ESTIMATED WATER USE, BY COUNTY, IN NORTH CAROLINA, 1990

by Silvia Terziotti, Tony P. Schrader, and M.W. Treece, Jr.

U.S. GEOLOGICAL SURVEY
Open-File Report 94-522

Prepared in cooperation with the
DIVISION OF WATER RESOURCES of the
NORTH CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES

Raleigh, North Carolina
1994

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CONTENTS

ILLUSTRATIONS

ILLUSTRATIONS--Continued

TABLES

CONVERSION FACTORS

Multiply	By	To obtain
	Flow	
gallon per day (gal/d)	0.003785	cubic meter per day
million gallons per day (Mgal/d)	0.04381	cubic meter per second
	Energy	
kilowatt hour (kWh)	3,600,000	joule

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ABSTRACT

Data on water use in North Carolina were compiled for 1990 as part of a cooperative agreement between the U.S. Geological Survey and the Division of Water Resources of the North Carolina Department of Environment, Health, and Natural Resources. Data were compiled from a number of Federal, State, and private sources for the offstream water-use categories of public supply, domestic, commercial, industrial, mining, livestock, irrigation, and thermoelectric-power generation. Data also were collected for instream use from hydroelectric facilities.

Total estimated offstream water use in the State for 1990 was about 8,940 million gallons per day. About 95 percent of the water withdrawn was from surface-water sources. Thermoelectric-power generation accounted for about 81 percent of all withdrawals. Data for instream water use for hydroelectric-power generation also were compiled. This instream water use totaled about 66,900 million gallons per day. Each water-use category is summarized in this report by county and source of water supply.

INTRODUCTION

Although North Carolina has a high average annual precipitation rate and seemingly abundant water resources, increases in population growth and in municipal, industrial, agricultural, and recreational water use have placed increasing demands on the State's water supply. Although years of plentiful rainfall provide adequate water supplies to meet demands during years of drought, conflicts may arise that require rationing and other conservation measures to ensure that water supplies are adequate to meet demands and that water quality remains unaffected by low flow. In order to assist in planning and management of the State's water resources, accurate estimates of water use must be inventoried.

The U.S. Geological Survey (USGS), in cooperation with the Division of Water Resources (DWR) of the North Carolina Department of Environment, Health, and Natural Resources (DEHNR), inventoried and compiled ground- and surface-water use in North Carolina for 1990. These data were compiled from a variety of Federal, State, and private sources for the offstream water-use categories of public supply, domestic, commercial, industrial, mining, livestock, irrigation, and thermoelectric-power generation. Data also were compiled for instream use from hydroelectric facilities.

Purpose and Scope

The purpose of this report is to provide an inventory of water use, by county, in North Carolina for 1990 (fig. 1). Data are summarized for nine categories of water use as required for USGS Circular 1081, "Estimated Use of Water in the United States," which is published every 5 years. Water-use estimates for instream and offstream use are summarized, as well as water use by source--ground water and surface water.

Data-Compilation Procedures

Estimates for water withdrawn by category were obtained primarily from DWR. Other sources include

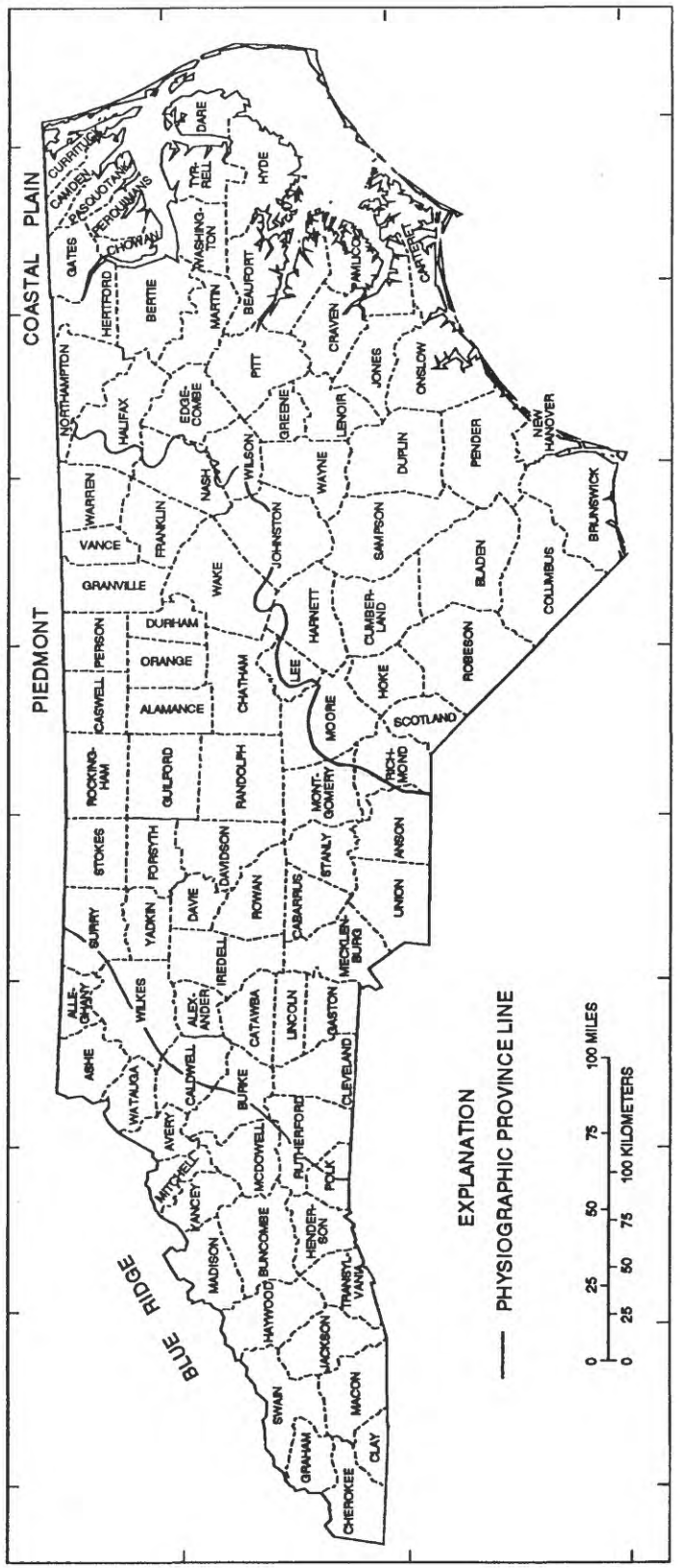

Figure 1. Counties and physiographic provinces in North Carolina.

the DEHNR, Division of Environmental Health (Public Water Supply Section), Division of Land Records, and Division of Environmental Management; North Carolina Department of Commerce, Industrial Development Division; U.S. Department of Commerce, Bureau of the Census; North Carolina State University, Agricultural Extension Service and Department of Agricultural Engineering; North Carolina Crop and Livestock Reporting Service; U.S. Environmental Protection Agency; communications with power companies and individual power-generation plants; Tennessee Valley Authority; U.S. Department of Energy; and U.S. Army Corps of Engineers. This information is summarized by category in table 1.

Public-supply water use is defined as water withdrawn by public and private suppliers that furnish water for at least 25 people, or that have a minimum of 15 hookups. This includes water delivered for domestic, commercial, industrial, and thermoelectric-power generation use and for other users who do not supply their own water needs. Domestic, self-supplied water use is limited to individual households that are not served by public-supply systems. Industrial, self-supplied water use is made up of withdrawals for industrial purposes, not supplied by public-supply systems. Commercial, self-supplied withdrawals refer to water withdrawn by hotels, restaurants, office buildings, and other commercial facilities and institutions, including universities and military installations. Mining water use consists of withdrawals for use in the extraction of minerals and in quarry operations. Mining water use includes water used to wash, sort, and separate mineral products. The livestock category includes water used for livestock watering, feed lots, dairy operations, and fish farming. Irrigation water use is defined as water applied to land to assist in the growing of crops, nursery plants, and pastures. Water applied to golf courses and parks also is included in this category. Water used for power generation includes the instream use by 40 hydroelectric powerplants and offstream withdrawals by 16 fossil-fuel and 3 nuclear facilities in North Carolina. This category is further divided into water use for hydroelectric and thermoelectric power (fossil-fuel and nuclear facilities). Water use for hydroelectric-power generation is the only category in this report considered to be instream water use.

Most county-level data are based on site-specific data collected and stored by DWR. Categories of domestic, livestock, and irrigation water use were not available for each site within the State; therefore, estimates were calculated using coefficients applied to census data or agricultural statistics.

WATER USE

In 1990, offstream water use in North Carolina was estimated to be 8,940 million gallons per day (Mgal/d). Offstream water use refers to all water "withdrawn or diverted from a ground- or surface-water source for public water supply, industry, irrigation, livestock, thermoelectric-power generation, and other uses. It is sometimes referred to as off-channel use or withdrawal," (Solley and others, 1993, p. vi). Of the total withdrawals in 1990, 81 percent, or 7,210 Mgal/d, was for thermoelectric-power generation. Of the remaining categories, public supply accounted for the largest amount of water withdrawals in North Carolina, representing 9 percent, or about 805 Mgal/d, of total water withdrawals (fig. 2)

Surface water was the source of 95 percent, or about 8,510 Mgal/d, of withdrawals in North Carolina in 1990; thermoelectric power represented 85 percent of surface-water withdrawals in 1990. Public supply was the second largest category of surface-water use, totaling 8 percent of all offstream withdrawals (fig. 3).

Only 5 percent of all water withdrawn in 1990 was from ground water. Large ground-water withdrawals occur primarily in the coastal counties of North Carolina. Of ground-water withdrawals, 31 percent was by public suppliers and 24 percent was by domestic users. Self-supplied industry and mining combined accounted for 30 percent of the ground-water withdrawals. Offstream water use is summarized by category of use and source of water supply in table 2.

For the purposes of this report, instream water use is limited to use of water for the generation of hydroelectric power. Instream water use is the use of water, but not the withdrawal, from a ground- or surface-water source. Other examples of instream water use include fish propagation, navigation, and recreation. Because the generation of hydroelectric power requires significant quantities of water that is moved through turbines, this water use affects water availability and perhaps water quality and, therefore, should be considered in planning and management of water resources. Table 3 identifies the total water used in North Carolina for the generation of electricity by hydroelectric facilities.

Table 1. Source of water-use data, by category, in North Carolina, 1990

[DEHNR, North Carolina Department of Environment, Health, and Natural Resources; DWR, Division of Water Resources; DEH, Division of Environmental Health; PWSS, Public Water Supply Section; DOC, Department of Commerce; NCSU, North Carolina State University; gal/d, gallons per day; USGS, U.S. Geological Survey; NCDOC, North Carolina Department of Commerce; IDD, Industrial Development Division; DLR, Division of Land Resources]

Water-use category	Data sources	Type of data provided and(or) method of collection
Public supply	DEHNR, DWR	Site visit and mail survey of public-supply facilities aggregated by county.
	DEHNR, DEH, PWSS	Community water systems, noncommunity water systems, and data on population served, withdrawal rates, and source of water supply used to supplement site data from DEHNR.
Domestic	DEHNR, DWR	Site visit and mail survey of public-supply facilities used to calculate population served by public-supply systems.
	DEHNR, DEH, PWSS	Population served by public suppliers.
	U.S. DOC, Bureau of Census	Population within a county.
	NCSU	Water-use coefficient of 60 gal/d per person.
	USGS	Calculation per county: (County population) - (Population served by public supply) x (60 gal/d).
Industrial	DEHNR, DWR	1987 mail survey of industries that withdrew more than 80,000 gal/d followed by telephone interviews. Site visits made when necessary.
	NCDOC, IDD	Identification of industries from "Directory of North Carolina Manufacturing Firms," 1987.
	USGS	Assist DEHNR in mail surveys and telephone followup. Aggregate site data by county.
Commercial	DEHNR, DWR	Questionnaires, site visits, or telephone or mail contacts. Data collected for universities, military facilities, prisons, campgrounds, parks, and recreational services.
	DEHNR, DEH, PWSS	Used to supplement DEHNR, DWR data.
	USGS	Aggregate site data by county.
Mining	DEHNR, DLR	Questionnaires, site visits, or telephone or mail contacts. Identification of mining operations in "Directory of North Carolina Mineral Producers," 1981.
	NCDOC, IDD	Identification of mining operations from "Directory of North Carolina Manufacturing Firms," 1987.
	USGS	Aggregate data on withdrawal amounts, location of diversion, source of diversion, and return flows by county.

Table 1. Source of water-use data, by category, in North Carolina, 1990--Continued

[DEHNR, North Carolina Department of Environment, Health, and Natural Resources; DWR, Division of Water Resources; DEH, Division of Environmental Health; PWSS, Public Water Supply Section; DOC, Department of Commerce; NCSU, North Carolina State University; gal/d, gallons per day; USGS, U.S. Geological Survey; NCDOC, North Carolina Department of Commerce; IDD, Industrial Development Division; DLR, Division of Land Resources]

Water-use category	Data sources	Type of data provided and(or) method of collection
Livestock	NCSU, Agricultural Extension Service	Coefficients provided for per capita water requirements of livestock type: dairy cattle, 40 gal/d; horses, 12 gal/d; dry or beef cattle, 12 gal/d; hogs, 4 gal/d; sheep, 2 gal/d; chickens, 9 gal/d per 100 chickens; turkeys, 9 gal/d per 50 turkeys.
	North Carolina Crop and Livestock Reporting Service	Livestock populations per county.
	USGS	Estimates of ground- or surface-water source. Calculation per county: (Number of dairy cattle) x (40 gal/d) + (Number of horses) x (12 gal/d) + (Number of beef cattle) x (12 gal/d) + (Number of hogs) x (4 gal/d) + (Number of sheep) x (2 gal/d) + (Number of chickens) x (9 gal/d per 100 chickens) + (Number of turkeys) x (9 gal/d per 50 turkeys).
Irrigation	DEHNR, DWR	Field surveys.
	NCSU, Agricultural Extension Service	Water-use estimates by county agents.
	NCSU, Department of Agricultural Engineering	Surveys to record amount of irrigated acreage by crop in each county. Estimates of water requirements and application rates for each crop. Application coefficients for crops (inches per acre): tobacco, 4; corn, 7; peanuts, 5; soybeans, 4; small fruits, 9; tree fruits, 6; Irish potatoes, 4; sweet potatoes, 4; vegetables, 4; wheat, 4; hay 8; other small grain, 2; alfalfa (coastal), 6; alfalfa (other), 8; pasture, 2.
	North Carolina Nursery Men's Association	Application rates by plant type; acreage and plant type.
Power generation	DEHNR, DWR	Mail survey.
	U.S. Environmental Protection Agency	Records on power-generation operations.
	Duke Power Company Carolina Power and Light Company Nantahala Power and Light Company Virginia Electric Company Tennessee Valley Authority U.S. Department of Energy U.S. Corps of Engineers	Contacts with power-generation companies.
	USGS	Compilation of data.

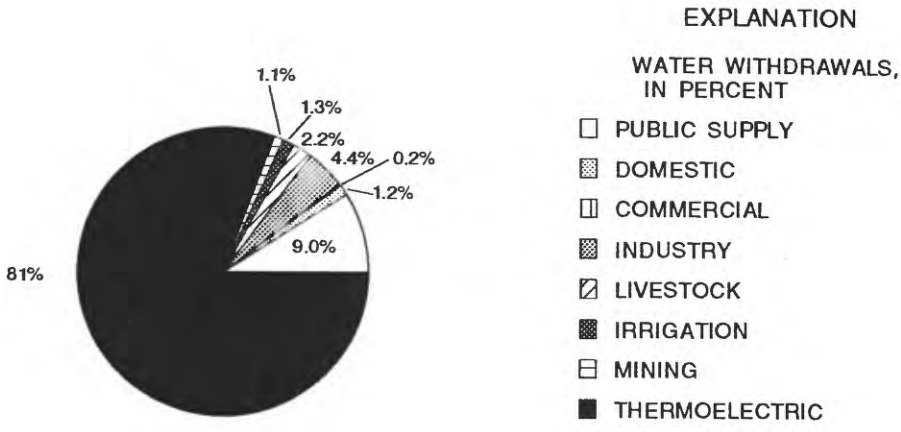

Figure 2. Water withdrawals, by type of use, in North Carolina, 1990.

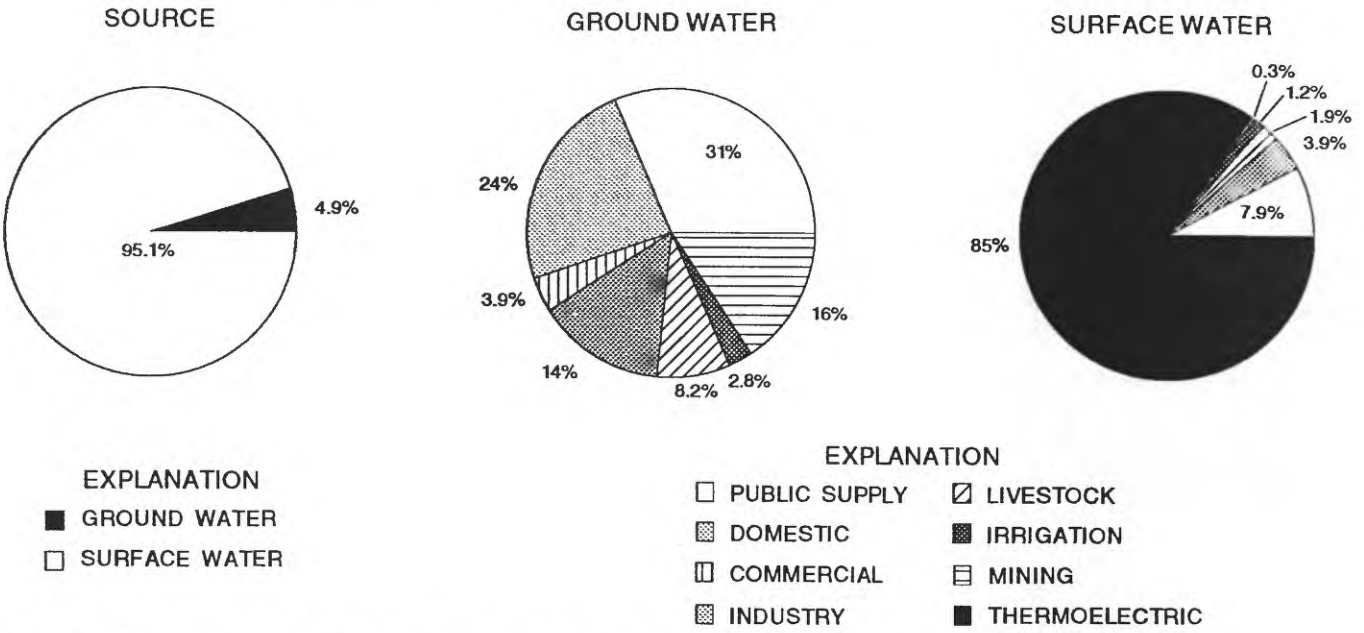

Figure 3. Water withdrawals, by source and category, in North Carolina, 1990.

Table 2. Total water withdrawals, by water-use category, in North Carolina, 1990
[Values in million gallons per day]

Water source	Public supply	Domestic	Commercial	Industrial	Mining	Livestock	Irrigation	Thermoelectric	Total
Ground water	136.95	102.95	16.98	62.70	67.97	35.65	11.98	0	435.18
Surface water	667.85	0	0	333.31	27.54	165.11	101.74	7,210.09	8,505.64
Total	804.80	102.95	16.98	396.01	95.51	200.76	113.72	7,210.09	8,940.82

Table 3. Hydroelectric-power generation water use in North Carolina, 1990
[Values in million gallons per day]

Water source	Water use	Power generation in gigawatt-hours
Ground water	0	0
Surface water	66,875.90	7,070
Total	66,875.90	7,070

Offstream Water Use by Category and Source

The water-use categories of public supply, domestic, commercial, industrial, mining, livestock, irrigation, and thermoelectric-power generation are summarized by county (table 4) and by source of water (fig. 4). Counties with the largest withdrawals are those that contain thermoelectric-power generation facilities. The counties of Brunswick, Mecklenburg, and Person each had withdrawal amounts exceeding 1,000 Mgal/d. The majority of the water withdrawn was for thermoelectric-power generation. Three coastal counties (Camden, Hyde, and Tyrrell) each had withdrawal amounts less than 1 Mgal/d.

Consumptive use is defined as "the part of water withdrawn that is evaporated, transpired, incorporated into products or crops, consumed by humans or livestock, or otherwise removed from the immediate water environment" and, therefore, not returned to the source of the withdrawal (Solley and others, 1993). By examining consumptive use rather than withdrawals, it is apparent that Wake County has the highest consumptive-use rate in the State. Both water-use categories of public supply and irrigation reflect the county's large population and large irrigation use. Other counties with use amounts greater than 10 Mgal/d include Craven, Guilford, Mecklenburg, Moore, Person, and Rutherford. Moore County had high irrigation water withdrawals with a relatively small population. The remaining high-use counties have either high population and public-supply withdrawals, large withdrawal amounts for thermoelectric-power generation, or a combination of both.

Public Supply

In 1990, North Carolina had a population of 6,628,650. Of this number, about 72 percent, or 4,755,900 people, were served by a public water-supply system. Mecklenburg County, which includes the city of Charlotte, had the highest population (495,900) served by public supply in the State. Other densely populated areas of the State--Cumberland (includes the population of Fort Bragg Army Base), Forsyth, Guilford, and Wake Counties--have large proportions of their populations served by public-supply systems (table 5).

Public-supply withdrawals are primarily from surface-water sources (table 5; fig. 5). Surface water provides an estimated 83 percent of the water withdrawn for this category.

In addition to providing water for domestic use, public suppliers also deliver water to commercial, industrial, thermoelectric-power, and other public facilities (the use of water for municipal functions, such as firefighting, street cleaning, and recreation). These uses, other than domestic, account for approximately 60 percent of all water withdrawn by public suppliers (fig. 5). Also included in the public-supply category are losses resulting from the transfer of water outside of the county or State and losses associated with leaky pipes in the distribution systems (table 5). The "public use and losses" column (table 5) was computed by subtracting the total deliveries to domestic, commercial, industrial, and thermoelectric water users from the total water withdrawals.

Columbus, Forsyth, Guilford, Mecklenburg, and Wake Counties accounted for 30 percent of all withdrawals from public suppliers (fig. 6). Of these five counties, only Columbus has a relatively low population, with the majority of withdrawals being delivered to industrial users, rather than to domestic users.

Domestic

In 1990, water use (withdrawals plus deliveries) for domestic purposes totaled about 422 Mgal/d. About 1.9 million people in North Carolina rely on private wells or springs for their household water needs. Withdrawals for self-supplied domestic use was about 103 Mgal/d. Self-supplied domestic water use was derived by multiplying an assumed per capita use rate (55 gal/d) by the population that obtain water from private wells and springs. Per capita use for people

Table 4. Total withdrawals, by water-use category, by county, in North Carolina, 1990
[Values in million gallons per day]

County	Public supply	Domestic	Commercial	Industrial	Mining	Livestock	Irrigation	Thermoelectric	Total withdrawals	Consumptive use
ALAMANCE	14.84	2.27	0.20	2.66	0.70	0.83	1.29	0.00	22.79	5.39
ALEXANDER	1.31	0.91	0.00	0.50	0.00	0.79	0.15	0.00	3.66	1.45
ALLEGHANY	0.28	0.32	0.00	0.00	0.00	0.49	0.33	0.00	1.42	0.99
ANSON	4.24	0.38	0.00	8.97	7.09	0.49	0.57	0.00	21.74	2.82
ASHE	0.48	1.01	0.00	0.37	0.00	1.06	0.39	0.00	3.31	1.27
AVERY	0.87	0.33	0.09	0.01	0.00	3.04	1.43	0.00	5.77	1.81
BEAUFORT	2.13	1.39	0.14	1.96	56.80	0.29	1.86	0.00	64.57	7.73
BERTIE	1.01	0.70	0.00	2.49	0.00	0.45	1.47	0.00	6.12	2.37
BLADEN	1.75	0.78	0.00	1.20	0.00	0.32	1.60	0.00	5.65	2.72
BRUNSWICK	14.22	1.35	0.51	7.88	0.00	0.09	0.42	1,598.98	1,623.45	4.19
BUNCOMBE	24.94	2.81	0.17	6.82	1.80	0.91	0.54	1.70	39.69	7.80
BURKE	16.50	0.78	0.00	0.31	0.00	1.92	0.78	0.00	20.29	2.47
CABARRUS	6.91	2.43	0.01	0.05	0.00	0.30	0.75	0.00	10.45	2.84
CALDWELL	5.86	1.12	0.00	0.51	0.00	0.69	0.48	0.00	8.66	2.28
CAMDEN	0.25	0.11	0.00	0.00	0.00	0.03	0.07	0.00	0.46	0.19
CARTERET	4.56	0.97	0.06	0.04	0.00	0.01	0.45	0.00	6.09	1.76
CASWELL	0.47	1.00	0.02	0.00	0.00	0.14	1.42	0.00	3.05	1.96
CATAWBA	17.93	2.51	0.00	0.02	1.68	0.39	0.17	730.05	752.75	3.37
CHATHAM	3.47	1.23	0.00	0.86	0.00	1.32	0.67	148.82	156.37	3.18
CHEROKEE	1.30	0.73	0.04	0.07	0.00	4.25	0.10	0.00	6.49	0.78
CHOWAN	2.23	0.07	0.00	0.79	0.00	0.10	0.14	0.00	3.33	0.64
CLAY	0.18	0.36	0.00	0.00	0.00	3.84	0.03	0.00	4.41	0.26
CLEVELAND	12.83	1.62	0.00	1.21	0.00	0.54	0.88	0.00	17.08	3.15
COLUMBUS	46.03	1.86	0.01	43.76	0.00	0.18	0.87	0.00	92.71	5.28
CRAVEN	11.49	0.13	3.69	19.17	5.69	0.33	2.46	0.00	42.96	10.03
CUMBERLAND	29.94	0.04	0.02	12.30	0.00	0.27	2.58	0.00	45.15	9.28
CURRITUCK	0.79	0.27	0.28	0.00	0.00	0.03	0.43	0.00	1.80	1.04
DARE	3.77	0.30	0.02	0.00	0.00	0.00	0.01	0.00	4.10	0.75
DAVIDSON	15.96	0.20	0.01	0.00	0.47	0.39	0.47	0.00	17.50	3.42
DAVIE	2.12	0.60	0.00	0.01	0.96	0.35	0.45	0.00	4.49	1.36
DUPLIN	4.80	1.26	0.00	1.71	0.00	3.26	0.60	0.00	11.63	4.96
DURHAM	22.21	1.81	0.05	0.01	0.00	0.08	1.73	0.00	25.89	6.00
EDGECOMBE	3.29	1.76	0.00	0.00	0.00	0.28	3.15	0.00	8.48	4.22
FORSYTH	41.87	2.28	0.08	0.02	0.59	0.19	0.24	0.00	45.27	8.15
FRANKLIN	2.01	1.44	0.11	0.01	0.00	0.40	1.32	0.00	5.29	2.70
GASTON	30.96	2.57	0.10	2.14	0.82	0.20	0.34	288.02	325.15	4.95
GATES	0.51	0.09	0.00	0.00	0.00	0.21	0.21	0.00	1.02	0.59
GRAHAM	0.55	0.25	0.00	0.00	0.00	10.26	0.01	0.00	11.07	0.15
GRANVILLE	2.40	1.11	0.02	0.00	0.00	0.26	1.84	0.00	5.63	2.61
GREENE	2.50	0.12	0.00	0.00	0.00	0.93	1.33	0.00	4.88	2.79
GUILFORD	44.18	3.58	0.06	17.23	1.92	0.46	2.02	0.00	69.45	17.19
HALIFAX	6.82	0.93	0.00	26.90	0.00	0.51	1.81	0.00	36.97	3.41
HARNETT	5.72	0.34	0.01	0.07	0.00	0.28	2.77	0.00	9.19	4.24
HAYWOOD	5.41	1.35	0.02	50.60	0.00	52.17	0.20	0.00	109.75	4.48
HENDERSON	6.57	1.03	0.02	1.89	0.00	0.81	0.50	0.00	10.82	2.09

Table 4. Total withdrawals, by water-use category, by county, in North Carolina, 1990--Continued
[Values in million gallons per day]

County	Public supply	Domestic	Com-mercial	Industrial	Mining	Live-stock	Irrigation	Thermo-electric	Total with-drawals	Con-sumptive use
HERTFORD	1.79	0.51	0.00	1.43	0.00	0.13	1.52	0.00	5.38	2.32
HOKE	3.51	0.67	0.14	0.00	0.00	0.05	0.79	0.00	5.16	1.44
HYDE	0.50	0.05	0.01	0.00	0.00	0.05	0.00	0.00	0.61	0.17
IREDELL	8.42	2.30	0.02	0.84	0.00	1.15	0.54	0.00	13.27	3.90
JACKSON	1.34	0.47	0.03	0.01	0.00	4.61	1.61	0.00	8.07	1.98
JOHNSTON	5.37	2.42	0.00	0.09	0.16	0.56	1.85	0.00	10.45	4.01
JONES	0.59	0.00	0.00	0.00	0.00	0.06	0.66	0.00	1.31	0.89
LEE	5.05	0.15	0.01	0.00	0.08	0.11	0.69	0.00	6.09	1.75
LENOIR	7.13	0.25	0.44	3.35	0.00	0.68	0.29	0.00	12.14	3.34
LINCOLN	4.72	1.86	0.00	0.15	0.00	0.44	0.03	0.00	7.20	1.47
MCDOWELL	3.19	1.12	0.03	3.05	0.00	7.57	0.16	0.00	15.12	1.89
MACON	1.39	0.81	0.04	0.00	0.00	15.79	0.14	0.00	18.17	0.71
MADISON	1.37	0.58	0.00	0.00	0.00	5.53	0.30	0.00	7.78	0.91
MARTIN	2.15	0.76	0.00	88.87	0.00	0.19	0.61	0.00	92.58	1.58
MECKLENBURG	65.02	0.85	0.01	0.24	2.42	0.23	0.58	2,324.51	2,393.86	15.88
MITCHELL	0.84	0.51	0.16	0.22	8.18	2.34	0.10	0.00	12.35	0.63
MONTGOMERY	2.92	0.46	0.01	0.00	0.00	0.32	0.94	0.00	4.65	1.69
MOORE	5.86	1.40	0.00	0.03	0.00	1.12	15.61	0.00	24.02	18.09
NASH	13.49	0.21	0.00	0.14	0.00	0.74	3.08	0.00	17.66	4.76
NEW HANOVER	15.14	1.47	0.02	8.40	0.00	0.00	0.20	1.04	26.27	5.54
NORTHAMPTON	1.26	0.45	0.01	0.20	0.00	0.36	0.19	0.00	2.47	1.01
ONSLOW	8.91	2.45	6.08	0.48	0.00	0.27	0.09	0.00	18.28	9.14
ORANGE	9.49	0.71	0.02	0.00	0.40	0.42	0.82	0.00	11.86	2.80
PAMLICO	0.85	0.04	0.00	0.00	0.00	0.03	3.06	0.00	3.98	3.30
PASQUOTANK	2.83	0.13	0.00	0.00	0.00	0.05	0.32	0.00	3.33	0.91
PENDER	0.78	1.17	0.03	0.00	0.00	0.13	0.07	0.00	2.18	0.77
PERQUIMANS	0.90	0.04	0.00	0.00	0.00	0.18	0.08	0.00	1.20	0.46
PERSON	4.37	0.97	0.00	0.00	0.00	0.17	1.39	1,160.31	1,167.21	13.33
PITT	13.18	0.53	0.00	0.00	0.36	0.93	2.13	0.00	17.13	4.94
POLK	0.95	0.48	0.00	1.00	0.00	0.09	0.10	0.00	2.62	0.51
RANDOLPH	6.60	3.49	0.22	0.52	0.36	1.38	1.34	0.00	13.91	4.84
RICHMOND	5.66	0.70	0.06	1.96	0.00	0.25	2.19	0.00	10.82	3.48
ROBESON	18.80	1.52	0.00	3.57	0.00	0.36	0.74	0.30	25.29	4.04
ROCKINGHAM	12.79	1.78	0.02	0.03	1.01	0.21	2.21	70.29	88.34	4.11
ROWAN	18.68	1.35	0.01	13.78	0.02	0.58	0.56	29.48	64.46	4.15
RUTHERFORD	10.03	1.54	0.02	2.25	0.00	0.41	0.05	9.93	24.23	11.29
SAMPSON	2.44	1.76	0.00	1.82	0.00	2.44	2.61	0.00	11.07	6.52
SCOTLAND	5.73	0.63	1.37	4.65	0.00	0.14	0.78	0.00	13.30	3.11
STANLY	9.99	0.71	0.03	1.93	0.02	0.54	0.48	0.00	13.70	1.93
STOKES	1.51	1.15	0.01	0.16	0.00	0.14	0.05	813.42	816.44	0.89
SURRY	7.69	2.38	0.03	2.47	0.64	0.64	1.43	0.00	15.28	3.77
SWAIN	0.32	0.47	0.01	0.00	0.36	21.93	0.05	0.00	23.14	0.66
TRANSYLVANIA	1.51	0.71	0.02	31.11	0.00	23.03	0.13	0.00	56.51	2.74
TYRRELL	0.27	0.03	0.00	0.00	0.00	0.20	0.03	0.00	0.53	0.32
UNION	8.16	2.64	0.00	3.54	0.85	2.31	2.11	0.00	19.61	6.66

