PROCESSING WATER-CHEMISTRY DATA, GULF COAST AQUIFER SYSTEMS, SOUTH-CENTRAL UNITED STATES, WITH SUMMARY OF DISSOLVED-SOLIDS CONCENTRATIONS AND WATER TYPES

By Robert A. Pettijohn

U.S. GEOLOGICAL SURVEY
Water-Resources Investigations Report 86-4186

Austin, Texas
1986

UNITED STATES DEPARTMENT OF THE INTERIOR

DONALD PAUL HODEL, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

For more information
write to:

Project Chief
U.S. Geological Suvey
Gulf Coast RASA
N. Shore Plaza Bldg., Rm. 104
55 North Interregional Hwy.
Austin, Texas 78702

Copies of this report can
be purchased from:

U.S. Geologicl Survey
Books and Open-File Reports
Federal Center, Bldg., 41
Box 25425
Denver, Colorado 80225
Telephone (303) 236-7476

ILLUSTRATIONS

TABLES

FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM (SI) METRIC UNITS

Multiply inch-pound units	By	To obtain SI units
mile (mi)	1.609	kilometer
square mile (mi^2)	2.590	square kilometer

CONTENTS

PROCESSING WATER-CHEMISTRY DATA, GULF COAST AQUIFER SYSTEMS, SOUTH-CENTRAL UNITED STATES, WITH SUMMARY OF DISSOLVED-SOLIDS CONCENTRATIONS AND WATER TYPES

By Robert A. Pettijohn

ABSTRACT

Procedures used to process about 95,600 water-chemistry analyses of water samples from the gulf coast aquifer systems are described. The descriptions include the retrieval of data from the original records, the various modifications to the data, the analysis and tabulations of the data, and the plotting and contouring of the data on maps to portray the areal distribution of selected physical properties and chemical constituents in the study area.

A statistical summary of dissolved-solids concentrations and the mode of both primary and secondary water types are presented by county in tabular array. Water-chemistry data from the original records for the gulf coast aquifer systems and files of processed data have been stored on computer tape.

INTRODUCTION

The areal extent of the Gulf Coast Regional Aquifer-System Analysis (RASA) study is about 230,000 mi^2 and includes all or part of 10 States (fig. 1). The geologic units considered in this report extend from the land surface to the top of the clayey confining layer of the Midway Group of Tertiary age in most of the study area or to the top of the geopressure zone in some coastal areas of Louisiana and Texas or to the top of Upper Cretaceous units in the northeast part of the study area (Grubb, 1984).

The data used to study the chemistry of water from aquifers in the gulf coast aquifer systems were obtained from the U.S. Geological Survey's National Water Data Storage and Retrieval System (WATSTORE) water-quality file; the brine computer-tape file, compiled by Taylor (1975) from data supplied by the petroleum industry; and the Texas computer-tape file, compiled by the Texas Department of Water Resources (TDWR).

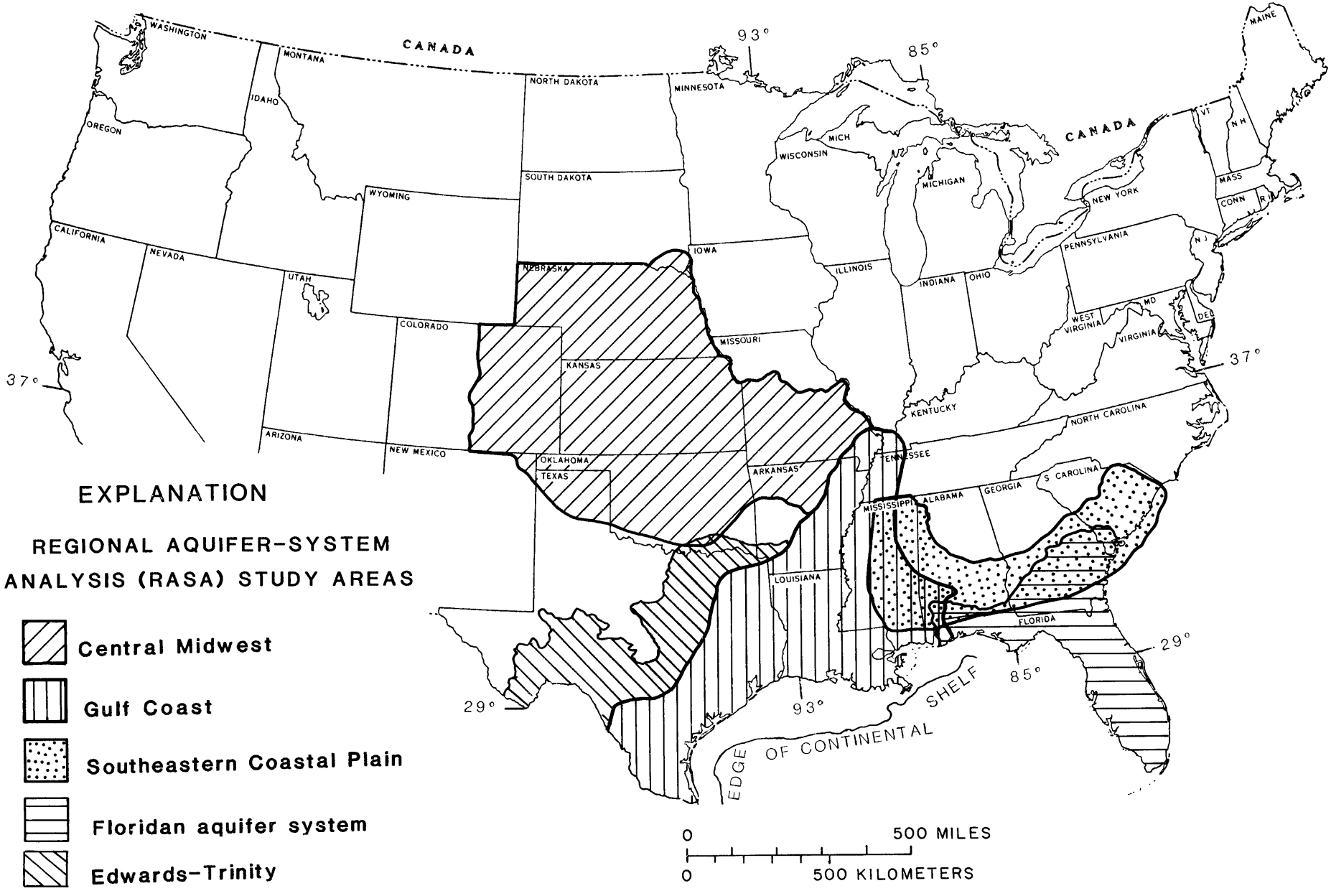

Figure 1.--Gulf Coast Regional Aquifer-System Analysis study area and adjacent Regional Aquifer-System Analysis study areas.

The primary purpose of this report is to describe the procedures used to process and edit water-chemistry data from the gulf coast aquifer systems. A secondary purpose of this report is to provide a statistical summary of dissolved-solids concentrations and primary and secondary water types by county for the gulf coast aquifer systems.

This report can be used as a basic reference for describing data-processing procedures (fig. 2) used to obtain water-quality data presented in interpretative reports prepared about the chemistry of water in the gulf coast aquifer systems.

PROCESSING WATER-CHEMISTRY DATA

Data Storage

Water Data Storage and Retrieval System Water-Quality File

Chemical-analysis data for 76,184 ground-water samples collected in the gulf coast area were coded and stored in the water-quality file of the WATSTORE System (table 1) of the U.S. Geological Survey in Reston, Virginia. This is the main source of the water-chemistry data for this study. The data were stored in WATSTORE by station identification number. Other identifiers are agency, State, county, site, station name, and geologic unit. Individual analyses are stored by date collected within each station record. Each property and constituent associated with each analysis is identified by a unique five-digit code.

In addition to chemical data, the file also contains results of physical, radiochemical and biological analyses of either single or composite water samples (Hutchinson, 1975). However for this study, only the physical properties and chemical constituents were processed and analyzed to provide the information needed for interpretative reports.

Brine Computer-Tape File

Chemical analyses of 12,388 water samples collected from oil test and production wells in Texas and Louisiana by oil companies is a second source of water-chemistry data in the gulf coast area. These chemical analyses were compiled and stored on computer-tape at the U.S. Geological Survey Headquarters in Reston, Virginia, (R. E. Taylor, U.S. Geological Survey, oral commun., 1985). Although the computer-tape file contains both freshwater and saline-water analyses, the majority are saline-water analyses.

The procedure for storing the data is presented in a data report (Taylor, 1975). The brine computer-tape file, is used primarily to supplement the chemical data from the WATSTORE file (table 1).

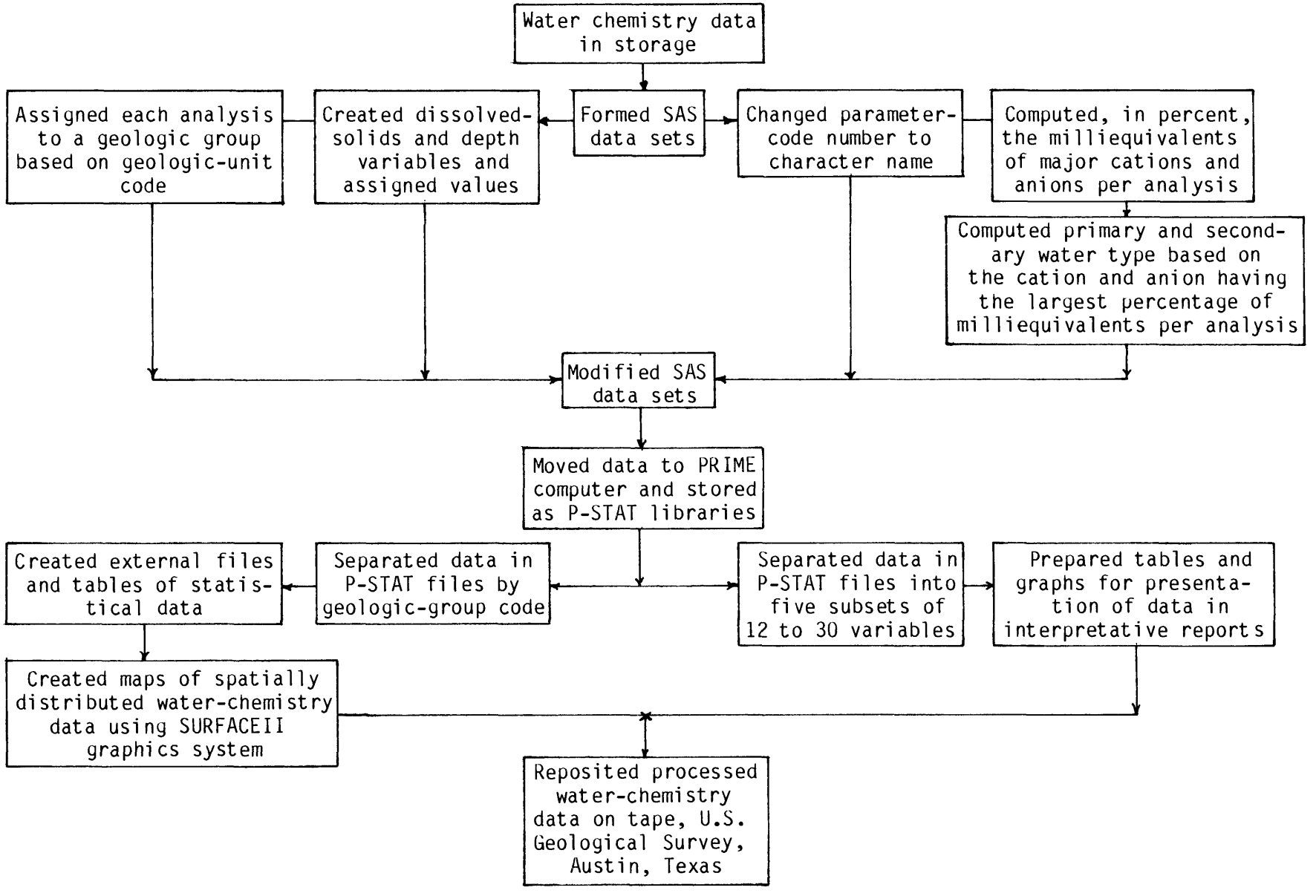

Figure 2.--Generalized flow diagram of data-processing procedure

Table 1.--*Source files of water-chemistry analyses.*

Source file	WATSTORE water-quality file	Brine computer-tape file	Texas Department of Water Resources computer-tape file
Extent of area of water analyses (square miles)	230,000	88,654	96,890
Location of area of water analyses (States)	All or part of 10 States in study area	Louisiana, Texas, and Continental Shelf area	Texas
Number of analyses comprising original file	76,184	12,388	7,024
Number of analyses having values for dissolved-solids concentration	38,916	11,545	6,826
Number of sampling sites after deleting all but the most recent analysis	17,079	6,513	3,829
Number of sampling sites within geologic units studied	14,768	4,566	3,581 1/

1/ Number was decreased to 1,953 when duplicate analyses in the other 2 files were deleted from this file.

Texas Department of Water Resources Computer-Tape File

Chemical analyses of 7,024 ground-water samples in the Gulf Coast area of Texas are a third source of water-chemistry data in the gulf coast area of Texas. These data, labeled as the Texas Department of Water Resources computer-tape file, were processed and used to supplement data from the WATSTORE file in the Texas part of the Gulf Coast area. In processing the TDWR data, some analysis were determined to be unacceptable and were not used to supplement the WATSTORE file.

Data Retrieval

Statistical Analysis System

The chemical data from the WATSTORE file stored by state, the brine file and later the TDWR file were converted to a format suitable for retrieval using a computer program called SAS (Statistical Analysis System) [1/] developed by SAS Institute Inc. (1979) (table 2). SAS was used because it was available on the U.S. Geological Survey's computer and because it provided a method of retrieving the data and storing as data sets, which can then be checked, modified, edited, and analyzed using statistical methods. Each State's data were stored separately as SAS data sets. The maximum number of parameters retrieved for each water analysis was limited to 126 and consisted of physical properties, chemical constituents, and location identifiers. Using SAS procedures, the five-digit parameter codes were changed to character names that clearly identify each parameter (table 2).

A SAS program was written to: (1) Obtain the most reliable value for dissolved-solids concentration and for depth of sample collection for each analysis, (2) assign each geologic unit to 1 of 10 arbitarily defined geologic groups, and (3) compute the primary and secondary water type for each water analysis.

The dissolved-solids value was obtained from the SAS program by using an order of priority from: (1) Sum of constituents, (2) residue at 180°C, and (3) residue at 105°C. The procedure continues until a value is found or if no value exists it is left blank. The order of priority for depth of sample is: (1) Depth of well, (2) depth of hole, and (3) depth of sampling.

