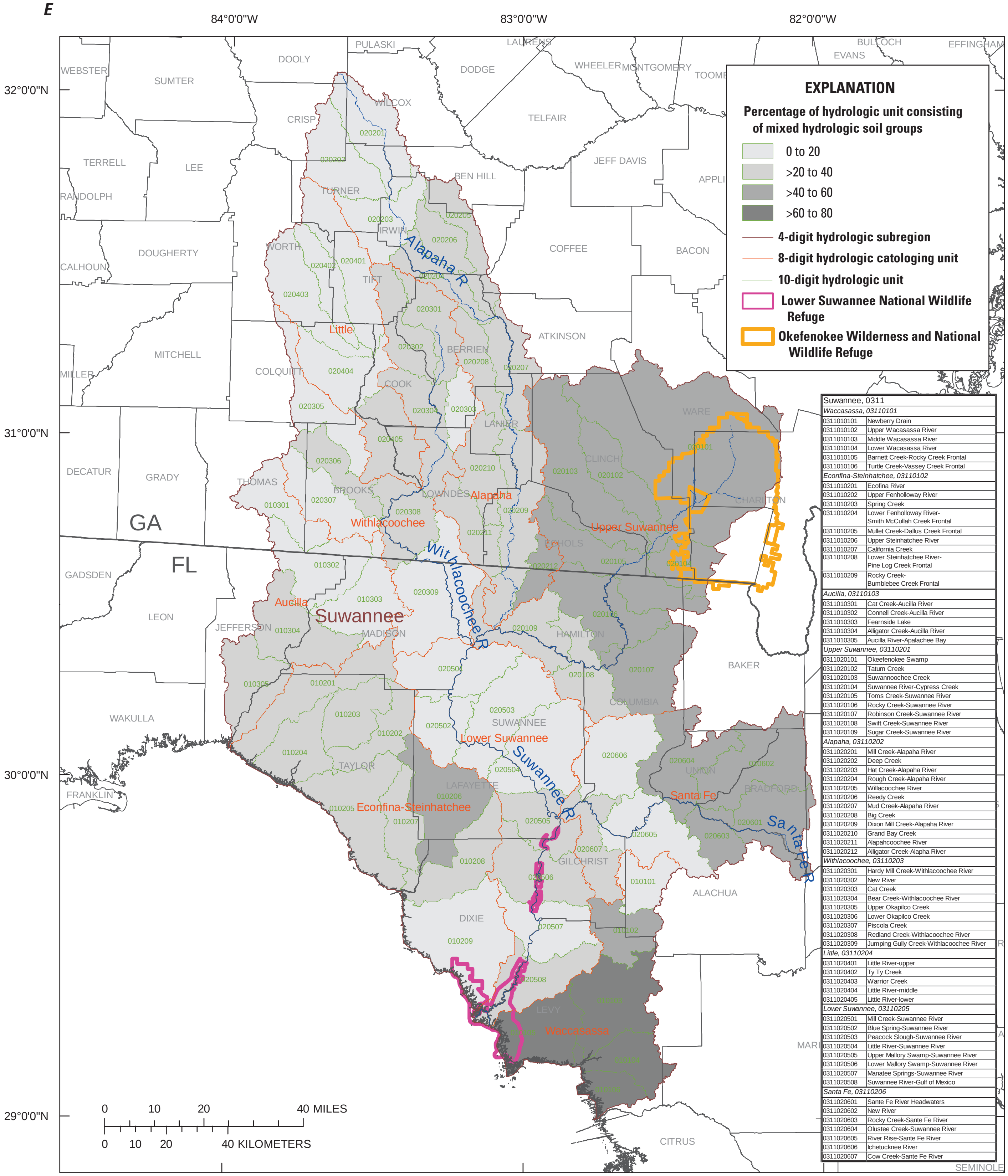
E



Suwannee, 0311	
Waccasassa, 03110101	
0311010101	Newberry Drain
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0311010301	Cat Creek-Aucilla River
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0311020109	Sugar Creek-Suwannee River
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0311020201	Mill Creek-Alapaha River
0311020202	Deep Creek
0311020203	Hat Creek-Alapaha River
0311020204	Rough Creek-Alapaha River
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0311020301	Hardy Mill Creek-Withlacoochee River
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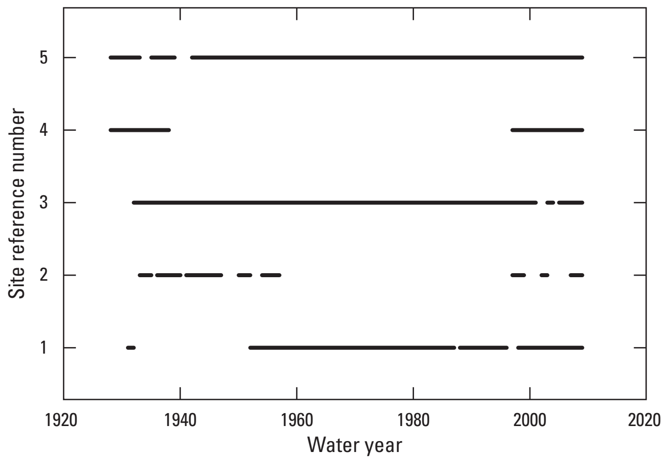
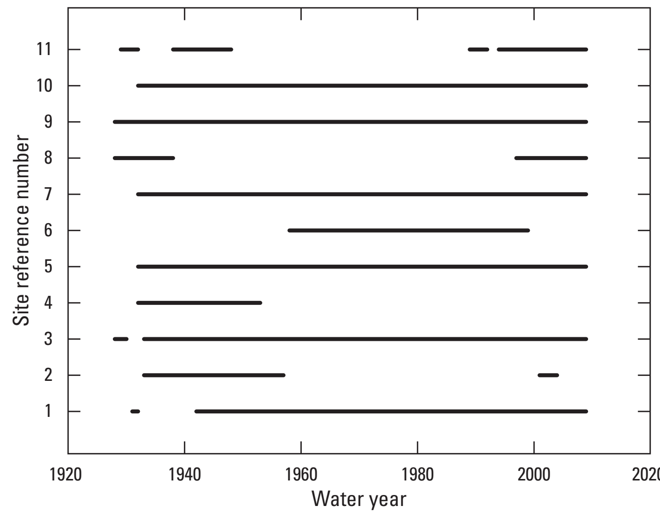


EXPLANATION

—— **Period of record**—Gaging station number and name. Number in parentheses is site reference number

02319500 Suwannee River at Ellaville, FL (5)
02320000 Suwannee River at Luraville, FL (4)
02320500 Suwannee River at Branford, FL (3)
02323000 Suwannee River near Bell, FL (2)
02323500 Suwannee River near Wilcox, FL (1)

Figure D4. Periods of record for mean-daily gage-height data used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge, Florida and Georgia. Locations of gaging stations are shown in figure D1.



EXPLANATION

—— **Period of record**—Gaging station number and name. Number in parentheses is site reference number

02318500 Withlacoochee River (US 84) near Quitman, GA (11)
02319000 Withlacoochee River near Pinetta, FL (10)
02319500 Suwannee River at Ellaville, FL (9)
02320000 Suwannee River at Luraville, FL (8)
02320500 Suwannee River at Branford, FL (7)
02320700 Santa Fe River near Graham, FL (6)
02321500 Santa Fe River at Worthington Springs, FL (5)
02321975 Santa Fe River (US 441) near High Springs, FL (4)
02322500 Santa Fe River near Fort White, FL (3)
02323000 Suwannee River near Bell, FL (2)
02323500 Suwannee River near Wilcox, FL (1)

Figure D5. Periods of record for mean-daily discharge data used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge, Florida and Georgia. Locations of gaging stations are shown in figure D1.

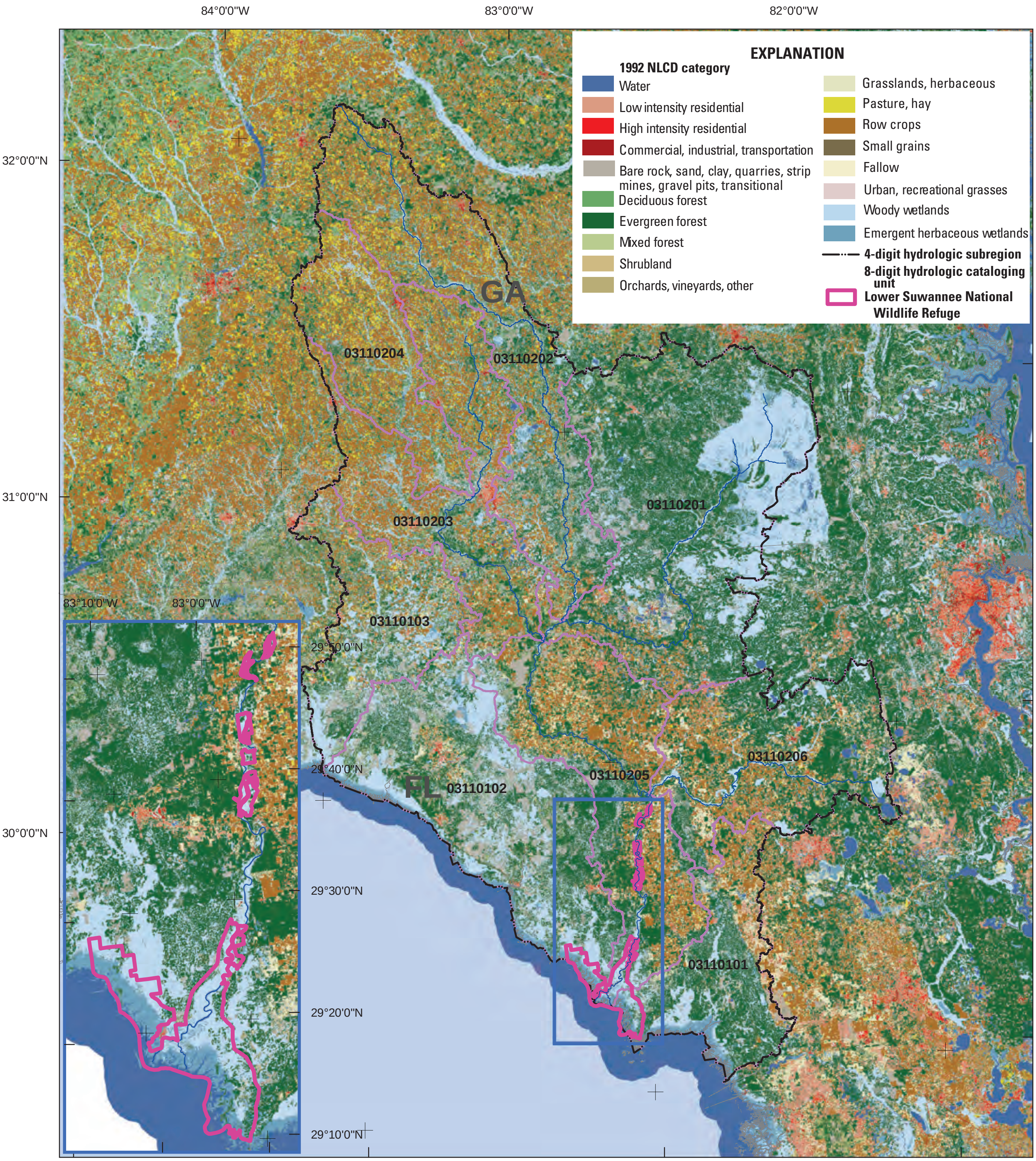


Figure D6. Land cover for 1992 for the Suwannee hydrologic subregion (0311) (land-cover source: 1992 National Land Cover Database [NLCD; Vogelmann and others, 2001]).

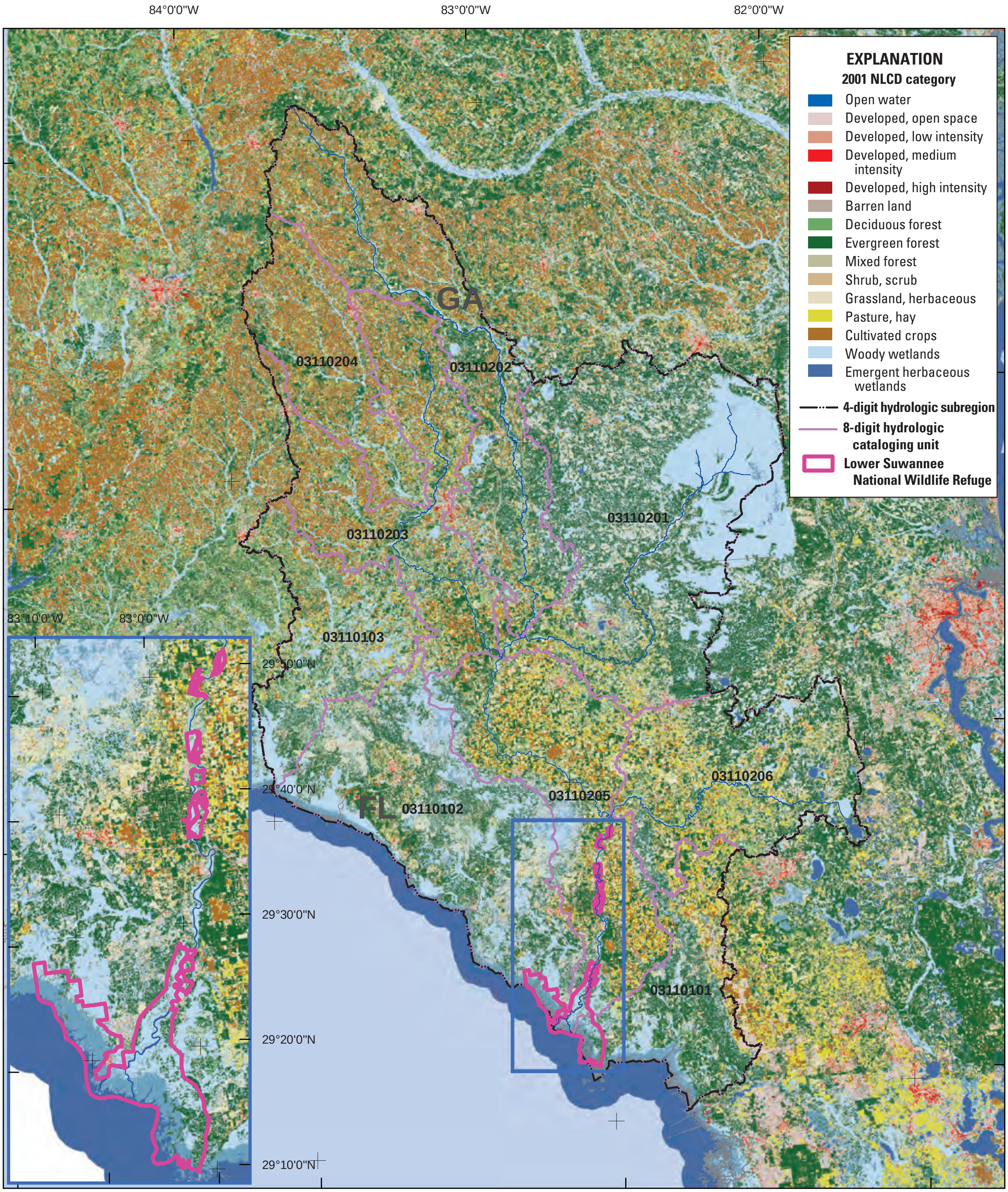


Figure D7. Land cover for 2001 for the Suwannee hydrologic subregion (0311) (land-cover source: 2001 National Land Cover Database [NLCD; Homer and others, 2007]).

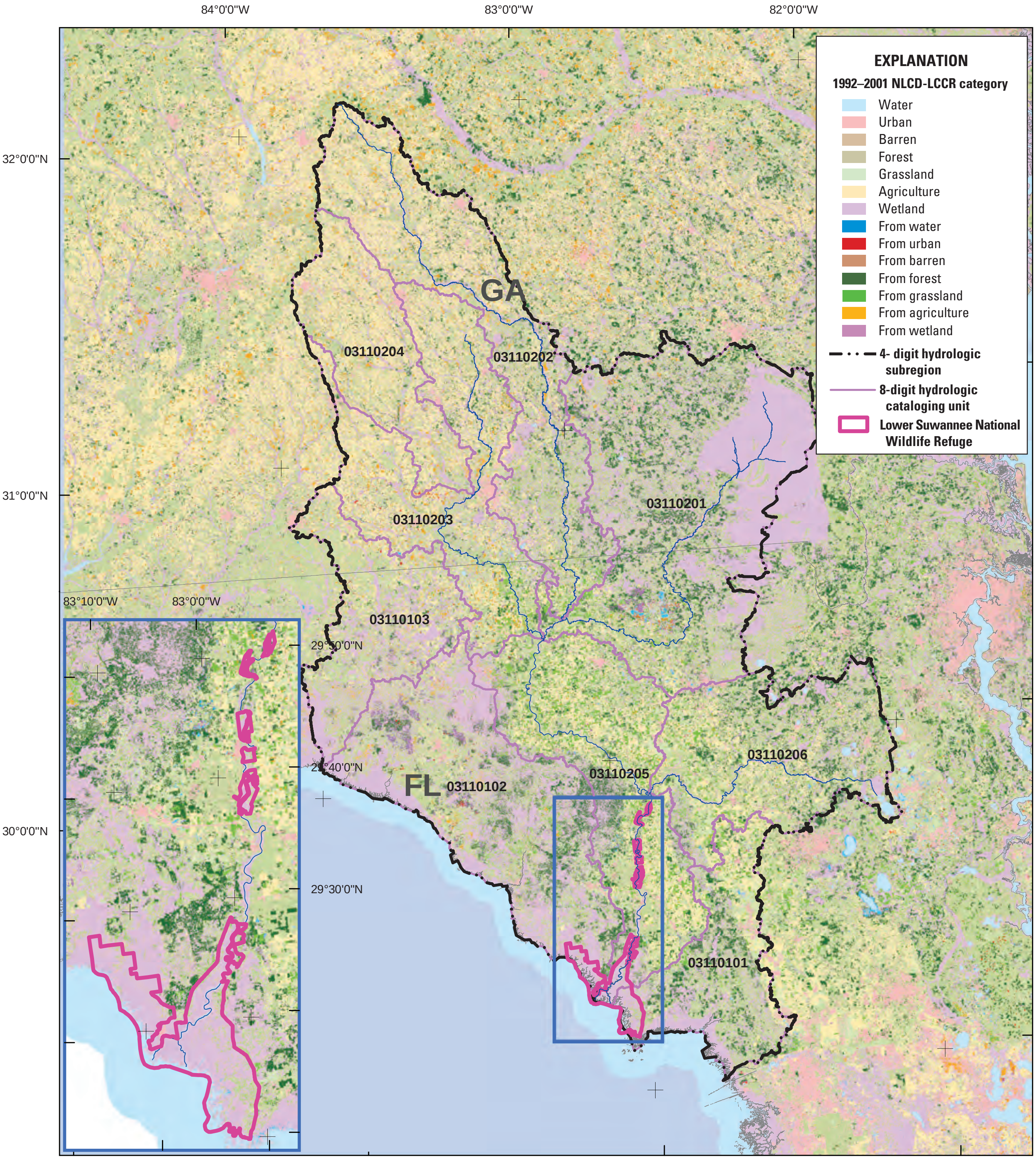


Figure D8. Land-cover change for the period from 1992 to 2001 for the Suwannee hydrologic subregion (0311) (land-cover data source: National Land Cover Database [NLCD] 1992–2001 Land Cover Change Retrofit [LCCR] product [Fry and others, 2009]).

Table D–1. Management objectives and environmental issues for the Lower Suwannee National Wildlife Refuge, Florida.

[Environmental issues do not correspond to management objectives]

Refuge management objectives[a,b,c,d]	Environmental issues[b,c,e]
Thinning of slash pine forests in order to reforest more native longleaf/wiregrass and mixed hardwood communities	Furrows, wind rows, and ditching associated with previous land management practices (commercial forestry, grazing) negatively affecting natural water flow
Restore, conserve, and enhance the natural diversity, abundance,and ecological function of refuge habitat, with an emphasis on managing habitat to benefit threatened and endangered species	Impacts to water quality and quantity in the Suwannee River due to residential, commercial, and agricultural competition for water
Expansion of monitoring and research for wildlife habitat and populations	Exotic wildlife and plant species
Protect the lower reaches of the Suwannee River ecosystem	Groundwater withdrawals during drought conditions could stress the system
Protect, maintain, enhance, and where appropriate, restore habitats along the lower reaches of the Suwannee River	Minimum-flow criteria for the Suwannee River
Protect water quality and quantity through sound resource management and cooperative relationships with State agencies that have jurisdictional authority over the water and aquatic resources therein	Conversion of freshwater swamp to marsh
Provide optimal habitat for threatened and endangered species and species of special concern in the State of Florida	Maintain water quality and quantity to support native species
Restore and improve forest habitats with sound forest management practices	Potential future climate-related impacts
Manage critical fire dependent habitats by applying frequent prescribed fires that mimic natural fire occurrences	
Protect significant archeological resources	
Provide for outdoor recreational opportunities for the American public	
Development and implementation of environmental education programs	

[a]Buell and others, 2009.

[b]U.S. Fish and Wildlife Service, undated[a].

[c]Larry Woodward, U.S. Fish and Wildlife Service, written commun., November 19, 2014.

[d]U.S. Fish and Wildlife Service, undated[b].

[e]Thom and others, 2015.

Table D–2*A*. Station characteristics for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. dms, latitude and longitude coordinates in degrees, minutes, and seconds. Gage location in relation to the refuge property: us, upstream; usds, upstream and downstream; ds, downstream. ft, foot; mi², square mile]

USGS station number	Station name	County and State	Latitude and longitude[a] (dms)	Hydrologic cataloging unit[b]	Drainage area[c] (mi²)	Datum of gage[d] (ft)	Gage location
			Upper Suwannee (03110201)				
02314274	Suwannee R at Sill nr Fargo, GA	Charlton, GA	304814N, 0822503W	03110201	—	117.00	us
023142741	N Fork Suwannee R at Sill nr Fargo, GA	Charlton, GA	304858N, 0822449W	03110201	—	117.00	us
02314495	Suwannee R ab Fargo, GA	Clinch, GA	*304227N, 0823221W*	03110201	1,260	91.90	us
02314500	Suwannee R (US 441) at Fargo, GA	Clinch, GA	304050N, 0823338W	03110201	1,130	91.90	us
02315500	Suwannee R at White Springs, FL	Columbia, FL	301932N, 0824418W	03110201	2,430	0.00[e] (48.54)	us
02315550	Suwannee R at Suwannee Springs, FL	Suwannee, FL	302334N, 0825600W	03110201	2,630	0.00	us
			Alapaha (03110202)				
02317500	Alapaha R at Statenville, GA	Echols, GA	304214N, 0830200W	03110202	1,400	76.77	us
02317620	Alapaha R nr Jennings, FL	Hamilton, FL	303553N, 0830424W	03110202	1,680	0.00[f] (58.22)	us
			Withlacoochee (03110203)				
02318500	Withalacoochee R (US 84) nr Quitman, GA	Brooks, GA	*304735N, 0832713W*	03110203	1,480	84.30	us
02319000	Withalacoochee R nr Pinetta, FL	Madison, FL	303543N, 0831535W	03110203	2,120	47.21	us
02319300	Withalacoochee R nr Madison, FL	Hamilton, FL	302856N, 0831435W	03110203	2,240	0.00	us
02319394	Withalacoochee R nr Lee, FL	Madison, FL	302437N, 0831049W	03110203	2,330	0.88	us
			Lower Suwannee (03110205)				
02319500	Suwannee R at Ellaville, FL	Suwannee, FL	302304N, 0831019W	03110205	6,970	27.22	us
02319800	Suwannee R at Dowling Park, FL	Lafayette, FL	301441N, 0831459W	03110205	7,190	0.00	us
02320000	Suwannee R at Luraville, FL	Suwannee, FL	300559N, 0831018W	03110205	7,280	0.00[g] (16.49)	us
02320500	Suwannee R at Branford, FL	Suwannee, FL	295720N, 0825540W	03110205	7,880	4.81	us
02323000	Suwannee R nr Bell, FL	Gilchrist, FL	294728N, 0825528W	03110205	9,390	0.00[h] (3.60)	us
02323500	Suwannee R nr Wilcox, FL	Levy, FL	293522N, 0825612W	03110205	9,640	–0.53	usds
02323592	Suwannee R ab Gopher R nr Suwannee, FL	Dixie, FL	292021N, 0830512W	03110205	9,973	–2.10	usds
291841-083070800	East Pass Suwannee r nr Suwannee, FL	Levy, FL	291841N, 0830708W	03110205	—	—	usds

Table D–2A. Station characteristics for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.—Continued

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USGS station number	Station name	County and State	Latitude and longitude[a] (dms)	Hydrologic cataloging unit[b]	Drainage area[c] (mi^2)	Datum of gage[d] (ft)	Gage location
			Santa Fe (03110206)				
02320700	Santa Fe R nr Graham, FL	Alachua, FL	295046N, 0821311W	03110206	94.9	103.55	us
02321500	Santa Fe R at Worthington Springs, FL	Alachua, FL	295518N, 0822535W	03110206	575	42.74	us
02321975	Santa Fe R (US 441) nr High Springs, FL	Alachua, FL	295109N, 0823631W	03110206	859	49.96	us
02322000	Santa Fe R nr High Springs, FL	Columbia, FL	295033N, 0823752W	03110206	868	26.36	us
02322500	Santa Fe R nr Ft White, FL	Gilchrist, FL	295055N, 0824255W	03110206	1,017	20.86	us
02322800	Santa Fe R nr Hildreth, FL	Gilchrist, FL	295441N, 0825138W	03110206	1,374	3.50	us

[a]Latitude and longitude coordinates in roman (or normal) font are referenced to NAD 27; those in italicized font are referenced to NAD 83.

[b]The 8-digit hydrologic units were developed by the U.S. Geological Survey as a standardized set of hydrologic boundaries and numerical codes for the river-basin units of the United States (Seaber and others, 1994). The 8-digit hydrologic unit code encompasses four levels of subdivision: region (2-digit), subregion (4-digit), accounting unit (6-digit), and cataloging unit (8-digit).

[c]—, the drainage area is either indeterminate or not delineated.

[d]Datum-of-gage values are from records of the USGS except those shown in parentheses, which are from records of the Georgia Department of Transportation. All datum-of-gage values are referenced to NGVD 29. —, datum of gage not established.

[e]Datum of gage was 48.54 ft NGVD 29 prior to October 1, 1979; 0.00 ft NGVD 29 October 1, 1979, to present.

[f]Datum of gage was 58.22 ft NGVD 29 prior to October 1, 1999; 0.00 ft NGVD 29 October 1, 1999, to present.

[g]Datum of gage was 16.49 ft NGVD 29 prior to October 1, 1937; 0.00 ft NGVD 29 October 1, 1937, to present.

[h]Datum of gage was 3.60 ft NGVD 29 prior to November 17, 1956; 0.00 ft NGVD 29 November 17, 1956, to present.

Table D–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31]

USGS station number	Station name	Parameter	Water-year record		Calendar-year record	
			Period of record[a]	Record completeness[a]	Period of record[a]	Record completeness[a]
		Upper Suwannee (03110201)				
02314274	Suwannee R at Sill nr Fargo, GA	Discharge	2000–2002	3, 0, 0–1.00	1999–2002	2, 2, 0–0.75
023142741	N Fork Suwannee R at Sill nr Fargo, GA	Discharge	1999–2003	4, 1, 0–0.98	1998–2003	4, 2, 0–0.81
02314495	Suwannee R ab Fargo, GA	Gage height	2000–2009	5, 5, 0–0.90	1999–2009	6, 5, 0–0.82
02314500	Suwannee R (US 441) at Fargo, GA	Gage height	1987–2009	4, 8, 11–0.49	1986–2009	3, 11, 10–0.47
		Discharge	1927–2009	75, 4, 4–0.93	1927–2009	74, 4, 5–0.93
02315500	Suwannee R at White Springs, FL	Gage height	1906–2009	50, 37, 17–0.79	1906–2009	47, 39, 18–0.79
		Discharge	1906–2009	83, 4, 17–0.82	1906–2009	83, 3, 18–0.82
02315550	Suwannee R at Suwannee Springs, FL	Discharge	1975–1996	22, 0, 0–1.00	1974–1996	21, 2, 0–0.96
		Alapaha (03110202)				
02317500	Alapaha R at Statenville, GA	Gage height	1998–2009	7, 5, 0–0.98	1997–2009	7, 6, 0–0.90
		Discharge	1921–2009	76, 3, 10–0.88	1921–2009	77, 3, 9–0.88
02317620	Alapaha R nr Jennings, FL	Gage height	1976–2009	11, 7, 16–0.45	1976–2009	8, 11, 15–0.45
		Discharge	1976–2009	14, 3, 17–0.44	1976–2009	11, 8, 15–0.44
		Withlacoochee (03110203)				
02318500	Withalacoochee R (US 84) nr Quitman, GA	Gage height	1994–2009	4, 12, 0–0.90	1993–2009	3, 14, 0–0.84
		Discharge[b]	1929–2009	31, 6, 44–0.42	1928–2009	30, 8, 44–0.41
02319000	Withalacoochee R nr Pinetta, FL	Gage height	1932–2009	58, 20, 0–0.99	1931–2009	59, 20, 0–0.98
		Discharge[b]	1932–2009	77, 1, 0–1.00	1931–2009	77, 2, 0–0.99
02319300	Withalacoochee R nr Madison, FL	Gage height	2005–2010	3, 3, 0–0.81	2004–2009	4, 2, 0–0.81
		Discharge	2005–2008	3, 1, 0–0.97	2004–2008	3, 2, 0–0.78
02319394	Withalacoochee R nr Lee, FL	Gage height	2001–2009	3, 6, 0–0.95	2000–2009	3, 7, 0–0.86
		Discharge	2001–2009	7, 2, 0–0.97	2000–2009	8, 2, 0–0.87
		Lower Suwannee (03110205)				
02319500	Suwannee R at Ellaville, FL	Gage height[b]	1927–2009	59, 24, 0–0.98	1927–2009	54, 29, 0–0.98
		Discharge[b]	1927–2009	81, 2, 0–0.99	1927–2009	81, 2, 0–0.99
02319800	Suwannee R at Dowling Park, FL	Gage height	1997–2009	2, 11, 0–0.94	1996–2009	3, 11, 0–0.88
		Discharge	1997–2009	11, 2, 0–0.99	1996–2009	12, 2, 0–0.92
02320000	Suwannee R at Luraville, FL	Gage height[b]	1927–2009	15, 11, 57–0.28	1927–2009	13, 12, 58–0.28
		Discharge[b]	1927–2009	22, 4, 57–0.29	1927–2009	22, 3, 58–0.29
		Water temperature	1996–2009	2, 7, 5–0.45	1996–2009	2, 8, 4–0.45
02320500	Suwannee R at Branford, FL	Gage height[b]	1931–2009	68, 11, 0–0.99	1931–2009	69, 10, 0–0.99
		Dischargeb	1931–2009	77, 2, 0–0.99	1931–2009	77, 2, 0–0.99
		Specific conductance	1990–1990	0, 1, 0–0.13	1990–1990	0, 1, 0–0.13

Table D–2*B*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.—Continued

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31]

USGS station number	Station name	Parameter	Water-year record		Calendar-year record	
			Period of record[a]	Record completeness[a]	Period of record[a]	Record completeness[a]
Lower Suwannee (03110205)—Continued						
02323000	Suwannee R nr Bell, FL	Gage height[b]	1932–2011	14, 27, 39–0.46	1932–2011	10, 31, 39–0.46
		Discharge[b]	1932–2011	35, 3, 42–0.45	1932–2011	34, 3, 43–0.45
02323500	Suwannee R nr Wilcox, FL	Gage height[b]	1931–2011	42, 28, 11–0.79	1930–2011	42, 29, 11–0.78
		Discharge[b]	1931–2011	71, 0, 0–0.88	1930–2011	69, 4, 9–0.87
		Water temperature	1999–2011	0, 12, 0–0.64	1999–2011	0, 12, 0–0.64
02323592	Suwannee R ab Gopher R nr Suwannee, FL	Gage height	1999–2011	5, 8, 0–0.92	1999–2011	4, 9, 0–0.92
		Discharge	1999–2011	11, 2, 0–0.94	1999–2011	10, 3, 0–0.94
		Water temperature	1999–2011	3, 10, 0–0.92	1999–2011	3, 10, 0–0.92
		Specific conductance	1999–2011	3, 10, 0–0.71	1999–2011	1, 12, 0–0.71
		Salinity	1999–2011	5, 8, 0–0.87	1999–2011	4, 9, 0–0.87
291841-083070800	East Pass Suwannee r nr Suwannee, FL	Discharge	1995–2001	1, 6, 0–0.66	1995–2000	0, 6, 0–0.77
		Water temperature	1995–2001	1, 6, 0–0.58	1995–2000	0, 6, 0–0.68
		Salinity	1995–1999	0, 5, 0–0.56	1995–1999	0, 5, 0–0.56
Santa Fe (03110206)						
02320700	Santa Fe R nr Graham, FL	Discharge[b]	1957–1998	41, 1, 0–0.98	1957–1998	40, 2, 0–0.98
02321500	Santa Fe R at Worthington Springs, FL	Gage height	1932–2011	40, 38, 2–0.94	1931–2011	38, 42, 1–0.93
		Discharge[b]	1932–2011	80, 0, 0–1.00	1931–2011	79, 2, 0–0.99
02321975	Santa Fe R (US 441) nr High Springs, FL	Discharge[b]	1993–2002	9, 0, 0–0.90	1992–2002	7, 4, 0–0.82
02322000	Santa Fe R nr High Springs, FL	Discharge	1931–1971	40, 1, 0–0.99	1931–1971	39, 2, 0–0.99
02322500	Santa Fe R nr Ft White, FL	Gage height	1928–2010	39, 36, 8–0.82	1927–2010	38, 41, 5–0.81
		Discharge[b]	1928–2010	80, 2, 1–0.97	1927–2010	79, 4, 1–0.96
02322800	Santa Fe R nr Hildreth, FL	Gage height	1947–2010	23, 32, 9–0.75	1947–2010	19, 36, 9–0.75
		Discharge	2001–2010	7, 2, 1–0.79	2000–2010	6, 4, 1–0.72

[a]Period shown is for indicated type of year and includes gaps if data collection was discontinuous. Record completeness: number of complete-record, partial-record, and null-record water or calendar years—fraction of total record length with mean-daily values. The fraction-of-total-record-length calculation is based on complete beginning and ending water or calendar years as well as complete intervening years. Therefore, the fraction-of-total-record-length numbers may be different for water years when compared to calendar years.

[b]Indicators of Hydrologic Alteration (IHA) analysis was performed for these parameters. Periods of record for IHA analyses shown in figure D4 (gage height) and figure D5 (discharge).

Table D–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
		Raw data[b]
lsr_tabular_hydrostats_raw.accdb	lsr001	Raw data—mean-daily values for gage height, discharge, water-surface elevation, velocity, water temperature, specific conductance, and salinity; minimum-daily and maximum-daily values for discharge, water-surface elevation, velocity, water temperature, and salinity; sum-daily values for precipitation; for gaging stations in the contributing watersheds of the Lower Suwannee NWR
		Descriptive statistics, spread measures, and ratio measures[b]
lsr_tabular_hydrostats.accdb	lsr[***var***]01c	Mean-daily values for parameter ***var***, calendar-year reference period
	lsr[***var***]01w	Mean-daily values for parameter ***var***, water-year reference period
	lsr[***var***]cy02	Calendar-year statistics for mean-daily values for parameter ***var***
	lsr[***var***]cd02	Calendar-decade statistics for mean-daily values for parameter ***var***
	lsr[***var***]cym02	Calendar-year-month statistics for mean-daily values for parameter ***var***
	lsr[***var***]wy02	Water-year statistics for mean-daily values for parameter ***var***
	lsr[***var***]mo02	Period-of-record monthly statistics metrics, based on mean-daily values, for parameter ***var***, complete calendar years
	lsr[***var***]mom02	Period-of-record monthly statistics metrics, based on annual monthly means of mean-daily values, for parameter ***var***, complete calendar years
	lsr[***var***]jc02	Period-of-record calendar-year-julian-day statistics, based on mean-daily values, for parameter ***var***, complete calendar years
	lsr[***var***]jw02	Period-of-record water-year-julian-day statistics, based on mean-daily values, for parameter ***var***, complete calendar years
		IHA metrics[c]
regional_iha_***var***_lsr.xlsxd	1_day_min	Minimum 1-day mean of mean-daily values
	3_day_min	Minimum 3-day mean of mean-daily values
	7_day_min	Minimum 7-day mean of mean-daily values
	30_day_min	Minimum 30-day mean of mean-daily values
	90_day_min	Minimum 90-day mean of mean-daily values
	1_day_max	Maximum 1-day mean of mean-daily values
	3_day_max	Maximum 3-day mean of mean-daily values
	7_day_max	Maximum 7-day mean of mean-daily values
	30_day_max	Maximum 30-day mean of mean-daily values
	90_day_max	Maximum 90-day mean of mean-daily values
	baseflow	Baseflow index: 7-day mean minimum discharge/mean-annual discharge
	[***var***]7525s	75th–25th percentile spread measure for mean-daily values
	summary	IHA period-of-record summary data for IHA parameter groups and environmental-flow components: summary data include the 10th, 25th, 50th, 75th, and 90th percentiles and the 75th–25th percentile spread measure
	02318500	Complete IHA analysis for USGS 02318500, Withlacoochee R (US 84) nr Quitman, GA (discharge)

Table D–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
		IHA metrics[c]—Continued
regional_iha_***var***_lsr.xlsxd—Continued	02319000	Complete IHA analysis for USGS 02319000, Withlacoochee R nr Pinetta, FL (discharge)
	02319500	Complete IHA analysis for USGS 02319500, Suwannee R at Ellaville, FL (gage height, discharge)
	02320000	Complete IHA analysis for USGS 02320000, Suwannee R at Luraville, FL (gage height, discharge)
	02320500	Complete IHA analysis for USGS 02320500, Suwannee R at Branford, FL (gage height, discharge)
	02323000	Complete IHA analysis for USGS 02323000, Suwannee R nr Bell, FL (gage height, discharge)
	02323500	Complete IHA analysis for USGS 02323500, Suwannee R nr Wilcox, FL (gage height, discharge)
	02320700	Complete IHA analysis for USGS 02320700, Santa Fe R nr Graham, FL (discharge)
	02321500	Complete IHA analysis for USGS 02321500, Santa Fe R at Worthington Springs, FL (discharge)
	02321975	Complete IHA analysis for USGS 02321975, Santa Fe R (US 441) nr High Springs, FL (discharge)
	02322500	Complete IHA analysis for USGS 02322500, Santa Fe R nr Ft White, FL (discharge)
SSSSSSSSS_iha_[***var***].xlsx	ann	Water-year annual values for all IHA parameter groups and EFC groups, for parameter ***var***, gaging station ***SSSSSSSS***[e] (parameter definitions given in table D4)
	sco	IHA scorecard: period-of-record summary data, median values and coefficients of dispersion for IHA parameter groups and EFC groups, for parameter ***var***, gaging station ***SSSSSSSS***[e]
	lsq	Linear-regression models for IHA parameter groups and EFC groups with water year, for parameter ***var***, gaging station ***SSSSSSSS***[e]
	pct	IHA period-of-record summary data for IHA parameter groups and EFC groups: summary data include the 10th, 25th, 50th, 75th, and 90th percentiles and the 75th–25th percentile spread measure, for parameter ***var***, gaging station ***SSSSSSSS***[e]
	daily_efcs	Mean-daily values coded with IHA EFC groups, period of record, for parameter ***var***, gaging station ***SSSSSSSS***[e]
	msg	IHA conditional information messages concerning data quality as related to the IHA analysis, gaging station ***SSSSSSSS***[e]
		Geospatial data summaries
lsr_nlcd.xlsx	lsr_nlcd92_h0408rfg_pct	Land-cover percentages for hydrologic subregions and cataloging units (contributing-watershed area for the Lower Suwannee NWR) and refuge acquisition areas based on 1992 NLCD level 2 categories (Vogelmann and others, 2001)
	lsr_nlcd01_h0408rfg_pct	Land-cover percentages for hydrologic subregions and cataloging units (contributing-watershed area for the Lower Suwannee NWR) and refuge acquisition areas based on 2001 NLCD level 2 categories (Homer and others, 2007)
	lsr_lcc9201_h0408rfg_pct	Land-cover-change percentages for hydrologic subregions and cataloging units (contributing-watershed area for the Lower Suwannee NWR) and refuge acquisition areas based on 1992-2001 NLCD-LCCR Anderson level 1 categories (Fry and others, 2009; Anderson and others, 1976)

Table D–3*A*. Database Microsoft Access and Microsoft Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
		Geospatial data summaries—Continued
lsr_sgo_hsg.xlsx	lsr_sgo_hsg_pct	STATSGO database HSGs A through D and mixed soil group percentages for hydrologic subregions, cataloging units, and 10-digit hydrologic units (contributing-watershed area for the Lower Suwannee NWR) and refuge acquisition areas (U.S. Department of Agriculture, 1994, 2009; Wolock, 1997)
lsr_eco34.xlsx	lsr_eco4huc_12_pct	EPA Level IV ecoregion percentages for 12-digit hydrologic units (contributing-watershed area for the Lower Suwannee NWR) (U.S. Environmental Protection Agency, 2011)
	lsr_eco3huc_12_pct	EPA Level III ecoregion percentages for 12-digit hydrologic units (contributing-watershed area for the Lower Suwannee NWR) (U.S. Environmental Protection Agency, 2011)
	lsr_eco4huc_10_pct	EPA Level IV ecoregion percentages for 10-digit hydrologic units (contributing-watershed area for the Lower Suwannee NWR) (U.S. Environmental Protection Agency, 2011)
	lsr_eco3huc_10_pct	EPA Level III ecoregion percentages for 10-digit hydrologic units (contributing-watershed area for the Lower Suwannee NWR) (U.S. Environmental Protection Agency, 2011)
	lsr_eco4huc_08_pct	EPA Level IV ecoregion percentages for hydrologic cataloging units (contributing-watershed area for the Lower Suwannee NWR) (U.S. Environmental Protection Agency, 2011)
	lsr_eco3huc_08_pct	EPA Level III ecoregion percentages for hydrologic cataloging units (contributing-watershed area for the Lower Suwannee NWR) (U.S. Environmental Protection Agency, 2011)
lsr_pop_census.xlsx	tblLsrPop01	U.S. Census Bureau county-level population data, 1930–2010 (U.S. Census Bureau, 2011)
	pop_pct_chg	Descriptive statistics for percent population change, 1930–1970, and 1970–2010

[a]In the file/table/worksheet name, ***var*** refers to the hydrologic parameter, where ***var=gmn***, gage height, in feet; ***qmn***, discharge, in cubic feet per second; ***tmn***, water temperature, in degrees Celsius; ***kmn***, specific conductance, in microsiemens per centimeter; ***smn***, salinity, in parts per thousand; all parameters are mean-daily values.

[b]Field names, field types, and field definitions given in table D3*B*.

[c]IHA parameter-groups, EFC groups, EFCs, and parameter definitions listed in table D4 (Richter and others, 1996; The Nature Conservancy, 2009).

[d]IHA regional analysis restricted to USGS gaging stations 02318500, 02319000, 02319500, 02320000, 02320500, 02323000, 02323500, 02320700, 02321500, 02321975, 02322500. Gaging-station information presented in tables D2*A* and D2*B*.

[e]IHA analysis of mean-daily gage-height record for USGS gaging stations 02319500, 02320000, 02320500, 02323000, and 02323500; IHA analysis of mean-daily discharge record for USGS gaging stations 02318500, 02319000, 02319500, 02320000, 02320500, 02323000, 02323500, 02320700, 02321500, 02321975, and 02322500. Gaging-station characteristics, parameters, and periods of record given in tables D2*A* and D2*B*.

Table D–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Percentile: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Specified period of analysis: por, period of record, cy, calendar year, wy, water year; hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Measurements: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; ft/s, foot per second; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Raw data[c]	
agency_cd	lsr001	Text	USGS collecting-agency code
datetime	lsr001	Date/time	Calendar date of daily value
disch_eqmn	lsr001	Double precision	Equivalent-mean-daily discharge, in ft^3/s
disch_eqmn_cd	lsr001	Text	Equivalent-mean-daily discharge, data-value qualification code[d]
disch_min	lsr001	Double precision	Minimum-daily discharge, in ft^3/s
disch_min_cd	lsr001	Text	Minimum-daily discharge, data-value qualification code[d]
disch_mn	lsr001	Double precision	Mean-daily discharge, in ft^3/s
disch_mn_cd	lsr001	Text	Mean-daily discharge, data-value qualification code[d]
disch_mx	lsr001	Double precision	Maximum-daily discharge, in ft^3/s
disch_mx_cd	lsr001	Text	Maximum-daily discharge, data-value qualification code[d]
elev1929_min	lsr001	Double precision	Minimum-daily elevation, referenced to NGVD 1929, in ft
elev1929_min_cd	lsr001	Text	Minimum-daily elevation, referenced to NGVD 1929, data-value qualification code[d]
elev1929_mn	lsr001	Double precision	Mean-daily elevation, referenced to NGVD 1929, in ft
elev1929_mn_cd	lsr001	Text	Mean-daily elevation, referenced to NGVD 1929, data-value qualification code[d]
elev1929_mx	lsr001	Double precision	Maximum-daily elevation, referenced to NGVD 1929, in ft
elev1929_mx_cd	lsr001	Text	Maximum-daily elevation, referenced to NGVD 1929, data-value qualification code[d]
ght_mn	lsr001	Double precision	Mean-daily gage height, in ft
ght_mn_cd	lsr001	Text	Mean-daily gage height, data-value qualification code[d]
ght_mn_tr	lsr001	Double precision	Mean-daily gage height, transducer, in ft
ght_mn_tr_cd	lsr001	Text	Mean-daily gage height, transducer, data-value qualification code[d]
pcp_sm	lsr001	Double precision	Sum-daily precipitation, in inches
pcp_sm_cd	lsr001	Text	Sum-daily precipitation, data-value qualification code[d]
salinity_min	lsr001	Double precision	Minimum-daily salinity, in parts per thousand
salinity_min_cd	lsr001	Text	Minimum-daily salinity, data-value qualification code[d]
salinity_mn	lsr001	Double precision	Mean-daily salinity, in parts per thousand
salinity_mn_cd	lsr001	Text	Mean-daily salinity, data-value qualification code[d]
salinity_mn_bt	lsr001	Double precision	Mean-daily salinity, bottom, in parts per thousand
salinity_mn_bt_cd	lsr001	Text	Mean-daily salinity, bottom, data-value qualification code[d]
salinity_mx	lsr001	Double precision	Maximum-daily salinity, in parts per thousand
salinity_mx_cd	lsr001	Text	Maximum-daily salinity, data-value qualification code[d]
site_no	lsr001	Text	USGS station identification number
spc_mn	lsr001	Double precision	Mean-daily specific conductance, in µS/cm
spc_mn_cd	lsr001	Text	Mean-daily specific conductance, data-value qualification code[d]
spc_mn_bt	lsr001	Text	Mean-daily specific conductance, bottom, in µS/cm

Table D–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Percentile: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Specified period of analysis: por, period of record, cy, calendar year, wy, water year; hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Measurements: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; ft/s, foot per second; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Raw data[c]—Continued	
spc_mn_bt_cd	lsr001	Double precision	Mean-daily specific conductance, bottom, data-value qualification code[d]
spc_uv	lsr001	Double precision	Unit-value specific conductance, in µS/cm
spc_uv_cd	lsr001	Text	Unit-value specific conductance, data-value qualification code[d]
vel_min	lsr001	Double precision	Minimum-daily velocity, in ft/s
vel_min_cd	lsr001	Text	Minimum-daily velocity, data-value qualification code[d]
vel_mn	lsr001	Double precision	Mean-daily velocity, in ft/s
vel_mn_cd	lsr001	Text	Mean-daily velocity, data-value qualification code[d]
vel_mx	lsr001	Double precision	Maximum-daily velocity, in ft/s
vel_mx_cd	lsr001	Text	Maximum-daily velocity, data-value qualification code[d]
wtemp_min	lsr001	Double precision	Minimum-daily water temperature, in °C
wtemp_min_cd	lsr001	Text	Minimum-daily water temperature, data-value qualification code[d]
wtemp_mn	lsr001	Double precision	Mean-daily water temperature, in °C
wtemp_mn_cd	lsr001	Text	Mean-daily water temperature, data-value qualification code[d]
wtemp_mn_bt	lsr001	Double precision	Mean-daily water temperature, bottom, in °C
wtemp_mn_bt_cd	lsr001	Text	Mean-daily water temperature, bottom, data-value qualification code[d]
wtemp_mn_fh	lsr001	Double precision	Mean-daily water temperature, in °F
wtemp_mn_fh_cd	lsr001	Text	Mean-daily water temperature, data-value qualification code[d]
wtemp_mx	lsr001	Double precision	Maximum-daily water temperature, in °C
wtemp_mx_cd	lsr001	Text	Maximum-daily water temperature, data-value qualification code[d]
		Descriptive statistics, spread measures, ratio measures[e]	
[***var***]	lsr[***var***]01[c,w]	Double precision	Mean-daily value for parameter ***var***
[***var***]_10	all tables (-lsr[***var***]01[c,w])	Double precision	10th percentile of mean-daily values, parameter ***var***
[***var***]_20	all tables (-lsr[***var***]01[c,w])	Double precision	20th percentile of mean-daily values, parameter ***var***
[***var***]_25	all tables (-lsr[***var***]01[c,w])	Double precision	25th percentile of mean-daily values, parameter ***var***
[***var***]_50	all tables (-lsr[***var***]01[c,w])	Double precision	50th percentile (median) of mean-daily values, parameter ***var***
[***var***]_75	all tables (-lsr[***var***]01[c,w])	Double precision	75th percentile of mean-daily values, parameter ***var***
[***var***]_80	all tables (-lsr[***var***]01[c,w])	Double precision	80th percentile of mean-daily values, parameter ***var***
[***var***]_90	all tables (-lsr[***var***]01[c,w])	Double precision	90th percentile of mean-daily values, parameter ***var***
[***var***]_cd	lsr[***var***]01[c,w]	Double precision	Mean-daily value for parameter ***var***, data-value qualification code[d]
[***var***]_cdf	lsr[***var***]cd02	Double precision	Calendar-decade fraction represented by mean-daily values, parameter ***var***
[***var***]_cmf	lsr[***var***]cym02	Double precision	Calendar-month fraction represented by mean-daily values, parameter ***var***

Table D–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Percentile: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Specified period of analysis: por, period of record, cy, calendar year, wy, water year; hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Measurements: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; ft/s, foot per second; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Descriptive statistics, spread measures, ratio measures[e]—Continued			
[***var***]_cv	all tables (-lsr[***var***]01[c,w])	Double precision	Coefficient of variation of mean-daily values, parameter ***var***
[***var***]_cy_n	lsr[***var***]mo02	Double precision	Number of complete calendar years in the long-term monthly record for parameter ***var***
[***var***]_cyf	lsr[***var***]cy02; lsr[***var***]cym02	Double precision	Calendar-year fraction represented by mean-daily values, parameter ***var***
[***var***]_mi	all tables (-lsr[***var***]01[c,w])	Double precision	Minimum of mean-daily values, parameter ***var***
[***var***]_mn	all tables (-lsr[***var***]01[c,w])	Double precision	Mean of mean-daily values, parameter ***var***
[***var***]_mx	all tables (-lsr[***var***]01[c,w])	Double precision	Maximum of mean-daily values, parameter ***var***
[***var***]_n	all tables (-lsr[***var***]01[c,w])	Long integer	Number of mean-daily values, parameter ***var***
[***var***]_nm	all tables (-lsr[***var***]01[c,w])	Long integer	Number of missing values of mean-daily values, parameter ***var***
[***var***]_ny	lsr[***var***]cd02	Double precision	Number of calendar years in each calendar decade, including fractional years, represented by mean-daily values, parameter ***var***
[***var***]_sd	all tables (-lsr[***var***]01[c,w])	Double precision	Standard deviation of mean-daily values, parameter ***var***
[***var***]_va	all tables (-lsr[***var***]01[c,w])	Double precision	Variance of mean-daily values, parameter ***var***
[***var***]_wyf	lsr[***var***]wy02	Double precision	Water-year fraction represented by mean-daily values, parameter ***var***
[***var***]7525r	all tables (-lsr[***var***]01[c,w])	Double precision	75th–25th percentile ratio measure of mean-daily values, parameter ***var***: p75/p25
[***var***]7525s	all tables (-lsr[***var***]01[c,w])	Double precision	75th–25th percentile spread measure of mean-daily values, parameter ***var***: (p75–p25)/p50
[***var***]8020r	all tables (-lsr[***var***]01[c,w])	Double precision	80th–20th percentile ratio measure of mean-daily values, parameter ***var***: p80/p20
[***var***]8020s	all tables (-lsr[***var***]01[c,w])	Double precision	80th–20th percentile spread measure of mean-daily values, parameter ***var***: (p80–p20)/p50
[***var***]9010r	all tables (-lsr[***var***]01[c,w])	Double precision	90th–10th percentile ratio measure of mean-daily values, parameter ***var***: p90/p10
[***var***]9010s	all tables (-lsr[***var***]01[c,w])	Double precision	90th–10th percentile spread measure of mean-daily values, parameter ***var***: (p90–p10)/p50
cdate	lsr[***var***]01[c,w]	Text	Character date, yyyymmdd format, added to preserve pre-1900 dates in Microsoft Excel files
cdt_bnd_mi	lsr[***var***]01[c,w]	Date/time	Calendar-year minimum-date boundary, January 1 of the first calendar year of record, ***mm/dd/yyyy*** format
cdt_bnd_mx	lsr[***var***]01[c,w]	Date/time	Calendar-year maximum-date boundary, December 31 of the last calendar year of record, ***mm/dd/yyyy*** format