Table 4. Total withdrawals, by water-use category, by county, in North Carolina, 1990--Continued
[Values in million gallons per day]

County	Public supply	Domestic	Com-mercial	Industrial	Mining	Live-stock	Irrigation	Thermo-electric	Total with-drawals	Con-sumptive use
VANCE	4.84	0.07	0.00	0.00	0.00	0.06	1.22	0.00	6.19	2.00
WAKE	40.94	1.61	0.02	3.18	0.03	0.27	10.76	32.45	89.26	34.97
WARREN	0.10	0.79	0.04	0.00	0.00	0.21	0.59	0.00	1.73	1.12
WASHINGTON	0.86	0.23	0.01	0.00	0.00	0.53	0.00	0.00	1.63	0.80
WATAUGA	2.73	0.99	0.64	0.03	0.00	0.68	0.25	0.00	5.32	1.71
WAYNE	7.47	1.96	1.64	0.50	0.00	1.18	1.65	0.79	15.19	7.18
WILKES	6.22	1.32	0.00	2.27	0.30	2.46	0.12	0.00	12.69	4.72
WILSON	8.09	0.94	0.00	0.00	0.30	0.26	3.58	0.00	13.17	5.13
YADKIN	1.22	1.14	0.02	0.00	0.00	0.52	1.31	0.00	4.21	2.34
YANCEY	0.38	0.72	0.01	1.20	1.50	1.59	0.20	0.00	5.60	0.58
TOTAL	804.80	102.95	16.98	396.01	95.51	200.76	113.72	7,210.09	8,940.82	390.29

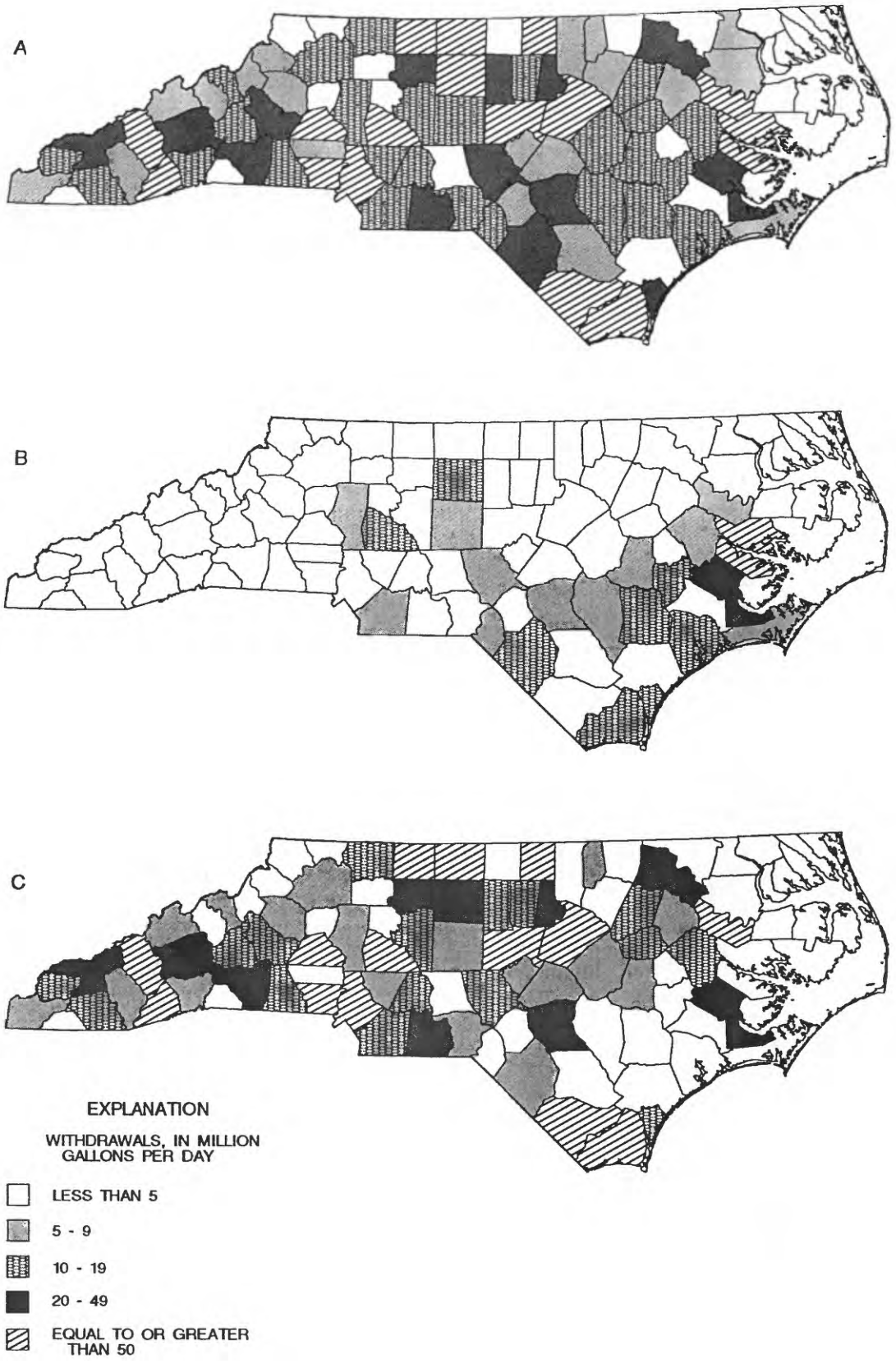

Figure 4. (A) All sources of water, (B) ground-water, and (C) surface-water withdrawals, by county, in North Carolina, 1990.

Table 5. Public-supply water use, by county, in North Carolina, 1990
[Mgal/d, million gallons per day; gal/d, gallons per day]

County	Population served, in thousands			Withdrawals, fresh, in Mgal/d			Per capita withdrawals, in gal/d	Water deliveries, by type of use, in Mgal/d				Public use and losses
	Ground water	Surface water	Total population	Ground water	Surface water	Total withdrawals		Domestic	Commercial	Industrial	Thermoelectric	
ALAMANCE	2.29	64.70	66.99	0.19	14.65	14.84	221.53	4.19	3.26	6.42	0.00	0.97
ALEXANDER	0.00	10.93	10.93	0.00	1.31	1.31	119.85	0.67	0.32	0.12	0.00	0.20
ALLEGHANY	3.83	0.00	3.83	0.28	0.00	0.28	73.11	0.23	0.04	0.00	0.00	0.01
ANSON	0.64	15.96	16.60	0.04	4.20	4.24	255.42	1.22	0.04	0.78	0.00	2.20
ASHE	3.77	0.00	3.77	0.48	0.00	0.48	127.32	0.35	0.05	0.07	0.00	0.01
AVERY	8.79	0.00	8.79	0.87	0.00	0.87	98.98	0.49	0.12	0.00	0.00	0.26
BEAUFORT	8.07	8.90	16.97	0.96	1.17	2.13	125.52	0.85	0.77	0.33	0.00	0.18
BERTIE	7.75	0.00	7.75	1.01	0.00	1.01	130.32	0.57	0.09	0.02	0.00	0.33
BLADEN	14.44	0.00	14.44	1.75	0.00	1.75	121.19	1.09	0.12	0.24	0.00	0.30
BRUNSWICK	18.41	7.96	26.37	9.02	5.20	14.22	539.25	1.92	2.64	6.50	0.29	2.87
BUNCOMBE	3.16	120.64	123.80	0.33	24.61	24.94	201.45	8.78	12.30	2.96	0.00	0.90
BURKE	0.66	60.83	61.49	0.13	16.37	16.50	268.34	3.15	1.27	10.98	0.00	1.10
CABARRUS	2.10	52.64	54.74	0.20	6.71	6.91	126.23	3.14	1.37	2.37	0.00	0.03
CALDWELL	0.33	49.98	50.31	0.10	5.76	5.86	116.48	2.82	0.65	1.43	0.00	0.96
CAMDEN	3.95	0.00	3.95	0.25	0.00	0.25	63.29	0.16	0.00	0.00	0.00	0.09
CARTERET	34.85	0.00	34.85	4.56	0.00	4.56	130.85	2.79	1.08	0.03	0.00	0.66
CASWELL	0.96	1.50	2.46	0.07	0.40	0.47	191.06	0.18	0.08	0.01	0.00	0.20
CATAWBA	0.75	72.05	72.80	1.11	16.82	17.93	246.29	6.27	1.47	6.68	0.00	3.51
CHATHAM	2.62	13.81	16.43	0.18	3.29	3.47	211.20	1.44	0.25	1.21	0.00	0.57
CHEROKEE	0.83	6.03	6.86	0.14	1.16	1.30	189.50	0.77	0.31	0.20	0.00	0.02
CHOWAN	12.21	0.00	12.21	2.23	0.00	2.23	182.64	1.08	0.29	0.55	0.00	0.31
CLAY	0.55	0.00	0.55	0.18	0.00	0.18	327.27	0.05	0.02	0.00	0.00	0.11
CLEVELAND	6.93	48.40	55.33	0.54	12.29	12.83	231.88	3.28	1.18	6.71	0.00	1.66
COLUMBUS	13.98	1.74	15.72	2.18	43.85	46.03	2,928.12	2.03	0.11	43.73	0.00	0.16
CRAVEN	79.30	0.00	79.30	11.49	0.00	11.49	144.89	5.58	2.55	3.13	0.00	0.23
CUMBERLAND	61.35	212.47	273.82	4.64	25.30	29.94	109.34	16.75	6.51	2.88	0.16	3.64
CURRITUCK	8.81	0.00	8.81	0.79	0.00	0.79	89.67	0.66	0.07	0.00	0.00	0.06
DARE	17.23	0.00	17.23	3.77	0.00	3.77	218.80	1.95	1.67	0.01	0.00	0.14
DAVIDSON	0.00	123.01	123.01	0.00	15.96	15.96	129.75	7.78	1.05	2.85	0.00	4.28
DAVIE	0.00	16.92	16.92	0.00	2.12	2.12	125.30	1.15	0.18	0.38	0.00	0.41
DUPLIN	17.17	0.00	17.17	4.80	0.00	4.80	279.56	1.15	3.00	0.23	0.00	0.42
DURHAM	1.32	147.53	148.85	0.07	22.14	22.21	149.21	11.11	7.30	1.60	0.00	2.20
EDGECOMBE	4.47	20.03	24.50	0.53	2.76	3.29	134.29	0.71	1.01	1.23	0.00	0.34
FORSYTH	4.19	220.18	224.37	0.37	41.50	41.87	186.61	21.55	1.13	15.14	0.00	4.05
FRANKLIN	0.93	9.22	10.15	0.16	1.85	2.01	198.03	1.27	0.11	0.34	0.00	0.29

Table 5. Public-supply water use, by county, in North Carolina, 1990--Continued
[Mgal/d, million gallons per day; gal/d, gallons per day]

County	Population served, in thousands			Withdrawals, fresh, in Mgal/d			Per capita withdrawals, in gal/d	Water deliveries, by type of use, in Mgal/d				Public use and losses
	Ground water	Surface water	Total population	Ground water	Surface water	Total withdrawals		Domestic	Commercial	Industrial	Thermoelectric	
GASTON	0.00	128.28	128.28	0.00	30.96	30.96	241.35	10.33	1.71	14.57	0.00	4.35
GATES	7.66	0.00	7.66	0.51	0.00	0.51	66.58	0.44	0.07	0.00	0.00	0.00
GRAHAM	0.00	2.58	2.58	0.00	0.55	0.55	213.18	0.16	0.09	0.03	0.00	0.27
GRANVILLE	0.47	17.75	18.22	0.07	2.33	2.40	131.72	0.42	0.76	0.46	0.00	0.76
GREENE	13.26	0.00	13.26	2.50	0.00	2.50	188.54	1.54	0.17	0.02	0.00	0.77
GUILFORD	0.61	281.74	282.35	0.04	44.14	44.18	156.47	18.41	6.96	9.67	0.00	9.14
HALIFAX	3.33	35.28	38.61	0.64	6.18	6.82	176.64	2.47	0.98	2.46	0.00	0.91
HARNETT	8.14	53.45	61.59	0.65	5.07	5.72	92.87	3.32	0.60	0.21	0.00	1.59
HAYWOOD	0.27	22.05	22.32	0.03	5.38	5.41	242.38	1.23	1.13	1.63	0.00	1.42
HENDERSON	0.74	49.83	50.57	0.11	6.46	6.57	129.92	2.84	1.25	0.94	0.00	1.54
HERTFORD	13.16	0.00	13.16	1.79	0.00	1.79	136.02	1.02	0.38	0.28	0.00	0.11
HOKE	10.76	0.00	10.76	3.51	0.00	3.51	326.21	0.77	0.00	1.40	0.00	1.34
HYDE	4.45	0.00	4.45	0.50	0.00	0.50	112.36	0.29	0.04	0.00	0.00	0.17
IREDELL	9.86	41.27	51.13	1.15	7.27	8.42	164.68	3.96	0.49	2.05	0.00	1.92
JACKSON	5.46	12.84	18.30	0.32	1.02	1.34	73.22	0.43	0.50	0.00	0.00	0.41
JOHNSTON	8.29	28.93	37.22	1.11	4.26	5.37	144.28	2.56	0.99	1.03	0.00	0.79
JONES	9.34	0.00	9.34	0.59	0.00	0.59	63.17	0.53	0.02	0.00	0.00	0.04
LEE	1.43	37.26	38.69	0.26	4.79	5.05	130.52	2.70	0.09	1.67	0.00	0.59
LENOIR	52.66	0.00	52.66	7.13	0.00	7.13	135.40	3.93	0.68	1.16	0.00	1.36
LINCOLN	0.00	16.51	16.51	0.00	4.72	4.72	285.89	1.25	2.08	1.13	0.00	0.26
MCDOWELL	0.00	15.35	15.35	0.00	3.19	3.19	207.82	0.65	0.26	1.30	0.00	0.98
MACON	0.18	8.62	8.80	0.07	1.32	1.39	157.95	0.50	0.57	0.04	0.00	0.28
MADISON	1.37	5.05	6.42	0.11	1.26	1.37	213.40	0.92	0.36	0.01	0.00	0.08
MARTIN	11.33	0.00	11.33	2.15	0.00	2.15	189.76	1.05	0.46	0.62	0.00	0.02
MECKLENBURG	3.10	492.80	495.90	0.25	64.77	65.02	131.12	45.59	12.14	3.06	0.00	4.23
MITCHELL	0.00	5.25	5.25	0.00	0.84	0.84	160.00	0.50	0.10	0.24	0.00	0.00
MONTGOMERY	1.17	13.74	14.91	0.12	2.80	2.92	195.84	0.86	0.45	0.64	0.00	0.97
MOORE	14.67	18.81	33.48	2.51	3.35	5.86	175.03	2.83	1.35	0.98	0.00	0.70
NASH	5.85	67.02	72.87	0.67	12.82	13.49	185.12	2.28	3.25	5.12	0.00	2.84
NEW HANOVER	15.85	77.74	93.59	3.22	11.92	15.14	161.77	6.68	2.67	2.85	0.00	2.94
NORTHAMPTON	12.53	0.00	12.53	1.26	0.00	1.26	100.56	0.65	0.17	0.28	0.00	0.16
ONSLOW	105.28	0.00	105.28	8.91	0.00	8.91	84.63	5.64	1.58	0.21	0.00	1.48
ORANGE	0.00	80.95	80.95	0.00	9.49	9.49	117.23	4.04	3.14	0.74	0.00	1.57
PAMLICO	10.67	0.00	10.67	0.85	0.00	0.85	79.66	0.63	0.18	0.01	0.00	0.03
PASQUOTANK	25.28	3.63	28.91	2.33	0.50	2.83	97.89	1.57	0.25	1.00	0.00	0.01

Table 5. Public-supply water use, by county, in North Carolina, 1990--Continued
[Mgal/d, million gallons per day; gal/d, gallons per day]

County	Population served, in thousands			Withdrawals, fresh, in Mgal/d			Per capita withdrawals, in gal/d	Water deliveries, by type of use, in Mgal/d				Public use and losses
	Ground water	Surface water	Total population	Ground water	Surface water	Total withdrawals		Domestic	Commercial	Industrial	Thermoelectric	
PENDER	7.57	0.00	7.57	0.78	0.00	0.78	103.04	0.51	0.16	0.02	0.00	0.09
PERQUIMANS	9.77	0.00	9.77	0.90	0.00	0.90	92.12	0.60	0.13	0.00	0.00	0.17
PERSON	0.00	12.51	12.51	0.00	4.37	4.37	349.32	0.50	0.33	2.71	0.00	0.83
PITT	47.48	50.82	98.30	4.65	8.53	13.18	134.08	5.30	3.92	2.85	0.00	1.11
POLK	4.74	1.00	5.74	0.95	0.00	0.95	165.51	0.27	0.12	0.56	0.00	0.00
RANDOLPH	2.49	40.55	43.04	0.63	5.97	6.60	153.35	2.45	0.75	2.83	0.00	0.57
RICHMOND	16.47	15.40	31.87	1.63	4.03	5.66	177.60	1.98	1.10	2.40	0.00	0.18
ROBESON	56.07	21.41	77.48	12.80	6.00	18.80	242.64	5.80	3.25	8.34	0.00	1.41
ROCKINGHAM	0.97	52.67	53.64	0.08	12.71	12.79	238.44	3.36	0.61	8.40	0.00	0.42
ROWAN	7.07	79.08	86.15	0.54	18.14	18.68	216.83	5.69	5.26	7.01	0.00	0.72
RUTHERFORD	0.99	27.85	28.84	0.10	9.93	10.03	347.78	1.88	0.63	7.03	0.00	0.49
SAMPSON	15.23	0.00	15.23	2.44	0.00	2.44	160.21	1.16	0.21	0.93	0.00	0.14
SCOTLAND	22.25	0.00	22.25	5.73	0.00	5.73	257.53	1.39	0.85	0.34	0.00	3.15
STANLY	0.00	38.86	38.86	0.00	9.99	9.99	257.08	1.69	0.31	5.33	0.00	2.66
STOKES	1.36	15.03	16.39	0.15	1.36	1.51	92.13	0.95	0.14	0.40	0.00	0.02
SURRY	0.83	17.65	18.48	0.09	7.60	7.69	416.13	1.11	1.23	4.41	0.00	0.94
SWAIN	0.00	2.81	2.81	0.00	0.32	0.32	113.88	0.19	0.12	0.01	0.00	0.00
TRANSYLVANIA	1.92	10.76	12.68	0.29	1.22	1.51	119.09	0.76	0.18	0.00	0.00	0.57
TYRRELL	3.40	0.00	3.40	0.27	0.00	0.27	79.41	0.25	0.01	0.00	0.00	0.01
UNION	9.95	26.22	36.17	3.53	4.63	8.16	225.60	1.97	2.04	4.12	0.00	0.03
VANCE	0.00	37.60	37.60	0.00	4.84	4.84	128.72	2.17	0.53	2.00	0.00	0.14
WAKE	3.38	390.69	394.07	0.34	40.60	40.94	103.89	18.50	12.10	4.31	0.00	6.03
WARREN	1.04	1.88	2.92	0.10	0.00	0.10	34.25	0.10	0.00	0.00	0.00	0.00
WASHINGTON	9.85	0.00	9.85	0.86	0.00	0.86	87.31	0.58	0.28	0.00	0.00	0.00
WATAUGA	2.40	16.63	19.03	0.23	2.50	2.73	143.46	1.01	0.93	0.00	0.00	0.79
WAYNE	24.90	44.07	68.97	2.34	5.13	7.47	108.31	2.83	1.39	1.93	0.00	1.32
WILKES	2.21	33.21	35.42	0.13	6.09	6.22	175.61	2.46	1.22	2.43	0.00	0.11
WILSON	3.77	45.14	48.91	0.40	7.69	8.09	165.41	3.09	1.32	1.05	0.00	2.63
YADKIN	2.43	7.25	9.68	0.21	1.01	1.22	126.03	0.40	0.42	0.39	0.00	0.01
YANCEY	0.00	2.30	2.30	0.00	0.38	0.38	165.22	0.20	0.07	0.00	0.00	0.11
TOTAL	962.35	3,793.55	4,755.90	136.95	667.85	804.80	169.22	319.32	137.94	244.74	0.45	102.35

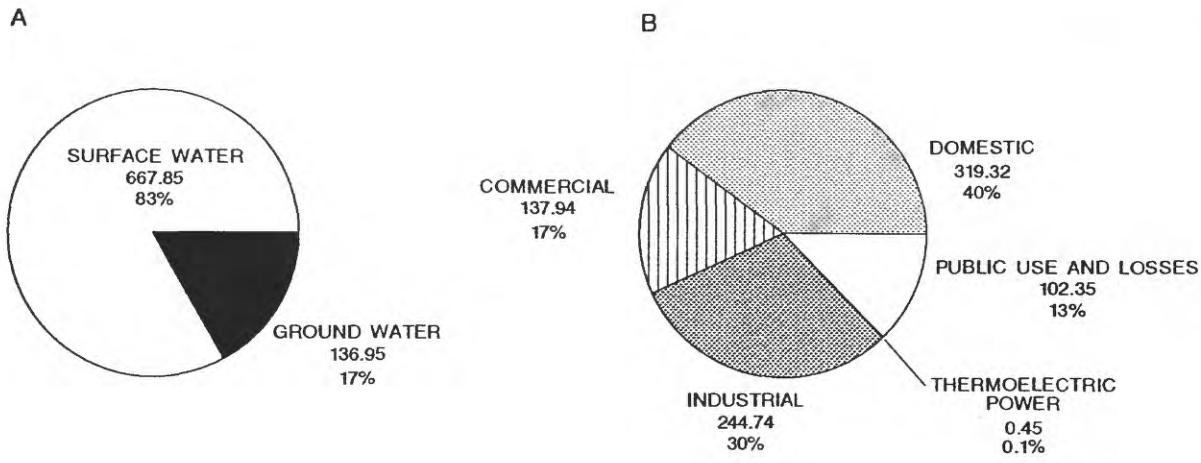

Figure 5. (A) Sources of public-supply withdrawals and (B) public-supply delivery in North Carolina, 1990 (in million gallons per day and percent of total).

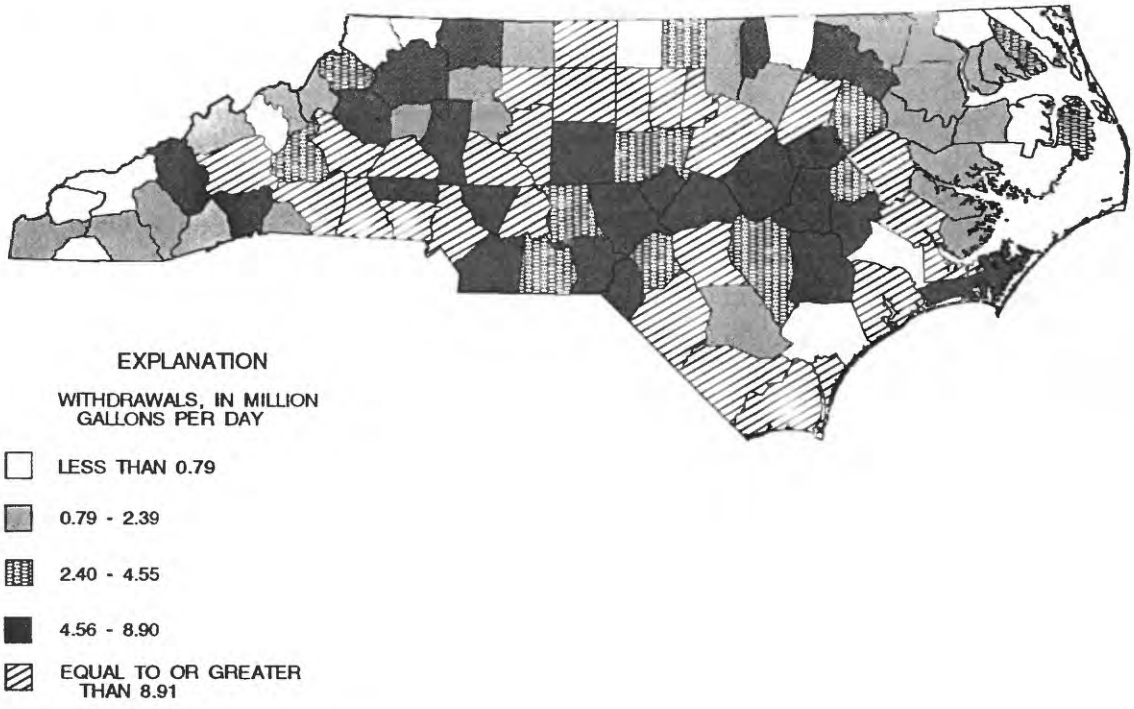

Figure 6. Public-supply withdrawals, by county, in North Carolina, 1990.

served by public suppliers was about 67 gal/d. Public suppliers delivered 319 Mgal/d to about 4.7 million domestic users.

Guilford County had the largest population served by private wells or springs in the State (65,060 persons). Buncombe, Catawba, Gaston, Randolph, and Union Counties also had large populations not served by public-supply systems. These six counties each withdrew greater that 2.5 Mgal/d for self-supplied domestic use and as a group accounted for about 17 percent of the self-supplied domestic use in 1990 (table 6; fig. 7A). Self-supplied domestic water use was assumed to be entirely from ground water.

Public-supply systems provided water for about 72 percent of the State's population in 1990. More heavily urbanized counties tend to have higher percentages of the population served by public suppliers than do rural counties. Cumberland, Forsyth, Guilford, Mecklenburg, and Wake Counties have the highest total populations in the State as well as the

Table 6. Domestic water use, by county, in North Carolina, 1990
[Mgal/d, million gallons per day; gal/d, gallons per day]

County	Self supplied					Public supply			Total
	Population, in thousands	Ground water, withdrawals, in Mgal/d	Surface water, withdrawals, in Mgal/d	Total withdrawals, in Mgal/d	Per capita withdrawal, in gal/d	Population served, in thousands	Deliveries from public supply, in Mgal/d	Per capita use, in gal/d	Withdrawals and deliveries in Mgal/d
ALAMANCE	41.22	2.27	0.00	2.27	55.00	66.99	4.19	62.55	6.46
ALEXANDER	16.61	0.91	0.00	0.91	55.00	10.93	0.67	61.30	1.58
ALLEGHANY	5.76	0.32	0.00	0.32	55.00	3.83	0.23	60.05	0.55
ANSON	6.87	0.38	0.00	0.38	55.00	16.60	1.22	73.49	1.60
ASHE	18.44	1.01	0.00	1.01	55.00	3.77	0.35	92.84	1.36
AVERY	6.08	0.33	0.00	0.33	55.00	8.79	0.49	55.75	0.82
BEAUFORT	25.31	1.39	0.00	1.39	55.00	16.97	0.85	50.09	2.24
BERTIE	12.64	0.70	0.00	0.70	55.00	7.75	0.57	73.55	1.27
BLADEN	14.22	0.78	0.00	0.78	55.00	14.44	1.09	75.48	1.87
BRUNSWICK	24.62	1.35	0.00	1.35	55.00	26.37	1.92	72.81	3.27
BUNCOMBE	51.02	2.81	0.00	2.81	55.00	123.80	8.78	70.92	11.59
BURKE	14.25	0.78	0.00	0.78	55.00	61.49	3.15	51.23	3.93
CABARRUS	44.20	2.43	0.00	2.43	55.00	54.74	3.14	57.36	5.57
CALDWELL	20.40	1.12	0.00	1.12	55.00	50.31	2.82	56.05	3.94
CAMDEN	1.95	0.11	0.00	0.11	55.00	3.95	0.16	40.51	0.27
CARTERET	17.71	0.97	0.00	0.97	55.00	34.85	2.79	80.06	3.76
CASWELL	18.23	1.00	0.00	1.00	55.00	2.46	0.18	73.17	1.18
CATAWBA	45.61	2.51	0.00	2.51	55.00	72.80	6.27	86.13	8.78
CHATHAM	22.33	1.23	0.00	1.23	55.00	16.43	1.44	87.64	2.67
CHEROKEE	13.31	0.73	0.00	0.73	55.00	6.86	0.77	112.24	1.50
CHOWAN	1.30	0.07	0.00	0.07	55.00	12.21	1.08	88.45	1.15
CLAY	6.61	0.36	0.00	0.36	55.00	0.55	0.05	90.91	0.41
CLEVELAND	29.38	1.62	0.00	1.62	55.00	55.33	3.28	59.28	4.90
COLUMBUS	33.87	1.86	0.00	1.86	55.00	15.72	2.03	129.13	3.89
CRAVEN	2.31	0.13	0.00	0.13	55.00	79.30	5.58	70.37	5.71
CUMBERLAND	0.74	0.04	0.00	0.04	55.00	273.82	16.75	61.17	16.79
CURRITUCK	4.93	0.27	0.00	0.27	55.00	8.81	0.66	74.91	0.93
DARE	5.52	0.30	0.00	0.30	55.00	17.23	1.95	113.17	2.25
DAVIDSON	3.67	0.20	0.00	0.20	55.00	123.01	7.78	63.25	7.98
DAVIE	10.94	0.60	0.00	0.60	55.00	16.92	1.15	67.97	1.75
DUPLIN	22.83	1.26	0.00	1.26	55.00	17.17	1.15	66.98	2.41
DURHAM	32.99	1.81	0.00	1.81	55.00	148.85	11.11	74.64	12.92
EDGECOMBE	32.06	1.76	0.00	1.76	55.00	24.50	0.71	28.98	2.47
FORSYTH	41.51	2.28	0.00	2.28	55.00	224.37	21.55	96.05	23.83
FRANKLIN	26.26	1.44	0.00	1.44	55.00	10.15	1.27	125.12	2.71
GASTON	46.81	2.57	0.00	2.57	55.00	128.28	10.33	80.53	12.90
GATES	1.65	0.09	0.00	0.09	55.00	7.66	0.44	57.44	0.53
GRAHAM	4.62	0.25	0.00	0.25	55.00	2.58	0.16	62.02	0.41
GRANVILLE	20.13	1.11	0.00	1.11	55.00	18.22	0.42	23.05	1.53
GREENE	2.12	0.12	0.00	0.12	55.00	13.26	1.54	116.14	1.66

Table 6. Domestic water use, by county, in North Carolina, 1990--Continued
[Mgal/d, million gallons per day; gal/d, gallons per day]

County	Self supplied					Public supply			Total
	Population, in thousands	Ground water, withdrawals, in Mgal/d	Surface water, withdrawals, in Mgal/d	Total withdrawals, in Mgal/d	Per capita withdrawal, in gal/d	Population served, in thousands	Deliveries from public supply, in Mgal/d	Per capita use, in gal/d	Withdrawals and deliveries in Mgal/d
GUILFORD	65.06	3.58	0.00	3.58	55.00	282.35	18.41	65.20	21.99
HALIFAX	16.91	0.93	0.00	0.93	55.00	38.61	2.47	63.97	3.40
HARNETT	6.23	0.34	0.00	0.34	55.00	61.59	3.32	53.90	3.66
HAYWOOD	24.62	1.35	0.00	1.35	55.00	22.32	1.23	55.11	2.58
HENDERSON	18.72	1.03	0.00	1.03	55.00	50.57	2.84	56.16	3.87
HERTFORD	9.36	0.51	0.00	0.51	55.00	13.16	1.02	77.51	1.53
HOKE	12.10	0.67	0.00	0.67	55.00	10.76	0.77	71.56	1.44
HYDE	0.96	0.05	0.00	0.05	55.00	4.45	0.29	65.17	0.34
IREDELL	41.80	2.30	0.00	2.30	55.00	51.13	3.96	77.45	6.26
JACKSON	8.55	0.47	0.00	0.47	55.00	18.30	0.43	23.50	0.90
JOHNSTON	44.09	2.42	0.00	2.42	55.00	37.22	2.56	68.78	4.98
JONES	0.07	0.00	0.00	0.00	55.00	9.34	0.53	56.75	0.53
LEE	2.68	0.15	0.00	0.15	55.00	38.69	2.70	69.79	2.85
LENOIR	4.61	0.25	0.00	0.25	55.00	52.66	3.93	74.63	4.18
LINCOLN	33.81	1.86	0.00	1.86	55.00	16.51	1.25	75.71	3.11
MCDOWELL	20.33	1.12	0.00	1.12	55.00	15.35	0.65	42.35	1.77
MACON	14.70	0.81	0.00	0.81	55.00	8.80	0.50	56.82	1.31
MADISON	10.53	0.58	0.00	0.58	55.00	6.42	0.92	143.30	1.50
MARTIN	13.75	0.76	0.00	0.76	55.00	11.33	1.05	92.67	1.81
MECKLENBURG	15.52	0.85	0.00	0.85	55.00	495.90	45.59	91.93	46.44
MITCHELL	9.18	0.51	0.00	0.51	55.00	5.25	0.50	95.24	1.01
MONTGOMERY	8.44	0.46	0.00	0.46	55.00	14.91	0.86	57.68	1.32
MOORE	25.53	1.40	0.00	1.40	55.00	33.48	2.83	84.53	4.23
NASH	3.81	0.21	0.00	0.21	55.00	72.87	2.28	31.29	2.49
NEW HANOVER	26.69	1.47	0.00	1.47	55.00	93.59	6.68	71.38	8.15
NORTHAMPTON	8.27	0.45	0.00	0.45	55.00	12.53	0.65	51.88	1.10
ONSLOW	44.56	2.45	0.00	2.45	55.00	105.28	5.64	53.57	8.09
ORANGE	12.90	0.71	0.00	0.71	55.00	80.95	4.04	49.91	4.75
PAMLICO	0.70	0.04	0.00	0.04	55.00	10.67	0.63	59.04	0.67
PASQUOTANK	2.39	0.13	0.00	0.13	55.00	28.91	1.57	54.31	1.70
PENDER	21.29	1.17	0.00	1.17	55.00	7.57	0.51	67.37	1.68
PERQUIMANS	0.68	0.04	0.00	0.04	55.00	9.77	0.60	61.41	0.64
PERSON	17.67	0.97	0.00	0.97	55.00	12.51	0.50	39.97	1.47
PITT	9.62	0.53	0.00	0.53	55.00	98.30	5.30	53.92	5.83
POLK	8.68	0.48	0.00	0.48	55.00	5.74	0.27	47.04	0.75
RANDOLPH	63.51	3.49	0.00	3.49	55.00	43.04	2.45	56.92	5.94
RICHMOND	12.65	0.70	0.00	0.70	55.00	31.87	1.98	62.13	2.68
ROBESON	27.70	1.52	0.00	1.52	55.00	77.48	5.80	74.86	7.32
ROCKINGHAM	32.42	1.78	0.00	1.78	55.00	53.64	3.36	62.64	5.14
ROWAN	24.46	1.35	0.00	1.35	55.00	86.15	5.69	66.05	7.04