1/ The use of brand names in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

Table 2.--*Data processing performed and files generated by selected computer programs*

Computer program	Type of processing performed	Type of files created	Types of data per file	Location of file
Statistical analysis system (SAS)	(1) Retrieved data from source files; (2) computed values for dissolved-solids concentrations and depth, and modes for primary and secondary water types; and (3) converted parameter codes to character names.	SAS data sets with character names for data. Generated values for dissolved-solids concentrations and depth, and modes for primary and secondary water types.	132	U.S. Geological Survey computer in Reston, Virginia
Princeton statistical system (P-STAT)	Retrieved SAS data sets from U.S. Geological Survey computer in Reston, Virginia, and stored as P-STAT files on U.S. Geological Survey computer in Austin, Texas	P-STAT files of the (1) data from all States obtained from WATSTORE and computer-tape brine files, and (2) data by individual State obtained from WATSTORE and the brine computer-tape file.	16 132	U.S. Geological Survey computer in Austin, Texas
	Selectively separated and modified data in the P-STAT files.	P-STAT files of the (1) the subset data by geologic group and (2) each of the 5 data subsets that include the data from all source files.	14 28 to 46	U.S. Geological Survey computer in Austin, Texas
	Computed statistics and ratios for selected data.	External files of statistical data for use by the Surface II graphics system.	Variable, less than 10	U.S. Geological Survey computer in Austin, Texas
Surface II graphics system	Created maps of selected, spatially distributed data by plotter or line printer.	External files of selected, spatially distributed data.	Variable, less than 10	U.S. Geological Survey computer in Austin, Texas

Each analysis of a water sample was assigned to 1 of 10 geologic groups based on the geologic unit code. Only 8 geologic groups are considered in this report (table 3).

The primary and secondary water types were computed by the SAS program from the four major cations: calcium, magnesium, sodium, and potassium and the four major anions: carbonate, bicarbonate, sulfate, and chloride in the analyses. By dividing the milliequivalents of one of the cations by the total milliequivalents of the four cations and multiplying by 100, the program computed the percent milliequivalents of that cation in each water analysis. This procedure was used to determine the percent milliequivalent of each of the above cations and anions in all of the water analyses.

Using the computed percent values for each of the major cations and an if statement, the program selected the cation that had the highest percent of the total milliequivalents of cations as the primary cation in the water analysis and the next highest percent as the secondary cation in the water analysis. The same procedure was followed to determine the primary and secondary anions in the water analysis. By combining the number representing the primary cation with the number representing the primary anion, a two-digit number representing the primary water type was generated. A two-digit number representing secondary water type was generated by the same procedure.

The parameters--dissolved-solids, depth of sample, primary and secondary water types--generated by the SAS program and the associated value for each of those parameters for each analysis were added respectively to the SAS WATSTORE data set, the SAS Brine data set and later to the SAS TDWR data set.

Princeton Statistical System

The chemical data stored as SAS data sets on the U.S. Geological Survey WRD computer in Reston, Virginia, and accessible by Amdahl were moved over a period of several months to the U.S. Geological Survey computer in Austin, Texas, and stored as P-STAT library files (P-STAT Inc., 1985). This was done to make the data more accessible and to decrease computer costs.

The data were moved to the U.S. Geological Survey computer in Austin, Texas, in two phases. The first phase involved moving the data for 16 parameters which are referred to as the basic parameter subset. The basic parameter subset consists of station ID, latitude and longitude in decimal degrees, column and row numbers, depth of sample, datum of site, elevation of land surface, geologic unit, geologic group, county, state, specific conductance, dissolved solids, primary water type and secondary water type. These parameters were chosen for the basic parameter subset because they were needed to accomplish the first objective of the water chemistry part of the Gulf Coast RASA study which was to map the areal distribution of the primary water types and the dissolved-solids concentrations.

Table 3.--*Summary of codes of geologic units comprising each of the geologic groups or series*

System	Series	Group	Geologic unit codes 1/	Assigned geologic group code
QUATERNARY	HOLOCENE		ALTS , ALVM , AMOT , ALVL , CLVM , OTSH TRRC , HLCN , LTAV , PNCL , AVJK , AVYG HGTC , GRNR , HLCN , DLTCY, SDGV , TRCS NLLV , PNBR , MRVA , SLNO , CNZS , LTRC BDBC , BIBC , STEP , BRLD , RGRD	QUART
	PLEISTOCENE		LFTT , BMLS , CHCT , CHCTL, BMNT , LGLD CHCTU, GFCS , GLFC , BMLG , SYMR , LEON PCRC , PLSC , ACFL , GDYG , LRGO , BNTL DDMRO, GRMC , GZNO , LFSV , LEBL , LEBU MGMR , MRVA , NORC , CEVG , LISS , DRVA PNCLU, PRIR , RRVA , LWGD , WLLS , SLBR SLGZ , UPTCD, WLLN , ALLM , MCSB , 02LC 04BR , 05BR , 05LC , LWCX , 06BR , 07LC 12NO , LAKE	PLELO
TERTIARY	PLIOCENE		CRNL , EVGL , GRMF , GOLD , GDYG , UVLD PLCN , ABIT , CVGN , KNTD , BLSN , TRTR SLDL , BGBC , BLCK , PCMC , EVBC , TCFC PNCLL, 01FP , 02FP , 08BR , VLCC , GDLG 10BR , 12BR , 15BR , 17BR , IGNS , EVJPU	PLIO
	MIOCENE		CTHL , MOCN , CTHLU, HBRG , OKVC , RWLS PCGL , BKVL , JSPRU, LGRT , 24BR , OKVL YCFC , AMIT , LOKV , JPCL , CRCK , CRNB DGHL , FLMG , 28BR , HMND , JSPR , FRKL RMSY , CJCK , WMCK , 03FP , 20BR , 23BR	MIOCE
	OLIGOCENE		OLGC , FRIO , OGCE , VKBJ , FRCT , TSCL MSPQ , FRHL , ANHC , GLND , BCTN , VKBG	VICKBG
	EOCENE	JACKSON	JCKS , COCO , CCKFJ, WBLF , OCAL , JKYG MDBC	JCKS
		CLAIBORNE	CLBR , BGFD , CKMN , GSPR , LRDO , CCKF CZRK , BSCC , TLLT , CRRZ , CRVR , SPRT MMPS , ELPC , CZSP , LRDR , MRDR , MSLM GCCW , LSBN , QCSP , QNCT , RKCZ , RKLW WNON , WNSB , WCHS , YEGU , QCCZ	CLBR
	PALEOCENE	WILCOX	WLCX , HCGB , NNFL , TSCM , PRCK , NBRN NHOL , 05NP , 14WX , WLCXL, COCK , ODBK WLCXM, WLCXU, FRPL , CZWX , KNCD , SMBR MUWX , CLTN , MDWY , INDO	WLCX
		MIDWAY		

1/ Definitions of geologic unit codes are published in the WATSTORE user's guide, appendix F (Hutchison, 1975). (Numeric prefixes to codes have been deleted. Where the same code appears in two geologic groups or series, it was deleted from the oldest one.)

In the first phase, two data files consisting of the basic parameters were initially stored as P-STAT libraries on the Texas District computer. Data for one of the files, which was created by combining the basic parameter data in SAS data sets from each of the states in the study area, came originally from WATSTORE. The other file was created from the Brine SAS data set. A third file, a basic parameter P-STAT file, was created later from the TDWR data.

The second phase involved moving the computer stored data for 126 parameters from Reston, Virginia, to Austin, Texas. These data, stored as SAS data sets, one set for the brine data and one set for each of the following States for the WATSTORE data: Alabama, Arkansas, Kentucky, Louisiana, Mississippi, Missouri, Tennessee, and Texas were moved and stored as 9 separate P-STAT files on the Survey computer in Austin. After the completion of phase 2, the P-STAT files created in phase 1 were removed from the computer and stored on tape.

Data Management

Compiling Procedures

The P-STAT software system was used in phase 1 and 2 to modify, analyze, and compile the data into a format suitable for mapping the primary water types, the dissolved-solids concentrations and other parameters of interest. This software system also was used to create an external (output) file that could be used by Surface II Graphics System to post and contour the data (Sampson, 1975).

The first modification (step 1) using P-STAT and the P-STAT files, which consisted of data for the basic parameters from the WATSTORE file, brine and TDWR files, was to establish a separate file for those analyses that contained a value for dissolved-solids concentration. This data-processing step decreased the number of analyses that came from the WATSTORE file from 76,184 to 38,916, from the brine file from 12,388 to 11,545, and from the TDWR file from 7,024 to 6,826 (table 1). The second modification (step 2) was to select only the most recent analysis at each sampling site which decreased the number of analyses that came from the WATSTORE file to 17,079, from the brine file to 6,513, and from the TDWR file to 3,829.

The third modification (step 3) was to sort the files modified in step 2 by the arbitarily defined geologic groups. This created 8 new P-STAT files for each of the three initial source files. The files created in step 3 were separated into geologic groups because water-bearing sediments are identified in the literature and drilling records primarily by geologic groups. Thus, the data presented in this and other reports from the Gulf Coast RASA can be used in conjunction with geologic maps and well data to determine generalized water quality in most areas of the gulf coast aquifer systems.

The fourth modification (step 4) was to create row 10 and column 10 variables for locating chemical parameter values by row and column in a grid matrix consisting of squares that were 10 mi on a side of the gulf coast aquifer systems study area. The row 10 and column 10 variables were sorted in ascending order using P-STAT. These files, containing data for the basic parameters, can now be analyzed using statistical procedures available in P-STAT.

Each of the 9 P-STAT files, created in phase 2 and including all parameters, received additional modification. They were separated into 5 subsets containing from 11 to 29 parameters (table 4). Parameters common to each of the 5 subsets are the parameters in the basic parameter subset as well as year, month, day of sampling, and aquifer name designated as a model layer number. Similar subsets created from each of the 9 P-STAT files were then combined to form 1 P-STAT file for each of the 5 subsets. This modification of the data provided a grouping of parameters into one file that are similar in chemistry. It also decreased the size of data files, thus making it easier to analyze and manage the data using the P-STAT system software.

Interpreting Procedures

Median concentrations of dissolved-solids were computed for each 100-mi^2 area of the aquifer systems where data exist for the arbitarily defined geologic groups. These data, stored in an external (output) file, were plotted and contoured using the Surface II Graphics System (Sampson, 1975).

The primary water type was determined for each 100-mi^2 area of the aquifer systems where the geologic group had been determined. These data, stored in an external (output) file, were plotted at the center of each 100-mi^2 using the Surface II Graphics System.

The procedures used to compute median dissolved-solids concentrations also were used to compute median concentrations for calcium, magnesium, potassium, iron, silica, bicarbonate, sulfate, chloride, fluoride, and sodium; medium values of temperature, and pH, and the ratios of magnesium to calcium, sodium to calcium, bicarbonate to sulfate, silicic acid to dissolved solids, sodium plus potassium to silica acid, sodium plus potassium to bicarbonate, calcium plus magnesium to bicarbonate, calcium plus magnesium to silicic acid, bicarbonate to silicic acid, bicarbonate to hydrogen sulfide, calcium to silica, and magnesium to silica.

Mapping Procedures

The plotting and contouring procedures of the Surface II Graphics System were used to make maps showing areal distribution of values of the water-chemistry properties and constituents. The Surface II Graphics System, using the external (output) file from P-STAT, creates a plot file of the data points. The location and value of the data points are then plotted, contoured, or both using the line printer, the plotter, or a graphics terminal.

Table 4.--*Data in each of the five subsets stored in P-STAT files*

Subset 1	Subset 2	Subset 3	Subset 4	Subset 5
Chloride, dissolved	Hydroxide	Boron	Milliequivalents of anion	Agency
Calcium, dissolved	Organic carbon	Barium	Milliequivalents of cations	State
Magnesium, dissolved	Acidity, total as $CaCO_3$	Beryllium	Milliequivalents of ions	County
Potassium, dissolved	Acidity (H)	Cadmium	Milliequivalents of calcium	Station name
Sodium, dissolved	Specific gravity	Chromium	Milliequivalents of chloride	Sample source
Sodium plus potassium, dissolved	Density	Lead	Milliequivalents of carbonate	Latitude
Iron, dissolved	Dissolved solids residue at 105°C	Nickel	Milliequivalents of fluoride	Longitude
Iron, total	Dissolved solids residue at 180°C	Strontium	Milliequivalents of bicarbonate	Longitude (decimal degrees)
Manganese, dissolved	Dissolved solids, calculated, sum of constituents	Zinc	Milliequivalents of potassium	Latitude (decimal degrees)
Manganense, total	Resistivity	Aluminum	Milliequivalents of mangesium	X-plot coordinate
Alkalinity, total as $CaCO_3$	Pumping time	Arsenic	Milliequivalents of sodium	Y-plot coordinate
Bicarbonate	Depth to top of sample interval	Cesium	Milliequivalents of sulfate	
Carbonate	Depth to top water-bearing zone	Lithium	Percent carbonate plus bicarbonate	
Hydrogen sulfide	Depth to bottom sample interval	Selenium	Percent chloride	
Sulfide, dissolved	Depth to bottom water-bearing zone	Mercury	Percent carbonate	
Sulfate, dissolved	Depth below land surface	Iodine	Percent bicarbonate	
Phosphorus, dissolved orthophosphate as PO_4	Elevation of land surface	Chloride	Percent sulfate	
Phosphorus, dissolved orthophosphate as P			Percent calcium	
Phosphorus, dissolved as P			Percent magnesium	
Nitrogen, ammonia, dissolved as N			Percent sodium	
Nitrogen, ammonia, total as N				
Nitrogen, dissolved as N				
Nitrogen, nitrate, dissolved as N				
Nitrogen, nitrite plus nitrate dissolved as N				
Silica, dissolved				
Fluoride, dissolved				
pH				
Temperature (°C)				
Oxygen, dissolved				

Some examples from using the plotting and contouring procedures are maps showing: (1) The primary water type in 100-mi^2 areas for selected aquifers, (2) the median values of selected properties and constituents and ratios of selected constituents per 100-mi^2 areas for selected aquifers, and (3) contours only of median values.

Data Presentation

Tables

P-STAT was used routinely for tabulating summary statistics or for producing cross tabulation of categorical numeric variables. P-STAT was used to provide table 5 with parameter labels and the table title. Two important advantages of creating tables using the computer are: (1) The opportunity to check and correct data before each table is printed, and (2) the ease in which a table format can be changed.

The summary of dissolved-solids concentrations and water types by county (table 5) was produced by the computer processes described in this report. The summary was produced to provide a general overview of the chemistry of water in the gulf coast aquifer systems.

Graphs

The P-STAT was used to make graphs showing change in the value of a variable with time or space or the relationship between two or more variables. P-STAT was also used to produce histograms and scatter plots. These two types of plots usually required adjustment of scale using the P-STAT procedures to obtain the most meaningful graphs.

Maps

The maps prepared using the Surface II System were checked for data values that appear to be anomalies and for data points that plot outside the boundary of the study area or outside the area of the geologic group or aquifer layer. If the plotted data indicates that the decimal point is incorrectly placed or that the data point belongs in a different geologic group or aquifer layer or is incorrectly located, the appropriate correction is made. Otherwise the data point is deleted.