Table D–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Percentile: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Specified period of analysis: por, period of record, cy, calendar year, wy, water year; hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Measurements: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; ft/s, foot per second; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Descriptive statistics, spread measures, ratio measures[e]—Continued			
cnty	lsr[***var***]01[c,w]	Text	FIPS county code
da	all tables	Double precision	Drainage area of gaged watershed, in mi^2
date	lsr[***var***]01[c,w]	Date/time	Date, ***mm/dd/yyyy*** format
date_mi	lsr[***var***]01[c,w]	Date/time	Date of first daily value, ***mm/dd/yyyy*** format
date_mx	lsr[***var***]01[c,w]	Date/time	Date of last daily value, ***mm/dd/yyyy*** format
day	lsr[***var***]01[c,w]	Long integer	Calendar day
decade	lsr[***var***]01[c,w]; lsr[***var***]cd02	Long integer	Calendar decade
jday_c	lsr[***var***]01[c,w]; lsr[***var***]jc02	Long integer	Calendar-year Julian day
jday_w	lsr[***var***]01[c,w]; lsr[***var***]jw02	Long integer	Water-year Julian day
l[***var***]	lsr[***var***]01[c,w]	Double precision	Log-10 mean-daily value for parameter ***var***
l[***var***]_cv	all tables (-lsr[***var***] 01[c,w])	Double precision	Coefficient of variation of every 5th percentile of log-10 parameter ***var***
latdec	lsr[***var***]01[c,w]	Double precision	Decimal latitude of gaging station, NAD 83
londec	lsr[***var***]01[c,w]	Double precision	Decimal longitude of gaging station, NAD 83
lsalt	lsr[***var***]01[c,w]	Double precision	Land-surface altitude of gage, NGVD 29, in ft
month	lsr[***var***]01[c,w]; lsr[***var***]cym02; lsr[***var***]mo02; lsr[***var***]mom02	Long integer	Calendar month
month_nd	lsr[***var***]mo02	Double precision	Number of days in the calendar month
qmn_y50	all ***qmn*** tables (-lsr***qmn***01)	Double precision	Median discharge yield, in $ft^3/s/mi^2$
qmn_ymn	all ***qmn*** tables (-lsr***qmn***01)	Double precision	Mean discharge yield, in $ft^3/s/mi^2$
sname	lsr[***var***]01[c,w]	Text	USGS station name
staid	all tables	Text	USGS station identification number
wdt1_bnd_mi	lsr[***var***]01[c,w]	Date/time	Water-year minimum-date boundary, October 1 of the first water year of record, calendar-year minimum minus one when month is January–September, ***mm/dd/yyyy*** format
wdt1_bnd_mx	lsr[***var***]01[c,w]	Date/time	Water-year maximum-date boundary, September 30 of the last water year of record, calendar-year minimum when month is January–September, ***mm/dd/yyyy*** format
wdt2_bnd_mi	lsr[***var***]01[c,w]	Date/time	Water-year minimum-date boundary, October 1 of the first water year of record, calendar-year minimum when month is October–December, ***mm/dd/yyyy*** format
wdt2_bnd_mx	lsr[***var***]01[c,w]	Date/time	Water-year maximum-date boundary, September 30 of the last water year of record, calendar-year minimum plus one when month is October–December, ***mm/dd/yyyy*** format

Table D–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Descriptive statistics, spread measures, ratio measures[e]—Continued			
wyear	lsr[***var***]01[c,w]; lsr[***var***]wy02	Long integer	Water year
year	lsr[***var***]01[c,w]; lsr[***var***]cy02; lsr[***var***]cym02	Long integer	Calendar year
Geospatial data summaries[f]			
AREA	tblLsrPop01	Double precision	County area, in m^2
CNTYNAME	tblLsrPop01	Text	County name
lsr_statecty	tblLsrPop01	Long integer	Numeric FIPS code
hga_pct	lsr_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG A[h]
hgb_pct	lsr_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG B[h]
hgc_pct	lsr_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG C[h]
hgd_pct	lsr_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG D[h]
hgm_pct	lsr_sgo_hsg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils that have mixed HSG classification[h]
huc_chg_pct	lsr_lcc9201_h0408rfg_pct	Double precision	Areal percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
huc04	all worksheets (-lsr_eco[3,4]huc_[08,10,12]_pct, tblLsrPop01, pop_pct_chg)	Text	Hydrologic subregion (4-digit hydrologic unit) code[h]
huc08	all worksheets (-tblLsrPop01, pop_pct_chg)	Text	Hydrologic cataloging unit (8-digit hydrologic unit) code[h]
huc08_l3_pct	lsr_eco3huc_08_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level III ecoregion in each hydrologic cataloging unit (8-digit hydrologic unit)
huc08_l4_pct	lsr_eco4huc_08_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level IV ecoregion in each hydrologic cataloging unit (8-digit hydrologic unit)
huc08_name	lsr_eco[3,4]huc_[08,10,12]_pct	Text	Hydrologic cataloging unit (8-digit hydrologic unit) name[i]

Table D–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
huc10	lsr_sgo_hsg_pct, lsr_eco[3,4]huc_[10,12]_pct	Text	10-digit hydrologic unit code[h]
huc10_l3_pct	lsr_eco3huc_10_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level III ecoregion in each 10-digit hydrologic unit
huc10_l4_pct	lsr_eco4huc_10_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level IV ecoregion in each 10-digit hydrologic unit
huc10_name	lsr_eco[3,4]huc_[10,12]_pct	Text	10-digit hydrologic unit name[h]
huc12	lsr_eco[3,4]huc_12_pct	Text	12-digit hydrologic unit code[h]
huc12_l3_pct	lsr_eco3huc_12_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level III ecoregion in each 12-digit hydrologic unit
huc12_l4_pct	lsr_eco4huc_12_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level IV ecoregion in each 12-digit hydrologic unit
huc12_name	lsr_eco[3,4]huc_12_pct	Text	12-digit hydrologic unit name[h]
mass_bal	lsr_lcc9201_h0408rfg_pct	Double precision	Sum-check for land-cover change net gain/loss percentages
net_1	lsr_lcc9201_h0408rfg_pct	Double precision	Net percentage gain or loss of water within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_2	lsr_lcc9201_h0408rfg_pct	Double precision	Net percentage gain or loss of urban land within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_3	lsr_lcc9201_h0408rfg_pct	Double precision	Net percentage gain or loss of barren land within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_4	lsr_lcc9201_h0408rfg_pct	Double precision	Net percentage gain or loss of forest within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_5	lsr_lcc9201_h0408rfg_pct	Double precision	Net percentage gain or loss of grassland within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs

Table D–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
net_6	lsr_lcc9201_h0408rfg_pct	Double precision	Net percentage gain or loss of agricultural land within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_7	lsr_lcc9201_h0408rfg_pct	Double precision	Net percentage gain or loss of wetland within the area of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
nwr	lsr_nlcd92_h0408rfg_pct, lsr_nlcd01_h0408rfg_pct, lsr_lcc9201_h0408rfg_pct, lsr_sgo_hsg_pct	Text	U.S. Fish and Wildlife Service National Wildlife Refuge name
pct_11	lsr_nlcd92_h0408rfg_pct, lsr_nlcd01_h0408rfg_pct	Double precision	Percent open water—all areas of open water, generally with less than 25 percent cover of vegetation or soil (1992, 2001)[i,j]
pct_21	lsr_nlcd92_h0408rfg_pct, lsr_nlcd01_h0408rfg_pct	Double precision	Percent developed—low-intensity residential (1992)[i]; Developed, open space—includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes (2001)[j]
pct_22	lsr_nlcd92_h0408rfg_pct, lsr_nlcd01_h0408rfg_pct	Double precision	Percent developed—high-intensity residential (1992)[i]; Developed, low intensity—includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20–49 percent of total cover. These areas most commonly include single-family housing units (2001)[j]
pct_23	lsr_nlcd92_h0408rfg_pct, lsr_nlcd01_h0408rfg_pct	Double precision	Percent developed—commercial/industrial/transportation (1992)[i]; Developed, medium intensity—includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50–79 percent of the total cover. These areas most commonly include single-family housing units (2001)[j]
pct_24	lsr_nlcd01_h0408rfg_pct	Double precision	Developed, high intensity—includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to 100 percent of the total cover (2001)[j]
pct_31	lsr_nlcd92_h0408rfg_pct, lsr_nlcd01_h0408rfg_pct	Double precision	Barren—bare rock/sand/clay (1992)[i]; Barren land (rock/sand/clay)—barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15 percent of total cover (2001)[j]

Table D–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Percentile: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Specified period of analysis: por, period of record, cy, calendar year, wy, water year; hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Measurements: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; ft/s, foot per second; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Geospatial data summaries[f]—Continued			
pct_32	lsr_nlcd92_h0408rfg_pct	Double precision	Barren—quarries/strip mines/gravel pits (1992)[i]; Unconsolidated shore[k] —unconsolidated material such as silt, sand, or gravel that is subject to inundation and redistribution due to the action of water. Characterized by substrates lacking vegetation except for pioneering plants that become established during brief periods when growing conditions are favorable. Erosion and deposition by waves and currents produce a number of landforms representing this class (2001)[j]
pct_33	lsr_nlcd92_h0408rfg_pct	Double precision	Barren—transitional (1992)[i]
pct_41	lsr_nlcd92_h0408rfg_pct, lsr_nlcd01_h0408rfg_pct	Double precision	Vegetated, natural forested upland—deciduous forest (1992)[i]; Deciduous forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change (2001)[j]
pct_42	lsr_nlcd92_h0408rfg_pct, lsr_nlcd01_h0408rfg_pct	Double precision	Vegetated, natural forested upland—evergreen forest (1992)[i]; Evergreen forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species maintain their leaves all year. Canopy is never without green foliage (2001)[j]
pct_43	lsr_nlcd92_h0408rfg_pct, lsr_nlcd01_h0408rfg_pct	Double precision	Vegetated, natural forested upland - mixed forest (1992)[i]; Mixed forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. Neither deciduous nor evergreen species are greater than 75 percent of total tree cover (2001)[j]
pct_51	lsr_nlcd92_h0408rfg_pct	Double precision	Shrubland (1992)i
pct_52	lsr_nlcd01_h0408rfg_pct	Double precision	Shrub/Scrub—Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20 percent of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions (2001)[j]
pct_61	lsr_nlcd92_h0408rfg_pct	Double precision	Orchards/vineyards/other (1992)i
pct_71	lsr_nlcd92_h0408rfg_pct, lsr_nlcd01_h0408rfg_pct	Double precision	Herbaceous upland—grasslands/herbaceous (1992)[i]; Grassland/herbaceous—areas dominated by grammanoid or herbaceous vegetation, generally greater than 80 percent of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing (2001)[j]
pct_81	lsr_nlcd92_h0408rfg_pct, lsr_nlcd01_h0408rfg_pct	Double precision	Herbaceous planted/cultivated—pasture/hay (1992)[i]; Pasture/hay—areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation (2001)[j]
pct_82	lsr_nlcd92_h0408rfg_pct, lsr_nlcd01_h0408rfg_pct	Double precision	Herbaceous planted/cultivated—row crops (1992)[i]; Cultivated crops—areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled (2001)[j]

Table D–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Percentile: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Specified period of analysis: por, period of record, cy, calendar year, wy, water year; hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Measurements: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; ft/s, foot per second; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
pct_85	lsr_nlcd92_h0408rfg_pct	Double precision	Herbaceous planted/cultivated—urban/recreational grasses (1992)[i]
pct_90	lsr_nlcd01_h0408rfg_pct	Double precision	Woody wetlands—areas where forest or shrubland vegetation accounts for greater than 20 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water (2001)[j]
pct_91	lsr_nlcd92_h0408rfg_pct	Double precision	Wetlands—woody wetlands (1992)[i]
pct_92	lsr_nlcd92_h0408rfg_pct	Double precision	Wetlands—emergent herbaceous wetlands (1992)[i]
pct_95	lsr_nlcd01_h0408rfg_pct	Double precision	Emergent herbaceous wetlands—areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water (2001)[j]
pct_tot	lsr_nlcd92_h0408rfg_pct, lsr_nlcd01_h0408rfg_pct, lsr_sgo_hsg_pct	Double precision	Sum-check for land-cover percentages and percentages of hydrologic soil groups[h,l]
POP010130D	tblLsrPop01	Double precision	Resident population (April 1—complete count) 1930
POP010140D	tblLsrPop01	Double precision	Resident population (April 1—complete count) 1940
POP010150D	tblLsrPop01	Double precision	Resident population (April 1—complete count) 1950
POP010160D	tblLsrPop01	Double precision	Resident population (April 1—complete count) 1960
POP010170D	tblLsrPop01	Double precision	Resident population (April 1—complete count) 1970
POP010180D	tblLsrPop01	Double precision	Resident population (April 1—complete count) 1980
POP010190D	tblLsrPop01	Double precision	Resident population (April 1—complete count) 1990
POP010200D	tblLsrPop01	Double precision	Resident population (April 1—complete count) 2000
POP010210D	tblLsrPop01	Double precision	Resident population (April 1—complete count) 2010
POP020170D	tblLsrPop01	Double precision	Resident population (April 1—revised) 1970
pop3070_neg	pop_pct_chg	Double precision	Descriptive statistics for population decrease, 1930–1970
pop3070_pct	tblLsrPop01	Double precision	Percent change in population, 1930–1970
pop3070_pos	pop_pct_chg	Double precision	Descriptive statistics for population increase, 1930–1970
pop7010_neg	pop_pct_chg	Double precision	Descriptive statistics for population decrease, 1970–2010
pop7010_pct	tblLsrPop01	Double precision	Percent change in population, 1970–2010
pop7010_pos	pop_pct_chg	Double precision	Descriptive statistics for population increase, 1970–2010
ST	tblLsrPop01	Text	Two-letter U.S. Postal Service state code
to_1_pct	lsr_lcc9201_h0408rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area reclassified in the 2001 NLCD that was converted to water[m]
to_2_pct	lsr_lcc9201_h0408rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area reclassified in the 2001 NLCD that was converted to urban[m]

Table D–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for the Lower Suwannee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Percentile: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Specified period of analysis: por, period of record, cy, calendar year, wy, water year; hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Measurements: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft, foot; ft/s, foot per second; in, inch; mi^2, square mile; µS/cm, microsiemen per centimeter at 25 °C; mg/L, milligram per liter]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Geospatial data summaries[f]—Continued			
to_3_pct	lsr_lcc9201_h0408rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area reclassified in the 2001 NLCD that was converted to barren[m]
to_4_pct	lsr_lcc9201_h0408rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area reclassified in the 2001 NLCD that was converted to forest[m]
to_5_pct	lsr_lcc9201_h0408rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area reclassified in the 2001 NLCD that was converted to grassland[m]
to_6_pct	lsr_lcc9201_h0408rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area reclassified in the 2001 NLCD that was converted to agriculture[m]
to_7_pct	lsr_lcc9201_h0408rfg_pct	Double precision	Percentage of the hydrologic subregion (4-digit hydrologic unit), hydrologic cataloging unit (8-digit hydrologic unit), or refuge-acquisition area reclassified in the 2001 NLCD that was converted to wetland[m]
to_tot_pct	lsr_lcc9201_h0408rfg_pct	Double precision	Sum-check for land-cover change percentages
us_l3code	lsr_eco[3,4]huc_[08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level III ecoregion code[n]
us_l3name	lsr_eco[3,4]huc_[08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level III ecoregion name[n]
us_l4code	lsr_eco3huc_[08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level IV ecoregion code[n]
us_l4name	lsr_eco3huc_[08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level IV ecoregion name[n]

[a]In the file/table/worksheet name, ***var*** refers to the hydrologic parameter, where ***var=gmn***, gage height, in feet; ***qmn***, discharge, in cubic feet per second; ***tmn***, water temperature, in degrees Celsius; ***kmn***, specific conductance, in microsiemens per centimeter; ***smn***, salinity, in parts per thousand; all parameters are mean-daily values.

[b]Arguments enclosed in square brackets in table/worksheet names represent separate tables/worksheets. For example, lsr[***var***]01 refers to 2 tables/worksheets—lsrgmn1 and lsr***qmn***1, if ***var***=gmn, ***qmn***. “All tables” or “all worksheets” with one or more table/worksheet names in parentheses indicates that the table/worksheet reference(s) in parentheses is(are) excluded for the listed field. Tables refer to Microsoft Access files, worksheets refer to Microsoft Excel files.

[c]Raw-data file: lsr_tabular_hydrostats_raw.accdb (Microsoft Access).

[d]Data-value qualification codes, USGS NWISWeb database (U.S. Geological Survey, 2002, 2011): Eqp—equipment malfunction, A—approved for publication-processing and review completed, P—provisional data subject to revision, 1—daily value is write-protected without any remark code to be printed, e—value has been estimated.

[e]Descriptive-statistics, spread-measures, and ratio-measures file: lsr_tabular_hydrostats.accdb (Microsoft Access).

[f]Geospatial data summaries files: lsr_nlcd.xlsx, lsr_sgo_hsg.xlsx, lsr_eco34.xlsx, lsr_pop_census.xlsx (Microsoft Excel).

[g]U.S. Department of Agriculture, 2009.

[h]Seaber and others, 1994; U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013.

[i]Vogelmann and others, 2001.

[j]Homer and others, 2007.

[k]Coastal NLCD class only.

[l]Percentages of hydrologic soil groups A through D in 4-digit and 8-digit hydrologic units do not necessarily add up to 100 percent because, in some cases, there are STATSGO soil map-unit classifications that include multiple hydrologic soil groups (U.S. Department of Agriculture, 2009). Data for multiple-group map units are not included in the analysis.

[m]Fry and others, 2009.

[n]U.S. Environmental Protection Agency, 2011.

Table D–4A. Summary descriptive statistics and percentiles for gage height by water year for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Water year, October 1, preceding calendar year, through September 30, current calendar year, Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual gage height,[b] in feet			Mean-daily gage height,[b] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[c] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Upper Suwannee (03110201)														
02314495	Suwannee River	2000–2009 (5)	7.26	6.24 (2002)	7.93 (2001)	2.48 (2002)	19.79 (2004)	— (2.90)	— (3.50)	7.08 (5.88)	7.19 (7.81)	7.84 (7.84)	— (9.14)	— (11.25)
02314500	Suwannee River	1987–2009 (4)	3.83	1.60 (2002)	9.30 (2005)	0.45 (2001)	18.71 (2005)	— (0.89)	— (1.00)	— (1.36)	2.22 (1.86)	— (5.70)	— (10.31)	— (12.12)
02315500	Suwannee River	1906–2009 (50)	7.09	1.95 (1955)	18.23 (1948)	0.21 (1981)	40.00 (1973)	2.17 (1.35)	2.70 (1.64)	4.03 (2.44)	6.48 (4.37)	9.81 (9.05)	12.29 (17.20)	13.35 (23.31)
Alapaha (03110202)														
02317500	Alapaha River	1998–2009 (7)	4.79	1.82 (2002)	10.83 (1998)	0.54 (2000)	29.42 (1998)	— (0.68)	— (0.77)	2.33 (1.09)	3.32 (2.25)	8.08 (5.55)	— (13.81)	— (19.43)
02317620	Alapaha River	1976–2009 (11)	7.15	4.36 (1981)	9.24 (1987)	3.18 (2000)	31.84 (1986)	— (3.40)	4.90 (3.50)	5.62 (3.87)	7.18 (5.13)	8.48 (8.11)	9.16 (14.40)	— (19.14)
Withlacoochee (03110203)														
02318500	Withlacoochee River	1994–2009 (4)	4.47	2.86 (2007)	8.18 (2003)	1.55 (1999)	26.34 (2003)	— (1.65)	— (1.71)	— (1.80)	3.43 (2.43)	— (5.32)	— (10.33)	— (13.62)
02319000	Withlacoochee River	1932–2009 (58)	9.66	6.86 (1955)	14.38 (1948)	6.29 (1955)	38.20 (1948)	7.32 (6.60)	7.88 (6.71)	8.34 (7.00)	9.49 (8.01)	10.57 (10.34)	12.21 (14.84)	12.73 (18.80)
02319300	Withlacoochee River	2005–2010 (3)	42.41	41.51 (2007)	43.10 (2008)	40.40 (2008)	65.74 (2008)	— (40.57)	— (40.70)	— (40.92)	42.63 (41.38)	— (42.79)	— (45.18)	— (47.64)
02319394	Withlacoochee River	2001–2009 (3)	32.46	29.37 (2002)	35.62 (2003)	28.61 (2002)	56.37 (2003)	— (28.70)	— (28.76)	— (29.10)	32.38 (30.77)	— (33.63)	— (38.41)	— (44.05)
Lower Suwannee (03110205)														
02319500	Suwannee River	1927–2009 (59)	7.09	2.41 (1968)	16.92 (1948)	1.40 (2003)	40.77 (1948)	3.16 (2.06)	3.60 (2.30)	4.40 (2.88)	6.61 (4.48)	9.09 (9.12)	11.74 (16.02)	12.38 (20.58)
02319800	Suwannee River	1997–2009 (2)	23.31	21.97 (2002)	24.65 (2008)	21.12 (2002)	39.27 (2008)	— (21.19)	— (21.22)	— (21.39)	23.31 (21.80)	— (23.60)	— (27.88)	— (30.83)
02320000	Suwannee River	1927–2009 (15)	6.63	1.31 (2007)	12.03 (2005)	0.40 (2007)	33.70 (1928)	— (0.76)	1.35 (1.15)	3.47 (2.30)	5.81 (4.72)	10.64 (9.02)	11.66 (14.95)	— (19.40)
02320500	Suwannee River	1931–2009 (68)	9.12	3.06 (1955)	19.04 (1948)	1.97 (1956)	34.03 (1948)	4.12 (2.98)	5.01 (3.55)	6.10 (4.86)	9.26 (7.62)	11.60 (11.91)	13.88 (17.20)	14.07 (20.45)
02323000	Suwannee River	1932–2011 (14)	5.9	1.57 (2011)	9.93 (1998)	0.42 (2011)	21.47 (1998)	— (1.19)	2.60 (1.53)	3.87 (2.76)	6.43 (4.91)	7.23 (7.96)	8.64 (12.08)	— (14.03)

Table D–4*A*. Summary descriptive statistics and percentiles for gage height by water year for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.—Continued

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Water year, October 1, preceding calendar year, through September 30, current calendar year, Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual gage height,[b] in feet			Mean-daily gage height,[b] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[c] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Lower Suwannee (03110205)—Continued														
02323500	Suwannee River	1931–2011 (42)	5.16	2.44 (1955)	9.41 (1965)	–0.55 (1999)	18.56 (1973)	3.19 (2.47)	3.34 (2.75)	3.94 (3.29)	5.12 (4.34)	6.01 (6.34)	7.43 (8.82)	7.58 (10.41)
02323592	Suwannee River	1999–2011 (5)	3.21	2.90 (2001)	3.90 (2005)	0.88 (2000)	5.67 (2009)	— (2.01)	— (2.32)	2.93 (2.80)	2.97 (3.22)	3.33 (3.63)	— (4.03)	— (4.35)
Santa Fe (03110206)														
02321500	Santa Fe River	1932–2011 (40)	10.59	6.90 (2007)	13.65 (1970)	5.68 (2007)	24.58 (1934)	7.71 (7.14)	8.25 (7.44)	9.73 (8.09)	10.50 (9.65)	11.92 (12.49)	12.71 (15.45)	13.13 (16.69)
02322500	Santa Fe River	1928–2010 (39)	1.57	0.27 (2007)	3.42 (1965)	0.06 (2008)	15.22 (1964)	0.44 (0.50)	0.85 (0.69)	1.09 (0.89)	1.39 (1.18)	1.91 (1.77)	2.82 (2.95)	3.16 (4.16)
02322800	Santa Fe River	1947–2010 (23)	8.8	3.50 (2007)	15.57 (1965)	2.39 (2008)	24.12 (1960)	4.99 (3.28)	5.22 (3.87)	6.37 (5.13)	9.23 (7.77)	10.16 (11.58)	12.21 (15.82)	14.96 (18.37)

[a]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily gage height are based on complete water years. Year of minimum and maximum values for mean-annual and mean-daily gage-height numbers shown in parentheses.

[c]Percentiles listed for mean-annual and mean-daily gage height are based on complete water years.

Table D–4*B*. Summary descriptive statistics and percentiles for gage height by calendar year for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual gage height,[b] in feet			Mean-daily gage height,[b] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[c] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
						Upper Suwannee (03110201)								
02314495	Suwannee River	1999–2009 (6)	6.87	4.16 (2007)	8.72 (2004)	1.79 (2007)	20.13 (2004)	— (2.61)	— (2.96)	5.53 (4.53)	7.43 (7.80)	7.93 (7.84)	— (9.37)	— (12.04)
02314500	Suwannee River	1986–2009 (3)	2.09	1.68 (2000)	2.59 (2001)	0.45 (2001)	7.19 (2001)	— (0.83)	— (0.94)	— (1.24)	2.01 (1.65)	— (2.10)	— (4.49)	— (5.90)
02315500	Suwannee River	1906–2009 (47)	6.95	2.38 (1955)	16.71 (1964)	0.21 (1981)	40.00 (1973)	2.52 (1.40)	2.62 (1.72)	3.75 (2.50)	6.21 (4.25)	9.31 (8.65)	12.15 (16.65)	13.23 (23.07)
						Alapaha (03110202)								
02317500	Alapaha River	1997–2009 (7)	4.4	1.97 (1999)	8.47 (1998)	0.54 (1999)	29.42 (1998)	— (0.66)	— (0.75)	2.54 (1.04)	2.86 (2.27)	7.84 (5.20)	— (10.77)	— (17.46)
02317620	Alapaha River	1976–2009 (8)	6.71	4.37 (1981)	8.00 (1978)	3.19 (2008)	31.84 (1986)	— (3.42)	— (3.51)	5.69 (3.81)	7.25 (4.74)	7.70 (7.65)	— (12.29)	— (18.01)
						Withlacoochee (03110203)								
02318500	Withla-coochee River	1993–2009 (3)	4.76	2.87 (2007)	7.42 (2005)	1.62 (1996)	24.17 (2005)	— (1.70)	— (1.74)	— (1.86)	4.00 (2.63)	— (5.71)	— (10.42)	— (14.35)
02319000	Withla-coochee River	1931–2009 (59)	9.52	6.84 (1955)	14.15 (1964)	6.19 (2001)	38.20 (1948)	7.22 (6.60)	7.48 (6.70)	8.27 (6.98)	9.37 (7.93)	10.59 (10.12)	11.92 (14.41)	12.11 (18.22)
02319300	Withla-coochee River	2004–2009 (4)	43.66	41.43 (2007)	46.93 (2005)	40.40 (2007)	67.12 (2005)	— (40.61)	— (40.75)	— (41.03)	43.15 (41.89)	— (44.45)	— (48.85)	— (52.08)
02319394	Withla-coochee River	2000–2009 (3)	32.29	29.84 (2002)	35.73 (2003)	28.61 (2002)	56.37 (2003)	— (28.70)	— (28.76)	— (29.10)	31.31 (30.90)	— (33.27)	— (37.64)	— (41.41)
						Lower Suwannee (03110205)								
02319500	Suwannee River	1927–2009 (54)	7.13	2.26 (1968)	15.60 (1964)	1.47 (2000)	40.77 (1948)	3.04 (2.05)	3.71 (2.29)	4.63 (2.92)	6.70 (4.58)	9.01 (9.34)	11.09 (16.05)	12.77 (20.32)
02319800	Suwannee River	1996–2009 (3)	26.51	22.40 (2002)	31.76 (1998)	21.12 (2002)	53.98 (1998)	— (21.22)	— (21.36)	— (21.87)	25.38 (23.76)	— (27.44)	— (38.34)	— (42.57)
02320000	Suwannee River	1927–2009 (13)	6.51	1.66 (2002)	13.55 (1928)	0.50 (2002)	33.70 (1928)	— (0.82)	2.78 (1.34)	3.35 (2.44)	6.30 (4.96)	8.91 (8.80)	10.92 (14.00)	— (18.10)
02320500	Suwannee River	1931–2009 (69)	9.14	3.03 (1955)	17.80 (1964)	1.97 (1956)	34.03 (1948)	4.09 (3.06)	4.93 (3.63)	6.53 (4.93)	9.17 (7.65)	11.73 (11.97)	13.81 (17.09)	14.69 (20.32)
02323000	Suwan-nee River	1932–2011 (10)	7.04	5.13 (2009)	9.85 (1998)	0.98 (2010)	21.47 (1998)	— (2.40)	— (2.87)	5.70 (3.97)	7.15 (5.95)	7.93 (9.37)	— (13.29)	— (14.83)

Table D–4*B*. Summary descriptive statistics and percentiles for gage height by calendar year for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.—Continued

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual gage height,[b] in feet			Mean-daily gage height,[b] in feet		Percentiles of mean-annual gage height and (mean-daily gage height),[c] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Lower Suwannee (03110205)—Continued														
02323500	Suwannee River	1930–2011 (42)	5.24	2.44 (1955)	9.22 (1964)	0.90 (1957)	18.56 (1973)	2.65 (2.39)	3.06 (2.66)	4.20 (3.22)	4.97 (4.41)	6.52 (6.51)	7.52 (9.18)	7.74 (10.85)
02323592	Suwannee River	1999–2011 (4)	3.02	2.91 (2001)	3.24 (2008)	0.76 (2008)	5.44 (2008)	— (1.96)	— (2.24)	— (2.70)	2.97 (3.09)	— (3.38)	— (3.66)	— (3.86)
Santa Fe (03110206)														
02321500	Santa Fe River	1931–2011 (38)	10.77	8.20 (1962)	13.51 (1959)	5.98 (2001)	24.47 (1948)	8.25 (7.32)	8.50 (7.62)	9.88 (8.28)	10.67 (9.86)	11.83 (12.68)	12.22 (15.51)	12.49 (16.71)
02322500	Santa Fe River	1927–2010 (38)	1.63	0.23 (2007)	3.14 (1966)	0.06 (2007)	15.22 (1964)	0.48 (0.49)	0.76 (0.68)	1.10 (0.88)	1.55 (1.20)	2.22 (1.87)	2.76 (3.20)	3.10 (4.54)
02322800	Santa Fe River	1947–2010 (19)	9.1	3.43 (2007)	15.46 (1964)	2.18 (2001)	24.12 (1960)	— (3.18)	4.66 (3.81)	5.92 (4.79)	8.80 (8.09)	12.10 (12.50)	15.05 (16.48)	— (18.54)

[a]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily gage height are based on complete calendar years. Year of minimum and maximum values for mean-annual and mean-daily gage-height numbers shown in parentheses.

[c]Percentiles listed for mean-annual and mean-daily gage height are based on complete calendar years.

Table D–5*A*. Summary descriptive statistics and percentiles for discharge by water year for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Water year, October 1, preceding calendar year, through September 30, current calendar year. ft^3/s, cubic feet per second; Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual discharge,[b] in ft^3/s			Mean-daily discharge,[b] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[e] in cubic feet per second						
			Mean (yield[c])	Min	Max	Min[d]	Max	5	10	25	50	75	90	95
Upper Suwannee (03110201)														
02314274	Suwannee River	2000–2002 (3)	67.6	56.8 (2002)	87.6 (2001)	3.00 (2000)	546 (2002)	— (11.0)	— (15.0)	— (22.0)	58.3 (41.0)	— (77.0)	— (158)	— (223)
023142741	N Fork Suwannee River	1999–2003 (4)	40	17.8 (2002)	64.2 (2001)	0 (2000)	395 (2001)	— (0.25)	— (0.75)	— (11.0)	39.1 (23.0)	— (32.0)	— (84.5)	— (175)
02314500	Suwannee River	1927–2009 (75)	991	48.7 (2007)	3,510 (1948)	0 (1944)	13,800 (1929)	82.8 (12.0)	119 (30.0)	478 (103)	871 (416)	1,370 (1,340)	2,020 (2,590)	2,230 (3,830)
02315500	Suwannee River	1906–2009 (83)	1,750	103 (2007)	6,810 (1948)	2.80 (1990)	38,000 (1973)	176 (25.0)	299 (54.0)	845 (176)	1,460 (677)	2,500 (2,170)	3,780 (4,880)	3,990 (7,270)
02315550	Suwannee River	1975–1996 (22)	1,810	340 (1989)	3,760 (1991)	49.0 (1991)	17,800 (1984)	725 (127)	735 (177)	1,030 (321)	1,810 (872)	2,440 (2,390)	2,970 (4,660)	3,710 (6,990)
Alapaha (03110202)														
02317500	Alapaha River	1921–2009 (76)	1,060	127 (1981)	3,280 (1948)	17.0 (1955)	26,500 (1948)	181 (39.0)	333 (51.0)	520 (108)	932 (364)	1,520 (1,290)	1,890 (2,920)	2,230 (4,420)
02317620	Alapaha River	1976–2009 (14)	1,370	273 (1981)	2,750 (1984)	34.0 (1986)	18,100 (1986)	— (55.0)	304 (69.0)	747 (117)	1,380 (433)	1,980 (1,540)	2,280 (4,290)	— (6,540)
Withlacoochee (03110203)														
02318500	Withlacoochee River	1929–2009 (31)	1,130	200 (2002)	3,200 (1991)	5.80 (2007)	34,900 (1991)	286 (15.0)	339 (22.0)	509 (58.0)	882 (350)	1,610 (1,200)	2,200 (3,150)	2,770 (4,880)
02319000	Withlacoochee River	1932–2009 (77)	1,700	236 (1955)	5,370 (1948)	57.0 (2002)	73,600 (1948)	403 (114)	483 (140)	899 (226)	1,460 (612)	2,300 (1,870)	3,110 (4,530)	3,780 (6,900)
02319300	Withlacoochee River	2005–2008 (3)	751	304 (2007)	1,170 (2008)	11.0 (2007)	17,000 (2008)	— (24.0)	— (32.0)	— (61.0)	778 (153)	— (826)	— (1,990)	— (2,920)
02319394	Withlacoochee River	2001–2009 (7)	1,960	568 (2002)	4,550 (2005)	215 (2002)	18,200 (2003)	— (299)	— (330)	697 (408)	1,620 (987)	3,410 (2,460)	— (4,550)	— (6,630)
Lower Suwannee (03110205)														
02319500	Suwannee River	1927–2009 (81)	6,280	1,290 (1955)	19,700 (1948)	667 (2007)	94,700 (1948)	1,810 (1,150)	2,590 (1,390)	3,500 (2,060)	5,650 (3,750)	8,230 (7,860)	11,700 (14,500)	12,000 (19,800)
02319800	Suwannee River	1997–2009 (11)	4,860	1,480 (2002)	11,700 (2005)	875 (2002)	53,100 (1998)	— (999)	1,560 (1,090)	1,670 (1,360)	3,670 (2,520)	7,560 (5,650)	11,500 (11,600)	— (17,200)
02320000	Suwannee River	1927–2009 (22)	6,120	1,600 (2007)	12,900 (2005)	993 (2007)	66,000 (1928)	1,670 (1,180)	1,740 (1,350)	3,340 (1,950)	4,710 (3,560)	8,800 (7,580)	12,200 (14,600)	12,500 (19,700)

Table D–5*A*. Summary descriptive statistics and percentiles for discharge by water year for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.—Continued

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Water year, October 1, preceding calendar year, through September 30, current calendar year. ft^3/s, cubic feet per second; Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual discharge,[b] in ft^3/s			Mean-daily discharge,[b] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[e] in cubic feet per second						
			Mean (yield[c])	Min	Max	Min[d]	Max	5	10	25	50	75	90	95
						Lower Suwannee (03110205)—Continued								
02320500	Suwannee River	1931–2009 (77)	6,840	1,950 (1955)	19,200 (1948)	1,330 (2002)	82,800 (1948)	2,150 (1,840)	3,270 (2,170)	4,200 (2,940)	6,360 (4,760)	8,780 (8,550)	12,100 (14,300)	12,800 (19,000)
02323000	Suwannee River	1932–2011 (35)	8,010	3,010 (2002)	24,100 (1948)	2,020 (2011)	82,300 (1948)	3,110 (2,780)	3,460 (3,230)	5,370 (4,290)	6,940 (6,100)	9,700 (9,730)	11,800 (15,100)	16,100 (19,100)
02323500	Suwannee River	1931–2011 (71)	9,790	3,270 (2002)	24,500 (1948)	1,070 (2002)	84,700 (1948)	3,690 (3,460)	5,300 (4,140)	6,700 (5,400)	9,280 (7,750)	12,500 (12,200)	15,000 (18,000)	16,300 (22,700)
02323592	Suwannee River	1999–2011 (11)	7,720	3,400 (2002)	17,300 (2005)	-935 (2004)	36,300 (2005)	— (2,670)	4,170 (3,080)	4,460 (4,050)	7,510 (5,980)	9,020 (9,230)	10,900 (14,700)	— (19,700)
291841-083070800	East Pass Suwannee River	1995–2001 (1)	2,090	2,090 (2000)	2,090 (2000)	130 (2000)	4,700 (2000)	— (1,240)	— (1,370)	— (1,650)	— (2,000)	— (2,460)	— (2,980)	— (3,340)
						Santa Fe (03110206)								
02320700	Santa Fe River	1957–1998 (41)	52.3	5.67 (1990)	155 (1970)	0.03 (1981)	1,870 (1964)	10.5 (0.31)	11.6 (0.67)	24.7 (4.00)	45.9 (20.0)	72.9 (58.0)	95.7 (138)	121 (213)
02321500	Santa Fe River	1932–2011 (80)	403	3.80 (2007)	1,160 (1948)	0 (2000)	19,000 (1964)	53.6 (5.50)	82.7 (12.0)	246 (37.0)	381 (120)	545 (408)	734 (1,070)	891 (1,730)
02321975	Santa Fe River	1993–2002 (9)	579	16.7 (2002)	1,210 (1998)	0 (2002)	9,150 (1998)	— (6.70)	— (42.0)	470 (204)	482 (406)	784 (676)	— (1,120)	— (1,560)
02322000	Santa Fe River	1931–1971 (40)	846	81.8 (1956)	2,140 (1948)	31.0 (1956)	19,600 (1964)	203 (120)	374 (182)	545 (292)	721 (540)	1,050 (1,080)	1,670 (1,860)	1,750 (2,500)
02322500	Santa Fe River	1928–2010 (80)	1,500	589 (2002)	3,110 (1948)	342 (2009)	16,900 (1964)	726 (674)	914 (773)	1,150 (968)	1,420 (1,240)	1,810 (1,760)	2,220 (2,510)	2,560 (3,120)
02322800	Santa Fe River	2001–2010 (7)	1,610	971 (2002)	2,650 (2005)	-1,070 (2009)	9,710 (2004)	— (879)	— (919)	1,260 (1,040)	1,450 (1,320)	1,820 (1,960)	— (2,640)	— (3,060)

[a]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily discharge are based on complete water years. Year of minimum and maximum values for mean-annual and mean-daily discharge numbers shown in parentheses.

[c]Yield units are cubic feet per second per square mile. Yields are based on contributing drainage areas where given.

[d]Mean daily discharge of zero first occurred during the water year indicated but may subsequently have occurred in one or more years.

[e]Percentiles listed for mean-annual and mean-daily discharge are based on complete water years.

Table D–5*B*. Summary descriptive statistics and percentiles for discharge by calendar year for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Calendar year, January 1 through December 31. ft^3/s, cubic feet per second; Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual discharge,[b] in ft^3/s			Mean-daily discharge,[b] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[e] in cubic feet per second						
			Mean (yield[c])	Min	Max	Min[d]	Max	5	10	25	50	75	90	95
						Upper Suwannee (03110201)								
02314274	Suwannee River	1999–2002 (2)	69.2	54.7 (2000)	83.6 (2001)	3.00 (2000)	464 (2001)	— (7.00)	— (14.0)	— (22.0)	69.2 (46.0)	— (84.0)	— (170)	— (215)
023142741	N Fork Suwannee River	1998–2003 (4)	36.3	22.2 (2000)	59.4 (2001)	0 (2000)	395 (2001)	— (0.25)	— (0.75)	— (9.50)	31.8 (23.0)	— (31.0)	— (77.0)	— (147)
02314500	Suwannee River	1927–2009 (74)	993	70.7 (1943)	2,850 (1964)	0 (1943)	13,800 (1928)	107 (12.0)	136 (31.0)	502 (106)	936 (414)	1,400 (1,340)	1,920 (2,600)	2,240 (3,830)
02315500	Suwannee River	1906–2009 (83)	1,750	144 (1943)	5,450 (1964)	2.80 (1990)	38,000 (1973)	216 (26.0)	257 (55.0)	851 (178)	1,490 (678)	2,600 (2,170)	3,570 (4,880)	4,190 (7,270)
02315550	Suwannee River	1974–1996 (21)	1,850	297 (1989)	3,850 (1991)	49.0 (1990)	17,800 (1984)	637 (125)	686 (172)	1,130 (320)	1,650 (917)	2,620 (2,460)	2,900 (4,770)	3,630 (7,160)
						Alapaha (03110202)								
02317500	Alapaha River	1921–2009 (77)	1,050	137 (1981)	2,800 (1964)	17.0 (1954)	26,500 (1948)	222 (39.0)	340 (51.0)	542 (108)	1,020 (364)	1,410 (1,280)	1,870 (2,890)	2,200 (4,400)
02317620	Alapaha River	1976–2009 (11)	1,170	278 (1981)	2,420 (1983)	34.0 (1986)	18,100 (1986)	— (54.0)	305 (67.0)	571 (111)	1,330 (349)	1,440 (1,330)	1,620 (3,290)	— (5,510)
						Withlacoochee (03110203)								
02318500	Withlacoochee River	1928–2009 (30)	1,190	219 (1938)	3,210 (1991)	5.80 (2007)	34,900 (1991)	283 (15.0)	299 (22.0)	509 (58.0)	1,130 (355)	1,840 (1,270)	2,150 (3,410)	2,320 (5,160)
02319000	Withlacoochee River	1931–2009 (77)	1,700	237 (1968)	5,020 (1964)	57.0 (2002)	73,600 (1948)	413 (115)	476 (142)	909 (228)	1,670 (616)	2,230 (1,880)	3,050 (4,530)	3,510 (6,910)
02319300	Withlacoochee River	2004–2008 (3)	1,390	303 (2007)	3,200 (2005)	11.0 (2006)	16,900 (2005)	— (24.0)	— (32.0)	— (63.0)	663 (214)	— (1,930)	— (3,380)	— (5,380)
02319394	Withlacoochee River	2000–2009 (8)	1,960	688 (2007)	3,760 (2005)	215 (2002)	18,200 (2003)	— (305)	— (335)	912 (451)	1,770 (1,030)	2,930 (2,400)	— (4,600)	— (6,470)
						Lower Suwannee (03110205)								
02319500	Suwannee River	1927–2009 (81)	6,290	1,380 (1955)	16,300 (1928)	667 (2007)	94,700 (1948)	1,860 (1,150)	2,420 (1,400)	3,670 (2,070)	5,790 (3,760)	8,380 (7,860)	10,900 (14,500)	12,100 (19,800)
02319800	Suwannee River	1996–2009 (12)	4,900	1,640 (2007)	10,800 (1998)	875 (2002)	53,100 (1998)	— (1,010)	1,750 (1,110)	1,920 (1,420)	3,690 (2,740)	7,280 (5,820)	9,190 (11,300)	— (16,800)
02320000	Suwannee River	1927–2009 (22)	6,160	1,640 (2007)	15,900 (1928)	993 (2007)	66,000 (1928)	1,880 (1,180)	1,970 (1,350)	3,300 (2,010)	5,140 (3,650)	8,560 (7,660)	11,100 (14,600)	11,400 (19,700)

Table D–5*B*. Summary descriptive statistics and percentiles for discharge by calendar year for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.—Continued

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Calendar year, January 1 through December 31. ft^3/s, cubic feet per second; Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual discharge,[b] in ft^3/s			Mean-daily discharge,[b] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge),[e] in cubic feet per second						
			Mean (yield[c])	Min	Max	Min[d]	Max	5	10	25	50	75	90	95
Lower Suwannee (03110205)—Continued														
02320500	Suwannee River	1931–2009 (77)	6,840	2,010 (1955)	16,100 (1964)	1,330 (2002)	82,800 (1948)	2,350 (1,850)	3,130 (2,180)	4,230 (2,960)	6,350 (4,780)	8,930 (8,550)	11,500 (14,300)	12,700 (19,000)
02323000	Suwannee River	1932–2011 (34)	8,090	3,270 (2002)	19,700 (1948)	2,050 (2002)	82,300 (1948)	3,340 (2,870)	4,210 (3,310)	5,640 (4,360)	7,370 (6,170)	10,700 (9,770)	12,300 (15,200)	14,100 (19,400)
02323500	Suwannee River	1930–2011 (69)	9,880	3,110 (2007)	20,700 (1948)	1,070 (2002)	84,700 (1948)	4,210 (3,510)	5,040 (4,180)	6,940 (5,430)	9,390 (7,800)	12,600 (12,300)	15,600 (18,200)	16,100 (22,800)
02323592	Suwannee River	1999–2011 (10)	7,630	3,560 (2002)	14,100 (2005)	-935 (2004)	36,300 (2005)	— (2,610)	— (3,030)	4,530 (3,970)	6,860 (5,840)	10,700 (9,060)	— (14,300)	— (19,700)
Santa Fe (03110206)														
02320700	Santa Fe River	1957–1998 (40)	51.3	3.61 (1990)	147 (1959)	0.03 (1981)	1,870 (1964)	7.68 (0.31)	9.85 (0.66)	26.5 (4.00)	46.5 (20.0)	69.0 (58.0)	107 (135)	124 (206)
02321500	Santa Fe River	1931–2011 (79)	408	30.8 (2007)	1,040 (1959)	0 (2000)	19,000 (1964)	51.1 (6.50)	93.8 (14.0)	212 (39.0)	391 (124)	578 (416)	776 (1,080)	862 (1,740)
02321975	Santa Fe River	1992–2002 (7)	665	290 (1999)	1,330 (1998)	99.0 (1993)	9,150 (1998)	— (195)	— (214)	562 (308)	606 (497)	655 (723)	— (1,180)	— (1,610)
02322000	Santa Fe River	1931–1971 (39)	855	147 (1955)	1,880 (1948)	31.0 (1956)	19,600 (1964)	155 (119)	273 (180)	490 (295)	776 (554)	1,180 (1,100)	1,580 (1,870)	1,780 (2,520)
02322500	Santa Fe River	1927–2010 (79)	1,510	602 (2002)	2,840 (1948)	342 (2009)	16,900 (1964)	709 (669)	844 (775)	1,160 (972)	1,430 (1,250)	1,880 (1,780)	2,310 (2,520)	2,540 (3,160)
02322800	Santa Fe River	2000–2010 (6)	1,480	955 (2002)	2,290 (2004)	-1,070 (2009)	9,710 (2004)	— (842)	— (902)	1,010 (1,000)	1,370 (1,170)	1,900 (1,680)	— (2,430)	— (2,860)

[a]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily discharge are based on complete calendar years. Year of minimum and maximum values for mean-annual and mean-daily discharge numbers shown in parentheses.

[c]Yield units are cubic feet per second per square mile. Yields are based on contributing drainage areas where given.

[d]Mean daily discharge of zero first occurred during the calendar year indicated but may subsequently have occurred in one or more years.

[e]Percentiles listed for mean-annual and mean-daily discharge are based on complete calendar years. Dashed lines indicate too few values to compute the indicated percentile.

Table D–6*A*. Summary descriptive statistics and percentiles for selected water-quality parameters by water year for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Lower Suwannee hydrologic cataloging unit (03110205), Florida and Georgia.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual parameter value[b]			Mean-daily parameter value[b]		Percentiles of mean-annual parameter values and (mean-daily parameter values)[c]						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Water temperature, in degrees Celsius														
02320000	Suwannee River	1996–2009 (2)	26.0	25.7 (2005)	26.2 (2006)	14.4 (2006)	33.7 (2005)	— (17.8)	— (18.8)	— (21.8)	26.0 (26.7)	— (30.4)	— (32.2)	— (32.7)
02323592	Suwannee River	1999–2011 (3)	22.1	21.2 (2005)	23.3 (2002)	11.7 (2001)	30.4 (2002)	— (14.3)	— (15.5)	— (18.2)	21.9 (22.2)	— (26.7)	— (28.1)	— (28.3)
0291841-083070800	East Pass Suwannee River	1995–2001 (1)	23.2	23.2 (2000)	23.2 (2000)	13.2 (2000)	30.5 (2000)	— (15.4)	— (16.7)	— (19.7)	— (22.8)	— (27.9)	— (29.1)	— (29.5)
Specific conductance, in microsiemens per centimeter at 25 degrees Celsius														
02323592	Suwannee River	1999–2011 (3)	343	277 (2009)	390 (2007)	60.0 (2009)	13,800 (2006)	— (147)	— (187)	— (298)	362 (350)	— (379)	— (391)	— (400)
Salinity, in parts per thousand														
02323592	Suwannee River	1999–2011 (5)	0.16	0.13 (2009)	0.19 (2007)	0.03 (2009)	8.30 (2006)	— (0.07)	— (0.09)	0.14 (0.14)	0.18 (0.16)	0.18 (0.18)	— (0.18)	— (0.19)

[a]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily parameter values are based on complete water years. Year of minimum and maximum parameter values for mean-annual and mean-daily parameter-value numbers shown in parentheses.

[c]Percentiles listed for mean-annual and mean-daily parameter values are based on complete water years.

Table D–6*B*. Summary descriptive statistics and percentiles for selected water-quality parameters by calendar year for gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Lower Suwannee hydrologic cataloging unit (03110205), Florida and Georgia.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number	River name	Period of record[a]	Mean-annual parameter value[b]			Mean-daily parameter value[b]		Percentiles of mean-annual parameter values and (mean-daily parameter values)[c]						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Water temperature, in degrees Celsius														
02320000	Suwannee River	1996–2009 (2)	26.0	25.7 (2005)	26.2 (2006)	14.4 (2006)	33.7 (2005)	— (18.1)	— (18.9)	— (22.0)	26.0 (25.9)	— (30.4)	— (32.2)	— (32.7)
02323592	Suwannee River	1999–2011 (3)	22.8	22.3 (2001)	23.2 (2002)	11.7 (2001)	30.4 (2002)	— (14.4)	— (15.6)	— (19.0)	22.8 (22.7)	— (27.6)	— (28.4)	— (28.8)
Specific conductance, in microsiemens per centimeter at 25 degrees Celsius														
02323592	Suwannee River	1999–2011 (1)	382	382 (2006)	382 (2006)	108 (2006)	13,800 (2006)	— (143)	— (185)	— (328)	— (375)	— (381)	— (394)	— (405)
Salinity, in parts per thousand														
02323592	Suwannee River	1999–2011 (4)	0.16	0.14 (2001)	0.19 (2006)	0.04 (2001)	8.30 (2006)	— (0.08)	— (0.10)	— (0.14)	0.16 (0.17)	— (0.18)	— (0.18)	— (0.18)

[a]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[b]Statistics listed for mean-annual and mean-daily parameter values are based on complete calendar years. Year of minimum and maximum parameter values for mean-annual and mean-daily parameter-value numbers shown in parentheses.

[c]Percentiles listed for mean-annual and mean-daily parameter values are based on complete calendar years.