Table 6. Domestic water use, by county, in North Carolina, 1990--Continued
[Mgal/d, million gallons per day; gal/d, gallons per day]

County	Self supplied					Public supply			Total
	Population, in thousands	Ground water, withdrawals, in Mgal/d	Surface water, withdrawals, in Mgal/d	Total withdrawals, in Mgal/d	Per capita withdrawal, in gal/d	Population served, in thousands	Deliveries from public supply, in Mgal/d	Per capita use, in gal/d	Withdrawals and deliveries in Mgal/d
RUTHERFORD	28.08	1.54	0.00	1.54	55.00	28.84	1.88	65.19	3.42
SAMPSON	32.07	1.76	0.00	1.76	55.00	15.23	1.16	76.17	2.92
SCOTLAND	11.50	0.63	0.00	0.63	55.00	22.25	1.39	62.47	2.02
STANLY	12.91	0.71	0.00	0.71	55.00	38.86	1.69	43.49	2.40
STOKES	20.83	1.15	0.00	1.15	55.00	16.39	0.95	57.96	2.10
SURRY	43.22	2.38	0.00	2.38	55.00	18.48	1.11	60.06	3.49
SWAIN	8.46	0.47	0.00	0.47	55.00	2.81	0.19	67.62	0.66
TRANSYLVANIA	12.84	0.71	0.00	0.71	55.00	12.68	0.76	59.94	1.47
TYRRELL	0.46	0.03	0.00	0.03	55.00	3.40	0.25	73.53	0.28
UNION	48.04	2.64	0.00	2.64	55.00	36.17	1.97	54.47	4.61
VANCE	1.29	0.07	0.00	0.07	55.00	37.60	2.17	57.71	2.24
WAKE	29.30	1.61	0.00	1.61	55.00	394.07	18.50	46.95	20.11
WARREN	14.35	0.79	0.00	0.79	55.00	2.92	0.10	34.25	0.89
WASHINGTON	4.15	0.23	0.00	0.23	55.00	9.85	0.58	58.88	0.81
WATAUGA	17.92	0.99	0.00	0.99	55.00	19.03	1.01	53.07	2.00
WAYNE	35.70	1.96	0.00	1.96	55.00	68.97	2.83	41.03	4.79
WILKES	23.97	1.32	0.00	1.32	55.00	35.42	2.46	69.45	3.78
WILSON	17.15	0.94	0.00	0.94	55.00	48.91	3.09	63.18	4.03
YADKIN	20.81	1.14	0.00	1.14	55.00	9.68	0.40	41.32	1.54
YANCEY	13.12	0.72	0.00	0.72	55.00	2.30	0.20	86.96	0.92
TOTAL	1,872.75	102.95	0.00	102.95	55.00	4,755.90	319.32	67.14	422.27

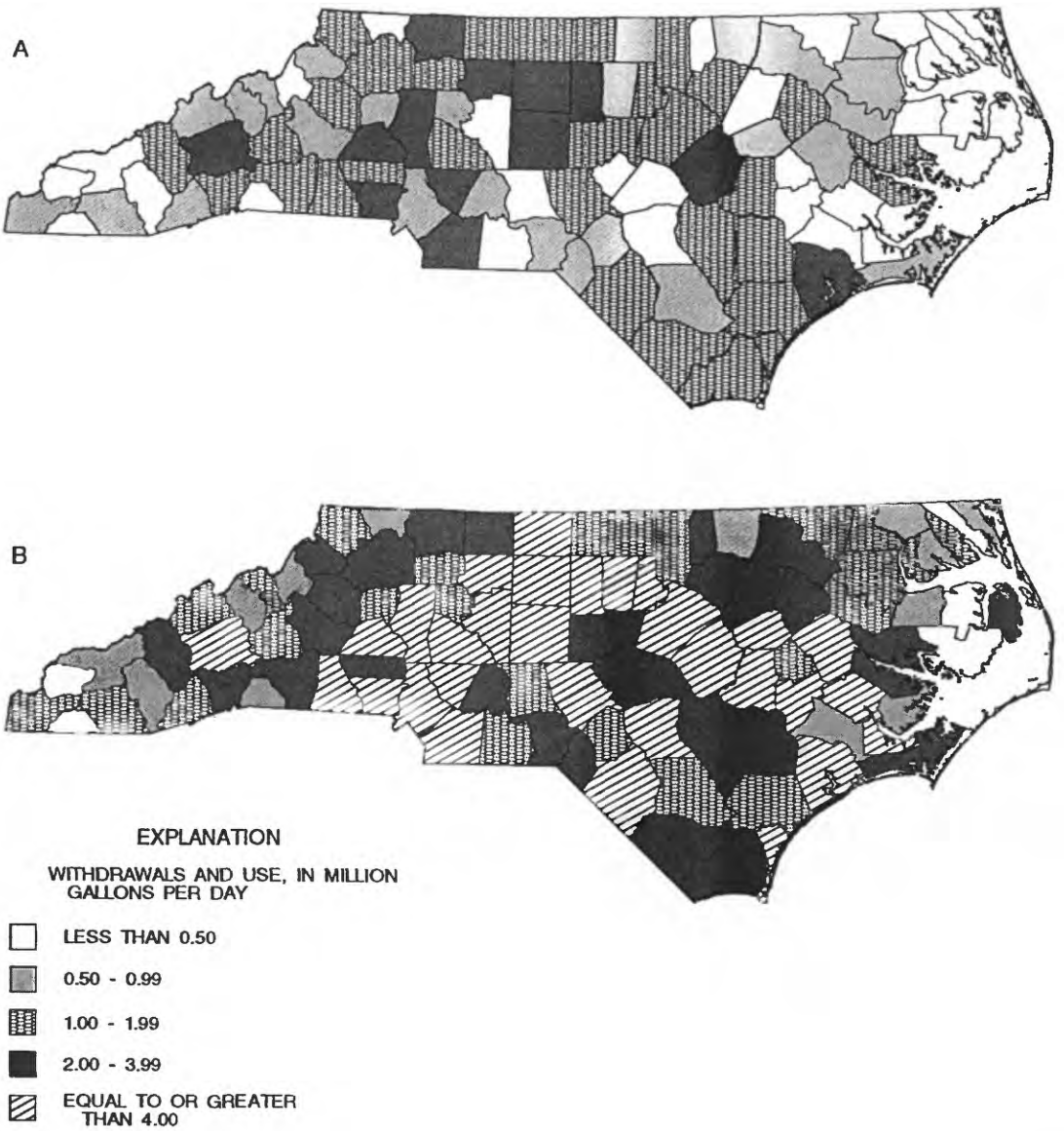

Figure 7. Total domestic water (A) withdrawals and (B) use (withdrawals and deliveries from public suppliers), by county, in North Carolina, 1990.

highest number of persons served by public-supply systems and the greatest total domestic water use (fig. 7B). Public-supply systems provided about 76 percent of all water for domestic use (fig. 8).

More than 80 percent of the populations of five counties were reliant on private wells or springs in 1990: Clay, 92 percent; Caswell, 88 percent; Yancey, 85 percent; and Ashe and Warren, 83 percent each. These counties have relatively small total populations and are in more rural areas of the State. In contrast, less than 5 percent of the populations of six counties were reliant on private water supplies: Cumberland, 0 percent; Jones, 1 percent; and Craven, Davidson, Mecklenburg, and Vance, 3 percent each. Craven,

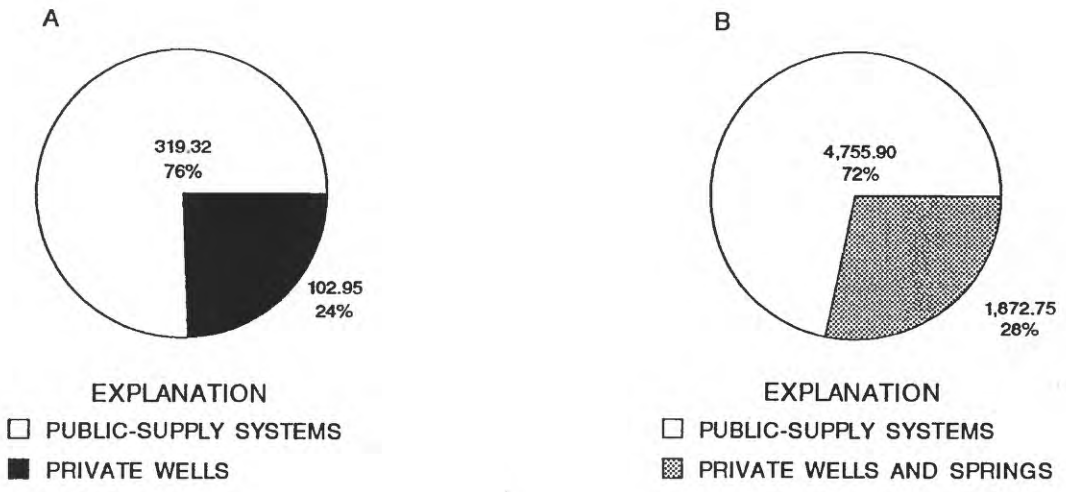

Figure 8. (A) Withdrawals from public suppliers and private wells and (B) population served by public supply and private wells in North Carolina, 1990.

Jones, and Vance Counties are rural, non-urbanized areas with small total populations served by public-supply systems. Cumberland and Mecklenburg Counties are highly urbanized counties with large public suppliers. Davidson County has a large population and is in close proximity to several urbanized areas (fig. 9).

Commercial

Self-supplied commercial water use is often under reported and difficult to estimate because withdrawals by commercial users tend to be relatively small. In 1990, withdrawals for commercial use in North Carolina were estimated to be about 17 Mgal/d. Two counties had high withdrawal rates in comparison to other counties--Craven and Onslow Counties, which reported self-supplied commercial water use of 3.69 and 6.08 Mgal/d, respectively. Both counties contain military bases and account for roughly 58 percent of all withdrawals for commercial use. Other county withdrawals range from 0 to 1.64 Mgal/d (table 7; fig. 10). The source of self-supplied water was assumed to be ground water.

Three counties received more than 12 Mgal/d of water each from public suppliers for commercial use--Buncombe, Mecklenburg, and Wake Counties. These are urbanized counties which have large numbers of commercial users. Public-supply sources accounted for approximately 89 percent of all commercial water use (fig. 11).

Industrial

Withdrawals for industrial water use in North Carolina totaled approximately 396 Mgal/d in 1990. Of these withdrawals, 84 percent were from surface-water sources. Public supplies delivered about 38 percent of the total water used for industry (fig. 12). Withdrawals from counties with large paper companies (Columbus, Haywood, and Martin) accounted for about 47 percent of all withdrawals (table 8; fig. 13). Although these facilities use a substantial amount of water for cooling and cleaning processes, most of the water is returned after treatment. Industries in Martin County withdrew more than 88 Mgal/d, which accounted for about 22 percent of total withdrawals for industrial use. Only two counties, Craven and New Hanover, use saline water for industrial processing. Total saline water withdrawals were 5.52 Mgal/d in 1990.

Public suppliers provided about 38 percent of the water used for industrial purposes. The highest delivery amount in the State in 1990 was to a paper plant in Columbus County. This delivery accounted for about 18 percent of all deliveries to industrial facilities in North Carolina. Total water use (deliveries and withdrawals) for industrial use varied geographically, with Columbus, Haywood, and Martin Counties again having the largest totals (fig. 13).

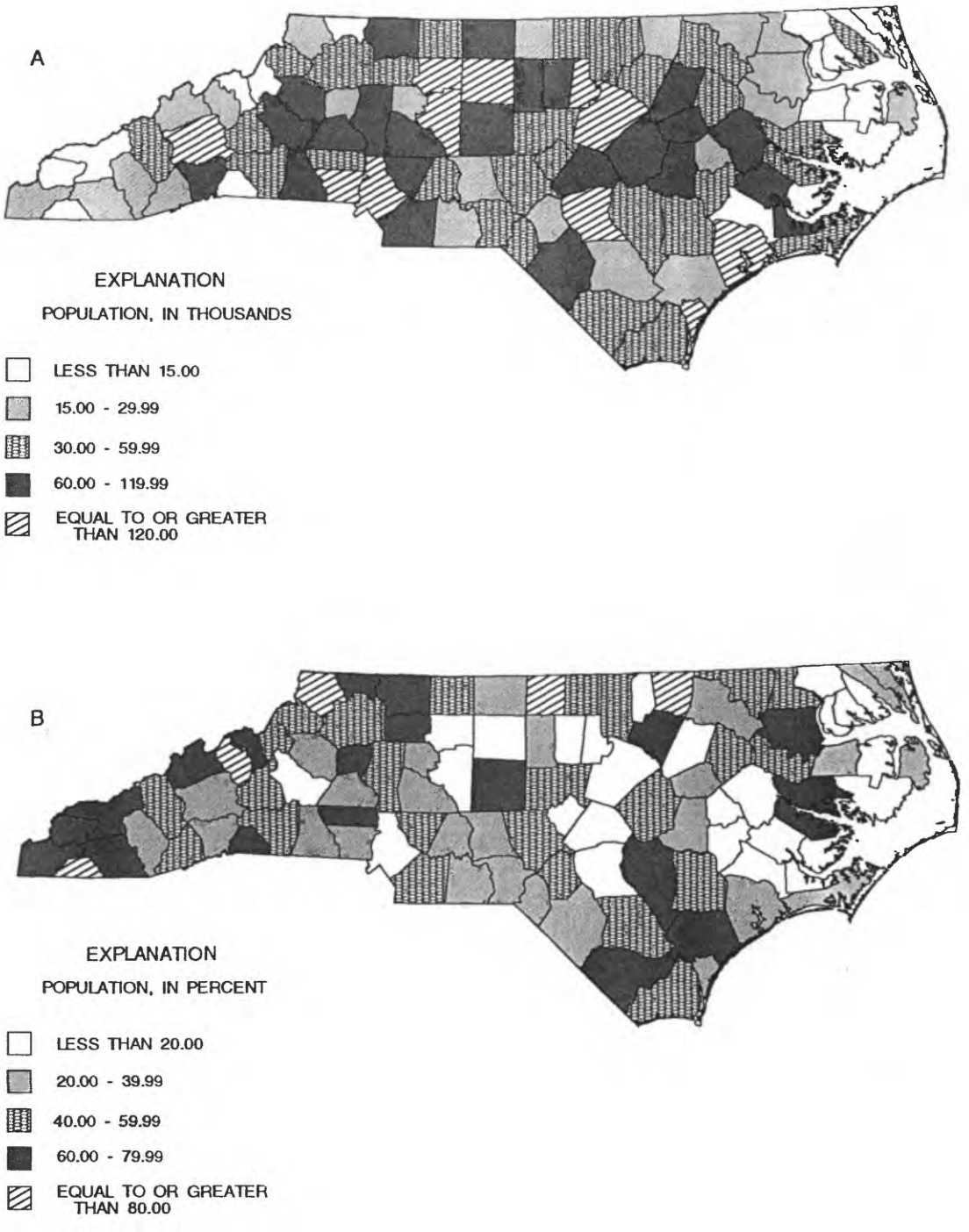

Figure 9. (A) Total population and (B) percent of population reliant on self-supplied water for domestic use in North Carolina, 1990.

Table 7. Commercial water use, in million gallons per day, by county, in North Carolina, 1990

County	Self-supplied withdrawals			Deliveries from public supply	With-drawals and deliveries
	Ground water	Surface water	Total		
ALAMANCE	0.20	0.00	0.20	3.26	3.46
ALEXANDER	0.00	0.00	0.00	0.32	0.32
ALLEGHANY	0.00	0.00	0.00	0.04	0.04
ANSON	0.00	0.00	0.00	0.04	0.04
ASHE	0.00	0.00	0.00	0.05	0.05
AVERY	0.09	0.00	0.09	0.12	0.21
BEAUFORT	0.14	0.00	0.14	0.77	0.91
BERTIE	0.00	0.00	0.00	0.09	0.09
BLADEN	0.00	0.00	0.00	0.12	0.12
BRUNSWICK	0.51	0.00	0.51	2.64	3.15
BUNCOMBE	0.17	0.00	0.17	12.30	12.47
BURKE	0.00	0.00	0.00	1.27	1.27
CABARRUS	0.01	0.00	0.01	1.37	1.38
CALDWELL	0.00	0.00	0.00	0.65	0.65
CAMDEN	0.00	0.00	0.00	0.00	0.00
CARTERET	0.06	0.00	0.06	1.08	1.14
CASWELL	0.02	0.00	0.02	0.08	0.10
CATAWBA	0.00	0.00	0.00	1.47	1.47
CHATHAM	0.00	0.00	0.00	0.25	0.25
CHEROKEE	0.04	0.00	0.04	0.31	0.35
CHOWAN	0.00	0.00	0.00	0.29	0.29
CLAY	0.00	0.00	0.00	0.02	0.02
CLEVELAND	0.00	0.00	0.00	1.18	1.18
COLUMBUS	0.01	0.00	0.01	0.11	0.12
CRAVEN	3.69	0.00	3.69	2.55	6.24
CUMBERLAND	0.02	0.00	0.02	6.51	6.53
CURRITUCK	0.28	0.00	0.28	0.07	0.35
DARE	0.02	0.00	0.02	1.67	1.69
DAVIDSON	0.01	0.00	0.01	1.05	1.06
DAVIE	0.00	0.00	0.00	0.18	0.18
DUPLIN	0.00	0.00	0.00	3.00	3.00
DURHAM	0.05	0.00	0.05	7.30	7.35
EDGECOMBE	0.00	0.00	0.00	1.01	1.01
FORSYTH	0.08	0.00	0.08	1.13	1.21
FRANKLIN	0.11	0.00	0.11	0.11	0.22
GASTON	0.10	0.00	0.10	1.71	1.81
GATES	0.00	0.00	0.00	0.07	0.07
GRAHAM	0.00	0.00	0.00	0.09	0.09
GRANVILLE	0.02	0.00	0.02	0.76	0.78
GREENE	0.00	0.00	0.00	0.17	0.17
GUILFORD	0.06	0.00	0.06	6.96	7.02
HALIFAX	0.00	0.00	0.00	0.98	0.98
HARNETT	0.01	0.00	0.01	0.60	0.61
HAYWOOD	0.02	0.00	0.02	1.13	1.15
HENDERSON	0.02	0.00	0.02	1.25	1.27

Table 7. Commercial water use, in million gallons per day, by county, in North Carolina, 1990--Continued

County	Self-supplied withdrawals			Deliveries from public supply	With-drawals and deliveries
	Ground water	Surface water	Total		
HERTFORD	0.00	0.00	0.00	0.38	0.38
HOKE	0.14	0.00	0.14	0.00	0.14
HYDE	0.01	0.00	0.01	0.04	0.05
IREDELL	0.02	0.00	0.02	0.49	0.51
JACKSON	0.03	0.00	0.03	0.50	0.53
JOHNSTON	0.00	0.00	0.00	0.99	0.99
JONES	0.00	0.00	0.00	0.02	0.02
LEE	0.01	0.00	0.01	0.09	0.10
LENOIR	0.44	0.00	0.44	0.68	1.12
LINCOLN	0.00	0.00	0.00	2.08	2.08
MCDOWELL	0.03	0.00	0.03	0.26	0.29
MACON	0.04	0.00	0.04	0.57	0.61
MADISON	0.00	0.00	0.00	0.36	0.36
MARTIN	0.00	0.00	0.00	0.46	0.46
MECKLENBURG	0.01	0.00	0.01	12.14	12.15
MITCHELL	0.16	0.00	0.16	0.10	0.26
MONTGOMERY	0.01	0.00	0.01	0.45	0.46
MOORE	0.00	0.00	0.00	1.35	1.35
NASH	0.00	0.00	0.00	3.25	3.25
NEW HANOVER	0.02	0.00	0.02	2.67	2.69
NORTHAMPTON	0.01	0.00	0.01	0.17	0.18
ONSLOW	6.08	0.00	6.08	1.58	7.66
ORANGE	0.02	0.00	0.02	3.14	3.16
PAMLICO	0.00	0.00	0.00	0.18	0.18
PASQUOTANK	0.00	0.00	0.00	0.25	0.25
PENDER	0.03	0.00	0.03	0.16	0.19
PERQUIMANS	0.00	0.00	0.00	0.13	0.13
PERSON	0.00	0.00	0.00	0.33	0.33
PITT	0.00	0.00	0.00	3.92	3.92
POLK	0.00	0.00	0.00	0.12	0.12
RANDOLPH	0.22	0.00	0.22	0.75	0.97
RICHMOND	0.06	0.00	0.06	1.10	1.16
ROBESON	0.00	0.00	0.00	3.25	3.25
ROCKINGHAM	0.02	0.00	0.02	0.61	0.63
ROWAN	0.01	0.00	0.01	5.26	5.27
RUTHERFORD	0.02	0.00	0.02	0.63	0.65
SAMPSON	0.00	0.00	0.00	0.21	0.21
SCOTLAND	1.37	0.00	1.37	0.85	2.22
STANLY	0.03	0.00	0.03	0.31	0.34
STOKES	0.01	0.00	0.01	0.14	0.15
SURRY	0.03	0.00	0.03	1.23	1.26
SWAIN	0.01	0.00	0.01	0.12	0.13
TRANSYLVANIA	0.02	0.00	0.02	0.18	0.20
TYRRELL	0.00	0.00	0.00	0.01	0.01
UNION	0.00	0.00	0.00	2.04	2.04

Table 7. Commercial water use, in million gallons per day, by county, in North Carolina, 1990--Continued

County	Self-supplied withdrawals			Deliveries from public supply	With-drawals and deliveries
	Ground water	Surface water	Total		
VANCE	0.00	0.00	0.00	0.53	0.53
WAKE	0.02	0.00	0.02	12.10	12.12
WARREN	0.04	0.00	0.04	0.00	0.04
WASHINGTON	0.01	0.00	0.01	0.28	0.29
WATAUGA	0.64	0.00	0.64	0.93	1.57
WAYNE	1.64	0.00	1.64	1.39	3.03
WILKES	0.00	0.00	0.00	1.22	1.22
WILSON	0.00	0.00	0.00	1.32	1.32
YADKIN	0.02	0.00	0.02	0.42	0.44
YANCEY	0.01	0.00	0.01	0.07	0.08
TOTAL	16.98	0.00	16.98	137.94	154.92

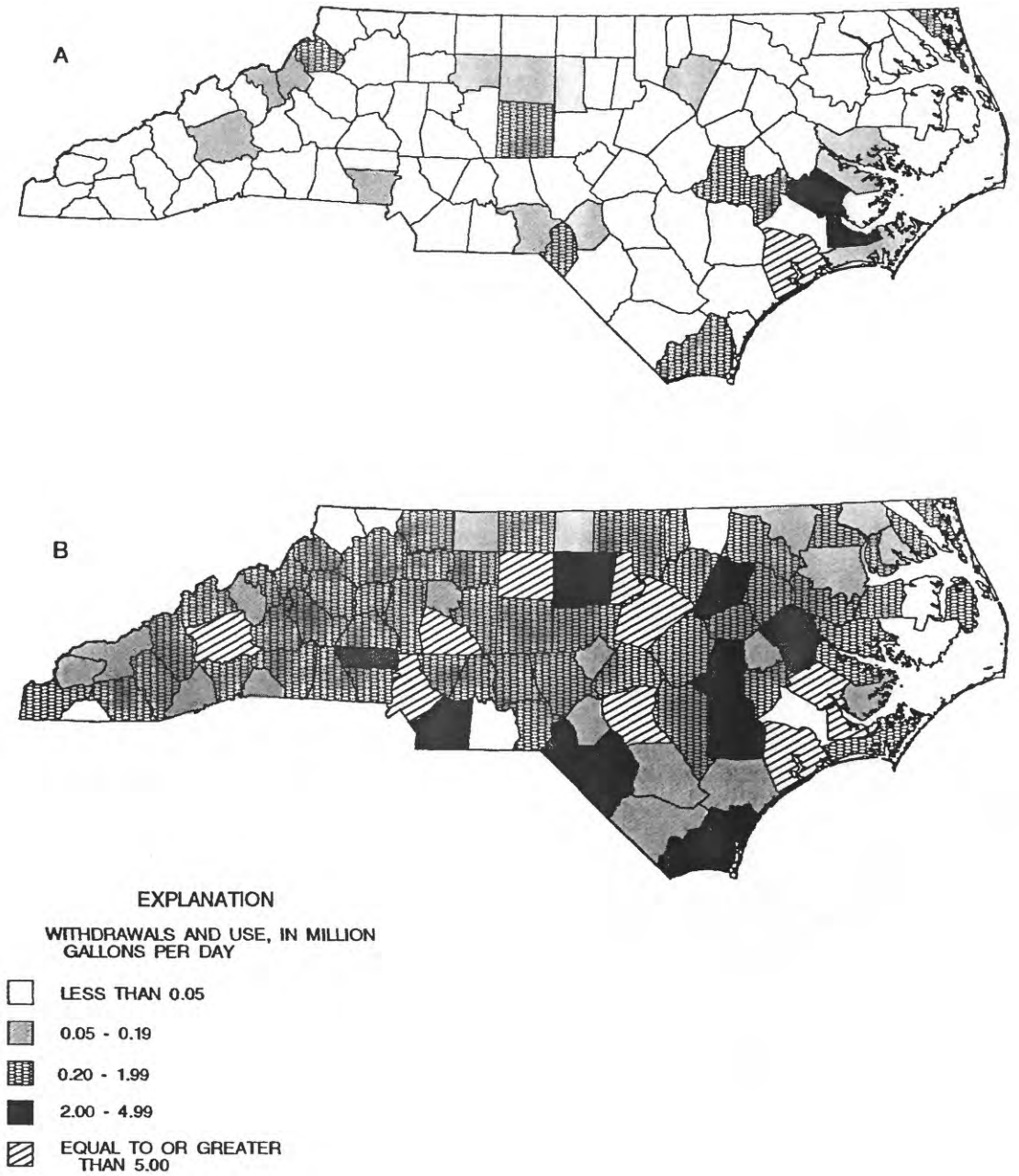

Figure 10. Total commercial (A) self-supplied water withdrawals and (B) water use (withdrawals and deliveries from public suppliers), by county, in North Carolina, 1990.

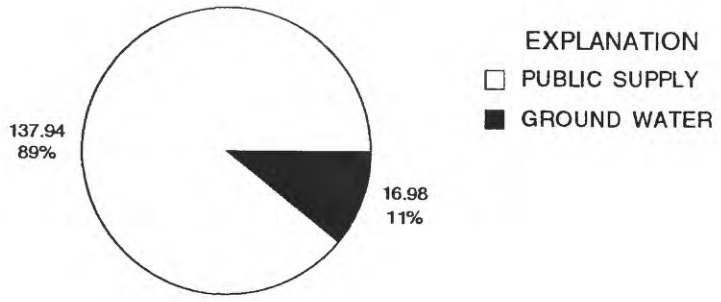

Figure 11. Source of water for commercial use in North Carolina, 1990 (in million gallons per day and percent of total).

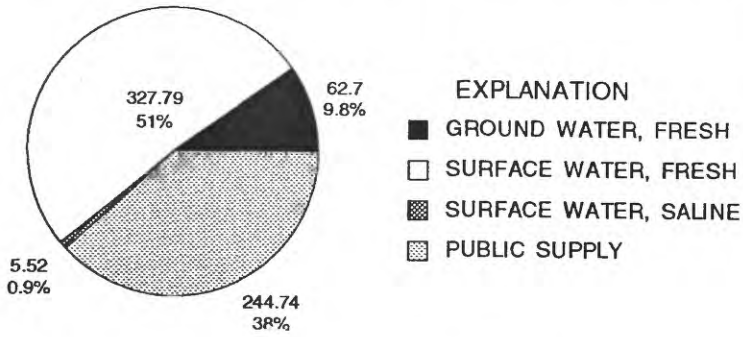

Figure 12. Source of water for industrial use in North Carolina, 1990 (in million gallons per day and percent of total).