The computer-generated contours or lines on maps showing data are checked to determine if those contours or lines correctly represent the data. Some correction of the contours or lines is usually necessary.

Data Repository

The chemical data of water from the gulf coast aquifer systems and used in the Gulf Coast RASA study are stored on computer tape at the U.S. Geological Survey office in Austin, Texas. The P-STAT files created as described in the data retrieval and management sections also were stored on computer tape. The computer tapes will remain available during the duration of the project and probably will remain available as long as the data remain pertinent to knowledge of the chemistry of water in the gulf coast aquifer systems.

SUMMARY

The data used to study the chemistry of water in the gulf coast aquifer systems were stored on disk or tapes and consisted of about 95,600 analyses. Because of the quantity and location of the data, it was necessary to use the computer to retrieve, compile, modify, analyze, and edit the data prior to preparing interpretative reports.

This report was prepared primarily to describe and document the procedures used in processing the water-chemistry data from the gulf coast aquifer systems and the effect of the processing on the quantity and quality of the data. This report will serve as a basic reference for reports that will use the data derived from the described computer-processing procedures.

The data processing began with the retrieval of water-chemistry data from the WATSTORE file, the brine computer-tape file, and the Texas Department of Water Resources computer-tape file. The data from these files were retrieved and stored in the U.S. Geological Survey computer in Austin, Texas, as P-STAT files. The data in the P-STAT files were then modified, analyzed, and compiled into specifically formatted files from which P-STAT was used to create graphs, tables, and external (output) files which can be used by Surface II Graphics System to plot and contour data.

Although processing decreases the quantity, it generally increases the quality of data by deleting analyses that have missing parameter values, duplicate analyses, and questionable values.

Both the original file of water-chemistry data for the gulf coast aquifer systems and files of processed data have been stored on tape and reside at the Texas District

The summary of dissolved-solids concentrations and primary and secondary water types (table 5) provides both an example of results from the data-processing procedures and an overview by county of the water chemistry of the gulf coast aquifer systems. More detailed descriptions of the water chemistry of the study area will be presented in planned reports from the Gulf Coast RASA.

SELECTED REFERENCES

Grubb, H. F., 1984, Planning report for the Gulf Coast Regional Aquifer-System Analysis in the Gulf of Mexico Coastal Plain, United States: U.S. Geological Survey Water-Resources Investigations Report 84-4219, 30 p.

Hutchison, N. E., compiler, 1975, WATSTORE User's guide, Volume 3 and Appendix F: U.S. Geological Survey Open-File Report 75-4265, 322 p.

P-STAT Inc., 1985, P-STAT user's manual version 8 (2d ed.): Princeton, New Jersey, 858 p.

Sampson, R. J., 1975, Surface II Graphics System revised,1978: Lawrence, Kansas, Kansas Geological Survey, 240 p.

SAS Institute Inc., 1979, SAS user's guide (1979 ed.): Raleigh, North Carolina, 494 p.

Taylor, R. E., 1975, Chemical analyses of ground water for saline-water resources studies in Texas Coastal Plain stored in National Data Storage and Retrieval System: U.S. Geological Survey Open-File Report 75-79, 669 p.

SUMMARY TABLE

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems*

[*See table 6 for county names. Chemical symbols: Ca = Calcium, Mg = Magnesium, Na = Sodium, HCO_3 = Bicarbonate, Cl = Chloride, SO_4 = Sulfate. Type is mode for each county.*]

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Wilcox aquifers				
Ala.	23	569	286	992	375	4	$NaHCO_3$	MgCl
Ala.	25	743	439	1,300	230	4	NaCl	$CaHCO_3$
Ala.	35	110	---	110	110	1	$CaHCO_3$	$NaSO_4$
Ala.	91	530	---	530	530	1	---	---
Ala.	97	163,000	---	163,000	163,000	1	---	---
Ala.	99	568	261	1,000	260	7	$NaHCO_3$	CaCl
Ala.	119	135	7	140	130	2	$NaHCO_3$	$CaSO_4$
Ala.	131	838	963	2,700	180	6	$NaHCO_3$	CaCl
Ark.	19	170	---	170	170	1	---	---
Ark.	21	63	28	95	46	3	$NaHCO_3$	CaCl
Ark.	31	143	12	150	130	3	$NaHCO_3$	CaCl
Ark.	35	118	15	150	95	19	$NaHCO_3$	CaCl
Ark.	37	220	113	300	140	2	---	---
Ark.	39	140	---	140	140	1	$CaHCO_3$	$NaSO_4$
Ark.	55	163	6	170	160	3	$NaHCO_3$	CaCl
Ark.	57	64	---	64	64	1	$NaHCO_3$	$CaSO_4$
Ark.	59	115	106	350	17	16	$CaHCO_3$	MgCl
Ark.	73	130	---	130	130	1	$NaHCO_3$	$CaSO_4$
Ark.	77	559	155	660	380	3	---	---
Ark.	85	124	80	244	24	7	$NaHCO_3$	$CaSO_4$
Ark.	91	620	524	1,400	160	9	$NaHCO_3$	CaCl
Ark.	93	132	57	357	98	19	$NaHCO_3$	$CaSO_4$
Ark.	99	157	46	190	125	2	$CaHCO_2$	$MgSO_4$
Ark.	103	1,630	891	2,260	1,000	2	NaCl	$CaHCO_3$
Ark.	111	164	78	312	110	6	$NaHCO_3$	CaCl
Ark.	119	41	---	41	41	1	$CaHCO_3$	NaCl
Ark.	123	135	21	150	120	2	$NaHCO_3$	CaCl
Ark.	125	210	113	430	21	8	$NaHCO_3$	CaCl
Ark.	139	7,900	---	7,900	7,900	1	NaCl	$CaSO_4$
Ark.	145	120	---	120	120	1	$CaHCO_3$	NaCl
Ark.	147	150	0	150	150	2	$CaHCO_3$	MgCl
Ky.	7	102	40	130	73	2	$NaHCO_3$	$CaSO_4$
Ky.	35	84	30	120	50	5	$MgHCO_3$	CaCl
Ky.	39	330	---	330	330	1	$CaHCO_3$	MgCl
Ky.	105	190	28	210	170	2	$CaHCO_3$	MgCl
Ky.	145	75	55	190	30	12	$NaHCO_3$	CaCl
Ky.	157	130	---	130	130	1	$CaHCO_3$	$MgSO_4$

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Wilcox aquifers				
La.	3	24,000	---	24,000	24,000	1	NaCl	$CaHCO_3$
La.	9	26,200	---	26,200	26,200	1	NaCl	$CaHCO_3$
La.	11	24,400	---	24,400	24,400	1	---	---
La.	13	681	927	4,400	71	39	$NaHCO_3$	CaCl
La.	15	542	299	1,400	110	34	$NaHCO_3$	CaCl
La.	17	534	329	1,600	130	48	$NaHCO_3$	CaCl
La.	29	97,300	17,500	137,000	56,500	34	NaCl	$MgHCO_3$
La.	31	522	407	2,700	84	102	$NaHCO_3$	CaCl
La.	39	62,400	46,900	142,000	17,700	5	NaCl	$CaHCO_3$
La.	69	873	859	4,200	140	34	$NaHCO_3$	CaCl
La.	77	68,700	35,400	145,000	13,500	16	NaCl	$MgHCO_3$
La.	81	474	709	4,300	57	39	$NaHCO_3$	CaCl
La.	85	687	551	2,500	100	47	$NaHCO_3$	CaCl
La.	97	123,000	31,800	147,000	87,300	3	NaCl	$CaHCO_3$
La.	107	93,900	14,100	118,000	83,700	5	---	---
La.	119	600	713	3,600	130	23	$NaHCO_3$	CaCl
Miss.	7	155	72	320	36	18	$CaHCO_3$	$MgSO_4$
Miss.	9	64	42	110	27	4	$CaHCO_3$	$NaSO_4$
Miss.	11	658	374	1,400	360	6	$NaHCO_3$	CaCl
Miss.	13	190	117	390	79	5	$NaHCO_3$	CaCl
Miss.	15	265	242	950	130	11	$NaHCO_3$	$CaSO_4$
Miss.	19	105	56	190	31	18	NaCl	$CaHCO_3$
Miss.	23	248	100	520	130	17	$NaHCO_3$	CaCl
Miss.	27	600	223	1,000	260	11	$NaHCO_3$	CaCl
Miss.	33	152	13	165	140	3	$NaHCO_3$	CaCl
Miss.	43	346	192	970	160	18	$NaHCO_3$	CaCl
Miss.	49	1,940	577	2,600	1,200	5	$NaHCO_3$	CaCl
Miss.	51	240	164	860	103	21	$NaHCO_3$	$CaSO_4$
Miss.	53	300	127	390	210	2	$NaHCO_3$	$CaSO_4$
Miss.	61	235	7	240	230	2	$NaHCO_3$	CaCl
Miss.	69	61	39	138	10	8	$CaHCO_3$	$MgSO_4$
Miss.	71	98	52	190	26	15	$NaHCO_3$	CaCl
Miss.	75	147	38	220	22	42	$CaHCO_3$	$CaSO_4$
Miss.	79	172	40	250	136	7	$NaHCO_3$	$CaSO_4$
Miss.	83	379	286	1,100	200	9	$NaHCO_3$	CaCl
Miss.	89	365	163	480	250	2	$NaHCO_3$	CaCl
Miss.	93	80	44	110	30	3	CaCl	$NaSO_4$
Miss.	97	197	113	440	80	15	$NaHCO_3$	$CaSO_4$
Miss.	99	101	46	181	36	19	$NaHCO_3$	$CaSO_4$
Miss.	101	132	38	200	77	15	$NaHCO_3$	$CaSO_4$
Miss.	103	28	---	28	28	1	---	---
Miss.	107	209	88	380	62	17	$NaHCO_3$	CaCl
Miss.	111	14,000	---	14,000	14,000	1	NaCl	$MgHCO_3$

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Wilcox aquifers				
Miss.	119	499	448	1,700	130	10	$NaHCO_3$	CaCl
Miss.	121	1,400	---	1,400	1,400	1	$NaHCO_3$	CaCl
Miss.	123	283	52	330	220	4	$NaHCO_3$	$CaSO_4$
Miss.	125	1,740	1,210	2,590	880	2	NaCl	$CaHCO_3$
Miss.	133	378	77	490	281	13	$NaHCO_3$	CaCl
Miss.	135	421	254	1,000	110	11	$NaHCO_3$	CaCl
Miss.	137	182	44	270	150	6	$NaHCO_3$	CaCl
Miss.	143	219	33	260	162	9	$NaHCO_3$	MgCl
Miss.	151	987	305	1,700	520	17	$NaHCO_3$	CaCl
Miss.	153	670	99	740	600	2	---	---
Miss.	155	200	97	385	97	8	$NaHCO_3$	CaCl
Miss.	159	143	266	1,300	19	22	$NaHCO_3$	$CaSO_4$
Miss.	161	203	163	539	25	11	$NaHCO_3$	CaCl
Miss.	163	338	127	520	140	7	$NaHCO_3$	MgCl
Mo.	133	204	57	290	130	7	$CaHCO_3$	MgCl
Mo.	143	350	233	659	160	4	$CaHCO_3$	MgCl
Mo.	155	125	25	168	100	7	$NaHCO_3$	$CaSO_4$
Mo.	201	348	392	1,040	134	5	$CaHCO_3$	MgCl
Mo.	207	149	129	240	57	2	$NaHCO_3$	CaCl
Tenn.	17	101	93	330	26	10	$CaHCO_3$	NaCl
Tenn.	23	30	4	32	27	2	$NaHCO_3$	MgCl
Tenn.	47	440	---	440	440	1	$NaHCO_3$	$CaSO_4$
Tenn.	69	54	29	110	24	10	$CaHCO_3$	MgCl
Tenn.	77	115	93	250	52	4	CaCl	$NaHCO_3$
Tenn.	79	48	20	85	34	6	$CaHCO_3$	$CaHCO_3$
Tenn.	113	40	18	75	18	7	NaCl	$MgHCO_3$
Tenn.	157	112	6	120	100	17	$NaHCO_3$	$CaSO_4$
Tenn.	167	81	---	81	81	1	$CaHCO_3$	$MgSO_4$
Tenn.	183	39	3	41	36	3	$MgHCO_3$	$CaSO_4$
Tex.	1	599	405	1,700	77	45	$NaHCO_3$	CaCl
Tex.	13	1,640	1,590	6,860	227	27	$NaHCO_3$	CaCl
Tex.	15	69,300	44,800	130,000	1,330	16	NaCl	$CaHCO_3$
Tex.	21	675	532	3,740	171	134	$CaHCO_3$	$NaSO_4$
Tex.	25	29,300	19,900	58,800	609	26	NaCl	$CaHCO_3$
Tex.	29	700	394	1,230	272	7	$NaSO_4$	CaCl
Tex.	41	1,000	507	2,480	526	15	$NaHCO_3$	CaCl
Tex.	51	587	456	1,880	264	15	$CaHCO_3$	$NaSO_4$
Tex.	55	927	716	4,780	141	262	$NaHCO_3$	NaCl
Tex.	57	327	78	382	272	2	$CaHCO_3$	NaCl
Tex.	63	394	158	780	172	17	$NaHCO_3$	CaCl
Tex.	67	574	375	1,400	30	45	$NaHCO_3$	CaCl
Tex.	73	929	186	1,060	797	2	---	---
Tex.	89	37,300	39,200	61,000	136	73	NaCl	$CaHCO_3$