Table D–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Calendar year, January 1 through December 31. Files listed in table D8 are included in the plot_pdf directory of the database]

USGS station number	Station name	Parameter	Plot frames[a–e]	File name[f]
		Upper Suwannee (03110201)		
02314274	Suwannee R at Sill nr Fargo, GA	Discharge	A1, A2, A4; A5–A8	s02314274qmn.p12ar.pdf
		Discharge	A1, A2, A4; A5–A8	s02314274qmn.p12lg.pdf
023142741	N Fork Suwannee R at Sill nr Fargo, GA	Discharge	A1, A2, A4; A5–A8	s023142741qmn.p12ar.pdf
02314495	Suwannee R ab Fargo, GA	Gage height	A1, A2, A4; A5–A8	s02314495gmn.p12ar.pdf
		Gage height	A1, A2, A4; A5–A8	s02314495gmn.p12lg.pdf
02314500	Suwannee R (US 441) at Fargo, GA	Gage height	A1–A4; A5–A8	s02314500gmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02314500qmn.p12ar.pdf
02315500	Suwannee R at White Springs, FL	Gage height	A1–A4; A5–A8	s02315500gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02315500gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02315500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02315500qmn.p12lg.pdf
02315550	Suwannee R at Suwannee Springs, FL	Discharge	A1–A4; A5–A8	s02315550qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02315550qmn.p12lg.pdf
		Alapaha (03110202)		
02317500	Alapaha R at Statenville, GA	Gage height	A1–A4; A5–A8	s02317500gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02317500gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02317500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02317500qmn.p12lg.pdf
02317620	Alapaha R nr Jennings, FL	Gage height	A1–A4; A5–A8	s02317620gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02317620gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02317620qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02317620qmn.p12lg.pdf
		Withlacoochee (03110203)		
02318500	Withalacoochee R (US 84) nr Quitman, GA	Gage height	A1–A4; A5–A8	s02318500gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02318500gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02318500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02318500qmn.p12lg.pdf
02319000	Withalacoochee R nr Pinetta, FL	Gage height	A1–A4; A5–A8	s02319000gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02319000gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02319000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02319000qmn.p12lg.pdf
02319300	Withalacoochee R nr Madison, FL	Gage height	A1–A4; A5–A8	s02319300gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02319300gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02319300qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02319300qmn.p12lg.pdf
02319394	Withalacoochee R nr Lee, FL	Gage height	A1–A4; A5–A8	s02319394gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02319394gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02319394qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02319394qmn.p12lg.pdf

Table D–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.—Continued

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Calendar year, January 1 through December 31. Files listed in table D8 are included in the plot_pdf directory of the database]

USGS station number	Station name	Parameter	Plot frames[a–e]	File name[f]
		Lower Suwannee (03110205)		
02319500	Suwannee R at Ellaville, FL	Gage height	A1–A4; A5–A8	s02319500gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02319500gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02319500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02319500qmn.p12lg.pdf
02319800	Suwannee R at Dowling Park, FL	Gage height	A1–A4; A5–A8	s02319800gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02319800gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02319800qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02319800qmn.p12lg.pdf
02320000	Suwannee R at Luraville, FL	Gage height	A1–A4; A5–A8	s02320000gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02320000gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02320000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02320000qmn.p12lg.pdf
		Water temperature	A1–A4; A5–A8	s02320000tmn.p12ar.pdf
		Water temperature	A1–A4; A5–A8	s02320000tmn.p12lg.pdf
02320500	Suwannee R at Branford, FL	Gage height	A1–A4; A5–A8	s02320500gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02320500gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02320500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02320500qmn.p12lg.pdf
02323000	Suwannee R nr Bell, FL	Gage height	A1–A4; A5–A8	s02323000gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02323000gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02323000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02323000qmn.p12lg.pdf
02323500	Suwannee R nr Wilcox, FL	Gage height	A1–A4; A5–A8	s02323500gmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02323500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02323500qmn.p12lg.pdf
		Water temperature	A1, A2, A4	s02323500tmn.p01ar.pdf
		Water temperature	A1, A2, A4	s02323500tmn.p01lg.pdf
02323592	Suwannee R ab Gopher R nr Suwannee, FL	Gage height	A1–A4; A5–A8	s02323592gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02323592gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02323592qmn.p12ar.pdf
		Water temperature	A1–A4; A5–A8	s02323592tmn.p12ar.pdf
		Water temperature	A1–A4; A5–A8	s02323592tmn.p12lg.pdf
		Specific conductance	A1, A2, A4; A5, A6, A7	s02323592kmn.p12ar.pdf
		Specific conductance	A1, A2, A4; A5, A6, A7	s02323592kmn.p12lg.pdf
		Salinity	A1–A4; A5–A8	s02323592smn.p12ar.pdf
		Salinity	A1–A4; A5–A8	s02323592smn.p12lg.pdf

Table D–7. Graphical summary files for plots of gage height, discharge, water temperature, specific conductance, and salinity data collected at gaging stations in the contributing watersheds of the Lower Suwannee National Wildlife Refuge and vicinity, Suwannee subregion (0311), Florida and Georgia.—Continued

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure D1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure D1. Calendar year, January 1 through December 31. Files listed in table D8 are included in the plot_pdf directory of the database]

USGS station number	Station name	Parameter	Plot frames[a–e]	File name[f]
		Lower Suwannee (03110205)—Continued		
291841-083070800	East Pass Suwannee R nr Suwannee, FL	Discharge	A1, A2, A4	s291841083070800qmn.p01ar.pdf
		Water temperature	A1, A2, A4	s291841083070800tmn.p01ar.pdf
		Water temperature	A1, A2, A4	s291841083070800tmn.p01lg.pdf
		Salinity	A1, A2, A4; A5, A6, A7	s291841083070800smn.p12ar.pdf
		Salinity	A1, A2, A4; A5, A6	s291841083070800smn.p12lg.pdf
		Santa Fe (03110206)		
02320700	Santa Fe R nr Graham, FL	Discharge	A1–A4; A5–A8	s02320700qmn.p12ar.pdf
		Discharge	A1–A4; A5, A6, A8	s02320700qmn.p12lg.pdf
02321500	Santa Fe R at Worthington Springs, FL	Gage height	A1–A4; A5–A8	s02321500gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02321500gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02321500qmn.p12ar.pdf
02321975	Santa Fe R (US 441) nr High Springs, FL	Discharge	A1, A2, A4; A5–A8	s02321975qmn.p12ar.pdf
02322000	Santa Fe R nr High Springs, FL	Discharge	A1–A4; A5–A8	s02322000qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02322000qmn.p12lg.pdf
02322500	Santa Fe R nr Ft White, FL	Gage height	A1–A4; A5–A8	s02322500gmn.p12ar.pdf
		Gage height	A1–A4; A5, A6, A8	s02322500gmn.p12lg.pdf
		Discharge	A1–A4; A5–A8	s02322500qmn.p12ar.pdf
		Discharge	A1–A4; A5–A8	s02322500qmn.p12lg.pdf
02322800	Santa Fe R nr Hildreth, FL	Gage height	A1–A4; A5–A8	s02322800gmn.p12ar.pdf
		Gage height	A1–A4; A5–A8	s02322800gmn.p12lg.pdf
		Discharge	A1, A2, A4; A5–A8	s02322800qmn.p12ar.pdf

[a]A1, mean-daily values; A2, A3, A4, boxplot interpolation of mean-daily values, annual timestep (A2), decadal timestep (A3), monthly timestep, period-of-record (A4); A5, annual-distribution spread measures; A6, annual-distribution ratio measures; A7, annual distribution, log-coefficient of variation, set of every 5th percentile of mean-daily values for each complete calendar year; Richards-Baker flashiness index; A8, long-term daily seasonality.

[b]Percentile spread measures are calculated as the difference between the indicated percentiles divided by the median where 7525 = (p75–p25) / p50, 8020 = (p80–p20) / p50, and 9010 = (p90–p10) / p50.

[c]Percentile ratio measures are calculated as the ratios of the indicated percentiles where 7525 = p75 / p25, 8020 = p80 / p20, and 9010 = p90 / p10.

[d]Richards-Baker flashiness index (Baker and others, 2004).

[e]Plots A2, A5–A7, greater than or equal to 90-percent-complete calendar years only; plot A3, greater than or equal to 90-percent-complete calendar decades only; plot A4, period-of-record monthly distributions for greater than or equal to 90-percent-complete calendar years only; plot A8, period-of-record daily distributions for complete calendar years only—50th percentile, n > 1; 25th, 75th percentiles, n > 4; 10th, 90th percentiles, n > 10.

[f]File-naming conventions: sSSSSSSSS***var***.p[01,12]***ps***.pdf; SSSSSSSS, USGS station identification number; ***var***: gmn, mean-daily gage height, in feet; qmn, mean-daily discharge, in cubic feet per second; tmn, mean-daily water temperature, in degrees Celsius; kmn, mean-daily specific conductance, in microsiemens per centimeter at 25 degrees Celsius; smn, salinity, in parts per thousand; p[01,12], p01, plots A1–A4; p12, plots A1–A4, page 1, plots A5–A8, page 2; ***ps***, plot scale: ar, plots A1–A5, vertical axis arithmetic, plots A6–A8, vertical axis base-10 logarithmic; lg, plots A1–A8, base-10 logarithmic.

Table D–8. Land-cover percentages for the Lower Suwannee National Wildlife Refuge and contributing watersheds, Florida and Georgia, based on the 1992 National Land Cover Database.

[See figure D6 for map of 1992 land cover, hydrologic cataloging units, and hydrologic subregions. NLCD, National Land Cover Database; 1992 NLCD (Vogelmann and others, 2001); NWR, National Wildlife Refuge]

Hydrologic cataloging unit, subregion, or NWR	Percentage of 1992 NLCD land-cover class[a]																	
	11	21	22	23	31	32	33	41	42	43	51	61	71	81	82	85	91	92
Hydrologic cataloging unit																		
03110101	2.4	2.0	0.1	0.3	0.1	0.1	4.4	0.0	38.4	0.0	1.6	<0.1	8.9	0.8	9.5	0.0	22.9	8.7
03110102	0.8	0.7	0.1	0.3	<0.1	<0.1	12.0	0.8	32.0	3.7	0.6	0.1	1.8	0.2	0.9	0.1	39.3	6.5
03110103	0.7	1.1	0.1	0.2	<0.1	0.1	8.6	2.4	23.5	9.3	0.1	0.6	5.0	2.0	14.4	0.1	29.1	2.7
03110201	0.6	0.4	<0.1	0.2	0.1	0.3	6.8	0.5	44.7	0.9	0.2	0.1	1.6	0.4	3.1	<0.1	35.3	4.8
03110202	0.9	0.7	0.2	0.4	0.1	0.1	7.2	4.5	24.9	4.8	0.1	<0.1	0.5	8.8	26.7	0.3	18.0	1.9
03110203	1.0	1.7	0.3	0.6	<0.1	<0.1	6.9	4.2	19.4	6.1	0.4	0.2	2.4	6.6	34.0	0.2	14.3	1.6
03110204	0.9	0.6	0.2	0.6	0.1	0.1	5.3	5.5	15.0	4.0	0.1	<0.1	0.2	15.5	38.1	0.2	13.1	0.6
03110205	1.0	1.3	0.1	0.3	0.1	<0.1	8.0	0.8	35.3	1.7	0.9	0.1	13.5	1.6	22.4	<0.1	11.1	1.8
03110206	1.5	2.2	0.2	0.5	<0.1	0.2	5.4	0.0	44.2	0.0	1.3	0.3	11.4	1.9	14.9	0.1	14.2	1.6
Hydrologic subregion																		
0311	1.0	1.1	0.1	0.4	<0.1	0.1	7.5	1.9	32.5	3.1	0.5	0.2	4.6	3.6	16.4	0.1	23.5	3.4
National Wildlife Refuge																		
Lower Suwannee	13.3	<0.1	0.0	<0.1	<0.1	0.0	0.9	0.0	13.3	0.0	0.5	<0.1	0.5	<0.1	0.1	0.0	41.9	29.4

[a]1992 NLCD class definitions:
- 11, open water
- 21, low-intensity residential
- 22, high-intensity residential
- 23, commercial/industrial/transportation
- 31, bare rock/sand/clay
- 32, quarries/strip mines/gravel pits
- 33, transitional
- 41, deciduous forest
- 42, evergreen forest
- 43, mixed forest
- 51, shrubland
- 61, orchards/vineyards/other
- 71, grasslands/herbaceous
- 81, pasture/hay
- 82, row crops
- 85, urban/recreational grasses
- 91, woody wetlands
- 92, emergent herbaceous wetlands

Table D–9. Land-cover percentages for the Lower Suwannee National Wildlife Refuge and contributing watersheds, Florida and Georgia, based on the 2001 National Land Cover Database.

[See figure D7 for map of 2001 land cover, hydrologic cataloging units, and hydrologic subregions. NLCD, National Land Cover Database; 2001 NLCD (Homer and others, 2007); NWR, National Wildlife Refuge]

Hydrologic cataloging unit, subregion, or NWR	Percentage of 2001 NLCD land-cover class[a]														
	11	21	22	23	24	31	41	42	43	52	71	81	82	90	95
Hydrologic cataloging unit															
03110101	1.5	4.2	0.6	0.1	<0.1	0.3	2.0	34.3	0.4	2.5	12.8	7.5	4.4	19.9	9.4
03110102	0.4	4.1	0.6	0.1	<0.1	0.4	1.8	26.4	4.1	1.1	10.4	1.2	1.6	40.1	7.7
03110103	0.3	3.9	0.5	0.1	<0.1	0.1	9.5	21.3	11.9	0.2	8.3	5.2	8.9	28.2	1.7
03110201	0.3	3.5	0.8	0.1	<0.1	0.4	1.7	31.4	2.1	1.1	10.4	2.0	1.6	43.5	1.2
03110202	0.6	4.5	1.2	0.2	0.2	0.1	5.4	26.0	5.2	0.5	7.6	6.1	21.6	19.7	1.3
03110203	0.5	5.4	1.4	0.4	0.2	0.1	7.1	21.2	9.0	0.4	8.6	7.6	23.9	12.9	1.4
03110204	0.7	4.5	1.8	0.4	0.2	0.1	6.9	17.8	5.2	0.2	6.3	9.7	31.8	13.0	1.5
03110205	0.7	5.6	1.1	0.1	<0.1	0.1	2.9	27.0	5.4	1.0	18.4	13.2	10.4	11.6	2.3
03110206	1.2	5.2	1.1	0.3	0.1	0.3	2.7	31.2	5.4	1.5	18.7	12.0	4.8	14.8	0.7
Hydrologic subregion															
0311	0.6	4.5	1.0	0.2	0.1	0.2	4.0	26.9	5.1	0.9	11.3	6.5	10.8	25.1	2.8
National Wildlife Refuge															
Lower Suwannee	11.7	1.2	0.1	<0.1	<0.1	0.1	1.0	13.5	0.7	0.2	1.8	0.1	0.1	39.3	30.2

[a]2001 NLCD class definitions:
11, open water
21, developed, open space
22, developed, low intensity
23, developed, medium intensity
24, developed, high intensity
31, bare land (rock/sand/clay)
41, deciduous forest
42, evergreen forest
43, mixed forest
52, shrub/scrub
71, grasslands/herbaceous
81, pasture/hay
82, cultivated crops
90, woody wetlands
95, emergent herbaceous wetlands

Table D–10. Land-cover change percentages for the Lower Suwannee National Wildlife Refuge and contributing watersheds, Florida and Georgia, from 1992 to 2001, based on the 1992–2001 National Land Cover Database-Land Cover Change Retrofit product.

[See figure D8 for map of 1992–2001 land cover change, hydrologic cataloging units, and hydrologic subregions. NWR, National Wildlife Refuge; HUC, hydrologic unit code; NLCD-LCCR, National Land Cover Database-Land Cover Change Retrofit product; 1992–2001 NLCD-LCCR (Fry and others, 2009); positive percent net change values indicate a net gain, negative percent net change values indicate a net loss]

Hydrologic cataloging unit, subregion, or NWR	Percentage of HUC/NWR with classification change[a]	Percentage of total HUC/NWR area changed in modified Anderson level 1 classifications, 2001[b,c]							Percentage net change from 1992 to 2001 in modified Anderson level 1 classifications[b,d]						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Hydrologic cataloging unit															
03110101	14.6	0.2	3.0	1.0	23.4	44.8	11.0	16.7	–1.8	2.9	1.0	–44.3	16.7	10.3	15.2
03110102	13.3	0.1	5.8	1.7	18.0	48.7	6.4	19.3	–0.2	4.4	1.7	–43.0	37.2	0.2	–0.4
03110103	6.1	1.7	2.6	0.5	29.2	37.6	23.5	4.9	0.0	–1.3	0.1	–12.1	35.6	–8.8	–13.5
03110201	14.9	1.0	5.9	1.5	19.2	50.5	7.0	14.9	–0.8	5.3	0.9	–49.3	32.8	3.7	7.4
03110202	10.2	0.9	4.1	0.4	34.6	30.5	18.4	11.2	0.5	3.7	0.3	–20.8	17.7	–5.6	4.2
03110203	9.7	1.1	2.9	0.3	43.5	25.0	20.2	7.0	0.0	–0.8	0.2	4.1	12.5	–15.3	–0.7
03110204	6.9	3.2	2.4	0.5	45.5	22.8	12.2	13.2	2.6	1.0	0.5	1.6	22.8	–40.9	12.3
03110205	19.6	0.1	4.3	0.4	43.2	27.2	16.8	8.0	–1.0	4.0	0.4	–1.8	–18.3	13.2	3.5
03110206	16.8	0.1	4.8	0.8	28.8	47.3	13.1	5.0	–0.6	4.6	0.7	–33.3	18.6	10.2	–0.1
Hydrologic subregion															
0311	13.0	0.6	4.6	0.9	29.7	39.7	12.8	11.7	–0.4	3.6	0.7	–27.2	17.9	1.7	3.7
National Wildlife Refuge															
Lower Suwannee	1.9	2.6	4.5	3.1	37.2	25.7	2.6	24.3	–10.0	4.3	3.1	–5.2	–14.9	1.9	20.9

[a]Areal percentage of 30-meter cells that were reclassified between 1992 and 2001 using methods described in Fry and others (2009). The reclassified area is used as the base for comparison in presenting the modified Anderson Level 1 classification and net-change percentages for 2001.

[b]Classifications modified from Anderson level 1 land-cover classifications (Anderson and others, 1976):

1, water
2, urban
3, barren
4, forest
5, grassland
6, agriculture
7, wetland

[c]Percentages given are of the portion of the HUC/NWR that changed classification between 1992 and 2001.

[d]The interpretation would be a conversion from the classification(s) with negative values to the classification(s) with positive values. For example, in the 14.6 percent of HUC 03110101 that changed classification between 1992 and 2001, primarily forest land was converted to grassland, agriculture, or wetland. Note that the net gains in modified Anderson level 1 classification balance the net losses.

Chapter E. Hydrologic and Landscape Database for the Okefenokee National Wildlife Refuge and Contributing Watersheds in Georgia and Florida

Introduction

This chapter, along with the information provided in Part I of this report, describes and documents the development, use, and context of a hydrologic and landscape database for the Okefenokee National Wildlife Refuge (NWR) and contributing watersheds in two hydrologic cataloging units: St. Marys (03070204) and Upper Suwannee (03110201) (fig. E1). NWR-management objectives for the Okefenokee NWR (table E1; U.S. Fish and Wildlife Service, undated; U.S. Fish and Wildlife Service, 2006) include providing an optimum habitat and protection for threatened and endangered species, and restoring missing and fragmented native upland communities. Additionally, providing recreational and environmental education opportunities to the public are management priorities.

NWR Setting and Environmental Issues

The Okefenokee NWR was established in 1937 to serve as a breeding ground for migratory birds and other wildlife. The NWR is located in Charlton, Ware, and Clinch Counties, in Georgia and in Baker County, Florida. The NWR is managed out of Folkston, Georgia. It presently includes 403,119 acres with an approved acquisition area of 519,480 acres. The Okefenokee NWR is primarily swamp area with peat covering the swamp floor (Thom and others, 2015; U.S. Fish and Wildlife Service, undated; U.S. Fish and Wildlife Service, 2006).

Environmental issues threatening the Okefenokee NWR include degradation of water quality from fertilizer and herbicides used on nearby timberland areas, and reversal of groundwater recharge to swamps caused by increasing groundwater withdrawals from the coastal aquifer. Also, adjacent industrial forestland, NWR facilities, and urban area have created challenges for managing natural fires and have caused the need for prescribed burns (U.S. Fish and Wildlife Service, 2006). This database is a useful tool to begin addressing these environmental issues. For example, historical and current water-quality data provide a framework for monitoring future water quality and the impact of nearby fertilizer and herbicide use. Historical and current discharge and gage height data set context for changes in water quantity and provide FWS managers a frame of reference to assess changes in water demand.

Physiographic Setting

The contributing watershed area for the Okefenokee NWR, as defined in this report, includes the hydrologic cataloging units (CUs; 8-digit hydrologic units) St. Marys (03070204) and Upper Suwannee (03110201) (fig. E1) (Seaber and others, 1994; U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013). The drainage area of the St. Marys and Upper Suwannee CUs is 4,223 square miles.

The Okefenokee NWR is located in the eastern part of the Upper Suwannee CU and the western part of the St. Marys CU within the Okefenokee Swamp U.S. Environmental Protection Agency Level IV ecoregion (fig. E2; U.S. Environmental Protection Agency, 2011). The St. Marys and Upper Suwannee CUs are predominantly composed of the Okefenokee Plains, Okefenokee Swamp, and Sea Island Flatwoods ecoregions. Smaller sections of the Tallahassee Hills/Valdosta Limesink, Bacon Terraces, and Sea Islands/Coastal Marsh ecoregions are located in the southwest, north, and eastern parts of the contributing watershed area. Mean-annual precipitation for the contributing-watershed area ranges from 48 to 52 inches per year (in/yr), based on 1981–2010 climate normals (PRISM Climate Group, 2012). Mean-annual runoff for the period 1951–80 (Gebert and others, 1987) ranges from 11 in/yr in the western part of the Upper Suwannee CU to 15 in/yr in the southeast part of the St. Marys CU. Figures E3*A–E* show the distribution of the hydrologic soil groups (HSGs) A through D and mixed HSG for the 18 10-digit hydrologic cataloging units (HUC10) in the contributing watershed area as areal percentages of each HUC10.

Data and Database Files

Hydrologic and Landscape Data

Twenty-five gaging stations and 50 observation wells were selected to be included in the hydrologic and landscape database for the Okefenokee NWR and contributing watersheds (fig. E1; tables E2*A–D* [tables E2–E15 are at the end of the chapter]). Continuous hydrologic data collected at the gaging stations include gage height, elevation above the North American Vertical Datum of 1988 (NAVD 88) or the National Geodetic Vertical Datum of 1929 (NGVD 29), discharge, water temperature, precipitation, and stream velocity. Continuous hydrologic data collected at the observation wells include depth to water level and elevation above NGVD 29. Station characteristics are presented in tables E2*A*, *B*, and station periods of record for available data from each site are presented in tables E2*C*–*D*. Six gaging stations have only annual-peak data available and the periods of record for these stations are not listed in table E2*C*. Fifteen gaging stations have daily record for gage height, 5 stations have daily record for elevation above either NAVD 88 or NGVD 29, 16 stations have daily record for discharge data, 2 stations have daily record for water temperature, 4 stations have daily record for precipitation, and 1 station has daily record for stream velocity. Twenty-one observation well stations have daily record for both depth to water level and elevation above NGVD 29, 11 have only daily record for depth to water-level data, and 18 have only daily record for elevation above NGVD 29. Gaging station locations, station-description data, and hydrologic data included in this database were retrieved from the U.S. Geological Survey (USGS) National Water Information System (NWISWeb) database (U.S. Geological Survey, 2002, 2011).

Tabular and spatial landscape data were compiled. Categories of tabular landscape data summarized in Microsoft Excel files in the database include ecoregions, land cover, population, and soils data. Spatial data mapped in this report include ecoregions, land cover, soils, geographic and hydrologic boundaries, hydrography, and site locations.

Database Files

Database files are organized into three directories: (1) data, (2) iha, and (3) plots_pdf. The data directory contains three subdirectories: (1) access, (2) ascii, and (3) excel. The access subdirectory contains one Microsoft Access file with raw hydrologic data (okf_tabular_hydrostats_raw.accdb) and three Microsoft Access files with statistical summary data (okf_tabular_hydrostats01c.accdb, okf_tabular_hydrostats01w.accdb, and okf_tabular_hydrostats02.accdb). The raw data are aggregated by calendar year (January 1 through December 31) and water year (October 1 through September 30) for annual summaries, and also by calendar decade, calendar year and month, calendar month of the period of record, and Julian day over the period of record for both calendar and water years. The long-term (period of record) monthly and daily summary data are for complete years only. The long-term monthly summary data are based on both mean-daily values and monthly mean values. The ascii subdirectory contains raw NWISWeb data files that follow the naming convention sSSSSSSSS[dv,pk]_rdb, where SSSSSSSS is the USGS station identification number, dv is daily value, and pk is peak value. The excel subdirectory contains four Microsoft Excel files summarizing ecoregion (okf_eco34.xlsx), land cover (okf_nlcd.xlsx), population (okf_pop_census.xlsx), and soils (okf_sgo_hsg.xlsx) data. The iha directory contains Microsoft Excel files with Indicators of Hydrologic Alteration (IHA)-outputs for each station and parameter combination in which IHA computations were completed. The files follow the naming convention s***SSSSSSSS***_iha_***var***.xlsx, where ***SSSSSSSS*** is the USGS station identification number, and ***var*** is either gmn for mean-daily gage height, qmn for mean-daily discharge, gtdhh for gage height tidal high high, gtdll for gage height tidal low low, wl29mn for mean-daily water-level elevation above NGVD 29, wl29mx for maximum daily water-level elevation above NGVD 29, or dwlmn for mean-daily depth to water level. In addition, five IHA summary workbooks are included that contain the data for mean-daily gage height (regional_iha_gmn_okf.xlsx), mean-daily discharge (regional_iha_qmn_okf.xlsx), daily record for gage height tidal high high and low low (regional_iha_gtdll-hh_okf.xlsx), mean-daily and maximum water-level elevation above NGVD 29 (regional_iha_wl29mn-mx_okf.xlsx), and mean-daily depth to water level (regional_iha_dwlmn_okf.xlsx). The plots_pdf directory contains Adobe portable document file (PDF) plot files. A list of the database files, tables and worksheets, and table and worksheet descriptions is included in table E3*A*. A list of database field names, field types, and field definitions is included in table E3*B*. Periods of record for mean-daily gage height and mean-daily discharge data used in IHA analyses are shown in figures E4 and E5, respectively.

Database Summary Data

This section includes statistical and graphical summaries of the hydrologic data and IHA summary data, and zonal summaries of the National Land Cover Database (NLCD) land-cover and land-cover-change data. The summary data describe the data in the database, provide a context for hydrologic analysis, and can help database users determine which data are suitable for answering specific NWR hydrologic questions related to environmental issues discussed above.

Hydrologic Statistical and Graphical Summary

A station-level summary of the hydrologic data by both water year and calendar year is presented in tables E4–E6. The primary purpose of these summary tables is to provide database users with information on the quantity and quality of available data, facilitate comparisons between stations, and provide a benchmark for evaluating current hydrologic conditions within the context of the long-term record. Tables E4*A* (water year) and E4*B* (calendar year) summarize the mean-annual and mean-daily gage-height values for each gaging station. The mean, minimum, and maximum values and the 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles are given for mean-annual gage height, and the minimum and maximum and the same percentiles are also given for mean-daily gage height. The water or calendar year is indicated for the minimum and maximum values for mean-annual and mean-daily gage height. Tables E5*A* (water year) and E5*B* (calendar year) present the same statistics for discharge (with the addition of long-term yield). Tables E6*A* and E6*B* present the same statistics for selected water-quality parameters. Table E7 lists the graphical summary plots available for each gaging station.

Plot files are located in the plots_pdf directory of the database. See Part I of this report for a detailed description of plot files.

Interstation Comparison of Indicators of Hydrologic Alteration

For comparison among sites, IHA results are summarized in five separate Microsoft Excel workbooks as regional analyses for mean-daily gage height (regional_iha_gmn_okf.xlsx), mean-daily discharge (regional_iha_qmn_okf.xlsx), daily record for gage height tidal high high and low low (regional_iha_gtdll-hh_okf.xlsx), mean-daily and maximum water-level elevation above NGVD 29 (regional_iha_wl29mn-mx_okf.xlsx), and mean-daily depth to water level (regional_iha_dwlmn_okf.xlsx). The IHA output has been reorganized in these workbooks to facilitate interstation comparisons. The regional IHA workbooks contain the following worksheets: 5 each for the 1-, 3-, 7-, 30-, and 90-day minimum and maximum values, 1 with the baseflow-index values, 1 with a plot of the 75th–25th percentile spread measure, a summary worksheet, and 1 for each station with the complete IHA analysis for that station included. This reorganization facilitates interstation comparison by compiling all of the IHA results into one place.

Landscape GIS Layers

Figures E6–E8 and tables E8–E10 present the land-cover and land-use data for the geographic extent based on the 1992 NLCD (Vogelmann and others, 2001), 2001 NLCD (Homer and others, 2007), and 1992–2001 NLCD-Land Cover Change Retrofit (LCCR) product (Fry and others, 2009) datasets. Land-cover and land-use percentages derived from the 1992 NLCD and 2001 NLCD data are summarized by 10- and 12-digit hydrologic units and NWR boundary in tables E8 and E9. The land-cover change percentages derived from 1992–2001 NLCD-LCCR are presented in table E10.

Summary

This chapter, along with methods described in Part I of this report, documents the development, use, and context of a hydrologic and landscape database for the Okefenokee National Wildlife Refuge (NWR) and contributing watersheds in Georgia and Florida. The contributing watersheds include the St. Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units (CUs), with total drainage area of 4,223 square miles. The NWR is located in the eastern part of the Upper Suwannee CU and the western part of the St. Marys CU within the Okefenokee Swamp U.S. Environmental Protection Agency Level IV ecoregion. Activities throughout this geographic extent, particularly application of fertilizer and herbicides on timberland areas, increasing groundwater withdrawals, and nearby urban area, all have potential to either directly or indirectly affect the NWR.

References Cited in Part II, Chapter E

Anderson, J.R., Hardy, E.E., Roach, J.T., and Witmer, R.E., 1976, A land use and land cover classification system for use with remote sensor data: U.S. Geological Survey Professional Paper 964, 28 p.

Fry, J.A., Coan, M.J., Homer, C.G., Meyer, D.K., and Wickham, J.D., 2009, Completion of the National Land Cover Database (NLCD) 1992–2001 Land Cover Change Retrofit product: U.S. Geological Survey Open-File Report 2008–1379, 18 p., accessed March 23, 2015, at http://www.mrlc.gov/nlcdrlc.php.

Gebert, W.A., Graczyk, D.J., and Krug, W.R., 1987, Average annual runoff in the United States, 1951–80: U.S. Geological Survey Hydrologic Investigations Atlas HA–710, scale 1:7,500,000, accessed March 21, 2011, at https://pubs.er.usgs.gov/publication/ha710.

Homer, C., Dewitz, J., Fry, J., Coan, M., Hossain, N., Larson, C., Herold, N., McKerrow, A., VanDriel, J.N., and Wickham, J., 2007, Completion of the 2001 National Land Cover Database for the Conterminous United States, Photogrammetric Engineering and Remote Sensing: U.S. Geological Survey National Land Cover Database 2001 (NLCD 2001), v. 73, no. 4, p. 337–341, accessed March 23, 2015, at http://www.mrlc.gov/nlcd2001.php.

PRISM Climate Group [Oregon State University], 2012, United States average annual precipitation, 1981–2010 (4km; BIL), accessed March 10, 2015, at http://prism.oregonstate.edu.

Richter, B.D., Baumgartner, J.V., Powell, J., and Braun, D.P., 1996, A method for assessing hydrologic alteration within ecosystems: Conservation Biology, v. 10, p. 1163–1174.

Seaber, P.R., Kapinos, F.P., and Knapp, G.L., 1994, Hydrologic unit maps: U.S. Geological Survey Water-Supply Paper 2294, 66 p.

The Nature Conservancy, 2009, Indicators of hydrologic alteration, Version 7.1, User's manual: The Nature Conservancy with rPurview LLC-Ted Rybicki, Totten Software Design, Smythe Scientific Software, 81 p., accessed April 1, 2015, at http://www.conservationgateway.org/ConservationPractices/Freshwater/EnvironmentalFlows/MethodsandTools/IndicatorsofHydrologicAlteration/Documents/IHAV7.pdf.

Thom, T.A., Hunt, K.J., and Faustini, J., 2015, Water Resource Inventory and Assessment (WRIA)—Okefenokee National Wildlife Refuge, Ware, Charlton, and Clinch Counties, Georgia, and Baker County, Florida: U.S. Fish and Wildlife Service, Southeast Region, 113 p. plus appendixes. [Also available at http://ecos.fws.gov/ServCatFiles/reference/holding/52787.]

U.S. Department of Agriculture, 2009, Hydrologic soil groups, Chapter 7 *in* National Engineering Handbook, Part 630, Hydrology: Natural Resources Conservation Service, 210-VI-NEH, 13 p., accessed March 12, 2015, at http://policy.nrcs.usda.gov/.

U.S. Department of Agriculture, 2011, Watershed boundary dataset (WBD): Natural Resources Conservation Service, accessed February 11, 2011, at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/water/watersheds/.

U.S. Environmental Protection Agency, 2011, Level III and IV ecoregions of the continental United States: Western Ecology Division, accessed November 30, 2016, at https://catalog.data.gov/dataset/u-s-level-iii-and-iv-ecoregions-u-s-epa.

U.S. Fish and Wildlife Service, 2006, Okefenokee National Wildlife Refuge, Comprehensive conservation plan: U.S. Fish and Wildlife Service, Southeast Region. 352 p.

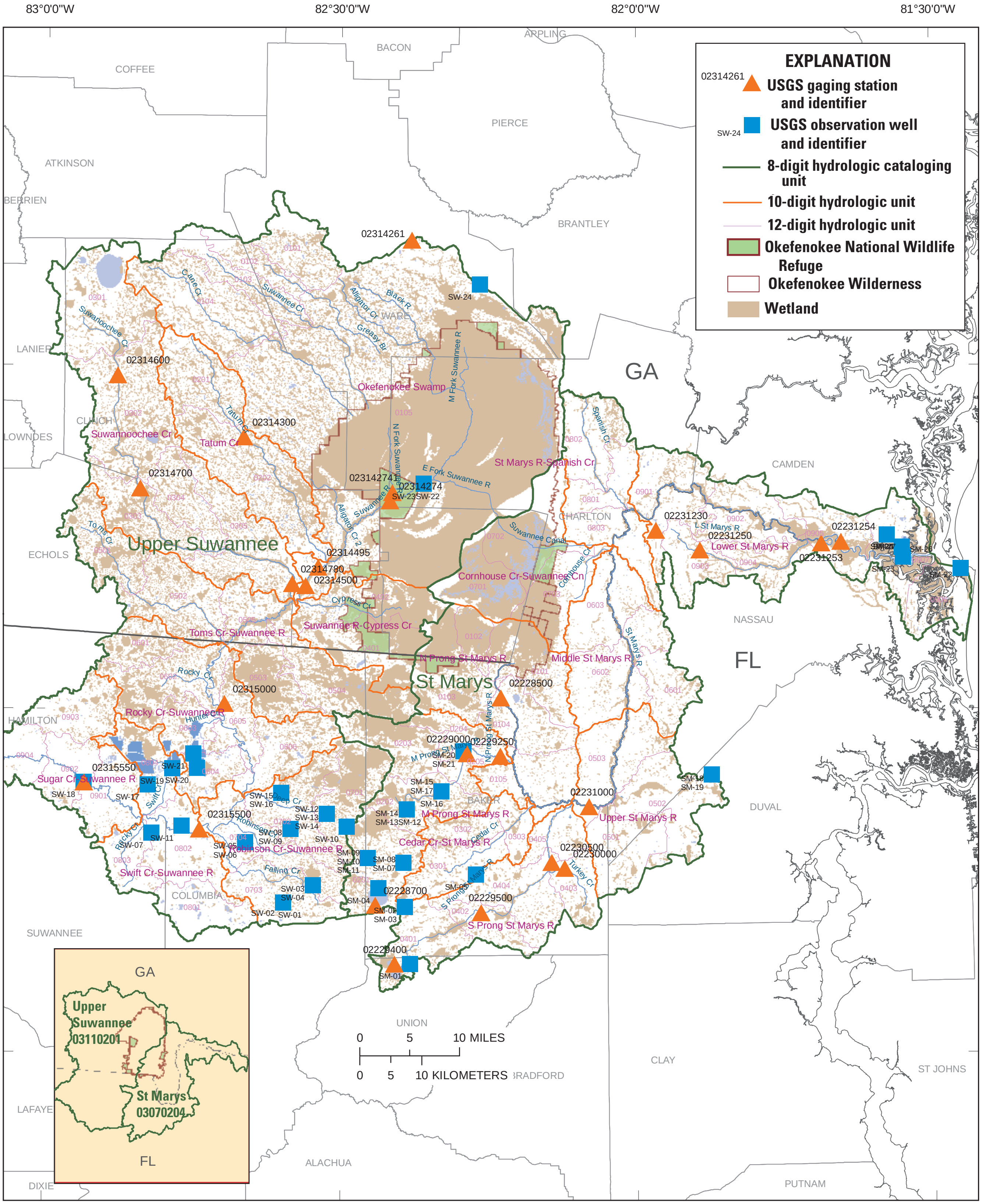
U.S. Fish and Wildlife Service, undated, Okefenokee National Wildlife Refuge: U.S. Fish and Wildlife Service Fact Sheet, 2 p., accessed March 24, 2015, at http://www.fws.gov/southeast/pubs/facts/okfcon.pdf.

U.S. Geological Survey, 2002, NWISWeb—New site for the Nation's water data: U.S. Geological Survey Fact Sheet FS–128–02, 2 p., accessed March 24, 2015, at http://pubs.usgs.gov/fs/fs-128-02/.

U.S. Geological Survey, 2011, USGS water data for the Nation, National Water Information System, Web database (NWISWeb), accessed February 11, 2011, at http://waterdata.usgs.gov/usa/nwis/nwis.

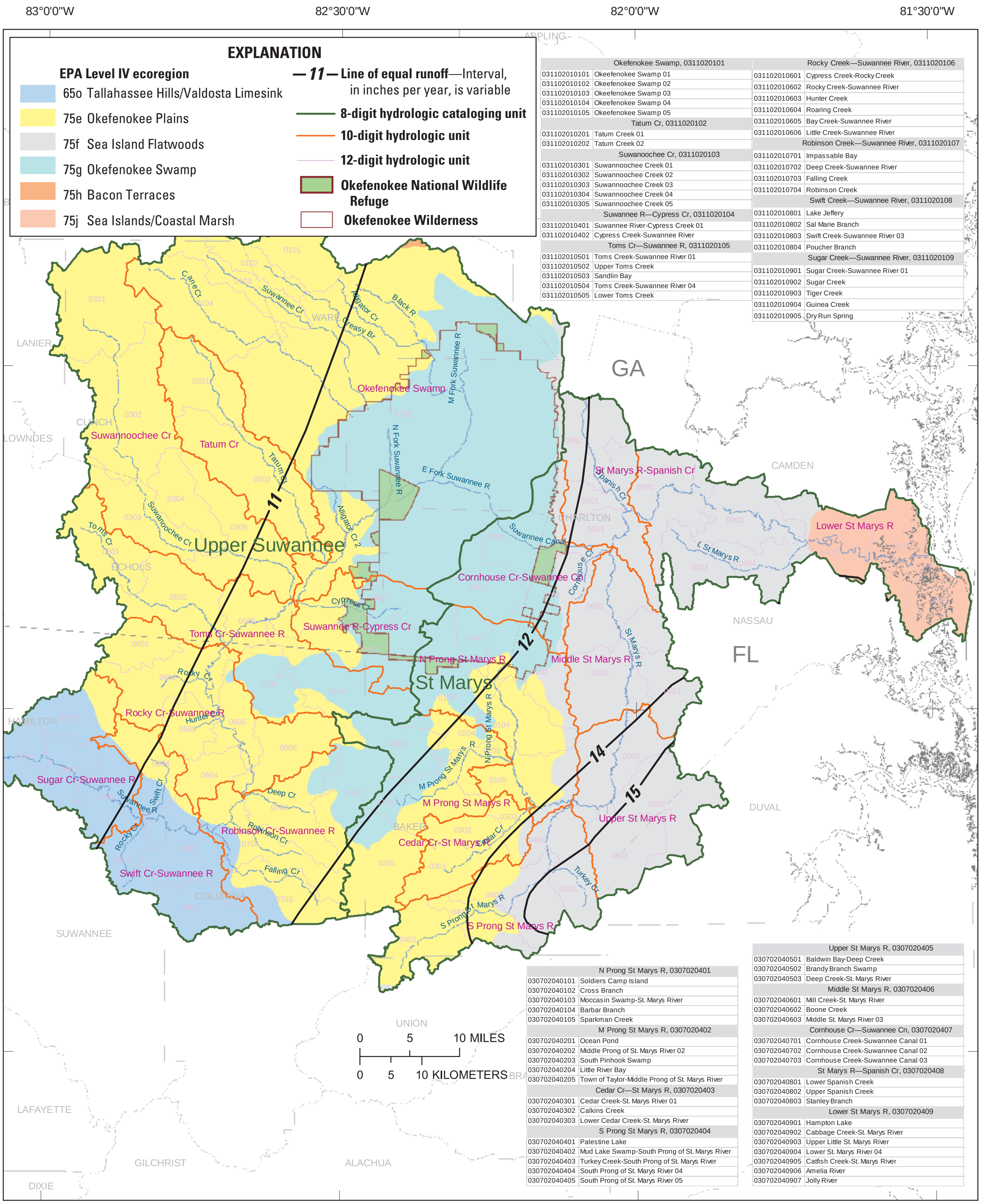
U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2013, Federal Standards and Procedures for the National Watershed Boundary Dataset (WBD) (4th ed.): U.S. Geological Survey Techniques and Methods, book 11, chap. A3, 77 p.

Vogelmann, J.E., Howard, S.M., Yang, Limin, Larson, C.R., Wylie, B.K., and Van Driel, J.N., 2001, Completion of the 1990s National Land Cover Data Set for the conterminous United States from Landsat thematic mapper data and ancillary data sources, Photogrammetric Engineering and Remote Sensing, v. 67, p. 650–662, accessed March 23, 2015, at http://www.mrlc.gov/nlcd1992.php.



Base modified from U.S. Geological Survey digital data, various scales

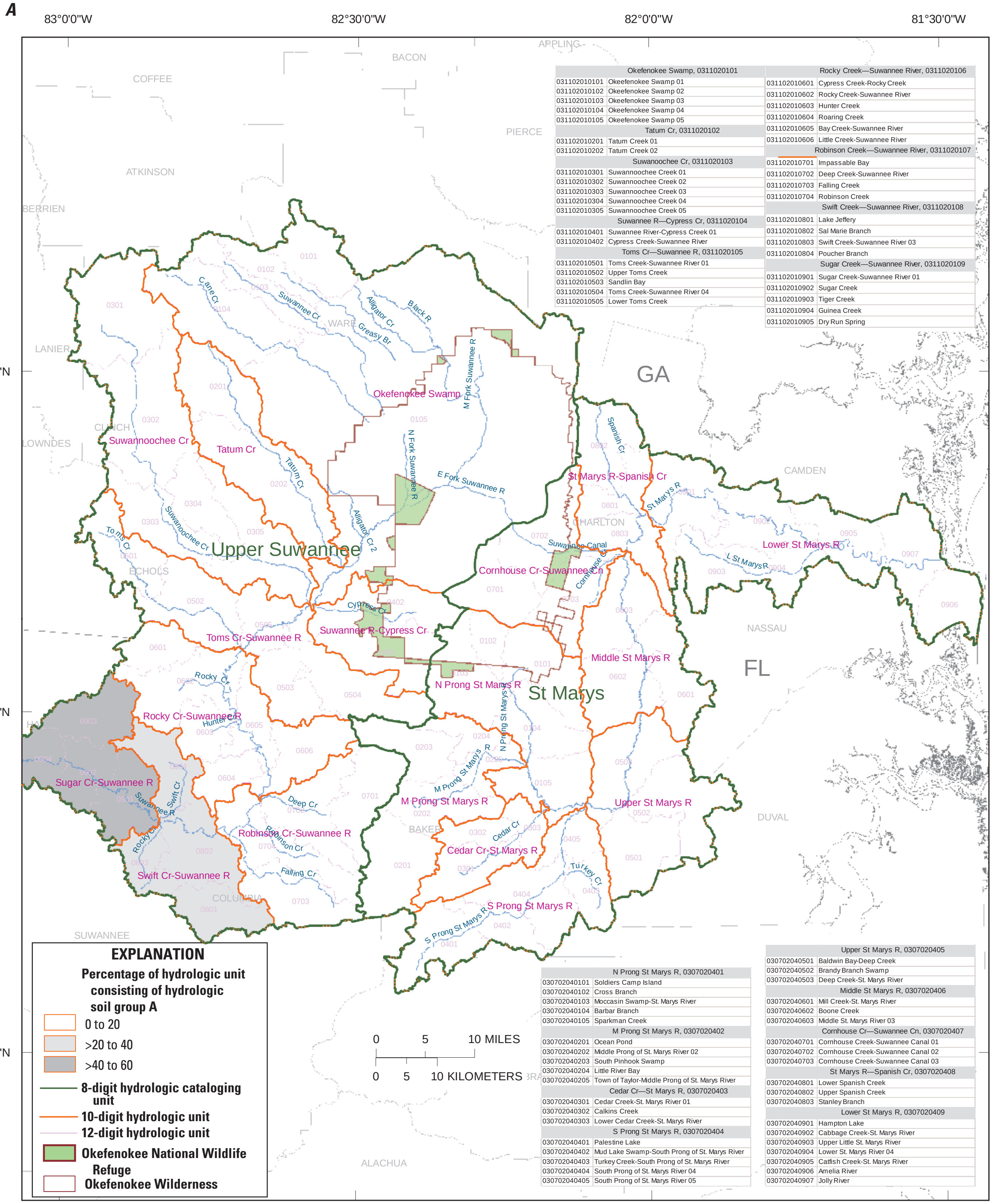
Figure E1. Location of the Okefenokee National Wildlife Refuge (NWR) and the Okefenokee Wilderness vicinity with major contributing watersheds, waterways, and gaging stations. Map inset, lower left, shows the hydrologic cataloging units (8-digit hydrologic units) that define the contributing watershed area for the Okefenokee NWR: St. Marys, 03070204; and Upper Suwannee, 03110201. [USGS, U.S. Geological Survey]



Base modified from U.S. Geological Survey digital data, various scales

Figure E2. Location of the Okefenokee National Wildlife Refuge and Okefenokee Wilderness, St. Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units, 10-digit and 12-digit hydrologic units, lines of equal mean-annual runoff for the period 1951–80 (Gebert and others, 1987), and U.S. Environmental Protection Agency (EPA) Level IV ecoregions in the Upper Suwannee and St. Marys cataloging units (U.S. Environmental Protection Agency, 2011).

A



Okefenokee Swamp, 0311020101	
031102010101	Okeefenokee Swamp 01
031102010102	Okeefenokee Swamp 02
031102010103	Okeefenokee Swamp 03
031102010104	Okeefenokee Swamp 04
031102010105	Okeefenokee Swamp 05
Tatum Cr, 0311020102	
031102010201	Tatum Creek 01
031102010202	Tatum Creek 02
Suwanoochee Cr, 0311020103	
031102010301	Suwannoochee Creek 01
031102010302	Suwannoochee Creek 02
031102010303	Suwannoochee Creek 03
031102010304	Suwannoochee Creek 04
031102010305	Suwannoochee Creek 05
Suwannee R—Cypress Cr, 0311020104	
031102010401	Suwannee River-Cypress Creek 01
031102010402	Cypress Creek-Suwannee River
Toms Cr—Suwannee R, 0311020105	
031102010501	Toms Creek-Suwannee River 01
031102010502	Upper Toms Creek
031102010503	Sandlin Bay
031102010504	Toms Creek-Suwannee River 04
031102010505	Lower Toms Creek

Rocky Creek—Suwannee River, 0311020106	
031102010601	Cypress Creek-Rocky Creek
031102010602	Rocky Creek-Suwannee River
031102010603	Hunter Creek
031102010604	Roaring Creek
031102010605	Bay Creek-Suwannee River
031102010606	Little Creek-Suwannee River
Robinson Creek—Suwannee River, 0311020107	
031102010701	Impassable Bay
031102010702	Deep Creek-Suwannee River
031102010703	Falling Creek
031102010704	Robinson Creek
Swift Creek—Suwannee River, 0311020108	
031102010801	Lake Jeffery
031102010802	Sal Marie Branch
031102010803	Swift Creek-Suwannee River 03
031102010804	Poucher Branch
Sugar Creek—Suwannee River, 0311020109	
031102010901	Sugar Creek-Suwannee River 01
031102010902	Sugar Creek
031102010903	Tiger Creek
031102010904	Guinea Creek
031102010905	Dry Run Spring

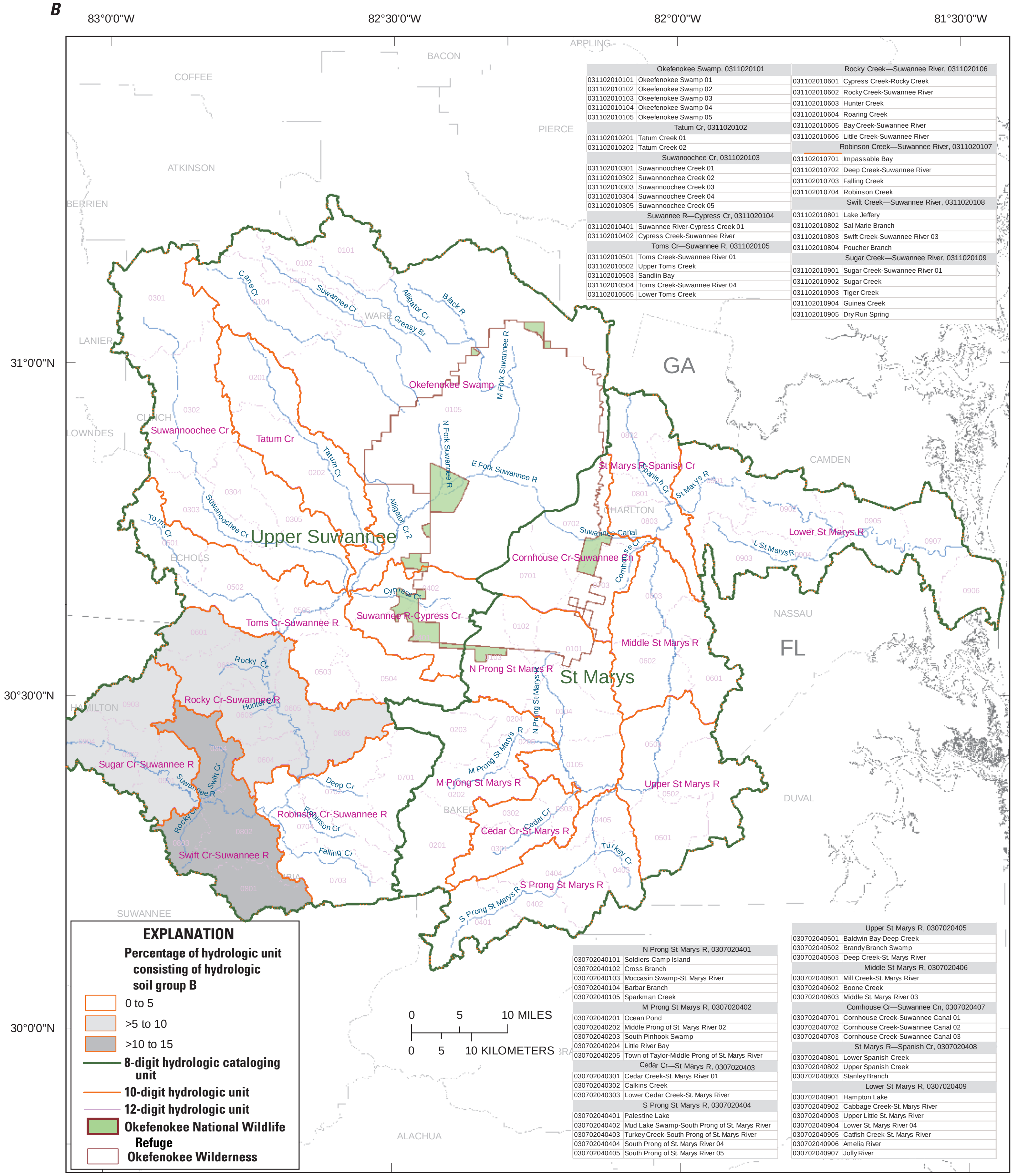
N Prong St Marys R, 0307020401	
030702040101	Soldiers Camp Island
030702040102	Cross Branch
030702040103	Moccasin Swamp-St. Marys River
030702040104	Barbar Branch
030702040105	Sparkman Creek
M Prong St Marys R, 0307020402	
030702040201	Ocean Pond
030702040202	Middle Prong of St. Marys River 02
030702040203	South Pinhook Swamp
030702040204	Little River Bay
030702040205	Town of Taylor-Middle Prong of St. Marys River
Cedar Cr—St Marys R, 0307020403	
030702040301	Cedar Creek-St. Marys River 01
030702040302	Calkins Creek
030702040303	Lower Cedar Creek-St. Marys River
S Prong St Marys R, 0307020404	
030702040401	Palestine Lake
030702040402	Mud Lake Swamp-South Prong of St. Marys River
030702040403	Turkey Creek-South Prong of St. Marys River
030702040404	South Prong of St. Marys River 04
030702040405	South Prong of St. Marys River 05

Upper St Marys R, 0307020405	
030702040501	Baldwin Bay-Deep Creek
030702040502	Brandy Branch Swamp
030702040503	Deep Creek-St. Marys River
Middle St Marys R, 0307020406	
030702040601	Mill Creek-St. Marys River
030702040602	Boone Creek
030702040603	Middle St. Marys River 03
Cornhouse Cr—Suwannee Cn, 0307020407	
030702040701	Cornhouse Creek-Suwannee Canal 01
030702040702	Cornhouse Creek-Suwannee Canal 02
030702040703	Cornhouse Creek-Suwannee Canal 03
St Marys R—Spanish Cr, 0307020408	
030702040801	Lower Spanish Creek
030702040802	Upper Spanish Creek
030702040803	Stanley Branch
Lower St Marys R, 0307020409	
030702040901	Hampton Lake
030702040902	Cabbage Creek-St. Marys River
030702040903	Upper Little St. Marys River
030702040904	Lower St. Marys River 04
030702040905	Catfish Creek-St. Marys River
030702040906	Amelia River
030702040907	Jolly River

Base modified from U.S. Geological Survey digital data, various scales

Figure E3. Maps showing percentages of U.S. Department of Agriculture hydrologic soil group (HSG) shown by 10-digit hydrologic unit in the St. Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units for *A*, HSG A; soils in HSG A have low runoff potential: water is freely transmitted through the soil, *B*, HSG B; soils in HSG B have moderately low runoff potential: water transmission through the soil is unimpeded, *C*, HSG C; soils in HSG C have moderately high runoff potential: water transmission through the soil is somewhat restricted, *D*, HSG D; soils in HSG D have high runoff potential: water transmission through the soil is restricted or very restricted, and *E*, mixed HSG; soils in mixed HSG have variable runoff potential: water transmission through the soil is more spatially variable on a local scale than in soils that fall within a single HSG classification (U.S. Department of Agriculture, 2009).