Table 8. Industrial water use, in million gallons per day, by county, in North Carolina, 1990

County	Self-supplied withdrawals								Deliveries from public suppy	Total			
	Ground water	Surface water		Total				Total		Withdrawal and deliveries	Consumptive use		
	Fresh	Fresh	Saline	Ground water	Surface water	Fresh	Saline				Fresh	Saline	Total
ALAMANCE	0.06	2.60	0.00	0.06	2.60	2.66	0.00	2.66	6.42	9.08	1.00	0.00	1.00
ALEXANDER	0.05	0.45	0.00	0.05	0.45	0.50	0.00	0.50	0.12	0.62	0.00	0.00	0.00
ALLEGHANY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANSON	0.01	8.96	0.00	0.01	8.96	8.97	0.00	8.97	0.78	9.75	0.33	0.00	0.33
ASHE	0.01	0.36	0.00	0.01	0.36	0.37	0.00	0.37	0.07	0.44	0.03	0.00	0.03
AVERY	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.00	0.01
BEAUFORT	1.96	0.00	0.00	1.96	0.00	1.96	0.00	1.96	0.33	2.29	0.12	0.00	0.12
BERTIE	2.48	0.01	0.00	2.48	0.01	2.49	0.00	2.49	0.02	2.51	0.05	0.00	0.05
BLADEN	1.20	0.00	0.00	1.20	0.00	1.20	0.00	1.20	0.24	1.44	0.20	0.00	0.20
BRUNSWICK	0.08	7.80	0.00	0.08	7.80	7.88	0.00	7.88	6.50	14.38	2.12	0.00	2.12
BUNCOMBE	0.25	6.57	0.00	0.25	6.57	6.82	0.00	6.82	2.96	9.78	1.17	0.00	1.17
BURKE	0.31	0.00	0.00	0.31	0.00	0.31	0.00	0.31	10.98	11.29	0.24	0.00	0.24
CABARRUS	0.05	0.00	0.00	0.05	0.00	0.05	0.00	0.05	2.37	2.42	0.00	0.00	0.00
CALDWELL	0.05	0.46	0.00	0.05	0.46	0.51	0.00	0.51	1.43	1.94	0.35	0.00	0.35
CAMDEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 8. Industrial water use, in million gallons per day, by county, in North Carolina, 1990--Continued

County	Self-supplied withdrawals								Deliveries from public suppy	Total			
	Ground water	Surface water		Total				Total		Withdrawal and deliveries	Consumptive use		
	Fresh	Fresh	Saline	Ground water	Surface water	Fresh	Saline				Fresh	Saline	Total
CARTERET	0.04	0.00	0.00	0.04	0.00	0.04	0.00	0.04	0.03	0.07	0.04	0.00	0.04
CASWELL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
CATAWBA	0.02	0.00	0.00	0.02	0.00	0.02	0.00	0.02	6.68	6.70	0.00	0.00	0.00
CHATHAM	0.01	0.85	0.00	0.01	0.85	0.86	0.00	0.86	1.21	2.07	0.34	0.00	0.34
CHEROKEE	0.05	0.02	0.00	0.05	0.02	0.07	0.00	0.07	0.20	0.27	0.02	0.00	0.02
CHOWAN	0.00	0.79	0.00	0.00	0.79	0.79	0.00	0.79	0.55	1.34	0.03	0.00	0.03
CLAY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CLEVELAND	0.41	0.80	0.00	0.41	0.80	1.21	0.00	1.21	6.71	7.92	0.16	0.00	0.16
COLUMBUS	0.30	43.46	0.00	0.30	43.46	43.76	0.00	43.76	43.73	87.49	2.97	0.00	2.97
CRAVEN	0.17	13.53	5.47	0.17	19.00	13.70	5.47	19.17	3.13	22.30	1.10	0.62	1.72
CUMBERLAND	0.14	12.16	0.00	0.14	12.16	12.30	0.00	12.30	2.88	15.18	1.01	0.00	1.01
CURRITUCK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DARE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
DAVIDSON	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.85	2.85	0.00	0.00	0.00
DAVIE	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.38	0.39	0.00	0.00	0.00
DUPLIN	1.71	0.00	0.00	1.71	0.00	1.71	0.00	1.71	0.23	1.94	0.35	0.00	0.35
DURHAM	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01	1.60	1.61	0.00	0.00	0.00
EDGECOMBE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.23	1.23	0.00	0.00	0.00
FORSYTH	0.02	0.00	0.00	0.02	0.00	0.02	0.00	0.02	15.14	15.16	0.01	0.00	0.01
FRANKLIN	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.34	0.35	0.00	0.00	0.00
GASTON	0.24	1.90	0.00	0.24	1.90	2.14	0.00	2.14	14.57	16.71	0.05	0.00	0.05
GATES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRAHAM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00
GRANVILLE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.46	0.00	0.00	0.00
GREENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00
GUILFORD	15.39	1.84	0.00	15.39	1.84	17.23	0.00	17.23	9.67	26.90	7.51	0.00	7.51
HALIFAX	0.00	26.90	0.00	0.00	26.90	26.90	0.00	26.90	2.46	29.36	0.00	0.00	0.00
HARNETT	0.07	0.00	0.00	0.07	0.00	0.07	0.00	0.07	0.21	0.28	0.01	0.00	0.01
HAYWOOD	0.00	50.60	0.00	0.00	50.60	50.60	0.00	50.60	1.63	52.23	3.10	0.00	3.10
HENDERSON	0.09	1.80	0.00	0.09	1.80	1.89	0.00	1.89	0.94	2.83	0.01	0.00	0.01
HERTFORD	1.43	0.00	0.00	1.43	0.00	1.43	0.00	1.43	0.28	1.71	0.18	0.00	0.18
HOKE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40	1.40	0.00	0.00	0.00
HYDE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IREDELL	0.54	0.30	0.00	0.54	0.30	0.84	0.00	0.84	2.05	2.89	0.19	0.00	0.19
JACKSON	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.00	0.01
JOHNSTON	0.09	0.00	0.00	0.09	0.00	0.09	0.00	0.09	1.03	1.12	0.00	0.00	0.00
JONES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LEE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	1.67	0.00	0.00	0.00
LENOIR	3.35	0.00	0.00	3.35	0.00	3.35	0.00	3.35	1.16	4.51	0.59	0.00	0.59
LINCOLN	0.00	0.15	0.00	0.00	0.15	0.15	0.00	0.15	1.13	1.28	0.00	0.00	0.00
MCDOWELL	1.35	1.70	0.00	1.35	1.70	3.05	0.00	3.05	1.30	4.35	1.05	0.00	1.05
MACON	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.00
MADISON	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
MARTIN	2.86	86.01	0.00	2.86	86.01	88.87	0.00	88.87	0.62	89.49	0.20	0.00	0.20
MECKLENBURG	0.16	0.08	0.00	0.16	0.08	0.24	0.00	0.24	3.06	3.30	0.03	0.00	0.03

Table 8. Industrial water use, in million gallons per day, by county, in North Carolina, 1990--Continued

County	Self-supplied withdrawals								Deliv-eries from public suppy	Total			
	Ground water	Surface water		Total				Total		With-drawal and deliv-eries	Consumptive use		
	Fresh	Fresh	Saline	Ground water	Surface water	Fresh	Saline				Fresh	Saline	Total
MITCHELL	0.00	0.22	0.00	0.00	0.22	0.22	0.00	0.22	0.24	0.46	0.01	0.00	0.01
MONTGOMERY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.64	0.00	0.00	0.00
MOORE	0.03	0.00	0.00	0.03	0.00	0.03	0.00	0.03	0.98	1.01	0.00	0.00	0.00
NASH	0.14	0.00	0.00	0.14	0.00	0.14	0.00	0.14	5.12	5.26	0.14	0.00	0.14
NEW HANOVER	6.65	1.70	0.05	6.65	1.75	8.35	0.05	8.40	2.85	11.25	1.66	0.01	1.67
NORTHAMPTON	0.20	0.00	0.00	0.20	0.00	0.20	0.00	0.20	0.28	0.48	0.10	0.00	0.10
ONSLOW	0.48	0.00	0.00	0.48	0.00	0.48	0.00	0.48	0.21	0.69	0.11	0.00	0.11
ORANGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.74	0.74	0.00	0.00	0.00
PAMLICO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
PASQUOTANK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
PENDER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00
PERQUIMANS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERSON	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.71	2.71	0.00	0.00	0.00
PITT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.85	2.85	0.00	0.00	0.00
POLK	0.18	0.82	0.00	0.18	0.82	1.00	0.00	1.00	0.56	1.56	0.08	0.00	0.08
RANDOLPH	0.26	0.26	0.00	0.26	0.26	0.52	0.00	0.52	2.83	3.35	0.00	0.00	0.00
RICHMOND	0.24	1.72	0.00	0.24	1.72	1.96	0.00	1.96	2.40	4.36	0.12	0.00	0.12
ROBESON	3.57	0.00	0.00	3.57	0.00	3.57	0.00	3.57	8.34	11.91	0.30	0.00	0.30
ROCKINGHAM	0.03	0.00	0.00	0.03	0.00	0.03	0.00	0.03	8.40	8.43	0.01	0.00	0.01
ROWAN	10.08	3.70	0.00	10.08	3.70	13.78	0.00	13.78	7.01	20.79	0.75	0.00	0.75
RUTHERFORD	0.04	2.21	0.00	0.04	2.21	2.25	0.00	2.25	7.03	9.28	0.00	0.00	0.00
SAMPSON	1.82	0.00	0.00	1.82	0.00	1.82	0.00	1.82	0.93	2.75	0.55	0.00	0.55
SCOTLAND	0.64	4.01	0.00	0.64	4.01	4.65	0.00	4.65	0.34	4.99	0.17	0.00	0.17
STANLY	0.06	1.87	0.00	0.06	1.87	1.93	0.00	1.93	5.33	7.26	0.11	0.00	0.11
STOKES	0.16	0.00	0.00	0.16	0.00	0.16	0.00	0.16	0.40	0.56	0.02	0.00	0.02
SURRY	0.08	2.39	0.00	0.08	2.39	2.47	0.00	2.47	4.41	6.88	0.55	0.00	0.55
SWAIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
TRANSYLVANIA	1.37	29.74	0.00	1.37	29.74	31.11	0.00	31.11	0.00	31.11	2.06	0.00	2.06
TYRRELL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNION	0.34	3.20	0.00	0.34	3.20	3.54	0.00	3.54	4.12	7.66	0.80	0.00	0.80
VANCE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00
WAKE	0.13	3.05	0.00	0.13	3.05	3.18	0.00	3.18	4.31	7.49	0.03	0.00	0.03
WARREN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WASHINGTON	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WATAUGA	0.03	0.00	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.00	0.00
WAYNE	0.50	0.00	0.00	0.50	0.00	0.50	0.00	0.50	1.93	2.43	0.42	0.00	0.42
WILKES	0.68	1.59	0.00	0.68	1.59	2.27	0.00	2.27	2.43	4.70	0.97	0.00	0.97
WILSON	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05	1.05	0.00	0.00	0.00
YADKIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.39	0.00	0.00	0.00
YANCEY	0.00	1.20	0.00	0.00	1.20	1.20	0.00	1.20	0.00	1.20	0.00	0.00	0.00
TOTAL	62.70	327.79	5.52	62.70	333.31	390.49	5.52	396.01	244.74	635.23	33.54	0.63	34.17

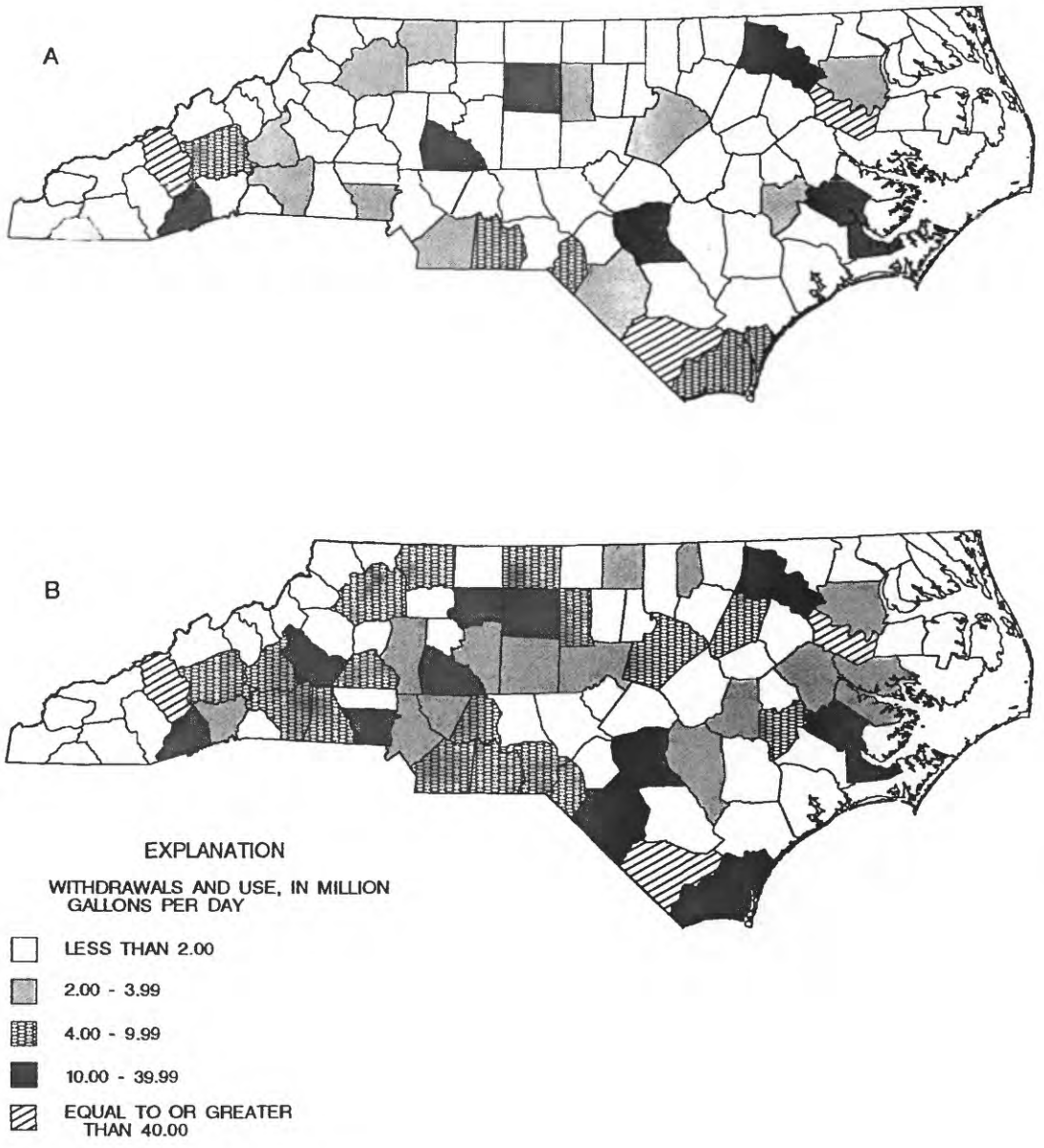

Figure 13. Total industrial water (A) withdrawals and (B) use, by county, in North Carolina, 1990.

Mining

Mining water withdrawals accounted for approximately 1 percent of all water withdrawn in North Carolina in 1990. Of the 95.51 Mgal/d of water withdrawn for mining, about 29 percent (27.54 Mgal/d) was from surface-water sources (fig. 14). In Beaufort County, a phosphate mine dewatering operation accounts for 84 percent of the ground-water withdrawals and 59 percent of all water withdrawn for mining (table 9). Other counties with relatively high withdrawal amounts for mining include Mitchell County, which contains a mining operation that uses ground- and surface-water sources; Anson County, which contains a sand and gravel operation that uses surface water; and Craven County, which withdraws more than 5 Mgal/d (fig. 15). More than 93 percent of the water used in mining was returned to the source from which it was withdrawn.

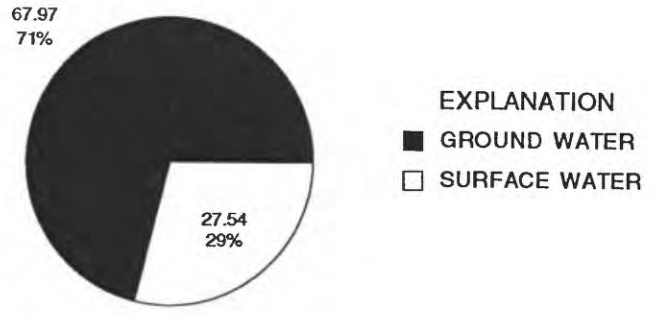

Figure 14. Source of water for mining use in North Carolina, 1990 (in million gallons per day and percent of total).

Table 9. Mining water use, in million gallons per day, by county, in North Carolina, 1990

County	Withdrawals			Consumptive use, total
	Ground water	Surface water	Total	
ALAMANCE	0.31	0.39	0.70	0.00
ALEXANDER	0.00	0.00	0.00	0.00
ALLEGHANY	0.00	0.00	0.00	0.00
ANSON	0.00	7.09	7.09	0.92
ASHE	0.00	0.00	0.00	0.00
AVERY	0.00	0.00	0.00	0.00
BEAUFORT	56.80	0.00	56.80	4.60
BERTIE	0.00	0.00	0.00	0.00
BLADEN	0.00	0.00	0.00	0.00
BRUNSWICK	0.00	0.00	0.00	0.00
BUNCOMBE	0.00	1.80	1.80	0.10
BURKE	0.00	0.00	0.00	0.00
CABARRUS	0.00	0.00	0.00	0.00
CALDWELL	0.00	0.00	0.00	0.00
CAMDEN	0.00	0.00	0.00	0.00
CARTERET	0.00	0.00	0.00	0.00
CASWELL	0.00	0.00	0.00	0.00
CATAWBA	0.00	1.68	1.68	0.00
CHATHAM	0.00	0.00	0.00	0.00
CHEROKEE	0.00	0.00	0.00	0.00
CHOWAN	0.00	0.00	0.00	0.00
CLAY	0.00	0.00	0.00	0.00
CLEVELAND	0.00	0.00	0.00	0.00
COLUMBUS	0.00	0.00	0.00	0.00
CRAVEN	5.40	0.29	5.69	0.00
CUMBERLAND	0.00	0.00	0.00	0.00
CURRITUCK	0.00	0.00	0.00	0.00
DARE	0.00	0.00	0.00	0.00
DAVIDSON	0.00	0.47	0.47	0.00
DAVIE	0.00	0.96	0.96	0.00
DUPLIN	0.00	0.00	0.00	0.00
DURHAM	0.00	0.00	0.00	0.00
EDGECOMBE	0.00	0.00	0.00	0.00
FORSYTH	0.32	0.27	0.59	0.00
FRANKLIN	0.00	0.00	0.00	0.00
GASTON	0.65	0.17	0.82	0.13
GATES	0.00	0.00	0.00	0.00
GRAHAM	0.00	0.00	0.00	0.00
GRANVILLE	0.00	0.00	0.00	0.00
GREENE	0.00	0.00	0.00	0.00
GUILFORD	0.48	1.44	1.92	0.10
HALIFAX	0.00	0.00	0.00	0.00
HARNETT	0.00	0.00	0.00	0.00
HAYWOOD	0.00	0.00	0.00	0.00
HENDERSON	0.00	0.00	0.00	0.00
HERTFORD	0.00	0.00	0.00	0.00
HOKE	0.00	0.00	0.00	0.00
HYDE	0.00	0.00	0.00	0.00
IREDELL	0.00	0.00	0.00	0.00
JACKSON	0.00	0.00	0.00	0.00
JOHNSTON	0.00	0.16	0.16	0.00
JONES	0.00	0.00	0.00	0.00
LEE	0.00	0.08	0.08	0.03
LENOIR	0.00	0.00	0.00	0.00
LINCOLN	0.00	0.00	0.00	0.00
MCDOWELL	0.00	0.00	0.00	0.00
MACON	0.00	0.00	0.00	0.00
MADISON	0.00	0.00	0.00	0.00
MARTIN	0.00	0.00	0.00	0.00
MECKLENBURG	0.14	2.28	2.42	0.17
MITCHELL	3.45	4.73	8.18	0.00
MONTGOMERY	0.00	0.00	0.00	0.00
MOORE	0.00	0.00	0.00	0.00
NASH	0.00	0.00	0.00	0.00
NEW HANOVER	0.00	0.00	0.00	0.00
NORTHAMPTON	0.00	0.00	0.00	0.00
ONSLOW	0.00	0.00	0.00	0.00
ORANGE	0.10	0.30	0.40	0.02
PAMLICO	0.00	0.00	0.00	0.00
PASQUOTANK	0.00	0.00	0.00	0.00
PENDER	0.00	0.00	0.00	0.00
PERQUIMANS	0.00	0.00	0.00	0.00
PERSON	0.00	0.00	0.00	0.00
PITT	0.00	0.36	0.36	0.01
POLK	0.00	0.00	0.00	0.00
RANDOLPH	0.06	0.30	0.36	0.00
RICHMOND	0.00	0.00	0.00	0.00
ROBESON	0.00	0.00	0.00	0.00
ROCKINGHAM	0.00	1.01	1.01	0.01
ROWAN	0.00	0.02	0.02	0.00
RUTHERFORD	0.00	0.00	0.00	0.00
SAMPSON	0.00	0.00	0.00	0.00
SCOTLAND	0.00	0.00	0.00	0.00
STANLY	0.02	0.00	0.02	0.00
STOKES	0.00	0.00	0.00	0.00
SURRY	0.24	0.40	0.64	0.00
SWAIN	0.00	0.36	0.36	0.36
TRANSYLVANIA	0.00	0.00	0.00	0.00
TYRRELL	0.00	0.00	0.00	0.00
UNION	0.00	0.85	0.85	0.00

Table 9. Mining water use, in million gallons per day, by county, in North Carolina, 1990--Continued

County	Withdrawals			Consumptive use, total
	Ground water	Surface water	Total	
VANCE	0.00	0.00	0.00	0.00
WAKE	0.00	0.03	0.03	0.00
WARREN	0.00	0.00	0.00	0.00
WASHINGTON	0.00	0.00	0.00	0.00
WATAUGA	0.00	0.00	0.00	0.00
WAYNE	0.00	0.00	0.00	0.00
WILKES	0.00	0.30	0.30	0.00
WILSON	0.00	0.30	0.30	0.00
YADKIN	0.00	0.00	0.00	0.00
YANCEY	0.00	1.50	1.50	0.00
TOTAL	67.97	27.54	95.51	6.45

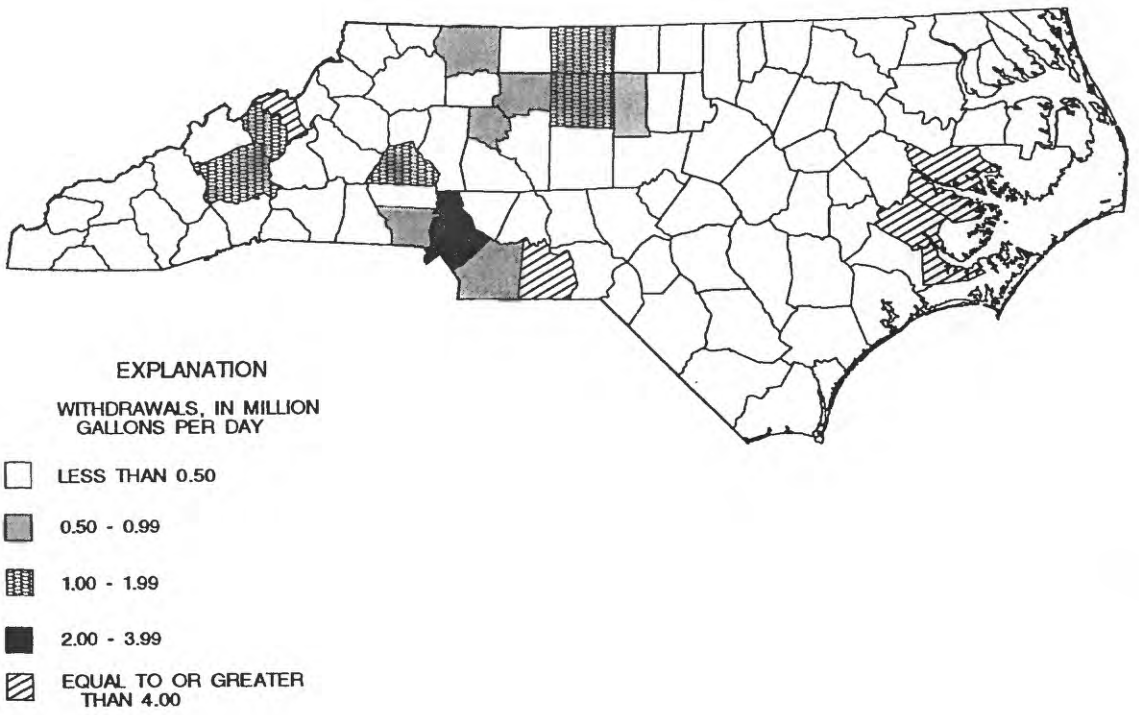

Figure 15. Total withdrawals for mining use in North Carolina, 1990.

Livestock

The livestock category is broken down into two subcategories of water use: (1) water used to feed and clean "stock," such as dairy and beef cows, hogs, chickens, turkeys, and sheep; and (2) water used for "animal specialties," such as horse farms, catfish farms, and trout farms. In most cases, the amount of water used for maintenance of animal populations is relatively small compared to water use in other categories. Water used for all livestock was only 2 percent of all water withdrawn in North Carolina in 1990. Of the 200.76 Mgal/d used for all livestock, approximately 18 percent was from a ground-water source (fig. 16).

Water used for stock accounted for about 20 percent of water withdrawn for all livestock in the State in 1990 (table 10). Nine counties had withdrawals for stock populations of more than 1 Mgal/d (Chatham, Duplin, Iredell, Moore, Randolph, Sampson, Union, Wayne, and Wilkes Counties) and are, predictably, in rural areas of the State. The other counties had relatively low water use for this category (fig. 17).

The majority of water used for animal specialties was for aquaculture operations in the western counties of Haywood, Swain, and Transylvania. These three counties each had trout farms that required considerable amounts of surface water to maintain acceptable water levels and water quality for fish populations. Unlike water used for stock, very little of the water withdrawn for animal specialties was actually consumed; most was returned to the original source.

Irrigation

Irrigation water use for 1990 was estimated using information obtained from the Agricultural Extension Service and Department of Agricultural Engineering at North Carolina State University. For each county, estimates of irrigated acreage by crop for 1990 and application-rate coefficients for each crop were used to calculate the amount of water applied to crops. The 1990 irrigation water-withdrawal estimates are substantially lower than those reported for 1983 and 1985 in previous USGS publications (Treece, 1990; Treece, Bales, and Moreau, 1990). These differences are primarily a result of differences in data-collection procedures and climatic conditions between the years.

Irrigation water-use data for 1983-85 were derived from site-specific data collection for approximately 50 of the 100 counties in the State. Irrigation water-use estimates for the other counties that were not surveyed were based on computations of crop acreage multiplied by application-rate

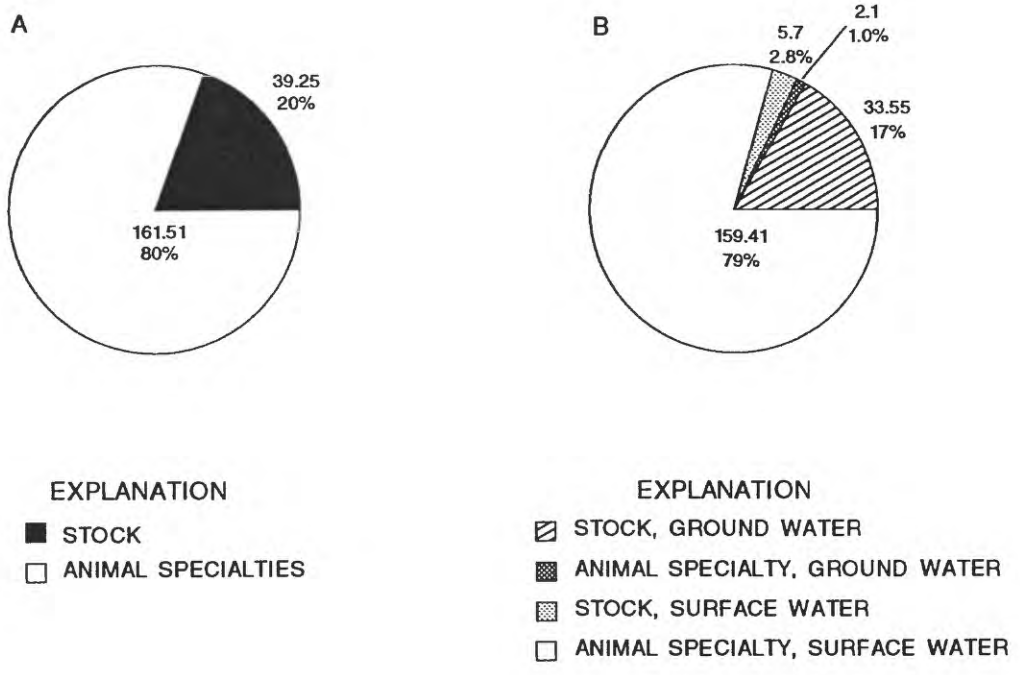

Figure 16. (A) Stock and animal-specialty water use and (B) source of water for livestock water use in North Carolina, 1990 (in million gallons per day and percent of total).

Table 10. Livestock water use, in million gallons per day, by county, in North Carolina, 1990

County	Stock				Animal specialties				Total livestock			
	Withdrawals			Consumptive use	Withdrawals			Consumptive use	Withdrawals			Consumptive use
	Ground water	Surface water	Total		Ground water	Surface water	Total		Ground water	Surface water	Total	
ALAMANCE	0.50	0.08	0.58	0.58	0.21	0.04	0.25	0.25	0.71	0.12	0.83	0.83
ALEXANDER	0.66	0.12	0.78	0.78	0.01	0.00	0.01	0.01	0.67	0.12	0.79	0.79
ALLEGHANY	0.42	0.07	0.49	0.49	0.00	0.00	0.00	0.00	0.42	0.07	0.49	0.49
ANSON	0.41	0.07	0.48	0.48	0.01	0.00	0.01	0.01	0.42	0.07	0.49	0.49
ASHE	0.33	0.05	0.38	0.38	0.03	0.65	0.68	0.03	0.36	0.70	1.06	0.41
AVERY	0.02	0.00	0.02	0.02	0.00	3.02	3.02	0.00	0.02	3.02	3.04	0.02
BEAUFORT	0.13	0.16	0.29	0.29	0.00	0.00	0.00	0.00	0.13	0.16	0.29	0.29
BERTIE	0.38	0.07	0.45	0.45	0.00	0.00	0.00	0.00	0.38	0.07	0.45	0.45
BLADEN	0.29	0.02	0.31	0.31	0.01	0.00	0.01	0.01	0.30	0.02	0.32	0.32
BRUNSWICK	0.06	0.02	0.08	0.08	0.01	0.00	0.01	0.01	0.07	0.02	0.09	0.09
BUNCOMBE	0.32	0.06	0.38	0.38	0.02	0.51	0.53	0.03	0.34	0.57	0.91	0.41
BURKE	0.13	0.04	0.17	0.17	0.02	1.73	1.75	0.02	0.15	1.77	1.92	0.19
CABARRUS	0.22	0.03	0.25	0.25	0.04	0.01	0.05	0.05	0.26	0.04	0.30	0.30
CALDWELL	0.14	0.02	0.16	0.16	0.02	0.51	0.53	0.03	0.16	0.53	0.69	0.19
CAMDEN	0.02	0.01	0.03	0.03	0.00	0.00	0.00	0.00	0.02	0.01	0.03	0.03
CARTERET	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01
CASWELL	0.12	0.02	0.14	0.14	0.00	0.00	0.00	0.00	0.12	0.02	0.14	0.14
CATAWBA	0.22	0.04	0.26	0.26	0.11	0.02	0.13	0.13	0.33	0.06	0.39	0.39
CHATHAM	1.11	0.19	1.30	1.30	0.02	0.00	0.02	0.02	1.13	0.19	1.32	1.32
CHEROKEE	0.11	0.02	0.13	0.13	0.01	4.11	4.12	0.01	0.12	4.13	4.25	0.14
CHOWAN	0.09	0.01	0.10	0.10	0.00	0.00	0.00	0.00	0.09	0.01	0.10	0.10
CLAY	0.09	0.01	0.10	0.10	0.00	3.74	3.74	0.00	0.09	3.75	3.84	0.10
CLEVELAND	0.44	0.07	0.51	0.51	0.03	0.00	0.03	0.03	0.47	0.07	0.54	0.54
COLUMBUS	0.15	0.01	0.16	0.16	0.02	0.00	0.02	0.02	0.17	0.01	0.18	0.18
CRAVEN	0.29	0.04	0.33	0.33	0.00	0.00	0.00	0.00	0.29	0.04	0.33	0.33
CUMBERLAND	0.16	0.02	0.18	0.18	0.08	0.01	0.09	0.09	0.24	0.03	0.27	0.27
CURRITUCK	0.02	0.01	0.03	0.03	0.00	0.00	0.00	0.00	0.02	0.01	0.03	0.03
DARE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DAVIDSON	0.32	0.06	0.38	0.38	0.01	0.00	0.01	0.01	0.33	0.06	0.39	0.39
DAVIE	0.28	0.05	0.33	0.33	0.02	0.00	0.02	0.02	0.30	0.05	0.35	0.35
DUPLIN	2.91	0.33	3.24	3.22	0.02	0.00	0.02	0.02	2.93	0.33	3.26	3.24
DURHAM	0.03	0.01	0.04	0.04	0.04	0.00	0.04	0.04	0.07	0.01	0.08	0.08
EDGECOMBE	0.24	0.04	0.28	0.28	0.00	0.00	0.00	0.00	0.24	0.04	0.28	0.28
FORSYTH	0.12	0.03	0.15	0.15	0.03	0.01	0.04	0.04	0.15	0.04	0.19	0.19
FRANKLIN	0.32	0.06	0.38	0.38	0.02	0.00	0.02	0.02	0.34	0.06	0.40	0.40
GASTON	0.16	0.03	0.19	0.19	0.01	0.00	0.01	0.01	0.17	0.03	0.20	0.20
GATES	0.18	0.03	0.21	0.21	0.00	0.00	0.00	0.00	0.18	0.03	0.21	0.21
GRAHAM	0.01	0.00	0.01	0.01	0.00	10.25	10.25	0.00	0.01	10.25	10.26	0.01
GRANVILLE	0.21	0.03	0.24	0.24	0.02	0.00	0.02	0.02	0.23	0.03	0.26	0.26
GREENE	0.79	0.14	0.93	0.93	0.00	0.00	0.00	0.00	0.79	0.14	0.93	0.93
GUILFORD	0.34	0.05	0.39	0.39	0.06	0.01	0.07	0.07	0.40	0.06	0.46	0.46
HALIFAX	0.43	0.08	0.51	0.51	0.00	0.00	0.00	0.00	0.43	0.08	0.51	0.51
HARNETT	0.22	0.05	0.27	0.27	0.01	0.00	0.01	0.01	0.23	0.05	0.28	0.28
HAYWOOD	0.27	0.04	0.31	0.31	0.02	51.84	51.86	0.02	0.29	51.88	52.17	0.33
HENDERSON	0.23	0.04	0.27	0.27	0.04	0.50	0.54	0.05	0.27	0.54	0.81	0.32

Table 10. Livestock water use, in million gallons per day, by county, in North Carolina, 1990--Continued