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Wilcox aquifers				
Tex.	123	89,500	46,100	255,000	487	38	NaCl	$CaHCO_3$
Tex.	127	1,430	1,710	6,360	294	21	NaCl	$CaSO_4$
Tex.	131	12,400	18,600	70,800	140	37	NaCl	$CaHCO_3$
Tex.	149	52,300	71,600	103,000	1,607	2	$NaHCO_3$	$CaSO_4$
Tex.	158	805	328	1,080	168	6	NaCl	$CaHCO_3$
Tex.	159	305	192	794	49	19	$NaHCO_3$	CaCl
Tex.	161	503	199	691	246	4	$CaHCO_3$	NaCl
Tex.	163	5,370	6,310	9,830	914	2	NaCl	$MgHCO_3$
Tex.	175	34,900	20,100	79,500	727	35	NaCl	$CaHCO_3$
Tex.	177	1,380	777	2,700	303	12	$NaHCO_3$	$MgSO_4$
Tex.	183	1,090	504	2,900	310	51	$NaHCO_3$	$CaHCO_3$
Tex.	185	77,500	99,800	148,000	6,890	2	NaCl	$CaHCO_3$
Tex.	187	1,090	1,010	8,580	78	145	$CaHCO_3$	$NaSO_4$
Tex.	199	33,700	22,800	71,100	3,800	10	NaCl	$CaSO_4$
Tex.	201	80,000	70,900	158,000	19,600	3	NaCl	$CaHCO_3$
Tex.	203	661	523	1,770	94	8	$CaHCO_3$	NaCl
Tex.	213	659	1,060	7,000	37	111	$NaHCO_3$	CaCl
Tex.	225	60,800	82,300	119,000	2,630	2	NaCl	$CaSO_4$
Tex.	241	24,100	11,900	41,100	10,800	6	NaCl	$CaHCO_3$
Tex.	247	4,000	5,510	7,900	107	2	NaCl	$CaHCO_3$
Tex.	255	36,400	21,900	62,800	4,290	13	NaCl	$CaHCO_3$
Tex.	283	13,400	11,300	25,900	3,790	3	NaCl	$CaHCO_3$
Tex.	285	17,000	24,400	81,000	146	26	NaCl	$CaHCO_3$
Tex.	287	430	289	1,300	62	36	NaCl	$CaSO_4$
Tex.	289	515	342	1,500	80	30	$NaHCO_3$	$CaSO_4$
Tex.	293	521	562	3,700	90	47	---	---
Tex.	297	44,900	31,500	148,000	594	26	NaCl	$CaHCO_3$
Tex.	311	21,200	12,200	34,800	259	31	NaCl	$CaHCO_3$
Tex.	315	677	723	5,030	100	125	$NaHCO_3$	CaCl
Tex.	323	980	537	1,600	656	3	NaCl	$CaSO_4$
Tex.	325	1,160	825	2,600	408	12	$CaHCO_3$	NaCl
Tex.	331	401	225	840	60	14	$NaHCO_3$	CaCl
Tex.	339	99,100	27,800	121,000	67,700	3	NaCl	$CaHCO_3$
Tex.	343	501	202	900	173	19	$NaHCO_3$	CaCl
Tex.	347	342	213	521	107	3	$NaHCO_3$	CaCl
Tex.	349	1,160	686	2,900	180	28	$CaHCO_3$	NaCl
Tex.	351	29,800	13,300	53,200	21,300	5	NaCl	$CaHCO_3$
Tex.	365	699	372	1,790	187	16	$NaHCO_3$	$MgSO_4$
Tex.	373	34,200	69,200	193,000	78	63	NaCl	$CaHCO_3$
Tex.	379	1,080	1,590	6,530	232	16	$NaHCO_3$	CaCl
Tex.	395	617	---	617	617	1	$NaHCO_3$	MgCl
Tex.	401	461	326	890	46	5	$NaHCO_3$	$CaSO_4$
Tex.	403	5,150	9,500	25,300	15	19	NaCl	$CaHCO_3$

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
Wilcox aquifers								
Tex.	405	419	395	1,510	15	39	$NaHCO_3$	CaCl
Tex.	423	482	465	1,960	141	19	$NaHCO_3$	$CASO_4$
Tex.	449	498	332	1,400	161	36	$NaHCO_3$	CaCl
Tex.	457	41,100	19,600	107,000	22,700	18	NaCl	$CaHCO_3$
Tex.	459	471	367	2,130	37	38	$NaHCO_3$	CaCl
Tex.	467	533	687	4,200	46	71	$NaHCO_3$	CaCl
Tex.	469	66,700	52,500	225,000	3,040	17	NaCl	$CaHCO_3$
Tex.	477	37,900	33,800	138,000	17,474	14	NaCl	$MgHCO_3$
Tex.	479	10,700	7,680	24,400	552	19	NaCl	$CaHCO_3$
Tex.	481	15,400	---	15,400	15,400	1	NaCl	$CaSO_4$
Tex.	491	126	---	126	126	1	$CaHCO_3$	NaCl
Tex.	493	2,640	2,690	8,400	152	27	NaCl	$CaHCO_3$
Tex.	499	585	1,020	6,700	68	67	$NaHCO_3$	CaCl
Tex.	505	9,090	7,060	15,200	1,360	3	NaCl	$CaHCO_3$
Tex.	507	1,310	1,340	3,640	378	5	$NaHCO_3$	$CaSO_4$
Claiborne aquifers								
Ala.	25	230	---	230	230	1	$NaHCO_3$	$CaSO_4$
Ala.	35	150	---	150	150	1	$CaHCO_3$	$MgSO_4$
Ala.	53	195	7	200	190	2	$CaHCO_3$	$NaSO_4$
Ala.	99	175	---	175	175	1	---	---
Ark.	1	223	66	320	110	8	$NaHCO_3$	CaCl
Ark.	3	426	179	630	230	7	$NaHCO_3$	CaCl
Ark.	11	215	173	900	25	24	$NaHCO_3$	CaCl
Ark.	13	173	93	309	14	14	$NaHCO_3$	CaCl
Ark.	17	691	384	1,280	250	7	NaCl	$CaHCO_3$
Ark.	21	130	---	130	130	1	$NaHCO_3$	CaCl
Ark.	25	204	78	330	110	11	$NaHCO_3$	$CaSO_4$
Ark.	27	212	82	490	77	32	$NaHCO_3$	CaCl
Ark.	31	137	15	150	120	3	$CaHCO_3$	MgCl
Ark.	35	117	27	160	89	7	$CaHCO_3$	$MgSO_4$
Ark.	37	269	74	370	160	5	$CaHCO_3$	MgCl
Ark.	39	212	279	840	31	14	NaCl	$CaHCO_3$
Ark.	41	191	54	370	131	50	$NaHCO_3$	CaCl
Ark.	43	228	73	460	140	20	$NaHCO_3$	CaCl
Ark.	53	161	136	510	39	30	$CaHCO_3$	$MgSO_4$
Ark.	55	42	1	43	41	2	$NaHCO_3$	CaCl
Ark.	57	81	---	81	81	1	---	---
Ark.	59	67	49	150	29	7	$NaHCO_3$	CaCl
Ark.	69	217	181	650	60	44	$NaHCO_3$	$CaSO_4$
Ark.	73	254	181	680	94	9	$NaHCO_3$	$CaSO_4$

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Claiborne aquifers				
Ark.	77	860	644	1,600	430	3	NaCl	$CaHCO_3$
Ark.	79	211	124	574	63	25	$NaHCO_3$	CaCl
Ark.	85	230	---	230	230	1	$CaHCO_3$	MgCl
Ark.	91	190	114	390	46	12	$NaHCO_3$	CaCl
Ark.	93	210	---	210	210	1	$CaHCO_3$	MgCl
Ark.	95	867	671	2,250	380	7	$NaHCO_3$	CaCl
Ark.	99	107	55	160	22	5	$CaHCO_3$	CaCl
Ark.	103	451	736	2,820	17	42	$NaHCO_3$	$CaSO_4$
Ark.	107	605	365	1,600	360	10	$NaHCO_3$	CaCl
Ark.	117	393	203	780	210	10	$CaHCO_3$	MgCl
Ark.	123	284	24	310	260	5	$CaHCO_3$	MgCl
Ark.	125	63	---	63	63	1	$CaHCO_3$	$NaSO_4$
Ark.	139	332	184	1,300	70	67	$NaHCO_3$	CaCl
Ky.	7	113	88	360	36	14	$CaHCO_3$	CaCl
Ky.	35	38	4	40	35	2	$NaHCO_3$	CaCl
Ky.	39	110	69	340	51	26	$NaHCO_3$	MgCal
Ky.	75	192	164	760	35	26	$CaHCO_3$	$MgSO_4$
Ky.	83	67	62	310	22	41	$NaHCO_3$	CaCl
Ky.	105	137	86	360	64	21	$CaHCO_3$	MgCl
Ky.	145	47	7	52	42	2	$NaHCaO_3$	CaCl
La.	3	38,700	27,300	70,200	22,200	3	NaCl	$CaHCO_3$
La.	11	22,900	9,700	39,200	16,300	5	NaCl	$CaHCO_3$
La.	13	110	84	610	16	70	$NaHCO_3$	CaCl
La.	15	296	315	1,200	43	14	$NaHCO_3$	CaCl
La.	17	213	130	400	88	7	$NaHCO_3$	CaCl
La.	21	486	474	2,300	110	46	$NaHCO_3$	CaCl
La.	27	188	78	350	76	36	$NaHCO_3$	CaCl
La.	35	567	231	1,220	300	27	$NaHCO_3$	CaCl
La.	39	77,500	10,500	84,800	65,400	3	NaCl	$CaHCO_3$
La.	43	838	455	1,700	240	10	$NaHCO_3$	$CaSO_4$
La.	49	298	220	1,500	26	59	$NaHCO_3$	$CaSO_4$
La.	59	637	193	990	370	23	$NaHCO_3$	$CaSO_4$
La.	61	230	89	550	70	58	$NaHCO_3$	CaCl
La.	65	1,300	0	1,300	1,300	2	$NaHCO_3$	CaCl
La.	67	749	404	1,670	170	35	$NaHCO_3$	CaCl
La.	69	485	347	1,400	32	27	$NaHCO_3$	$CaSO_4$
La.	73	657	590	4,500	140	68	$NaHCO_3$	CaCl
La.	77	41,000	17,400	59,200	24,400	3	NaCl	$CaSO_4$
La.	79	61,000	---	61,000	61,000	1	NaCl	$CaHCO_3$
La.	83	480	242	1,300	220	23	$NaHCO_3$	CaCl
La.	85	353	231	1,000	55	26	$NaHCO_3$	CaCl
La.	97	92,700	24,500	124,000	67,900	4	NaCl	$CaHCO_3$
La.	107	84,900	---	84,900	84,900	1	---	---

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Claiborne aquifers				
La.	111	479	279	1,200	33	58	$NaHCO_3$	CaCl
La.	115	370	---	370	370	1	---	---
La.	119	206	160	970	25	79	$NaHCO_3$	CaCl
La.	123	538	153	940	360	22	$NaHCO_3$	CaCl
La.	127	514	661	5,760	27	73	$NaHCO_3$	CaCl
Miss.	7	121	94	225	42	3	$NaHCO_3$	CaCl
Miss.	11	392	122	600	180	13	$NaHCO_3$	CaCl
Miss.	15	130	64	210	64	7	$CaHCO_3$	$MgSO_4$
Miss.	21	1,310	---	1,310	1,310	1	---	---
Miss.	23	262	169	693	22	16	$NaHCO_3$	$CaSO_4$
Miss.	27	428	231	810	160	6	$CaHCO_3$	$MgSO_4$
Miss.	29	470	---	470	470	1	$NaHCO_3$	CaCl
Miss.	33	86	58	260	32	16	$CaHCO_3$	NaCl
Miss.	43	280	---	280	280	1	---	---
Miss.	49	388	227	1,300	0	62	$NaHCO_3$	$CaSO_4$
Miss.	51	198	168	530	75	6	$NaHCO_3$	$CaSO_4$
Miss.	53	239	80	490	190	12	$NaHCO_3$	$CaSO_4$
Miss.	55	528	57	570	450	4	$NaHCO_3$	CaCl
Miss.	61	3,250	13,300	63,000	57	22	$NaHCO_3$	$CaSO_4$
Miss.	67	511	23	535	489	3	$NaHCO_3$	$CaSO_4$
Miss.	73	14,000	5,660	18,000	10,000	2	NaCl	$CaHCO_3$
Miss.	75	91	---	91	91	1	---	---
Miss.	79	139	122	525	30	16	$NaHCO_3$	NaCl
Miss.	83	270	83	360	190	4	$NaHCO_3$	$MgSO_4$
Miss.	89	619	1,970	11,000	115	30	$NaHCO_3$	$CaSO_4$
Miss.	91	34,000	---	34,000	34,000	1	NaCl	$MgHCO_3$
Miss.	93	35	7	40	30	2	$NaHCO_3$	CaCl
Miss.	97	175	159	410	62	4	$CaHCO_3$	$MgSO_4$
Miss.	101	128	96	320	21	13	$CaHCO_3$	NaCl
Miss.	107	59	32	120	33	6	$NaHCO_3$	CaCl
Miss.	111	110,000	---	110,000	110,000	1	NaCl	$MgSO_4$
Miss.	119	151	36	190	120	3	$NaHCO_3$	$CaSO_4$
Miss.	121	284	81	648	204	43	$NaHCO_3$	$CaSO_4$
Miss.	123	167	72	380	58	23	$NaHCO_3$	$CaSO_4$
Miss.	125	514	57	600	430	7	$NaHCO_3$	CaCl
Miss.	127	342	60	420	290	4	$NaHCO_3$	CaCl
Miss.	129	261	83	422	150	13	$NaHCO_3$	$CaSO_4$
Miss.	133	430	118	620	250	7	$NaHCO_3$	$CaSO_4$
Miss.	135	298	113	370	130	4	$NaHCO_3$	MgCl
Miss.	137	81	28	110	153	4	$CaHCO_3$	CaCl
Miss.	150	1,150	1,160	4,900	280	15	$NaHCO_3$	CaCl
Miss.	151	626	414	2,500	250	76	$NaHCO_3$	CaCl

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Claiborne aquifers				
Miss.	153	532	203	780	270	5	$NaHCO_3$	$CaSO_4$
Miss.	161	60	---	60	60	1	$NaHCO_3$	$CaSO_4$
Miss.	163	218	67	365	120	21	$NaHCO_3$	$CaSO_4$
Tenn.	17	38	---	38	38	1	---	---
Tenn.	33	119	91	330	40	11	$NaHCO_3$	CaCl
Tenn.	45	141	94	420	66	14	$CaHCO_3$	$MgSO_4$
Tenn.	47	49	20	77	19	10	$CaHCO_3$	NaCl
Tenn.	53	61	35	170	25	20	$CaHCO_3$	NaCl
Tenn.	69	62	37	130	27	7	NaCl	$CaHCO_3$
Tenn.	75	68	27	110	34	10	$NaHCO_3$	CaCl
Tenn.	79	44	14	58	26	4	$CaHCO_3$	$MgSO_4$
Tenn.	95	157	38	200	130	3	$CaHCO_3$	$MgSO_4$
Tenn.	97	134	36	220	110	8	$MgHCO_3$	CaCl
Tenn.	113	38	21	78	26	6	$CaHCO_3$	NaCl
Tenn.	131	81	43	140	36	4	$CaHCO_3$	MgCl
Tenn.	157	93	45	260	35	101	$CaHCO_3$	MgCl
Tenn.	167	74	12	83	61	3	$CaHCO_3$	NaCl
Tenn.	183	75	95	350	23	20	$NaHCO_3$	CaCl
Tex.	1	233	204	1,690	35	110	$NaHCO_3$	$CaSO_4$
Tex.	5	961	1,130	5,410	93	20	$NaHCO_3$	CaCl
Tex.	13	592	704	7,110	21	291	$CaHCO_3$	NaCl
Tex.	15	29,600	8,180	35,300	23,800	2	NaCl	$CaHCO_3$
Tex.	21	757	920	4, 020	67	82	$NaHCaO_3$	CaCl
Tex.	25	602	1,170	12,900	60	178	NaCl	$NaHCO_3$
Tex.	29	157	31	190	130	3	$CaHCO_3$	NaCl
Tex.	41	872	707	3,130	175	79	$NaHCO_3$	CaCl
Tex.	51	818	901	4,670	95	100	$NaHCO_3$	$CaSO_4$
Tex.	55	632	604	2,700	69	55	$CaSO_4$	MgCl
Tex.	63	178	124	320	93	3	$NaHCO_3$	CaCl
Tex.	67	154	232	1,300	20	50	$NaHCO_3$	$CaSO_4$
Tex.	71	122,000	30,400	167,000	106,000	4	NaCl	$CaSO_4$
Tex.	73	465	305	1,200	112	13	$NaHCO_3$	$CaSO_4$
Tex.	89	40,300	45,800	122,000	18,600	5	NaCl	$CaHCO_3$
Tex.	123	13,500	9,000	20,500	505	5	$NaHCO_3$	CaCl
Tex.	127	590	739	7,340	234	94	$NaHCO_3$	CaCl
Tex.	131	27,000	22,100	93,400	4,400	19	NaCl	$CaHCO_3$
Tex.	157	35,400	19,900	59,400	4,640	6	NaCl	$CaHCO_3$
Tex.	158	404	402	1,280	56	10	$NaHCO_3$	CaCl
Tex.	159	174	94	240	107	2	CaCl	$NaHCO_3$
Tex.	161	289	55	328	250	2	$CaHCO_3$	$NaSO_4$
Tex.	163	607	426	2,540	203	182	$CaHCO_3$	CaCl
Tex.	175	10,400	4,430	14,000	3,930	4	NaCl	$CaHCO_3$