B



Okefenokee Swamp, 0311020101	
031102010101	Okeefenokee Swamp 01
031102010102	Okeefenokee Swamp 02
031102010103	Okeefenokee Swamp 03
031102010104	Okeefenokee Swamp 04
031102010105	Okeefenokee Swamp 05
Tatum Cr, 0311020102	
031102010201	Tatum Creek 01
031102010202	Tatum Creek 02
Suwanoochee Cr, 0311020103	
031102010301	Suwannoochee Creek 01
031102010302	Suwannoochee Creek 02
031102010303	Suwannoochee Creek 03
031102010304	Suwannoochee Creek 04
031102010305	Suwannoochee Creek 05
Suwannee R—Cypress Cr, 0311020104	
031102010401	Suwannee River-Cypress Creek 01
031102010402	Cypress Creek-Suwannee River
Toms Cr—Suwannee R, 0311020105	
031102010501	Toms Creek-Suwannee River 01
031102010502	Upper Toms Creek
031102010503	Sandlin Bay
031102010504	Toms Creek-Suwannee River 04
031102010505	Lower Toms Creek

Rocky Creek—Suwannee River, 0311020106	
031102010601	Cypress Creek-Rocky Creek
031102010602	Rocky Creek-Suwannee River
031102010603	Hunter Creek
031102010604	Roaring Creek
031102010605	Bay Creek-Suwannee River
031102010606	Little Creek-Suwannee River
Robinson Creek—Suwannee River, 0311020107	
031102010701	Impassable Bay
031102010702	Deep Creek-Suwannee River
031102010703	Falling Creek
031102010704	Robinson Creek
Swift Creek—Suwannee River, 0311020108	
031102010801	Lake Jeffery
031102010802	Sal Marie Branch
031102010803	Swift Creek-Suwannee River 03
031102010804	Poucher Branch
Sugar Creek—Suwannee River, 0311020109	
031102010901	Sugar Creek-Suwannee River 01
031102010902	Sugar Creek
031102010903	Tiger Creek
031102010904	Guinea Creek
031102010905	Dry Run Spring

N Prong St Marys R, 0307020401	
030702040101	Soldiers Camp Island
030702040102	Cross Branch
030702040103	Moccasin Swamp-St. Marys River
030702040104	Barbar Branch
030702040105	Sparkman Creek
M Prong St Marys R, 0307020402	
030702040201	Ocean Pond
030702040202	Middle Prong of St. Marys River 02
030702040203	South Pinhook Swamp
030702040204	Little River Bay
030702040205	Town of Taylor-Middle Prong of St. Marys River
Cedar Cr—St Marys R, 0307020403	
030702040301	Cedar Creek-St. Marys River 01
030702040302	Calkins Creek
030702040303	Lower Cedar Creek-St. Marys River
S Prong St Marys R, 0307020404	
030702040401	Palestine Lake
030702040402	Mud Lake Swamp-South Prong of St. Marys River
030702040403	Turkey Creek-South Prong of St. Marys River
030702040404	South Prong of St. Marys River 04
030702040405	South Prong of St. Marys River 05

Upper St Marys R, 0307020405	
030702040501	Baldwin Bay-Deep Creek
030702040502	Brandy Branch Swamp
030702040503	Deep Creek-St. Marys River
Middle St Marys R, 0307020406	
030702040601	Mill Creek-St. Marys River
030702040602	Boone Creek
030702040603	Middle St. Marys River 03
Cornhouse Cr—Suwannee Cn, 0307020407	
030702040701	Cornhouse Creek-Suwannee Canal 01
030702040702	Cornhouse Creek-Suwannee Canal 02
030702040703	Cornhouse Creek-Suwannee Canal 03
St Marys R—Spanish Cr, 0307020408	
030702040801	Lower Spanish Creek
030702040802	Upper Spanish Creek
030702040803	Stanley Branch
Lower St Marys R, 0307020409	
030702040901	Hampton Lake
030702040902	Cabbage Creek-St. Marys River
030702040903	Upper Little St. Marys River
030702040904	Lower St. Marys River 04
030702040905	Catfish Creek-St. Marys River
030702040906	Amelia River
030702040907	Jolly River

Base modified from U.S. Geological Survey digital data, various scales

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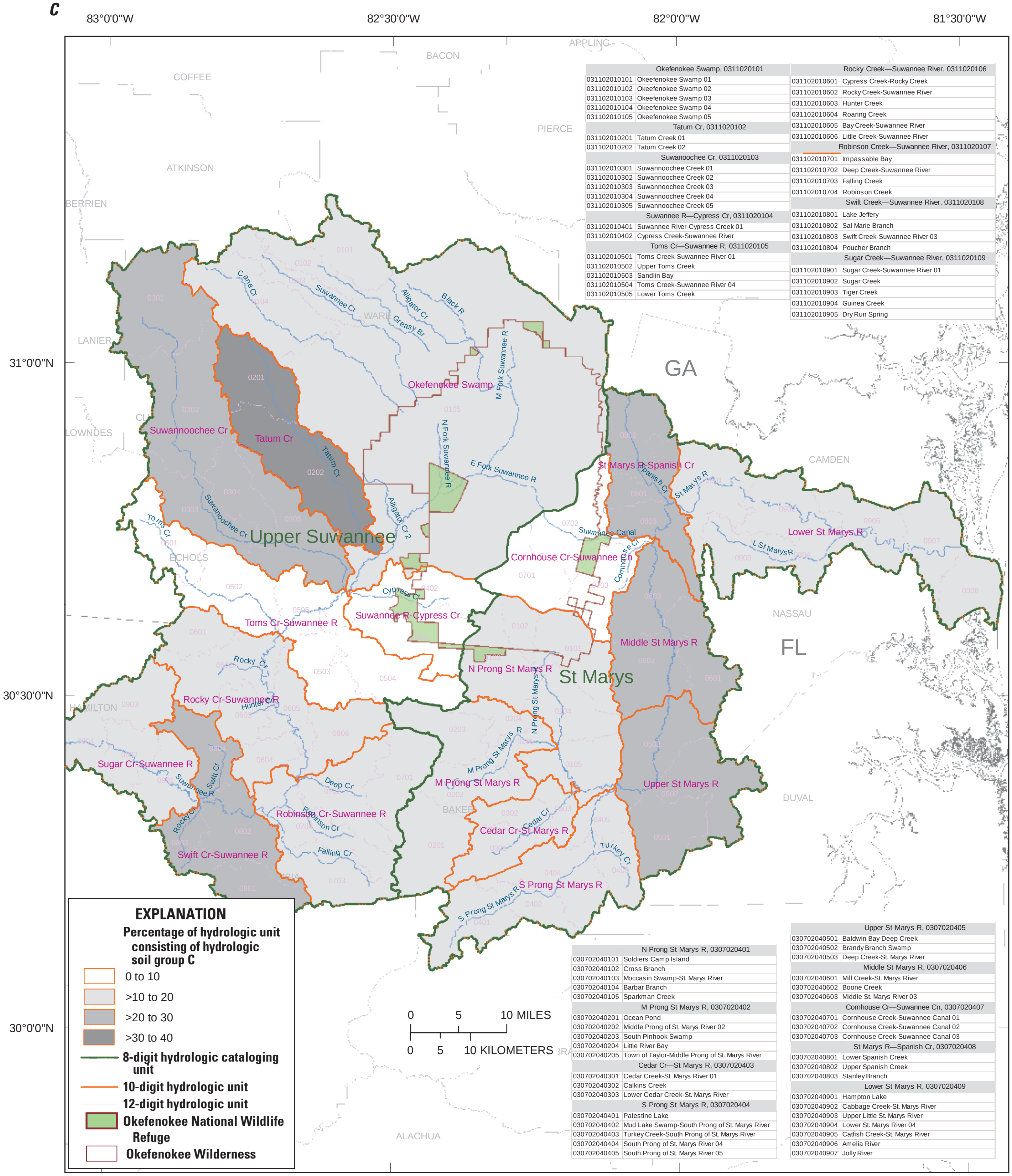
C



Okefenokee Swamp, 0311020101	
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031102010102	Okeefenokee Swamp 02
031102010103	Okeefenokee Swamp 03
031102010104	Okeefenokee Swamp 04
031102010105	Okeefenokee Swamp 05
Tatum Cr, 0311020102	
031102010201	Tatum Creek 01
031102010202	Tatum Creek 02
Suwanoochee Cr, 0311020103	
031102010301	Suwannoochee Creek 01
031102010302	Suwannoochee Creek 02
031102010303	Suwannoochee Creek 03
031102010304	Suwannoochee Creek 04
031102010305	Suwannoochee Creek 05
Suwannee R—Cypress Cr, 0311020104	
031102010401	Suwannee River-Cypress Creek 01
031102010402	Cypress Creek-Suwannee River
Toms Cr—Suwannee R, 0311020105	
031102010501	Toms Creek-Suwannee River 01
031102010502	Upper Toms Creek
031102010503	Sandlin Bay
031102010504	Toms Creek-Suwannee River 04
031102010505	Lower Toms Creek

Rocky Creek—Suwannee River, 0311020106	
031102010601	Cypress Creek-Rocky Creek
031102010602	Rocky Creek-Suwannee River
031102010603	Hunter Creek
031102010604	Roaring Creek
031102010605	Bay Creek-Suwannee River
031102010606	Little Creek-Suwannee River
Robinson Creek—Suwannee River, 0311020107	
031102010701	Impassable Bay
031102010702	Deep Creek-Suwannee River
031102010703	Falling Creek
031102010704	Robinson Creek
Swift Creek—Suwannee River, 0311020108	
031102010801	Lake Jeffery
031102010802	Sal Marie Branch
031102010803	Swift Creek-Suwannee River 03
031102010804	Poucher Branch
Sugar Creek—Suwannee River, 0311020109	
031102010901	Sugar Creek-Suwannee River 01
031102010902	Sugar Creek
031102010903	Tiger Creek
031102010904	Guinea Creek
031102010905	Dry Run Spring

N Prong St Marys R, 0307020401	
030702040101	Soldiers Camp Island
030702040102	Cross Branch
030702040103	Moccasin Swamp-St. Marys River
030702040104	Barbar Branch
030702040105	Sparkman Creek
M Prong St Marys R, 0307020402	
030702040201	Ocean Pond
030702040202	Middle Prong of St. Marys River 02
030702040203	South Pinhook Swamp
030702040204	Little River Bay
030702040205	Town of Taylor-Middle Prong of St. Marys River
Cedar Cr—St Marys R, 0307020403	
030702040301	Cedar Creek-St. Marys River 01
030702040302	Calkins Creek
030702040303	Lower Cedar Creek-St. Marys River
S Prong St Marys R, 0307020404	
030702040401	Palestine Lake
030702040402	Mud Lake Swamp-South Prong of St. Marys River
030702040403	Turkey Creek-South Prong of St. Marys River
030702040404	South Prong of St. Marys River 04
030702040405	South Prong of St. Marys River 05

Upper St Marys R, 0307020405	
030702040501	Baldwin Bay-Deep Creek
030702040502	Brandy Branch Swamp
030702040503	Deep Creek-St. Marys River
Middle St Marys R, 0307020406	
030702040601	Mill Creek-St. Marys River
030702040602	Boone Creek
030702040603	Middle St. Marys River 03
Cornhouse Cr—Suwannee Cn, 0307020407	
030702040701	Cornhouse Creek-Suwannee Canal 01
030702040702	Cornhouse Creek-Suwannee Canal 02
030702040703	Cornhouse Creek-Suwannee Canal 03
St Marys R—Spanish Cr, 0307020408	
030702040801	Lower Spanish Creek
030702040802	Upper Spanish Creek
030702040803	Stanley Branch
Lower St Marys R, 0307020409	
030702040901	Hampton Lake
030702040902	Cabbage Creek-St. Marys River
030702040903	Upper Little St. Marys River
030702040904	Lower St. Marys River 04
030702040905	Catfish Creek-St. Marys River
030702040906	Amelia River
030702040907	Jolly River

Base modified from U.S. Geological Survey digital data, various scales

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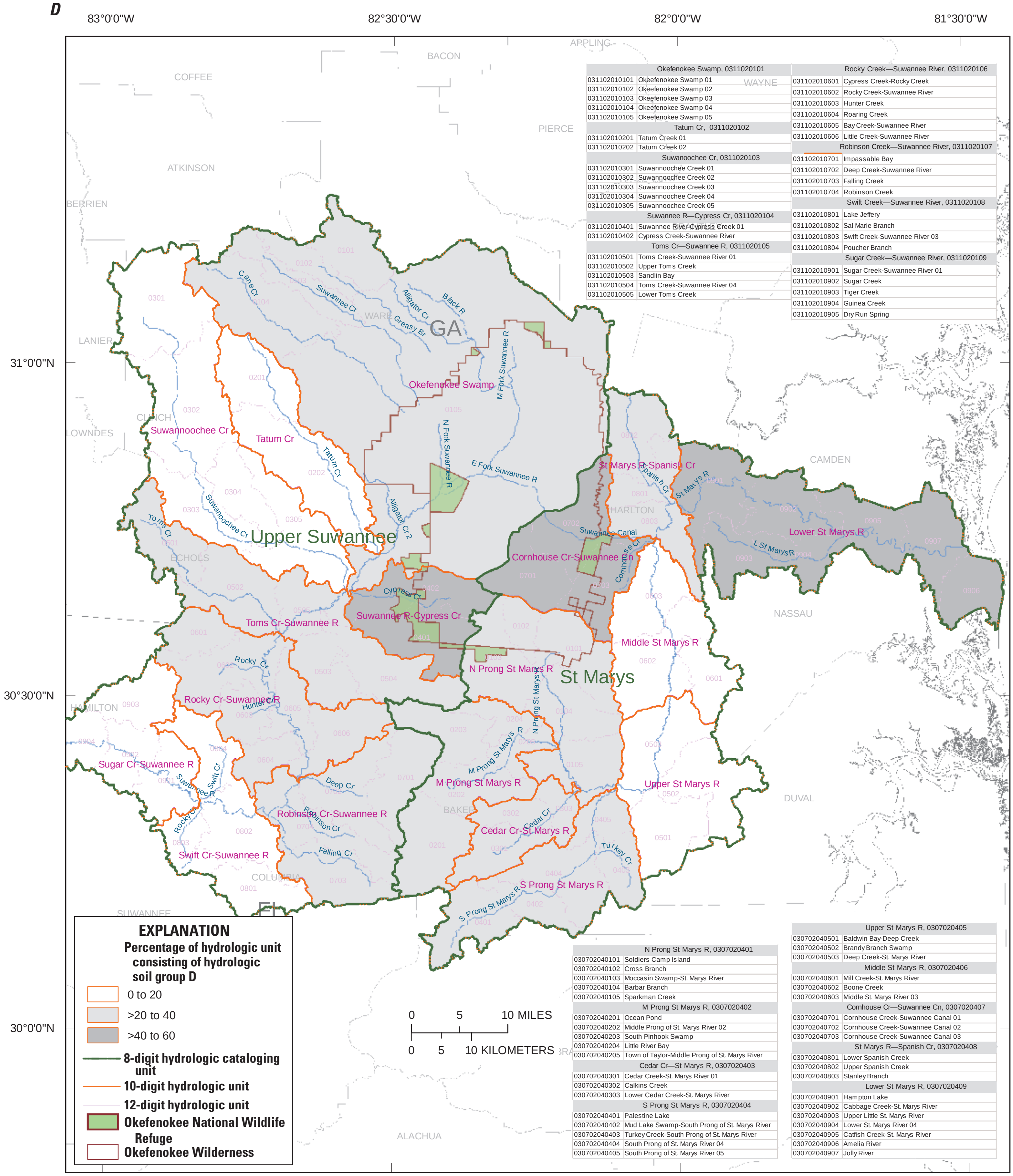
D



Okefenokee Swamp, 0311020101	
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031102010102	Okeefenokee Swamp 02
031102010103	Okeefenokee Swamp 03
031102010104	Okeefenokee Swamp 04
031102010105	Okeefenokee Swamp 05
Tatum Cr, 0311020102	
031102010201	Tatum Creek 01
031102010202	Tatum Creek 02
Suwanoochee Cr, 0311020103	
031102010301	Suwannoochee Creek 01
031102010302	Suwannoochee Creek 02
031102010303	Suwannoochee Creek 03
031102010304	Suwannoochee Creek 04
031102010305	Suwannoochee Creek 05
Suwannee R—Cypress Cr, 0311020104	
031102010401	Suwannee River-Cypress Creek 01
031102010402	Cypress Creek-Suwannee River
Toms Cr—Suwannee R, 0311020105	
031102010501	Toms Creek-Suwannee River 01
031102010502	Upper Toms Creek
031102010503	Sandlin Bay
031102010504	Toms Creek-Suwannee River 04
031102010505	Lower Toms Creek

Rocky Creek—Suwannee River, 0311020106	
031102010601	Cypress Creek-Rocky Creek
031102010602	Rocky Creek-Suwannee River
031102010603	Hunter Creek
031102010604	Roaring Creek
031102010605	Bay Creek-Suwannee River
031102010606	Little Creek-Suwannee River
Robinson Creek—Suwannee River, 0311020107	
031102010701	Impassable Bay
031102010702	Deep Creek-Suwannee River
031102010703	Falling Creek
031102010704	Robinson Creek
Swift Creek—Suwannee River, 0311020108	
031102010801	Lake Jeffery
031102010802	Sal Marie Branch
031102010803	Swift Creek-Suwannee River 03
031102010804	Poucher Branch
Sugar Creek—Suwannee River, 0311020109	
031102010901	Sugar Creek-Suwannee River 01
031102010902	Sugar Creek
031102010903	Tiger Creek
031102010904	Guinea Creek
031102010905	Dry Run Spring

N Prong St Marys R, 0307020401	
030702040101	Soldiers Camp Island
030702040102	Cross Branch
030702040103	Moccasin Swamp-St. Marys River
030702040104	Barbar Branch
030702040105	Sparkman Creek
M Prong St Marys R, 0307020402	
030702040201	Ocean Pond
030702040202	Middle Prong of St. Marys River 02
030702040203	South Pinhook Swamp
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Cedar Cr—St Marys R, 0307020403	
030702040301	Cedar Creek-St. Marys River 01
030702040302	Calkins Creek
030702040303	Lower Cedar Creek-St. Marys River
S Prong St Marys R, 0307020404	
030702040401	Palestine Lake
030702040402	Mud Lake Swamp-South Prong of St. Marys River
030702040403	Turkey Creek-South Prong of St. Marys River
030702040404	South Prong of St. Marys River 04
030702040405	South Prong of St. Marys River 05

Upper St Marys R, 0307020405	
030702040501	Baldwin Bay-Deep Creek
030702040502	Brandy Branch Swamp
030702040503	Deep Creek-St. Marys River
Middle St Marys R, 0307020406	
030702040601	Mill Creek-St. Marys River
030702040602	Boone Creek
030702040603	Middle St. Marys River 03
Cornhouse Cr—Suwannee Cn, 0307020407	
030702040701	Cornhouse Creek-Suwannee Canal 01
030702040702	Cornhouse Creek-Suwannee Canal 02
030702040703	Cornhouse Creek-Suwannee Canal 03
St Marys R—Spanish Cr, 0307020408	
030702040801	Lower Spanish Creek
030702040802	Upper Spanish Creek
030702040803	Stanley Branch
Lower St Marys R, 0307020409	
030702040901	Hampton Lake
030702040902	Cabbage Creek-St. Marys River
030702040903	Upper Little St. Marys River
030702040904	Lower St. Marys River 04
030702040905	Catfish Creek-St. Marys River
030702040906	Amelia River
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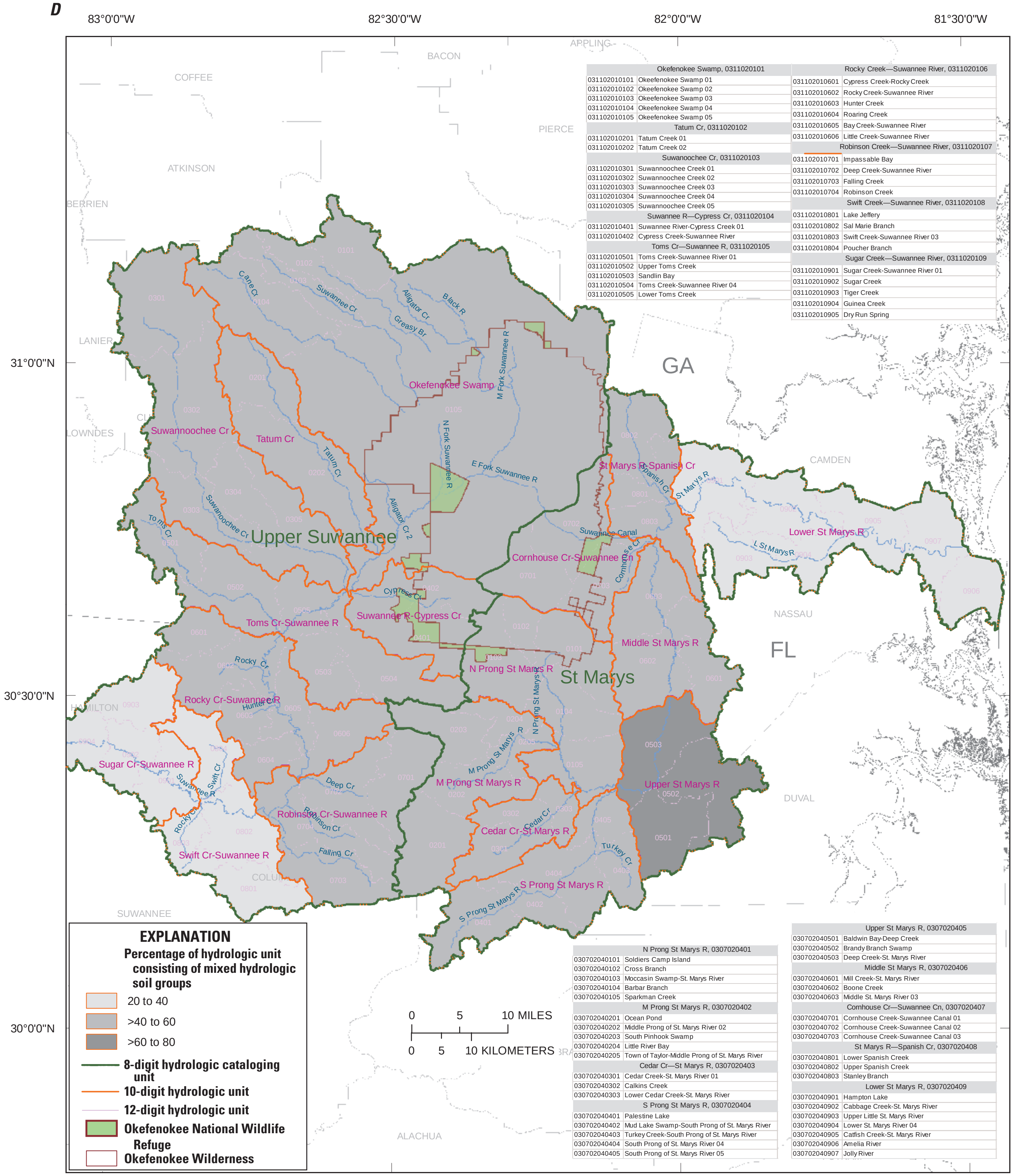
Base modified from U.S. Geological Survey digital data, various scales

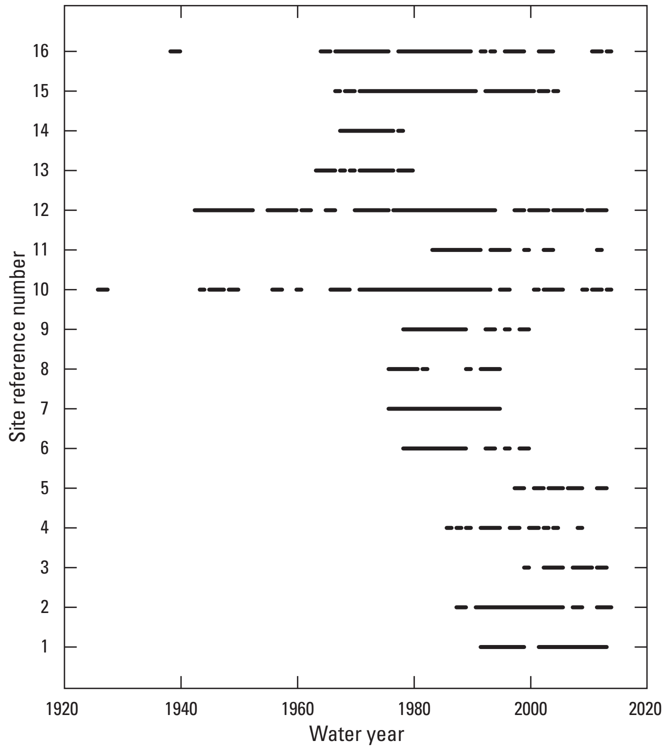
Figure E3. Maps showing percentages of U.S. Department of Agriculture hydrologic soil group (HSG) shown by 10-digit hydrologic unit in the St. Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units for *A*, HSG A; soils in HSG A have low runoff potential: water is freely transmitted through the soil, *B*, HSG B; soils in HSG B have moderately low runoff potential: water transmission through the soil is unimpeded, *C*, HSG C; soils in HSG C have moderately high runoff potential: water transmission through the soil is somewhat restricted, *D*, HSG D; soils in HSG D have high runoff potential: water transmission through the soil is restricted or very restricted, and *E*, mixed HSG; soils in mixed HSG have variable runoff potential: water transmission through the soil is more spatially variable on a local scale than in soils that fall within a single HSG classification (U.S. Department of Agriculture, 2009).—Continued

D



Base modified from U.S. Geological Survey digital data, various scales

Figure E3. Maps showing percentages of U.S. Department of Agriculture hydrologic soil group (HSG) shown by 10-digit hydrologic unit in the St. Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units for *A*, HSG A; soils in HSG A have low runoff potential: water is freely transmitted through the soil, *B*, HSG B; soils in HSG B have moderately low runoff potential: water transmission through the soil is unimpeded, *C*, HSG C; soils in HSG C have moderately high runoff potential: water transmission through the soil is somewhat restricted, *D*, HSG D; soils in HSG D have high runoff potential: water transmission through the soil is restricted or very restricted, and *E*, mixed HSG; soils in mixed HSG have variable runoff potential: water transmission through the soil is more spatially variable on a local scale than in soils that fall within a single HSG classification (U.S. Department of Agriculture, 2009).—Continued

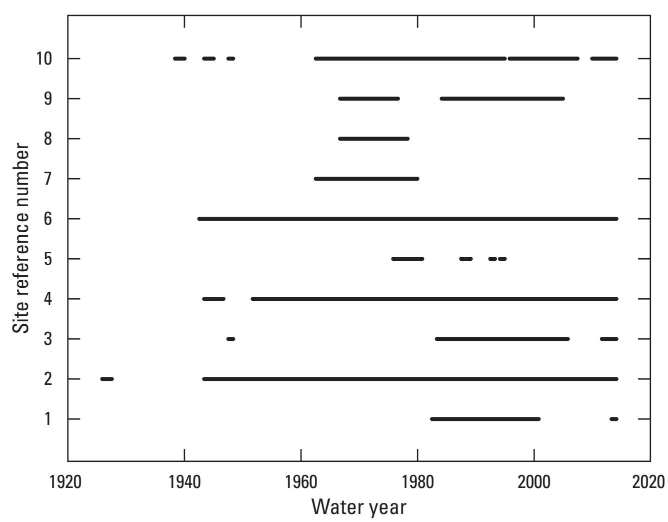


EXPLANATION

Period of record—Gaging station number and name. Number in parentheses is site reference number

02228500 North Prong Saint Marys River at Moniac, GA (gmn) (16)
02229000 North Prong Saint Marys River at Taylor, GA (gmn) (15)
02230000 Turkey Creek at MacClenny, FL (gmn) (14)
02230500 South Prong Saint Marys River at Glen Saint Mary, FL (gmn) (13)
02231000 Saint Marys River near MacClenny, FL (gmn) (12)
02315000 Suwannee River near Benton, FL (gmn) (11)
02315500 Suwannee River at White Springs, FL (gmn) (10)
02315550 Suwannee River at Suwanne Springs, FL (gmn) (9)
02231253 Saint Marys River near Gross, FL (gtdll) (8)
02231253 Saint Marys River near Gross, FL (gtdhh) (7)
02315500 Suwannee River at White Springs, FL (wl29mn) (6)
302416081522601 D-348 Monticello Drug Company well at Jacksonville, FL (wl29mx) (5)
302416081522602 D-349 Monticello Drug Company well at Jacksonville, FL (wl29mx) (4)
304313081330001 33D069 (dwlmn) (3)
304942082213801 27E004 (dwlmn) (2)
310706082155101 27G003 (dwlmn) (1)

Figure E4. Periods of record for mean-daily gage height (gmn), tidal-low-daily gage height (gtdll), tidal-high-daily gage-height (gtdhh), mean-daily and maximum-daily water-level elevation above the National Geodetic Vertical Datum of 1929 (wl29mn, wl29mx), and mean-daily depth-to-water-level (dwlmn) data used in Indicators of Hydrologic Alteration analyses for gaging stations and observation wells in the contributing watersheds and vicinity of Okefenokee National Wildlife Refuge, Florida and Georgia. Locations of gaging stations and observation wells are shown in figure E1.

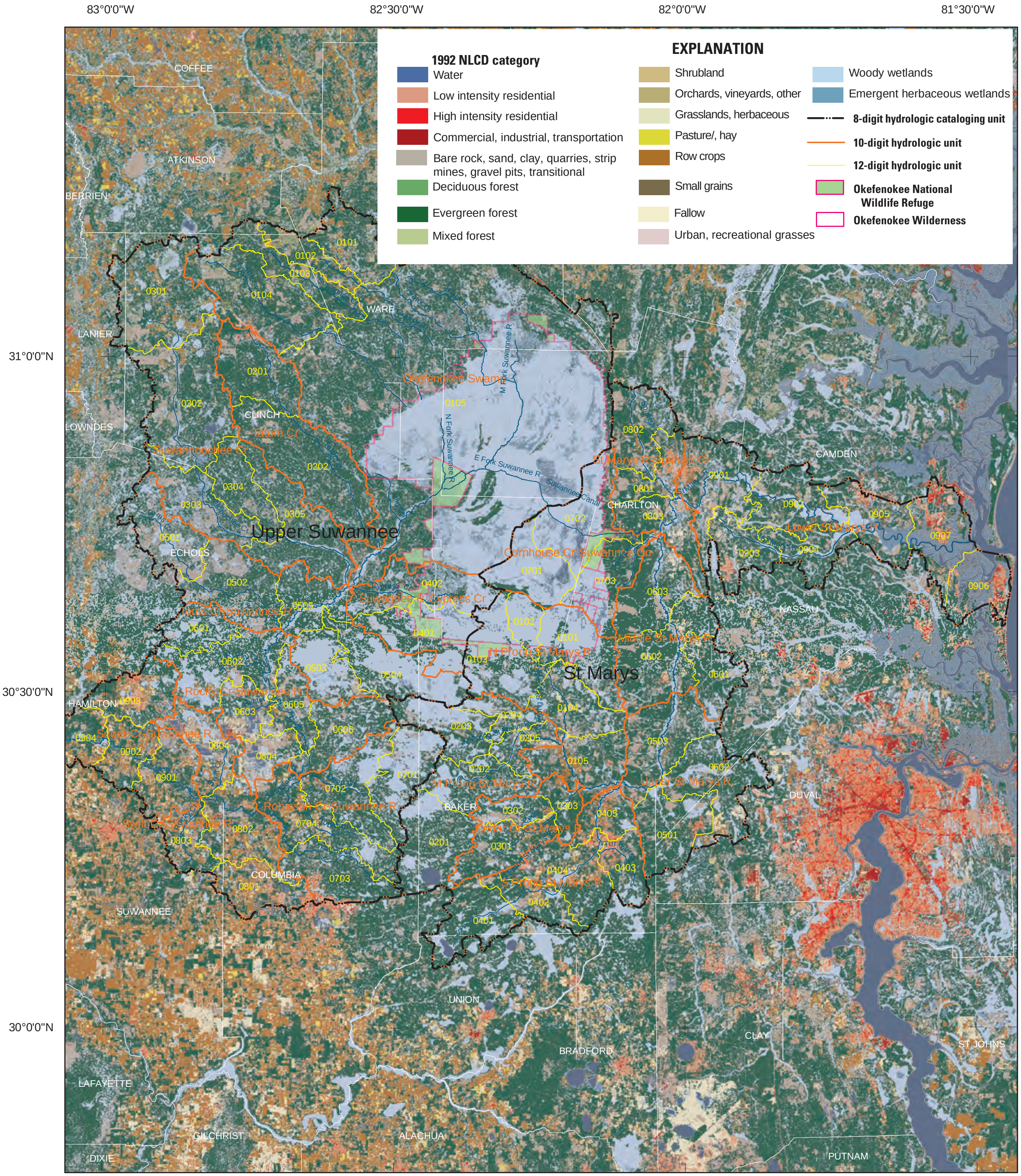


EXPLANATION

Period of record—Gaging station number and name. Number in parentheses is site reference number

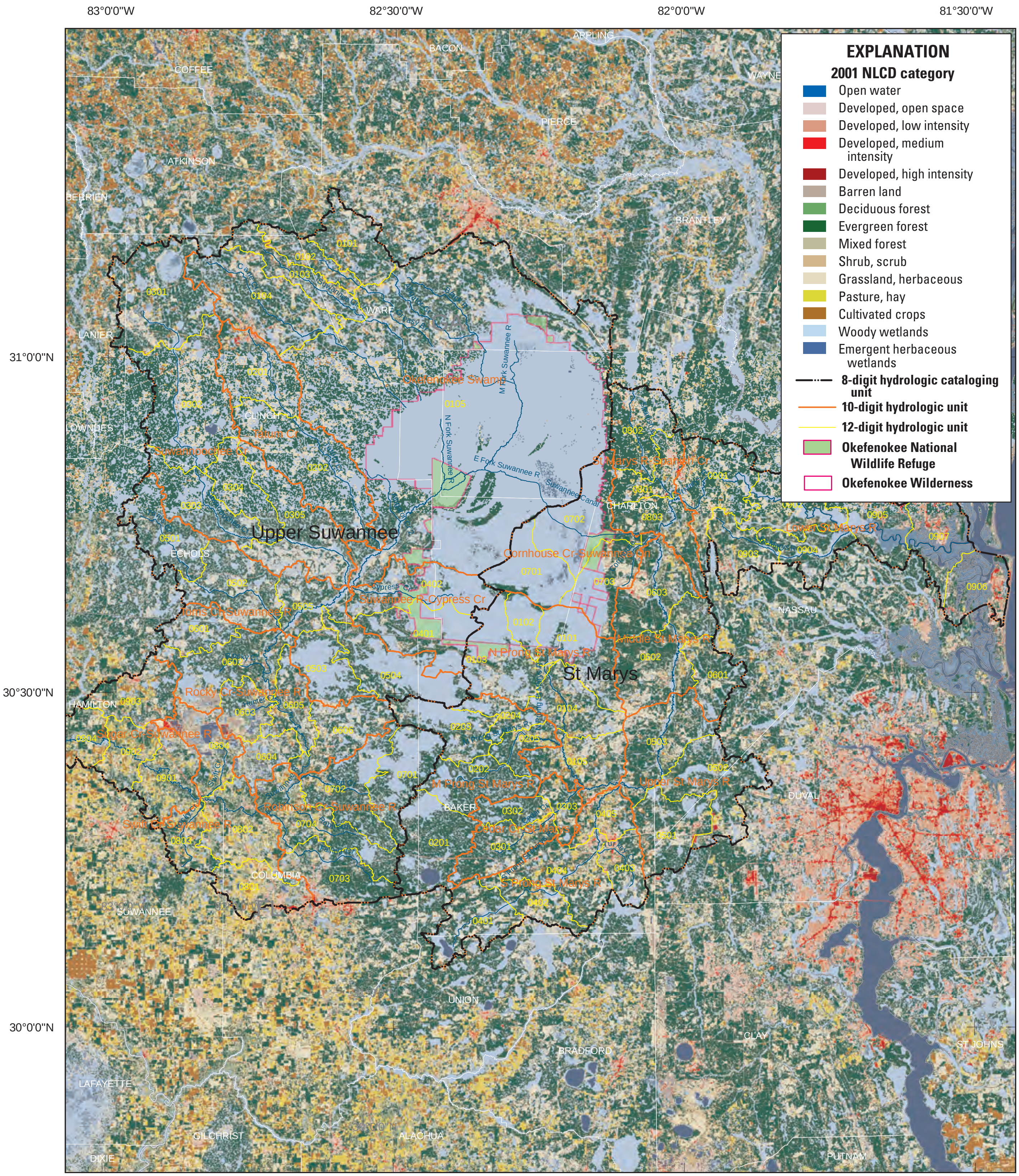
02228500 North Prong Saint Marys River at Moniac, GA (10)
02229000 North Prong Saint Marys River at Taylor, GA (9)
02230000 Turkey Creek at MacClenny, FL (8)
02230500 South Prong Saint Marys River at Glen Saint Mary, FL (7)
02231000 Saint Marys River near MacClenny, FL (6)
02231253 Saint Marys River near Gross, FL (5)
02314500 Suwannee River (US 441) at Fargo, GA (4)
02315000 Suwannee River near Benton, FL (3)
02315500 Suwannee River at White Springs, FL (2)
02315550 Suwannee River at Suwannee Springs, FL (1)

Figure E5. Periods of record for mean-daily discharge data used in Indicators of Hydrologic Alteration analyses for gaging stations in the contributing watersheds and vicinity of Okefenokee National Wildlife Refuge, Florida and Georgia. Locations of gaging stations are shown in figure E1.



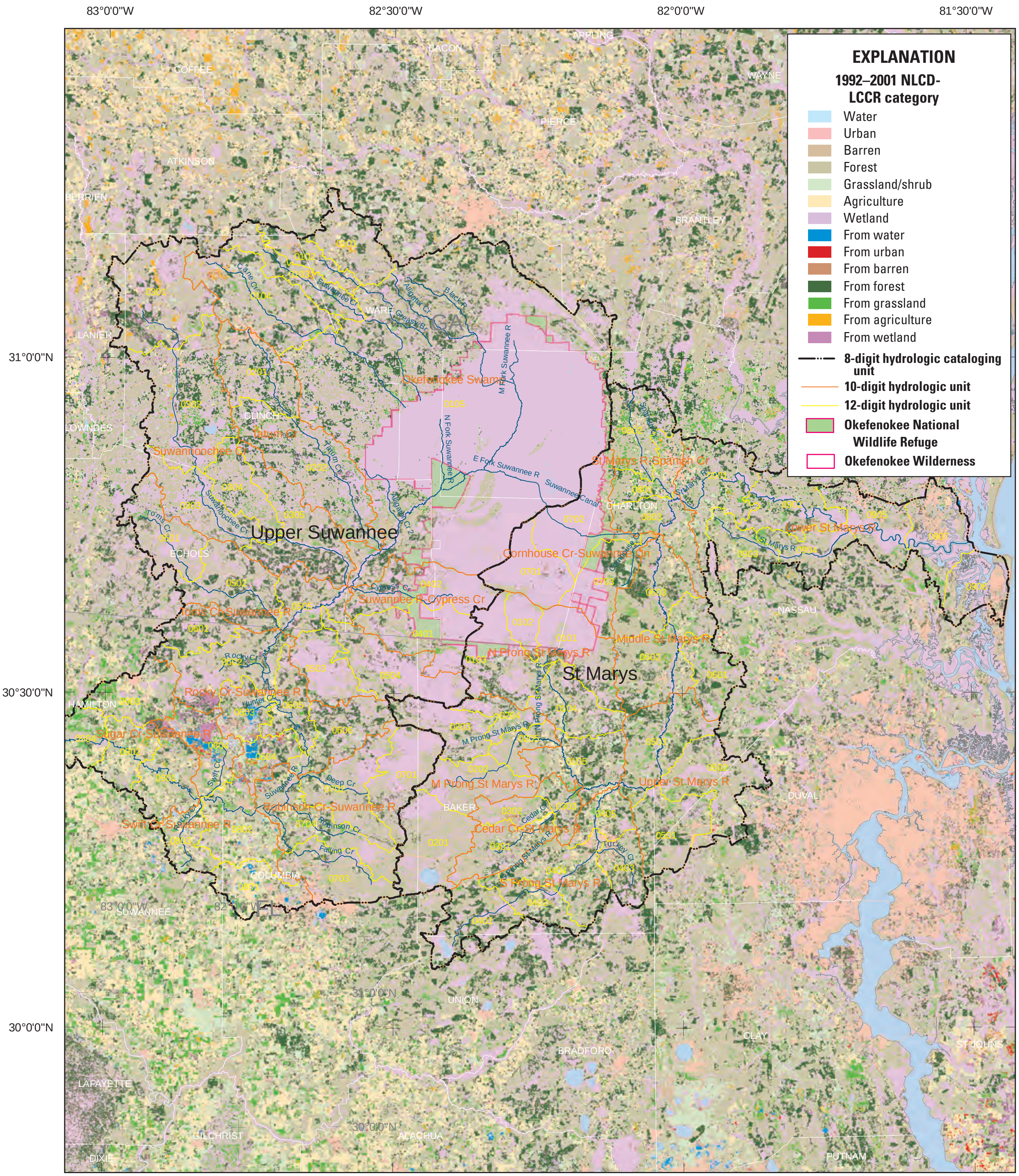
Base modified from U.S. Geological Survey digital data, various scales

Figure E6. Land cover for 1992 for the Upper Suwannee (03110201) and St. Marys (03070204) hydrologic cataloging units (land-cover source: 1992 National Land Cover Database [NLCD; Vogelmann and others, 2001]).



Base modified from U.S. Geological Survey digital data, various scales

Figure E7. Land cover for 2001 for the Upper Suwannee (03110201) and St. Marys (03070204) hydrologic cataloging units (land-cover source: 2001 National Land Cover Database [NLCD; Homer and others, 2007]).



Base modified from U.S. Geological Survey digital data, various scales

Figure E8. Land-cover change for the period from 1992 to 2001 for the Upper Suwannee (03110201) and St. Marys (03070204) hydrologic cataloging units (land-cover data source: National Land Cover Database [NLCD] 1992–2001 Land Cover Change Retrofit [LCCR] product [Fry and others, 2009]).

Table E–1. Management objectives and environmental issues for the Okefenokee National Wildlife Refuge, Georgia and Florida.

[Environmental issues do not correspond to management objectives]

Refuge management objectives[a,b,c]	Environmental issues[b,c]
Provide optimum habitat and protection to threatened and endangered species populations within the refuge	Degradation of water quality from fertilizer and herbicides on nearby timberland areas, agriculture, and wastewater discharge
Restore missing and fragmented native upland communities	Increasing withdrawals for municipal, industrial, and agricultural demand. More information on the water budget for Okefenokee Swamp is needed
Provide opportunities for recreation such as hunting and fishing	Adjacent private industrial forestland, refuge facilities, and the growing urban interface areas create challenges to managing natural fire
Develop and implement environmental education programs	
Maintain water quality and quantity for diverse biological communities	

[a]U.S. Fish and Wildlife Service, undated.

[b]U.S. Fish and Wildlife Service, 2006.

[c]Thom and others, 2015.

Table E–2*A*. Station characteristics for gaging stations in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.

[Stations 02314274, 023142741, 02314495, 02314500, and 02314780 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. dms, latitude and longitude coordinates in degrees, minutes, and seconds; mi^2, square mile; ft, foot. Gage location in relation to the refuge property: us, upstream; ds, downstream; usds, upstream and downstream and(or) on refuge property; nc, no hydrologic connection]

USGS station number	Station name	County and State	Latitude and longitude[a] (dms)	Drainage area[b] (mi^2)	Datum of gage[c] (ft)	Gage location
			Altamaha-St Marys (0307)[d]			
			St Marys (03070204)[d]			
02228500	N Prong St Marys R at Moniac, GA	Baker, FL	303103N, 0821350W	160	89.40 (92.62)[e]	ds
02228700	Ocean Pond at Olustee, FL	Baker, FL	301255N, 0822631W	13.1	150.40	nc
02229000	M Prong St Marys R at Taylor, GA	Baker, FL	302610N, 0821715W	125	—	ds
02229250	M Prong St Marys R nr Taylor, GA	Baker, FL	302557N, 0821352W	186	—	ds
02229400	Palestine Lake nr Olustee, FL	Union, FL	300746N, 0822434W	—	—	nc
02229500	S Prong St Marys R nr Sanderson, FL	Baker, FL	301217N, 0821549W	57.8	—	ds
02230000	Turkey Cr at MacClenny, FL	Baker, FL	301608N, 0820721W	19.9	99.95	ds
02230500	S Prong St Marys R at Glen St Mary, FL	Baker, FL	301640N, 0820840W	156	77.13	ds
02231000	St Marys R nr MacClenny, FL	Baker, FL	302131N, 0820454W	700	40.00	ds
02231230[g]	Pigeon Cr at Boulogne, FL	Nassau, FL	304539N, 0815804W	9.36	—	ds
02231250	Little St Marys R nr Hilliard, FL	Nassau, FL	*304355N, 0815335W*	19.8	—	ds
02231253	St Marys R nr Gross, FL	Nassau, FL	304429N, 0814117W	1,360	—	ds
02231254	St Marys R (I-95) nr Kingsland, GA	Camden, GA	304438N, 0813916W	1,400	*–9.50*	ds
			Suwannee (0311)[d]			
			Upper Suwannee (03110201)[d]			
02314261[g]	Boggy Bay trib at Fourth Ave nr Waycross, GA	Ware, GA	311100N, 0822253W	0.15	—	us
02314274	Suwannee R at Sill nr Fargo, GA	Charlton, GA	304814N, 0822503W	—	117.00	usds
023142741	N Fork Suwannee R at Sill nr Fargo, GA	Charlton, GA	304858N, 0822449W	—	117.00	usds
02314300[g]	Tatum Cr (US 441) nr Homerville, GA	Clinch, GA	305347N, 0823957W	48.1	142.00	ds
02314495	Suwannee R ab Fargo, GA	Clinch, GA	*304227N, 0823221W*	1,260	*91.00*	ds
02314500	Suwannee R (US 441) at Fargo, GA	Clinch, GA	*304050N, 0823338W*	1,130	*91.00*	ds
02314600[g]	Suwanoochee Cr (US 84) at Dupont, GA	Clinch, GA	305909N, 0825250W	93.7	169.65	ds
02314700[g]	Suwanoochee Cr (SR 187) nr Thelma, GA	Clinch, GA	304918N, 0825028W	195	143.69	ds
02314780[g]	Suwanoochee Cr (SR 94) nr Fargo, GA	Clinch, GA	304059N, 0823459W	450	105.00	ds
02315000	Suwannee R nr Benton, FL	Columbia, FL	303026N, 0824259W	2,090	0.00	ds
02315500	Suwannee R at White Springs, FL	Columbia, FL	301932N, 0824418W	2,430	0 (48.54)[f]	ds
02315550	Suwannee R at Suwannee Springs, FL	Suwannee, FL	302334N, 0825600W	2,630	0.00	ds

[a]Latitude and longitude coordinates in roman (or normal) font are referenced to NAD 27; those in italicized font are referenced to NAD 83.

[b]Drainage areas in parentheses are shown when the contributing drainage area is less than the actual drainage area. —, the drainage area is either indeterminate or not delineated.

[c]Datum-of-gage values in roman (or normal) font are referenced to NGVD 29; those values in italicized font are referenced to NAVD 88. —, datum of gage not established.

[d]The 8-digit hydrologic units were developed by the U.S. Geological Survey as a standardized set of hydrologic boundaries and numerical codes for the river-basin units of the United States (Seaber and others, 1994). The 8-digit hydrologic unit code encompasses four levels of subdivision: region (2-digit), subregion (4-digit), accounting unit (6-digit), and cataloging unit (8-digit).

[e]Datum of non-recording gage at site 800 ft downstream, prior to June 30, 1934.

[f]Datum of gage prior to October 1, 1979.

[g]Only annual peak-value data available.

Table E–2*B*. Station characteristics for observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.