County	Stock				Animal specialties				Total livestock			
	Withdrawals			Consumptive use	Withdrawals			Consumptive use	Withdrawals			Consumptive use
	Ground water	Surface water	Total		Ground water	Surface water	Total		Ground water	Surface water	Total	
HERTFORD	0.11	0.02	0.13	0.13	0.00	0.00	0.00	0.00	0.11	0.02	0.13	0.13
HOKE	0.04	0.01	0.05	0.05	0.00	0.00	0.00	0.00	0.04	0.01	0.05	0.05
HYDE	0.04	0.01	0.05	0.05	0.00	0.00	0.00	0.00	0.04	0.01	0.05	0.05
IREDELL	0.93	0.16	1.09	1.09	0.05	0.01	0.06	0.06	0.98	0.17	1.15	1.15
JACKSON	0.03	0.00	0.03	0.03	0.01	4.57	4.58	0.01	0.04	4.57	4.61	0.04
JOHNSTON	0.45	0.08	0.53	0.53	0.02	0.01	0.03	0.03	0.47	0.09	0.56	0.56
JONES	0.05	0.01	0.06	0.06	0.00	0.00	0.00	0.00	0.05	0.01	0.06	0.06
LEE	0.10	0.00	0.10	0.10	0.01	0.00	0.01	0.01	0.11	0.00	0.11	0.11
LENOIR	0.58	0.10	0.68	0.68	0.00	0.00	0.00	0.00	0.58	0.10	0.68	0.68
LINCOLN	0.38	0.06	0.44	0.44	0.00	0.00	0.00	0.00	0.38	0.06	0.44	0.44
MCDOWELL	0.06	0.01	0.07	0.07	0.01	7.49	7.50	0.01	0.07	7.50	7.57	0.08
MACON	0.08	0.01	0.09	0.09	0.02	15.68	15.70	0.02	0.10	15.69	15.79	0.11
MADISON	0.11	0.02	0.13	0.13	0.00	5.40	5.40	0.00	0.11	5.42	5.53	0.13
MARTIN	0.16	0.03	0.19	0.19	0.00	0.00	0.00	0.00	0.16	0.03	0.19	0.19
MECKLENBURG	0.18	0.03	0.21	0.21	0.02	0.00	0.02	0.02	0.20	0.03	0.23	0.23
MITCHELL	0.03	0.00	0.03	0.03	0.01	2.30	2.31	0.01	0.04	2.30	2.34	0.04
MONTGOMERY	0.26	0.05	0.31	0.31	0.01	0.00	0.01	0.01	0.27	0.05	0.32	0.32
MOORE	0.91	0.16	1.07	1.07	0.04	0.01	0.05	0.05	0.95	0.17	1.12	1.12
NASH	0.61	0.11	0.72	0.72	0.02	0.00	0.02	0.02	0.63	0.11	0.74	0.74
NEW HANOVER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NORTHAMPTON	0.30	0.05	0.35	0.35	0.01	0.00	0.01	0.01	0.31	0.05	0.36	0.36
ONSLOW	0.21	0.04	0.25	0.25	0.02	0.00	0.02	0.02	0.23	0.04	0.27	0.27
ORANGE	0.33	0.06	0.39	0.39	0.03	0.00	0.03	0.03	0.36	0.06	0.42	0.42
PAMLICO	0.03	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.03
PASQUOTANK	0.03	0.01	0.04	0.04	0.01	0.00	0.01	0.01	0.04	0.01	0.05	0.05
PENDER	0.10	0.02	0.12	0.12	0.01	0.00	0.01	0.01	0.11	0.02	0.13	0.13
PERQUIMANS	0.16	0.02	0.18	0.18	0.00	0.00	0.00	0.00	0.16	0.02	0.18	0.18
PERSON	0.13	0.03	0.16	0.16	0.01	0.00	0.01	0.01	0.14	0.03	0.17	0.17
PITT	0.76	0.13	0.89	0.89	0.03	0.01	0.04	0.04	0.79	0.14	0.93	0.93
POLK	0.06	0.01	0.07	0.07	0.02	0.00	0.02	0.02	0.08	0.01	0.09	0.09
RANDOLPH	1.14	0.21	1.35	1.35	0.03	0.00	0.03	0.03	1.17	0.21	1.38	1.38
RICHMOND	0.23	0.02	0.25	0.25	0.00	0.00	0.00	0.00	0.23	0.02	0.25	0.25
ROBESON	0.28	0.05	0.33	0.33	0.03	0.00	0.03	0.03	0.31	0.05	0.36	0.36
ROCKINGHAM	0.15	0.02	0.17	0.17	0.03	0.01	0.04	0.04	0.18	0.03	0.21	0.21
ROWAN	0.45	0.08	0.53	0.53	0.04	0.01	0.05	0.05	0.49	0.09	0.58	0.58
RUTHERFORD	0.13	0.02	0.15	0.15	0.25	0.01	0.26	0.04	0.38	0.03	0.41	0.19
SAMPSON	2.08	0.35	2.43	2.41	0.01	0.00	0.01	0.01	2.09	0.35	2.44	2.42
SCOTLAND	0.12	0.02	0.14	0.14	0.00	0.00	0.00	0.00	0.12	0.02	0.14	0.14
STANLY	0.40	0.07	0.47	0.47	0.06	0.01	0.07	0.07	0.46	0.08	0.54	0.54
STOKES	0.11	0.02	0.13	0.13	0.01	0.00	0.01	0.01	0.12	0.02	0.14	0.14
SURRY	0.50	0.09	0.59	0.59	0.04	0.01	0.05	0.05	0.54	0.10	0.64	0.64
SWAIN	0.02	0.00	0.02	0.02	0.01	21.90	21.91	0.01	0.03	21.90	21.93	0.03
TRANSYLVANIA	0.05	0.01	0.06	0.06	0.00	22.97	22.97	0.00	0.05	22.98	23.03	0.06
TYRRELL	0.17	0.03	0.20	0.20	0.00	0.00	0.00	0.00	0.17	0.03	0.20	0.20
UNION	1.89	0.31	2.20	2.16	0.09	0.02	0.11	0.11	1.98	0.33	2.31	2.27

Table 10. Livestock water use, in million gallons per day, by county, in North Carolina, 1990--Continued

County	Stock				Animal specialties				Total livestock			
	Withdrawals			Consumptive use	Withdrawals			Consumptive use	Withdrawals			Consumptive use
	Ground water	Surface water	Total		Ground water	Surface water	Total		Ground water	Surface water	Total	
VANCE	0.04	0.01	0.05	0.05	0.01	0.00	0.01	0.01	0.05	0.01	0.06	0.06
WAKE	0.18	0.03	0.21	0.21	0.05	0.01	0.06	0.06	0.23	0.04	0.27	0.27
WARREN	0.18	0.03	0.21	0.21	0.00	0.00	0.00	0.00	0.18	0.03	0.21	0.21
WASHINGTON	0.45	0.08	0.53	0.53	0.00	0.00	0.00	0.00	0.45	0.08	0.53	0.53
WATAUGA	0.13	0.02	0.15	0.15	0.03	0.50	0.53	0.03	0.16	0.52	0.68	0.18
WAYNE	0.96	0.18	1.14	1.11	0.03	0.01	0.04	0.04	0.99	0.19	1.18	1.15
WILKES	2.08	0.36	2.44	2.40	0.02	0.00	0.02	0.02	2.10	0.36	2.46	2.42
WILSON	0.21	0.04	0.25	0.25	0.01	0.00	0.01	0.01	0.22	0.04	0.26	0.26
YADKIN	0.43	0.07	0.50	0.50	0.02	0.00	0.02	0.02	0.45	0.07	0.52	0.52
YANCEY	0.05	0.01	0.06	0.06	0.02	1.51	1.53	0.02	0.07	1.52	1.59	0.08
TOTAL	33.55	5.70	39.25	39.10	2.10	159.41	161.51	2.14	35.65	165.11	200.76	41.24

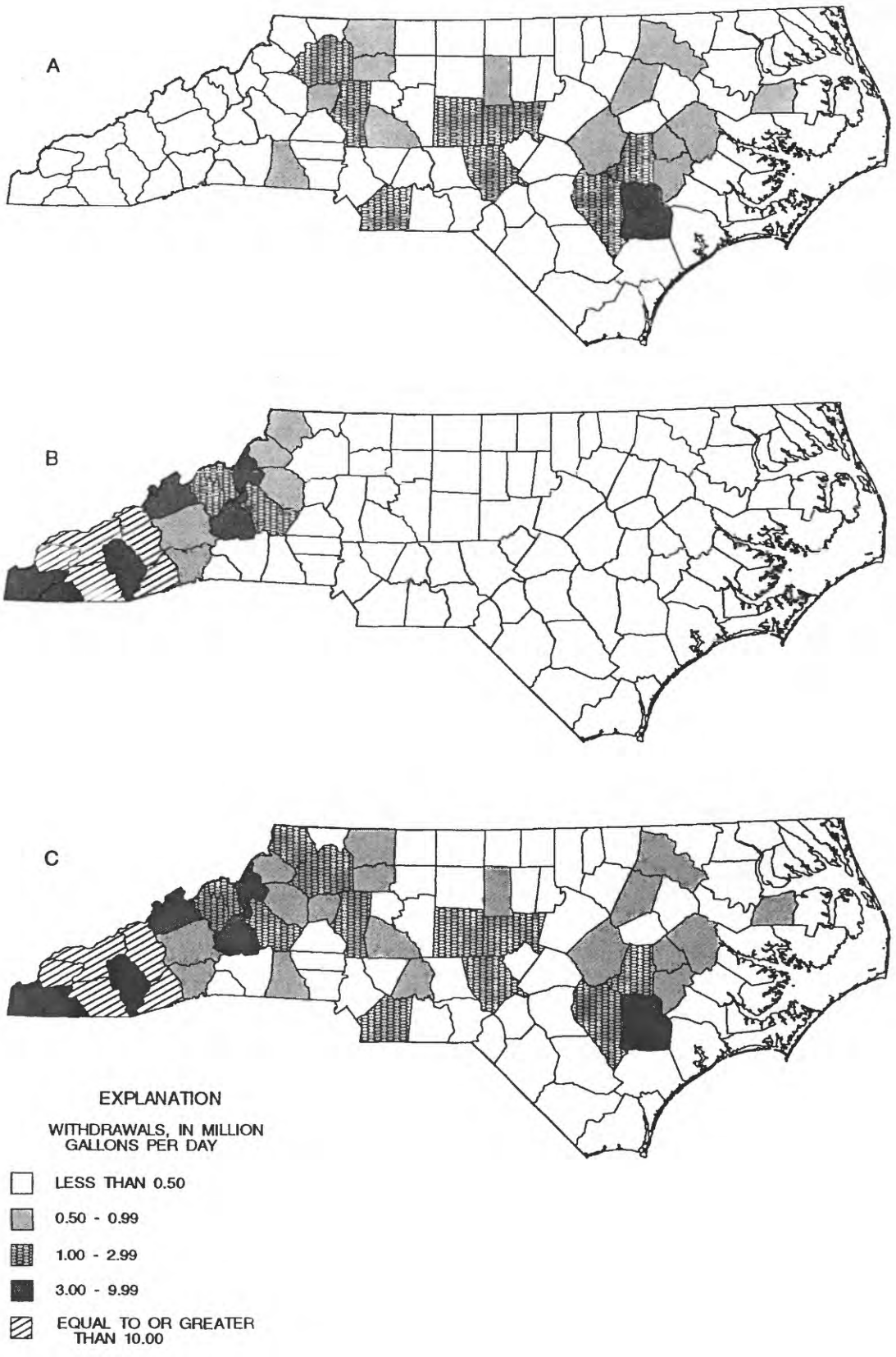

Figure 17. Water withdrawals for (A) stock, (B) animal specialties, and (C) all livestock, by county, in North Carolina, 1990.

coefficients. Irrigation water withdrawals were large in 1983 as a result of extremely low precipitation rates in the critical months of the growing season. In 1990, funding limitations prevented the collection of site-specific water-use data for irrigation; therefore, all county estimates were based on crop acreage/application-rate coefficient computations.

Withdrawals for irrigation in North Carolina were about 114 Mgal/d, roughly 13 percent of all water withdrawn for the State in 1990. Approximately 90 percent of these withdrawals was from surface-water sources (fig. 18). Moore and Wake Counties had considerably high withdrawal amounts compared to the rest of the State. The two counties accounted for about 26 Mgal/d, or 23 percent of withdrawals for this category (table 11). Other county withdrawal amounts ranged from 0.00 to 3.58 Mgal/d (fig. 19A).

Almost half of the counties in the State used some reclaimed sewage for irrigation. Robeson County reported a use of 5.07 Mgal/d, followed by Duplin County's reported use of 1.91 Mgal/d. All other counties used less than 1 Mgal/d of reclaimed sewage for irrigation (fig. 19B).

The number of acres of irrigated land is reported by spray techniques (systems using center pivot, trickle, drip, or traveling gun) and flood irrigation (flooding, furrow, or ditch). Only two counties, Bladen and Orange, reported using flood irrigation. Land irrigated by flooding totaled 150 acres.

The five counties that had the highest number of acres irrigated by spray systems were Carteret (22,740 acres), Nash (9,770 acres), Harnett (8,830 acres), Sampson (8,380 acres), and Edgecombe (8,200 acres) (fig. 19C). These five counties accounted for 31 percent of the total acres irrigated in the State. Piedmont and Coastal Plain counties accounted for almost all acres irrigated.

Thermoelectric-Power Generation

Thermoelectric-power generation includes water use for the generation of power by fossil fuel and nuclear energy. North Carolina has 16 fossil-fuel plants and 3 nuclear plants located within 15 counties. Water use for thermoelectric-power generation accounts for about 81 percent of all water withdrawn in the State. The use of water for these plants is primarily for cooling processes, so little is actually consumed. Of the 7,210.54 Mgal/d of water withdrawn for thermoelectric-power generation, only about 42.54 Mgal/d were not returned to the original source (table 12). The use of water for production of nuclear power was about 55 percent of the total water used for thermoelectric-power generation (fig. 20A). The nuclear plants are located in Brunswick, Mecklenburg, and Wake Counties. Other counties that use water for thermoelectric-power generation are those where fossil-fuel plants are located (fig. 21).

The water source for these plants was almost exclusively surface water. No ground water was used for the production of power, and only 0.45 Mgal/d was obtained from public suppliers (table 5).

The power generated by thermoelectric plants was approximately 73,000 gigawatt-hours (GWh). Fossil-fuel plants supplied roughly 65 percent of the power, and the remainder was produced by nuclear plants (figure 20B).

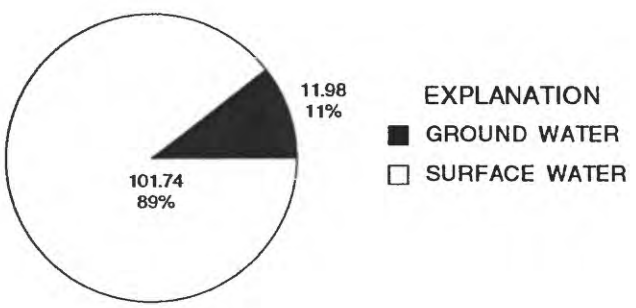

Figure 18. Source of water withdrawals for irrigation use in North Carolina, 1990 (in million gallons per day and percent of total).

Table 11. Irrigation water use, by county, in North Carolina, 1990
[Mgal/d, million gallons per day]

County	Withdrawals, in Mgal/d			Reclaimed sewage, in Mgal/d	Irrigated land by type, in thousand acres			Consumptive use, in Mgal/d
	Fresh water		Total					
	Ground	Surface			Spray	Flood	Total	
ALAMANCE	0.00	1.29	1.29	0.00	3.18	0.00	3.18	1.29
ALEXANDER	0.00	0.15	0.15	0.00	0.45	0.00	0.45	0.15
ALLEGHANY	0.00	0.33	0.33	0.00	0.35	0.00	0.35	0.33
ANSON	0.00	0.57	0.57	0.13	1.17	0.00	1.17	0.57
ASHE	0.00	0.39	0.39	0.00	0.07	0.00	0.07	0.39
AVERY	0.00	1.43	1.43	0.00	0.23	0.00	0.23	1.43
BEAUFORT	0.70	1.16	1.86	0.31	2.59	0.00	2.59	1.86
BERTIE	0.14	1.33	1.47	0.30	3.01	0.00	3.01	1.47
BLADEN	0.69	0.91	1.60	0.00	0.92	0.13	1.05	1.60
BRUNSWICK	0.00	0.42	0.42	0.07	0.08	0.00	0.08	0.42
BUNCOMBE	0.00	0.54	0.54	0.00	0.19	0.00	0.19	0.54
BURKE	0.00	0.78	0.78	0.00	0.15	0.00	0.15	0.78
CABARRUS	0.00	0.75	0.75	0.00	0.14	0.00	0.14	0.75
CALDWELL	0.00	0.48	0.48	0.00	0.25	0.00	0.25	0.48
CAMDEN	0.00	0.07	0.07	0.00	0.19	0.00	0.19	0.07
CARTERET	0.30	0.15	0.45	0.52	22.74	0.00	22.74	0.45
CASWELL	0.00	1.42	1.42	0.04	4.75	0.00	4.75	1.42
CATAWBA	0.01	0.16	0.17	0.00	0.13	0.00	0.13	0.17
CHATHAM	0.00	0.67	0.67	0.22	0.57	0.00	0.57	0.67
CHEROKEE	0.00	0.10	0.10	0.00	0.05	0.00	0.05	0.10
CHOWAN	0.00	0.14	0.14	0.00	0.33	0.00	0.33	0.14
CLAY	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.03
CLEVELAND	0.00	0.88	0.88	0.00	0.31	0.00	0.31	0.88
COLUMBUS	0.11	0.76	0.87	0.15	0.21	0.00	0.21	0.87
CRAVEN	0.44	2.02	2.46	0.35	2.28	0.00	2.28	2.46
CUMBERLAND	1.41	1.17	2.58	0.00	0.91	0.00	0.91	2.58
CURRITUCK	0.00	0.43	0.43	0.03	0.59	0.00	0.59	0.43
DARE	0.00	0.01	0.01	0.50	0.01	0.00	0.01	0.01
DAVIDSON	0.00	0.47	0.47	0.26	1.07	0.00	1.07	0.47
DAVIE	0.00	0.45	0.45	0.06	0.82	0.00	0.82	0.45
DUPLIN	0.00	0.60	0.60	1.91	0.81	0.00	0.81	0.60
DURHAM	0.13	1.60	1.73	0.13	1.66	0.00	1.66	1.73
EDGECOMBE	0.05	3.10	3.15	0.00	8.20	0.00	8.20	3.15
FORSYTH	0.00	0.24	0.24	0.00	0.40	0.00	0.40	0.24
FRANKLIN	0.00	1.32	1.32	0.05	0.98	0.00	0.98	1.32
GASTON	0.07	0.27	0.34	0.00	0.13	0.00	0.13	0.34
GATES	0.00	0.21	0.21	0.02	0.51	0.00	0.51	0.21
GRAHAM	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.01
GRANVILLE	0.01	1.83	1.84	0.00	6.13	0.00	6.13	1.84
GREENE	0.24	1.09	1.33	0.00	1.13	0.00	1.13	1.33
GUILFORD	0.01	2.01	2.02	0.09	4.25	0.00	4.25	2.02
HALIFAX	0.02	1.79	1.81	0.02	4.17	0.00	4.17	1.81
HARNETT	0.90	1.87	2.77	0.24	8.83	0.00	8.83	2.77
HAYWOOD	0.00	0.20	0.20	0.00	0.49	0.00	0.49	0.20
HENDERSON	0.02	0.48	0.50	0.16	0.45	0.00	0.45	0.50

Table 11. Irrigation water use, by county, in North Carolina, 1990--Continued
[Mgal/d, million gallons per day]

County	Withdrawals, in Mgal/d			Reclaimed sewage, in Mgal/d	Irrigated land by type, in thousand acres			Consumptive use, in Mgal/d
	Fresh water		Total					
	Ground	Surface			Spray	Flood	Total	
HERTFORD	0.01	1.51	1.52	0.81	2.96	0.00	2.96	1.52
HOKE	0.00	0.79	0.79	0.00	0.47	0.00	0.47	0.79
HYDE	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
IREDELL	0.01	0.53	0.54	0.62	1.17	0.00	1.17	0.54
JACKSON	0.00	1.61	1.61	0.00	0.68	0.00	0.68	1.61
JOHNSTON	0.00	1.85	1.85	0.20	4.27	0.00	4.27	1.85
JONES	0.00	0.66	0.66	0.00	2.01	0.00	2.01	0.66
LEE	0.00	0.69	0.69	0.00	2.20	0.00	2.20	0.69
LENOIR	0.10	0.19	0.29	0.00	0.69	0.00	0.69	0.29
LINCOLN	0.00	0.03	0.03	0.03	0.01	0.00	0.01	0.03
MCDOWELL	0.00	0.16	0.16	0.00	0.07	0.00	0.07	0.16
MACON	0.00	0.14	0.14	0.00	0.17	0.00	0.17	0.14
MADISON	0.00	0.30	0.30	0.00	0.62	0.00	0.62	0.30
MARTIN	0.00	0.61	0.61	0.00	1.10	0.00	1.10	0.61
MECKLENBURG	0.03	0.55	0.58	0.00	0.14	0.00	0.14	0.58
MITCHELL	0.00	0.10	0.10	0.00	0.03	0.00	0.03	0.10
MONTGOMERY	0.01	0.93	0.94	0.39	0.87	0.00	0.87	0.94
MOORE	1.02	14.59	15.61	0.00	5.15	0.00	5.15	15.61
NASH	0.00	3.08	3.08	0.09	9.77	0.00	9.77	3.08
NEW HANOVER	0.00	0.20	0.20	0.82	0.18	0.00	0.18	0.20
NORTHAMPTON	0.03	0.16	0.19	0.29	0.41	0.00	0.41	0.19
ONSLOW	0.02	0.07	0.09	0.02	0.13	0.00	0.13	0.09
ORANGE	0.08	0.74	0.82	0.03	0.86	0.02	0.88	0.82
PAMLICO	2.27	0.79	3.06	0.00	2.74	0.00	2.74	3.06
PASQUOTANK	0.29	0.03	0.32	0.00	0.81	0.00	0.81	0.32
PENDER	0.00	0.07	0.07	0.16	0.01	0.00	0.01	0.07
PERQUIMANS	0.00	0.08	0.08	0.08	0.18	0.00	0.18	0.08
PERSON	0.00	1.39	1.39	0.00	4.67	0.00	4.67	1.39
PITT	0.36	1.77	2.13	0.06	5.13	0.00	5.13	2.13
POLK	0.00	0.10	0.10	0.00	0.15	0.00	0.15	0.10
RANDOLPH	0.00	1.34	1.34	0.65	2.50	0.00	2.50	1.34
RICHMOND	0.00	2.19	2.19	0.00	3.64	0.00	3.64	2.19
ROBESON	0.11	0.63	0.74	5.07	1.65	0.00	1.65	0.74
ROCKINGHAM	0.00	2.21	2.21	0.00	7.06	0.00	7.06	2.21
ROWAN	0.00	0.56	0.56	0.01	1.12	0.00	1.12	0.56
RUTHERFORD	0.00	0.05	0.05	0.03	0.04	0.00	0.04	0.05
SAMPSON	0.11	2.50	2.61	0.38	8.38	0.00	8.38	2.61
SCOTLAND	0.28	0.50	0.78	0.04	1.21	0.00	1.21	0.78
STANLY	0.00	0.48	0.48	0.00	1.02	0.00	1.02	0.48
STOKES	0.00	0.05	0.05	0.03	0.09	0.00	0.09	0.05
SURRY	0.00	1.43	1.43	0.06	2.73	0.00	2.73	1.43
SWAIN	0.00	0.05	0.05	0.00	0.01	0.00	0.01	0.05
TRANSYLVANIA	0.00	0.13	0.13	0.00	0.03	0.00	0.03	0.13
TYRRELL	0.00	0.03	0.03	0.00	0.08	0.00	0.08	0.03
UNION	0.00	2.11	2.11	0.00	0.41	0.00	0.41	2.11

Table 11. Irrigation water use, by county, in North Carolina, 1990--Continued
[Mgal/d, million gallons per day]

County	Withdrawals, in Mgal/d			Reclaimed sewage, in Mgal/d	Irrigated land by type, in thousand acres			Consumptive use, in Mgal/d
	Fresh water		Total		Spray	Flood	Total	
	Ground	Surface						
VANCE	0.00	1.22	1.22	0.00	4.06	0.00	4.06	1.22
WAKE	0.51	10.25	10.76	0.92	5.54	0.00	5.54	10.76
WARREN	0.00	0.59	0.59	0.00	1.91	0.00	1.91	0.59
WASHINGTON	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
WATAUGA	0.00	0.25	0.25	0.00	0.10	0.00	0.10	0.25
WAYNE	0.47	1.18	1.65	0.33	1.19	0.00	1.19	1.65
WILKES	0.00	0.12	0.12	0.00	0.27	0.00	0.27	0.12
WILSON	1.02	2.56	3.58	0.09	3.41	0.00	3.41	3.58
YADKIN	0.00	1.31	1.31	0.00	4.24	0.00	4.24	1.31
YANCEY	0.00	0.20	0.20	0.00	0.03	0.00	0.03	0.20
TOTAL	11.98	101.74	113.72	16.79	184.26	0.15	184.41	113.72

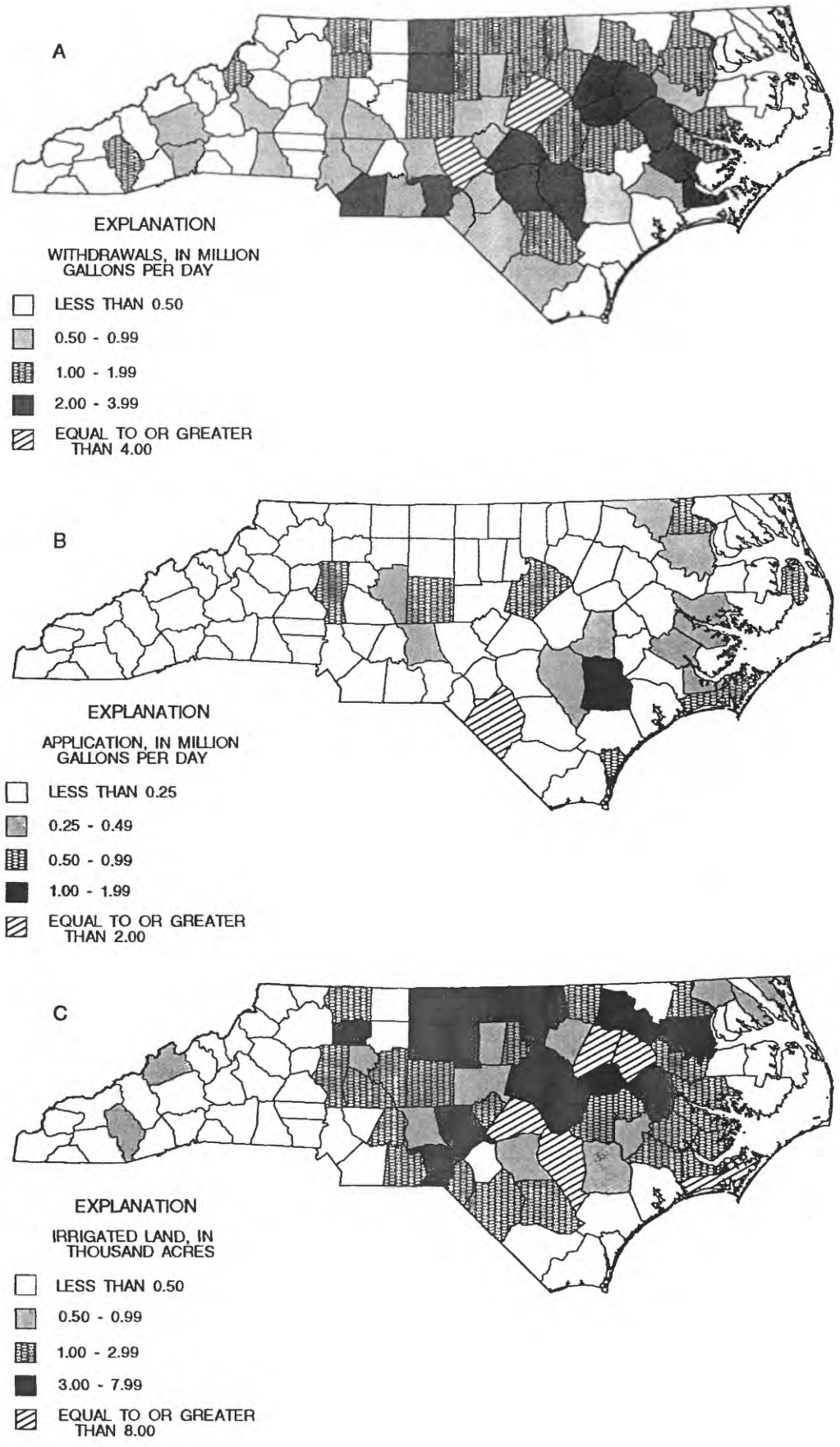

Figure 19. Irrigation water use by (A) freshwater withdrawals, (B) reclaimed wastewater applications, and (C) total acres, by county, in North Carolina, 1990.

Table 12. Thermoelectric-power generation water use, in million gallons per day, and power generated, in gigawatts per hour, by county, in North Carolina, 1990
[GWh, gigawatts per hour]

County	Self-supplied withdrawals	Deliveries from public supply	Total withdrawals and deliveries	Consumptive use	Power generated, in GWh
ALAMANCE	0.00	0.00	0.00	0.00	0.00
ALEXANDER	0.00	0.00	0.00	0.00	0.00
ALLEGHANY	0.00	0.00	0.00	0.00	0.00
ANSON	0.00	0.00	0.00	0.00	0.00
ASHE	0.00	0.00	0.00	0.00	0.00
AVERY	0.00	0.00	0.00	0.00	0.00
BEAUFORT	0.00	0.00	0.00	0.00	0.00
BERTIE	0.00	0.00	0.00	0.00	0.00
BLADEN	0.00	0.00	0.00	0.00	0.00
BRUNSWICK	1,598.98	0.29	1,599.27	0.00	8,371.15
BUNCOMBE	1.70	0.00	1.70	1.70	2,209.64
BURKE	0.00	0.00	0.00	0.00	0.00
CABARRUS	0.00	0.00	0.00	0.00	0.00
CALDWELL	0.00	0.00	0.00	0.00	0.00
CAMDEN	0.00	0.00	0.00	0.00	0.00
CARTERET	0.00	0.00	0.00	0.00	0.00
CASWELL	0.00	0.00	0.00	0.00	0.00
CATAWBA	730.05	0.00	730.05	0.00	9,574.00
CHATHAM	148.82	0.00	148.82	0.00	1,164.67
CHEROKEE	0.00	0.00	0.00	0.00	0.00
CHOWAN	0.00	0.00	0.00	0.00	0.00
CLAY	0.00	0.00	0.00	0.00	0.00
CLEVELAND	0.00	0.00	0.00	0.00	0.00
COLUMBUS	0.00	0.00	0.00	0.00	0.00
CRAVEN	0.00	0.00	0.00	0.00	0.00
CUMBERLAND	0.00	0.16	0.16	0.03	159.05
CURRITUCK	0.00	0.00	0.00	0.00	0.00
DARE	0.00	0.00	0.00	0.00	0.00
DAVIDSON	0.00	0.00	0.00	0.00	0.00
DAVIE	0.00	0.00	0.00	0.00	0.00
DUPLIN	0.00	0.00	0.00	0.00	0.00
DURHAM	0.00	0.00	0.00	0.00	0.00
EDGECOMBE	0.00	0.00	0.00	0.00	0.00
FORSYTH	0.00	0.00	0.00	0.00	0.00
FRANKLIN	0.00	0.00	0.00	0.00	0.00
GASTON	288.02	0.00	288.02	0.00	3,123.00
GATES	0.00	0.00	0.00	0.00	0.00
GRAHAM	0.00	0.00	0.00	0.00	0.00
GRANVILLE	0.00	0.00	0.00	0.00	0.00
GREENE	0.00	0.00	0.00	0.00	0.00
GUILFORD	0.00	0.00	0.00	0.00	0.00
HALIFAX	0.00	0.00	0.00	0.00	0.00
HARNETT	0.00	0.00	0.00	0.00	0.00
HAYWOOD	0.00	0.00	0.00	0.00	0.00
HENDERSON	0.00	0.00	0.00	0.00	0.00

Table 12. Thermoelectric-power generation water use, in million gallons per day, and power generated, in gigawatts per hour, by county, in North Carolina, 1990--Continued
[GWh, gigawatts per hour]

County	Self-supplied withdrawals	Deliveries from public supply	Total withdrawals and deliveries	Consumptive use	Power generated, in GWh
HERTFORD	0.00	0.00	0.00	0.00	0.00
HOKE	0.00	0.00	0.00	0.00	0.00
HYDE	0.00	0.00	0.00	0.00	0.00
IREDELL	0.00	0.00	0.00	0.00	0.00
JACKSON	0.00	0.00	0.00	0.00	0.00
JOHNSTON	0.00	0.00	0.00	0.00	0.00
JONES	0.00	0.00	0.00	0.00	0.00
LEE	0.00	0.00	0.00	0.00	0.00
LENOIR	0.00	0.00	0.00	0.00	0.00
LINCOLN	0.00	0.00	0.00	0.00	0.00
MCDOWELL	0.00	0.00	0.00	0.00	0.00
MACON	0.00	0.00	0.00	0.00	0.00
MADISON	0.00	0.00	0.00	0.00	0.00
MARTIN	0.00	0.00	0.00	0.00	0.00
MECKLENBURG	2,324.51	0.00	2,324.51	0.00	11,195.17
MITCHELL	0.00	0.00	0.00	0.00	0.00
MONTGOMERY	0.00	0.00	0.00	0.00	0.00
MOORE	0.00	0.00	0.00	0.00	0.00
NASH	0.00	0.00	0.00	0.00	0.00
NEW HANOVER	1.04	0.00	1.04	1.04	1,119.26
NORTHAMPTON	0.00	0.00	0.00	0.00	0.00
ONSLOW	0.00	0.00	0.00	0.00	0.00
ORANGE	0.00	0.00	0.00	0.00	0.00
PAMLICO	0.00	0.00	0.00	0.00	0.00
PASQUOTANK	0.00	0.00	0.00	0.00	0.00
PENDER	0.00	0.00	0.00	0.00	0.00
PERQUIMANS	0.00	0.00	0.00	0.00	0.00
PERSON	1,160.31	0.00	1,160.31	11.30	14,613.08
PITT	0.00	0.00	0.00	0.00	0.00
POLK	0.00	0.00	0.00	0.00	0.00
RANDOLPH	0.00	0.00	0.00	0.00	0.00
RICHMOND	0.00	0.00	0.00	0.00	0.00
ROBESON	0.30	0.00	0.30	0.30	270.66
ROCKINGHAM	70.29	0.00	70.29	0.00	606.00
ROWAN	29.48	0.00	29.48	0.00	676.00
RUTHERFORD	9.93	0.00	9.93	9.93	1,989.00
SAMPSON	0.00	0.00	0.00	0.00	0.00
SCOTLAND	0.00	0.00	0.00	0.00	0.00
STANLY	0.00	0.00	0.00	0.00	0.00
STOKES	813.42	0.00	813.42	0.00	10,747.00
SURRY	0.00	0.00	0.00	0.00	0.00
SWAIN	0.00	0.00	0.00	0.00	0.00
TRANSYLVANIA	0.00	0.00	0.00	0.00	0.00
TYRRELL	0.00	0.00	0.00	0.00	0.00
UNION	0.00	0.00	0.00	0.00	0.00

Table 12. Thermoelectric-power generation water use, in million gallons per day, and power generated, in gigawatts per hour, by county, in North Carolina, 1990--Continued
[GWh, gigawatts per hour]

County	Self-supplied withdrawals	Deliveries from public supply	Total withdrawals and deliveries	Consumptive use	Power generated, in GWh
VANCE	0.00	0.00	0.00	0.00	0.00
WAKE	32.45	0.00	32.45	17.45	6,339.00
WARREN	0.00	0.00	0.00	0.00	0.00
WASHINGTON	0.00	0.00	0.00	0.00	0.00
WATAUGA	0.00	0.00	0.00	0.00	0.00
WAYNE	0.79	0.00	0.79	0.79	845.18
WILKES	0.00	0.00	0.00	0.00	0.00
WILSON	0.00	0.00	0.00	0.00	0.00
YADKIN	0.00	0.00	0.00	0.00	0.00
YANCEY	0.00	0.00	0.00	0.00	0.00
TOTAL	7,210.09	0.45	7,210.54	42.54	73,001.86

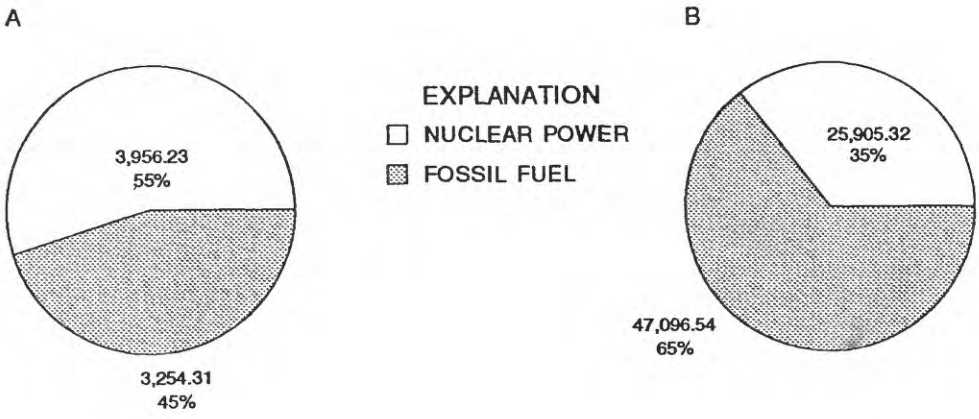

Figure 20. (A) Water withdrawals by type of thermoelectric-power source, in milion gallons per day and percent of total, and (B) power generation by type of thermoelectric-power source, in gigawatt-hours and percent of total, in North Carolina, 1990.