Table 5.--*Summary of dissolved-solias concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Claiborne aquifers				
Tex.	177	1,170	1,670	11,700	96	294	$CaHCO_3$	CaCl
Tex.	183	135	35	160	110	2	$NaHCO_3$	CaCl
Tex.	185	1,640	1,280	7,500	366	44	$NaSO_4$	CaCl
Tex.	187	250	189	719	67	14	NaCl	$CaSO_4$
Tex.	199	117,000	17,700	144,000	70,400	18	NaCl	$CaHCO_3$
Tex.	201	64,600	36,700	233,000	41,200	24	NaCl	$CaHCO_3$
Tex.	213	454	1,190	8,210	39	50	$CaHCO_3$	$NaSO_4$
Tex.	225	1,520	2,000	6,580	49	50	NaCl	$CaHCO_3$
Tex.	241	46,200	35,200	106,000	17,300	11	NaCl	$CaHCO_3$
Tex.	247	32,300	15,500	85,700	5,980	69	NaCl	$CaHCO_3$
Tex.	255	15,300	15,700	47,600	600	7	NaCl	$CaHCO_3$
Tex.	283	1,310	1,070	5,000	374	140	$NaHCO_3$	CaCl
Tex.	285	18,200	10,300	39,900	6,810	8	NaCl	$CaHCO_3$
Tex.	287	784	786	4,670	100	49	$NaHCO_3$	$CaSO_4$
Tex.	289	295	243	1,840	34	133	$NaHCO_3$	$CaSO_4$
Tex.	291	84,300	40,900	185,000	20,200	16	NaCl	$CaHCO_3$
Tex.	297	10,600	36,800	204,000	330	49	NaCl	$CaHCO_3$
Tex.	311	2,960	3,720	28,600	562	72	$NaHCO_3$	CaCl
Tex.	313	500	449	818	183	2	$NaHCO_3$	CaCl
Tex.	315	466	409	1,550	44	28	$CaHCO_3$	NaCl
Tex.	323	589	293	1,000	328	4	CaCl	$NaHCO_3$
Tex.	325	538	481	4,400	165	125	$CaHCO_3$	$MgSO_4$
Tex.	331	307	---	307	307	1	$NaHCO_3$	CaCl
Tex.	339	76,500	11,800	114,000	49,600	20	NaCl	$CaHCO_3$
Tex.	343	1,510	---	1,510	1,510	1	$NaHCO_3$	CaCl
Tex.	347	12,500	45,900	172,000	40	14	$NaHCO_3$	$CaSO_4$
Tex.	351	60,500	8,150	86,200	49,300	17	NaCl	$CaHCO_3$
Tex.	365	160	---	160	160	1	$NaHCO_3$	CaCl
Tex.	373	38,100	40,400	110,240	68	16	NaCl	CaCl
Tex.	401	220	---	220	220	1	$NaHCO_3$	$CaSO_4$
Tex.	403	800	440	1,750	91	23	$NaHCO_3$	$CaSO_4$
Tex.	405	303	387	1,878	16	58	$NaHCO_3$	CaCl
Tex.	423	149	79	354	28	57	$NaHCO_3$	NaCl
Tex.	427	33,000	21,600	79,500	6,480	29	NaCl	$CaHCO_3$
Tex.	449	584	751	4,590	40	36	$NaHCO_3$	$CaSO_4$
Tex.	455	935	---	935	935	1	$NaHCO_3$	CaCl
Tex.	457	64,100	17,600	79,000	15,000	11	NaCl	$CaHCO_3$
Tex.	459	295	269	953	30	33	$NaHCO_3$	CaCl
Tex.	467	336	202	723	101	14	$CaHCO_3$	$NaSO_4$
Tex.	469	12,000	---	12,000	12,000	1	NaCl	$MgHCO_3$
Tex.	473	46,800	19,600	67,800	759	17	NaCl	$CaHCO_3$
Tex.	477	18,600	5,510	28,400	2,230	36	NaCl	$MgHCO_3$

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter) Mean	Standard deviation	Maximum	Minimum	Number sampling sites	Primary water type	Secondary water type
				Claiborne aquifers				
Tex.	479	3,980	7,690	23,000	720	14	$NaHCO_3$	CaCl
Tex.	493	337	228	1,110	79	93	$NaHCO_3$	NaCl
Tex.	499	225	224	1,510	23	62	$CaHCO_3$	$NaSO_4$
Tex.	505	19,500	8,680	31,800	10,200	7	NaCl	$CaHCO_3$
Tex.	507	525	549	6,056	260	129	$CaHCO_3$	$CaSO_4$
				Jackson aquifers				
Ala.	25	120	---	120	120	1	---	---
Ala.	35	123	38	150	96	2	$CaHCO_3$	$MgSO_4$
Ark.	11	385	113	482	239	5	$NaHCO_3$	$CaSO_4$
Ark.	25	1,108	895	2,320	160	4	$CaSO_4$	$NaHCO_3$
Ark.	43	1,580	1,660	5,330	183	12	NaCl	$MgSO_4$
Ark.	53	98	---	98	98	1	$NaSO_4$	MgCl
Ark.	69	639	835	2,400	83	7	$NaSO_4$	$CaHCO_3$
Ark.	79	369	308	873	78	5	$NaSO_4$	$MgHCO_3$
Miss.	49	540	156	650	430	2	$NaHCO_3$	$CaSO_4$
Miss.	153	630	170	750	510	2	---	---
Tenn.	97	210	53	280	141	5	---	---
Tenn.	157	638	795	1,200	76	2	---	---
Tex.	5	629	---	629	629	1	$NaSO_4$	$CaHCO_3$
Tex.	13	3,930	878	4,870	3,080	6	$NaSO_4$	CaCl
Tex.	15	29,900	5,200	41,000	13,600	38	NaCl	$CaHCO_3$
Tex.	25	6,180	---	6,180	6,180	1	$CaSO_4$	NaCl
Tex.	41	439	206	827	249	6	$NaHCO_3$	CaCl
Tex.	51	1,830	499	2,600	873	8	NaCl	$CaHCO_3$
Tex.	131	13,700	12,300	120,000	4,450	109	NaCl	$CaHCO_3$
Tex.	177	1,260	594	2,200	375	33	NaCL	$CaSO_4$
Tex.	185	1,040	679	3,310	183	39	$NaHCO_3$	CaCl
Tex.	241	674	---	674	674	1	$NaHCO_3$	CaCl
Tex.	247	35,000	20,000	64,600	7,410	33	NaCl	$CaHCO_3$
Tex.	255	6,810	4,470	9,970	3,640	2	NaCl	$CaHCO_3$
Tex.	287	1,300	191	1,570	1,080	10	$NaSO_4$	$CaSO_4$
Tex.	297	23,800	51,600	274,000	297	34	NaCl	CaCl
Tex.	311	5,840	5,870	20,100	1,350	27	NaCl	$CaSO_4$
Tex.	373	799	991	5,800	138	31	$NaHCO_3$	CaCl
Tex.	403	1,140	1,300	3,640	61	6	$NaHCO_3$	$CaSO_4$
Tex.	427	40,500	25,100	78,800	3,350	22	NaCl	$CaHCO_3$
Tex.	457	1,270	472	1,860	889	4	$NaHCO_3$	CaCl
Tex.	477	924	943	5,050	65	27	$NaHCO_3$	CaCl
Tex.	481	459	---	459	459	1	$NaHCO_3$	CaCl
Tex.	505	24,300	8,370	35,500	12,800	9	NaCl	$CaSO_4$

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Miocene aquifers				
Ala.	3	723	2,100	12,000	20	40	NaCl	$MgSO_4$
Ala.	25	30	15	40	19	2	$CaHCO_3$	MgCl
Ala.	35	32	---	32	32	1	---	---
Ala.	97	749	2,280	13,000	12	38	NaCl	$CaHCO_3$
Ala.	99	61	45	120	20	5	$CaHCO_3$	MgCl
Ala.	129	185	81	310	83	5	$CaHCO_3$	MgCl
La.	1	115,000	---	115,000	115,000	1	NaCl	$CaHCO_3$
La.	3	70,200	39,300	102,000	729	10	$NaHCO_3$	CaCl
La.	7	94,400	65,900	163,000	425	7	NaCl	$CaHCO_3$
La.	9	990	800	5,500	250	78	$NaHCO_3$	CaCl
La.	11	5,330	20,400	81,700	157	16	$NaHCO_3$	CaCl
La.	17	734	---	734	734	1	---	---
La.	19	111,000	36,100	281,000	20,900	58	NaCl	$CaHCO_3$
La.	23	94,300	62,000	285,000	388	71	NaCl	$CaHCO_3$
La.	25	486	463	2,630	170	31	$NaHCO_3$	CaCl
La.	29	581	362	1,500	260	25	$NaHCO_3$	$CaHCO_3$
La.	33	16,300	38,000	134,000	160	92	$NaHCO_3$	$CaSO_4$
La.	37	228	53	301	110	16	$NaHCO_3$	$CaSO_4$
La.	39	391	---	391	391	1	---	---
La.	43	517	697	3,600	56	46	$NaHCO_3$	$CaHCO_3$
La.	45	198,000	71,500	328,000	4,240	95	NaCl	$CaHCO_3$
La.	47	120,000	53,200	272,000	300	60	NaCl	$CaHCO_3$
La.	51	106,000	43,200	156,000	19,300	50	NaCl	$CaHCO_3$
La.	53	81,400	39,800	189,000	200	54	NaCl	$CaHCO_3$
La.	57	123,000	41,800	243,000	11,900	124	NaCl	$CaHCO_3$
La.	59	333	386	2,000	49	24	$NaHCO_3$	$CaHCO_3$
La.	63	4,230	21,100	112,000	167	28	$NaHCO_3$	$CaSO_4$
La.	69	2,680	4,660	12,000	230	10	NaCl	$CaHCO_3$
La.	71	56,600	---	56,600	56,600	1	NaCl	$CaHCO_3$
La.	75	97,300	30,800	162,000	1,890	193	NaCl	$CaHCO_3$
La.	77	1,670	9,210	64,200	160	48	$NaHCO_3$	$CaSO_4$
La.	79	373	291	2,600	35	176	$NaHCO_3$	CaCl
La.	85	137	74	250	51	8	$NaHCO_3$	CaCl
La.	89	126,000	37,600	179,000	24,900	28	NaCl	$CaHCO_3$
La.	91	250	52	310	140	9	$NaHCO_3$	$CaSO_4$
La.	93	125,000	28,700	176,000	67,300	22	NaCl	$CaHCO_3$
La.	95	468	59	510	426	2	$NaHCO_3$	CaCl
La.	97	98,200	30,200	132,000	4,920	14	NaCl	$CaHCO_3$
La.	99	116,000	35,600	181,000	1,870	58	NaCl	$CaHCO_3$
La.	101	111,000	52,700	285,000	2,280	119	NaCl	$CaHCO_3$
La.	103	178	32	250	130	13	$NaHCO_3$	$CaSO_4$
La.	105	214	90	620	140	28	$NaHCO_3$	$CaSO_4$
La.	109	72,300	25,400	93,100	28,100	5	NaCl	$CaHCO_3$

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Miocene aquifers				
La.	113	71,700	54,400	122,000	11,000	6	NaCl	$CaHCO_3$
La.	115	219	81	360	28	65	$NaHCO_3$	CaCl
La.	117	152	46	291	84	25	$NaHCO_3$	$CaSO_4$
La.	121	456	654	2,310	179	10	$NaHCO_3$	$MgSO_4$
La.	125	298	341	1,730	120	21	$NaHCO_3$	$CaSO_4$
La.	700	56,300	33,000	136,000	4,180	33	NaCl	$CaHCO_3$
La.	709	136,000	94,300	218,000	568	7	NaCl	$CaHCO_3$
La.	711	85,500	53,800	130,000	2,340	11	NaCl	$CaHCO_3$
La.	712	142,000	162,000	257,000	27,700	2	NaCl	$CaSO_4$
La.	713	131,000	31,500	149,000	67,200	6	NaCl	$CaHCO_3$
La.	714	149,000	65,200	329,000	1,400	118	NaCl	$CaHCO_3$
La.	715	88,500	64,300	296,000	1,440	84	NaCl	$CaHCO_3$
La.	717	71,500	46,700	214,000	10,900	89	NaCl	$CaHCO_3$
La.	719	116,000	35,900	207,000	18,600	67	NaCl	$CaHCO_3$
La.	721	56,200	15,700	84,200	34,500	23	NaCl	$CaHCO_3$
La.	724	151,000	66,600	260,000	60,400	15	NaCl	$CaHCO_3$
La.	725	79,500	47,700	412,000	2,990	211	NaCl	$CaHCO_3$
La.	726	51,900	29,900	109,000	26,700	11	NaCl	$CaHCO_3$
La.	728	77,700	---	77,700	77,700	1	NaCl	$CaSO_4$
Miss.	1	394	325	2,100	84	31	$CaHCO_3$	MgCl
Miss.	5	55	23	93	27	10	$NaHCO_3$	CaCl
Miss.	21	374	219	840	36	11	$NaHCO_3$	CaCl
Miss.	29	140	112	519	30	18	$NaHCO_3$	$CaSO_4$
Miss.	31	100	73	257	22	16	$CaHCO_3$	$CaSO_4$
Miss.	35	126	86	600	16	43	$NaHCO_3$	$CaSO_4$
Miss.	37	93	75	280	24	15	$NaHCO_3$	CaCl
Miss.	39	205	122	520	86	18	$NaHCO_3$	CaCl
Miss.	41	113	74	420	27	26	$NaHCO_3$	$CaSO_4$
Miss.	45	300	85	450	150	22	$NaHCO_3$	CaCl
Miss.	47	285	148	1,000	120	65	$NaHCO_3$	$CaSO_4$
Miss.	49	537	203	750	347	4	$NaHCO_3$	$CaSO_4$
Miss.	59	544	369	2,900	29	112	$NaHCO_3$	CaCl
Miss.	61	124	93	190	58	2	$CaHCO_3$	$NaSO_4$
Miss.	63	350	408	1,400	100	9	$CaHCO_3$	$MgSO_4$
Miss.	65	53	66	210	11	9	$NaHCO_3$	CaCl
Miss.	67	126	77	400	18	39	$NaHCO_3$	$CaSO_4$
Miss.	73	106	52	218	16	45	$NaHCO_3$	CaCl
Miss.	77	118	73	210	22	16	$NaHCO_3$	CaCl
Miss.	85	96	112	390	37	9	$NaHCO_3$	CaCl
Miss.	91	88	53	200	19	26	$NaHCO_3$	$CaSO_4$
Miss.	109	151	58	230	22	27	$NaHCO_3$	$CaSO_4$
Miss.	111	647	1,820	9,410	16	45	$NaHCO_3$	CaCl
Miss.	113	96	64	200	23	21	$NaHCO_3$	$CaSO_4$