[Stations 304213081270801 (SM-22) and 304313081330001 (SM-23) may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) wells shown in figure E1. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. dms, latitude and longitude coordinates in degrees, minutes, and seconds. ft, foot]

USGS station number (map ID)	Station name	County and State	Latitude and longitude[a] (dms)	Well depth (hole depth)[b] (ft)	Land surface altitude[c] (ft)	National (local) aquifer code[d]	National (local) aquifer name[d]
			Altamaha-St Marys (0307)[e]				
			St Marys (03070204)[e]				
300747082225801 (SM-01)	0072221	Union, FL	300747N, 0822258W	724 (—)	153.00	— (—)	— (—)
301245082233085 (SM-02)	USFS-Olustee, deeper well	Baker, FL	301245N, 0822330W	253 (—)	—	S400FLRDN (120FLRD)	Floridan (Floridan)
301246082233085 (SM-03)	USFS-Olustee, shallower well	Baker, FL	301246N, 0822330W	45 (—)	—	S100SURFCL (112NRSD)	Surficial (Nonartesian sand)
301423082261185 (SM-04)	USGS-Ocean Pond	Baker, FL	301423N, 0822611W	134 (—)	—	S400FLRDN (120FLRD)	Floridan (Floridan)
301535082162085 (SM-05)	B-11-DUP	Baker, FL	301535N, 0821620W	825 (—)	—	S400FLRDN (120FLRD)	Floridan (Floridan)
301635082234002 (SM-07)	BS-195082234002	Baker, FL	301635N, 0822340W	107 (107)	152.65	— (—)	— (—)
301635082234085 (SM-08)	B-18 ONF #8 Floridan well	Baker, FL	301635N, 0822340W	152 (—)	—	S400FLRDN (120FLRD)	Floridan (Floridan)
301702082271501 (SM-09)	ONF #7 Floridan well	Baker, FL	301702N, 0822715W	184 (208)	140.67	S400FLRDN (120FLRD)	Floridan (Floridan)
301702082271502 (SM-10)	ONF #7 water table well	Baker, FL	301702N, 0822715W	25.0 (25.0)	140.67	S100SURFCL (112NRSD)	Surficial (Nonartesian sand)
301702082271585 (SM-11)	B-20 ONF #7 Floridan well	Baker, FL	301702N, 0822715W	184 (—)	—	S400FLRDN (120FLRD)	Floridan (Floridan)
302115082232201 (SM-12)	SRWMD B-2	Baker, FL	302115N, 0822322W	294 (294)	131.64	S400FLRDN (120FLRD)	Floridan (Floridan)
302115082232202 (SM-13)	BS-24	Baker, FL	302115N, 0822322W	70.0 (70.0)	131.64	— (—)	— (—)
302115082232285 (SM-14)	B-23 ONF #5 Floridan well	Baker, FL	302115N, 0822322W	292 (—)	—	S400FLRDN (120FLRD)	Floridan (Floridan)
302251082194901 (SM-15)	B-25 ONF #6 Floridan well nr Taylor, FL	Baker, FL	302251N, 0821949W	338 (338)	127.90	S400FLRDN (120FLRD)	Floridan (Floridan)
302251082194902 (SM-16)	B-26 ONF #6 Hawthorne well nr Taylor, FL	Baker, FL	302251N, 0821949W	122 (122)	127.90	S500INTRMD (122HTRNS)	Intermediate (Hawthorne sand and gravel)
302251082194986 (SM-17)	B-26 ONF #6 shallow well	Baker, FL	302251N, 0821949W	122 (—)	—	S500INTRMD (122HTRNS)	Intermediate (Hawthorne sand and gravel)
302416081522601 (SM-18)	D-348 Monticello Drug Co well at Jacksonville, FL	Baker, FL	302416N, 0815226W	708 (—)	86.78	S400FLRDN (120FLRD)	Floridan (Floridan)
302416081522602 (SM-19)	D-349 Monticello Drug Co well at Jacksonville, FL	Baker, FL	302416N, 0815226W	2,230 (—)	85.66	S400FLRDN (120FLRD)	Floridan (Floridan)

Table E–2*B*. Station characteristics for observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 304213081270801 (SM-22) and 304313081330001 (SM-23) may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) wells shown in figure E1. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. dms, latitude and longitude coordinates in degrees, minutes, and seconds. ft, foot]

USGS station number (map ID)	Station name	County and State	Latitude and longitude[a] (dms)	Well depth (hole depth)[b] (ft)	Land surface altitude[c] (ft)	National (local) aquifer code[d]	National (local) aquifer name[d]
			Altamaha-St Marys (0307)[e]—Continued				
			St Marys (03070204)[e]—Continued				
302620082173501 (SM-20)	B-9 USGS well at Taylor, FL	Baker, FL	302620N, 0821735W	905 (—)	116.30	S400FLRDN (120FLRD)	Floridan (Floridan)
302620082173585 (SM-21)	B-9 nr Taylor, FL-DUP1	Baker, FL	302620N, 0821735W	903 (—)	—	S400FLRDN (120FLRD)	Floridan (Floridan)
304213081270801 (SM-22)	N-19 Ft Clinch State Park at Fernandina Beach, FL	Nassau, FL	304213N, 0812708W	710 (710)	8.41	S400FLRDN (120FLRD)	Floridan (Floridan)
304313081330001 (SM-23)	33D069	Camden, GA	304313.2N, 081325908W	575 (575)	8.00	S400FLRDN (120FLRD)	Floridan (Floridan)
304406081330502 (SM-24)	33D071	Camden, GA	304406N, 0813305W	365 (370)	10.00	N9999OTHER (122BRCKU)	Other (Upper Brunswick)
304406081330503 (SM-25)	33D072	Camden, GA	304406N, 0813305W	255 (260)	10.00	S100SURFCL (110SFCL)	Surficial (Surficial)
304406081330505 (SM-26)	33D074	Camden, GA	304406N, 0813305W	2,004 (2,126)	10.00	S400FLRDN (120FLRDL)	Floridan (Lower Floridan)
304512081343601 (SM-27)	33E007	Camden, GA	304511.6N, 0813436.8W	760 (770)	18.00	S400FLRDN (120FLRDU)	Floridan (Upper Floridan)
			Suwannee (0311)[e]				
			Upper Suwannee (03110201)[e]				
301307082355001 (SW-01)	ONF #10 Floridan well	Columbia, FL	301307N, 0823550W	192 (192)	182.97	S400FLRDN (120FLRD)	Floridan (Floridan)
301307082355002 (SW-02)	ONF #10 water table well	Columbia, FL	301307N, 0823550W	32.0 (32.0)	182.97	S100SURFCL (112NRSD)	Surficial (Nonartesian sand)
301437082324801 (SW-03)	ONF #9 Floridan well	Columbia, FL	301437N, 0823248W	189 (189)	149.71	S400FLRDN (120FLRD)	Floridan (Floridan)
301437082324802 (SW-04)	ONF #9 Hawthorne well	Columbia, FL	301437N, 0823248W	102 (102)	149.71	S500INTRMD (122HTRNS)	Intermediate (Hawthorne sand and gravel)
301822082393901 (SW-05)	New Hope School well nr White Springs, FL	Columbia, FL	301822N, 0823939W	129 (167)	127.00	S400FLRDN (120FLRD)	Floridan (Floridan)
301822082393985 (SW-06)	New Hope School well	Columbia, FL	301822N, 0823939W	167 (—)	—	S400FLRDN (120FLRD)	Floridan (Floridan)
301909082490985 (SW-07)	Local no.019-249-1	Suwannee, FL	301909N, 0824909W	133 (—)	90.19	S400FLRDN (120FLRD)	Floridan (Floridan)
301933082350501 (SW-08)	ONF #2 Floridan well	Columbia, FL	301933N, 0823505W	262 (—)	135.95	S400FLRDN (120FLRD)	Floridan (Floridan)
301933082350502 (SW-09)	ONF #2 water table well	Columbia, FL	301933N, 0823505W	22.0 (22.0)	136.58	S100SURFCL (112NRSD)	Surficial (Nonartesian sand)

Table E–2*B*. Station characteristics for observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 304213081270801 (SM-22) and 304313081330001 (SM-23) may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) wells shown in figure E1. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. dms, latitude and longitude coordinates in degrees, minutes, and seconds. ft, foot]

USGS station number (map ID)	Station name	County and State	Latitude and longitude[a] (dms)	Well depth (hole depth)[b] (ft)	Land surface altitude[c] (ft)	National (local) aquifer code[d]	National (local) aquifer named
			Suwannee (0311)[e]—Continued				
			Upper Suwannee (03110201)[e]—Continued				
301945082292202 (SW-10)	ONF #4 Hawthorne well	Columbia, FL	301945N, 0822922W	145 (145)	135.29	S500INTRMD (122HTRNS)	Intermediate (Hawthorne sand and gravel)
301948082460601 (SW-11)	Stephen Foster memorial well	Hamilton, FL	301948N, 0824606W	259 (—)	104.00	S400FLRDN (120FLRD)	Floridan (Floridan)
302052082312401 (SW-12)	ONF #3 Floridan well	Columbia, FL	302052N, 0823124W	220 (220)	128.40	S400FLRDN (120FLRD)	Floridan (Floridan)
302052082312402 (SW-13)	ONF #3 Hawthorne well	Columbia, FL	302052N, 0823124W	93.0 (93.0)	128.40	S500INTRMD (122HTRNS)	Intermediate (Hawthorne sand and gravel)
302052082312485 (SW-14)	ONF #3 Floridan well	Columbia, FL	302052N, 0823124W	220 (—)	—	S400FLRDN (120FLRD)	Floridan (Floridan)
302243082360201 (SW-15)	ONF #1 Floridan well	Columbia, FL	302243N, 0823602W	226 (228)	119.90	S400FLRDN (120FLRD)	Floridan (Floridan)
302243082360202 (SW-16)	ONF #1 water table well	Columbia, FL	302243N, 0823602W	25.0 (25.0)	120.14	S100SURFCL (112NRSD)	Surficial (Nonartesian sand)
302323082493501 (SW-17)	A C Hogan well	Hamilton, FL	302323N, 0824935W	215 (—)	140.00	S400FLRDN (120FLRD)	Floridan (Floridan)
302334082560201 (SW-18)	Suwannee Spgs well	Suwannee, FL	302334N, 0825602W	58.0 (—)	—	S400FLRDN (120FLRD)	Floridan (Floridan)
302447082470585 (SW-19)	Occidental Chemical Co	Hamilton, FL	302447N, 0824705W	160 (—)	—	S400FLRDN (120FLRD)	Floridan (Floridan)
302450082443501 (SW-20)	Occidental Pond monitor well CW-2 nr White Sgs, FL	Hamilton, FL	302450N, 0824435W	28.0 (28.0)	159.00	S100SURFCL (112NRSD)	Surficial (Nonartesian sand)
302607082445701 (SW-21)	Occidental Pond clay monitor well nr White Sgs, FL	Hamilton, FL	302607N, 0824457W	25.0 (25.0)	151.00	S100SURFCL (112NRSD)	Surficial (Nonartesian sand)
304942082213801 (SW-22)	27E004	Charlton, GA	304943N, 0822138W	700 (700)	116.00	S400FLRDN (120FLRD)	Floridan (Floridan)
304943082213701 (SW-23)	27E002	Charlton, GA	304943N, 0822138W	591 (647)	116.00	S400FLRDN (120FLRD)	Floridan (Floridan)
310706082155101 (SW-24)	27G003	Ware, GA	310706N, 0821556W	1,856 (1,970)	150.00	S400FLRDN (120FLRD)	Floridan (Floridan)

[a]Latitude and longitude coordinates in roman (or normal) font are referenced to NAD 27, those in italicized font are referenced to NAD 83.

[b]Well depths and(or) hole depths in roman (or normal) font are referenced to NGVD 29, those values in italicized font are referenced to NAVD 88. —, well depth and(or) hole depth not established.

[c]Datum-of-gage values in roman (or normal) font are referenced to NGVD 29, those values in italicized font are referenced to NAVD 88. —, datum of gage not established.

[d]National and local aquifer codes and names are explained on the USGS NWISWeb Web site at http://help.waterdata.usgs.gov/codes-and-parameters. Links to aquifer-code metadata and downloadable reference files of aquifer codes are also provided.

[e]The 8-digit hydrologic units were developed by the U.S. Geological Survey as a standardized set of hydrologic boundaries and numerical codes for the river-basin units of the United States (Seaber and others, 1994). The 8-digit hydrologic unit code encompasses four levels of subdivision: region (2-digit), subregion (4-digit), accounting unit (6-digit), and cataloging unit (8-digit).

Table E–2*C*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.

[Stations 02314274, 023142741, 02314495, and 02314500 may be of most interest due to their proximity to refuge boundaries. Periods-of-record for gaging stations with only annual peak-value data are not listed. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929]

USGS station number	Station name	Parameter[a]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		Altamaha-St Marys (0307)				
		St Marys (03070204)				
02228500	N Prong St Marys R at Moniac, GA	Gage height[c]	1921–2013	42, 28, 23–0.70	1921–2012	43, 28, 21–0.70
		Elevation above NAVD 88	2011–2013	1, 2, 0–0.65	2010–2012	0, 3, 0–0.66
		Discharge[c]	1921–2013	63, 9, 21–0.73	1921–2012	61, 11, 20–0.73
02228700	Ocean Pond at Olustee, FL	Elevation above NGVD 29	1976–1994	1, 16, 2–0.10	1975–1993	1, 17, 1–0.10
02229000	M Prong St Marys R at Taylor, GA	Gage height[c]	1956–2001	30, 7, 9–0.78	1955–2001	28, 10, 9–0.76
		Discharge[c]	1956–2001	37, 1, 8–0.82	1955–2001	35, 4, 8–0.80
02229250	M Prong St Marys R nr Taylor, GA	Gage height	1997–2002	3, 3, 0–0.78	1997–2002	3, 3, 0–0.78
		Discharge	1997–2002	4, 2, 0–0.82	1997–2002	4, 2, 0–0.82
02229400	Palestine Lake nr Olustee, FL	Elevation above NGVD 29	1975–1994	0, 13, 7–0.04	1975–1993	0, 13, 6–0.04
02229500	S Prong St Marys R nr Sanderson, FL	Gage height	1955–1961	1, 6, 0–0.71	1955–1960	1, 5, 0–0.83
		Discharge	1956–1961	5, 1, 0–0.88	1955–1960	5, 1, 0–0.88
02230000	Turkey Cr at MacClenny, FL	Gage height[c]	1955–1969	12, 2, 1–0.87	1955–1969	10, 5, 0–0.87
		Dischargec	1956–1977	14, 3, 5–0.66	1955–1977	13, 4, 6–0.63
02230500	S Prong St Marys R at Glen St Mary, FL	Gage height[c]	1950–1971	16, 5, 1–0.93	1950–1971	13, 9, 0–0.93
		Dischargec	1950–1972	21, 2, 0–0.95	1950–1971	21, 1, 0–0.99
02231000	St Marys R nr MacClenny, FL	Gage height[c]	1927–2012	66, 19, 1–0.98	1926–2012	63, 24, 0–0.97
		Elevation above NAVD 88	2011–2012	1, 1, 0–1.00	2010–2012	1, 2, 0–0.67
		Dischargec	1927–2012	86, 0, 0–1.00	1926–2012	85, 2, 0–0.99
		Water temperature, unit value	1965–1977	0, 11, 2–0.64	1965–1977	1, 9, 3–0.64
02231250	Little St Marys R nr Hilliard, FL	Gage height	1965–1967	2, 1, 0–0.89	1965–1967	1, 2, 0–0.89
		Discharge	1965–1967	2, 1, 0–0.92	1965–1967	2, 1, 0–0.92
02231253	St Marys R nr Gross, FL	Gage height, tidal low low[c]	1966–1990	12, 9, 4–0.73	1966–1990	12, 10, 3–0.73
		Gage height, tidal high high[c]	1966–1990	12, 9, 4–0.73	1966–1990	12, 10, 3–0.73
		Discharge[c,d]	1966–1990	10, 8, 7–0.60	1966–1990	9, 12, 4–0.60
02231254	St Marys R (I-95) nr Kingsland, GA	Gage height, tidal low low	2010–2013	1, 1, 2–0.37	2010–2013	0, 3, 1–0.37
		Gage height, tidal high high	2010–2013	1, 1, 2–0.37	2010–2013	0, 3, 1–0.37
		Stream velocity	2010–2013	0, 0, 4–0.00	2010–2012	0, 0, 3–0.00
		Discharge, tidal low low	2010–2013	1, 1, 2–0.37	2010–2013	0, 3, 1–0.37
		Discharge, tidal high high	2010–2013	1, 1, 2–0.37	2010–2013	0, 3, 1–0.37
		Precipitation, sum	2010–2010	0, 1, 0–0.52	2010–2010	0, 1, 0–0.52
		Water temperature	2010–2013	0, 0, 4–0.00	2010–2013	0, 0, 4–0.00

Table E–2*C*. Hydrologic-data periods-of-record for gaging stations in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 02314274, 023142741, 02314495, and 02314500 may be of most interest due to their proximity to refuge boundaries. Periods-of-record for gaging stations with only annual peak-value data are not listed. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929]

USGS station number	Station name	Parameter[a]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
Suwannee (0311)						
Upper Suwannee (03110201)						
02314274	Suwannee R at Sill nr Fargo, GA	Discharge	2000–2002	3, 0, 0–1.00	1999–2002	2, 2, 0–0.75
		Discharge, minimum	2000–2002	2, 1, 0–0.98	1999–2002	2, 2, 0–0.73
		Discharge, maximum	2000–2002	2, 1, 0–0.98	1999–2002	2, 2, 0–0.73
023142741	N Fork Suwannee R at Sill nr Fargo, GA	Discharge	1999–2003	4, 1, 0–0.98	1998–2003	4, 2, 0–0.81
		Discharge, minimum	1999–2003	0, 5, 0–0.93	1998–2003	1, 5, 0–0.77
		Discharge, maximum	1999–2003	0, 5, 0–0.93	1998–2003	1, 5, 0–0.77
		Precipitation, sum	2001–2001	0, 1, 0–0.97	2000–2001	0, 2, 0–0.48
02314495	Suwannee R ab Fargo, GA	Gage height	2000–2013	7, 6, 1–0.87	1999–2013	8, 6, 1–0.81
		Precipitation, sum	2002–2013	7, 4, 1–0.80	2002–2013	6, 5, 1–0.80
02314500	Suwannee R (US 441) at Fargo, GA	Gage height	1987–2013	5, 10, 12–0.53	1986–2013	3, 14, 11–0.51
		Discharge[c]	1927–2013	79, 3, 5–0.92	1927–2013	77, 4, 6–0.92
		Precipitation, sum	2002–2013	4, 7, 1–0.84	2002–2013	4, 7, 1–0.84
02315000	Suwannee R nr Benton, FL	Gage height[c]	1976–2013	18, 13, 7–0.73	1975–2012	19, 13, 6–0.73
		Discharge[c]	1932–2013	31, 4, 47–0.40	1932–2012	30, 5, 46–0.40
02315500	Suwannee R at White Springs, FL	Gage height[c]	1906–2013	53, 38, 17–0.79	1906–2012	49, 40, 18–0.80
		Elevation above NGVD 29[c]	1906–1993	44, 27, 17–0.76	1906–1993	41, 29, 18–0.76
		Discharge[c]	1906–2013	87, 4, 17–0.82	1906–2012	86, 3, 18–0.82
02315550	Suwannee R at Suwannee Springs, FL	Gage height[c]	1970–2013	18, 10, 16–0.61	1969–2013	17, 13, 15–0.60
		Discharge[c]	1975–2012	23, 0, 15–0.61	1974–2012	21, 4, 14–0.59
		Discharge, equivalent mean	1975–1984	1, 1, 8–0.16	1974–1984	0, 4, 7–0.14

[a]All parameters listed are mean-daily values except where other statistics or measurements are indicated.

[b]Period shown is for indicated type of year and includes gaps if data collection was discontinuous. Record completeness: number of complete-record, partial-record, and null-record water or calendar years—fraction of total record length with mean-daily values. The fraction-of-total-record-length calculation is based on complete beginning and ending water or calendar years as well as complete intervening years. Therefore, the fraction-of-total-record-length numbers may be different for water years when compared to calendar years.

[c]Indicators of Hydrologic Alteration (IHA) analysis was performed for these parameters. Periods of record for IHA analyses shown in figure E4 (gage height) and figure E5 (discharge). IHA analysis was only done for station-parameter combinations with a minimum of 10 complete water years of record.

[d]Negative parameter values set to zero for the IHA analysis—parameter distributions censored at zero and IHA results given for the positive portion of the distribution because the IHA software will not analyze negative values.

Table E–2*D*. Hydrologic-data periods-of-record for observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.

[Stations 304213081270801 and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1; USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. NAVD 88, North American Vertical Datum of 1988; NGVD 29; National Geodetic Vertical Datum of 1929]

USGS station number	Station name	Parameter[a]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		Altamaha-St Marys (0307)				
		St Marys (03070204)				
300747082225801	0072221	Elevation above NGVD 29, maximum	1959–1982	7, 17, 0–0.42	1958–1982	6, 19, 0–0.41
		Elevation above NGVD 29, unit value	1988–1995	0, 8, 0–0.05	1988–1994	0, 7, 0–0.06
		Depth to water level	1977–1979	1, 2, 0–0.48	1977–1979	0, 3, 0–0.48
		Depth to water level, minimum	1959–1983	7, 18, 0–0.46	1958–1983	7, 19, 0–0.44
301245082233085	USFS-Olustee, deeper well	Elevation above NGVD 29, unit value	1988–1995	0, 8, 0–0.05	1988–1994	0, 7, 0–0.06
301246082233085	USFS-Olustee, shallower well	Elevation above NGVD 29, unit value	1989–1995	0, 7, 0–0.02	1989–1994	0, 6, 0–0.03
301423082261185	USGS-Ocean Pond	Elevation above NGVD 29, unit value	1960–1995	1, 35, 0–0.24	1959–1994	1, 34, 1–0.24
301535082162085	B-11-DUP	Elevation above NGVD 29, unit value	1965–1995	0, 16, 15–0.01	1965–1994	0, 16, 14–0.01
301635082234002	BS-195082234002	Elevation above NGVD 29, maximum	1976–1977	0, 2, 0–0.36	1976–1977	0, 2, 0–0.36
		Depth to water level	1976–1977	0, 2, 0–0.25	1976–1977	0, 2, 0–0.25
		Depth to water level, minimum	1976–1977	0, 2, 0–0.25	1976–1977	0, 2, 0–0.25
		Depth to water level, maximum	1976–1977	0, 2, 0–0.25	1976–1977	0, 2, 0–0.25
301635082234085	B-18 ONF #8 Floridan well	Elevation above NGVD 29, unit value	1978–1994	0, 16, 1–0.02	1977–1994	0, 17, 1–0.01
301702082271501	ONF #7 Floridan well	Elevation above NGVD 29, maximum	1977–1977	0, 1, 0–0.54	1976–1977	0, 2, 0–0.27
		Depth to water level	1977–1977	0, 1, 0–0.48	1976–1977	0, 2, 0–0.24
		Depth to water level, minimum	1977–1977	0, 1, 0–0.48	1976–1977	0, 2, 0–0.24
		Depth to water level, maximum	1977–1977	0, 1, 0–0.48	1976–1977	0, 2, 0–0.24
301702082271502	ONF #7 water table well	Elevation above NGVD 29, maximum	1976–1977	0, 2, 0–0.36	1976–1977	0, 2, 0–0.36
		Depth to water level	1976–1977	0, 2, 0–0.36	1976–1977	0, 2, 0–0.36
		Depth to water level, minimum	1976–1977	0, 2, 0–0.36	1976–1977	0, 2, 0–0.36
		Depth to water level, maximum	1976–1977	0, 2, 0–0.36	1976–1977	0, 2, 0–0.36

Table E–2*D*. Hydrologic-data periods-of-record for observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 304213081270801 and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1; USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. NAVD 88, North American Vertical Datum of 1988; NGVD 29; National Geodetic Vertical Datum of 1929]

USGS station number	Station name	Parameter[a]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
Altamaha-St Marys (0307)—Continued						
St Marys (03070204)—Continued						
301702082271585	B-20 ONF #7 Floridan well	Elevation above NGVD 29, unit value	1988–1994	0, 7, 0–0.03	1988–1994	0, 7, 0–0.03
302115082232201	SRWMD B-2	Elevation above NGVD 29, maximum	1976–1977	0, 1, 1–0.75	1976–1977	0, 2, 0–0.75
		Depth to water level	1976–1977	0, 1, 1–0.70	1976–1977	0, 2, 0–0.70
		Depth to water level, minimum	1976–1977	0, 1, 1–0.70	1976–1977	0, 2, 0–0.70
		Depth to water level, maximum	1976–1977	0, 1, 1–0.70	1976–1977	0, 2, 0–0.70
302115082232202	BS-24	Elevation above NGVD 29, maximum	1976–1977	0, 2, 0–0.31	1976–1977	0, 2, 0–0.31
		Depth to water level	1976–1977	0, 2, 0–0.28	1976–1977	0, 2, 0–0.28
		Depth to water level, minimum	1976–1977	0, 2, 0–0.28	1976–1977	0, 2, 0–0.28
		Depth to water level, maximum	1976–1977	0, 2, 0–0.28	1976–1977	0, 2, 0–0.28
302115082232285	B-23 ONF #5 Floridan well	Elevation above NGVD 29, unit value	1978–1994	0, 16, 1–0.02	1977–1994	0, 17, 1–0.01
302251082194901	B-25 ONF #6 Floridan well nr Taylor, FL	Elevation above NGVD 29, maximum	1976–1984	6, 3, 0–0.82	1976–1983	6, 2, 0–0.92
		Depth to water level	1976–1979	1, 3, 0–0.71	1976–1979	2, 2, 0–0.71
		Depth to water level, minimum	1976–1982	3, 4, 0–0.70	1976–1982	3, 4, 0–0.70
		Depth to water level, maximum	1976–1979	0, 4, 0–0.69	1976–1979	1, 3, 0–0.69
302251082194902	B-26 ONF #6 Hawthorne well nr Taylor, FL	Elevation above NGVD 29, maximum	1976–1982	3, 4, 0–0.75	1976–1982	3, 4, 0–0.75
		Depth to water level	1976–1979	0, 4, 0–0.60	1976–1979	0, 4, 0–0.60
		Depth to water level, minimum	1976–1982	2, 5, 0–0.69	1976–1982	1, 6, 0–0.69
		Depth to water level, maximum	1976–1979	0, 4, 0–0.59	1976–1979	0, 4, 0–0.59
302251082194986	B-26 ONF #6 shallow well	Elevation above NGVD 29, unit value	1987–1994	0, 8, 0–0.03	1987–1994	0, 8, 0–0.03
302416081522601	D-348 Monticello Drug Co well at Jacksonville, FL	Elevation above NGVD 29, maximum[c]	1992–2013	12, 10, 0–0.95	1991–2013	12, 11, 0–0.91

Table E–2*D*. Hydrologic-data periods-of-record for observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 304213081270801 and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1; USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. NAVD 88, North American Vertical Datum of 1988; NGVD 29; National Geodetic Vertical Datum of 1929]

USGS station number	Station name	Parameter[a]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		Altamaha-St Marys (0307)—Continued				
		St Marys (03070204)—Continued				
302416081522602	D-349 Monticello Drug Co well at Jacksonville, FL	Elevation above NGVD 29, maximum[c]	1975–2009	14, 17, 4–0.80	1974–2009	14, 20, 2–0.78
302620082173501	B-9 USGS well at Taylor, FL	Depth to water level, minimum	1983–1984	0, 2, 0–0.50	1982–1983	0, 2, 0–0.50
302620082173585	B-9 nr Taylor, FL-DUP1	Elevation above NGVD 29, unit value	1973–1994	0, 14, 8–0.02	1973–1994	0, 15, 7–0.02
304213081270801	N-19 Ft Clinch State Park at Fernandina Beach, FL	Elevation above NGVD 29, maximum	1986–2005	6, 14, 0–0.96	1985–2005	7, 14, 0–0.92
304313081330001	33D069	Depth to water level[c,d]	1994–2013	11, 9, 0–0.89	1994–2013	10, 10, 0–0.89
304406081330502	33D071	Depth to water level	1998–2013	8, 8, 0–0.88	1998–2013	8, 8, 0–0.88
304406081330503	33D072	Depth to water level	1998–2013	5, 11, 0–0.85	1998–2013	5, 11, 0–0.85
304406081330505	33D074	Depth to water level	2003–2013	2, 9, 0–0.86	2003–2013	1, 10, 0–0.86
304512081343601	33E007	Depth to water level	1994–2009	7, 9, 0–0.91	1993–2008	10, 6, 0–0.91
		Suwannee (0311)				
		Upper Suwannee (03110201)				
301307082355001	ONF #10 Floridan well	Elevation above NGVD 29, maximum	1976–1981	2, 4, 0–0.63	1976–1981	1, 5, 0–0.63
		Depth to water level	1976–1979	0, 4, 0–0.41	1976–1979	0, 4, 0–0.41
		Depth to water level, minimum	1976–1982	2, 5, 0–0.52	1976–1981	1, 5, 0–0.60
		Depth to water level, maximum	1976–1979	0, 4, 0–0.41	1976–1979	0, 4, 0–0.41
301307082355002	ONF #10 water table well	Elevation above NGVD 29, maximum	1976–1977	0, 2, 0–0.39	1976–1977	0, 2, 0–0.39
		Depth to water level	1976–1977	0, 2, 0–0.37	1976–1977	0, 2, 0–0.37
		Depth to water level, minimum	1976–1977	0, 2, 0–0.37	1976–1977	0, 2, 0–0.37
		Depth to water level, maximum	1976–1977	0, 2, 0–0.37	1976–1977	0, 2, 0–0.37
301437082324801	ONF #9 Floridan well	Elevation above NGVD 29, maximum	1976–1977	1, 1, 0–0.56	1976–1977	0, 2, 0–0.56
		Depth to water level	1976–1978	0, 3, 0–0.51	1976–1978	0, 3, 0–0.51
		Depth to water level, minimum	1976–1978	0, 3, 0–0.51	1976–1978	0, 3, 0–0.51
		Depth to water level, maximum	1976–1978	0, 3, 0–0.51	1976–1978	0, 3, 0–0.51

Table E–2*D*. Hydrologic-data periods-of-record for observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 304213081270801 and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1; USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. NAVD 88, North American Vertical Datum of 1988; NGVD 29; National Geodetic Vertical Datum of 1929]

USGS station number	Station name	Parameter[a]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		Suwannee (0311)—Continued				
		Upper Suwannee (03110201)—Continued				
301437082324802	ONF #9 Hawthorne well	Elevation above NGVD 29, maximum	1976–1977	0, 2, 0–0.15	1976–1977	0, 2, 0–0.15
		Depth to water level	1976–1977	0, 2, 0–0.16	1976–1977	0, 2, 0–0.16
		Depth to water level, minimum	1976–1977	0, 2, 0–0.16	1976–1977	0, 2, 0–0.16
		Depth to water level, maximum	1976–1977	0, 2, 0–0.16	1976–1977	0, 2, 0–0.16
301822082393901	New Hope School well nr White Springs, FL	Elevation above NGVD 29, maximum	1978–1981	3, 1, 0–0.95	1977–1981	3, 2, 0–0.76
		Depth to water level	1978–1979	0, 2, 0–0.58	1977–1979	0, 3, 0–0.39
		Depth to water level, minimum	1978–1982	3, 2, 0–0.65	1977–1981	2, 3, 0–0.65
		Depth to water level, maximum	1978–1979	0, 2, 0–0.58	1977–1979	0, 3, 0–0.39
301822082393985	New Hope School well	Elevation above NGVD 29, unit value	1982–1992	0, 11, 0–0.70	1982–1992	0, 11, 0–0.70
301909082490985	Local no.019-249-1	Elevation above NGVD 29, unit value	1964–1994	0, 19, 12–0.01	1964–1994	0, 20, 11–0.01
301933082350501	ONF #2 Floridan well	Elevation above NGVD 29, maximum	1976–1976	0, 1, 0–0.09	1976–1976	0, 1, 0–0.09
		Depth to water level	1976–1976	0, 1, 0–0.09	1976–1976	0, 1, 0–0.09
		Depth to water level, minimum	1976–1976	0, 1, 0–0.09	1976–1976	0, 1, 0–0.09
		Depth to water level, maximum	1976–1976	0, 1, 0–0.09	1976–1976	0, 1, 0–0.09
301933082350502	ONF #2 water table well	Elevation above NGVD 29, maximum	1976–1976	0, 1, 0–0.15	1976–1976	0, 1, 0–0.15
		Depth to water level	1976–1976	0, 1, 0–0.15	1976–1976	0, 1, 0–0.15
		Depth to water level, minimum	1976–1976	0, 1, 0–0.15	1976–1976	0, 1, 0–0.15
		Depth to water level, maximum	1976–1976	0, 1, 0–0.15	1976–1976	0, 1, 0–0.15
301945082292202	ONF #4 Hawthorne well	Elevation above NGVD 29, maximum	1976–1977	0, 2, 0–0.37	1976–1977	0, 2, 0–0.37
		Depth to water level	1976–1977	0, 2, 0–0.32	1976–1977	0, 2, 0–0.32
		Depth to water level, minimum	1976–1977	0, 2, 0–0.32	1976–1977	0, 2, 0–0.32
		Depth to water level, maximum	1976–1977	0, 2, 0–0.32	1976–1977	0, 2, 0–0.32

Table E–2*D*. Hydrologic-data periods-of-record for observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 304213081270801 and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1; USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. NAVD 88, North American Vertical Datum of 1988; NGVD 29; National Geodetic Vertical Datum of 1929]

USGS station number	Station name	Parameter[a]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
		Suwannee (0311)—Continued				
		Upper Suwannee (03110201)—Continued				
301948082460601	Stephen Foster memorial well	Depth to water level, minimum	1961–1970	0, 5, 5–0.00	1961–1970	0, 5, 5–0.00
302052082312401	ONF #3 Floridan well	Elevation above NGVD 29, maximum	1976–1981	3, 3, 0–0.74	1976–1981	2, 4, 0–0.74
		Depth to water level	1976–1979	0, 4, 0–0.53	1976–1979	0, 4, 0–0.53
		Depth to water level, minimum	1976–1982	3, 4, 0–0.69	1976–1982	2, 5, 0–0.69
		Depth to water level, maximum	1976–1979	0, 4, 0–0.53	1976–1979	0, 4, 0–0.53
302052082312402	ONF #3 Hawthorne well	Elevation above NGVD 29, maximum	1976–1981	3, 3, 0–0.73	1976–1981	2, 4, 0–0.73
		Depth to water level	1976–1979	0, 4, 0–0.47	1976–1979	0, 4, 0–0.47
		Depth to water level, minimum	1976–1982	3, 4, 0–0.67	1976–1982	2, 5, 0–0.67
		Depth to water level, maximum	1976–1979	0, 4, 0–0.48	1976–1979	0, 4, 0–0.47
302052082312485	ONF #3 Floridan well	Elevation above NGVD 29, unit value	1982–1994	3, 10, 0–0.57	1982–1994	3, 10, 0–0.57
302243082360201	ONF #1 Floridan well	Elevation above NGVD 29, maximum	1976–1984	6, 3, 0–0.89	1976–1984	5, 4, 0–0.89
		Depth to water level	1976–1979	0, 4, 0–0.69	1976–1979	0, 4, 0–0.69
		Depth to water level, minimum	1976–1984	5, 4, 0–0.88	1976–1984	4, 5, 0–0.88
		Depth to water level, maximum	1976–1979	0, 4, 0–0.69	1976–1979	0, 4, 0–0.69
302243082360202	ONF #1 water table well	Elevation above NGVD 29, maximum	1976–1981	3, 2, 1–0.66	1976–1981	1, 5, 0–0.66
		Depth to water level	1976–1979	0, 4, 0–0.61	1976–1979	0, 4, 0–0.61
		Depth to water level, minimum	1976–1982	3, 4, 0–0.66	1976–1982	2, 5, 0–0.66
		Depth to water level, maximum	1976–1979	0, 4, 0–0.61	1976–1979	0, 4, 0–0.61
302323082493501	A C Hogan well	Depth to water level, minimum	1968–1974	0, 4, 3–0.00	1967–1973	0, 5, 2–0.00
302334082560201	Suwannee Spgs well	Elevation above NGVD 29, maximum	1978–1981	3, 1, 0–0.86	1978–1981	2, 2, 0–0.86
		Depth to water level	1978–1979	0, 2, 0–0.39	1978–1979	0, 2, 0–0.39
		Depth to water level, minimum	1978–1982	3, 2, 0–0.69	1978–1981	2, 2, 0–0.86
		Depth to water level, maximum	1978–1979	0, 2, 0–0.39	1978–1979	0, 2, 0–0.39

Table E–2*D*. Hydrologic-data periods-of-record for observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 304213081270801 and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1; USGS hydrologic subregions, hydrologic-subregion codes, hydrologic cataloging units, and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar year, January 1 through December 31. NAVD 88, North American Vertical Datum of 1988; NGVD 29; National Geodetic Vertical Datum of 1929]

USGS station number	Station name	Parameter[a]	Water-year record		Calendar-year record	
			Period of record[b]	Record completeness[b]	Period of record[b]	Record completeness[b]
Suwannee (0311)—Continued						
Upper Suwannee (03110201)—Continued						
302447082470585	Occidental Chemical Co	Elevation above NGVD 29, unit value	1975–1995	0, 16, 5–0.01	1975–1995	0, 16, 5–0.01
302450082443501	Occidental Pond monitor well CW-2 nr White Sgs, FL	Elevation above NGVD 29, maximum	1996–1998	2, 1, 0–0.73	1996–1998	1, 2, 0–0.73
302607082445701	Occidental Pond clay monitor well nr White Sgs, FL	Elevation above NGVD 29, maximum	1996–1998	2, 1, 0–0.73	1996–1998	1, 2, 0–0.73
304942082213801	27E004	Depth to water level[c]	1978–2013	25, 11, 0–0.91	1978–2013	23, 13, 0–0.91
304943082213701	27E002	Depth to water level	1974–1975	2, 0, 0–1.00	1973–1975	1, 2, 0–0.67
310706082155101	27G003	Depth to water level[c]	1981–2012	24, 8, 0–0.96	1981–2012	25, 7, 0–0.96

[a]All parameters listed are mean-daily values except where other statistics or measurements are indicated.

[b]Period shown is for indicated type of year and includes gaps if data collection was discontinuous. Record completeness: number of complete-record, partial-record, and null-record water or calendar years—fraction of total record length with mean-daily values. The fraction-of-total-record-length calculation is based on complete beginning and ending water or calendar years as well as complete intervening years. Therefore, the fraction-of-total-record-length numbers may be different for water years when compared to calendar years.

[c]Indicators of Hydrologic Alteration (IHA) analysis was performed for these parameters. Periods of record for IHA analyses shown in figure E4 (water level). IHA analysis was only done for station-parameter combinations with a minimum of 10 complete water years of record.

[d]Negative parameter values set to zero for the IHA analysis—parameter distributions censored at zero and IHA results given for the positive portion of the distribution because the IHA software will not analyze negative values.

Table E–3*A*. Database Microsoft Accesss and Microsoct Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for Okefenokee National Wildlife Refuge and Okefenokee Wilderness Area, contributing watersheds, and vicinity, Florida and Georgia.

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
		Raw data[b]
okf_tabular_hydrostats_raw.accdb	okf001_dv	Raw data—mean-daily values for gage height, discharge, tidally filtered discharge, stream velocity, water level, depth to water level, and water temperature; minimum-daily and maximum-daily values for gage height, tidally filtered gage height, discharge, and depth to water level; maximum-daily values for water level; unit values for water level and water temperature; sum-daily values for precipitation; for gaging stations and(or) observation wells in the contributing watersheds and vicinity of Okefenokee NWR and Okefenokee Wilderness Area
	okf001_pk	USGS peak-value data for gage height and discharge
		Descriptive statistics, spread measures, and ratio measures[b]
okf_tabular_hydrostats01c.accdb	okf[***var***]01c_usgs	Daily values for parameter ***var***, calendar-year reference period
okf_tabular_hydrostats01w.accdb	okf[***var***]01w_usgs	Daily values for parameter ***var***, water-year reference period
okf_tabular_hydrostats02.accdb	okfpkst02	Peak-value statistics for gage height and discharge
	okf[***var***]cy02	Calendar-year statistics for daily values for parameter ***var***
	okf[***var***]cd02	Calendar-decade statistics for daily values for parameter ***var***
	okf[***var***]cym02	Calendar-year-month statistics for daily values for parameter ***var***
	okf[***var***]wy02	Water-year statistics for daily values for parameter ***var***
	okf[***var***]mo02	Period-of-record monthly statistics, based on daily values, for parameter ***var***, complete calendar years
	okf[***var***]mom02	Period-of-record monthly statistics, based on annual monthly means of daily values, for parameter ***var***, complete calendar years
	okf[***var***]jc02	Period-of-record calendar-year-julian-day statistics, based on daily values, for parameter ***var***, complete calendar years
	okf[***var***]jw02	Period-of-record water-year-julian-day statistics, based on daily values, for parameter ***var***, complete water years
		IHA metrics[c]
regional_iha_***var***_okf.xlsx[d]	1_day_min	Minimum 1-day mean of mean-daily values
	3_day_min	Minimum 3-day mean of mean-daily values
	7_day_min	Minimum 7-day mean of mean-daily values
	30_day_min	Minimum 30-day mean of mean-daily values
	90_day_min	Minimum 90-day mean of mean-daily values
	1_day_max	Maximum 1-day mean of mean-daily values
	3_day_max	Maximum 3-day mean of mean-daily values
	7_day_max	Maximum 7-day mean of mean-daily values
	30_day_max	Maximum 30-day mean of mean-daily values
	90_day_max	Maximum 90-day mean of mean-daily values
	baseflow	Baseflow index: 7-day mean minimum discharge / mean-annual discharge
	[***var***]7525s	75th–25th percentile spread measure for mean-daily values

Table E–3*A*. Database Microsoft Accesss and Microsoct Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for Okefenokee National Wildlife Refuge and Okefenokee Wilderness Area, contributing watersheds, and vicinity, Florida and Georgia.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
	IHA metrics[c]—Continued	
regional_iha_***var***_okf.xlsx[d]—Continued	summary	IHA period-of-record summary data for IHA parameter groups and environmental-flow components: summary data include the 10th, 25th, 50th, 75th, and 90th percentiles and the 75th–25th percentile spread measure
	02228500	Complete IHA analysis for USGS 02228500, N Prong St Marys R at Moniac, GA (gage height, discharge)
	02229000	Complete IHA analysis for USGS 02229000, Middle Prong St Marys R at Taylor, GA (gage height, discharge)
	02230000	Complete IHA analysis for USGS 02230000, Turkey Cr at MacClenny, FL (gage height, discharge)
	02230500	Complete IHA analysis for USGS 02230500, S Prong St Marys at Glen St Mary, FL (gage height, discharge)
	02231000	Complete IHA analysis for USGS 02231000, St Marys R nr MacClenny, FL (gage height, discharge)
	02231253	Complete IHA analysis for USGS 02231253, St Marys R nr Gross, FL (tidally filtered gage height, discharge)
	02314500	Complete IHA analysis for USGS 02314500, Suwannee R (US 441) at Fargo, GA (discharge)
	02315000	Complete IHA analysis for USGS 02315000, Suwannee R nr Benton, FL (gage height, discharge)
	02315500	Complete IHA analysis for USGS 02315500, Suwannee R at White Springs, FL (gage height, discharge, water level)
	02315550	Complete IHA analysis for USGS 02315550, Suwannee R at Suwannee Springs, FL (gage height, discharge)
	302416081522601	Complete IHA analysis for USGS 302416081522601, D-348 Monticello Drug Co well at Jacksonville, FL (water level)
	302416081522602	Complete IHA analysis for USGS 302416081522602, D-349 Monticello Drug Co well at Jacksonville, FL (water level)
	304313081330001	Complete IHA analysis for USGS 304313081330001, 33D069 (depth to water level)
	304942082213801	Complete IHA analysis for USGS 304942082213801, 27E004 (depth to water level)
	310706082155101	Complete IHA analysis for USGS 310706082155101, 27G003 (depth to water level)
s***SSSSSSSS***_iha_[***var***].xlsx	ann	Water-year annual values for all IHA parameter groups and EFC groups, for parameter ***var***, gaging station ***SSSSSSSS*** (parameter definitions given in table E4)
	sco	IHA scorecard: period-of-record summary data, median values and coefficients of dispersion for IHA parameter groups and EFC groups, for parameter ***var***, gaging station ***SSSSSSSS***

Table E–3*A*. Database Microsoft Accesss and Microsoct Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for Okefenokee National Wildlife Refuge and Okefenokee Wilderness Area, contributing watersheds, and vicinity, Florida and Georgia.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
	IHA metrics[c]—Continued	
s***SSSSSSSS***_iha_[***var***].xlsx—Continued	lsq	Linear-regression models for IHA parameter groups and EFC groups with water year, for parameter ***var***, gaging station ***SSSSSSSS***
	pct	IHA period-of-record summary data for IHA parameter groups and EFC groups: summary data include the 10th, 25th, 50th, 75th, and 90th percentiles and the 75th-25th percentile spread measure, for parameter ***var***, gaging station ***SSSSSSSS***
	daily_efcs	Daily values coded with IHA EFC groups, period of record, for parameter ***var***, gaging station ***SSSSSSSS***
	fdc	IHA flow-duration-curve table with data values and exceedence probabilities for the water-year period and for each month, for parameter ***var***, gaging station ***SSSSSSSS***
	msg	IHA conditional information messages concerning data quality as related to the IHA analysis, for parameter ***var***, gaging station ***SSSSSSSS***
	Geospatial data summaries	
okf_nlcd.xlsx	okf_nlcd92_h0812rfg_pct	Land-cover percentages for 12-digit and 10-digit hydrologic units, St Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units (contributing-watershed area and vicinity for Okefenokee NWR and Okefenokee Wilderness Area), and refuge acquisition areas, based on 1992 NLCD level 2 categories (Vogelmann and others, 2001)
	okf_nlcd01_h0812rfg_pct	Land-cover percentages for 12-digit and 10-digit hydrologic units, St Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units (contributing-watershed area and vicinity for Okefenokee NWR and Okefenokee Wilderness Area), and refuge acquisition areas, based on 2001 NLCD level 2 categories (Homer and others, 2007)
	okf_lcc9201_h0812rfg_pct	Land-cover-change percentages for 12-digit and 10-digit hydrologic units, St Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units (contributing-watershed area and vicinity for Okefenokee NWR and Okefenokee Wilderness Area), and refuge acquisition areas, based on 1992-2001 NLCD-LCCR Anderson level 1 categories (Multi-Resolution Land Characteristics Consortium (Fry and others, 2009; Anderson and others, 1976)
okf_sgo_hsg.xlsx	okf_sgo_hsg_pct	STATSGO database HSGs A through D and mixed percentages for 10-digit hydrologic units, St Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units (contributing-watershed area and vicinity for Okefenokee NWR and Okefenokee Wilderness Area), and refuge acquisition areas (U.S. Department of Agriculture, 1994, 2009; Wolock, 1997)

Table E–3*A*. Database Microsoft Accesss and Microsoct Excel file names, table/worksheet names, and table/worksheet descriptions for the hydrologic and landscape database for Okefenokee National Wildlife Refuge and Okefenokee Wilderness Area, contributing watersheds, and vicinity, Florida and Georgia.—Continued

[Files include raw data, descriptive statistics, IHA metrics, and geospatial data summaries. Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Abbreviations: EFC, environmental-flow component; EPA, U.S. Environmental Protection Agency; HSG, hydrologic soil group; IHA, Indicators of Hydrologic Alteration; NLCD, National Land Cover Database; NLCD-LCCR National Land Cover Database-Land Cover Change Retrofit product; NWR, National Wildlife Refuge; STATSGO, State Soil Geographic [Database]; USGS, U.S. Geological Survey]

File name[a]	Table/worksheet name[a]	Table/worksheet description[a]
Geospatial data summaries—Continued		
okf_eco34.xlsx	okf_eco4huc_12_pct	EPA Level IV ecoregion percentages for 12-digit hydrologic units, St Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units (contributing-watershed area and vicinity for Okefenokee NWR and Okefenokee Wilderness Area) (U.S. Environmental Protection Agency, 2011)
	okf_eco3huc_12_pct	EPA Level III ecoregion percentages for 12-digit hydrologic units, St Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units (contributing-watershed area and vicinity for Okefenokee NWR and Okefenokee Wilderness Area) (U.S. Environmental Protection Agency, 2011)
	okf_eco4huc_10_pct	EPA Level IV ecoregion percentages for 10-digit hydrologic units, St Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units (contributing-watershed area and vicinity for Okefenokee NWR and Okefenokee Wilderness Area) (U.S. Environmental Protection Agency, 2011)
	okf_eco3huc_10_pct	EPA Level III ecoregion percentages for 10-digit hydrologic units, St Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units (contributing-watershed area and vicinity for Okefenokee NWR and Okefenokee Wilderness Area) (U.S. Environmental Protection Agency, 2011)
	okf_eco4huc_08_pct	EPA Level IV ecoregion percentages for St Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units (contributing-watershed area and vicinity for Okefenokee NWR and Okefenokee Wilderness Area) (U.S. Environmental Protection Agency, 2011)
	okf_eco3huc_08_pct	EPA Level III ecoregion percentages for St Marys (03070204) and Upper Suwannee (03110201) hydrologic cataloging units (contributing-watershed area and vicinity for Okefenokee NWR and Okefenokee Wilderness Area) (U.S. Environmental Protection Agency, 2011)
okf_pop_census.xlsx	tblOkfPop01	U.S. Census Bureau county-level population data, 1930–2010 (U.S. Census Bureau, 2011)
	pop_pct_chg	Descriptive statistics for percent population change, 1930–1970, and 1970–2010

[a]In the file/table/worksheet name, ***var*** refers to the hydrologic parameter, where ***var=dwlmi, dwlmn, dwlmx***—depth to water level, in feet below land surface; ***gmn***—gage height, in feet; ***gtdhh***, gtdll—tidally filtered gage height, in feet; ***pcpsm***—precipitation, in inches; ***qmi, qmn, qmn_eq, qmx***—discharge, in cubic feet per second; ***qtdhh, qtdll***—tidally filtered discharge, in cubic feet per second; ***tmn, tuv***—water temperature, in degrees Fahrenheit, Celsius; ***vmn***—stream velocity, in feet per second; ***wl29mn, wl29mx, wl29uv, wl88mn***—water level, in feet. Parameter short names include the daily-values statistic: mn, mean daily value; mi, minimum daily value; mx, maximum daily value; mn_eq, equivalent mean-daily value; hh, tidal high-high daily value; ll, tidal low-low daily value; sm, sum-daily value; uv, unit value.

[b]Field names, field types, and field definitions given in table E3*B*.

[c]IHA parameter-groups, EFC groups, EFCs, and parameter definitions listed in table E4 (Richter and others, 1996; The Nature Conservancy, 2009).

[d]IHA regional analysis done for gaging stations and parameters indicated in table E2*B*. Gaging-station information presented in tables E2*A* and E2*B*.