Instream Water Use by Category

In this report, instream water use is limited to the reporting of water that is used for the generation of hydroelectric power. These data were collected directly from the 40 hydroelectric-power generation plants in North Carolina.

Hydroelectric-Power Generation

Hydroelectric-power generation plants require large amounts of water to drive the turbines for the generation of electricity. The total water used for hydroelectric-power production in 1990 was about 66,900 Mgal/d. This is more than seven times the amount of all offstream water use in the State. The counties with hydroelectric plants are located mostly in the western part of the State, with some notable exceptions (fig. 22). Hydroelectric plants in Halifax and Montgomery Counties, located in the Coastal Plain and Piedmont Provinces, respectively, used a combined 37,243.54 Mgal/d of water to produce electricity. This is 56 percent of all water used by the 40 hydroelectric plants in the State (table 13). Power generated by hydroelectric plants totaled about 7,074 GWh.

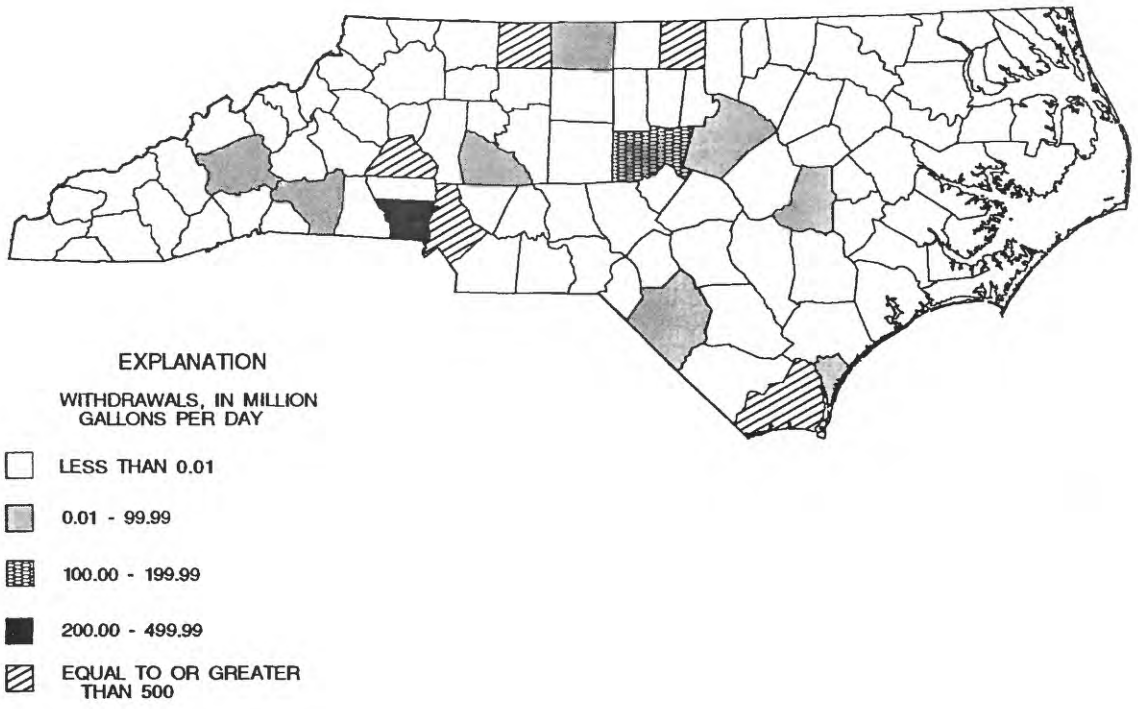

Figure 21. Total water withdrawals for thermoelectric-power generation in North Carolina, 1990.

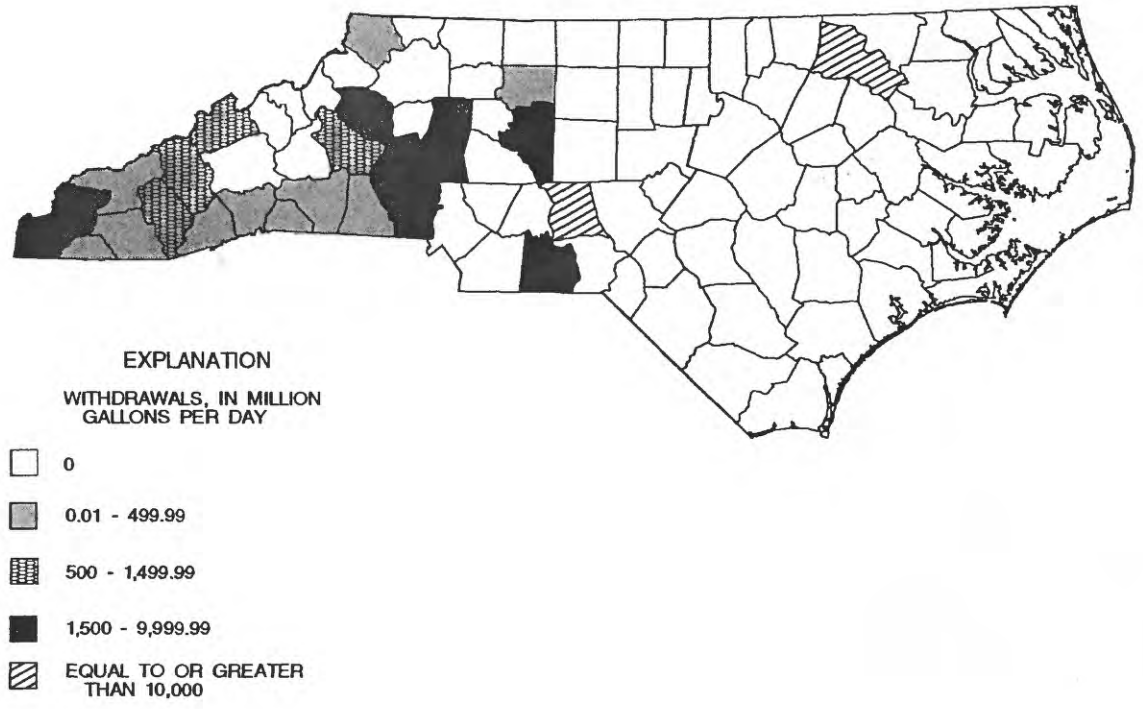

Figure 22. Total instream water use for hydroelectric-power generation in North Carolina, 1990.

Table 13. Hydroelectric-power generation water use, by county, in North Carolina, 1990
[Mgal/d, million gallons per day; GWh, gigawatts per hour]

County	Water use, Mgal/d	Power generated, GWh
ALAMANCE	0.00	0.00
ALEXANDER	0.00	0.00
ALLEGHANY	0.00	0.00
ANSON	5,334.44	149.96
ASHE	13.24	0.35
AVERY	0.00	0.00
BEAUFORT	0.00	0.00
BERTIE	0.00	0.00
BLADEN	0.00	0.00
BRUNSWICK	0.00	0.00
BUNCOMBE	0.00	0.00
BURKE	590.88	67.88
CABARRUS	0.00	0.00
CALDWELL	1,508.38	83.11
CAMDEN	0.00	0.00
CARTERET	0.00	0.00
CASWELL	0.00	0.00
CATAWBA	1,730.00	138.18
CHATHAM	0.00	0.00
CHEROKEE	2,408.23	403.95
CHOWAN	0.00	0.00
CLAY	375.97	30.02
CLEVELAND	61.65	1.31
COLUMBUS	0.00	0.00
CRAVEN	0.00	0.00
CUMBERLAND	0.00	0.00
CURRITUCK	0.00	0.00
DARE	0.00	0.00
DAVIDSON	4,263.51	189.96
DAVIE	0.00	0.00
DUPLIN	0.00	0.00
DURHAM	0.00	0.00
EDGECOMBE	0.00	0.00
FORSYTH	468.00	4.30
FRANKLIN	0.00	0.00
GASTON	2,308.66	160.08
GATES	0.00	0.00
GRAHAM	3,239.08	1,490.78
GRANVILLE	0.00	0.00
GREENE	0.00	0.00
GUILFORD	0.00	0.00
HALIFAX	19,465.17	896.52
HARNETT	0.00	0.00
HAYWOOD	602.76	445.67
HENDERSON	0.90	0.10
HERTFORD	0.00	0.00
HOKE	0.00	0.00
HYDE	0.00	0.00
IREDELL	1,711.80	115.66
JACKSON	1,105.55	507.88
JOHNSTON	0.00	0.00
JONES	0.00	0.00
LEE	0.00	0.00
LENOIR	0.00	0.00
LINCOLN	2,119.99	229.96
MCDOWELL	0.00	0.00
MACON	287.48	268.94
MADISON	862.83	21.56
MARTIN	0.00	0.00
MECKLENBURG	0.00	0.00
MITCHELL	0.00	0.00
MONTGOMERY	17,778.37	1,328.59
MOORE	0.00	0.00
NASH	0.00	0.00
NEW HANOVER	0.00	0.00
NORTHAMPTON	0.00	0.00
ONSLOW	0.00	0.00
ORANGE	0.00	0.00
PAMLICO	0.00	0.00
PASQUOTANK	0.00	0.00
PENDER	0.00	0.00
PERQUIMANS	0.00	0.00
PERSON	0.00	0.00
PITT	0.00	0.00
POLK	214.63	16.34
RANDOLPH	0.00	0.00
RICHMOND	0.00	0.00
ROBESON	0.00	0.00
ROCKINGHAM	0.00	0.00
ROWAN	0.00	0.00
RUTHERFORD	112.83	11.25
SAMPSON	0.00	0.00
SCOTLAND	0.00	0.00
STANLY	0.00	0.00
STOKES	0.00	0.00
SURRY	0.00	0.00
SWAIN	257.47	4.96
TRANSYLVANIA	54.08	506.80
TYRRELL	0.00	0.00
UNION	0.00	0.00

Table 13. Hydroelectric-power generation water use, by county, in North Carolina, 1990--Continued
[Mgal/d, million gallons per day; GWh, gigawatts per hour]

County	Water use, Mgal/d	Power generated, GWh
VANCE	0.00	0.00
WAKE	0.00	0.00
WARREN	0.00	0.00
WASHINGTON	0.00	0.00
WATAUGA	0.00	0.00
WAYNE	0.00	0.00
WILKES	0.00	0.00
WILSON	0.00	0.00
YADKIN	0.00	0.00
YANCEY	0.00	0.00
TOTAL	66,875.90	7,074.11

SUMMARY

In a cooperative effort between the U.S. Geological Survey and the Division of Water Resources of the North Carolina Department of Environment, Health, and Natural Resources, estimates of 1990 water use in North Carolina were collected for several categories. Data also were compiled from a number of other Federal, State, and private sources for the offstream water-use categories of public supply, domestic, commercial, industrial, mining, livestock, irrigation, and thermoelectric-power generation. Data for instream water use for hydroelectric-power generation also were collected.

In 1990, it was estimated that 8,940 million gallons of water per day were withdrawn from surface- and ground-water sources in the State. Of this total, 95 percent came from surface-water sources. Thermoelectric-power generation accounted for 81 percent of the total water withdrawn in the State, all of which was withdrawn from surface-water sources. Public-supply facilities withdrew about 805 Mgal/d, 83 percent of which was from surface water. Domestic users withdrew about 103 Mgal/d, all from ground water. Commercial establishments withdrew only about 17 Mgal/d, all from ground water. Industry withdrew about 396 Mgal/d; 84 percent was from surface-water sources. Mining operations withdrew about 95.5 Mgal/d, 29 percent of which was from surface water. Water use for livestock was about 201 Mgal/d, 82 percent of which was from surface water. Irrigation uses accounted for 114 Mgal/d; 89 percent was from surface water. The instream use for hydroelectric-power generation amounted to about 66,900 Mgal/d.

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GLOSSARY

Acres irrigated--The total number of acres of crops that were irrigated during the year.

Animal specialties--Water use associated with the production of fish in captivity except fish hatcheries, fur-bearing animals in captivity, horses, rabbits, and pets.

Commercial water use--Water for motels, hotels, restaurants, office buildings, and other commercial facilities and institutions, both civilian and military. The water may be obtained from a public-supply facility or may be self-supplied. See also public supply and self-supplied water.

Community water system--A water supplier that furnishes water for at least 25 people, or that has a minimum of 15 hookups.

Consumptive use--That part of water withdrawn that is evaporated, transpired, incorporated into products or crops, consumed by humans or livestock, or otherwise removed from the immediate water environment. Also referred to as water consumed.

Cooling water--Water used for cooling purposes, such as of condensers and nuclear reactors.

Delivery--The amount of water delivered to the point of use.

Domestic population served--The total number of people served by the public suppliers during the calendar year.

Domestic water use--Water used for household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens. Also called residential water use. The water may be obtained from a public-supply facility or may be self-supplied. See also public supply and self-supplied water.

Flood irrigation--Artificial application of water by flood techniques to lands to assist in the growing of crops and pastures or to maintain vegetative growth in recreational lands.

Fossil-fuel power--Electrical power generated by using fossil-fuel (coal, oil, or natural gas) energy.

Freshwater--Water that contains less than 1,000 milligrams per liter (mg/L) of dissolved solids; generally, more than 500 mg/L of dissolved solids is undesirable for drinking and many industrial uses.

Gigawatt-hour (GWh)--One billion watt-hours.

Ground water--Generally all subsurface water as distinct from surface water; specifically, that part of the subsurface water in the saturated zone (a zone in which all voids are filled with water) where the water is under pressure greater than atmospheric.

Hydroelectric-power generation water use--The use of water in the generation of electricity at plants where the turbine generators are driven by falling water; an instream use.

Industrial water use--Water used for industrial purposes, such as fabrication, processing, washing, and cooling, and includes such industries as steel, chemical and allied products, paper and allied products, and mining and petroleum refining. The water may be obtained from a public-supply facility or may be self-supplied. See also public supply and self-supplied water.

Instream use--Water use taking place within the stream channel for such purposes as hydroelectric-power generation, navigation, water-quality improvement, fish propagation, and recreation. Sometimes called nonwithdrawal use or in-channel use.

Irrigation water use--Artificial application of water to lands to assist in the growing of crops and pastures or to maintain vegetative growth in commercial nurseries and recreational lands, such as parks and golf courses.

Livestock water use--Water for stock watering, feed lots, dairy operations, fish farming, and other on-farm needs. Livestock as used here includes cattle, sheep, goats, hogs, and poultry. Also included are such animal specialties as horses, rabbits, bees, pets, fur-bearing animals in captivity, and fish in captivity.

Million gallons per day (Mgal/d)--A rate of flow of water.

Mining water use--Water use for the extraction of minerals occurring naturally, including solids, such as coal, clay, and ores; liquids, such as crude petroleum; and gases, such as natural gas. Also includes uses associated with quarrying for rock aggregates, such as sand and gravel, and well operations (dewatering),

milling (crushing, screening, washing, floatation, and other), and other preparations customarily done at the mine site or as part of a mining activity.

Noncommunity water system--A water supplier that furnishes water for less than 25 people and has less than 15 hookups.

Nuclear power--Electrical power generated using nuclear energy.

Offstream use--Water withdrawn and diverted from a ground- or surface-water source for public supply, domestic, commercial, industry, irrigation, livestock, thermoelectric-power generation, and other uses. Sometimes called off-channel use or withdrawal use.

Per capita use--The average amount of water used per person within a given unit area during a standard time period, generally per day.

Per capita withdrawals--The average amount of water withdrawn per person within a given unit area during a standard time period, generally per day.

Public supply--Water withdrawn by public and private water suppliers and delivered to groups of users. Public suppliers provide water for a variety of uses, such as domestic, commercial, thermoelectric power, industrial, and public water use. See also commercial water use, domestic water use, industrial water use, and public water use.

Public use and losses--The use of water for municipal functions, such as fire fighting, street cleaning, and recreation, and losses resulting from the transfer of water and conveyance losses associated with leaky pipes in the distribution systems.

Public water use--Water supplied from a public supply and used for such purposes as firefighting, street washing, and municipal parks and swimming pools. See also public supply.

Reclaimed sewage--Wastewater-treatment plant effluent that has been diverted or intercepted for reuse before it reaches a natural waterway or aquifer.

Saline water--Water that contains more than 1,000 mg/L of dissolved solids.

Self-supplied water--Water withdrawn from a ground- or surface-water source by a user rather than being obtained from a public-supply facility.

Spray irrigation--Artificial application of water by spray techniques to lands to assist in the growing of crops and pastures or to maintain vegetative growth in recreational lands.

Stock--Water use associated with the production of cattle, sheep, goats, hogs, and poultry. See also livestock water use.

Surface water--An open body of water, such as a stream or a lake.

Thermoelectric-power generation water use--Water used in the process of the generation of thermoelectric power. The water may be obtained from a public-supply facility or may be self-supplied. See also public supply and self-supplied water.

Watt-hour (Wh)--An electrical energy unit of measure equal to one watt of power supplied to or taken from an electrical circuit continuously for one hour.

Withdrawal--The amount of water withdrawn from a water source (ground or surface, fresh or saline). This is equivalent to "intake," "water diversion," or "pumpage," terms commonly used by industry, and for irrigation, and public supply, respectively. See also offstream use and self-supplied water.

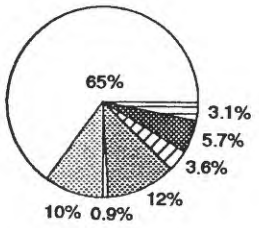
APPENDIX

ALAMANCE COUNTY

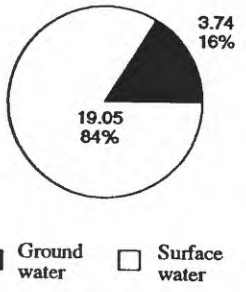
Population: 108,210
Acres irrigated: 3,180

Population served by public supply: 66,990
Hydroelectric power water use: 0 Mgal/d

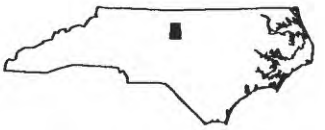
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

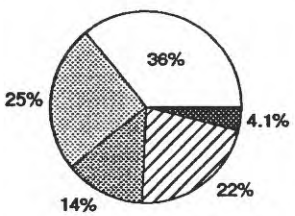
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.19	2.27	0.20	0.06	0.71	0	0.31	0
Surface water	14.65	0	0	2.60	0.12	1.29	0.39	0
Total	14.84	2.27	0.20	2.66	0.83	1.29	0.70	0

ALEXANDER COUNTY

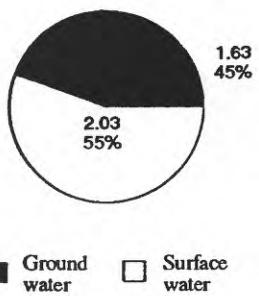
Population: 27,540
Acres irrigated: 450

Population served by public supply: 10,930
Hydroelectric power water use: 0 Mgal/d

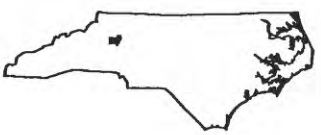
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

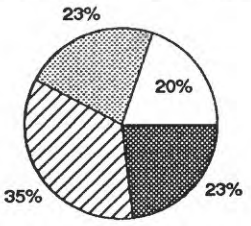
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0	0.91	0	0.05	0.67	0	0	0
Surface water	1.31	0	0	0.45	0.12	0.15	0	0
Total	1.31	0.91	0	0.50	0.79	0.15	0	0

ALLEGHANY COUNTY

Population: 9,590
Acres irrigated: 350

Population served by public supply: 3,830
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



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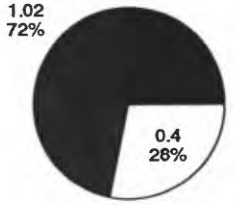
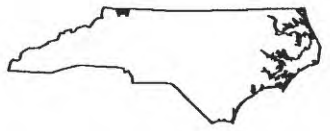


Ground water ■ Surface water □

County location map



Self-supplied withdrawals, in million gallons per day

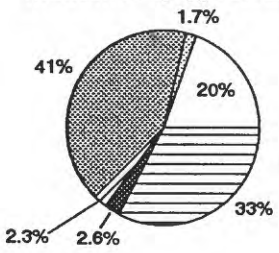
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.28	0.32	0	0	0.42	0	0	0
Surface water	0	0	0	0	0.07	0.33	0	0
Total	0.28	0.32	0	0	0.49	0.33	0	0

ANSON COUNTY

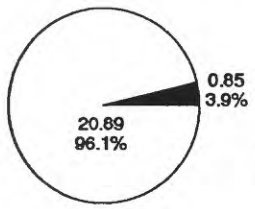
Population: 23,470
Acres irrigated: 1,170

Population served by public supply: 16,600
Hydroelectric power water use: 5,334.44 Mgal/d

Withdrawals by type of use

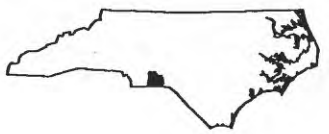


Withdrawals by source



Ground water ■ Surface water □

County location map



Self-supplied withdrawals, in million gallons per day

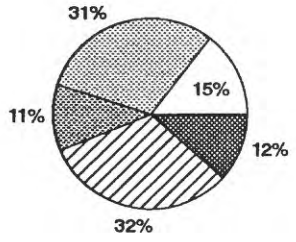
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.04	0.38	0	0.01	0.42	0	0	0
Surface water	4.20	0	0	8.96	0.07	0.57	7.09	0
Total	4.24	0.38	0	8.97	0.49	0.57	7.09	0

ASHE COUNTY

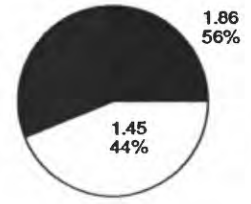
Population: 22,210
Acres irrigated: 70

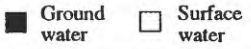
Population served by public supply: 3,770
Hydroelectric power water use: 13.24 Mgal/d

Withdrawals by type of use

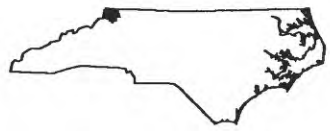


Withdrawals by source





County location map



Self-supplied withdrawals, in million gallons per day

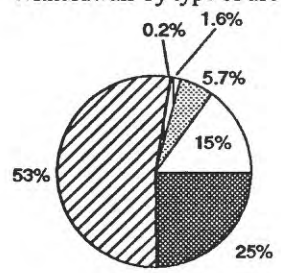
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.48	1.01	0	0.01	0.36	0	0	0
Surface water	0	0	0	0.36	0.70	0.39	0	0
Total	0.48	1.01	0	0.37	1.06	0.39	0	0

AVERY COUNTY

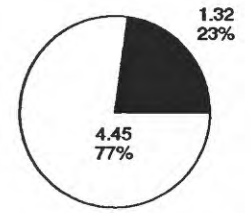
Population: 14,870
Acres irrigated: 230

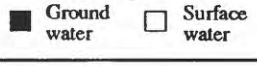
Population served by public supply: 8,790
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use

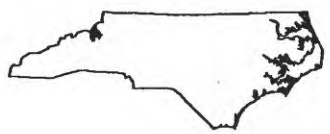


Withdrawals by source





County location map



Self-supplied withdrawals, in million gallons per day

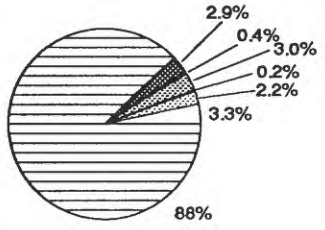
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.87	0.33	0.09	0.01	0.02	0	0	0
Surface water	0	0	0	0	3.02	1.43	0	0
Total	0.87	0.33	0.09	0.01	3.04	1.43	0	0

BEAUFORT COUNTY

Population: 42,280
Acres irrigated: 2,590

Population served by public supply: 16,970
Hydroelectric power water use: 0 Mgal/d

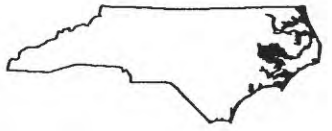
Withdrawals by type of use



Withdrawals by source

Ground water Surface water

County location map



Self-supplied withdrawals, in million gallons per day

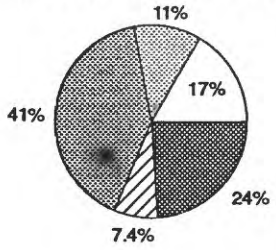
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.96	1.39	0.14	1.96	0.13	0.70	56.80	0
Surface water	1.17	0	0	0	0.16	1.16	0	0
Total	2.13	1.39	0.14	1.96	0.29	1.86	56.80	0

BERTIE COUNTY

Population: 20,390
Acres irrigated: 3,010

Population served by public supply: 7,750
Hydroelectric power water use: 0 Mgal/d

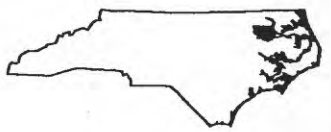
Withdrawals by type of use



Withdrawals by source

Ground water Surface water

County location map



Self-supplied withdrawals, in million gallons per day

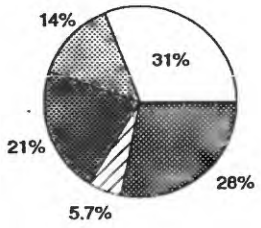
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	1.01	0.70	0	2.48	0.38	0.14	0	0
Surface water	0	0	0	0.01	0.07	1.33	0	0
Total	1.01	0.70	0	2.49	0.45	1.47	0	0

BLADEN COUNTY

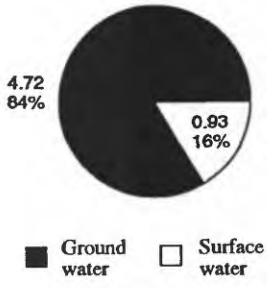
Population: 28,660
Acres irrigated: 1,050

Population served by public supply: 14,440
Hydroelectric power water use: 0 Mgal/d

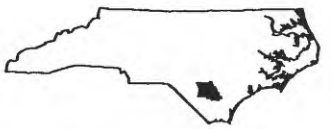
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

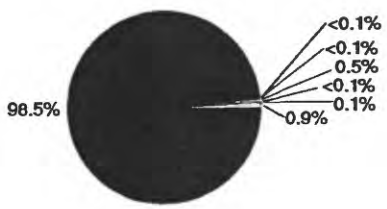
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	1.75	0.78	0	1.20	0.30	0.69	0	0
Surface water	0	0	0	0	0.02	0.91	0	0
Total	1.75	0.78	0	1.20	0.32	1.60	0	0

BRUNSWICK COUNTY

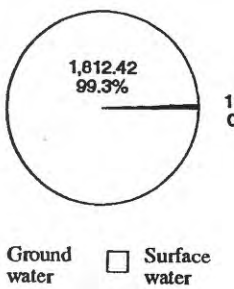
Population: 50,990
Acres irrigated: 80

Population served by public supply: 26,370
Hydroelectric power water use: 0 Mgal/d

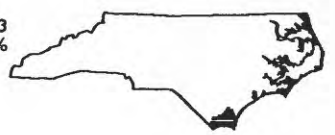
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

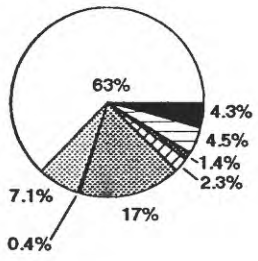
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	9.02	1.35	0.51	0.08	0.07	0	0	0
Surface water	5.20	0	0	7.80	0.02	0.42	0	1,598.98
Total	14.22	1.35	0.51	7.88	0.09	0.42	0	1,598.98

BUNCOMBE COUNTY

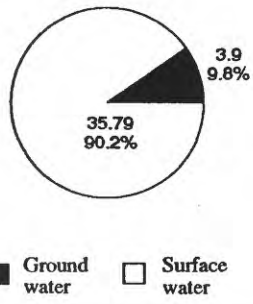
Population: 174,820
Acres irrigated: 190

Population served by public supply: 123,800
Hydroelectric power water use: 0 Mgal/d

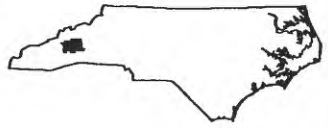
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

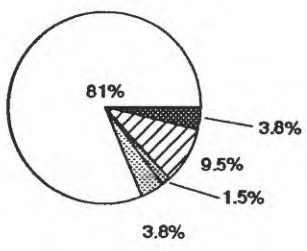
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.33	2.81	0.17	0.25	0.34	0	0	0
Surface water	24.61	0	0	6.57	0.57	0.54	1.80	1.70
Total	24.94	2.81	0.17	6.82	0.91	0.54	1.80	1.70

BURKE COUNTY

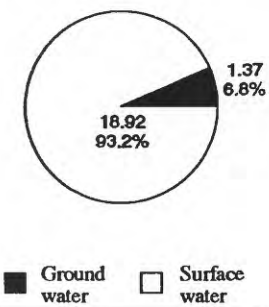
Population: 75,740
Acres irrigated: 150

Population served by public supply: 61,490
Hydroelectric power water use: 590.88 Mgal/d

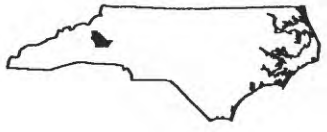
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

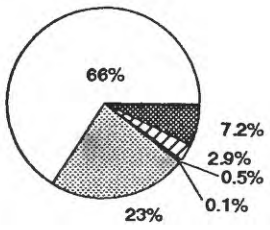
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.13	0.78	0	0.31	0.15	0	0	0
Surface water	16.37	0	0	0	1.77	0.78	0	0
Total	16.50	0.78	0	0.31	1.92	0.78	0	0

CABARRUS COUNTY

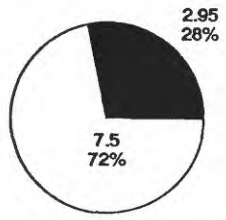
Population: 98,940
Acres irrigated: 140

Population served by public supply: 54,740
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use