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Miocene aquifers				
Miss.	121	174	59	243	139	3	CaCl	$MgHCO_3$
Miss.	127	167	101	300	20	9	$NaHCO_3$	$CaSO_4$
Miss.	129	79	68	270	20	13	$NaHCO_3$	$CaSO_4$
Miss.	131	141	78	320	23	18	$NaHCO_3$	CaCl
Miss.	147	31	8	46	19	8	$CaHCO_3$	NaCl
Miss.	153	122	71	230	22	13	$CaHCO_3$	$MgSO_4$
Miss.	157	126	43	200	59	14	$NaHCO_3$	$CaSO_4$
Tex.	15	701	424	1,350	172	5	$CaHCO_3$	NaCl
Tex.	25	1,170	649	4,030	247	115	$NaHCO_3$	CaCl
Tex.	39	77,100	35,800	150,000	9,760	15	NaCl	$CaHCO_3$
Tex.	47	14,600	14,300	68,300	789	30	NaCl	$CaSO_4$
Tex.	57	13,900	31,800	99,000	404	11	$CaHCO_3$	NaCl
Tex.	61	342	---	342	342	1	NaCl	$CaHCO_3$
Tex.	71	108,000	14,800	131,000	80,800	13	NaCl	$CaHCO_3$
Tex.	89	9,810	---	9,810	9,810	1	---	---
Tex.	131	3,230	3,190	17,200	591	31	NaCl	$CaHCO_3$
Tex.	149	885	296	1,360	627	6	$NaHCO_3$	CaCl
Tex.	157	65,100	24,000	135,000	44,200	11	NaCl	$MgHCO_3$
Tex.	175	3,040	---	3,040	3,040	1	NaCl	$CaHCO_3$
Tex.	177	808	380	1,890	397	26	$CaHCO_3$	NaCl
Tex.	185	666	251	1,310	49	71	$NaHCO_3$	CaCl
Tex.	199	46,400	39,800	74,600	18,300	2	---	---
Tex.	201	57,800	49,500	106,000	2,700	5	NaCl	$CaHCO_3$
Tex.	215	5,250	---	5,250	5,250	1	NaCl	$CaSO_4$
Tex.	239	53,700	15,600	67,000	21,800	11	NaCl	$CaHCO_3$
Tex.	241	433	919	5,560	21	36	$CaHCO_3$	$NaSO_4$
Tex.	245	101,000	50,600	124,000	10,200	5	NaCl	$CaHCO_3$
Tex.	249	1,890	---	1,890	1,890	1	---	---
Tex.	261	11,800	21,500	92,500	401	36	NaCl	$CaHCO_3$
Tex.	273	35,200	25,700	100,000	8,320	11	NaCl	$CaSO_4$
Tex.	291	432	78	506	338	5	$NaHCO_3$	CaCl
Tex.	297	894	2,510	25,900	277	102	$CaHCO_3$	NaCl
Tex.	311	2,880	1,350	5,490	570	66	NaCl	$CaSO_4$
Tex.	321	113,000	---	113,000	113,000	1	NaCl	$CaHCO_3$
Tex.	339	481	779	5,590	180	46	$CaHCO_3$	NaCl
Tex.	351	173	102	430	32	46	$CaHCO_3$	CaCl
Tex.	355	107,000	---	107,000	107,000	1	NaCl	$CaSO_4$
Tex.	361	80,400	---	80,400	80,400	1	NaCl	$CaHCO_3$
Tex.	373	566	584	4,040	29	176	$CaHCO_3$	NaCl
Tex.	391	69,400	3,880	74,300	64,800	6	NaCl	$CaHCO_3$
Tex.	407	556	501	2,610	29	71	$CaHCO_3$	NaCl
Tex.	409	61,900	26,000	85,400	1,160	19	NaCl	$CaHCO_3$
Tex.	427	19,300	15,600	42,200	2,860	6	NaCl	$CaHCO_3$

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
Miocene aquifers								
Tex.	457	492	670	3,400	34	59	$CaHCO_3$	NaCl
Tex.	469	16,000	19,300	64,400	1,350	11	NaCl	$CaHCO_3$
Tex.	471	482	---	482	482	1	$CaHCO_3$	NaCl
Tex.	473	709	177	834	584	2	---	---
Tex.	477	487	211	1,540	163	151	$CaHCO_3$	NaCl
Tex.	481	7,390	22,300	104,000	21	28	NaCl	$CaHCO_3$
Tex.	489	116,000	22,900	138,000	64,400	8	NaCl	$CaSO_4$
Tex.	602	59,200	60,300	102,000	16,500	2	NaCl	$CaHCO_3$
Tex.	708	70,500	34,200	98,300	492	7	NaCl	$CaHCO_3$
Pliocene aquifers								
Ala.	53	75	69	124	26	2	---	---
Ala.	97	32	17	68	13	9	$NaHCO_3$	CaCl
La.	3	320	205	1,000	150	25	$NaHCO_3$	CaCl
La.	5	1,100	---	1,100	1,100	1	NaCl	$CaHCO_3$
La.	9	410	---	410	410	1	$NaHCO_3$	CaCl
La.	11	174	64	340	43	20	$NaHCO_3$	NaCl
La.	19	198	23	224	180	3	NaHCO3	MgCl
La.	33	338	635	5,300	150	72	$NaHCO_3$	$CaSO_4$
La.	37	129	68	240	34	24	$NaHCO_3$	$CaSO_4$
La.	39	412	159	892	220	39	$NaHCO_3$	CaCl
La.	45	141,000	36,400	167,000	116,000	2	NaCl	$CaHCO_3$
La.	47	380	---	380	380	1	$NaHCO_3$	$CaSO_4$
La.	53	220	---	220	220	1	$NaHCaO_3$	CaCl
La.	63	180	36	230	48	37	$NaHCO_3$	$CaSO_4$
La.	71	380	---	380	380	1	---	---
La.	77	240	65	420	170	19	$NaHCO_3$	$CaSO_4$
La.	91	189	48	260	130	6	$NaHCO_3$	$CaSO_4$
La.	97	535	280	1,300	210	25	$NaHCO_3$	CaCl
La.	99	111,000	14,800	136,000	84,600	8	NaCl	$CaHCO_3$
La.	103	295	284	2,200	140	53	$NaHCO_3$	$CaSO_4$
La.	105	144	52	240	40	21	$NaHCO_3$	$CaSO_4$
La.	113	96,000	---	96,000	96,000	1	---	---
La.	117	103	51	260	24	16	$NaHCO_3$	$CaSO_4$
La.	121	260	223	1,500	140	34	$NaHCO_3$	$CaSO_4$
La.	125	174	74	470	70	44	$NaHCO_3$	$CaSO_4$
La.	703	133,000	---	133,000	133,000	1	---	---
La.	705	114,000	---	114,000	114,000	1	---	---
La.	707	127,000	10,800	139,000	118,000	3	NaCl	$CaHCO_3$
La.	709	76,100	65,300	122,000	30,000	2	NaCl	$CaSO_4$
La.	711	111,000	31,900	242,000	83,900	20	NaCl	$CaHCO_3$

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter) Mean	Standard deviation	Maximum	Minimum	Number sampling sites	Primary water type	Secondary water type
				Pliocene aquifers				
La.	712	182,000	104,000	314,000	25,900	7	NaCl	$CaHCO_3$
La.	713	169,000	---	169,000	169,000	1	---	---
La.	714	53,300	21,300	68,400	38,300	2	NaCl	$CaSO_4$
La.	715	92,900	39,400	122,000	27,300	5	NaCl	$CaHCO_3$
La.	725	119,000	---	119,000	119,000	1	NaCl	$CaHCO_3$
Miss.	5	38	0	38	38	2	NaCl	$CaHCO_3$
Miss.	21	430	---	430	430	1	$CaHCO_3$	MgCl
Miss.	29	110	---	110	110	1	NaCl	CaHCO3
Miss.	31	21	---	21	21	1	---	---
Miss.	39	16	4	18	13	2	NaCl	$CaHCO_3$
Miss.	45	251	60	320	185	4	$NaHCO_3$	CaCl
Miss.	47	188	59	380	39	73	$NaHCO_3$	$CaSO_4$
Miss.	59	421	350	2,400	11	53	$NaHCO_3$	CaCl
Miss.	65	31	14	54	21	5	$NaHCO_3$	CaCl
Miss.	73	39	30	160	13	47	$CaHCO_3$	CaCl
Miss.	77	27	---	27	27	1	$NaHCO_3$	CaCl
Miss.	85	282	387	1,690	31	30	NaCl	$CaHCO_3$
Miss.	113	47	17	69	22	6	$NaHCO_3$	CaCl
Miss.	127	29	8	42	21	7	$NaHCO_3$	MgCl
Miss.	131	15	0	15	15	2	NaCl	$MgHCO_3$
Miss.	147	22	2	24	20	3	$NaHCO_3$	CaCl
Miss.	157	373	451	692	54	2	NaCl	$MgHCO_3$
Tex.	15	572	280	1,300	170	25	$CaHCO_3$	NaCl
Tex.	25	925	443	2,690	58	126	$NaHCO_3$	CaCl
Tex.	39	612	129	703	520	2	$NaHCO_3$	CaCl
Tex.	47	1,070	729	4,670	300	125	NaHCO3	CaCl
Tex.	57	377	186	721	109	25	$CaHCO_3$	NaCl
Tex.	71	877	844	2,380	453	5	$NaHCO_3$	CaCl
Tex.	131	1,480	532	2,710	569	35	NaCl	$CaHCO_3$
Tex.	157	537	72	650	380	11	$NaHCO_3$	CaCl
Tex.	185	505	155	880	213	31	$CaHCO_3$	NaCl
Tex.	201	2,440	5,840	19,000	260	10	$NaHCO_3$	CaCl
Tex.	215	5,320	---	5,320	5,320	1	$NaSO_4$	CaCl
Tex.	241	295	146	660	70	17	$NaHCO_3$	CaCl
Tex.	249	802	137	1,020	678	5	NaCl	$CaHCO_3$
Tex.	261	1,460	939	6,850	730	73	NaCl	$CaSO_4$
Tex.	273	1,730	2,550	18,000	630	50	NaCl	$CaHCO_3$
Tex.	291	331	290	1,300	44	89	$CaHCO_3$	NaCl
Tex.	313	300	58	414	213	9	$NaHCO_3$	CaCl
Tex.	339	269	130	625	65	93	$CaHCO_3$	NaCl
Tex.	351	182	145	681	41	21	NaCl	$MgHCO_3$
Tex.	373	108	76	317	24	37	$CaHCO_3$	NaCl
Tex.	407	151	165	460	36	11	$CaHCO_3$	NaCl

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
Pliocene aquifers								
Tex.	457	144	108	470	24	27	$CaHCO_3$	NaCl
Tex.	471	328	---	328	328	1	$CaHCO_3$	NaCl
Tex.	473	382	287	2,830	121	136	$CaHCO_3$	NaCl
Tex.	477	415	238	1,500	119	59	$CaHCO_3$	NaCl
Tex.	481	183	73	336	31	16	$NaHCO_3$	CaCl
Pleistocene aquifers								
Ky.	7	197	118	410	94	8	$NaHCO_3$	CaCl
Ky.	35	91	41	130	48	3	NaCl	$CaHCO_3$
Ky.	39	172	---	172	172	1	---	---
Ky.	75	863	480	1,380	430	3	$CaHCO_3$	MgCl
Ky.	83	129	51	170	57	4	$CaHCO_3$	$NaSO_4$
Ky.	105	130	---	130	130	1	$NaHCO_3$	CaCl
Ky.	145	275	301	1,200	63	12	$NaHCO_3$	CaCl
Ky.	157	71	43	120	38	3	$CaHCO_3$	NaCl
La.	1	403	113	730	270	22	$CaHCO_3$	CaCl
La.	3	146	124	530	32	24	$NaHCO_3$	CaCl
La.	5	1,190	1,120	5,400	166	89	$NaHCO_3$	CaCl
La.	7	1,200	853	4,130	450	31	$CaHCO_3$	MgCl
La.	9	578	269	1,500	51	71	$CaHCO_3$	CaCl
La.	11	112	67	358	33	32	$NaHCO_3$	CaCl
La.	13	48	---	48	48	1	---	---
La.	15	573	362	1,700	110	47	$CaHCO_3$	MgCl
La.	17	983	725	3,700	79	38	NaCl	MgCl
La.	19	354	196	1,400	171	177	NaCl	$CaHCO_3$
La.	21	320	---	320	320	1	$CaHCO_3$	$MgSO_4$
La.	23	1,390	2,730	21,000	380	60	NaCl	$CaHCO_3$
La.	25	1,240	2,700	14,000	140	29	$CaHCO_3$	$CaHCO_3$
La.	29	544	222	1,100	52	14	$CaHCO_3$	$MgSO_4$
La.	31	454	270	790	57	7	$CaHCO_3$	NaCl
La.	33	460	948	6,600	52	82	$NaHCO_3$	CaCl
La.	35	522	169	825	270	11	$CaHCO_3$	NaCl
La.	37	65	35	150	26	15	NaCl	$CaHCO_3$
La.	39	325	178	742	41	34	$CaHCO_3$	CaCl
La.	41	702	648	2,920	110	47	$CaHCO_3$	MgCl
La.	43	217	313	1,500	23	63	$NaHCO_3$	MgCl
La.	45	557	367	1,900	120	30	$CaHCO_3$	NaCl
La.	47	688	716	4,850	186	69	$CaHCO_3$	MgCl
La.	51	1,400	1,260	8,700	345	62	NaCl	$CaHCO_3$
La.	53	569	884	4,900	200	28	$NaHCO_3$	CaCl