Table E–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Okefenokee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Specified period of analysis: por, period of record, cy, calendar year, wy, water year; hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft/s, foot per second; ft, foot; in, inch; mi^2, square mile]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Raw data[c]	
ag_dt	okf001_pk	Date/time	Date of maximum gage-height for water year (if not concurrent with peak)
ag_tm	okf001_pk	Date/time	Time of maximum gage-height for water year (if not concurrent with peak)
ag_gage_ht	okf001_pk	Double precision	Maximum gage height for water year in feet (if not concurrent with peak)
ag_gage_ht_cd	okf001_pk	Double precision	Maximum gage height code
agency_cd	okf001_[dv, pk]	Text	USGS collecting-agency code
datetime	okf001_[dv, pk]	Date/time	Calendar date of daily value
datetime_c	okf001_[dv, pk]	Text	Calendar date of daily value, character date
disch_eqmn	okf001_dv	Double precision	Equivalent mean-daily discharge, in ft^3/s
disch_eqmn_cd	okf001_dv	Text	Equivalent mean-daily discharge, data-value qualification code[d]
disch_mi	okf001_dv	Double precision	Minimum-daily discharge, in ft^3/s
disch_mi_cd	okf001_dv	Text	Minimum-daily discharge, data-value qualification code[d]
disch_mn	okf001_dv	Double precision	Mean-daily discharge, in ft^3/s
disch_mn_cd	okf001_dv	Text	Mean-daily discharge, data-value qualification code[d]
disch_mx	okf001_dv	Double precision	Maximum-daily discharge, in ft^3/s
disch_mx_cd	okf001_dv	Text	Maximum-daily discharge, data-value qualification code[d]
disch_tdhh	okf001_dv	Double precision	Tidally filtered high-high daily discharge, in ft^3/s
disch_tdhh_cd	okf001_dv	Text	Tidally filtered high-high daily discharge, data-value qualification code[d]
disch_tdll	okf001_dv	Double precision	Tidally filtered low-low daily discharge, in ft^3/s
disch_tdll_cd	okf001_dv	Text	Tidally filtered low-low daily discharge, data-value qualification code[d]
dpwl_mi	okf001_dv	Double precision	Minimum-daily depth to water level, in ft below land surface
dpwl_mi_cd	okf001_dv	Text	Minimum-daily depth to water level, data-value qualification code[d]
dpwl_mn	okf001_dv	Double precision	Mean-daily depth to water level, in ft below land surface
dpwl_mn_cd	okf001_dv	Text	Mean-daily depth to water level, data-value qualification code[d]
dpwl_mx	okf001_dv	Double precision	Maximum-daily depth to water level, in ft below land surface
dpwl_mx_cd	okf001_dv	Text	Maximum-daily depth to water level, data-value qualification code[d]
gage_ht	okf001_pk	Double precision	Gage height for the associated peak streamflow, in ft
gage_ht_cd	okf001_pk	Text	Gage height qualification code
ght_mn	okf001_dv	Double precision	Mean-daily gage height, in ft
ght_mn_cd	okf001_dv	Text	Mean-daily gage height, data-value qualification code[d]
ght_tdhh	okf001_dv	Double precision	Tidally filtered high-high daily gage height, in ft
ght_tdhh_cd	okf001_dv	Text	Tidally filtered high-high daily gage height, data-value qualification code[d]
ght_tdll	okf001_dv	Double precision	Tidally filtered low-low daily gage height, in ft

Table E–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Okefenokee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Specified period of analysis: por, period of record, cy, calendar year, wy, water year; hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft/s, foot per second; ft, foot; in, inch; mi^2, square mile]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Raw data[c]—Continued	
ght_tdll_cd	okf001_dv	Text	Tidally filtered low-low daily gage height, data-value qualification code[d]
peak_dt	okf001_pk	Date/time	Date of peak streamflow
peak_tm	okf001_pk	Date/time	Time of peak streamflow
peak_va	okf001_pk	Double precision	Annual peak streamflow value, in ft^3/s
peak_cd	okf001_pk	Text	Peak discharge-qualification code
pcp_sm	okf001_dv	Double precision	Sum-daily precipitation, in inches
pcp_sm_cd	okf001_dv	Text	Sum-daily precipitation, data-value qualification code[d]
site_no	okf001_[dv, pk]	Text	USGS station identification number
vel_mn	okf001_dv	Double precision	Mean-daily stream velocity, in ft/s
vel_mn_cd	okf001_dv	Text	Mean-daily stream velocity, data-value qualification code[d]
wlelev29_mn	okf001_dv	Double precision	Mean-daily water level, in ft, referenced to NGVD 29
wlelev29_mn_cd	okf001_dv	Text	Mean-daily water level, data-value qualification code[d]
wlelev29_mx	okf001_dv	Double precision	Maximum-daily water level, in ft, referenced to NGVD 29
wlelev29_mx_cd	okf001_dv	Text	Maximum-daily water level, data-value qualification code[d]
wlelev29_uv	okf001_dv	Double precision	Unit-value water level, in ft, referenced to NGVD 29
wlelev29_uv_cd	okf001_dv	Text	Unit-value water level, data-value qualification code[d]
wlelev88_mn	okf001_dv	Double precision	Mean-daily water level, in ft, referenced to NAVD 88
wlelev88_mn_cd	okf001_dv	Text	Mean-daily water level, data-value qualification code[d]
wtemp_fh_mn	okf001_dv	Double precision	Mean-daily water temperature, in °F
wtemp_fh_mn_cd	okf001_dv	Text	Mean-daily water temperature, data-value qualification code[d]
wtemp_uv	okf001_dv	Double precision	Unit-value water temperature, in °C
wtemp_uv_cd	okf001_dv	Text	Unit-value water temperature, data-value qualification code[d]
year_last_pk	okf001_pk	Date/time	Peak streamflow reported is the highest since this year
		Descriptive statistics, spread measures, ratio measures[e]	
[***var***]	okf[***var***]01[c,w]	Double precision	Daily value for parameter ***var***
[***var***]_10	all tables (-okf[***var***]01[c,w])	Double precision	10th percentile of daily values, parameter ***var***
[***var***]_20	all tables (-okf[***var***]01[c,w])	Double precision	20th percentile of daily values, parameter ***var***
[***var***]_25	all tables (-okf[***var***]01[c,w])	Double precision	25th percentile of daily values, parameter ***var***
[***var***]_50	all tables (-okf[***var***]01[c,w])	Double precision	50th percentile (median) of daily values, parameter ***var***
[***var***]_75	all tables (-okf[***var***]01[c,w])	Double precision	75th percentile of daily values, parameter ***var***
[***var***]_80	all tables (-okf[***var***]01[c,w])	Double precision	80th percentile of daily values, parameter ***var***
[***var***]_90	all tables (-okf[***var***]01[c,w])	Double precision	90th percentile of daily values, parameter ***var***
[***var***]_cd	okf[***var***]01[c,w]	Double precision	Daily value for parameter ***var***, data-value qualification code[d]
[***var***]_cdf	okf[***var***]cd02	Double precision	Calendar-decade fraction represented by daily values, parameter ***var***
[***var***]_cmf	okf[***var***]cym02	Double precision	Calendar-month fraction represented by daily values, parameter ***var***

Table E–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Okefenokee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Specified period of analysis: por, period of record, cy, calendar year, wy, water year; hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft/s, foot per second; ft, foot; in, inch; mi^2, square mile]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Descriptive statistics, spread measures, ratio measures[e]—Continued			
[***var***]_cv	all tables (-okf[***var***]01[c,w])	Double precision	Coefficient of variation of daily values, parameter ***var***
[***var***]_cy_n	okf[***var***]mo02	Double precision	Number of complete calendar years in the long-term monthly record for parameter ***var***
[***var***]_cyf	okf[***var***]cy02; okf[***var***]cym02	Double precision	Calendar-year fraction represented by daily values, parameter ***var***
[***var***]_mi	all tables (-okf[***var***]01[c,w])	Double precision	Minimum of daily values, parameter ***var***
[***var***]_mn	all tables (-okf[***var***]01[c,w])	Double precision	Mean of daily values, parameter ***var***
[***var***]_mx	all tables (-okf[***var***]01[c,w])	Double precision	Maximum of daily values, parameter ***var***
[***var***]_n	all tables (-okf[***var***]01[c,w])	Long integer	Number of daily values, parameter ***var***
[***var***]_nm	all tables (-okf[***var***]01[c,w])	Long integer	Number of missing values of daily values, parameter ***var***
[***var***]_ny	okf[***var***]cd02	Double precision	Number of calendar years in each calendar decade, including fractional years, represented by daily values, parameter ***var***
[***var***]_sd	all tables (-okf[***var***]01[c,w])	Double precision	Standard deviation of daily values, parameter ***var***
[***var***]_va	all tables (-okf[***var***]01[c,w])	Double precision	Variance of daily values, parameter ***var***
[***var***]_wyf	okf[***var***]wy02	Double precision	Water-year fraction represented by daily values, parameter ***var***
[***var***]7525r	all tables (-okf[***var***]01[c,w])	Double precision	75th–25th percentile ratio measure of daily values, parameter ***var***: p75/p25
[***var***]7525s	all tables (-okf[***var***]01[c,w])	Double precision	75th–25th percentile spread measure of daily values, parameter ***var***: (p75–p25)/p50
[***var***]8020r	all tables (-okf[***var***]01[c,w])	Double precision	80th–20th percentile ratio measure of daily values, parameter ***var***: p80/p20
[***var***]8020s	all tables (-okf[***var***]01[c,w])	Double precision	80th–20th percentile spread measure of daily values, parameter ***var***: (p80–p20)/p50
[***var***]9010r	all tables (-okf[***var***]01[c,w])	Double precision	90th–10th percentile ratio measure of daily values, parameter ***var***: p90/p10
[***var***]9010s	all tables (-okf[***var***]01[c,w])	Double precision	90th–10th percentile spread measure of daily values, parameter ***var***: (p90–p10)/p50
agency_cd	okf[***var***]01[c,w]	Text	Agency code
cdate	okf[***var***]01[c,w]	Text	Character date, ***yyyymmdd*** format, added to preserve pre-1900 dates in Microsoft Excel files
cdt_bnd_mi	okf[***var***]01[c,w]	Date/time	Calendar-year minimum-date boundary, January 1 of the first calendar year of record, ***mm/dd/yyyy*** format
cdt_bnd_mx	okf[***var***]01[c,w]	Date/time	Calendar-year maximum-date boundary, December 31 of the last calendar year of record, ***mm/dd/yyyy*** format
cnty	okf[***var***]01[c,w]	Text	FIPS county code
da	all tables (-okfpkst02)	Double precision	Drainage area of gaged watershed, in mi^2
date	okf[***var***]01[c,w]	Date/time	Date, ***mm/dd/yyyy*** format
date_mi	okf[***var***]01[c,w]	Date/time	Date of first daily value, ***mm/dd/yyyy*** format
date_mx	okf[***var***]01[c,w]	Date/time	Date of last daily value, ***mm/dd/yyyy*** format
day	okf[***var***]01[c,w]	Long integer	Calendar day

Table E–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Okefenokee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Specified period of analysis: por, period of record, cy, calendar year, wy, water year; hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft/s, foot per second; ft, foot; in, inch; mi^2, square mile]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
	Descriptive statistics, spread measures, ratio measures[e]—Continued		
decade	okf[***var***]01[c,w]; okf[***var***]cd02	Long integer	Calendar decade
hole_dp	okf[***var***]01[c,w]	Double precision	Hole depth, in ft
jday_c	okf[***var***]01[c,w]; okf[***var***]jc02	Long integer	Calendar-year Julian day
jday_w	okf[***var***]01[c,w]; okf[***var***]jw02	Long integer	Water-year Julian day
l[***var***]	okf[***var***]01[c,w]	Double precision	Log-10 daily value for parameter ***var***
l[***var***]_cv	all tables (-okf[***var***]01[c,w])	Double precision	Coefficient of variation of every 5th percentile of log-10 parameter ***var***
latdec	okf[***var***]01[c,w]	Double precision	Decimal latitude of gaging station, NAD 83
londec	okf[***var***]01[c,w]	Double precision	Decimal longitude of gaging station, NAD 83
lsalt	okf[***var***]01[c,w]	Double precision	Land-surface altitude of gage, NGVD 29, in ft
month	okf[***var***]01[c,w]; okf[***var***]cym02; okf[***var***]mo02; okf[***var***]mom02	Long integer	Calendar month
month_nd	okf[***var***]mo02	Double precision	Number of days in the calendar month
qmn_y50	all qmn tables (-okfqmn01[c,w])	Double precision	Median discharge yield, in $ft^3/s/mi^2$
qmn_ymn	all qmn tables (-okfqmn01[c,w])	Double precision	Mean discharge yield, in $ft^3/s/mi^2$
sname	okf[***var***]01[c,w]	Text	USGS station name
staid	all tables	Text	USGS station identification number
wdt1_bnd_mi	okf[***var***]01[c,w]	Date/time	Water-year minimum-date boundary, October 1 of the first water year of record, calendar-year minimum minus one when month is January–September, ***mm/dd/yyyy*** format
wdt1_bnd_mx	okf[***var***]01[c,w]	Date/time	Water-year maximum-date boundary, September 30 of the last water year of record, calendar-year minimum when month is January–September, ***mm/dd/yyyy*** format
wdt2_bnd_mi	okf[***var***]01[c,w]	Date/time	Water-year minimum-date boundary, October 1 of the first water year of record, calendar-year minimum when month is October–December, ***mm/dd/yyyy*** format
wdt2_bnd_mx	okf[***var***]01[c,w]	Date/time	Water-year maximum-date boundary, September 30 of the last water year of record, calendar-year minimum plus one when month is October–December, ***mm/dd/yyyy*** format
well_dp	okf[***var***]01[c,w]	Double precision	Well depth, in ft
wyear	okf[***var***]01[c,w]; okf[***var***]wy02	Long integer	Water year
year	okf[***var***]01[c,w]; okf[***var***]cy02; okf[***var***]cym02	Long integer	Calendar year
	Geospatial data summaries[f]		
AREA	tblOkfPop01	Double precision	County area, in m^2
CNTYNAME	tblOkfPop01	Text	County name
okf_statecty	tblOkfPop01	Long integer	Numeric FIPS code

Table E–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Okefenokee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Geospatial data summaries[f]—Continued			
hga_pct	okf_sgo_hsg_pct	Double precision	Percentage of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG A[g]
hgb_pct	okf_sgo_hsg_pct	Double precision	Percentage of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG B[g]
hgc_pct	okf_sgo_hsg_pct	Double precision	Percentage of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG C[g]
hgd_pct	okf_sgo_hsg_pct	Double precision	Percentage of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils classified in HSG D[g]
hgm_pct	okf_sgo_hsg_pct	Double precision	Percentage of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, or refuge-acquisition area with soils that have mixed HSG classification[g]
huc_chg_pct	okf_lcc9201_h0812rfg_pct	Double precision	Areal percentage of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
huc08	all tables (-tblOkfPop01, pop_pct_chg)	Text	Hydrologic cataloging unit (8-digit hydrologic unit) code[h]
huc08_l3_pct	okf_eco3huc_08_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level III ecoregion in each hydrologic cataloging unit (8-digit hydrologic unit)
huc08_l4_pct	okf_eco4huc_08_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level IV ecoregion in each hydrologic cataloging unit (8-digit hydrologic unit)
huc08_name	okf_eco[3,4]huc[08,10,12]_pct	Text	Hydrologic cataloging unit (8-digit hydrologic unit) name[h]
huc10	all tables (-okf_eco4huc_08_pct, okf_eco3huc_08_pct, tblOkfPop01, pop_pct_chg)	Text	10-digit hydrologic unit code[h]
huc10_l3_pct	okf_eco3huc_10_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level III ecoregion in each 10-digit hydrologic unit
huc10_l4_pct	okf_eco4huc_10_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level IV ecoregion in each 10-digit hydrologic unit
huc10_name	okf_eco[3,4]huc[10,12]_pct	Text	10-digit hydrologic unit name[h]
huc12	all tables (-okf_eco[3,4]huc_[08,10]_pct, tblOkfPop01, pop_pct_chg, okf_sgo_hsg_pct)	Text	12-digit hydrologic unit code[h]
huc12_l3_pct	okf_eco3huc_12_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level III ecoregion in each 12-digit hydrologic unit

Table E–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Okefenokee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
huc12_l4_pct	okf_eco4huc_12_pct	Double precision	Percentage of indicated U.S. Environmental Protection Agency Level IV ecoregion in each 12-digit hydrologic unit
huc12_name	okf_eco4huc_12_pct, okf_eco3huc_12_pct	Text	12-digit hydrologic unit name[h]
mass_bal	okf_lcc9201_h0812rfg_pct	Double precision	Sum-check for land-cover change net gain/loss percentages
net_1	okf_lcc9201_h0812rfg_pct	Double precision	Net percentage gain or loss of water within the area of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_2	okf_lcc9201_h0812rfg_pct	Double precision	Net percentage gain or loss of urban land within the area of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_3	okf_lcc9201_h0812rfg_pct	Double precision	Net percentage gain or loss of barren land within the area of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_4	okf_lcc9201_h0812rfg_pct	Double precision	Net percentage gain or loss of forest within the area of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_5	okf_lcc9201_h0812rfg_pct	Double precision	Net percentage gain or loss of grassland within the area of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_6	okf_lcc9201_h0812rfg_pct	Double precision	Net percentage gain or loss of agricultural land within the area of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
net_7	okf_lcc9201_h0812rfg_pct	Double precision	Net percentage gain or loss of wetland within the area of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area that changed land-cover classification between 1992 and 2001, based on the 1992 and 2001 NLCDs
nwr	okf_nlcd92_h0812rfg_pct, okf_nlcd01_h0812rfg_pct, okf_lcc9201_h0812rfg_pct, okf_sgo_hsg_pct	Text	U.S. Fish and Wildlife Service National Wildlife Refuge name

Table E–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Okefenokee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Geospatial data summaries[f]—Continued			
pct_11	okf_nlcd92_h0812rfg_pct, okf_nlcd01_h0812rfg_pct	Double precision	Percent open water—all areas of open water, generally with less than 25 percent cover of vegetation or soil (1992, 2001)[i,j]
pct_21	okf_nlcd92_h0812rfg_pct, okf_nlcd01_h0812rfg_pct	Double precision	Percent developed—low-intensity residential (1992)[i]; Developed, open space—includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes (2001)[j]
pct_22	okf_nlcd92_h0812rfg_pct, okf_nlcd01_h0812rfg_pct	Double precision	Percent developed—high-intensity residential (1992)[i]; Developed, low intensity—includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20–49 percent of total cover. These areas most commonly include single-family housing units (2001)[j]
pct_23	okf_nlcd92_h0812rfg_pct, okf_nlcd01_h0812rfg_pct	Double precision	Percent developed—commercial/industrial/transportation (1992)[i]; Developed, medium intensity - includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50–79 percent of the total cover. These areas most commonly include single-family housing units (2001)[j]
pct_24	okf_nlcd01_h0812rfg_pct	Double precision	Developed, high intensity—includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to 100 percent of the total cover (2001)[j]
pct_31	okf_nlcd92_h0812rfg_pct, okf_nlcd01_h0812rfg_pct	Double precision	Barren—bare rock/sand/clay (1992)[i]; Barren land (rock/sand/clay) — barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15 percent of total cover (2001)[j]
pct_32	okf_nlcd92_h0812rfg_pct	Double precision	Barren—quarries/strip mines/gravel pits (1992)[i]; Unconsolidated shore[k]—unconsolidated material such as silt, sand, or gravel that is subject to inundation and redistribution due to the action of water. Characterized by substrates lacking vegetation except for pioneering plants that become established during brief periods when growing conditions are favorable. Erosion and deposition by waves and currents produce a number of landforms representing this class (2001)[j]
pct_33	okf_nlcd92_h0812rfg_pct	Double precision	Barren—transitional (1992)[i]
pct_41	okf_nlcd92_h0812rfg_pct, okf_nlcd01_h0812rfg_pct	Double precision	Vegetated, natural forested upland—deciduous forest (1992)[i]; Deciduous forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change (2001)[j]

Table E–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Okefenokee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

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Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
		Geospatial data summaries[f]—Continued	
pct_42	okf_nlcd92_h0812rfg_pct, okf_nlcd01_h0812rfg_pct	Double precision	Vegetated, natural forested upland—evergreen forest (1992)[i]; Evergreen forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species maintain their leaves all year. Canopy is never without green foliage (2001)[j]
pct_43	okf_nlcd92_h0812rfg_pct, okf_nlcd01_h0812rfg_pct	Double precision	Vegetated, natural forested upland—mixed forest (1992)[i]; Mixed forest—areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. Neither deciduous nor evergreen species are greater than 75 percent of total tree cover (2001)[j]
pct_51	lsr_nlcd92_h0812rfg_pct	Double precision	Shrubland (1992)[i]
pct_52	okf_nlcd01_h0812rfg_pct	Double precision	Shrub/Scrub—Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20 percent of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions (2001)[j]
pct_61	lsr_nlcd92_h0812rfg_pct	Double precision	Orchards/vineyards/other (1992)[i]
pct_71	okf_nlcd92_h0812rfg_pct, okf_nlcd01_h0812rfg_pct	Double precision	Herbaceous upland—grasslands/herbaceous (1992)[i]; Grassland/herbaceous—areas dominated by grammanoid or herbaceous vegetation, generally greater than 80 percent of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing (2001)[j]
pct_81	okf_nlcd92_h0812rfg_pct, okf_nlcd01_h0812rfg_pct	Double precision	Herbaceous planted/cultivated—pasture/hay (1992)[i]; Pasture/hay—areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation (2001)[j]
pct_82	okf_nlcd92_h0812rfg_pct, okf_nlcd01_h0812rfg_pct	Double precision	Herbaceous planted/cultivated—row crops (1992)i; Cultivated crops—areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled (2001)[j]
pct_85	okf_nlcd92_h0812rfg_pct	Double precision	Herbaceous planted/cultivated—urban/recreational grasses (1992)[i]
pct_90	okf_nlcd01_h0812rfg_pct	Double precision	Woody wetlands—areas where forest or shrubland vegetation accounts for greater than 20 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water (2001)[j]
pct_91	okf_nlcd92_h0812rfg_pct	Double precision	Wetlands—woody wetlands (1992)[i]
pct_92	okf_nlcd92_h0812rfg_pct	Double precision	Wetlands—emergent herbaceous wetlands (1992)[i]
pct_95	okf_nlcd01_h0812rfg_pct	Double precision	Emergent herbaceous wetlands—areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water (2001)[j]

Table E–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Okefenokee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Specified period of analysis: por, period of record, cy, calendar year, wy, water year; hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft/s, foot per second; ft, foot; in, inch; mi^2, square mile]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Geospatial data summaries[f]—Continued			
pct_tot	okf_nlcd92_h0812rfg_pct, okf_nlcd01_h0812rfg_pct, okf_sgo_hsg_pct	Double precision	Sum-check for land-cover percentages and percentages of hydrologic soil groups[h,l]
POP010130D	tblOkfPop01	Double precision	Resident population (April 1—complete count) 1930
POP010140D	tblOkfPop01	Double precision	Resident population (April 1—complete count) 1940
POP010150D	tblOkfPop01	Double precision	Resident population (April 1—complete count) 1950
POP010160D	tblOkfPop01	Double precision	Resident population (April 1—complete count) 1960
POP010170D	tblOkfPop01	Double precision	Resident population (April 1—complete count) 1970
POP010180D	tblOkfPop01	Double precision	Resident population (April 1—complete count) 1980
POP010190D	tblOkfPop01	Double precision	Resident population (April 1—complete count) 1990
POP010200D	tblOkfPop01	Double precision	Resident population (April 1—complete count) 2000
POP010210D	tblOkfPop01	Double precision	Resident population (April 1—complete count) 2010
POP020170D	tblOkfPop01	Double precision	Resident population (April 1—revised) 1970
pop3070_neg	pop_pct_chg	Double precision	Descriptive statistics for population decrease, 1930–1970
pop3070_pct	tblOkfPop01	Double precision	Percent change in population, 1930–1970
pop3070_pos	pop_pct_chg	Double precision	Descriptive statistics for population increase, 1930–1970
pop7010_neg	pop_pct_chg	Double precision	Descriptive statistics for population decrease, 1970–2010
pop7010_pct	tblOkfPop01	Double precision	Percent change in population, 1970–2010
pop7010_pos	pop_pct_chg	Double precision	Descriptive statistics for population increase, 1970–2010
ST	tblOkfPop01	Text	Two-letter U.S. Postal Service state code
to_1_pct	okf_lcc9201_h0812rfg_pct	Double precision	Percentage of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to water[m]
to_2_pct	okf_lcc9201_h0812rfg_pct	Double precision	Percentage of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to urban[m]
to_3_pct	okf_lcc9201_h0812rfg_pct	Double precision	Percentage of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to barren[m]
to_4_pct	okf_lcc9201_h0812rfg_pct	Double precision	Percentage of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to forest[m]
to_5_pct	okf_lcc9201_h0812rfg_pct	Double precision	Percentage of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to grassland[m]

Table E–3*B*. Database field names, field types, and field definitions for Microsoft Access and Microsoft Excel raw data, descriptive statistics, and geospatial data summary files for the hydrologic and landscape database for Okefenokee National Wildlife Refuge contributing watersheds and vicinity, Florida and Georgia.—Continued

[Calendar year, January 1 through December 31; water year, October 1, preceding calendar year, through September 30, current calendar year; calendar decade, 10-year period beginning on January 1 of year zero and ending on December 31 of year nine. Percentiles: p90, 90th; p75, 75th; p50, 50th (median); p25, 25th; p10, 10th. Specified period of analysis: por, period of record, cy, calendar year, wy, water year; hydrologic metrics analysis periods: por, period of record; ap, annual period; ip, index period. Abbreviations: FIPS, Federal Information Processing Standards; HSG, hydrologic soil group (U.S. Department of Agriculture, 2009); NAD 83, North American Datum of 1983; NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929; NLCD, National Land Cover Database; USGS, U.S. Geological Survey. Units of measurement: °C, degree Celsius; °F, degree Fahrenheit; ft^3/s, cubic foot per second; ft/s, foot per second; ft, foot; in, inch; mi^2, square mile]

Field name[a]	Table(s)/worksheet(s)[a,b]	Field type	Field definition[a]
Geospatial data summaries[f]—Continued			
to_6_pct	okf_lcc9201_h0812rfg_pct	Double precision	Percentage of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to agriculture[m]
to_7_pct	okf_lcc9201_h0812rfg_pct	Double precision	Percentage of the hydrologic cataloging unit (8-digit hydrologic unit), 10-digit hydrologic unit, 12-digit hydrologic unit, or refuge-acquisition area reclassified in the 2001 NLCD that was converted to wetland[m]
to_tot_pct	okf_lcc9201_h0812rfg_pct	Double precision	Sum-check for land-cover change percentages
us_l3code	okf_eco3huc_[08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level III ecoregion code[n]
us_l3name	okf_eco3huc_[08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level III ecoregion name[n]
us_l4code	okf_eco[3,4]huc_[08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level IV ecoregion code[n]
us_l4name	okf_eco[3,4]huc_[08,10,12]_pct	Double precision	U.S. Environmental Protection Agency Level IV ecoregion name[n]

[a]In the file/table/worksheet name, ***var*** refers to the hydrologic parameter, where ***var***=dwlmi, dwlmn, dwlmx—depth to water level, in feet below land surface; gmn—gage height, in feet; gtdhh, gtdll—tidally filtered gage height, in feet; pcpsm—precipitation, in inches; qmi, qmn, qmx—discharge, in cubic feet per second; qtdhh, qtdll—tidally filtered discharge, in cubic feet per second; tmn, tuv—water temperature, in degrees Fahrenheit, Celsius; wl29mn, wl29mx, wl29uv, wl88mn—water level, in feet. Parameter short names include the daily-values statistic: mn, mean daily value; mi, minimum daily value; mx, maximum daily value; mn_eq, equivalent mean-daily value; hh, tidal high-high daily value; ll, tidal low-low daily value; sm, sum-daily value; uv, unit value.

[b]Arguments enclosed in square brackets in table/worksheet names represent separate tables/worksheets. For example, okf[***var***]01 refers to 2 tables/worksheets—okfgmn1 and okfqmn1, if ***var***=gmn, qmn. "All tables" with one or more table/worksheet names in parentheses indicates that the table/worksheet reference(s) in parentheses is(are) excluded for the listed field. Tables refer to Microsoft Access files, worksheets refer to Microsoft Excel files.

[c]Raw-data file: okf_tabular_hydrostats_raw.accdb (Microsoft Access).

[d]Data-value qualification codes, USGS NWISWeb database (U.S. Geological Survey, 2002, 2011): Eqp—equipment malfunction, A—approved for publication-processing and review completed, P—provisional data subject to revision, 1—daily value is write-protected without any remark code to be printed, e—value has been estimated.

[e]Descriptive-statistics, spread-measures, and ratio-measures file: okf_tabular_hydrostats.accdb (Microsoft Access).

[f]Geospatial data summaries files: okf_nlcd.xlsx, okf_sgo_hsg.xlsx, okf_eco34.xlsx, okf_pop_census.xlsx (Microsoft Excel).

[g]U.S. Department of Agriculture, 2009, 2011.

[h]Seaber and others, 1994; U. S. Geological Survey and U. S. Department of Agriculture, Natural Resources Conservation Service, 2013.

[i]Vogelmann and others, 2001.

[j]Homer and others, 2007.

[k]Coastal NLCD class only.

[l]Percentages of hydrologic soil groups A through D in 4-digit and 8-digit hydrologic units do not necessarily add up to 100 percent because, in some cases, there are STATSGO soil map-unit classifications that include multiple hydrologic soil groups (U.S. Department of Agriculture, 2009). Data for multiple-group map units are not included in the analysis.

[m]Fry and others, 2009.

[n]U.S. Environmental Protection Agency, 2011.

Table E–4*A*. Summary descriptive statistics and percentiles for gage height and water level by water year for gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.

[Stations 02314495, 02314500, 304213081270801, and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929]

USGS station number[a]	River/ aquifer name	Period of record[b]	Mean-annual gage height/ water level,[c] in feet			Mean-daily gage height/water level,[c] in feet		Percentiles of mean-annual gage height/water level and (mean-daily gage height/water level),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Altamaha-St Marys (0307)														
St Marys (03070204)														
Gaging stations														
02228500	N Prong St Marys River	1921–2013 (42)	6.66	5.06 (1956)	8.32 (1970)	3.78 (1954)	22.88 (1973)	5.48 (4.35)	5.61 (4.58)	5.94 (5.09)	6.55 (6.03)	7.34 (7.84)	7.68 (9.70)	7.91 (10.59)
02228500 (stream level, NAVD 88)	N Prong St Marys River	2011–2013 (1)	94.56	94.56 (2012)	94.56 (2012)	92.68 (2012)	106.95 (2012)	— (92.79)	— (92.98)	— (93.22)	— (93.40)	— (95.40)	— (97.87)	— (98.70)
02228700 (lake level, NGVD 29)[e]	Ocean Pond	1976–1994 (1)	154.62	154.62 (1976)	154.62 (1976)	154.20 (1976)	155.18 (1976)	— (154.30)	— (154.35)	— (154.46)	— (154.56)	— (154.82)	— (154.98)	— (155.04)
02229000[e]	M Prong St Marys River	1956–2001 (30)	3.52	1.67 (1962)	5.30 (1966)	0.86 (1963)	13.99 (1964)	1.74 (1.16)	2.14 (1.32)	2.82 (1.68)	3.52 (2.86)	4.15 (4.69)	4.93 (6.92)	5.24 (8.50)
02229250[e]	M Prong St Marys River	1997–2002 (3)	3.13	2.10 (2001)	4.90 (1998)	1.55 (2001)	17.55 (1998)	— (1.62)	— (1.66)	— (1.88)	2.39 (2.11)	— (3.12)	— (6.46)	— (8.86)
02229500[e]	S Prong St Marys River	1955–1961 (1)	1.81	1.81 (1957)	1.81 (1957)	0.74 (1957)	6.01 (1957)	— (0.80)	— (0.82)	— (0.90)	— (1.50)	— (2.56)	— (3.32)	— (3.68)
02230000[e]	Turkey Creek	1955–1969 (12)	2.04	1.25 (1962)	2.61 (1959)	0.61 (1965)	7.10 (1964)	— (0.85)	1.69 (0.96)	1.87 (1.16)	2.05 (1.60)	2.28 (2.56)	2.45 (4.01)	— (4.67)
02230500[e]	S Prong St Marys River	1950–1971 (16)	3.23	1.89 (1962)	4.78 (1970)	1.53 (1970)	13.93 (1964)	— (1.63)	2.02 (1.68)	2.71 (1.82)	3.05 (2.14)	3.89 (4.00)	4.29 (6.86)	— (7.95)
02231000	St Marys River	1927–2012 (66)	4.52	1.45 (1943)	7.73 (1970)	0.04 (1927)	22.90 (1964)	2.20 (1.00)	2.64 (1.24)	3.51 (1.88)	4.43 (3.32)	5.50 (6.17)	6.40 (9.86)	7.00 (11.93)
02231000 (stream level, NAVD 88)	St Marys River	2011–2012 (1)	41.12	41.12 (2011)	41.12 (2011)	40.17 (2011)	49.11 (2011)	— (40.24)	— (40.31)	— (40.55)	— (40.66)	— (41.14)	— (42.24)	— (43.19)
02231250[e]	Little St Marys River	1965–1967 (2)	11.41	11.25 (1967)	11.56 (1966)	9.59 (1967)	14.58 (1967)	— (10.26)	— (10.64)	— (10.92)	11.41 (11.24)	— (11.75)	— (12.49)	— (12.95)
02231253 (tidal low low)[e]	St Marys River	1966–1990 (12)	8.62	8.21 (1968)	8.99 (1983)	5.63 (1971)	13.91 (1970)	— (7.32)	8.28 (7.54)	8.36 (7.95)	8.58 (8.50)	8.91 (9.17)	8.96 (9.91)	— (10.34)
02231253 (tidal high high)[e]	St Marys River	1966–1990 (12)	12.95	12.68 (1968)	13.19 (1983)	10.94 (1971)	14.60 (1970)	— (12.27)	12.70 (12.40)	12.74 (12.66)	13.00 (12.94)	13.12 (13.23)	13.18 (13.52)	— (13.67)
02231254 (tidal low low)	St Marys River	2010–2013 (1)	–2.56	–2.56 (2012)	–2.56 (2012)	–4.60 (2012)	0.71 (2012)	— (–3.84)	— (–3.60)	— (–3.20)	— (–2.69)	— (–2.10)	— (–1.33)	— (–0.79)
02231254 (tidal high high)	St Marys River	2010–2013 (1)	2.32	2.32 (2012)	2.32 (2012)	0.44 (2012)	4.18 (2012)	— (1.43)	— (1.64)	— (1.98)	— (2.32)	— (2.67)	— (2.97)	— (3.16)

Table E–4*A*. Summary descriptive statistics and percentiles for gage height and water level by water year for gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 02314495, 02314500, 304213081270801, and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929]

USGS station number[a]	River/ aquifer name	Period of record[b]	Mean-annual gage height/ water level,[c] in feet			Mean-daily gage height/water level,[c] in feet		Percentiles of mean-annual gage height/water level and (mean-daily gage height/water level),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Altamaha-St Marys (0307)—Continued														
St Marys (03070204)—Continued														
Observation wells														
300747082225801[e]	Not designated	1977–1979 (1)	95.78	95.78 (1978)	95.78 (1978)	93.58 (1978)	98.21 (1978)	— (93.93)	— (94.10)	— (94.65)	— (95.53)	— (96.90)	— (97.93)	— (98.03)
300747082225801 (minimum)[e]	Not designated	1959–1983 (7)	96.31	95.07 (1980)	97.64 (1981)	92.62 (1980)	99.45 (1981)	— (93.87)	— (94.31)	95.67 (95.46)	96.07 (96.35)	97.49 (97.11)	— (98.16)	— (98.93)
300747082225801 (maximum)[e]	Not designated	1977–1979 (1)	95.84	95.84 (1978)	95.84 (1978)	93.64 (1978)	98.24 (1978)	— (93.99)	— (94.17)	— (94.70)	— (95.60)	— (96.97)	— (97.99)	— (98.07)
300747082225801 (water level, maximum, NGVD 29)	Not designated	1959–1982 (7)	56.44	55.11 (1981)	57.68 (1980)	53.30 (1981)	60.13 (1980)	— (53.82)	— (54.59)	55.26 (55.64)	56.68 (56.40)	57.08 (57.29)	— (58.44)	— (58.88)
301423082261185 (water level, unit value, NGVD 29)[e]	Floridan	1960–1995 (1)	54.24	54.24 (1989)	54.24 (1989)	53.06 (1989)	56.19 (1989)	— (53.16)	— (53.21)	— (53.36)	— (54.15)	— (55.00)	— (55.50)	— (55.84)
302251082194901[e]	Floridan	1976–1979 (1)	74.90	74.90 (1978)	74.90 (1978)	71.94 (1978)	77.24 (1978)	— (72.49)	— (72.96)	— (73.39)	— (75.32)	— (75.82)	— (77.06)	— (77.13)
302251082194901 (minimum)[e]	Floridan	1976–1982 (3)	76.16	74.88 (1978)	77.43 (1981)	71.89 (1978)	79.41 (1981)	— (73.18)	— (73.87)	— (75.51)	76.17 (76.16)	— (76.96)	— (78.33)	— (79.07)
302251082194901 (water level, maximum, NGVD 29)[e]	Floridan	1976–1984 (6)	51.92	50.36 (1981)	53.00 (1980)	48.36 (1981)	56.00 (1980)	— (48.85)	— (49.75)	50.77 (50.90)	52.24 (51.84)	52.91 (52.49)	— (54.64)	— (55.33)
302251082194902 (minimum)[e]	Intermediate	1976–1982 (2)	9.56	8.78 (1980)	10.33 (1979)	7.68 (1980)	13.73 (1979)	— (7.83)	— (8.08)	— (8.62)	9.56 (8.96)	— (9.83)	— (12.59)	— (13.32)
302251082194902 (water level, maximum, NGVD 29)[e]	Intermediate	1976–1982 (3)	118.03	117.46 (1979)	119.01 (1980)	114.06 (1979)	120.11 (1980)	— (114.76)	— (115.80)	— (117.43)	117.64 (118.48)	— (119.04)	— (119.50)	— (119.84)
302416081522601 (water level, maximum, NGVD 29)	Floridan	1992–2013 (12)	40.25	36.32 (2011)	44.69 (2005)	33.48 (2011)	46.32 (1998)	— (35.64)	37.41 (36.73)	37.99 (38.33)	40.69 (40.02)	42.00 (42.17)	42.47 (44.48)	— (44.94)
302416081522602 (water level, maximum, NGVD 29)[e]	Floridan	1975–2009 (14)	43.51	39.94 (2001)	46.31 (1983)	37.98 (2001)	48.29 (1983)	— (40.04)	41.29 (40.49)	42.60 (42.19)	43.70 (43.71)	44.58 (44.73)	45.36 (46.30)	— (46.94)

Table E–4*A*. Summary descriptive statistics and percentiles for gage height and water level by water year for gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 02314495, 02314500, 304213081270801, and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929]

USGS station number[a]	River/ aquifer name	Period of record[b]	Mean-annual gage height/ water level,[c] in feet			Mean-daily gage height/water level,[c] in feet		Percentiles of mean-annual gage height/water level and (mean-daily gage height/water level),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Altamaha-St Marys (0307)—Continued														
St Marys (03070204)—Continued														
Observation wells—Continued														
304213081270801 (water level, maximum, NGVD 29)[e]	Floridan	1986–2005 (6)	–10.13	–15.93 (1997)	–1.83 (2004)	–21.74 (1997)	8.97 (1992)	— (–18.44)	— (–16.54)	–12.28 (–13.94)	–11.15 (–11.06)	–8.45 (–6.89)	— (–2.07)	— (–0.46)
304313081330001	Floridan	1994–2013 (11)	–10.32	–23.09 (2005)	2.54 (2000)	–26.30 (2006)	7.71 (1999)	— (–23.35)	–21.54 (–22.94)	–20.07 (–19.35)	–17.13 (–15.28)	1.82 (0.30)	2.34 (2.61)	— (4.06)
304406081330502	Upper Brunswick	1998–2013 (8)	1.56	–10.24 (2005)	10.87 (2001)	–10.99 (2005)	11.97 (2000)	— (–10.56)	— (–9.60)	–7.50 (–7.13)	3.04 (7.84)	10.38 (10.27)	— (10.97)	— (11.28)
304406081330503	Surficial	1998–2013 (5)	4.73	2.32 (2004)	6.36 (2002)	1.27 (2004)	7.58 (2002)	— (1.76)	— (1.86)	2.65 (2.43)	6.13 (5.75)	6.20 (6.11)	— (6.91)	— (7.24)
304406081330505	Floridan	2003–2013 (2)	–32.20	–32.66 (2012)	–31.74 (2007)	–34.16 (2012)	–29.26 (2007)	— (–33.55)	— (–33.37)	— (–32.99)	–32.20 (–32.34)	— (–31.57)	— (–30.69)	— (–30.29)
304512081343601[e]	Floridan	1994–2009 (7)	–6.81	–16.28 (2005)	4.10 (2000)	–17.47 (2005)	7.64 (1999)	— (–16.63)	— (–16.03)	–13.64 (–14.15)	–9.67 (–8.71)	2.16 (1.25)	— (3.23)	— (5.49)
Suwannee (0311)														
Upper Suwannee (03110201)														
Gaging stations														
02314495	Suwannee River	2000–2013 (7)	6.51	2.53 (2011)	7.93 (2001)	1.64 (2011)	19.79 (2004)	— (2.23)	— (2.60)	6.24 (3.87)	7.09 (7.80)	7.84 (7.84)	— (9.34)	— (11.90)
02314500	Suwannee River	1987–2013 (5)	3.75	1.60 (2002)	9.30 (2005)	0.45 (2001)	18.71 (2005)	— (0.72)	— (0.87)	1.72 (1.24)	2.71 (1.83)	3.42 (5.70)	— (10.01)	— (11.73)
02315000	Suwannee River	1976–2013 (18)	78.79	75.01 (2000)	83.34 (1991)	74.01 (2000)	99.88 (1984)	— (74.41)	75.82 (74.62)	76.86 (75.12)	78.41 (76.62)	80.35 (80.28)	83.11 (86.42)	— (91.32)
02315500	Suwannee River	1906–2013 (53)	55.56	50.49 (1955)	66.75 (1948)	48.75 (1981)	88.54 (1973)	50.71 (49.87)	51.31 (50.16)	52.58 (50.99)	55.00 (52.87)	58.16 (57.47)	60.65 (65.59)	61.92 (71.70)
02315500 (stream level, NGVD 29)[e]	Suwannee River	1906–1993 (44)	56.09	50.49 (1955)	66.75 (1948)	48.75 (1981)	88.54 (1973)	51.31 (49.94)	51.56 (50.29)	53.25 (51.15)	55.51 (53.28)	58.50 (58.43)	61.01 (66.75)	61.92 (72.79)
02315550	Suwannee River	1970–2013 (18)	44.77	40.33 (1981)	49.72 (1973)	37.12 (1979)	78.90 (1973)	— (37.82)	41.37 (38.41)	41.95 (39.88)	44.53 (42.59)	46.91 (47.68)	48.92 (54.96)	— (59.19)

Table E–4*A*. Summary descriptive statistics and percentiles for gage height and water level by water year for gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 02314495, 02314500, 304213081270801, and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929]

USGS station number[a]	River/ aquifer name	Period of record[b]	Mean-annual gage height/ water level,[c] in feet			Mean-daily gage height/water level,[c] in feet		Percentiles of mean-annual gage height/water level and (mean-daily gage height/water level),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Suwannee (0311)—Continued														
Upper Suwannee (03110201)—Continued														
Observation wells														
301307082355001 (minimum)[e]	Floridan	1976–1982 (2)	126.12	124.57 (1980)	127.67 (1979)	117.92 (1980)	129.23 (1979)	— (120.40)	— (122.10)	— (124.94)	126.12 (127.11)	— (127.76)	— (128.56)	— (128.80)
301307082355001 (water level, maximum, NGVD 29)[e]	Floridan	1976–1981 (2)	56.80	55.25 (1979)	58.35 (1980)	53.69 (1979)	65.00 (1980)	— (54.12)	— (54.36)	— (55.16)	56.80 (55.81)	— (57.98)	— (60.82)	— (62.52)
301437082324801 (water level, maximum, NGVD 29)[e]	Floridan	1976–1977 (1)	57.58	57.58 (1977)	57.58 (1977)	54.46 (1977)	63.34 (1977)	— (54.60)	— (54.68)	— (55.48)	— (56.73)	— (60.04)	— (61.37)	— (61.63)
301822082393901 (minimum)[e]	Floridan	1978–1982 (3)	73.65	71.42 (1980)	74.80 (1981)	62.27 (1980)	77.61 (1981)	— (67.92)	— (70.48)	— (72.77)	74.74 (74.39)	— (75.24)	— (76.29)	— (76.90)
301822082393901 (water level, maximum, NGVD 29)[e]	Floridan	1978–1981 (3)	55.66	54.51 (1981)	57.89 (1980)	51.70 (1981)	67.04 (1980)	— (52.41)	— (53.02)	— (54.08)	54.57 (54.92)	— (56.54)	— (58.83)	— (61.39)
302052082312401 (minimum)[e]	Floridan	1976–1982 (3)	75.48	73.98 (1980)	76.64 (1981)	70.06 (1980)	78.75 (1981)	— (71.84)	— (73.69)	— (74.84)	75.81 (75.60)	— (76.41)	— (77.59)	— (78.27)
302052082312401 (water level, maximum, NGVD 29)[e]	Floridan	1976–1981 (3)	52.97	51.81 (1981)	54.47 (1980)	49.70 (1981)	58.39 (1980)	— (50.18)	— (50.86)	— (52.04)	52.64 (52.85)	— (53.61)	— (54.76)	— (56.61)
302052082312402 (minimum)[e]	Interme-diate	1976–1982 (3)	28.29	27.35 (1980)	28.79 (1981)	25.93 (1980)	30.97 (1979)	— (26.41)	— (27.26)	— (27.61)	28.72 (27.98)	— (28.95)	— (30.18)	— (30.55)
302052082312402 (water level, maximum, NGVD 29)[e]	Interme-diate	1976–1981 (3)	100.29	99.79 (1981)	101.23 (1980)	97.61 (1979)	102.65 (1980)	— (98.03)	— (98.40)	— (99.64)	99.86 (100.61)	— (100.97)	— (101.32)	— (102.17)
302052082312485 (water level, unit value, NGVD 29)[e]	Floridan	1982–1994 (3)	53.23	50.14 (1989)	56.99 (1984)	48.71 (1989)	63.66 (1984)	— (48.86)	— (49.15)	— (50.75)	52.56 (52.19)	— (55.35)	— (57.37)	— (60.13)
302243082360201 (minimum)[e]	Floridan	1976–1984 (5)	66.63	65.04 (1978)	68.14 (1981)	58.81 (1978)	70.33 (1981)	— (61.95)	— (63.80)	65.22 (65.73)	67.17 (66.86)	67.60 (68.04)	— (69.60)	— (69.97)
302243082360201 (water level, maximum, NGVD 29)[e]	Floridan	1976–1984 (6)	53.36	51.52 (1981)	55.04 (1977)	49.33 (1981)	61.92 (1977)	— (49.73)	— (50.81)	52.06 (51.75)	53.46 (52.89)	54.62 (54.18)	— (57.28)	— (59.04)

Table E–4*A*. Summary descriptive statistics and percentiles for gage height and water level by water year for gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 02314495, 02314500, 304213081270801, and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929]

USGS station number[a]	River/ aquifer name	Period of record[b]	Mean-annual gage height/ water level,[c] in feet			Mean-daily gage height/water level,[c] in feet		Percentiles of mean-annual gage height/water level and (mean-daily gage height/water level),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Suwannee (0311)—Continued														
Upper Suwannee (03110201)—Continued														
Observation wells—Continued														
302243082360202 (minimum)[e]	Surficial	1976–1982 (3)	2.40	1.98 (1978)	2.73 (1981)	0.80 (1978)	5.15 (1979)	— (0.97)	— (1.04)	— (1.31)	2.50 (2.21)	— (3.29)	— (4.32)	— (4.65)
302243082360202 (water level, maximum, NGVD 29)[e]	Surficial	1976–1981 (3)	117.74	117.41 (1981)	118.16 (1978)	114.99 (1979)	119.34 (1978)	— (115.49)	— (115.82)	— (116.85)	117.64 (117.93)	— (118.83)	— (119.10)	— (119.17)
302334082560201 (minimum)[e]	Floridan	1978–1982 (3)	26.47	24.64 (1980)	27.96 (1981)	11.55 (1980)	30.27 (1981)	— (19.90)	— (22.20)	— (25.19)	26.83 (27.52)	— (28.86)	— (29.85)	— (29.95)
302334082560201 (water level, maximum, NGVD 29)[e]	Floridan	1978–1981 (3)	43.33	41.84 (1981)	45.16 (1980)	39.53 (1981)	58.25 (1980)	— (39.85)	— (39.95)	— (40.94)	42.97 (42.29)	— (44.62)	— (47.60)	— (49.90)
302450082443501 (water level, maximum, NGVD 29)[e]	Surficial	1996–1998 (2)	146.03	145.91 (1998)	146.15 (1997)	144.75 (1998)	147.79 (1998)	— (145.14)	— (145.30)	— (145.67)	146.03 (146.06)	— (146.37)	— (146.63)	— (146.94)
302607082445701 (water level, maximum, NGVD 29)[e]	Surficial	1996–1998 (2)	145.33	145.22 (1998)	145.44 (1997)	143.13 (1998)	148.57 (1998)	— (143.35)	— (143.63)	— (144.18)	145.33 (145.27)	— (146.27)	— (147.37)	— (148.04)
304942082213801	Floridan	1978–2013 (25)	69.55	65.27 (2005)	74.05 (2012)	62.13 (1998)	77.23 (2011)	67.04 (65.07)	67.13 (66.01)	67.85 (67.76)	69.18 (69.26)	70.54 (71.42)	73.26 (73.32)	73.51 (74.50)
304943082213701[e]	Floridan	1974–1975 (2)	65.00	64.93 (1975)	65.06 (1974)	63.27 (1974)	66.33 (1974)	— (63.64)	— (64.02)	— (64.56)	65.00 (65.00)	— (65.60)	— (66.04)	— (66.16)
310706082155101	Floridan	1981–2012 (24)	102.74	98.21 (2005)	107.84 (2012)	95.08 (1998)	112.20 (2011)	99.23 (97.50)	99.26 (98.71)	100.47 (100.35)	102.52 (102.51)	105.39 (105.30)	106.68 (107.30)	106.89 (108.39)

[a]Unless indicated in parentheses under the station number, all gage-height and water-level values are mean-daily values (for example, minimum or maximum). Stream and lake gage heights are referenced to gage datum (table E2*A*) unless indicated as referenced to the vertical datum listed in parentheses. For observation wells, water levels are referenced to land-surface altitude (table E2*B*) unless indicated as referenced to the vertical datum listed in parentheses.

[b]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[c]Statistics listed for mean-annual and mean-daily gage height and water level are based on complete water years. Year of minimum and maximum values for mean-annual and mean-daily gage-height and water level shown in parentheses.

[d]Percentiles listed for mean-annual and mean-daily gage height and water level are based on complete water years.

[e]Discontinued site.

Table E–4*B*. Summary descriptive statistics and percentiles for gage height and water level by calendar year for gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.

[Stations 02314495, 02314500, 304213081270801, and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929]

USGS station number[a]	River/ aquifer name	Period of record[b]	Mean-annual gage height/ water level,[c] in feet			Mean-daily gage height/ water level,[c] in feet		Percentiles of mean-annual gage height/water level and (mean-daily gage height/water level),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Altamaha-St Marys (0307)														
St Marys (03070204)														
Gaging stations														
02228500	N Prong St Marys River	1921–2012 (43)	6.62	4.95 (1954)	8.21 (1964)	3.78 (1954)	22.88 (1973)	5.29 (4.32)	5.45 (4.53)	6.11 (5.09)	6.65 (6.00)	7.15 (7.74)	7.83 (9.60)	7.88 (10.53)
02228700 (lake level, NGVD 29)[e]	Ocean Pond	1975–1993 (1)	154.68	154.68 (1976)	154.68 (1976)	154.20 (1976)	155.18 (1976)	— (154.30)	— (154.38)	— (154.50)	— (154.62)	— (154.88)	— (155.00)	— (155.05)
02229000[e]	M Prong St Marys River	1955–2001 (28)	3.55	1.70 (1962)	5.48 (1991)	0.86 (1963)	13.99 (1964)	1.93 (1.15)	2.07 (1.32)	2.84 (1.74)	3.59 (2.92)	4.28 (4.69)	5.13 (6.87)	5.33 (8.50)
02229250[e]	M Prong St Marys River	1997–2002 (3)	3.10	1.88 (2001)	5.03 (1998)	1.53 (2001)	17.55 (1998)	— (1.59)	— (1.62)	— (1.74)	2.40 (2.07)	— (2.86)	— (6.33)	— (9.46)
02229500[e]	S Prong St Marys River	1955–1960 (1)	1.86	1.86 (1957)	1.86 (1957)	0.66 (1957)	6.01 (1957)	— (0.77)	— (0.80)	— (0.88)	— (1.59)	— (2.61)	— (3.35)	— (3.81)
02230000[e]	Turkey Creek	1955–1969 (10)	2.08	1.26 (1962)	2.70 (1959)	0.61 (1965)	7.10 (1964)	— (0.88)	— (0.98)	1.92 (1.17)	2.09 (1.63)	2.40 (2.62)	— (4.15)	— (4.73)
02230500[e]	S Prong St Marys River	1950–1971 (13)	3.16	1.88 (1951)	4.51 (1964)	1.53 (1970)	13.93 (1964)	— (1.62)	1.93 (1.68)	2.38 (1.80)	3.47 (2.11)	3.66 (3.79)	4.30 (6.72)	— (7.94)
02231000	St Marys River	1926–2012 (63)	4.50	1.39 (1943)	7.70 (1964)	0.04 (1927)	22.90 (1964)	2.11 (0.99)	2.46 (1.23)	3.55 (1.85)	4.51 (3.28)	5.45 (6.15)	6.21 (9.90)	6.69 (12.00)
02231000 (stream level, NAVD 88)	St Marys River	2010–2012 (1)	41.17	41.17 (2011)	41.17 (2011)	40.17 (2011)	49.11 (2011)	— (40.24)	— (40.31)	— (40.55)	— (40.80)	— (41.21)	— (42.24)	— (43.19)
02231250[e]	Little St Marys River	1965–1967 (1)	11.57	11.57 (1966)	11.57 (1966)	10.79 (1966)	14.29 (1966)	— (10.83)	— (10.88)	— (11.08)	— (11.36)	— (11.85)	— (12.54)	— (13.21)
02231253 (tidal low low)[e]	St Marys River	1966–1990 (12)	8.56	8.18 (1968)	8.89 (1972)	5.63 (1971)	13.91 (1969)	— (7.32)	8.33 (7.52)	8.41 (7.91)	8.53 (8.43)	8.75 (9.10)	8.89 (9.80)	— (10.26)
02231253 (tidal high high)[e]	St Marys River	1966–1990 (12)	12.93	12.67 (1968)	13.17 (1986)	10.94 (1971)	14.60 (1969)	— (12.26)	12.72 (12.39)	12.79 (12.65)	12.96 (12.92)	13.04 (13.20)	13.10 (13.48)	— (13.64)

Table E–4*B*. Summary descriptive statistics and percentiles for gage height and water level by calendar year for gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 02314495, 02314500, 304213081270801, and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929]

USGS station number[a]	River/ aquifer name	Period of record[b]	Mean-annual gage height/ water level,[c] in feet			Mean-daily gage height/ water level,[c] in feet		Percentiles of mean-annual gage height/water level and (mean-daily gage height/water level),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Altamaha-St Marys (0307)—Continued														
St Marys (03070204)—Continued														
Observation wells														
300747082225801 (minimum)[e]	Not desig-nated	1958–1983 (7)	96.36	95.33 (1980)	98.17 (1981)	92.62 (1980)	99.45 (1981)	— (93.88)	— (94.45)	95.46 (95.61)	96.32 (96.35)	96.70 (97.11)	— (98.16)	— (98.93)
300747082225801 (water level, maximum, NGVD 29)[e]	Not desig-nated	1958–1982 (6)	56.45	54.58 (1981)	57.42 (1980)	53.30 (1981)	60.13 (1980)	— (53.78)	— (54.56)	56.37 (55.72)	56.52 (56.43)	57.29 (57.29)	— (58.47)	— (58.92)
301423082261185 (water level, unit value, NGVD 29)[e]	Floridan	1959–1994 (1)	53.75	53.75 (1989)	53.75 (1989)	53.06 (1989)	55.04 (1989)	— (53.16)	— (53.21)	— (53.35)	— (53.54)	— (54.14)	— (54.64)	— (54.95)
302251082194901[e]	Floridan	1976–1979 (2)	75.06	74.86 (1978)	75.25 (1977)	71.88 (1977)	77.44 (1977)	— (72.22)	— (72.46)	— (73.39)	75.06 (75.43)	— (76.79)	— (77.14)	— (77.23)
302251082194901 (minimum)[e]	Floridan	1976–1982 (3)	75.99	74.85 (1978)	77.92 (1981)	71.84 (1977)	79.41 (1981)	— (72.32)	— (72.64)	— (74.61)	75.21 (76.22)	— (77.20)	— (78.92)	— (79.12)
302251082194901 (maximum)[e]	Floridan	1976–1979 (1)	75.29	75.29 (1977)	75.29 (1977)	71.92 (1977)	77.47 (1977)	— (72.23)	— (72.38)	— (72.90)	— (76.07)	— (77.12)	— (77.26)	— (77.39)
302251082194901 (water level, maximum, NGVD 29)[e]	Floridan	1976–1983 (6)	51.90	49.85 (1981)	52.92 (1978)	48.36 (1981)	56.00 (1980)	— (48.85)	— (49.75)	51.56 (50.90)	52.18 (51.84)	52.70 (52.44)	— (54.60)	— (55.33)
302251082194902 (minimum)[e]	Interme-diate	1976–1982 (1)	9.37	9.37 (1979)	9.37 (1979)	7.74 (1979)	13.69 (1979)	— (8.03)	— (8.50)	— (8.71)	— (8.89)	— (9.67)	— (11.15)	— (12.88)
302251082194902 (water level, maximum, NGVD 29)[e]	Interme-diate	1976–1982 (3)	118.15	117.31 (1981)	118.73 (1980)	114.10 (1979)	120.11 (1980)	— (115.85)	— (116.24)	— (117.43)	118.42 (118.48)	— (119.04)	— (119.50)	— (119.84)
302416081522601 (water level, maximum, NGVD 29)	Floridan	1991–2013 (12)	40.12	35.87 (2011)	44.75 (2005)	33.48 (2011)	46.32 (1998)	— (35.46)	37.61 (36.33)	37.91 (38.15)	40.85 (39.97)	41.63 (42.08)	42.21 (44.48)	— (44.94)
302416081522602 (water level, maximum, NGVD 29)[e]	Floridan	1974–2009 (14)	43.35	40.19 (2001)	45.11 (2003)	37.98 (2001)	47.91 (1986)	— (40.06)	41.13 (40.58)	42.60 (41.98)	43.61 (43.49)	44.59 (44.65)	44.94 (45.97)	— (46.51)

Table E–4*B*. Summary descriptive statistics and percentiles for gage height and water level by calendar year for gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 02314495, 02314500, 304213081270801, and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Calendar year, January 1 through December 31.
Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929]