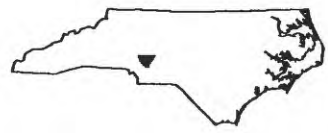


Withdrawals by source



Ground water Surface water

County location map



Self-supplied withdrawals, in million gallons per day

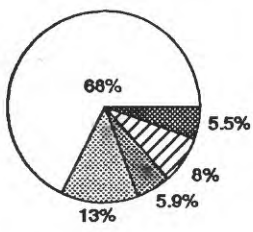
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.20	2.43	0.01	0.05	0.26	0	0	0
Surface water	6.71	0	0	0	0.04	0.75	0	0
Total	6.91	2.43	0.01	0.05	0.30	0.75	0	0

CALDWELL COUNTY

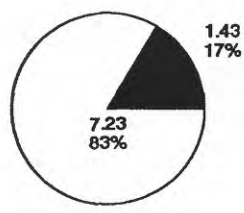
Population: 70,710
Acres irrigated: 250

Population served by public supply: 50,310
Hydroelectric power water use: 1,508.38 Mgal/d

Withdrawals by type of use

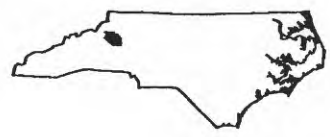


Withdrawals by source



Ground water Surface water

County location map



Self-supplied withdrawals, in million gallons per day

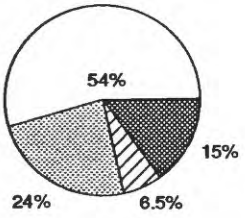
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.10	1.12	0	0.05	0.16	0	0	0
Surface water	5.76	0	0	0.46	0.53	0.48	0	0
Total	5.86	1.12	0	0.51	0.69	0.48	0	0

CAMDEN COUNTY

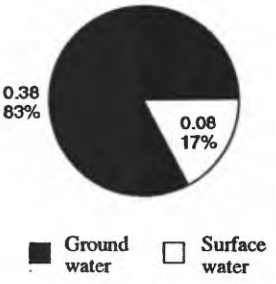
Population: 5,900
Acres irrigated: 190

Population served by public supply: 3,950
Hydroelectric power water use: 0 Mgal/d

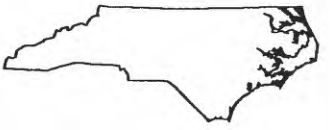
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

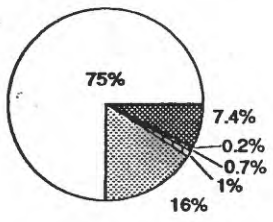
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.25	0.11	0	0	0.02	0	0	0
Surface water	0	0	0	0	0.01	0.07	0	0
Total	0.25	0.11	0	0	0.03	0.07	0	0

CARTERET COUNTY

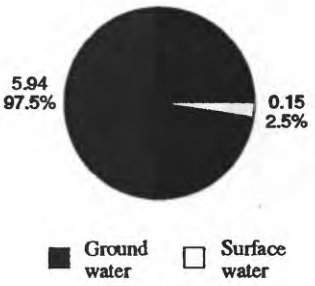
Population: 52,560
Acres irrigated: 22,740

Population served by public supply: 34,850
Hydroelectric power water use: 0 Mgal/d

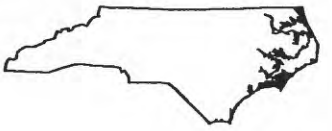
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

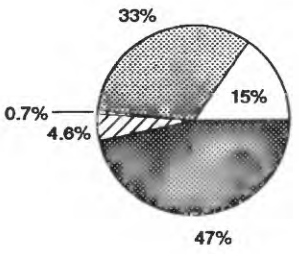
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	4.56	0.97	0.06	0.04	0.01	0.30	0	0
Surface water	0	0	0	0	0	0.15	0	0
Total	4.56	0.97	0.06	0.04	0.01	0.45	0	0

CASWELL COUNTY

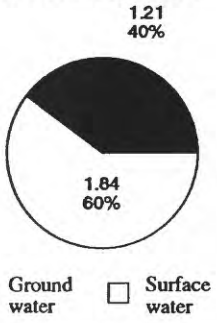
Population: 20,690
Acres irrigated: 4,750

Population served by public supply: 2,460
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Self-supplied withdrawals, in million gallons per day

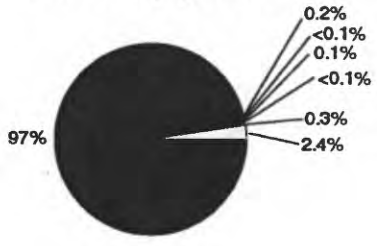
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.07	1.00	0.02	0	0.12	0	0	0
Surface water	0.40	0	0	0	0.02	1.42	0	0
Total	0.47	1.00	0.02	0	0.14	1.42	0	0

CATAWBA COUNTY

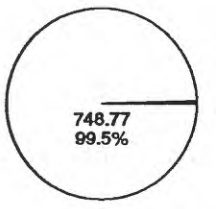
Population: 118,410
Acres irrigated: 130

Population served by public supply: 72,800
Hydroelectric power water use: 1,730 Mgal/d

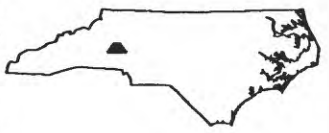
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

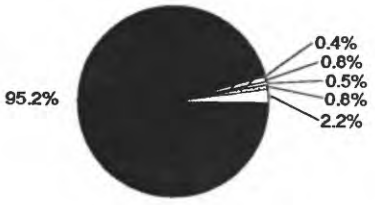
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	1.11	2.51	0	0.02	0.33	0.01	0	0
Surface water	16.82	0	0	0	0.06	0.16	1.68	730.05
Total	17.93	2.51	0	0.02	0.39	0.17	1.68	730.05

CHATHAM COUNTY

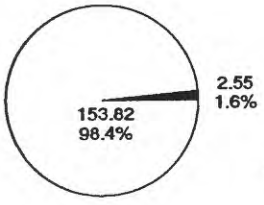
Population: 38,760
Acres irrigated: 570

Population served by public supply: 16,430
Hydroelectric power water use: 0 Mgal/d

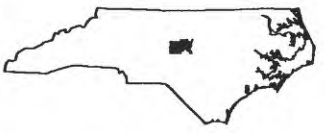
Withdrawals by type of use



Withdrawals by source



County location map



Ground water Surface water

Self-supplied withdrawals, in million gallons per day

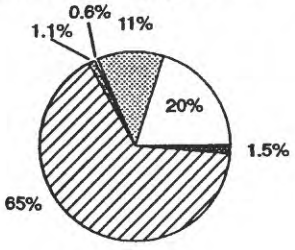
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.18	1.23	0	0.01	1.13	0	0	0
Surface water	3.29	0	0	0.85	0.19	0.67	0	148.82
Total	3.47	1.23	0	0.86	1.32	0.67	0	148.82

CHEROKEE COUNTY

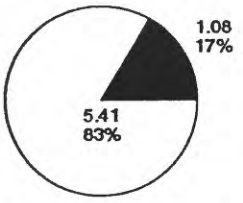
Population: 20,170
Acres irrigated: 50

Population served by public supply: 6,860
Hydroelectric power water use: 2,408.23 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Ground water Surface water

Self-supplied withdrawals, in million gallons per day

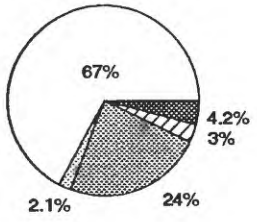
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.14	0.73	0.04	0.05	0.12	0	0	0
Surface water	1.16	0	0	0.02	4.13	0.10	0	0
Total	1.30	0.73	0.04	0.07	4.25	0.10	0	0

CHOWAN COUNTY

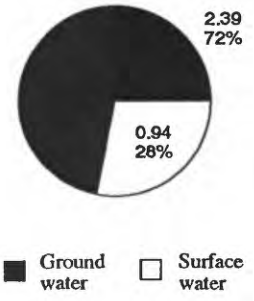
Population: 13,510
Acres irrigated: 330

Population served by public supply: 12,210
Hydroelectric power water use: 0 Mgal/d

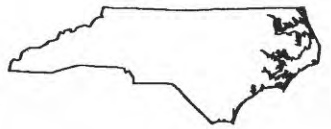
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

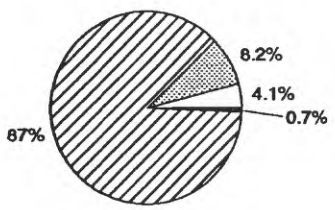
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	2.23	0.07	0	0	0.09	0	0	0
Surface water	0	0	0	0.79	0.01	0.14	0	0
Total	2.23	0.07	0	0.79	0.10	0.14	0	0

CLAY COUNTY

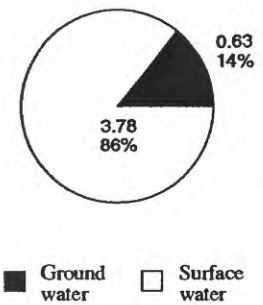
Population: 7,160
Acres irrigated: 0

Population served by public supply: 550
Hydroelectric power water use: 375.97 Mgal/d

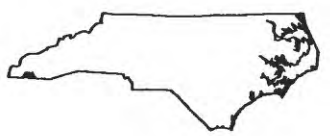
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

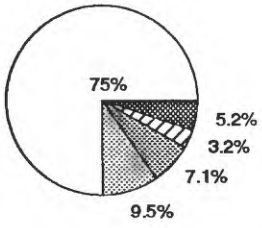
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.18	0.36	0	0	0.09	0	0	0
Surface water	0	0	0	0	3.75	0.03	0	0
Total	0.18	0.36	0	0	3.84	0.03	0	0

CLEVELAND COUNTY

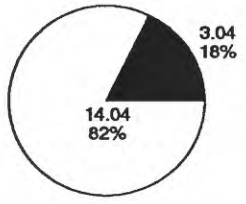
Population: 84,710
Acres irrigated: 310

Population served by public supply: 55,330
Hydroelectric power water use: 61.65 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Ground water ■ Surface water □

Self-supplied withdrawals, in million gallons per day

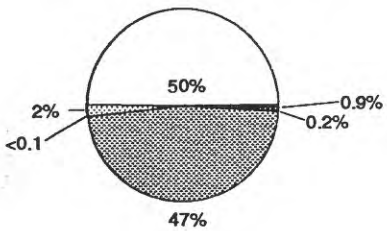
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.54	1.62	0	0.41	0.47	0	0	0
Surface water	12.29	0	0	0.80	0.07	0.88	0	0
Total	12.83	1.62	0	1.21	0.54	0.88	0	0

COLUMBUS COUNTY

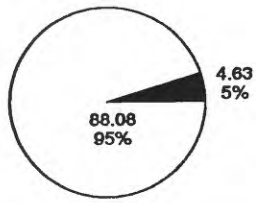
Population: 49,590
Acres irrigated: 210

Population served by public supply: 15,720
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Ground water ■ Surface water □

Self-supplied withdrawals, in million gallons per day

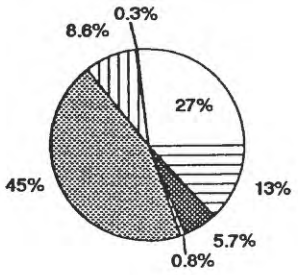
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	2.18	1.86	0.01	0.30	0.17	0.11	0	0
Surface water	43.85	0	0	43.46	0.01	0.76	0	0
Total	46.03	1.86	0.01	43.76	0.18	0.87	0	0

CRAVEN COUNTY

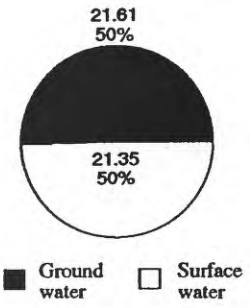
Population: 81,610
Acres irrigated: 2,280

Population served by public supply: 79,300
Hydroelectric power water use: 0 Mgal/d

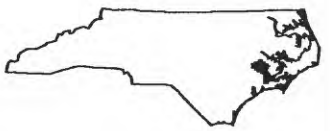
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

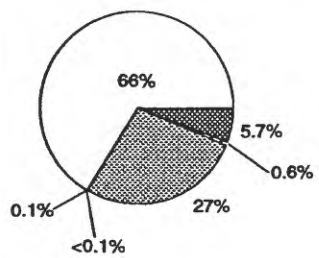
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	11.49	0.13	3.69	0.17	0.29	0.44	5.40	0
Surface water	0	0	0	19.00	0.04	2.02	0.29	0
Total	11.49	0.13	3.69	19.17	0.33	2.46	5.69	0

CUMBERLAND COUNTY

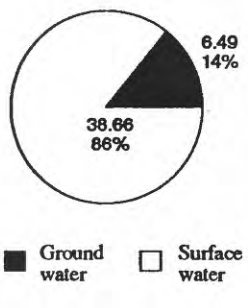
Population: 274,560
Acres irrigated: 910

Population served by public supply: 273,820
Hydroelectric power water use: 0 Mgal/d

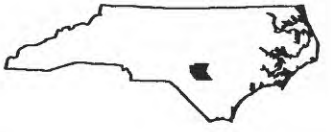
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

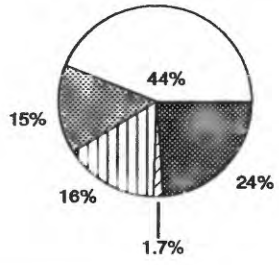
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	4.64	0.04	0.02	0.14	0.24	1.41	0	0
Surface water	25.30	0	0	12.16	0.03	1.17	0	0
Total	29.94	0.04	0.02	12.30	0.27	2.58	0	0

CURRITUCK COUNTY

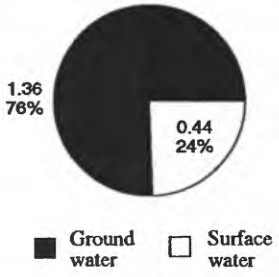
Population: 13,740
Acres irrigated: 590

Population served by public supply: 8,810
Hydroelectric power water use: 0 Mgal/d

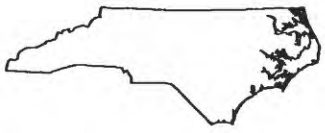
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

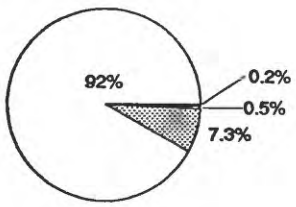
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.79	0.27	0.28	0	0.02	0	0	0
Surface water	0	0	0	0	0.01	0.43	0	0
Total	0.79	0.27	0.28	0	0.03	0.43	0	0

DARE COUNTY

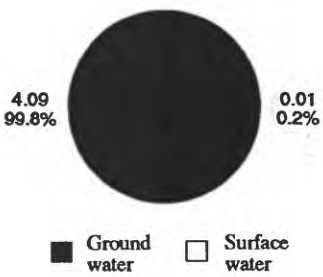
Population: 22,750
Acres irrigated: 10

Population served by public supply: 17,230
Hydroelectric power water use: 0 Mgal/d

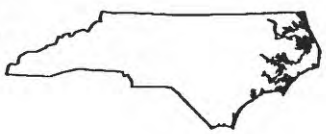
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

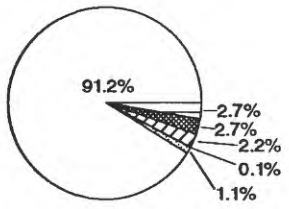
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	3.77	0.30	0.02	0	0	0	0	0
Surface water	0	0	0	0	0	0.01	0	0
Total	3.77	0.30	0.02	0	0	0.01	0	0

DAVIDSON COUNTY

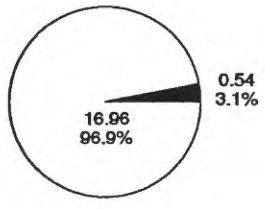
Population: 126,680
Acres irrigated: 1,070

Population served by public supply: 123,010
Hydroelectric power water use: 4,263.51 Mgal/d

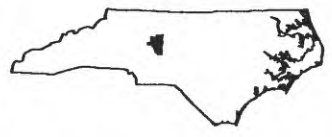
Withdrawals by type of use



Withdrawals by source



County location map



Ground water ■ Surface water □

Self-supplied withdrawals, in million gallons per day

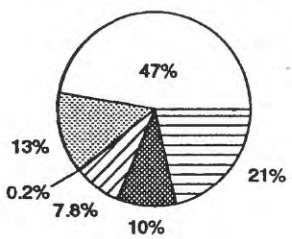
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0	0.20	0.01	0	0.33	0	0	0
Surface water	15.96	0	0	0	0.06	0.47	0.47	0
Total	15.96	0.20	0.01	0	0.39	0.47	0.47	0

DAVIE COUNTY

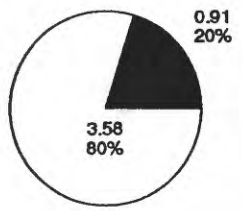
Population: 27,860
Acres irrigated: 820

Population served by public supply: 16,920
Hydroelectric power water use: 0 Mgal/d

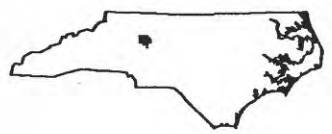
Withdrawals by type of use



Withdrawals by source



County location map



Ground water ■ Surface water □

Self-supplied withdrawals, in million gallons per day

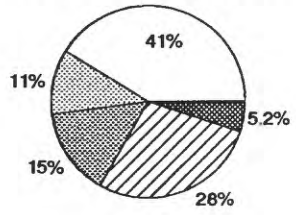
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0	0.60	0	0.01	0.30	0	0	0
Surface water	2.12	0	0	0	0.05	0.45	0.96	0
Total	2.12	0.60	0	0.01	0.35	0.45	0.96	0

DUPLIN COUNTY

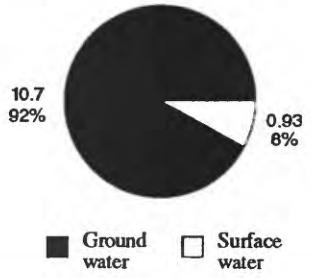
Population: 40,000
Acres irrigated: 810

Population served by public supply: 17,170
Hydroelectric power water use: 0 Mgal/d

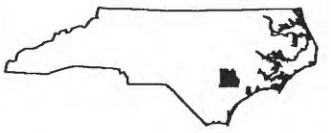
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

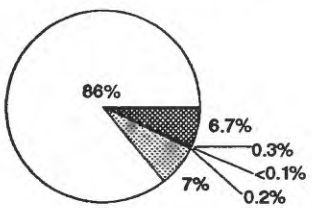
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	4.80	1.26	0	1.71	2.93	0	0	0
Surface water	0	0	0	0	0.33	0.60	0	0
Total	4.80	1.26	0	1.71	3.26	0.60	0	0

DURHAM COUNTY

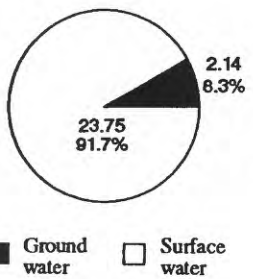
Population: 181,840
Acres irrigated: 1,660

Population served by public supply: 148,850
Hydroelectric power water use: 0 Mgal/d

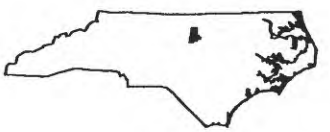
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

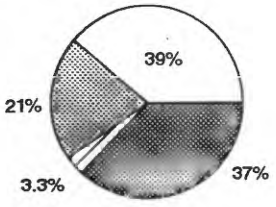
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.07	1.81	0.05	0.01	0.07	0.13	0	0
Surface water	22.14	0	0	0	0.01	1.60	0	0
Total	22.21	1.81	0.05	0.01	0.08	1.73	0	0

EDGECOMBE COUNTY

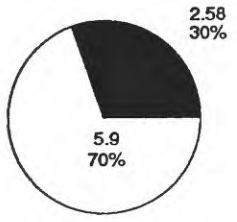
Population: 56,560
Acres irrigated: 8,200

Population served by public supply: 24,500
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Ground water ■ Surface water □

Self-supplied withdrawals, in million gallons per day

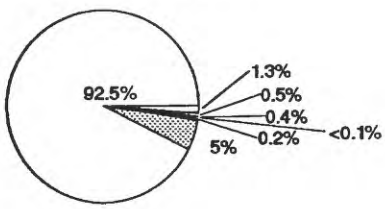
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.53	1.76	0	0	0.24	0.05	0	0
Surface water	2.76	0	0	0	0.04	3.10	0	0
Total	3.29	1.76	0	0	0.28	3.15	0	0

FORSYTH COUNTY

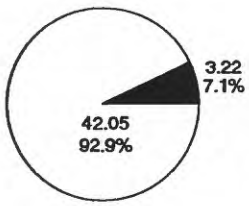
Population: 265,880
Acres irrigated: 400

Population served by public supply: 224,370
Hydroelectric power water use: 468.00 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Ground water ■ Surface water □

Self-supplied withdrawals, in million gallons per day

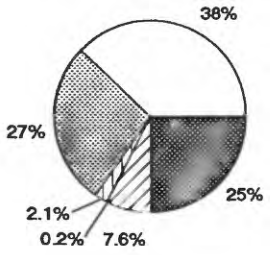
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.37	2.28	0.08	0.02	0.15	0	0.32	0
Surface water	41.50	0	0	0	0.04	0.24	0.27	0
Total	41.87	2.28	0.08	0.02	0.19	0.24	0.59	0

FRANKLIN COUNTY

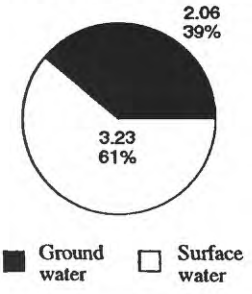
Population: 36,410
Acres irrigated: 980

Population served by public supply: 10,150
Hydroelectric power water use: 0 Mgal/d

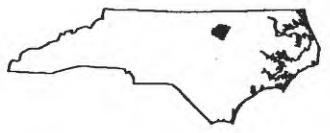
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

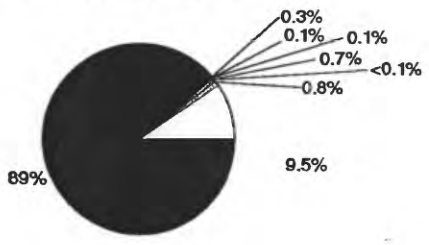
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.16	1.44	0.11	0.01	0.34	0	0	0
Surface water	1.85	0	0	0	0.06	1.32	0	0
Total	2.01	1.44	0.11	0.01	0.40	1.32	0	0

GASTON COUNTY

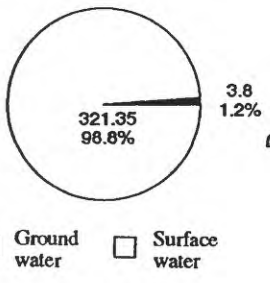
Population: 175,090
Acres irrigated: 130

Population served by public supply: 128,280
Hydroelectric power water use: 2,308.66 Mgal/d

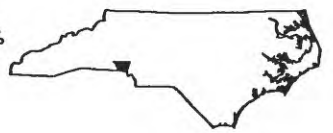
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

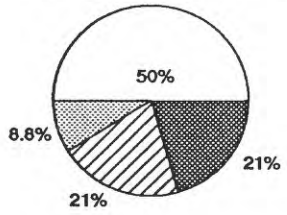
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0	2.57	0.10	0.24	0.17	0.07	0.65	0
Surface water	30.96	0	0	1.90	0.03	0.27	0.17	288.02
Total	30.96	2.57	0.10	2.14	0.20	0.34	0.82	288.02

GATES COUNTY

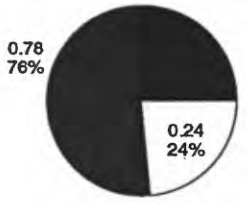
Population: 9,310
Acres irrigated: 510

Population served by public supply: 7,660
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use

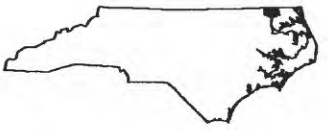


Withdrawals by source



Ground water Surface water

County location map



Self-supplied withdrawals, in million gallons per day

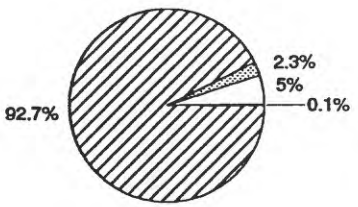
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.51	0.09	0	0	0.18	0	0	0
Surface water	0	0	0	0	0.03	0.21	0	0
Total	0.51	0.09	0	0	0.21	0.21	0	0

GRAHAM COUNTY

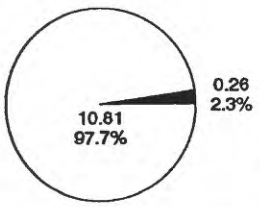
Population: 7,200
Acres irrigated: 10

Population served by public supply: 2,580
Hydroelectric power water use: 3,239.08 Mgal/d

Withdrawals by type of use

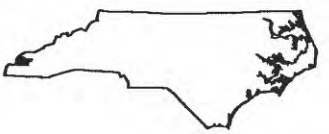


Withdrawals by source



Ground water Surface water

County location map



Self-supplied withdrawals, in million gallons per day

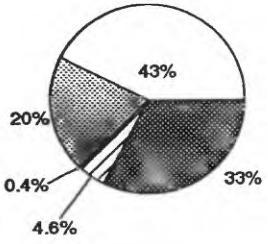
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0	0.25	0	0	0.01	0	0	0
Surface water	0.55	0	0	0	10.25	0.01	0	0
Total	0.55	0.25	0	0	10.26	0.01	0	0

GRANVILLE COUNTY

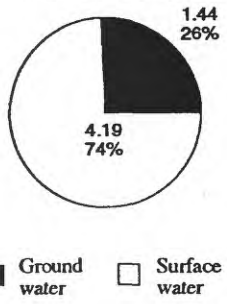
Population: 38,350
Acres irrigated: 6,130

Population served by public supply: 18,220
Hydroelectric power water use: 0 Mgal/d

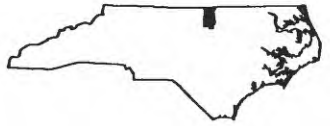
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

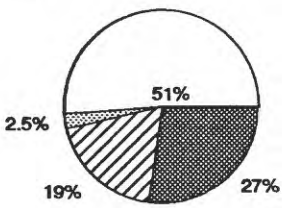
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.07	1.11	0.02	0	0.23	0.01	0	0
Surface water	2.33	0	0	0	0.03	1.83	0	0
Total	2.40	1.11	0.02	0	0.26	1.84	0	0

GREENE COUNTY

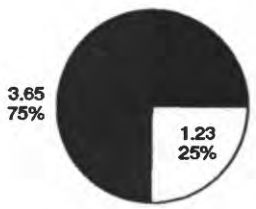
Population: 15,380
Acres irrigated: 1,130

Population served by public supply: 13,260
Hydroelectric power water use: 0 Mgal/d

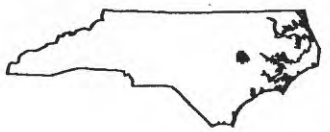
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

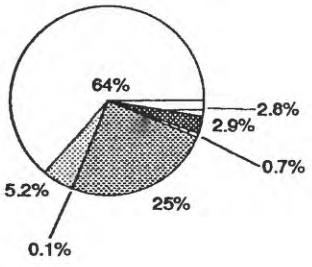
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	2.50	0.12	0	0	0.79	0.24	0	0
Surface water	0	0	0	0	0.14	1.09	0	0
Total	2.50	0.12	0	0	0.93	1.33	0	0

GUILFORD COUNTY

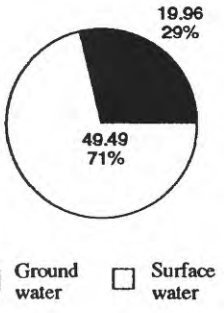
Population: 347,410
Acres irrigated: 4,250

Population served by public supply: 282,350
Hydroelectric power water use: 0 Mgal/d

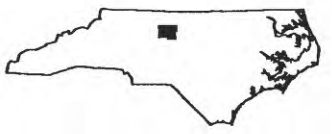
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

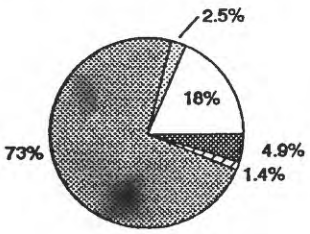
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.04	3.58	0.06	15.39	0.40	0.01	0.48	0
Surface water	44.14	0	0	1.84	0.06	2.01	1.44	0
Total	44.18	3.58	0.06	17.23	0.46	2.02	1.92	0

HALIFAX COUNTY

Population: 55,520
Acres irrigated: 4,170

Population served by public supply: 38,610
Hydroelectric power water use: 19,465.17 Mgal/d

Withdrawals by type of use



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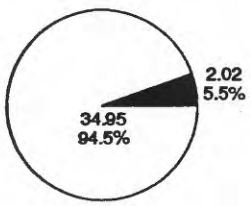


County location map

Self-supplied withdrawals, in million gallons per day

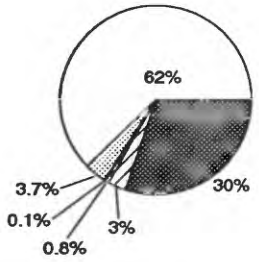
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.64	0.93	0	0	0.43	0.02	0	0
Surface water	6.18	0	0	26.90	0.08	1.79	0	0
Total	6.82	0.93	0	26.90	0.51	1.81	0	0

HARNETT COUNTY

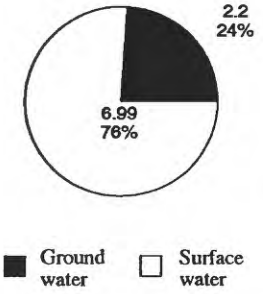
Population: 67,820
Acres irrigated: 8,830

Population served by public supply: 61,590
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Self-supplied withdrawals, in million gallons per day

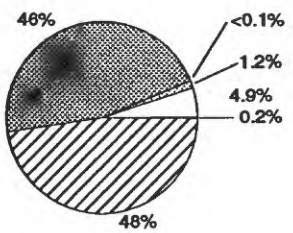
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.65	0.34	0.01	0.07	0.23	0.90	0	0
Surface water	5.07	0	0	0	0.05	1.87	0	0
Total	5.72	0.34	0.01	0.07	0.28	2.77	0	0

HAYWOOD COUNTY

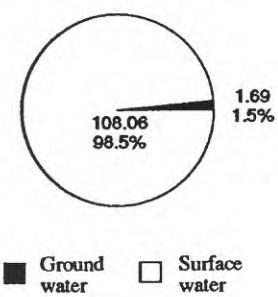
Population: 46,940
Acres irrigated: 490

Population served by public supply: 22,320
Hydroelectric power water use: 602.76 Mgal/d

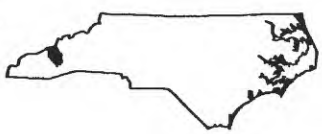
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

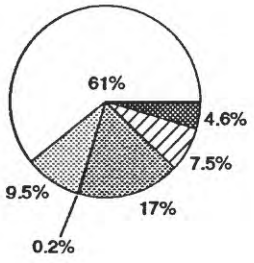
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.03	1.35	0.02	0	0.29	0	0	0
Surface water	5.38	0	0	50.60	51.88	0.20	0	0
Total	5.41	1.35	0.02	50.60	52.17	0.20	0	0

HENDERSON COUNTY

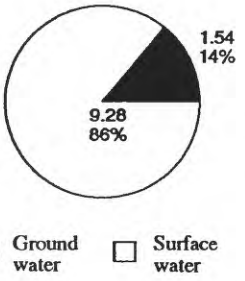
Population: 69,290
Acres irrigated: 450

Population served by public supply: 50,570
Hydroelectric power water use: 0.90 Mgal/d

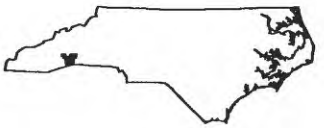
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

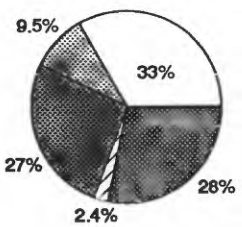
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.11	1.03	0.02	0.09	0.27	0.02	0	0
Surface water	6.46	0	0	1.80	0.54	0.48	0	0
Total	6.57	1.03	0.02	1.89	0.81	0.50	0	0

HERTFORD COUNTY

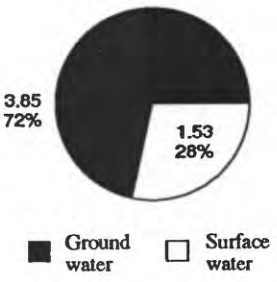
Population: 22,520
Acres irrigated: 2,960

Population served by public supply: 13,160
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Self-supplied withdrawals, in million gallons per day

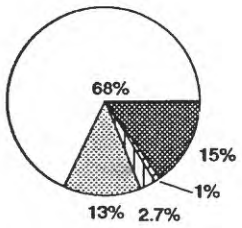
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	1.79	0.51	0	1.43	0.11	0.01	0	0
Surface water	0	0	0	0	0.02	1.51	0	0
Total	1.79	0.51	0	1.43	0.13	1.52	0	0