Table 5.--*Summary of dissolved-solias concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Pleistocene aquifers				
La.	55	324	533	3,300	97	34	CaHCO3	MgCl
La.	57	3,150	1,350	5,580	713	16	NaCl	$CaHCO_3$
La.	59	266	665	3,700	29	41	$NaHCO_3$	CaCl
La.	63	157	61	340	74	16	$NaHCO_3$	CaCl
La.	65	1,140	1,310	5,500	330	26	NaCl	$CaHCO_3$
La.	67	260	228	1,300	43	35	$CaHCO_3$	NaCl
La.	69	917	1,160	8,100	39	57	$CaHCO_3$	$MgSO_4$
La.	71	1,160	2,180	17,100	370	59	$NaHCO_3$	$CaHCO_3$
La.	73	848	1,200	3,400	92	7	$CaHCO_3$	$MgSO_4$
La.	75	8,550	10,500	32,400	1,210	14	NaCl	$MgHCO_3$
La.	77	1,640	1,930	3,000	270	2	NaCl	$CaHCO_3$
La.	79	483	592	4,000	27	125	$NaHCO_3$	CaCl
La.	81	673	755	4,700	38	41	$CaHCO_3$	MgCl
La.	83	377	415	2,000	63	20	$CaHCO_3$	MgCl
La.	87	3,180	1,660	5,650	1,200	8	NaCl	$MgHCO_3$
La.	89	1,400	687	3,640	410	53	NaCl	$CaHCO_3$
La.	91	32	11	51	15	9	$NaHCO_3$	CaCl
La.	93	974	633	3,180	240	80	$NaHCO_3$	CaCl
La.	95	1,180	834	6,900	290	84	NaCl	$CaHCO_3$
La.	97	379	222	1,400	93	86	$CaHCO_3$	MgCal
La.	99	591	258	1,490	269	39	$NaHCO_3$	CaCl
La.	101	754	579	2,800	317	24	NaCl	MgCl
La.	103	191	92	440	32	15	$NaHCO_3$	CaSO4
La.	105	139	103	340	37	9	$NaHCO_3$	CaSO4
La.	107	559	196	1,130	330	21	$CaHCO_3$	MgCl
La.	109	2,450	1,770	3,700	1,200	2	NaCl	$CaHCO_3$
La.	111	89	57	170	48	4	NaCl	$CaSO_4$
La.	113	621	347	1,860	260	44	$NaHCO_3$	CaCl
La.	115	51	26	100	22	20	$NaHCO_3$	MgCl
La.	117	77	44	142	21	8	$NaHCO_3$	CaCl
La.	119	159	88	260	31	8	$NaHCO_3$	CaCl
La.	121	304	123	710	170	19	$CaHCO_3$	MgCl
La.	123	452	180	788	123	18	$CaHCO_3$	MgCl
La.	125	218	188	470	82	6	$CaHCO_3$	MgCl
La.	127	119	133	520	33	14	CaCl	$MgHCO_3$
Miss.	1	360	33	410	330	5	$CaHCO_3$	MgCl
Miss.	11	403	53	503	320	8	$CaHCO_3$	$MgSO_4$
Miss.	21	377	31	410	350	3	$CaHCO_3$	$MgSO_4$
Miss.	27	340	24	370	310	6	$CaHCO_3$	MgCl
Miss.	33	218	29	247	190	3	$CaHCO_3$	MgCl
Miss.	51	390	---	390	390	1	$CaHCO_3$	MgCl
Miss.	53	379	108	550	285	5	$CaHCO_3$	MgCl
Miss.	55	570	---	570	570	1	---	---
Miss.	83	276	33	320	245	5	$CaHCO_3$	MgCl

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Pleistocene aquifers				
Miss.	107	170	---	170	170	1	$CaHCO_3$	MgCl
Miss.	119	249	65	343	135	10	$CaHCO_3$	MgCl
Miss.	125	472	73	560	350	6	$CaHCO_3$	$MgSO_4$
Miss.	133	353	98	510	230	6	$CaHCO_3$	MgCl
Miss.	135	283	41	320	230	4	$CaHCO_3$	$MgSO_4$
Miss.	143	283	82	330	160	4	$CaHCO_3$	MgCl
Miss.	149	610	28	630	590	2	$CaHCO_3$	MgCl
Miss.	151	503	174	950	230	27	$CaHCO_3$	$MgSO_4$
Miss.	157	390	99	460	320	2	$CaHCO_3$	MgCl
Miss.	163	390	53	450	350	3	$CaHCO_3$	$MgSO_4$
Tex.	7	4,360	13,100	122,000	258	131	NaCl	$MgSO_4$
Tex.	25	5,470	19,200	122,000	260	52	NaCl	$CaHCO_3$
Tex.	39	920	612	5,100	75	358	$NaHCO_3$	CaCl
Tex.	55	432	331	1,900	121	63	$CaHCO_3$	NaCl
Tex.	71	991	1,050	8,080	98	79	$NaHCO_3$	CaCl
Tex.	157	451	250	1,900	74	238	$CaHCO_3$	NaCl
Tex.	167	1,180	883	4,100	270	34	NaCl	$MgHCO_3$
Tex.	185	346	219	663	139	8	$NaHCO_3$	CaCl
Tex.	187	672	494	2,430	132	34	$CaHCO_3$	NaCl
Tex.	201	1,690	2,480	6,000	260	5	NaCl	$CaSO_4$
Tex.	239	732	262	1,630	167	58	$NaHCO_3$	CaCl
Tex.	241	183	123	561	21	23	$NaHCO_3$	NaCl
Tex.	245	938	843	4,480	80	72	$NaHCO_3$	NaCl
Tex.	249	3,460	---	3,460	3,460	1	CaCl	$NaHCO_3$
Tex.	273	5,260	5,630	21,200	1,000	14	NaCl	$CaSO_4$
Tex.	285	317	---	317	317	1	$NaHCO_3$	CaCl
Tex.	291	560	321	1,700	111	62	$CaHCO_3$	NaCl
Tex.	313	370	175	1,210	130	147	$NaHCO_3$	CaCl
Tex.	315	646	255	1,570	345	57	$CaHCO_3$	NaCl
Tex.	321	954	552	4,300	120	168	$NaHCO_3$	CaCl
Tex.	325	1,000	---	1,000	1,000	1	CaCl	$NaHCO_3$
Tex.	339	89	42	167	37	22	$NaHCO_3$	CaCl
Tex.	351	180	153	816	20	56	NaCl	$CaHCO_3$
Tex.	361	395	354	2,500	25	255	$NaHCO_3$	CaCl
Tex.	373	353	353	1,780	32	54	$NaHCO_3$	CaCl
Tex.	391	1,270	829	5,280	144	194	NaCl	$CaHCO_3$
Tex.	401	450	---	450	450	1	$NaHCO_3$	CaCl
Tex.	409	2,140	1,530	4,560	477	12	NaCl	$CaHCO_3$
Tex.	457	92	92	274	23	11	NaCl	$CaHCO_3$
Tex.	471	64	---	64	64	1	---	---
Tex.	477	660	449	3,900	167	85	$NaHCO_3$	CaCl
Tex.	481	345	511	2,310	21	19	$CaHCO_3$	NaCl
Tex.	489	1,170	1,080	5,220	80	43	NaCl	$CaHCO_3$
Tex.	507	2,280	1,560	5,140	363	12	CaCl	$NaSO_4$

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Holocene aquifers				
Ala.	3	211	138	328	30	5	$CaHCO_3$	$MgSO_4$
Ala.	97	203	566	2,000	10	12	$NaHCO_3$	NaCl
Ala.	119	280	---	280	280	1	$NaHCO_3$	CaCl
Ark.	1	419	129	620	110	28	$CaHCO_3$	MgCl
Ark.	3	359	137	580	96	25	$CaHCO_3$	NaCl
Ark.	11	130	42	160	100	2	$NaHCO_3$	$CaSO_4$
Ark.	13	126	48	160	92	2	NaCl	$CaHCO_3$
Ark.	17	869	865	3,100	190	17	$CaHCO_3$	$NaHCO_3$
Ark.	19	417	415	1,000	99	4	$CaHCO_3$	NaCl
Ark.	21	250	93	410	110	17	$CaHCO_3$	MgCl
Ark.	25	180	---	180	180	1	$NaHCO_3$	$CaSO_4$
Ark.	27	390	---	390	390	1	$CaHCO_3$	MgCl
Ark.	31	241	110	440	88	20	$CaHCO_3$	$MgSO_4$
Ark.	35	306	100	608	0	61	$CaHCO_3$	MgCl
Ark.	37	376	81	470	150	18	$CaHCO_3$	MgCl
Ark.	39	48	2	49	46	2	$NaHCO_3$	CaCl
Ark.	41	512	253	960	84	17	$CaHCO_3$	MgCl
Ark.	43	286	360	1,430	28	24	$NaHCO_3$	CaCl
Ark.	53	78	17	90	66	2	NaCl	$MgSO_4$
Ark.	55	290	287	1,100	58	11	$CaHCO_3$	CaCl
Ark.	59	70	27	110	47	5	$NaHCO_3$	CaCl
Ark.	63	578	619	1,500	180	4	$CaHCO_3$	$NaSO_4$
Ark.	67	246	63	370	150	25	$CaHCO_3$	$MgSO_4$
Ark.	69	409	152	730	180	21	$CaHCO_3$	MgCl
Ark.	73	261	151	430	120	4	$CaHCO_3$	NaCl
Ark.	75	317	134	730	180	19	$CaHCO_3$	$MgSO_4$
Ark.	77	360	75	450	209	19	$CaHCO_3$	$MgSO_4$
Ark.	79	387	199	830	80	19	$CaHCO_3$	NaCl
Ark.	81	283	192	690	99	8	NaCl	MgCl
Ark.	85	165	87	460	28	46	$CaHCO_3$	MgCl
Ark.	91	674	709	1,700	140	7	CaCl	$NaHCO_3$
Ark.	93	344	99	558	117	23	$CaHCO_3$	$MgSO_4$
Ark.	95	532	276	1,500	86	53	$CaHCO_3$	MgCl
Ark.	99	83	---	83	83	1	---	---
Ark.	107	454	140	696	194	11	$CaHCO_3$	$MgSO_4$
Ark.	111	348	81	500	200	19	$CaHCO_3$	$MgSO_4$
Ark.	117	320	89	706	163	52	$CaHCO_3$	MgCl
Ark.	119	396	112	550	218	9	$CaHCO_3$	MgCl
Ark.	121	233	50	290	140	8	$CaHCO_3$	MgCl
Ark.	123	337	120	560	114	35	$CaHCO_3$	MgCl
Ark.	145	270	190	843	33	21	$CaHCO_3$	NaCl
Ark.	147	235	86	380	93	12	$CaHCO_3$	MgCl
Ill.	3	460	85	520	400	2	$CaHCO_3$	MgCl
Ill.	153	570	325	800	340	2	$CaHCO_3$	$MgSO_4$

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
Holocene aquifers								
Ky.	7	157	152	450	55	6	$CaHCO_3$	NaCl
Ky.	35	67	16	78	55	2	$NaHCO_3$	MgCl
Ky.	39	450	108	540	330	3	$CaHCO_3$	$MgSO_4$
Ky.	75	396	155	707	210	10	$CaHCO_3$	$MgSO_4$
Ky.	83	32	---	32	32	1	$NaHCO_3$	CaCl
Ky.	105	285	262	470	100	2	$MgHCO_3$	$CaSO_4$
Ky.	145	1,620	2,240	4,200	260	3	$CaHCO_3$	CaCl
Ky.	157	176	94	380	46	10	$CaHCO_3$	MgCl
La.	9	558	187	998	100	30	$CaHCO_3$	MgCl
La.	11	110	---	110	110	1	$NaHCO_3$	CaCl
La.	21	1,570	2,020	3,000	140	2	NaCl	$CaHCO_3$
La.	25	110	---	110	110	1	$NaHCO_3$	$CaSO_4$
La.	51	3,640	3,630	8,700	480	8	$CaHCO_3$	$CaHCO_3$
La.	67	428	509	1,600	62	8	$CaHCO_3$	MgCl
La.	71	1,160	---	1,160	1,160	1	---	---
La.	73	3,900	---	3,900	3,900	1	NaCl	$CaSO_4$
La.	75	487	---	487	487	1	---	---
La.	77	590	---	590	590	1	$CaHCO_3$	$MgSO_4$
La.	87	2,370	2,200	4,820	586	3	NaCl	$CaHCO_3$
La.	89	754	209	902	606	2	---	---
La.	93	186	---	186	186	1	---	---
La.	95	623	371	1,040	330	3	$MgHCO_3$	CaCl
La.	97	835	93	919	720	4	---	---
La.	103	420	0	420	420	2	$NaHCO_3$	CaCl
La.	125	460	26	490	440	3	$CaHCO_3$	MgCl
Miss.	35	28	7	33	23	2	$NaHCO_3$	CaCl
Miss.	41	20	---	20	20	1	---	---
Miss.	47	120	---	120	120	1	---	---
Miss.	49	300	---	300	300	1	$NaSO_4$	CaCl
Miss.	57	43	3	45	41	2	$NaHCO_3$	CaCl
Miss.	59	565	64	610	520	2	---	---
Miss.	73	68	75	180	25	4	$CaHCO_3$	NaCl
Miss.	87	74	49	130	43	3	$CaHCO_3$	NaCl
Miss.	95	54	25	110	30	10	$NaHCO_3$	CaCl
Miss.	103	35	---	35	35	1	CaCl	$NaHCO_3$
Miss.	117	86	---	86	86	1	---	---
Miss.	119	267	---	267	267	1	---	---
Miss.	121	160	---	160	160	1	---	---
Miss.	141	22	---	22	22	1	---	---
Mo.	23	266	47	360	200	20	$CaHCO_3$	MgCl
Mo.	69	262	158	432	120	3	$CaHCO_3$	$MgSO_4$
Mo.	133	272	127	500	130	10	$CaHCO_3$	MgCl
Mo.	143	226	143	890	140	25	$CaHCO_3$	MgCl
Mo.	155	269	76	380	110	14	$CaHCO_3$	$MgSO_4$
Mo.	181	150	0	150	150	2	$CaHCO_3$	$MgSO_4$

Table 5.--*Summary of dissolved-solids concentrations and water types from the gulf coast aquifer systems--Continued*