USGS station number[a]	River/ aquifer name	Period of record[b]	Mean-annual gage height/ water level,[c] in feet			Mean-daily gage height/ water level,[c] in feet		Percentiles of mean-annual gage height/water level and (mean-daily gage height/water level),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Altamaha-St Marys (0307)—Continued														
St Marys (03070204)—Continued														
Observation wells—Continued														
304213081270801 (water level, maximum, NGVD 29)[e]	Floridan	1985–2005 (7)	–10.86	–16.22 (1997)	–2.31 (2004)	–22.83 (1996)	8.97 (1992)	— (–19.58)	— (–18.43)	–15.01 (–14.68)	–12.09 (–11.61)	–8.49 (–7.41)	— (–2.75)	— (–0.70)
304313081330001	Floridan	1994–2013 (10)	–9.84	–23.25 (2005)	3.04 (2000)	–26.30 (2006)	7.71 (1999)	— (–23.43)	— (–23.03)	–19.54 (–18.90)	–10.59 (–14.63)	0.81 (0.47)	— (2.52)	— (4.22)
304406081330502	Upper Bruns-wick	1998–2013 (8)	0.87	–10.63 (2005)	10.93 (2000)	–11.31 (2005)	11.97 (2000)	— (–10.82)	— (–10.41)	–7.86 (–7.71)	0.93 (–0.74)	10.27 (10.24)	— (10.97)	— (11.28)
304406081330503	Surficial	1998–2013 (5)	4.52	2.08 (2003)	6.25 (1999)	1.27 (2004)	7.58 (2002)	— (1.62)	— (1.76)	2.23 (2.17)	5.95 (5.68)	6.10 (6.11)	— (6.91)	— (7.24)
304406081330505	Floridan	2003–2013 (1)	–33.12	–33.12 (2012)	–33.12 (2012)	–35.03 (2012)	–31.28 (2012)	— (–34.65)	— (–34.56)	— (–34.01)	— (–33.12)	— (–32.31)	— (–31.72)	— (–31.48)
304512081343601[e]	Floridan	1993–2008 (10)	–5.07	–16.46 (2005)	3.02 (1999)	–17.47 (2005)	7.64 (1999)	— (–16.45)	— (–15.85)	–13.80 (–13.23)	–1.31 (–2.27)	0.05 (1.35)	— (3.35)	— (4.34)
Suwannee (0311)														
Upper Suwannee (03110201)														
Gaging stations														
02314495	Suwannee River	1999–2013 (8)	6.21	2.54 (2011)	8.73 (2004)	1.64 (2011)	20.13 (2004)	— (2.20)	— (2.38)	4.85 (3.20)	6.46 (6.61)	7.88 (7.82)	— (9.47)	— (12.20)
02314500	Suwannee River	1986–2013 (3)	2.09	1.68 (2000)	2.59 (2001)	0.45 (2001)	7.19 (2001)	— (0.83)	— (0.94)	— (1.24)	2.01 (1.65)	— (2.10)	— (4.49)	— (5.90)
02315000	Suwannee River	1975–2012 (19)	78.77	75.09 (2000)	82.94 (1984)	74.01 (2000)	99.88 (1984)	— (74.35)	75.35 (74.61)	76.71 (75.14)	78.94 (76.87)	80.90 (80.50)	82.16 (86.02)	— (90.66)
02315500	Suwannee River	1906–2012 (49)	55.45	50.92 (1955)	65.27 (1964)	48.75 (1981)	88.54 (1973)	51.06 (49.92)	51.16 (50.25)	52.54 (51.04)	54.75 (52.78)	57.53 (57.14)	60.69 (65.10)	61.77 (71.33)
02315500 (stream level, NGVD 29)[e]	Suwannee River	1906–1993 (41)	55.88	50.92 (1955)	65.27 (1964)	48.75 (1981)	88.54 (1973)	51.16 (49.94)	51.33 (50.31)	53.80 (51.20)	55.20 (53.24)	57.85 (58.04)	60.69 (65.99)	61.77 (71.98)
02315550	Suwannee River	1969–2013 (17)	44.21	38.80 (1989)	49.76 (1973)	37.12 (1978)	78.90 (1973)	— (37.90)	39.85 (38.40)	42.72 (39.48)	43.88 (42.09)	46.36 (46.71)	47.27 (53.77)	— (58.67)

Table E–4*B*. Summary descriptive statistics and percentiles for gage height and water level by calendar year for gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 02314495, 02314500, 304213081270801, and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929]

USGS station number[a]	River/ aquifer name	Period of record[b]	Mean-annual gage height/ water level,[c] in feet			Mean-daily gage height/ water level,[c] in feet		Percentiles of mean-annual gage height/water level and (mean-daily gage height/water level),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Suwannee (0311)—Continued														
Upper Suwannee (03110201)—Continued														
Observation wells														
301307082355001 (minimum)[e]	Floridan	1976–1981 (1)	127.33	127.33 (1979)	127.33 (1979)	122.84 (1979)	129.23 (1979)	— (125.09)	— (125.97)	— (126.95)	— (127.51)	— (127.85)	— (128.78)	— (128.92)
301307082355001 (water level, maximum, NGVD 29)[e]	Floridan	1976–1981 (1)	55.59	55.59 (1979)	55.59 (1979)	53.69 (1979)	60.08 (1979)	— (54.00)	— (54.14)	— (55.07)	— (55.41)	— (55.97)	— (56.95)	— (57.83)
301822082393901 (minimum)[e]	Floridan	1977–1981 (2)	72.92	71.50 (1980)	74.34 (1979)	62.27 (1980)	76.50 (1979)	— (65.96)	— (68.90)	— (71.96)	72.92 (73.98)	— (74.65)	— (74.97)	— (76.04)
301822082393901 (water level, maximum, NGVD 29)[e]	Floridan	1977–1981 (3)	56.75	54.97 (1979)	57.81 (1980)	52.81 (1979)	67.04 (1980)	— (53.29)	— (53.94)	— (54.68)	57.46 (55.71)	— (57.84)	— (61.42)	— (63.86)
302052082312401 (minimum)[e]	Floridan	1976–1982 (2)	74.87	74.21 (1980)	75.53 (1979)	70.06 (1980)	77.10 (1979)	— (71.45)	— (72.33)	— (74.38)	74.87 (75.38)	— (75.77)	— (76.22)	— (76.52)
302052082312401 (water level, maximum, NGVD 29)[e]	Floridan	1976–1981 (2)	53.58	52.92 (1979)	54.24 (1980)	51.35 (1979)	58.39 (1980)	— (51.93)	— (52.23)	— (52.68)	53.58 (53.07)	— (54.07)	— (56.12)	— (57.00)
302052082312402 (minimum)[e]	Interme-diate	1976–1982 (2)	27.80	27.55 (1980)	28.05 (1979)	25.93 (1980)	30.82 (1979)	— (26.23)	— (26.69)	— (27.42)	27.80 (27.79)	— (28.12)	— (28.60)	— (29.17)
302052082312402 (water level, maximum, NGVD 29)[e]	Interme-diate	1976–1981 (2)	100.78	100.53 (1979)	101.03 (1980)	97.76 (1979)	102.65 (1980)	— (99.41)	— (99.98)	— (100.46)	100.78 (100.79)	— (101.16)	— (101.89)	— (102.35)
302052082312485 (water level, unit value, NGVD 29)[e]	Floridan	1982–1994 (3)	54.61	52.35 (1988)	56.92 (1984)	50.34 (1988)	63.66 (1984)	— (50.99)	— (51.31)	— (52.05)	54.56 (54.08)	— (56.56)	— (58.99)	— (60.33)
302243082360201 (minimum)[e]	Floridan	1976–1984 (4)	66.54	65.14 (1978)	68.68 (1981)	58.81 (1978)	70.33 (1981)	— (61.52)	— (63.01)	— (65.56)	66.18 (66.82)	— (68.06)	— (69.80)	— (70.01)
302243082360201 (water level, maximum, NGVD 29)[e]	Floridan	1976–1984 (5)	53.35	50.98 (1981)	54.52 (1978)	49.33 (1981)	61.47 (1977)	— (49.69)	— (50.09)	52.86 (51.64)	54.11 (52.85)	54.30 (54.28)	— (57.44)	— (59.04)

Table E–4*B*. Summary descriptive statistics and percentiles for gage height and water level by calendar year for gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 02314495, 02314500, 304213081270801, and 304313081330001 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile. NAVD 88, North American Vertical Datum of 1988; NGVD 29, National Geodetic Vertical Datum of 1929]

USGS station number[a]	River/ aquifer name	Period of record[b]	Mean-annual gage height/ water level,[c] in feet			Mean-daily gage height/ water level,[c] in feet		Percentiles of mean-annual gage height/water level and (mean-daily gage height/water level),[d] in feet						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Suwannee (0311)—Continued														
Upper Suwannee (03110201)—Continued														
Observation wells—Continued														
302243082360202 (minimum)[e]	Surficial	1976–1982 (2)	2.65	2.60 (1978)	2.71 (1981)	0.80 (1978)	5.15 (1978)	— (0.98)	— (1.06)	— (1.48)	2.65 (2.50)	— (3.73)	— (4.42)	— (4.72)
302243082360202 (water level, maximum, NGVD 29)[e]	Surficial	1976–1981 (1)	117.54	117.54 (1978)	117.54 (1978)	114.99 (1978)	119.34 (1978)	— (115.33)	— (115.62)	— (116.30)	— (117.67)	— (118.89)	— (119.14)	— (119.19)
302334082560201 (minimum)[e]	Floridan	1978–1981 (2)	25.58	25.13 (1980)	26.03 (1979)	11.55 (1980)	29.95 (1979)	— (15.80)	— (21.09)	— (24.38)	25.58 (27.10)	— (27.83)	— (28.62)	— (29.39)
302334082560201 (water level, maximum, NGVD 29)[e]	Floridan	1978–1981 (2)	44.22	43.77 (1979)	44.67 (1980)	39.85 (1979)	58.25 (1980)	— (40.41)	— (41.18)	— (41.97)	44.22 (42.70)	— (45.42)	— (48.71)	— (54.00)
302450082443501 (water level, maximum, NGVD 29)[e]	Surficial	1996–1998 (1)	145.99	145.99 (1997)	145.99 (1997)	144.75 (1997)	146.62 (1997)	— (144.98)	— (145.22)	— (145.73)	— (146.12)	— (146.34)	— (146.47)	— (146.55)
302607082445701 (water level, maximum, NGVD 29)[e]	Surficial	1996–1998 (1)	145.30	145.30 (1997)	145.30 (1997)	143.13 (1997)	146.81 (1997)	— (143.33)	— (143.79)	— (144.35)	— (145.58)	— (146.19)	— (146.46)	— (146.55)
304942082213801	Floridan	1978–2013 (23)	69.55	65.38 (2005)	74.02 (2011)	62.13 (1998)	77.23 (2011)	67.12 (64.98)	67.28 (65.92)	67.86 (67.78)	69.26 (69.34)	71.00 (71.42)	72.99 (73.24)	73.13 (74.05)
304943082213701[e]	Floridan	1973–1975 (1)	65.44	65.44 (1974)	65.44 (1974)	64.62 (1974)	66.33 (1974)	— (64.72)	— (64.78)	— (65.01)	— (65.50)	— (65.84)	— (66.13)	— (66.22)
310706082155101	Floridan	1981–2012 (25)	102.43	98.25 (2005)	107.74 (2011)	95.08 (1998)	112.20 (2011)	99.21 (97.53)	99.63 (98.71)	100.15 (100.10)	101.51 (101.89)	103.91 (104.88)	106.62 (106.50)	107.08 (108.14)

[a]Unless indicated in parentheses under the station number, all gage-height and water-level values are mean-daily values (for example, minimum or maximum). Stream and lake gage heights are referenced to gage datum (table E2*A*) unless indicated as referenced to the vertical datum listed in parentheses. For observation wells, water levels are referenced to land-surface altitude (table E2*B*) unless indicated as referenced to the vertical datum listed in parentheses.

[b]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[c]Statistics listed for mean-annual and mean-daily gage height and water level are based on complete calendar years. Year of minimum and maximum values for mean-annual and mean-daily gage-height and water level shown in parentheses.

[d]Percentiles listed for mean-annual and mean-daily gage height and water level are based on complete calendar years.

[e]Discontinued site.

Table E–5*A*. Summary descriptive statistics and percentiles for discharge by water year for gaging stations in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.

[Stations 02314274, 023142741, and 02314500 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; ft^3/s, cubic foot per second; mi^2, square mile]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge)[f], in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Altamaha-St Marys (0307)														
St Marys (03070204)														
02228500	N Prong St Marys River	1921–2013 (63)	144 (0.90)	6.35 (2011)	377 (1973)	0 (1951)	11,400 (1973)	17.5 (0.10)	33.5 (1.10)	71.9 (9.80)	132 (41.0)	201 (143)	256 (390)	322 (595)
02229000[g]	M Prong St Marys River	1956–2001 (37)	104 (0.84)	1.30 (1956)	289 (1964)	0.05 (2000)	3,610 (1964)	7.08 (0.55)	19.8 (0.97)	58.9 (2.90)	94.9 (26.0)	137 (115)	187 (288)	214 (476)
02229250[g]	M Prong St Marys River	1997–2002 (4)	108 (0.58)	9.71 (2001)	295 (1998)	0.30 (2001)	3,860 (1998)	— (0.75)	— (1.10)	— (1.80)	64.1 (4.30)	— (35.0)	— (226)	— (579)
02229500[g]	S Prong St Marys River	1956–1961 (5)	48.7 (0.84)	1.77 (1956)	89.8 (1959)	0 (1956)	1,010 (1959)	— (0)	— (0)	31.5 (0.30)	59.6 (10.0)	60.7 (46.0)	— (135)	— (207)
02230000[g]	Turkey Creek	1956–1977 (14)	26.2 (1.32)	7.81 (1962)	51.8 (1964)	0.10 (1962)	1,280 (1964)	— (0.70)	10.1 (1.00)	15.5 (1.80)	25.5 (4.90)	31.9 (20.0)	49.9 (57.0)	— (122)
02230500[g]	S Prong St Marys River	1950–1972 (21)	154 (0.99)	19.3 (1962)	426 (1964)	1.30 (1955)	7,140 (1964)	24.6 (3.20)	25.6 (4.40)	93.5 (8.80)	133 (32.0)	193 (143)	277 (429)	398 (681)
02231000	St Marys River	1927–2012 (86)	631 (0.90)	77.7 (2011)	2,280 (1948)	9.60 (2002)	33,300 (2012)	120 (26.0)	189 (36.0)	330 (69.0)	598 (203)	806 (660)	1,090 (1,560)	1,200 (2,450)
02231250[g]	Little St Marys River	1965–1967 (2)	39.7 (2.00)	34.7 (1967)	44.6 (1966)	0 (1966)	738 (1967)	— (0)	— (0.20)	— (2.00)	39.7 (11.0)	— (38.0)	— (113)	— (178)
02231253[g]	St Marys River	1966–1990 (10)	1,520 (1.12)	328 (1968)	3,100 (1987)	–6,230 (1989)	17,300 (1970)	— (–1,030)	— (–561)	890 (220)	1,300 (1,170)	1,960 (2,460)	— (3,990)	— (5,370)
02231254 (tidal low low)	St Marys River	2010–2013 (1)	–22,400 (—)	–22,400 (2012)	–22,400 (2012)	–32,500 (2012)	380 (2012)	— (–27,200)	— (–26,100)	— (–24,400)	— (–22,600)	— (–21,000)	— (–19,500)	— (–18,300)
02231254 (tidal high high)	St Marys River	2010–2013 (1)	23,800 (—)	23,800 (2012)	23,800 (2012)	15,500 (2012)	45,300 (2012)	— (17,800)	— (19,600)	— (21,800)	— (23,700)	— (25,500)	— (27,200)	— (29,000)

Table E–5*A*. Summary descriptive statistics and percentiles for discharge by water year for gaging stations in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 02314274, 023142741, and 02314500 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; ft^3/s, cubic foot per second; mi^2, square mile]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge)[f], in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Suwannee (0311)														
Upper Suwannee (03110201)														
02314274[g]	Suwannee River	2000–2002 (3)	67.6 (—)	56.8 (2002)	87.6 (2001)	3.00 (2000)	546 (2002)	— (11.0)	— (15.0)	— (22.0)	58.4 (41.0)	— (77.5)	— (158)	— (223)
02314274 (minimum)[g]	Suwannee River	2000–2002 (2)	70.0 (—)	56.9 (2000)	83.1 (2001)	2.80 (2000)	453 (2001)	— (6.90)	— (16.0)	— (23.0)	70.0 (51.0)	— (84.0)	— (159)	— (206)
02314274 (maximum)[g]	Suwannee River	2000–2002 (2)	75.9 (—)	60.0 (2000)	91.9 (2001)	3.40 (2001)	469 (2001)	— (8.10)	— (17.0)	— (23.0)	75.9 (54.0)	— (91.0)	— (176)	— (224)
023142741[g]	N Fork Suwannee River	1999–2003 (4)	40.0 (—)	17.8 (2002)	64.2 (2001)	0 (2000)	395 (2001)	— (0.25)	— (0.75)	— (11.0)	39.1 (23.0)	— (32.0)	— (84.0)	— (174)
02314500	Suwannee River	1927–2013 (79)	964 (0.76)	14.5 (2011)	3,510 (1948)	0 (1944)	13,800 (1929)	76.8 (9.20)	116 (25.0)	474 (96.0)	838 (394)	1,360 (1,290)	2,030 (2,550)	2,230 (3,720)
02315000	Suwannee River	1932–2013 (31)	1,280 (0.62)	50.6 (2011)	3,290 (1984)	0.45 (2011)	18,200 (1984)	111 (14.0)	254 (26.0)	587 (100)	1,060 (438)	1,800 (1,500)	2,350 (3,560)	3,110 (5,620)
02315500	Suwannee River	1906–2013 (87)	1,720 (0.71)	71.1 (2011)	6,800 (1948)	1.70 (2011)	38,000 (1973)	164 (23.0)	296 (48.0)	845 (167)	1,370 (650)	2,390 (2,110)	3,780 (4,790)	3,990 (7,160)
02315550	Suwannee River	1975–2012 (23)	1,790 (0.68)	340 (1989)	3,760 (1991)	25.0 (2012)	17,900 (2012)	725 (101)	735 (159)	1,030 (306)	1,770 (848)	2,440 (2,340)	2,970 (4,610)	3,710 (6,990)
02315550 (equivalent mean)[g]	Suwannee River	1975–1984 (1)	46.9 (0.02)	46.9 (1975)	46.9 (1975)	38.0 (1975)	66.0 (1975)	— (38.0)	— (39.0)	— (42.0)	— (47.0)	— (50.0)	— (55.0)	— (59.0)

[a]Unless indicated in parentheses under the station number, all discharge values are mean-daily values (for example, minimum or maximum).

[b]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[c]Statistics listed for mean-annual and mean-daily discharge are based on complete water years. Year of minimum and maximum values for mean-annual and mean-daily discharge numbers shown in parentheses.

[d]Yield units are cubic feet per second per square mile. Yields are based on contributing drainage areas where given. —, the drainage area either is indeterminate or not delineated; yield not calculated.

[e]Mean daily discharge of zero first occurred during the water year indicated but may subsequently have occurred in one or more additional years.

[f]Percentiles listed for mean-annual and mean-daily discharge are based on complete water years. —, too few values to compute the indicated percentile.

[g]Discontinued site.

Table E–5*B*. Summary descriptive statistics and percentiles for discharge by calendar year for gaging stations in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.

[Stations 02314274, 023142741, and 02314500 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; ft^3/s, cubic foot per second; mi^2, square mile]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge)[f], in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
						Altamaha-St Marys (0307)								
						St Marys (03070204)								
02228500	N Prong St Marys River	1921–2012 (61)	143 (0.89)	8.98 (2011)	384 (1928)	0 (1951)	11,400 (1973)	24.2 (0.13)	29.1 (1.20)	80.9 (10.0)	131 (43.0)	186 (144)	249 (390)	338 (596)
02229000[g]	M Prong St Marys River	1955–2001 (35)	108 (0.87)	10.9 (1999)	310 (1964)	0.05 (2000)	3,610 (1964)	14.6 (0.67)	23.4 (1.10)	46.9 (3.50)	106 (28.0)	148 (122)	200 (296)	231 (491)
02229250[g]	M Prong St Marys River	1997–2002 (4)	97.5 (0.52)	4.97 (2001)	339 (1998)	0.30 (2001)	3,860 (1998)	— (0.65)	— (0.82)	— (1.50)	23.0 (3.60)	— (19.0)	— (167)	— (450)
02229500[g]	S Prong St Marys River	1955–1960 (5)	51.0 (0.88)	5.31 (1956)	98.9 (1959)	0 (1956)	1,010 (1959)	— (0)	— (0)	33.6 (0.40)	55.2 (11.0)	62.2 (49.0)	— (139)	— (213)
02230000[g]	Turkey Creek	1955–1977 (13)	27.1 (1.36)	7.88 (1962)	57.2 (1964)	0.10 (1962)	1,280 (1964)	— (0.70)	16.1 (1.00)	16.3 (1.80)	23.4 (5.30)	30.1 (21.0)	52.7 (60.0)	— (126)
02230500[g]	S Prong St Marys River	1950–1971 (21)	153 (0.98)	11.2 (1951)	446 (1964)	0.80 (1950)	7,140 (1964)	21.6 (3.20)	26.2 (4.20)	44.3 (8.20)	164 (30.0)	216 (141)	299 (426)	305 (672)
02231000	St Marys River	1926–2012 (85)	628 (0.90)	82.1 (2011)	1,830 (1947)	9.60 (2002)	27,600 (1947)	117 (26.0)	179 (36.0)	330 (70.0)	598 (203)	843 (659)	1,160 (1,570)	1,240 (2,460)
02231250[g]	Little St Marys River	1965–1967 (2)	34.6 (1.75)	24.3 (1965)	44.9 (1966)	0 (1965)	565 (1966)	— (0)	— (0.30)	— (3.70)	34.6 (13.0)	— (34.0)	— (87.0)	— (156)
02231253[g]	St Marys River	1966–1990 (9)	1,540 (1.13)	382 (1968)	3,130 (1987)	-7,620 (1989)	17,300 (1969)	— (-1,050)	— (-533)	1,090 (257)	1,740 (1,210)	1,790 (2,410)	— (3,890)	— (5,480)

Table E–5*B*. Summary descriptive statistics and percentiles for discharge by calendar year for gaging stations in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia. —Continued

[Stations 02314274, 023142741, and 02314500 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Calendar year, January 1 through December 31. Min, minimum value; Max, maximum value; ft^3/s, cubic foot per second; mi^2, square mile]

USGS station number[a]	River name	Period of record[b]	Mean-annual discharge,[c] in ft^3/s			Mean-daily discharge,[c] in ft^3/s		Percentiles of mean-annual discharge and (mean-daily discharge)[f], in cubic feet per second						
			Mean (yield[d])	Min	Max	Min[e]	Max	5	10	25	50	75	90	95
Suwannee (0311)														
Upper Suwannee (03110201)														
02314274[g]	Suwannee River	1999–2002 (2)	69.2 (—)	54.7 (2000)	83.6 (2001)	3.00 (2000)	464 (2001)	— (7.00)	— (14.0)	— (22.0)	69.2 (46.0)	— (84.0)	— (170)	— (215)
02314274 (minimum)[g]	Suwannee River	1999–2002 (2)	66.3 (—)	53.2 (2000)	79.3 (2001)	2.80 (2000)	453 (2001)	— (6.90)	— (14.0)	— (22.0)	66.3 (44.0)	— (81.0)	— (159)	— (206)
02314274 (maximum)[g]	Suwannee River	1999–2002 (2)	72.1 (—)	56.5 (2000)	87.7 (2001)	3.40 (2001)	469 (2001)	— (8.10)	— (14.0)	— (22.0)	72.1 (48.0)	— (85.0)	— (176)	— (224)
023142741[g]	N Fork Suwannee River	1998–2003 (4)	36.3 (—)	22.2 (2000)	59.4 (2001)	0 (2000)	395 (2001)	— (0.25)	— (0.75)	— (9.50)	31.8 (23.0)	— (31.0)	— (77.0)	— (146)
023142741 (minimum)[g]	N Fork Suwannee River	1998–2003 (1)	30.0 (—)	30.0 (2002)	30.0 (2002)	0 (2002)	275 (2002)	— (0.09)	— (0.18)	— (1.10)	— (9.50)	— (19.0)	— (115)	— (168)
023142741 (maximum)[g]	N Fork Suwannee River	1998–2003 (1)	33.5 (—)	33.5 (2002)	33.5 (2002)	0 (2002)	276 (2002)	— (0.12)	— (0.28)	— (1.80)	— (11.0)	— (22.0)	— (128)	— (212)
02314500	Suwannee River	1927–2013 (77)	972 (0.77)	16.2 (2011)	2,850 (1964)	0 (1943)	13,800 (1928)	86.9 (10.0)	125 (26.0)	506 (98.0)	916 (395)	1,370 (1,300)	1,920 (2,570)	2,240 (3,760)
02315000	Suwannee River	1932–2012 (30)	1,310 (0.63)	51.6 (2011)	3,230 (1984)	0.40 (1932)	18,200 (1984)	131 (11.0)	211 (25.0)	634 (101)	1,260 (446)	1,740 (1,560)	2,620 (3,660)	3,060 (5,700)
02315500	Suwannee River	1906–2012 (86)	1,720 (0.71)	70.4 (2011)	5,460 (1964)	1.70 (2011)	38,000 (1973)	215 (23.0)	241 (50.0)	851 (170)	1,440 (655)	2,540 (2,120)	3,570 (4,810)	4,190 (7,160)
02315550	Suwannee River	1974–2012 (21)	1,850 (0.71)	297 (1989)	3,850 (1991)	49.0 (1990)	17,800 (1984)	637 (125)	686 (173)	1,140 (320)	1,650 (918)	2,620 (2,470)	2,900 (4,770)	3,630 (7,160)

[a]Unless indicated in parentheses under the station number, all discharge values are mean-daily values (for example, minimum or maximum).

[b]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[c]Statistics listed for mean-annual and mean-daily discharge are based on complete calendar years. Year of minimum and maximum values for mean-annual and mean-daily discharge numbers shown in parentheses.

[d]Yield units are cubic feet per second per square mile. Yields are based on contributing drainage areas where given. —, the drainage area either is indeterminate or not delineated; yield not calculated.

[e]Mean daily discharge of zero first occurred during the calendar year indicated but may subsequently have occurred in one or more additional years.

[f]Percentiles listed for mean-annual and mean-daily discharge are based on complete calendar years. —, too few values to compute the indicated percentile.

[g]Discontinued site.

Table E–6*A*. Summary descriptive statistics and percentiles for selected water-quality parameters and climate variables by water year for gaging stations in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.

[Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Water year, October 1, preceding calendar year, through September 30, current calendar year. Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual parameter value[c]			Mean-daily parameter value[c]		Percentiles of mean-annual parameter values and (mean-daily parameter values)[d]						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Suwannee (0311)														
Upper Suwannee (03110201)														
Precipitation, in inches														
02314495 (sum)	Suwannee River	2002–2013 (7)	0.1	0.1 (2011)	0.2 (2004)	0.0 (2004)	7.0 (2012)	— (0.0)	— (0.0)	0.1 (0.0)	0.1 (0.0)	0.1 (0.0)	— (0.4)	— (0.8)
02314500 (sum)	Suwannee River	2002–2013 (4)	0.1	0.1 (2011)	0.1 (2005)	0.0 (2005)	4.3 (2009)	— (0.0)	— (0.0)	— (0.0)	0.1 (0.0)	— (0.0)	— (0.4)	— (0.7)

[a]Unless indicated in parentheses under the station number, all data values are mean-daily values (for example, minimum or maximum).

[b]Period shown is for water years and includes gaps if data collection was discontinuous. Number of complete water years shown in parentheses.

[c]Statistics listed for mean-annual and mean-daily parameter values are based on complete water years. Year of minimum and maximum parameter values for mean-annual and mean-daily parameter-value numbers shown in parentheses.

[d]Percentiles listed for mean-annual and mean-daily parameter values are based on complete water years.

Table E–6*B*. Summary descriptive statistics and percentiles for selected water-quality parameters and climate variables by calendar year for gaging stations in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.

[Stations 02314495 and 02314500 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Calendar year, January 1 through December 31; Min, minimum value; Max, maximum value; —, too few values to compute the indicated percentile]

USGS station number[a]	River name	Period of record[b]	Mean-annual parameter value[c]			Mean-daily parameter value[c]		Percentiles of mean-annual parameter values and (mean-daily parameter values)[d]						
			Mean	Min	Max	Min	Max	5	10	25	50	75	90	95
Altamaha-St Marys (0307)														
St Marys (03070204)														
Water temperature, in degrees Celsius														
02231000 (unit value)	St Marys River	1965–1977 (1)	18.8	18.8 (1968)	18.8 (1968)	6.0 (1968)	29.0 (1968)	— (9.0)	— (10.0)	— (12.0)	— (20.0)	— (24.0)	— (26.0)	— (27.0)
Suwannee (0311)														
Upper Suwannee (03110201)														
Precipitation, in inches														
02314495 (sum)	Suwannee River	2002–2013 (6)	0.1	0.1 (2006)	0.2 (2004)	0.0 (2004)	6.9 (2004)	— (0.0)	— (0.0)	0.1 (0.0)	0.1 (0.0)	0.1 (0.0)	— (0.4)	— (0.8)
02314500 (sum)	Suwannee River	2002–2013 (4)	0.1	0.1 (2011)	0.2 (2005)	0.0 (2005)	6.5 (2008)	— (0.0)	— (0.0)	— (0.0)	0.1 (0.0)	— (0.0)	— (0.5)	— (0.8)

[a]Unless indicated in parentheses under the station number, all data values are mean-daily values (for example, minimum or maximum).

[b]Period shown is for calendar years and includes gaps if data collection was discontinuous. Number of complete calendar years shown in parentheses.

[c]Statistics listed for mean-annual and mean-daily parameter values are based on complete calendar years. Year of minimum and maximum parameter values for mean-annual and mean-daily parameter-value numbers shown in parentheses.

[d]Percentiles listed for mean-annual and mean-daily parameter values are based on complete calendar years.

Table E–7. Graphical summary files for plots of gage height, water level, discharge, water temperature, and precipitation data collected at gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.

[Stations 304213081270801, 304313081330001, 02314274, 023142741, 02314495, and 02314500 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Calendar year, January 1 through December 31]

USGS station number	Station name	Parameter[a]	File name[b]
		Altamaha-St Marys (0307)	
		St Marys (03070204)	
		Gaging stations	
02228500	N Prong St Marys R at Moniac, GA	Gage height	s02228500gmn.p12ar.pdf
		Gage height	s02228500gmn.p12lg.pdf
		Elevation above NAVD 88	s02228500wl88mn.p01ar.pdf
		Elevation above NAVD 88	s02228500wl88mn.p01lg.pdf
		Elevation above NAVD 29	s02228500wl29mn.p12lg.pdf
		Discharge	s02228500qmn.p12ar.pdf
02228700	Ocean Pond at Olustee, FL	Elevation above NGVD 29	s02228700wl29mn.p01ar.pdf
		Elevation above NGVD 29	s02228700wl29mn.p01lg.pdf
02229000	M Prong St Marys R at Taylor, GA	Gage height	s02229000gmn.p12ar.pdf
		Gage height	s02229000gmn.p12lg.pdf
		Discharge	s02229000qmn.p12ar.pdf
		Discharge	s02229000qmn.p12lg.pdf
02229250	M Prong St Marys R nr Taylor, GA	Gage height	s02229250gmn.p12ar.pdf
		Gage height	s02229250gmn.p12lg.pdf
		Discharge	s02229250qmn.p12ar.pdf
		Discharge	s02229250qmn.p12lg.pdf
02229500	S Prong St Marys R nr Sanderson, FL	Gage height	s02229500gmn.p12ar.pdf
		Gage height	s02229500gmn.p12lg.pdf
		Discharge	s02229500qmn.p12ar.pdf
02230000	Turkey Cr at MacClenny, FL	Gage height	s02230000gmn.p12ar.pdf
		Gage height	s02230000gmn.p12lg.pdf
		Discharge	s02230000qmn.p12ar.pdf
		Discharge	s02230000qmn.p12lg.pdf
02230500	S Prong St Marys R at Glen St Mary, FL	Gage height	s02230500gmn.p12ar.pdf
		Gage height	s02230500gmn.p12lg.pdf
		Discharge	s02230500qmn.p12ar.pdf
		Discharge	s02230500qmn.p12lg.pdf
02231000	St Marys R nr MacClenny, FL	Gage height	s02231000gmn.p12ar.pdf
		Gage height	s02231000gmn.p12lg.pdf
		Elevation above NAVD 88	s02231000wl88mn.p01ar.pdf
		Elevation above NAVD 88	s02231000wl88mn.p01lg.pdf
		Discharge	s02231000qmn.p12ar.pdf
		Discharge	s02231000qmn.p12lg.pdf
		Water temperature, unit value	s02231000tuv.p12ar.pdf
		Water temperature, unit value	s02231000tuv.p12lg.pdf

Table E–7. Graphical summary files for plots of gage height, water level, discharge, water temperature, and precipitation data collected at gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 304213081270801, 304313081330001, 02314274, 023142741, 02314495, and 02314500 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Calendar year, January 1 through December 31]

USGS station number	Station name	Parameter[a]	File name[b]
		Altamaha-St Marys (0307)—Continued	
		St Marys (03070204)—Continued	
		Gaging stations—Continued	
02231250	Little St Marys R nr Hilliard, FL	Gage height	s02231250gmn.p12ar.pdf
		Gage height	s02231250gmn.p12lg.pdf
		Discharge	s02231250qmn.p12ar.pdf
02231253	St Marys R nr Gross, FL	Gage height, tidal low low	s02231253gtdll.p12ar.pdf
		Gage height, tidal low low	s02231253gtdll.p12lg.pdf
		Gage height, tidal high high	s02231253gtdhh.p12ar.pdf
		Gage height, tidal high high	s02231253gtdhh.p12lg.pdf
		Discharge	s02231253qmn.p12ar.pdf
		Observation wells	
300747082225801	0072221	Elevation above NGVD 29, maximum	s300747082225801wl29mx.p12ar.pdf
		Elevation above NGVD 29, maximum	s300747082225801wl29mx.p12lg.pdf
		Depth to water level, minimum	s300747082225801dwlmi.p12ar.pdf
		Depth to water level, minimum	s300747082225801dwlmi.p12lg.pdf
302251082194901	B-25 ONF #6 Floridan well nr Taylor, FL	Elevation above NGVD 29, maximum	s302251082194901wl29mx.p12ar.pdf
		Elevation above NGVD 29, maximum	s302251082194901wl29mx.p12lg.pdf
		Depth to water level	s302251082194901dwlmn.p12ar.pdf
		Depth to water level	s302251082194901dwlmn.p12lg.pdf
		Depth to water level, minimum	s302251082194901dwlmi.p12ar.pdf
		Depth to water level, minimum	s302251082194901dwlmi.p12lg.pdf
		Depth to water level, maximum	s302251082194901dwlmx.p12ar.pdf
		Depth to water level, maximum	s302251082194901dwlmx.p12lg.pdf
302251082194902	B-26 ONF #6 Hawthorne well nr Taylor, FL	Elevation above NGVD 29, maximum	s302251082194902wl29mx.p12ar.pdf
		Elevation above NGVD 29, maximum	s302251082194902wl29mx.p12lg.pdf
		Depth to water level	s302251082194902dwlmn.p01ar.pdf
		Depth to water level	s302251082194902dwlmn.p01lg.pdf
		Depth to water level, minimum	s302251082194902dwlmi.p12ar.pdf
		Depth to water level, minimum	s302251082194902dwlmi.p12lg.pdf
302416081522601	D-348 Monticello Drug Co well at Jacksonville, FL	Elevation above NGVD 29, maximum	s302416081522601wl29mx.p12ar.pdf
		Elevation above NGVD 29, maximum	s302416081522601wl29mx.p12lg.pdf

Table E–7. Graphical summary files for plots of gage height, water level, discharge, water temperature, and precipitation data collected at gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 304213081270801, 304313081330001, 02314274, 023142741, 02314495, and 02314500 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Calendar year, January 1 through December 31]

USGS station number	Station name	Parameter[a]	File name[b]
		Altamaha-St Marys (0307)—Continued	
		St Marys (03070204)—Continued	
		Observation wells—Continued	
302416081522602	D-349 Monticello Drug Co well at Jacksonville, FL	Elevation above NGVD 29, maximum	s302416081522602wl29mx.p12ar.pdf
		Elevation above NGVD 29, maximum	s302416081522602wl29mx.p12lg.pdf
304213081270801	N-19 Ft Clinch State Park at Fernandina Beach, FL	Elevation above NGVD 29, maximum	s304213081270801wl29mx.p12ar.pdf
304313081330001	33D069	Depth to water level	s304313081330001dwlmn.p12ar.pdf
304406081330502	33D071	Depth to water level	s304406081330502dwlmn.p12ar.pdf
304406081330503	33D072	Depth to water level	s304406081330503dwlmn.p12ar.pdf
		Depth to water level	s304406081330503dwlmn.p12lg.pdf
304406081330505	33D074	Depth to water level	s304406081330505dwlmn.p01ar.pdf
304512081343601	33E007	Depth to water level	s304512081343601dwlmn.p12ar.pdf
		Suwannee (0311)	
		Upper Suwannee (03110201)	
		Gaging stations	
02314274	Suwannee R at Sill nr Fargo, GA	Discharge	s02314274qmn.p12ar.pdf
		Discharge	s02314274qmn.p12lg.pdf
		Discharge, minimum	s02314274qmi.p12ar.pdf
		Discharge, minimum	s02314274qmi.p12lg.pdf
		Discharge, maximum	s02314274qmx.p12ar.pdf
		Discharge, maximum	s02314274qmx.p12lg.pdf
023142741	N Fork Suwannee R at Sill nr Fargo, GA	Discharge	s023142741qmn.p12ar.pdf
		Discharge, minimum	s023142741qmi.p12ar.pdf
		Discharge, maximum	s023142741qmx.p12ar.pdf
02314495	Suwannee R ab Fargo, GA	Gage height	s02314495gmn.p12ar.pdf
		Gage height	s02314495gmn.p12lg.pdf
		Precipitation, sum	s02314495pcpsm.p12ar.pdf
02314500	Suwannee R (US 441) at Fargo, GA	Gage height	s02314500gmn.p12ar.pdf
		Discharge	s02314500qmn.p12ar.pdf
		Precipitation, sum	s02314500pcpsm.p12ar.pdf
02315000	Suwannee R nr Benton, FL	Gage height	s02315000gmn.p12ar.pdf
		Gage height	s02315000gmn.p12lg.pdf
		Discharge	s02315000qmn.p12ar.pdf
		Discharge	s02315000qmn.p12lg.pdf

Table E–7. Graphical summary files for plots of gage height, water level, discharge, water temperature, and precipitation data collected at gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 304213081270801, 304313081330001, 02314274, 023142741, 02314495, and 02314500 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Calendar year, January 1 through December 31]

USGS station number	Station name	Parameter[a]	File name[b]
		Suwannee (0311)—Continued	
		Upper Suwannee (03110201)—Continued	
		Gaging stations—Continued	
02315500	Suwannee R at White Springs, FL	Gage height	s02315500gmn.p12ar.pdf
		Gage height	s02315500gmn.p12lg.pdf
		Elevation above NGVD 29	s02315500wl29mn.p12ar.pdf
		Elevation above NGVD 29	s02315500wl29mn.p12lg.pdf
		Discharge	s02315500qmn.p12ar.pdf
		Discharge	s02315500qmn.p12lg.pdf
02315550	Suwannee R at Suwannee Springs, FL	Gage height	s02315550gmn.p12ar.pdf
		Gage height	s02315550gmn.p12lg.pdf
		Discharge	s02315550qmn.p12ar.pdf
		Discharge	s02315550qmn.p12lg.pdf
		Observation wells	
301307082355001	ONF #10 Floridan well	Elevation above NGVD 29, maximum	s301307082355001wl29mx.p01ar.pdf
		Elevation above NGVD 29, maximum	s301307082355001wl29mx.p01lg.pdf
		Depth to water level, minimum	s301307082355001dwlmi.p01ar.pdf
		Depth to water level, minimum	s301307082355001dwlmi.p01lg.pdf
301822082393901	New Hope School well nr White Springs, FL	Elevation above NGVD 29, maximum	s301822082393901wl29mx.p12ar.pdf
		Elevation above NGVD 29, maximum	s301822082393901wl29mx.p12lg.pdf
		Depth to water level	s301822082393901dwlmn.p01ar.pdf
		Depth to water level	s301822082393901dwlmn.p01lg.pdf
		Depth to water level, minimum	s301822082393901dwlmi.p12ar.pdf
		Depth to water level, minimum	s301822082393901dwlmi.p12lg.pdf
		Depth to water level, maximum	s301822082393901dwlmx.p01ar.pdf
		Depth to water level, maximum	s301822082393901dwlmx.p01lg.pdf
301822082393985	New Hope School well	Elevation above NGVD 29, unit value	s301822082393985wl29uv.p12ar.pdf
		Elevation above NGVD 29, unit value	s301822082393985wl29uv.p12lg.pdf
302052082312401	ONF #3 Floridan well	Elevation above NGVD 29, maximum	s302052082312401wl29mx.p12ar.pdf
		Elevation above NGVD 29, maximum	s302052082312401wl29mx.p12lg.pdf
		Depth to water level, minimum	s302052082312401dwlmi.p12ar.pdf
		Depth to water level, minimum	s302052082312401dwlmi.p12lg.pdf

Table E–7. Graphical summary files for plots of gage height, water level, discharge, water temperature, and precipitation data collected at gaging stations and observation wells in the contributing watersheds, and vicinity, of the Okefenokee National Wildlife Refuge, Florida and Georgia.—Continued

[Stations 304213081270801, 304313081330001, 02314274, 023142741, 02314495, and 02314500 may be of most interest due to their proximity to refuge boundaries. Major drainage boundaries and locations of U.S. Geological Survey (USGS) gaging stations shown in figure E1. USGS hydrologic subregions and cataloging units, and subregion and hydrologic cataloging unit codes, listed as subheadings and also shown in figure E1. Calendar year, January 1 through December 31]

USGS station number	Station name	Parameter[a]	File name[b]
		Suwannee (0311)—Continued	
		Upper Suwannee (03110201)—Continued	
		Observation wells—Continued	
302052082312402	ONF #3 Hawthorne well	Elevation above NGVD 29, maximum	s302052082312402wl29mx.p12ar.pdf
		Elevation above NGVD 29, maximum	s302052082312402wl29mx.p12lg.pdf
		Depth to water level, minimum	s302052082312402dwlmi.p12ar.pdf
		Depth to water level, minimum	s302052082312402dwlmi.p12lg.pdf
302052082312485	ONF #3 Floridan well	Elevation above NGVD 29, unit value	s302052082312485wl29uv.p12ar.pdf
		Elevation above NGVD 29, unit value	s302052082312485wl29uv.p12lg.pdf
302243082360201	ONF #1 Floridan well	Elevation above NGVD 29, maximum	s302243082360201wl29mx.p12ar.pdf
		Elevation above NGVD 29, maximum	s302243082360201wl29mx.p12lg.pdf
		Depth to water level, minimum	s302243082360201dwlmi.p12ar.pdf
		Depth to water level, minimum	s302243082360201dwlmi.p12lg.pdf
302243082360202	ONF #1 water table well	Elevation above NGVD 29, maximum	s302243082360202wl29mx.p01ar.pdf
		Elevation above NGVD 29, maximum	s302243082360202wl29mx.p01lg.pdf
		Depth to water level, minimum	s302243082360202dwlmi.p12ar.pdf
		Depth to water level, minimum	s302243082360202dwlmi.p12lg.pdf
302334082560201	Suwannee Spgs well	Elevation above NGVD 29, maximum	s302334082560201wl29mx.p12ar.pdf
		Elevation above NGVD 29, maximum	s302334082560201wl29mx.p12lg.pdf
		Depth to water level, minimum	s302334082560201dwlmi.p12ar.pdf
		Depth to water level, minimum	s302334082560201dwlmi.p12lg.pdf
304942082213801	27E004	Depth to water level	s304942082213801dwlmn.p12ar.pdf
		Depth to water level	s304942082213801dwlmn.p12lg.pdf
310706082155101	27G003	Depth to water level	s310706082155101dwlmn.p12ar.pdf
		Depth to water level	s310706082155101dwlmn.p12lg.pdf

[a]All parameters listed are mean-daily values except where other statistics or measurements are indicated.

[b]File-naming conventions: sSSSSSSSS***var***.p[01,12]***ps***.pdf; SSSSSSSS, USGS station identification number; ***var***: variable listed in the parameter column; all gage-height and water-level data in feet; all discharge data in cubic feet per second; all water-temperature data in degrees Celsius; all precipitation data in inches; p[01,12], p01, plots A1–A4, p12, plots A1–A4, page 1, plots A5–A8, page 2; ***ps***, plot scale: ar, plots A1–A5, vertical axis arithmetic, plots A6–A8, vertical axis base-10 logarithmic; lg, plots A1–A8, base-10 logarithmic.

Table E–8. Land-cover percentages for Okefenokee National Wildlife Refuge and Wilderness and contributing watersheds, Florida and Georgia, based on the 1992 National Land Cover Database.

[See figure E6 for map of 1992 land cover, St Marys and Upper Suwannee hydrologic cataloging units, and listing of 12-digit and 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 1992 NLCD (Vogelmann and others, 2001); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of 1992 NLCD land-cover class[a]																	
	11	21	22	23	31	32	33	41	42	43	51	61	71	81	82	85	91	92
Altamaha—St Marys (0307)—St Marys (03070204)																		
North Prong St Marys River (0307020401)																		
030702040101	<0.1	<0.1	0.0	0.1	0.0	0.0	5.1	0.0	29.3	0.0	0.0	0.1	<0.1	<0.1	<0.1	0.0	59.0	6.327
030702040102	<0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.0	12.5	0.0	0.0	0.0	0.0	0.0	<0.1	0.0	82.4	4.688
030702040103	0.1	0.0	0.0	<0.1	0.0	0.0	3.6	0.0	27.4	0.0	<0.1	<0.1	0.1	<0.1	0.7	0.0	62.5	5.389
030702040104	<0.1	<0.1	0.0	0.1	0.1	0.0	14.5	0.0	48.9	0.0	0.0	0.1	2.1	0.2	0.2	0.0	33.0	0.711
030702040105	0.1	1.1	<0.1	0.2	<0.1	0.0	13.0	0.0	54.3	0.0	0.0	<0.1	1.2	0.1	7.5	0.0	21.2	1.305
Middle Prong St Marys River (0307020402)																		
030702040201	4.8	0.1	0.0	<0.1	0.0	0.0	2.0	0.0	53.4	0.0	0.0	0.1	<0.1	<0.1	0.0	0.0	38.7	0.9
030702040202	0.1	0.0	0.0	<0.1	0.0	0.0	2.0	0.0	54.1	0.0	0.0	<0.1	<0.1	0.0	<0.1	0.0	42.9	0.9
030702040203	0.1	0.0	0.0	0.1	0.0	0.0	6.7	0.0	38.2	0.0	0.0	0.1	0.1	0.0	0.1	0.0	51.9	2.7
030702040204	<0.1	<0.1	0.0	0.1	0.0	0.0	6.7	0.0	43.1	0.0	0.0	0.1	4.0	0.2	0.2	0.0	44.0	1.5
030702040205	<0.1	0.4	0.0	0.1	0.0	0.0	10.7	0.0	52.3	0.0	0.0	<0.1	5.8	0.0	1.0	0.0	28.7	0.9
Cedar Creek—St Marys River (0307020403)																		
030702040301	0.1	1.0	<0.1	0.2	0.0	0.0	10.5	0.0	60.5	0.0	0.2	0.1	1.6	0.6	2.0	0.0	22.4	0.8
030702040302	<0.1	0.0	0.0	<0.1	<0.1	0.0	15.2	0.0	50.4	0.0	0.0	<0.1	0.7	0.1	2.4	0.0	30.8	0.3
030702040303	0.1	0.8	<0.1	<0.1	0.0	0.0	7.3	0.0	68.6	0.0	0.2	<0.1	0.3	0.1	3.1	0.0	18.9	0.6
South Prong St Marys River (0307020404)																		
030702040401	3.1	<0.1	0.0	<0.1	0.1	0.0	4.0	0.0	62.9	0.0	<0.1	0.1	0.5	<0.1	0.2	0.0	28.4	0.6
030702040402	0.1	0.9	0.0	0.1	0.1	0.0	16.1	0.0	55.2	0.0	0.4	0.1	2.6	0.5	2.5	0.0	20.6	0.8
030702040403	0.2	8.8	0.8	0.9	0.1	0.0	12.7	0.0	52.7	0.0	0.2	0.5	0.6	0.1	1.0	0.0	20.2	1.3
030702040404	0.2	5.2	0.4	0.4	<0.1	0.0	7.6	0.0	54.4	0.0	1.6	0.6	4.2	0.7	5.7	<0.1	17.4	1.5
030702040405	0.1	8.9	0.9	0.7	0.3	0.0	14.0	0.0	47.6	0.0	0.4	0.3	0.6	0.4	8.7	0.1	16.4	0.6
Upper St Marys River (0307020405)																		
030702040501	0.3	2.1	0.2	0.4	<0.1	0.0	9.4	0.0	61.9	0.0	0.0	0.2	0.8	0.2	0.4	0.0	22.2	1.8
030702040502	0.5	0.4	<0.1	0.1	0.0	0.1	6.9	0.0	53.6	0.0	0.0	0.1	4.0	0.5	1.6	<0.1	29.3	3.1
030702040503	0.2	0.1	0.0	0.2	0.1	0.0	14.6	0.0	57.0	0.0	0.0	<0.1	0.7	<0.1	0.5	0.0	24.8	1.8
Middle St Marys River (0307020406)																		
030702040601	<0.1	0.1	0.0	0.1	<0.1	0.0	9.6	0.0	58.0	0.0	0.0	<0.1	2.5	0.2	<0.1	0.0	29.0	0.6
030702040602	0.1	1.2	<0.1	0.2	0.0	0.0	10.2	0.0	63.5	0.0	0.0	0.1	2.4	0.2	<0.1	0.0	20.8	1.2
030702040603	0.2	0.2	0.0	0.1	<0.1	0.0	11.6	0.0	62.7	0.0	0.0	<0.1	3.3	0.1	<0.1	0.0	20.3	1.6
Cornhouse Creek—Suwannee Canal (0307020407)																		
030702040701	2.9	0.0	0.0	0.0	0.0	0.0	0.1	0.0	6.3	0.0	<0.1	0.0	0.0	0.0	0.0	0.0	78.6	12.1
030702040702	3.4	<0.1	0.0	<0.1	0.0	0.0	4.2	0.0	15.7	0.0	<0.1	<0.1	<0.1	<0.1	<0.1	0.0	64.5	12.3
030702040703	0.1	0.0	0.0	<0.1	0.1	0.0	5.6	0.0	40.8	0.0	0.0	<0.1	0.1	0.0	0.0	0.0	45.7	7.6
St Marys River—Spanish Creek (0307020408)																		
030702040801	0.2	6.6	0.3	0.9	0.1	0.0	19.3	0.0	47.2	0.0	2.5	0.2	0.6	0.2	2.7	0.2	17.1	2.1
030702040802	0.1	0.3	0.0	0.2	0.0	0.0	18.8	<0.1	55.7	0.1	0.6	<0.1	0.4	0.1	1.4	<0.1	19.2	2.9
030702040803	0.5	0.3	<0.1	0.1	0.0	0.0	13.4	0.0	57.1	0.0	2.9	<0.1	3.5	0.2	<0.1	0.0	20.8	1.1
Lower St Marys R (0307020409)																		
030702040901	1.3	2.5	0.2	0.5	<0.1	0.1	11.0	0.0	44.2	0.0	5.0	0.1	1.7	0.1	1.4	0.0	29.4	2.4
030702040902	1.8	0.9	0.0	0.1	<0.1	0.0	5.3	0.0	52.1	0.0	3.1	0.1	1.3	0.1	0.2	0.0	33.8	1.4
030702040903	0.1	4.7	0.2	0.4	0.0	<0.1	7.7	0.0	52.3	0.0	1.9	0.2	6.7	0.3	<0.1	0.9	22.8	1.5
030702040904	0.6	0.2	0.0	0.1	0.1	0.0	5.1	0.0	57.0	0.0	1.6	<0.1	0.4	<0.1	0.0	0.0	31.5	3.3
030702040905	4.6	4.5	0.4	1.9	<0.1	0.0	4.6	0.0	37.0	0.0	3.1	0.1	1.0	0.1	0.9	0.3	24.9	16.7
030702040906	24.9	12.5	2.2	2.5	0.4	0.0	0.8	0.0	20.3	0.0	1.8	0.4	0.9	0.1	0.3	0.6	5.4	27.0
030702040907	15.6	9.7	2.3	3.7	0.3	0.0	2.3	0.0	23.0	0.0	2.2	0.3	0.7	0.1	1.0	1.4	9.6	27.8

Table E–8. Land-cover percentages for Okefenokee National Wildlife Refuge and Wilderness and contributing watersheds, Florida and Georgia, based on the 1992 National Land Cover Database.—Continued

[See figure E6 for map of 1992 land cover, St Marys and Upper Suwannee hydrologic cataloging units, and listing of 12-digit and 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 1992 NLCD (Vogelmann and others, 2001); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of 1992 NLCD land-cover class[a]																
	11	21	22	23	31	32	33	41	42	43	51	61	71	81	82	85	91	92
Suwannee (0311)—Upper Suwannee (03110201)																		
Okefenokee Swamp (0311020101)																		
031102010101	0.1	0.0	<0.1	<0.1	<0.1	<0.1	10.9	2.4	58.4	3.4	0.0	0.0	0.0	1.9	4.7	0.0	17.0	1.1
031102010102	<0.1	0.1	<0.1	0.1	<0.1	<0.1	7.8	6.7	55.3	7.8	0.0	0.0	0.0	2.7	6.1	<0.1	12.6	0.6
031102010103	<0.1	<0.1	0.0	<0.1	<0.1	<0.1	9.6	2.0	66.2	3.0	0.0	0.0	0.1	0.9	2.5	0.0	14.6	1.1
031102010104	<0.1	0.6	0.1	0.2	<0.1	0.0	11.3	2.8	61.9	3.4	0.0	0.1	0.4	0.6	0.7	0.4	15.5	1.8
031102010105	0.4	0.0	0.0	0.1	<0.1	0.0	3.6	0.1	33.9	0.3	<0.1	<0.1	0.1	0.1	0.4	<0.1	52.0	8.9
Tatum Creek (0311020102)																		
031102010201	0.1	1.5	0.2	0.2	<0.1	0.0	7.0	<0.1	71.7	<0.1	0.1	0.1	0.6	0.1	0.2	<0.1	16.5	1.6
031102010202	<0.1	0.0	0.0	<0.1	0.0	0.0	4.7	0.0	73.0	0.0	0.4	<0.1	<0.1	<0.1	0.1	0.0	19.6	2.2
Suwanoochee Creek (0311020103)																		
031102010301	<0.1	0.0	<0.1	<0.1	<0.1	<0.1	5.7	5.2	47.9	5.1	0.0	0.0	0.0	1.4	5.0	0.0	29.0	0.7
031102010302	0.8	0.1	<0.1	<0.1	<0.1	0.0	8.8	1.3	55.4	2.3	0.1	<0.1	<0.1	0.2	1.0	<0.1	26.8	3.0
031102010303	<0.1	<0.1	0.0	<0.1	0.0	0.0	14.5	<0.1	44.8	0.1	0.0	0.2	<0.1	<0.1	0.1	0.0	31.1	9.2
031102010304	<0.1	0.0	0.0	<0.1	0.0	0.0	4.9	0.0	68.3	0.0	<0.1	0.0	0.0	<0.1	<0.1	0.0	24.0	2.7
031102010305	<0.1	0.1	0.0	<0.1	0.0	0.0	4.5	0.0	66.2	0.0	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	25.6	3.5
Suwannee River—Cypress Creek (0311020104)																		
031102010401	0.1	<0.1	0.0	<0.1	0.0	0.0	2.3	0.0	27.2	0.0	0.0	<0.1	<0.1	<0.1	0.1	0.0	63.7	6.7
031102010402	<0.1	0.0	0.0	<0.1	0.0	0.0	3.3	0.0	38.4	0.0	<0.1	0.1	<0.1	<0.1	<0.1	0.0	44.3	13.7
Toms Creek—Suwannee River (0311020105)																		
031102010501	<0.1	0.0	0.0	<0.1	0.0	0.0	19.8	<0.1	35.2	0.2	0.0	<0.1	<0.1	<0.1	<0.1	0.0	38.7	5.9
031102010502	<0.1	0.0	0.0	<0.1	0.0	0.0	17.8	0.0	50.6	0.0	0.0	0.1	<0.1	<0.1	0.0	0.0	26.6	4.8
031102010503	<0.1	0.0	0.0	0.1	0.0	0.0	7.7	0.0	24.8	0.0	0.0	0.1	<0.1	<0.1	<0.1	0.0	64.6	2.6
031102010504	<0.1	0.0	0.0	<0.1	0.0	0.0	1.6	0.0	32.4	0.0	0.0	<0.1	<0.1	<0.1	0.1	0.0	62.9	3.0
031102010505	0.1	0.0	0.0	<0.1	0.0	0.0	1.7	0.0	62.2	0.0	0.0	<0.1	<0.1	<0.1	0.0	0.0	31.9	4.0
Rocky Creek—Suwannee River (0311020106)																		
031102010601	<0.1	<0.1	0.0	<0.1	0.0	0.0	1.5	0.0	54.9	0.0	0.0	<0.1	0.0	<0.1	0.0	0.0	42.9	0.8
031102010602	0.1	<0.1	0.0	<0.1	0.0	0.0	8.6	0.0	47.0	0.0	0.0	<0.1	0.7	0.2	1.0	0.0	39.9	2.3
031102010603	11.3	<0.1	0.0	1.6	<0.1	6.5	7.6	0.0	30.6	0.0	0.0	0.3	11.9	<0.1	2.3	0.0	23.5	4.3
031102010604	9.2	<0.1	0.0	0.8	1.7	12.3	4.2	0.0	21.1	0.0	0.0	0.1	16.2	<0.1	2.9	0.0	24.4	7.2
031102010605	0.4	0.0	0.0	0.1	<0.1	0.4	13.8	0.0	48.8	0.0	0.0	<0.1	2.3	0.3	2.2	0.0	29.4	2.4
031102010606	0.1	0.0	0.0	<0.1	0.0	0.0	8.0	0.0	56.8	0.0	0.0	0.1	0.3	0.1	0.2	0.0	32.8	1.7
Robinson Creek—Suwannee River (0311020107)																		
031102010701	0.1	0.0	0.0	<0.1	0.0	0.0	4.9	0.0	31.7	0.0	0.0	<0.1	0.0	0.0	<0.1	0.0	60.8	2.4
031102010702	<0.1	0.1	0.0	0.1	0.0	0.0	3.7	0.0	54.9	0.0	<0.1	<0.1	0.2	0.1	1.6	0.0	38.1	1.2
031102010703	0.5	4.9	0.6	1.0	<0.1	0.0	5.6	0.0	62.2	0.0	0.3	0.2	1.4	0.1	1.0	<0.1	21.3	0.8
031102010704	0.4	0.1	<0.1	<0.1	0.1	1.4	6.3	0.0	57.6	0.0	0.8	0.0	4.4	0.7	5.7	0.0	21.4	1.1
Swift Creek—Suwannee River (0311020108)																		
031102010801	3.7	7.1	0.6	1.1	0.1	0.0	9.0	0.0	31.6	0.0	1.9	0.1	9.0	1.3	25.9	0.4	6.2	1.9
031102010802	0.9	1.7	0.1	1.0	0.4	0.1	13.1	0.0	40.6	0.0	1.8	0.2	7.4	1.9	16.8	0.0	11.3	2.6
031102010803	1.2	0.3	0.0	0.6	<0.1	0.0	12.8	0.0	42.3	0.0	1.7	0.1	6.6	2.6	18.0	0.0	12.3	1.6
031102010804	7.0	<0.1	0.0	1.4	1.4	6.0	9.4	0.0	21.7	0.0	2.4	<0.1	11.6	0.9	9.9	0.0	24.4	3.9
Sugar Creek—Suwannee River (0311020109)																		
031102010901	1.3	0.2	0.0	0.2	0.2	2.1	15.2	0.0	43.8	0.0	1.0	<0.1	6.2	1.1	14.1	0.0	12.2	2.3
031102010902	0.5	0.1	0.0	0.1	<0.1	0.0	8.7	0.0	46.1	0.0	0.5	<0.1	8.7	1.1	21.5	0.1	10.9	1.8
031102010903	0.6	7.7	1.1	0.2	<0.1	0.0	6.8	0.0	46.0	0.0	0.0	0.3	5.2	1.2	10.8	0.0	18.6	1.5
031102010904	0.3	<0.1	0.0	0.1	<0.1	0.0	9.9	0.4	48.1	1.2	<0.1	0.1	8.6	1.1	17.0	0.0	10.7	2.4
031102010905	0.6	0.8	0.0	0.1	<0.1	0.0	12.9	2.6	28.2	11.7	0.6	0.1	7.1	0.8	21.4	0.0	12.3	0.9

Table E–8. Land-cover percentages for Okefenokee National Wildlife Refuge and Wilderness and contributing watersheds, Florida and Georgia, based on the 1992 National Land Cover Database.—Continued

[See figure E6 for map of 1992 land cover, St Marys and Upper Suwannee hydrologic cataloging units, and listing of 12-digit and 10-digit HUC names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 1992 NLCD (Vogelmann and others, 2001); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of 1992 NLCD land-cover class[a]																	
	11	21	22	23	31	32	33	41	42	43	51	61	71	81	82	85	91	92
Altamaha—St Marys (0307)—St Marys (03070204)																		
0307020401	0.1	0.3	<0.1	0.1	<0.1	0.0	7.9	0.0	36.8	0.0	<0.1	<0.1	0.7	0.1	1.9	0.0	48.3	3.7
0307020402	1.6	0.1	0.0	0.1	0.0	0.0	4.5	0.0	49.1	0.0	0.0	0.1	1.1	<0.1	0.1	0.0	42.1	1.4
0307020403	0.1	0.7	<0.1	0.1	<0.1	0.0	10.9	0.0	59.9	0.0	0.2	<0.1	1.1	0.4	2.3	0.0	23.7	0.6
0307020404	0.9	4.2	0.4	0.4	0.1	0.0	9.6	0.0	55.5	0.0	0.6	0.4	2.0	0.4	3.5	<0.1	21.0	1.0
0307020405	0.3	0.7	0.1	0.2	0.1	<0.1	10.3	0.0	57.2	0.0	0.0	0.1	1.9	0.3	0.9	0.0	25.6	2.2
0307020406	0.1	0.6	<0.1	0.1	<0.1	0.0	10.6	0.0	62.1	0.0	0.0	0.1	2.7	0.1	0.0	0.0	22.3	1.2
0307020407	2.2	<0.1	0.0	<0.1	<0.1	0.0	3.4	0.0	20.7	0.0	<0.1	<0.1	<0.1	0.0	0.0	0.0	62.8	10.8
0307020408	0.3	1.9	0.1	0.3	<0.1	0.0	17.1	<0.1	54.1	<0.1	1.9	0.1	1.5	0.1	1.3	0.1	19.2	2.1
0307020409	6.8	4.9	0.8	1.3	0.1	<0.1	5.6	0.0	40.4	0.0	2.9	0.2	1.7	0.1	0.6	0.4	22.9	11.2
Suwannee (0311)—Upper Suwannee (03110201)																		
0311020101	0.3	0.1	<0.1	0.1	<0.1	<0.1	5.0	0.7	39.3	1.0	<0.1	<0.1	0.2	0.3	0.8	<0.1	44.7	7.4
0311020102	<0.1	0.5	0.1	0.1	<0.1	0.0	5.5	<0.1	72.5	<0.1	0.3	<0.1	0.2	<0.1	0.1	<0.1	18.5	2.0
0311020103	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	7.6	1.7	55.5	2.0	<0.1	<0.1	<0.1	0.4	1.6	<0.1	27.5	3.4
0311020104	0.1	<0.1	0.0	<0.1	0.0	0.0	2.8	0.0	32.9	0.0	<0.1	0.1	<0.1	<0.1	<0.1	0.0	53.9	10.2
0311020105	<0.1	0.0	0.0	<0.1	0.0	0.0	10.1	<0.1	40.9	<0.1	0.0	<0.1	<0.1	<0.1	<0.1	0.0	44.7	4.1
0311020106	2.5	<0.1	0.0	0.3	0.2	2.2	7.7	0.0	45.5	0.0	0.0	0.1	3.8	0.1	1.2	0.0	33.6	2.8
0311020107	0.3	1.2	0.1	0.3	<0.1	0.4	5.1	0.0	52.0	0.0	0.3	0.1	1.6	0.3	2.2	<0.1	34.7	1.3
0311020108	3.1	2.3	0.2	1.0	0.5	1.5	11.2	0.0	34.1	0.0	2.0	0.1	8.7	1.7	17.5	0.1	13.5	2.6
0311020109	0.7	2.0	0.2	0.1	<0.1	0.5	10.9	0.7	41.8	2.9	0.4	0.1	7.0	1.1	16.8	<0.1	13.2	1.7
Hydrologic cataloging units																		
03070204	1.9	1.8	0.2	0.4	<0.1	<0.1	8.2	0.0	46.8	<0.1	0.8	0.1	1.4	0.2	1.1	0.1	32.4	4.6
03110201	0.6	0.4	<0.1	0.2	0.1	0.3	6.8	0.5	44.7	0.9	0.2	0.1	1.6	0.4	3.1	<0.1	35.3	4.8
National Wildlife Refuge																		
Okefenokee	0.9	<0.1	0.0	<0.1	0.0	0.0	0.8	0.0	22.7	0.0	<0.1	<0.1	<0.1	0.0	<0.1	0.0	53.2	22.3
Okefenokee Wilderness	1.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	6.7	0.0	<0.1	<0.1	0.0	0.0	<0.1	0.0	79.7	12.5

[a]1992 NLCD class definitions:
- 11, open water
- 21, low-intensity residential
- 22, high-intensity residential
- 23, commercial, industrial, transportation
- 31, bare rock, sand, clay
- 32, quarries, strip mines, gravel pits
- 33, transitional
- 41, deciduous forest
- 42, evergreen forest
- 43, mixed forest
- 51, shrubland
- 61, orchards, vineyards, other
- 71, grasslands, herbaceous
- 81, pasture/hay
- 82, row crops
- 85, urban/recreational grasses
- 91, woody wetlands
- 92, emergent herbaceous wetlands

Table E–9. Land-cover percentages for Okefenokee National Wildlife Refuge and Wilderness and contributing watersheds, Florida and Georgia, based on the 2001 National Land Cover Database.

[See figure E7 for map of 2001 land cover, St Marys and Upper Suwannee hydrologic cataloging units, and listing of 12-digit and 10-digit hydrologic unit names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 2001 NLCD (Homer and others, 2007); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of 2001 NLCD land-cover class[a]														
	11	21	22	23	24	31	41	42	43	52	71	81	82	90	95
Altamaha—St Marys (0307)—St Marys (03070204)															
North Prong St Marys River (0307020401)															
030702040101	<0.1	2.4	0.2	<0.1	0.0	0.1	<0.1	27.2	0.1	1.5	6.4	<0.1	0.4	61.4	0.2
030702040102	0.0	0.4	0.0	0.0	0.0	0.0	0.0	12.9	<0.1	0.5	1.4	0.0	<0.1	84.3	0.4
030702040103	<0.1	2.0	0.1	0.0	0.0	0.0	0.1	19.8	0.4	1.4	9.9	0.4	0.3	64.9	0.7
030702040104	0.0	3.9	0.5	<0.1	0.0	0.1	0.6	37.4	1.7	2.7	18.9	2.3	1.6	29.7	0.7
030702040105	0.0	4.8	0.9	0.2	0.1	0.3	0.9	37.7	3.3	3.1	22.4	4.7	4.5	16.5	0.5
Middle Prong St Marys River (0307020402)															
030702040201	4.4	3.0	0.3	<0.1	0.0	<0.1	<0.1	51.0	0.2	0.4	1.7	<0.1	<0.1	38.6	0.2
030702040202	<0.1	2.7	<0.1	0.0	0.0	<0.1	<0.1	53.9	0.5	0.3	0.8	<0.1	<0.1	41.6	0.1
030702040203	0.0	3.7	<0.1	0.0	0.0	<0.1	<0.1	34.0	0.2	2.2	7.8	<0.1	0.3	51.6	0.1
030702040204	0.0	3.1	0.1	0.0	0.0	0.0	0.2	36.2	0.6	2.1	14.1	2.1	0.5	40.7	0.3
030702040205	<0.1	5.0	0.2	0.0	0.0	0.0	0.8	52.3	3.6	0.7	8.7	4.0	1.8	22.8	0.1
Cedar Creek—St Marys River (0307020403)															
030702040301	0.1	4.7	0.8	<0.1	0.0	0.0	0.3	52.6	1.2	1.3	12.6	2.7	1.9	21.2	0.7
030702040302	0.0	3.0	<0.1	<0.1	0.0	0.0	0.2	55.9	0.2	0.9	5.2	1.6	0.8	32.2	<0.1
030702040303	0.0	3.7	0.2	0.0	0.0	<0.1	0.9	51.5	2.6	1.4	18.8	1.6	2.6	16.6	0.1
South Prong St Marys River (0307020404)															
030702040401	2.8	4.8	0.4	<0.1	0.0	0.1	0.1	42.7	0.3	1.9	17.8	0.5	0.6	26.8	1.1
030702040402	0.0	4.0	0.3	<0.1	0.0	0.0	0.7	42.7	0.8	2.2	22.2	4.6	1.9	20.0	0.6
030702040403	<0.1	8.4	3.3	0.7	0.1	0.4	0.6	36.8	1.6	2.0	24.8	1.6	1.3	17.7	0.6
030702040404	<0.1	8.4	2.3	0.2	0.1	0.0	0.9	40.6	2.1	1.0	20.5	5.3	1.6	16.4	0.6
030702040405	<0.1	9.3	2.6	0.7	0.1	0.1	2.5	31.8	3.7	1.8	20.7	6.9	5.6	13.9	0.2
Upper St Marys River (0307020405)															
030702040501	0.2	6.4	1.1	0.2	0.1	<0.1	0.7	47.6	1.6	1.5	16.2	1.0	1.3	21.6	0.7
030702040502	0.3	5.0	0.5	0.2	0.4	<0.1	0.8	46.2	1.9	0.8	11.9	2.5	0.4	28.2	0.9
030702040503	0.1	3.7	0.4	<0.1	<0.1	0.5	0.7	49.5	3.2	2.0	17.3	1.0	1.0	20.2	0.3
Middle St Marys River (0307020406)															
030702040601	<0.1	4.7	0.2	<0.1	<0.1	<0.1	0.3	51.3	0.8	1.2	12.8	2.5	1.5	24.5	0.2
030702040602	<0.1	5.5	0.5	<0.1	<0.1	0.1	1.1	54.0	3.3	2.4	14.5	2.1	1.0	15.2	0.2
030702040603	<0.1	5.7	0.6	0.4	<0.1	1.4	1.2	53.0	4.2	1.4	13.8	2.1	0.8	14.7	0.5
Cornhouse Creek—Suwannee Canal (0307020407)															
030702040701	1.2	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	<0.1	<0.1	0.0	0.0	90.8	2.1
030702040702	1.0	1.1	<0.1	<0.1	0.0	<0.1	<0.1	16.6	0.1	0.3	1.4	0.2	0.2	75.1	3.7
030702040703	0.1	2.3	0.6	0.2	0.0	1.6	0.1	27.2	0.5	1.7	12.3	0.1	0.9	52.0	0.5
St Marys River—Spanish Creek (0307020408)															
030702040801	0.1	9.2	2.8	0.5	0.1	0.1	1.3	49.2	3.1	1.2	15.9	2.1	2.4	11.3	0.8
030702040802	0.1	5.1	1.4	<0.1	0.0	<0.1	1.3	52.2	1.9	0.8	15.0	1.3	2.4	17.0	1.5
030702040803	0.3	4.8	0.3	<0.1	0.0	<0.1	1.8	55.1	4.4	1.2	13.7	2.4	1.4	14.1	0.4
Lower St Marys River (0307020409)															
030702040901	1.0	4.6	0.9	0.1	<0.1	0.1	2.6	43.4	5.2	1.0	18.5	1.8	1.6	18.6	0.3
030702040902	1.5	3.3	0.1	<0.1	0.0	0.0	1.9	43.7	3.2	0.4	13.5	0.8	0.6	30.5	0.5
030702040903	<0.1	7.0	1.4	0.3	0.1	<0.1	3.0	41.6	4.5	1.1	19.2	2.9	0.9	17.4	0.6
030702040904	0.3	2.4	0.1	<0.1	0.0	0.0	0.9	48.9	2.6	0.6	12.1	0.3	0.1	29.3	2.2
030702040905	3.2	7.2	4.1	0.9	0.2	0.2	0.7	34.1	2.4	0.4	7.7	0.5	0.4	22.8	15.3
030702040906	17.5	9.4	6.7	2.0	0.9	1.1	0.4	17.8	1.4	0.2	4.5	0.7	<0.1	4.4	33.1
030702040907	10.8	10.8	6.3	1.9	0.6	0.2	0.4	23.6	1.5	0.3	4.2	0.8	<0.1	7.6	31.0

Table E–9. Land-cover percentages for Okefenokee National Wildlife Refuge and Wilderness and contributing watersheds, Florida and Georgia, based on the 2001 National Land Cover Database.—Continued

[See figure E7 for map of 2001 land cover, St Marys and Upper Suwannee hydrologic cataloging units, and listing of 12-digit and 10-digit hydrologic unit names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 2001 NLCD (Homer and others, 2007); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of 2001 NLCD land-cover class[a]														
	11	21	22	23	24	31	41	42	43	52	71	81	82	90	95
Suwannee (0311)—Upper Suwannee (03110201)															
Okefenokee Swamp (0311020101)															
031102010101	<0.1	4.3	1.2	<0.1	0.0	<0.1	0.5	43.6	0.5	2.1	12.6	2.1	4.0	27.9	1.0
031102010102	0.0	5.4	2.2	0.1	0.0	<0.1	0.8	40.4	0.6	2.7	11.9	2.6	3.9	27.7	1.6
031102010103	<0.1	4.6	2.7	0.1	0.0	<0.1	0.6	39.9	0.2	1.3	12.1	1.6	3.3	32.8	0.9
031102010104	<0.1	4.3	2.7	0.2	<0.1	<0.1	0.7	39.0	0.2	1.9	13.5	1.6	1.9	32.4	1.6
031102010105	0.2	1.9	0.3	<0.1	<0.1	<0.1	0.2	21.7	0.3	0.6	6.1	0.5	0.4	66.5	1.3
Tatum Creek (0311020102)															
031102010201	<0.1	5.7	2.8	0.4	0.2	<0.1	0.5	36.5	0.3	2.0	16.0	1.3	1.3	32.1	1.0
031102010202	<0.1	3.6	0.6	<0.1	0.0	0.0	<0.1	41.7	0.1	0.9	10.7	0.2	0.3	41.4	0.4
Suwanoochee Creek (0311020103)															
031102010301	<0.1	3.7	0.8	<0.1	<0.1	0.2	0.9	39.8	0.8	1.1	12.1	1.3	2.8	33.1	3.4
031102010302	0.8	3.5	1.1	<0.1	0.0	<0.1	0.4	43.7	0.5	0.5	10.9	0.8	1.2	35.8	0.7
031102010303	<0.1	3.1	0.5	0.0	0.0	0.0	0.2	43.2	0.7	1.3	6.0	0.2	0.1	43.7	1.0
031102010304	<0.1	4.7	0.6	0.0	0.0	0.0	0.1	47.7	0.1	1.1	7.8	<0.1	0.1	37.2	0.5
031102010305	<0.1	4.2	0.9	<0.1	0.0	<0.1	0.2	35.8	0.3	0.8	18.0	0.1	0.3	38.8	0.6
Suwannee River—Cypress Creek (0311020104)															
031102010401	<0.1	2.6	0.2	0.0	0.0	<0.1	<0.1	21.7	0.1	1.8	2.8	<0.1	<0.1	70.2	0.5
031102010402	<0.1	1.6	0.1	0.0	0.0	0.0	0.1	19.9	0.2	1.6	5.2	<0.1	<0.1	70.6	0.7
Toms Creek—Suwannee River (0311020105)															
031102010501	0.0	2.3	0.6	<0.1	0.0	0.0	0.1	44.6	1.1	1.1	4.2	0.1	0.2	45.7	0.1
031102010502	0.0	2.9	0.6	0.0	0.0	0.0	0.3	38.5	0.8	2.0	16.2	0.2	0.4	38.0	0.2
031102010503	0.0	2.8	0.1	<0.1	0.0	0.0	0.1	25.7	<0.1	0.6	4.4	0.1	0.5	65.5	0.4
031102010504	<0.1	2.6	<0.1	0.0	0.0	<0.1	0.1	28.0	0.2	1.3	3.2	<0.1	0.1	64.1	0.3
031102010505	<0.1	4.1	0.4	0.0	0.0	0.1	0.5	38.3	1.3	1.8	13.5	0.1	0.8	37.4	1.8
Rocky Creek—Suwannee River (0311020106)															
031102010601	0.0	3.5	0.4	0.0	0.0	0.0	0.1	35.6	0.2	1.3	18.2	0.2	0.8	37.2	2.4
031102010602	0.3	3.7	0.2	<0.1	0.0	3.8	1.2	39.2	2.2	1.6	10.1	1.0	1.7	33.8	1.3
031102010603	3.1	3.8	0.7	0.4	0.9	6.5	6.4	23.9	5.5	3.0	16.1	1.0	1.9	20.1	6.7
031102010604	3.3	3.0	0.2	0.0	0.0	0.2	3.9	22.3	4.7	1.7	26.0	1.4	2.7	25.5	5.1
031102010605	<0.1	4.3	1.1	<0.1	0.0	<0.1	1.7	40.1	3.7	2.8	16.4	1.2	3.3	24.6	0.8
031102010606	<0.1	3.8	0.5	<0.1	0.0	0.1	1.0	38.0	2.0	1.9	19.8	0.8	1.5	29.8	0.8
Robinson Creek—Suwannee River (0311020107)															
031102010701	0.1	2.7	<0.1	0.0	0.0	0.0	<0.1	34.5	0.2	0.4	2.8	<0.1	<0.1	59.1	0.3
031102010702	0.0	3.6	0.2	<0.1	0.0	<0.1	0.4	49.9	1.3	0.9	5.4	0.9	0.9	35.8	0.7
031102010703	0.3	8.2	2.9	0.7	0.2	<0.1	3.0	50.4	4.7	0.2	6.6	1.5	0.4	20.6	0.2
031102010704	0.2	3.6	0.3	<0.1	0.0	0.2	4.3	43.5	7.3	1.1	12.5	3.9	1.9	21.0	0.4
Swift Creek—Suwannee River (0311020108)															
031102010801	1.4	11.9	4.0	1.4	0.7	0.1	4.6	15.3	10.4	0.5	18.7	17.7	6.1	6.1	1.2
031102010802	0.1	7.6	1.7	0.3	<0.1	0.1	7.9	24.5	13.1	1.0	21.0	10.3	2.8	9.1	0.5
031102010803	0.7	4.6	1.5	<0.1	0.0	0.0	7.5	31.3	7.3	1.3	15.6	13.0	5.0	11.8	0.4
031102010804	9.4	4.0	1.3	1.4	0.4	10.3	6.2	15.5	4.7	3.0	20.4	3.8	2.3	12.4	5.1
Sugar Creek—Suwannee River (0311020109)															
031102010901	0.6	5.4	1.5	0.5	<0.1	0.9	11.2	24.9	13.0	2.2	18.6	9.2	2.1	9.0	1.0
031102010902	0.3	5.2	1.2	0.3	0.0	1.1	14.8	21.2	11.3	1.0	17.9	12.9	7.1	5.2	0.7
031102010903	0.1	6.0	2.6	0.5	0.1	0.5	6.5	33.5	5.3	0.4	13.4	7.6	5.7	17.1	0.9
031102010904	0.0	4.9	0.4	<0.1	0.0	<0.1	10.4	28.6	9.8	0.8	18.6	10.7	7.4	7.8	0.6
031102010905	0.1	4.7	0.4	0.1	<0.1	<0.1	9.4	25.3	10.4	0.6	14.6	8.6	14.6	10.4	0.8

Table E–9. Land-cover percentages for Okefenokee National Wildlife Refuge and Wilderness and contributing watersheds, Florida and Georgia, based on the 2001 National Land Cover Database.—Continued

[See figure E7 for map of 2001 land cover, St Marys and Upper Suwannee hydrologic cataloging units, and listing of 12-digit and 10-digit hydrologic unit names. HUC, hydrologic unit code; NLCD, National Land Cover Database; 2001 NLCD (Homer and others, 2007); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of 2001 NLCD land-cover class[a]														
	11	21	22	23	24	31	41	42	43	52	71	81	82	90	95
Altamaha—St Marys (0307)—St Marys (03070204)															
0307020401	<0.1	2.9	0.4	0.1	<0.1	0.1	0.3	28.4	1.2	2.0	12.9	1.6	1.5	48.0	0.5
0307020402	1.4	3.3	0.1	<0.1	0.0	<0.1	0.1	46.6	0.7	1.0	4.9	0.7	0.3	40.6	0.2
0307020403	<0.1	4.0	0.4	<0.1	0.0	<0.1	0.4	53.2	1.3	1.2	12.2	2.2	1.8	22.8	0.4
0307020404	0.7	6.9	1.7	0.3	0.1	0.1	0.8	39.7	1.6	1.7	20.8	3.6	1.9	19.5	0.7
0307020405	0.2	4.9	0.6	0.2	0.2	0.2	0.7	47.8	2.3	1.4	15.1	1.5	0.9	23.5	0.6
0307020406	<0.1	5.4	0.5	0.2	0.0	0.5	1.0	53.1	3.1	1.8	13.9	2.2	1.0	17.0	0.3
0307020407	0.8	1.2	0.2	0.1	0.0	0.5	0.1	16.8	0.2	0.7	4.4	0.1	0.3	72.5	2.3
0307020408	0.1	6.0	1.4	0.2	<0.1	<0.1	1.5	52.4	3.1	1.0	14.7	1.9	2.1	14.6	1.0
0307020409	4.8	6.3	2.7	0.7	0.3	0.2	1.5	36.3	3.1	0.6	11.6	1.1	0.6	18.7	11.5
Suwannee (0311)—Upper Suwannee (03110201)															
0311020101	0.1	2.4	0.7	<0.1	<0.1	<0.1	0.3	25.4	0.3	0.9	7.4	0.7	0.9	59.4	1.3
0311020102	<0.1	4.4	1.3	0.1	0.1	<0.1	0.2	39.9	0.2	1.3	12.6	0.6	0.6	38.1	0.6
0311020103	0.2	3.8	0.8	<0.1	<0.1	0.1	0.4	41.4	0.5	0.9	11.7	0.6	1.2	37.1	1.4
0311020104	<0.1	2.1	0.1	0.0	0.0	<0.1	<0.1	20.8	0.1	1.7	4.0	<0.1	<0.1	70.4	0.6
0311020105	<0.1	2.9	0.4	<0.1	0.0	<0.1	0.2	35.1	0.6	1.4	8.4	0.1	0.4	50.1	0.5
0311020106	0.8	3.7	0.5	0.1	0.1	1.9	2.0	34.9	2.8	2.0	16.5	1.0	1.9	29.6	2.3
0311020107	0.1	4.4	0.8	0.2	<0.1	0.1	2.0	44.7	3.5	0.7	7.1	1.7	0.9	33.5	0.4
0311020108	2.8	7.2	2.1	0.8	0.3	2.6	6.6	21.3	9.3	1.4	19.4	10.9	3.8	9.7	1.8
0311020109	0.2	5.2	1.3	0.3	<0.1	0.5	10.2	26.9	9.9	1.0	16.4	9.5	7.4	10.3	0.8
Hydrologic cataloging units															
03070204	1.3	4.7	1.1	0.2	0.1	0.2	0.8	39.9	1.9	1.2	12.2	1.6	1.1	30.9	2.8
03110201	0.3	3.5	0.8	0.1	<0.1	0.4	1.7	31.4	2.1	1.1	10.4	2.0	1.6	43.5	1.2
National Wildlife Refuge															
Okefenokee	0.1	1.2	<0.1	<0.1	0.5	0.5	<0.1	13.0	0.1	0.5	0.7	<0.1	<0.1	82.9	1.4
Okefenokee Wilderness	0.4	0.1	<0.1	<0.1	0.5	0.5	<0.1	4.6	<0.1	<0.1	0.1	<0.1	<0.1	93.2	1.5

[a]2001 NLCD class definitions:
11, open water
21, developed, open space
22, developed, low intensity
23, developed, medium intensity
24, developed, high intensity
31, bare land (rock/sand/clay)
42, evergreen forest
52, shrub/scrub
71, grasslands/herbaceous
81, pasture/hay
82, cultivated crops
90, woody wetlands
95, emergent herbaceous wetlands

Table E–10. Land-cover-change percentages for Okefenokee National Wildlife Refuge and Wilderness and contributing watersheds, Florida and Georgia, based on the 1992–2001 National Land Cover Database-Land Cover Change Retrofit product.

[See figure E8 for map of 1992–2001 land-cover change, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. Positive percent-net-change values indicate a net gain, negative percent-net-change values indicate a net loss. Abbreviations: HUC, hydrologic unit code; NLCD-LCCR, National Land Cover Database-Land Cover Change Retrofit product; 1992–2001 NLCD-LCCR (Fry and others, 2009); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of HUC/NWR with classification change[a]	Percentage of total HUC area changed in modified Anderson level 1 classifications, 2001[b,c]							Percentage net change from 1992 to 2001 in modified Anderson level 1 classifications[b,d]						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Altamaha—St Marys (0307)—St Marys (03070204)															
North Prong St Marys River (0307020401)															
030702040101	10.4	0.1	7.6	0.8	13.1	66.9	2.2	9.3	0.1	7.5	0.8	–69.6	51.9	1.4	8.0
030702040102	2.8	0.0	3.2	0.0	22.1	64.5	0.8	9.4	0.0	3.2	0.0	–55.5	62.3	0.8	–10.8
030702040103	10.3	0.1	5.3	0.0	5.3	77.4	3.1	8.9	–0.1	5.3	0.0	–87.4	72.7	2.8	6.8
030702040104	18.6	0.0	6.4	0.1	12.7	66.8	5.7	8.4	0.0	6.1	0.1	–71.9	54.4	4.3	7.1
030702040105	25.4	0.0	7.8	0.7	11.6	62.0	13.4	4.5	–0.1	7.6	0.7	–73.1	50.5	12.5	1.8
Middle Prong St Marys River (0307020402)															
030702040201	2.8	0.1	4.1	0.6	34.6	35.2	1.1	24.3	–2.3	3.9	0.5	–21.8	2.0	0.4	17.3
030702040202	2.0	0.0	12.8	0.0	34.5	31.3	0.2	21.2	–1.1	12.4	0.0	–27.3	2.9	–1.7	14.7
030702040203	9.9	0.0	9.7	0.1	6.2	69.8	2.4	11.7	0.0	9.7	0.1	–85.7	65.3	1.8	8.7
030702040204	14.0	0.0	5.1	0.0	16.2	69.5	3.6	5.5	0.0	5.1	0.0	–64.0	52.4	2.9	3.5
030702040205	8.0	0.2	5.5	0.0	22.2	55.0	13.5	3.6	0.2	5.5	0.0	–50.7	31.1	13.4	0.5
Cedar Creek—St Marys River (0307020403)															
030702040301	12.6	0.0	5.2	0.0	22.9	54.3	8.4	9.2	–0.5	4.4	–0.2	–44.5	35.1	4.2	1.4
030702040302	9.8	0.0	3.0	0.0	45.2	40.9	2.7	8.2	–0.3	–3.4	–1.6	–2.5	11.3	–4.3	0.7
030702040303	24.8	0.0	2.7	<0.1	26.0	59.0	8.9	3.3	0.0	2.5	<0.1	–40.4	34.7	5.9	–2.8
South Prong St Marys River (0307020404)															
030702040401	23.0	0.0	6.6	0.1	7.5	77.3	3.0	5.4	0.0	6.6	0.1	–82.4	70.9	1.8	3.1
030702040402	24.5	0.0	4.0	0.0	17.8	68.1	5.4	4.7	0.0	3.9	0.0	–60.5	51.4	2.1	3.2
030702040403	24.2	0.1	11.1	0.4	2.9	77.5	5.3	2.7	–0.2	11.0	0.4	–90.9	75.5	4.8	–0.6
030702040404	22.6	0.0	7.1	0.0	21.8	56.7	5.9	8.5	–0.1	6.8	0.0	–48.7	33.6	3.6	4.7
030702040405	23.4	<0.1	10.5	0.4	19.2	51.4	16.6	1.9	–0.1	10.3	0.4	–56.9	31.8	16.0	–1.4
Upper St Marys River (0307020405)															
030702040501	21.9	0.1	4.5	0.1	16.4	61.6	6.3	11.1	0.1	4.4	0.1	–62.5	44.1	5.6	8.3
030702040502	15.0	0.7	4.9	0.1	25.3	50.3	3.4	15.3	0.7	4.3	–>0.1	–43.4	24.6	1.3	12.6
030702040503	22.9	<0.1	4.1	0.8	26.9	57.8	4.6	5.7	<0.1	3.9	0.8	–41.8	29.4	2.7	5.0
Middle St Marys River (0307020406)															
030702040601	23.5	0.0	5.2	<0.1	36.0	42.6	5.3	10.9	0.0	5.1	<0.1	–19.8	2.4	3.1	9.2
030702040602	18.0	0.2	5.8	0.1	31.8	53.6	3.8	4.7	0.1	5.6	0.1	–32.2	24.1	0.5	1.8
030702040603	22.3	0.0	9.8	3.5	22.2	54.7	2.1	7.7	–0.2	9.6	3.3	–47.9	31.8	0.2	3.1
Cornhouse Creek—Suwannee Canal (0307020407)															
030702040701	1.4	23.0	0.0	0.0	5.5	0.0	0.0	71.5	22.2	0.0	–19.0	–46.2	0.0	0.0	42.9
030702040702	3.1	4.1	4.7	0.1	45.6	30.9	3.6	10.9	4.1	4.6	0.1	–2.7	–15.2	2.1	6.9
030702040703	16.7	0.0	6.7	4.9	10.3	67.8	5.0	5.4	0.0	6.7	4.9	–74.0	56.5	3.2	2.8
St Marys River—Spanish Creek (0307020408)															
030702040801	19.2	0.5	9.5	0.1	36.2	41.3	4.6	7.8	0.4	9.1	<0.1	–15.6	3.0	–0.7	3.9
030702040802	24.4	0.2	6.8	<0.1	32.4	46.0	7.8	6.9	0.1	6.6	<0.1	–29.0	13.9	3.9	4.5
030702040803	15.2	0.1	5.8	0.2	31.2	54.0	5.3	3.3	0.1	5.6	0.1	–33.2	23.5	2.8	1.1
Lower St Marys River (0307020409)															
030702040901	18.1	0.7	3.5	0.5	21.7	61.8	6.5	5.3	0.3	2.6	0.4	–46.7	42.8	3.0	–2.4
030702040902	15.1	1.0	4.1	0.0	13.9	68.4	4.2	8.4	0.6	3.8	–0.3	–62.3	54.1	2.7	1.4
030702040903	20.7	0.0	5.6	<0.1	26.1	55.8	4.0	8.5	–0.1	5.3	<0.1	–40.9	27.6	2.6	5.4
030702040904	15.3	0.1	2.4	0.0	19.9	64.0	1.3	12.3	0.1	2.3	0.0	–55.2	43.2	<0.1	9.5
030702040905	12.0	1.2	22.3	1.3	15.3	44.2	3.3	12.3	–0.1	21.9	1.2	–54.5	27.6	2.3	1.5
030702040906	6.4	7.9	34.7	5.4	8.5	33.7	2.0	7.8	4.1	34.3	5.4	–59.2	26.1	1.0	–11.8
030702040907	9.0	4.8	32.0	0.3	30.6	21.2	0.7	10.4	0.9	30.8	–0.0	–16.2	–11.6	–2.0	–1.9

Table E–10. Land-cover-change percentages for Okefenokee National Wildlife Refuge and Wilderness and contributing watersheds, Florida and Georgia, based on the 1992–2001 National Land Cover Database-Land Cover Change Retrofit product.—Continued

[See figure E8 for map of 1992–2001 land-cover change, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. Positive percent-net-change values indicate a net gain, negative percent-net-change values indicate a net loss. Abbreviations: HUC, hydrologic unit code; NLCD-LCCR, National Land Cover Database-Land Cover Change Retrofit product; 1992–2001 NLCD-LCCR (Fry and others, 2009); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of HUC/ NWR with classification change[a]	Percentage of total HUC area changed in modified Anderson level 1 classifications, 2001[b,c]							Percentage net change from 1992 to 2001 in modified Anderson level 1 classifications[b,d]						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Suwannee (0311)—Upper Suwannee (03110201)															
Okefenokee Swamp (0311020101)															
031102010101	16.2	<0.1	5.7	0.0	9.5	52.0	13.0	19.8	–0.2	5.6	–1.1	–78.3	52.0	3.4	18.6
031102010102	18.7	0.0	7.8	0.1	6.2	46.2	15.8	23.9	0.0	7.8	–1.3	–85.6	46.2	9.3	23.6
031102010103	17.6	0.0	8.2	<0.1	9.8	43.0	15.6	23.3	–>0.1	8.1	–0.8	–73.2	34.4	9.3	22.3
031102010104	18.9	0.0	6.2	0.2	16.7	45.0	10.0	21.9	–0.1	5.5	0.1	–57.4	31.0	1.3	19.5
031102010105	9.0	<0.1	5.7	0.1	11.9	54.8	5.3	22.1	–>0.1	5.6	–0.3	–68.9	41.8	2.9	19.0
Tatum Creek (0311020102)															
031102010201	22.2	0.0	9.7	<0.1	4.6	64.3	6.8	14.5	–0.1	9.7	<0.1	–85.3	58.4	5.5	11.7
031102010202	17.6	<0.1	5.6	0.0	16.6	60.4	2.1	15.3	<0.1	5.6	<0.1	–53.8	37.2	0.4	10.6
Suwanoochee Creek (0311020103)															
031102010301	18.2	0.0	6.4	0.5	20.9	47.4	10.1	14.8	–>0.1	6.4	0.5	–44.8	43.7	–2.7	–3.1
031102010302	18.1	<0.1	7.2	0.1	22.9	51.5	6.3	12.0	–0.1	7.1	0.1	–45.1	31.8	3.3	2.9
031102010303	9.7	0.0	6.7	0.0	15.3	54.0	1.8	22.1	–0.1	6.7	–0.1	–62.2	41.5	0.1	14.0
031102010304	15.9	0.1	6.1	0.0	24.5	48.9	0.9	19.5	0.1	6.0	0.0	–40.5	16.5	<0.1	17.9
031102010305	25.1	0.0	6.4	0.1	7.7	75.0	1.5	9.4	0.0	6.3	0.1	–77.4	65.7	1.0	4.2
Suwannee River—Cypress Creek (0311020104)															
031102010401	5.6	0.0	7.8	0.1	19.8	45.0	0.0	27.2	–0.1	7.7	0.1	–57.7	25.2	–0.8	25.6
031102010402	9.3	0.0	5.8	0.0	6.6	65.3	0.1	22.1	0.0	5.7	0.0	–80.7	59.0	–0.3	16.3
Toms Creek—Suwannee River (0311020105)															
031102010501	7.0	0.0	10.1	0.0	27.4	50.7	2.4	9.4	–0.1	9.9	0.0	–39.1	29.1	1.4	–1.3
031102010502	20.1	0.0	5.3	0.0	3.2	81.4	2.8	7.4	0.0	5.3	0.0	–89.9	77.9	2.8	4.0
031102010503	8.9	0.0	6.9	0.0	25.3	44.3	5.1	18.4	0.0	6.9	0.0	–44.4	19.0	4.5	13.9
031102010504	8.6	0.1	6.3	0.1	20.8	43.0	1.2	28.5	0.1	5.2	0.1	–52.4	22.4	0.2	24.3
031102010505	20.4	<0.1	6.3	0.1	5.7	71.5	3.9	12.4	–0.2	6.3	0.1	–80.7	65.8	3.9	4.7
Rocky Creek—Suwannee River (0311020106)															
031102010601	25.9	0.0	5.6	0.0	1.5	68.0	3.6	21.3	0.0	5.6	0.0	–95.2	66.2	3.6	19.9
031102010602	19.0	1.6	3.8	17.4	7.2	48.1	7.6	14.3	1.6	3.8	17.4	–62.0	39.7	6.9	–7.4
031102010603	25.7	3.0	3.8	5.3	23.0	32.5	3.4	29.1	–15.2	2.4	–2.0	–19.8	21.0	1.7	12.0
031102010604	42.1	3.5	2.5	0.1	28.2	34.3	3.5	27.9	–16.0	–5.9	–5.6	–1.7	17.6	–4.8	16.4
031102010605	24.1	0.1	7.3	0.1	11.7	63.3	9.9	7.6	–0.6	6.1	–0.6	–67.7	52.5	8.6	1.6
031102010606	23.9	0.2	5.9	0.3	8.0	75.4	5.8	4.4	0.2	5.8	0.3	–79.9	67.2	5.6	0.8
Robinson Creek—Suwannee River (0311020107)															
031102010701	5.0	0.2	5.0	0.0	16.4	35.7	0.5	42.2	0.2	4.7	0.0	–60.8	21.6	–0.9	35.2
031102010702	8.5	0.0	6.4	0.2	27.4	41.0	9.3	15.7	–0.1	6.4	0.2	–40.8	15.3	7.9	11.2
031102010703	8.4	0.0	10.8	0.0	37.0	37.8	8.9	5.4	–0.4	10.7	0.0	–15.9	4.7	5.4	–4.6
031102010704	15.8	0.9	4.1	0.4	30.1	49.7	11.1	3.6	0.2	2.7	0.3	–29.2	20.8	8.7	–3.4
Swift Creek—Suwannee River (0311020108)															
031102010801	15.0	0.1	12.6	0.8	27.2	35.5	15.7	8.1	–14.8	12.4	0.7	–17.2	8.9	13.2	–3.2
031102010802	16.8	0.0	4.5	0.2	48.3	30.5	12.1	4.4	–3.6	3.5	0.1	11.2	–14.2	5.8	–2.9
031102010803	16.3	0.0	3.3	0.0	46.2	30.8	18.2	1.5	–0.8	3.3	0.0	6.6	–13.4	9.2	–4.9
031102010804	37.9	18.2	5.9	13.0	20.8	28.5	2.2	11.4	4.7	1.2	10.2	–3.6	9.1	–3.0	–18.6
Sugar Creek—Suwannee River (0311020109)															
031102010901	18.9	1.7	6.9	3.1	33.1	39.2	8.7	7.4	1.0	5.2	2.7	–14.1	7.9	0.7	–3.5
031102010902	18.1	1.6	4.6	6.3	34.5	33.0	18.4	1.8	1.2	4.3	6.1	–15.1	–0.7	12.1	–7.9
031102010903	24.2	0.2	4.5	1.9	48.9	29.0	10.9	4.5	–0.2	4.3	1.9	7.9	–22.6	9.8	–1.0
031102010904	23.2	0.0	3.0	0.0	61.8	25.2	9.0	1.1	–0.1	2.9	0.0	29.7	–39.7	7.8	–0.6
031102010905	23.0	0.0	2.3	0.1	45.8	26.8	23.7	1.3	–>0.1	2.1	<0.1	–0.9	–10.3	21.2	–12.1

Table E–10. Land-cover-change percentages for Okefenokee National Wildlife Refuge and Wilderness and contributing watersheds, Florida and Georgia, based on the 1992–2001 National Land Cover Database-Land Cover Change Retrofit product.—Continued

[See figure E8 for map of 1992–2001 land-cover change, Southern Florida hydrologic subregion, and listing of 10-digit HUC names. Positive percent-net-change values indicate a net gain, negative percent-net-change values indicate a net loss. Abbreviations: HUC, hydrologic unit code; NLCD-LCCR, National Land Cover Database-Land Cover Change Retrofit product; 1992–2001 NLCD-LCCR (Fry and others, 2009); NWR, National Wildlife Refuge]

12-digit HUC, 10-digit HUC, or NWR	Percentage of HUC/NWR with classification change[a]	Percentage of total HUC area changed in modified Anderson level 1 classifications, 2001[b,c]							Percentage net change from 1992 to 2001 in modified Anderson level 1 classifications[b,d]						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Altamaha—St Marys (0307)—St Marys (03070204)															
0307020401	14.7	<0.1	6.9	0.4	11.1	66.9	7.5	7.1	–>0.1	6.7	0.4	–74.6	55.9	6.6	4.9
0307020402	5.9	0.1	7.3	0.1	17.9	59.0	3.9	11.7	–0.4	7.2	0.1	–60.2	42.0	3.3	8.0
0307020403	14.8	0.0	3.8	<0.1	27.8	54.0	7.7	6.7	–0.3	2.3	–0.3	–35.9	31.0	3.5	–0.4
0307020404	23.3	<0.1	7.6	0.1	14.2	66.3	6.4	5.3	–0.1	7.4	0.1	–66.8	52.2	4.7	2.4
0307020405	19.8	0.2	4.4	0.4	23.1	57.0	4.8	10.0	0.2	4.2	0.3	–48.9	32.8	3.3	8.1
0307020406	20.6	0.1	7.1	1.3	29.3	51.4	3.6	7.3	<0.1	6.9	1.3	–35.0	21.8	1.0	4.0
0307020407	6.8	2.1	5.9	3.7	16.5	57.1	4.4	10.2	2.0	5.9	2.6	–59.3	40.0	2.8	5.8
0307020408	19.9	0.3	7.2	0.1	33.0	46.9	6.4	6.2	0.2	6.9	<0.1	–26.9	13.8	2.5	3.4
0307020409	13.9	1.5	10.8	0.6	20.2	54.4	3.9	8.7	0.5	10.3	0.5	–48.1	34.0	1.8	0.9
Suwannee (0311)—Upper Suwannee (03110201)															
0311020101	10.8	<0.1	6.0	0.1	12.1	52.0	7.7	22.1	<0.1	5.8	–0.4	–68.7	40.5	3.4	19.5
0311020102	19.2	<0.1	7.3	<0.1	11.7	62.0	4.0	15.0	<0.1	7.3	<0.1	–66.7	45.8	2.5	11.1
0311020103	18.1	<0.1	6.6	0.2	17.6	57.2	5.0	13.4	<0.1	6.6	0.2	–55.2	44.0	0.6	4.0
0311020104	7.5	0.0	6.5	0.1	11.5	57.8	0.1	24.0	<0.1	6.4	0.1	–72.2	46.5	–0.5	19.7
0311020105	13.0	<0.1	6.4	<0.1	11.6	65.5	3.0	13.4	<0.1	6.2	<0.1	–71.4	54.5	2.7	8.0
0311020106	25.0	1.4	4.7	4.6	13.0	53.8	5.7	16.7	–4.5	2.8	2.6	–54.4	44.1	3.6	5.9
0311020107	9.7	0.4	6.1	0.2	29.2	43.7	9.0	11.3	<0.1	5.4	0.2	–32.9	16.4	6.7	4.2
0311020108	21.5	8.0	6.3	5.9	32.6	30.5	9.2	7.7	–1.4	3.9	4.6	–0.5	–0.1	3.6	–10.1
0311020109	21.5	0.6	4.2	2.0	45.1	30.4	14.3	3.3	0.3	3.7	1.9	1.8	–13.3	10.8	–5.1
Hydrologic cataloging units															
03070204	15.3	0.4	7.2	0.6	20.9	57.7	5.4	7.8	0.2	6.9	0.5	–51.7	36.9	3.4	3.9
03110201	14.9	1.0	5.9	1.5	19.2	50.5	7.0	14.9	–0.8	5.3	0.9	–49.3	32.8	3.7	7.4
National Wildlife Refuge															
Okefenokee	1.6	0.1	11.4	<0.1	5.9	38.9	<0.1	43.7	–0.3	11.2	<0.1	–76.1	29.7	–0.3	35.8
Okefenokee Wilderness	0.5	7.6	1.7	<0.1	16.6	8.9	0.2	65.0	7.3	1.6	–4.2	–49.5	–1.2	–0.5	46.5

[a]Areal percentage of 30-meter cells that were reclassified between 1992 and 2001 using methods described in Fry and others (2009). The reclassified area is used as the base for comparison in presenting the modified Anderson Level 1 classification and net-change percentages for 2001.

[b]Classifications modified from Anderson level 1 land-cover classifications (Anderson and others, 1976):
1, water
2, urban
3, barren
4, forest
5, grassland
6, agriculture
7, wetland

[c]Percentages given are of the portion of the HUC/NWR that changed classification between 1992 and 2001.

[d]The interpretation would be a conversion from the classification(s) with negative values to the classification(s) with positive values. For example, in the 12.2 percent of HUC 0309010103 that changed classification between 1992 and 2001, primarily agricultural land or wetland was converted to urban land. The net gains in modified Anderson level 1 classification balance the net losses.

Summary

The hydrologic and landscape databases for the Cahaba River National Wildlife Refuge (NWR), the Caloosahatchee and "Ding" Darling NWRs, the Clarks River NWR, the Lower Suwannee NWR, and the Okefenokee NWR were developed by the U.S. Geological Survey (USGS) in cooperation with the U.S. Fish and Wildlife Service (USFWS) to provide an assessment and evaluation tool for NWR managers and USFWS scientific and technical staff to use in examining NWR-specific hydrologic patterns and trends as related to water availability and water quality for NWR ecosystems, habitats, and target species. The databases include hydrologic (discharge, gage height, and water quality) time-series data, statistics, and Indicators of Hydrologic Alteration (IHA) metrics that can be used to assess NWR hydrologic conditions and the availability of aquatic and riparian habitat, as well as landscape summary data that describe the NWR environmental setting and the locations of the hydrologic data-collection stations.

The primary purpose of this report is to describe data-collection, data-reduction, and data-analysis methods used to construct the databases, and provide statistical and graphical descriptions of the databases. The purpose of the databases is for hydrologic characterization and analysis to support NWR management of riparian and in-stream resources.

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