State	County code	Dissolved solids (milligrams per liter)				Number sampling sites	Primary water type	Secondary water type
		Mean	Standard deviation	Maximum	Minimum			
				Holocene aquifers				
Mo.	201	204	167	658	89	10	$CaHCO_3$	$MgSO_4$
Mo.	207	258	132	762	180	19	$CaHCO_3$	MgCl
Tenn.	17	69	28	89	49	2	NaCl	$CaHCO_3$
Tenn.	33	270	---	270	270	1	NaCl	$CaHCO_3$
Tenn.	45	298	117	480	150	10	$CaHCO_3$	$MgSO_4$
Tenn.	47	86	35	142	45	6	NaCl	$CaHCO_3$
Tenn.	69	175	78	230	120	2	NaCl	$CaHCO_3$
Tenn.	75	184	165	300	67	2	$NaHCO_3$	CaCl
Tenn.	77	530	---	530	530	1	$MgSO_4$	NaCl
Tenn.	95	446	148	590	230	7	$CaHCO_3$	$MgSO_4$
Tenn.	97	358	116	490	69	10	$CaHCO_3$	$MgSO_4$
Tenn.	109	199	315	670	24	4	CaCl	$NaHCO_3$
Tenn.	113	370	---	370	370	1	NaCl	$MgHCO_3$
Tenn.	131	353	139	470	200	3	$MgHCO_3$	$CaSO_4$
Tenn.	157	362	444	2,600	71	46	$CaHCO_3$	MgCl
Tenn.	167	266	154	450	72	5	$CaHCO_3$	NaCl
Tex.	7	2,500	2,230	7,500	520	10	NaCl	$CaHCO_3$
Tex.	15	606	---	606	606	1	$CaHCO_3$	NaCl
Tex.	21	911	663	2,060	348	6	$CaHCO_3$	NaCl
Tex.	25	1,310	737	2,960	639	34	CaCl	CaCl
Tex.	41	1,250	386	2,500	281	37	$CaHCO_3$	NaCl
Tex.	51	1,470	423	2,420	608	34	$CaHCO_3$	NaCl
Tex.	55	650	456	2,160	244	20	$CaHCO_3$	$NaHCO_3$
Tex.	57	450	---	450	450	1	$CaHCO_3$	NaCl
Tex.	177	728	306	1,370	360	29	$CaHCO_3$	NaCl
Tex.	185	549	453	1,000	94	3	$CaHCO_3$	NaCl
Tex.	187	586	295	1,330	251	13	$CaHCO_3$	NaCl
Tex.	213	1,350	2,240	9,950	179	18	$NaHCO_3$	$CaSO_4$
Tex.	225	640	---	640	640	1	$CaHCO_3$	NaCl
Tex.	261	46,000	5,660	50,000	42,000	2	NaCl	$MgSO_4$
Tex.	273	1,540	792	2,100	980	2	CaCl	$NaHCO_3$
Tex.	289	36	---	36	36	1	---	---
Tex.	297	529	210	907	120	11	$CaHCO_3$	NaCl
Tex.	311	847	446	1,660	512	8	$CaHCO_3$	NaCl
Tex.	315	775	---	775	775	1	$NaHCO_3$	CaCl
Tex.	321	1,020	106	1,100	950	2	$CaHCO_3$	NaCl
Tex.	331	1,380	160	1,540	1,220	3	CaCl	$NaHCO_3$
Tex.	349	1,280	841	2,500	377	7	NaCl	$CaSO_4$
Tex.	365	1,000	---	1,000	1,000	1	$NaSO_4$	$CaHCO_3$
Tex.	373	247	202	602	35	9	$CaHCO_3$	$MgSO_4$
Tex.	395	828	99	924	727	3	$CaHCO_3$	$MgSO_4$
Tex.	405	30	---	30	30	1	$MgHCO_3$	NaCl
Tex.	449	463	---	463	463	1	$CaHCO_3$	NaCl
Tex.	473	581	208	894	280	6	$CaHCO_3$	NaCl
Tex.	477	612	314	876	265	3	$CaHCO_3$	NaCl

Table 6.--*County codes for States in the study area*

State	County code	County name	State	County code	County name
Ala.	3	BALDWIN	Ark.	103	OUACHITA
Ala.	23	CHOCTAW	Ark.	107	PHILLIPS
Ala.	25	CLARKE	Ark.	111	POINSETT
Ala.	35	CONECUH	Ark.	117	PRAIRIE
Ala.	53	ESCAMBIA	Ark.	119	PULASKI
Ala.	91	MARENGO	Ark.	121	RANDOLPH
Ala.	97	MOBILE	Ark.	123	ST FRANCIS
Ala.	99	MONROE	Ark.	125	SALINE
Ala.	119	SUMTER	Ark.	139	UNION
Ala.	129	WASHINGTON	Ark.	145	WHITE
Ala.	131	WILCOX	Ark.	147	WOODRUFF
Ark.	1	ARKANSAS	Fla.	33	ESCAMBIA
Ark.	3	ASHLEY	Ill.	3	ALEXANDER
Ark.	11	BRADLEY	Ill.	153	PULASKI
Ark.	13	CALHOUN	Ky.	7	BALLARD
Ark.	17	CHICOT	Ky.	35	CALLOWAY
Ark.	19	CLARK	Ky.	39	CARLISLE
Ark.	21	CLAY	Ky.	75	FULTON
Ark.	25	CLEVELAND	Ky.	83	GRAVES
Ark.	27	COLUMBIA	Ky.	105	HICKMAN
Ark.	31	CRAIGHEAD	Ky.	145	MC CRACKEN
Ark.	35	CRITTENDEN	Ky.	157	MARSHALL
Ark.	37	CROSS	La.	1	ACADIA
Ark.	39	DALLAS	La.	3	ALLEN
Ark.	41	DESHA	La.	5	ASCENSION
Ark.	43	DREW	La.	7	ASSUMPTION
Ark.	53	GRANT	La.	9	AVOYELLES
Ark.	55	GREENE	La.	11	BEAUREGARD
Ark.	57	HEMPSTEAD	La.	13	BIENVILLE
Ark.	59	HOT SPRING	La.	15	BOSSIER
Ark.	63	INDEPENDENCE	La.	17	CADDO
Ark.	67	JACKSON	La.	19	CALCASIEU
Ark.	69	JEFFERSON	La.	21	CALDWELL
Ark.	73	LAFAYETTE	La.	23	CAMERON
Ark.	75	LAWRENCE	La.	25	CATAHOULA
Ark.	77	LEE	La.	27	CLAIBORNE
Ark.	79	LINCOLN	La.	29	CONCORDIA
Ark.	81	LITTLE RIVER	La.	31	DE SOTO
Ark.	85	LONOKE	La.	33	EAST BATON ROUGE
Ark.	91	MILLER	La.	35	EAST CARROLL
Ark.	93	MISSISSIPPI	La.	37	EAST FELICIANA
Ark.	95	MONROE	La.	39	EVANGELINE
Ark.	99	NEVADA	La.	41	FRANKLIN

Table 6.--*County codes for States in the study area--Continued*

State	County code	County name	State	County code	County name
La.	43	GRANT	La.	127	WINN
La.	45	IBERIA	Miss.	1	ADAMS
La.	47	IBERVILLE	Miss.	5	AMITE
La.	49	JACKSON	Miss.	7	ATTALA
La.	51	JEFFERSON	Miss.	9	BENTON
La.	53	JEFFERSON DAVIS	Miss.	11	BOLIVAR
La.	55	LA FAYETTE	Miss.	13	CALHOUN
La.	57	LA FOURCHE	Miss.	15	CARROLL
La.	59	LA SALLE	Miss.	17	CHICKASAW
La.	61	LINCOLN	Miss.	19	CHOCTAW
La.	63	LIVINGSTON	Miss.	21	CLAIBORNE
La.	65	MADISON	Miss.	23	CLARKE
La.	67	MOREHOUSE	Miss.	25	CLAY
La.	69	NATCHITOCHES	Miss.	27	COAHOMA
La.	71	ORLEANS	Miss.	29	COPIAH
La.	73	OUACHITA	Miss.	31	COVINGTON
La.	75	PLAQUEMINES	Miss.	33	DE SOTO
La.	77	POINTE COUPEE	Miss.	35	FORREST
La.	79	RAPIDES	Miss.	37	FRANKLIN
La.	81	RED RIVER	Miss.	39	GEORGE
La.	83	RICHLAND	Miss.	41	GREENE
La.	85	SABINE	Miss.	43	GRENADA
La.	87	ST BERNARD	Miss.	45	HANCOCK
La.	89	ST CHARLES	Miss.	47	HARRISON
La.	91	ST HELENA	Miss.	49	HINDS
La.	93	ST JAMES	Miss.	51	HOLMES
La.	95	ST JOHN THE BAPTIST	Miss.	53	HUMPHREYS
La.	97	ST LANDRY	Miss.	55	ISSAQUENA
La.	99	ST MARTIN	Miss.	59	JACKSON
La.	101	ST MARY	Miss.	61	JASPER
La.	103	ST TAMMANY	Miss.	63	JEFFERSON
La.	105	TANGIPAHOA	Miss.	65	JEFFERSON DAVIS
La.	107	TENSAS	Miss.	67	JONES
La.	109	TERREBONNE	Miss.	69	KEMPER
La.	111	UNION	Miss.	71	LAFAYETTE
La.	113	VERMILION	Miss.	73	LAMAR
La.	115	VERNON	Miss.	75	LAUDERDALE
La.	117	WASHINGTON	Miss.	77	LAWRENCE
La.	119	WEBSTER	Miss.	79	LEAKE
La.	121	WEST BATON ROUGE	Miss.	83	LEFLORE
La.	123	WEST CARROLL	Miss.	85	LINCOLN
La.	125	WEST FELICIANA	Miss.	89	MADISON

Table 6.--*County codes for States in the study area--Continued*

State	County code	County name	State	County code	County name
Miss.	91	MARION	Mo.	207	STODDARD
Miss.	93	MARSHALL	Mo.	223	WAYNE
Miss.	97	MONTGOMERY	Tenn.	17	CARROLL
Miss.	99	NESHOBA	Tenn.	23	CHESTER
Miss.	101	NEWTON	Tenn.	33	CROCKETT
Miss.	103	NOXUBEE	Tenn.	45	DYER
Miss.	105	OKTIBBEHA	Tenn.	47	FAYETTE
Miss.	107	PANOLA	Tenn.	53	GIBSON
Miss.	109	PEARL RIVER	Tenn.	69	HARDEMAN
Miss.	111	PERRY	Tenn.	75	HAYWOOD
Miss.	113	PIKE	Tenn.	77	HENDERSON
Miss.	115	PONTOTOC	Tenn.	79	HENRY
Miss.	119	QUITMAN	Tenn.	95	LAKE
Miss.	121	RANKIN	Tenn.	97	LAUDERDALE
Miss.	123	SCOTT	Tenn.	109	MC NAIRY
Miss.	125	SHARKEY	Tenn.	113	MADISON
Miss.	127	SIMPSON	Tenn.	131	OBION
Miss.	129	SMITH	Tenn.	157	SHELBY
Miss.	131	STONE	Tenn.	167	TIPTON
Miss.	133	SUNFLOWER	Tenn.	183	WEAKLEY
Miss.	135	TALLAHATCHIE	Tex.	1	ANDERSON
Miss.	137	TATE	Tex.	5	ANGELINA
Miss.	139	TIPPAH	Tex.	7	ARANSAS
Miss.	143	TUNICA	Tex.	13	ATASCOSA
Miss.	145	UNION	Tex.	15	AUSTIN
Miss.	147	WALTHALL	Tex.	21	BASTROP
Miss.	149	WARREN	Tex.	25	BEE
Miss.	151	WASHINGTON	Tex.	29	BEXAR
Miss.	153	WAYNE	Tex.	37	BOWIE
Miss.	155	WEBSTER	Tex.	39	BRAZORIA
Miss.	157	WILKINSON	Tex.	41	BRAZOS
Miss.	159	WINSTON	Tex.	47	BROOKS
Miss.	161	YALOBUSHA	Tex.	51	BURLESON
Miss.	163	YAZOO	Tex.	55	CALDWELL
Mo.	23	BUTLER	Tex.	57	CALHOUN
Mo.	69	DUNKLIN	Tex.	61	CAMERON
Mo.	133	MISSISSIPPI	Tex.	63	CAMP
Mo.	143	NEW MADRID	Tex.	67	CASS
Mo.	155	PEMISCOT	Tex.	71	CHAMBERS
Mo.	181	RIPLEY	Tex.	73	CHEROKEE
Mo.	201	SCOTT	Tex.	89	COLORADO

Table 6.--*County codes for States in the study area--Continued*

State	County code	County name	State	County code	County name
Tex.	123	DE WITT	Tex.	323	MAVERICK
Tex.	127	DIMMIT	Tex.	325	MEDINA
Tex.	131	DUVAL	Tex.	331	MILAM
Tex.	145	FALLS	Tex.	339	MONTGOMERY
Tex.	149	FAYETTE	Tex.	343	MORRIS
Tex.	157	FORT BEND	Tex.	347	NACOGDOCHES
Tex.	159	FRANKLIN	Tex.	349	NAVARRO
Tex.	161	FREESTONE	Tex.	351	NEWTON
Tex.	163	FRIO	Tex.	355	NUECES
Tex.	167	GALVESTON	Tex.	361	ORANGE
Tex.	175	GOLIAD	Tex.	365	PANOLA
Tex.	177	GONZALES	Tex.	373	POLK
Tex.	183	GREGG	Tex.	379	RAINS
Tex.	185	GRIMES	Tex.	387	RED RIVER
Tex.	187	GUADALUPE	Tex.	391	REFUGIO
Tex.	199	HARDIN	Tex.	395	ROBERTSON
Tex.	201	HARRIS	Tex.	401	RUSK
Tex.	203	HARRISON	Tex.	403	SABINE
Tex.	213	HENDERSON	Tex.	405	SAN AUGUSTINE
Tex.	215	HIDALGO	Tex.	407	SAN JACINTO
Tex.	223	HOPKINS	Tex.	409	SAN PATRICIO
Tex.	225	HOUSTON	Tex.	419	SHELBY
Tex.	231	HUNT	Tex.	423	SMITH
Tex.	239	JACKSON	Tex.	427	STARR
Tex.	241	JASPER	Tex.	449	TITUS
Tex.	245	JEFFERSON	Tex.	453	TRAVIS
Tex.	247	JIM HOGG	Tex.	455	TRINITY
Tex.	249	JIM WELLS	Tex.	457	TYLER
Tex.	255	KARNES	Tex.	459	UPSHUR
Tex.	257	KAUFMAN	Tex.	463	UVALDE
Tex.	261	KENEDY	Tex.	467	VAN ZANDT
Tex.	273	KLEBERG	Tex.	469	VICTORIA
Tex.	283	LA SALLE	Tex.	471	WALKER
Tex.	285	LAVACA	Tex.	473	WALLER
Tex.	287	LEE	Tex.	477	WASHINGTON
Tex.	289	LEON	Tex.	479	WEBB
Tex.	291	LIBERTY	Tex.	481	WHARTON
Tex.	293	LIMESTONE	Tex.	489	WILLACY
Tex.	297	LIVE OAK	Tex.	491	WILLIAMSON
Tex.	311	MC MULLEN	Tex.	493	WILSON
Tex.	313	MADISON	Tex.	499	WOOD
Tex.	315	MARION	Tex.	505	ZAPATA
Tex.	321	MATAGORDA	Tex.	507	ZAVALA