HOKE COUNTY

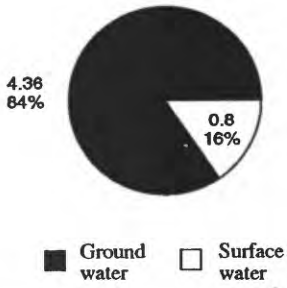
Population: 22,860
Acres irrigated: 470

Population served by public supply: 10,760
Hydroelectric power water use: 0 Mgal/d

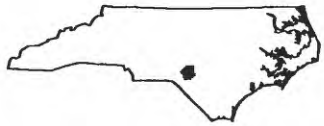
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

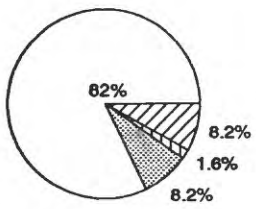
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	3.51	0.67	0.14	0	0.04	0	0	0
Surface water	0	0	0	0	0.01	0.79	0	0
Total	3.51	0.67	0.14	0	0.05	0.79	0	0

HYDE COUNTY

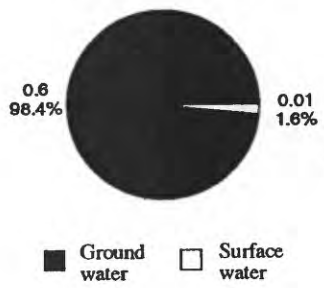
Population: 5,410
Acres irrigated: 0

Population served by public supply: 4,450
Hydroelectric power water use: 0 Mgal/d

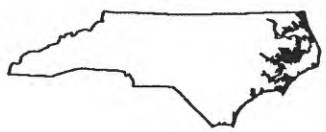
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

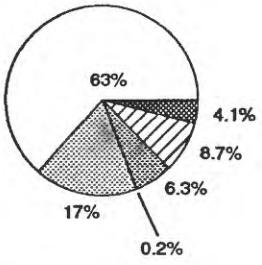
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.50	0.05	0.01	0	0.04	0	0	0
Surface water	0	0	0	0	0.01	0	0	0
Total	0.50	0.05	0.01	0	0.05	0	0	0

IREDELL COUNTY

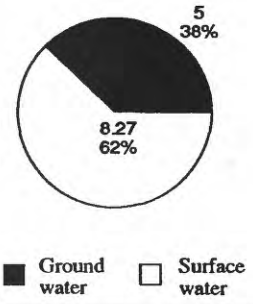
Population: 92,930
Acres irrigated: 1,170

Population served by public supply: 51,130
Hydroelectric power water use: 1,711.80 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Self-supplied withdrawals, in million gallons per day

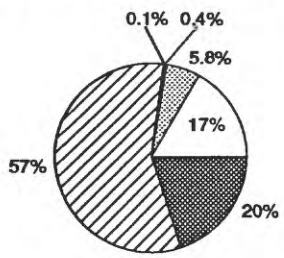
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	1.15	2.30	0.02	0.54	0.98	0.01	0	0
Surface water	7.27	0	0	0.30	0.17	0.53	0	0
Total	8.42	2.30	0.02	0.84	1.15	0.54	0	0

JACKSON COUNTY

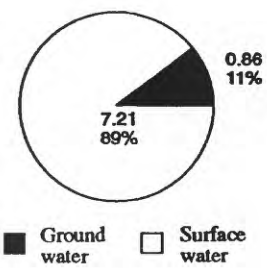
Population: 26,850
Acres irrigated: 680

Population served by public supply: 18,300
Hydroelectric power water use: 1,105.55 Mgal/d

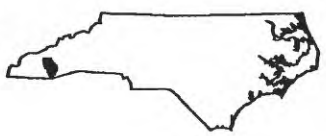
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

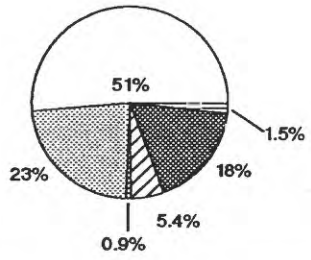
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.32	0.47	0.03	0	0.04	0	0	0
Surface water	1.02	0	0	0.01	4.57	1.61	0	0
Total	1.34	0.47	0.03	0.01	4.61	1.61	0	0

JOHNSTON COUNTY

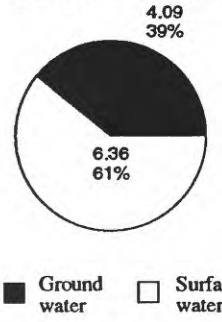
Population: 81,310
Acres irrigated: 4,270

Population served by public supply: 37,220
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Self-supplied withdrawals, in million gallons per day

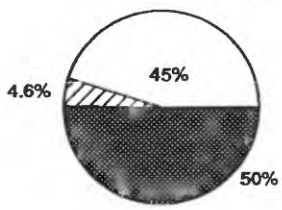
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	1.11	2.42	0	0.09	0.47	0	0	0
Surface water	4.26	0	0	0	0.09	1.85	0.16	0
Total	5.37	2.42	0	0.09	0.56	1.85	0.16	0

JONES COUNTY

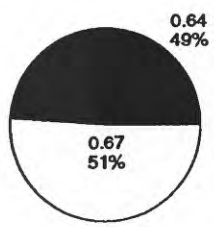
Population: 9,410
Acres irrigated: 2,010

Population served by public supply: 9,340
Hydroelectric power water use: 0 Mgal/d

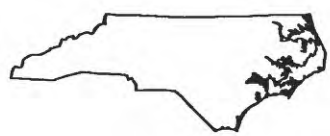
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

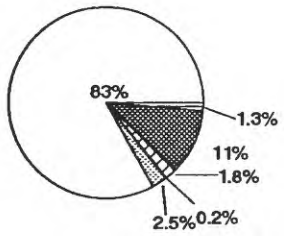
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.59	0	0	0	0.05	0	0	0
Surface water	0	0	0	0	0.01	0.66	0	0
Total	0.59	0	0	0	0.06	0.66	0	0

LEE COUNTY

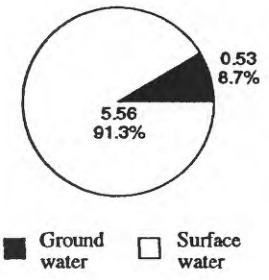
Population: 41,370
Acres irrigated: 2,200

Population served by public supply: 38,690
Hydroelectric power water use: 0 Mgal/d

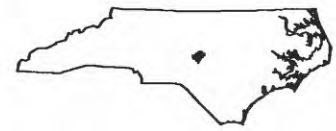
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

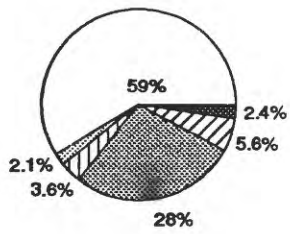
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.26	0.15	0.01	0	0.11	0	0	0
Surface water	4.79	0	0	0	0	0.69	0.08	0
Total	5.05	0.15	0.01	0	0.11	0.69	0.08	0

LENOIR COUNTY

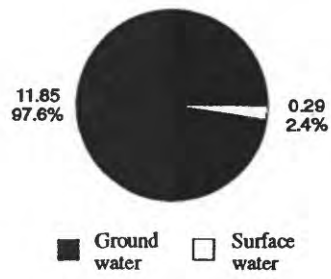
Population: 57,270
Acres irrigated: 690

Population served by public supply: 52,660
Hydroelectric power water use: 0 Mgal/d

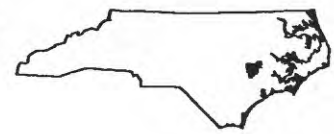
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

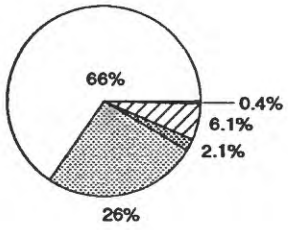
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	7.13	0.25	0.44	3.35	0.58	0.10	0	0
Surface water	0	0	0	0	0.10	0.19	0	0
Total	7.13	0.25	0.44	3.35	0.68	0.29	0	0

LINCOLN COUNTY

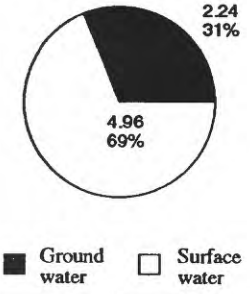
Population: 50,320
Acres irrigated: 10

Population served by public supply: 16,510
Hydroelectric power water use: 2,119.99 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Self-supplied withdrawals, in million gallons per day

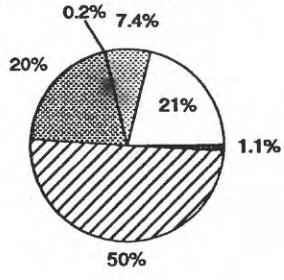
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0	1.86	0	0	0.38	0	0	0
Surface water	4.72	0	0	0.15	0.06	0.03	0	0
Total	4.72	1.86	0	0.15	0.44	0.03	0	0

MCDOWELL COUNTY

Population: 35,680
Acres irrigated: 70

Population served by public supply: 15,350
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



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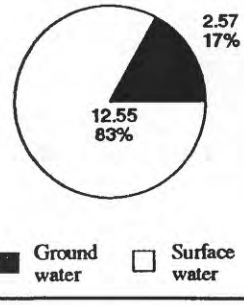
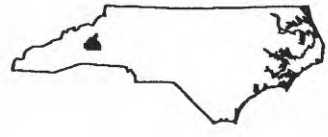


County location map



Self-supplied withdrawals, in million gallons per day

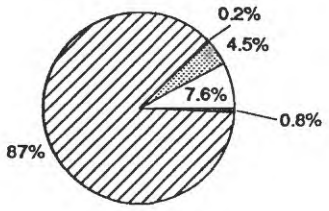
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0	1.12	0.03	1.35	0.07	0	0	0
Surface water	3.19	0	0	1.70	7.50	0.16	0	0
Total	3.19	1.12	0.03	3.05	7.57	0.16	0	0

MACON COUNTY

Population: 23,500
Acres irrigated: 170

Population served by public supply: 8,800
Hydroelectric power water use: 287.48 Mgal/d

Withdrawals by type of use



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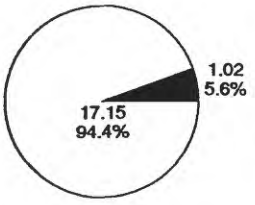
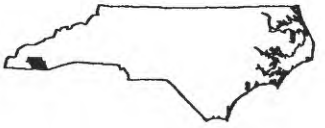


County location map



Ground water Surface water

Self-supplied withdrawals, in million gallons per day

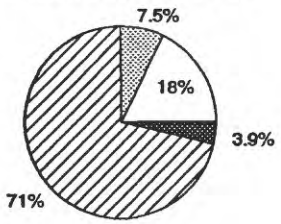
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.07	0.81	0.04	0	0.10	0	0	0
Surface water	1.32	0	0	0	15.69	0.14	0	0
Total	1.39	0.81	0.04	0	15.79	0.14	0	0

MADISON COUNTY

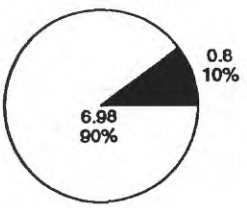
Population: 16,950
Acres irrigated: 620

Population served by public supply: 6,420
Hydroelectric power water use: 862.83 Mgal/d

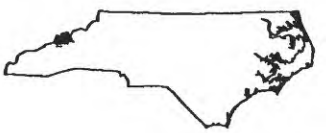
Withdrawals by type of use



Withdrawals by source



County location map



Ground water Surface water

Self-supplied withdrawals, in million gallons per day

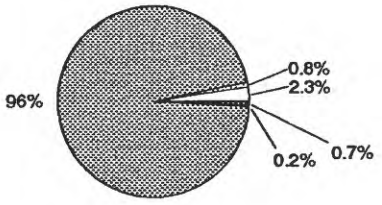
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.11	0.58	0	0	0.11	0	0	0
Surface water	1.26	0	0	0	5.42	0.30	0	0
Total	1.37	0.58	0	0	5.53	0.30	0	0

MARTIN COUNTY

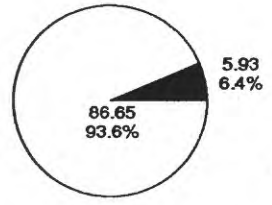
Population: 25,080
Acres irrigated: 1,100

Population served by public supply: 11,330
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Ground water ■ Surface water □

Self-supplied withdrawals, in million gallons per day

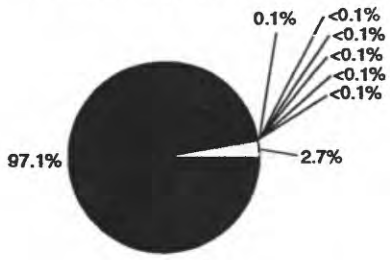
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	2.15	0.76	0	2.86	0.16	0	0	0
Surface water	0	0	0	86.01	0.03	0.61	0	0
Total	2.15	0.76	0	88.87	0.19	0.61	0	0

MECKLENBURG COUNTY

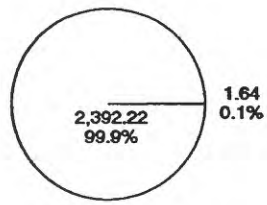
Population: 511,420
Acres irrigated: 140

Population served by public supply: 495,900
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Ground water ■ Surface water □

Self-supplied withdrawals, in million gallons per day

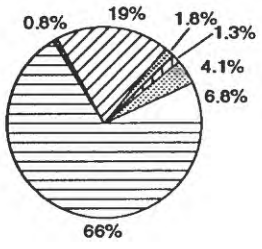
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.25	0.85	0.01	0.16	0.20	0.03	0.14	0
Surface water	64.77	0	0	0.08	0.03	0.55	2.28	2,324.51
Total	65.02	0.85	0.01	0.24	0.23	0.58	2.42	2,324.51

MITCHELL COUNTY

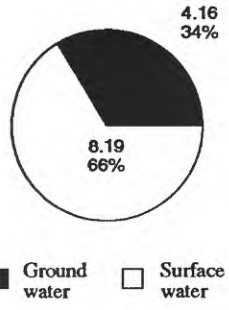
Population: 14,430
Acres irrigated: 30

Population served by public supply: 5,250
Hydroelectric power water use: 0 Mgal/d

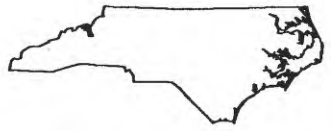
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

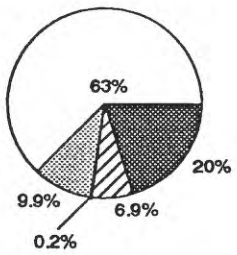
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0	0.51	0.16	0	0.04	0	3.45	0
Surface water	0.84	0	0	0.22	2.30	0.10	4.73	0
Total	0.84	0.51	0.16	0.22	2.34	0.10	8.18	0

MONTGOMERY COUNTY

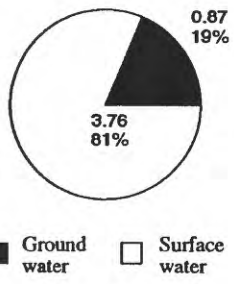
Population: 23,350
Acres irrigated: 870

Population served by public supply: 14,910
Hydroelectric power water use: 17,778.37 Mgal/d

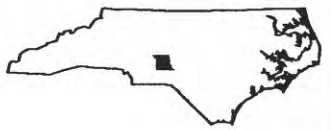
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

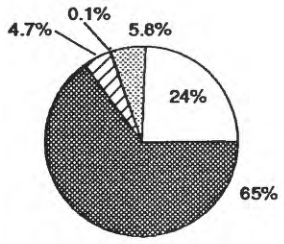
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.12	0.46	0.01	0	0.27	0.01	0	0
Surface water	2.80	0	0	0	0.05	0.93	0	0
Total	2.92	0.46	0.01	0	0.32	0.94	0	0

MOORE COUNTY

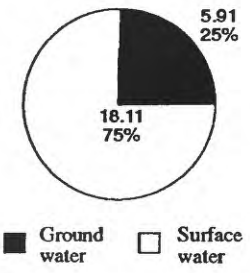
Population: 59,010
Acres irrigated: 5,150

Population served by public supply: 33,480
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Self-supplied withdrawals, in million gallons per day

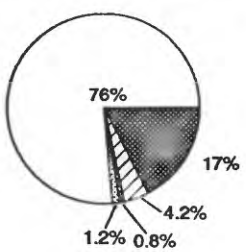
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	2.51	1.40	0	0.03	0.95	1.02	0	0
Surface water	3.35	0	0	0	0.17	14.59	0	0
Total	5.86	1.40	0	0.03	1.12	15.61	0	0

NASH COUNTY

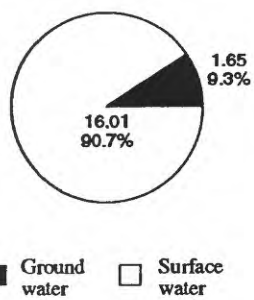
Population: 76,680
Acres irrigated: 9,770

Population served by public supply: 72,870
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Self-supplied withdrawals, in million gallons per day

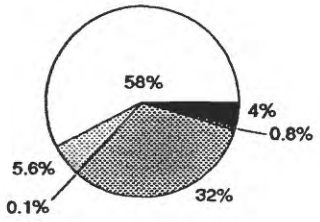
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.67	0.21	0	0.14	0.63	0	0	0
Surface water	12.82	0	0	0	0.11	3.08	0	0
Total	13.49	0.21	0	0.14	0.74	3.08	0	0

NEW HANOVER COUNTY

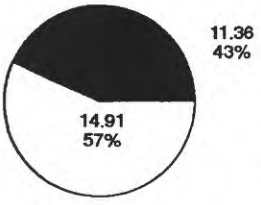
Population: 120,280
Acres irrigated: 180

Population served by public supply: 93,590
Hydroelectric power water use: 0 Mgal/d

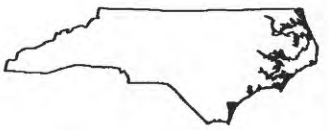
Withdrawals by type of use



Withdrawals by source



County location map



■ Ground water □ Surface water

Self-supplied withdrawals, in million gallons per day

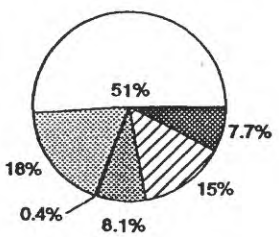
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	3.22	1.47	0.02	6.65	0	0	0	0
Surface water	11.92	0	0	1.75	0	0.20	0	1.04
Total	15.14	1.47	0.02	8.40	0	0.20	0	1.04

NORTHAMPTON COUNTY

Population: 20,800
Acres irrigated: 410

Population served by public supply: 12,530
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source

County location map

■ Ground water □ Surface water

Self-supplied withdrawals, in million gallons per day

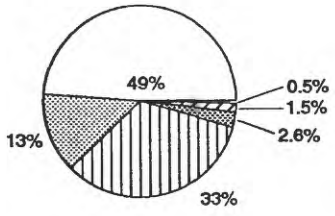
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	1.26	0.45	0.01	0.20	0.31	0.03	0	0
Surface water	0	0	0	0	0.05	0.16	0	0
Total	1.26	0.45	0.01	0.20	0.36	0.19	0	0

ONSLOW COUNTY

Population: 149,840
Acres irrigated: 130

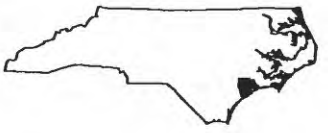
Population served by public supply: 105,280
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source

County location map



Ground water Surface water

Self-supplied withdrawals, in million gallons per day

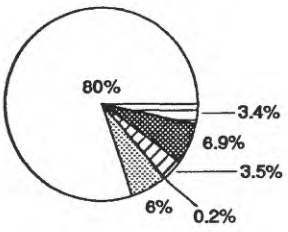
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	8.91	2.45	6.08	0.48	0.23	0.02	0	0
Surface water	0	0	0	0	0.04	0.07	0	0
Total	8.91	2.45	6.08	0.48	0.27	0.09	0	0

ORANGE COUNTY

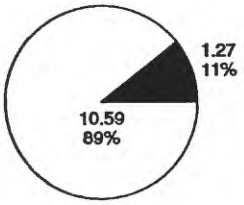
Population: 93,850
Acres irrigated: 880

Population served by public supply: 80,950
Hydroelectric power water use: 0 Mgal/d

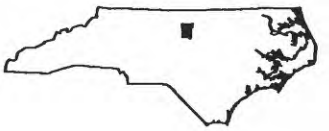
Withdrawals by type of use



Withdrawals by source



County location map



Ground water Surface water

Self-supplied withdrawals, in million gallons per day

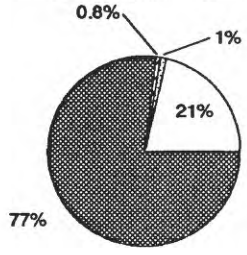
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0	0.71	0.02	0	0.36	0.08	0.10	0
Surface water	9.49	0	0	0	0.06	0.74	0.30	0
Total	9.49	0.71	0.02	0	0.42	0.82	0.40	0

PAMLICO COUNTY

Population: 11,370
Acres irrigated: 2,740

Population served by public supply: 10,670
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



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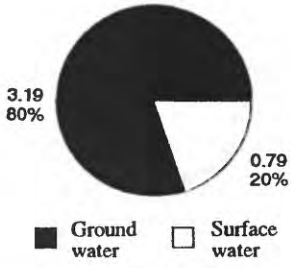


County location map

Self-supplied withdrawals, in million gallons per day

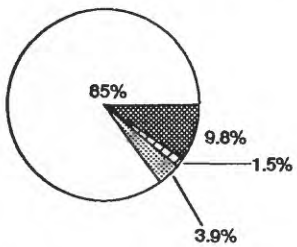
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.85	0.04	0	0	0.03	2.27	0	0
Surface water	0	0	0	0	0	0.79	0	0
Total	0.85	0.04	0	0	0.03	3.06	0	0

PASQUOTANK COUNTY

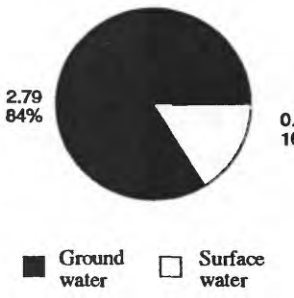
Population: 31,300
Acres irrigated: 810

Population served by public supply: 28,910
Hydroelectric power water use: 0 Mgal/d

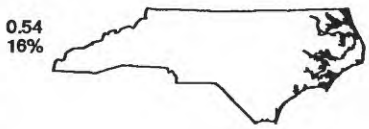
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

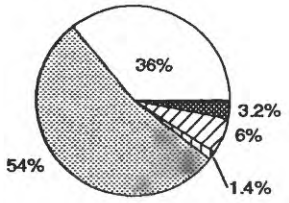
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	2.33	0.13	0	0	0.04	0.29	0	0
Surface water	0.50	0	0	0	0.01	0.03	0	0
Total	2.83	0.13	0	0	0.05	0.32	0	0

PENDER COUNTY

Population: 28,860
Acres irrigated: 10

Population served by public supply: 7,570
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source

County location map

Self-supplied withdrawals, in million gallons per day

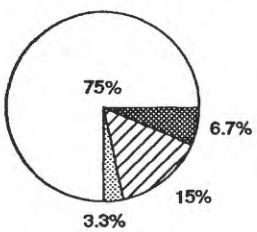
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.78	1.17	0.03	0	0.11	0	0	0
Surface water	0	0	0	0	0.02	0.07	0	0
Total	0.78	1.17	0.03	0	0.13	0.07	0	0

PERQUIMANS COUNTY

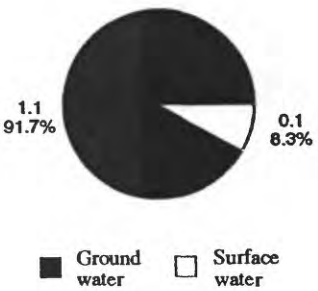
Population: 10,450
Acres irrigated: 180

Population served by public supply: 9,770
Hydroelectric power water use: 0 Mgal/d

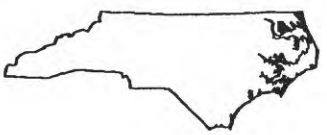
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

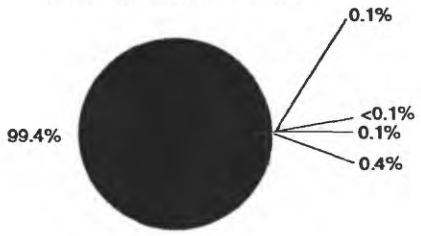
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.90	0.04	0	0	0.16	0	0	0
Surface water	0	0	0	0	0.02	0.08	0	0
Total	0.90	0.04	0	0	0.18	0.08	0	0

PERSON COUNTY

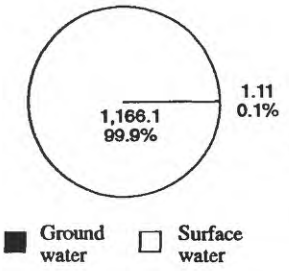
Population: 30,180
Acres irrigated: 4,670

Population served by public supply: 12,510
Hydroelectric power water use: 0 Mgal/d

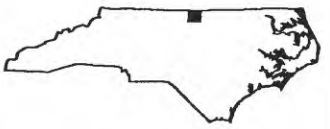
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

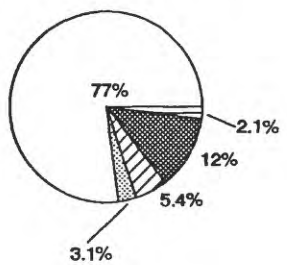
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0	0.97	0	0	0.14	0	0	0
Surface water	4.37	0	0	0	0.03	1.39	0	1,160.31
Total	4.37	0.97	0	0	0.17	1.39	0	1,160.31

PITT COUNTY

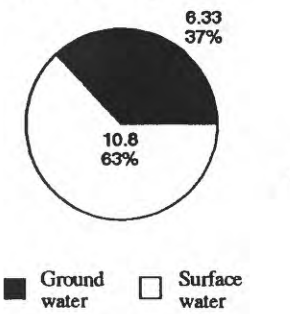
Population: 107,920
Acres irrigated: 5,130

Population served by public supply: 98,300
Hydroelectric power water use: 0 Mgal/d

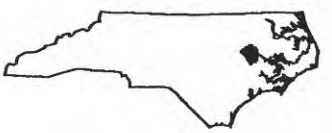
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

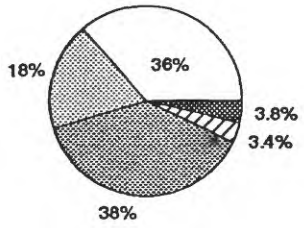
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	4.65	0.53	0	0	0.79	0.36	0	0
Surface water	8.53	0	0	0	0.14	1.77	0.36	0
Total	13.18	0.53	0	0	0.93	2.13	0.36	0

POLK COUNTY

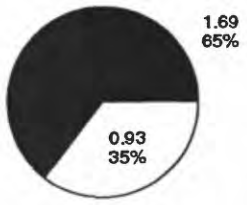
Population: 14,420
Acres irrigated: 150

Population served by public supply: 5,740
Hydroelectric power water use: 214.63 Mgal/d

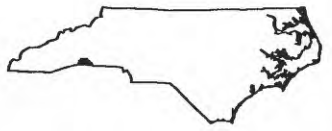
Withdrawals by type of use



Withdrawals by source



County location map



Ground water Surface water

Self-supplied withdrawals, in million gallons per day

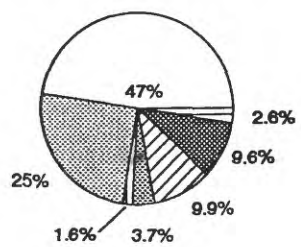
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.95	0.48	0	0.18	0.08	0	0	0
Surface water	0	0	0	0.82	0.01	0.10	0	0
Total	0.95	0.48	0	1.00	0.09	0.10	0	0

RANDOLPH COUNTY

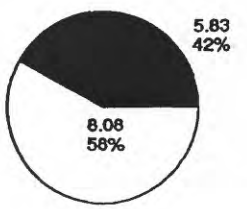
Population: 106,550
Acres irrigated: 2,500

Population served by public supply: 43,040
Hydroelectric power water use: 0 Mgal/d

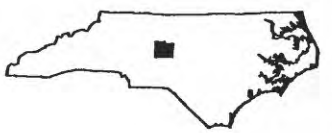
Withdrawals by type of use



Withdrawals by source



County location map



Ground water Surface water

Self-supplied withdrawals, in million gallons per day

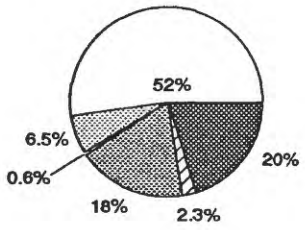
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.63	3.49	0.22	0.26	1.17	0	0.06	0
Surface water	5.97	0	0	0.26	0.21	1.34	0.30	0
Total	6.60	3.49	0.22	0.52	1.38	1.34	0.36	0

RICHMOND COUNTY

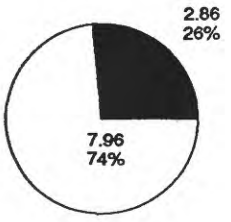
Population: 44,520
Acres irrigated: 3,640

Population served by public supply: 31,870
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use

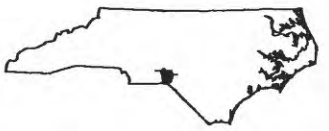


Withdrawals by source



Ground water Surface water

County location map



Self-supplied withdrawals, in million gallons per day

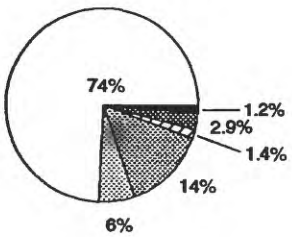
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	1.63	0.70	0.06	0.24	0.23	0	0	0
Surface water	4.03	0	0	1.72	0.02	2.19	0	0
Total	5.66	0.70	0.06	1.96	0.25	2.19	0	0

ROBESON COUNTY

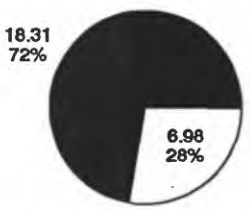
Population: 105,180
Acres irrigated: 1,650

Population served by public supply: 77,480
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



Ground water Surface water

County location map

Self-supplied withdrawals, in million gallons per day

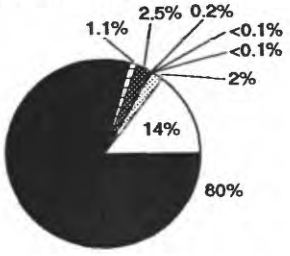
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	12.80	1.52	0	3.57	0.31	0.11	0	0
Surface water	6.00	0	0	0	0.05	0.63	0	0.30
Total	18.80	1.52	0	3.57	0.36	0.74	0	0.30

ROCKINGHAM COUNTY

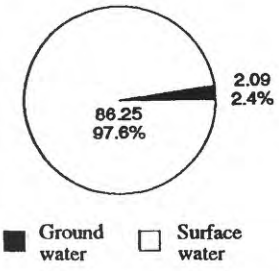
Population: 86,060
Acres irrigated: 7,060

Population served by public supply: 53,640
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Self-supplied withdrawals, in million gallons per day

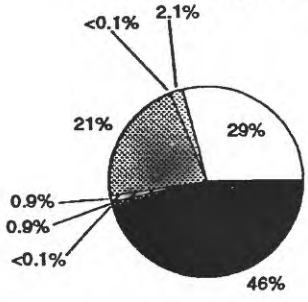
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.08	1.78	0.02	0.03	0.18	0	0	0
Surface water	12.71	0	0	0	0.03	2.21	1.01	70.29
Total	12.79	1.78	0.02	0.03	0.21	2.21	1.01	70.29

ROWAN COUNTY

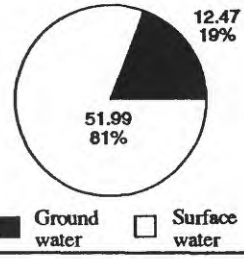
Population: 110,610
Acres irrigated: 1,120

Population served by public supply: 86,150
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Self-supplied withdrawals, in million gallons per day

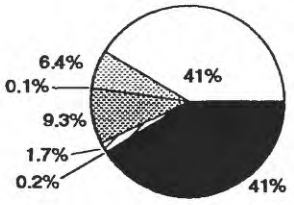
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.54	1.35	0.01	10.08	0.49	0	0	0
Surface water	18.14	0	0	3.70	0.09	0.56	0.02	29.48
Total	18.68	1.35	0.01	13.78	0.58	0.56	0.02	29.48

RUTHERFORD COUNTY

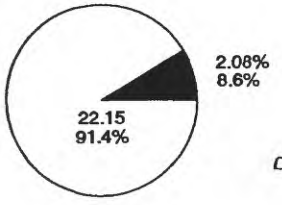
Population: 56,920
Acres irrigated: 40

Population served by public supply: 28,840
Hydroelectric power water use: 112.83 Mgal/d

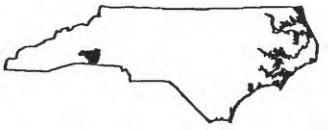
Withdrawals by type of use



Withdrawals by source



County location map



Ground water Surface water

Self-supplied withdrawals, in million gallons per day

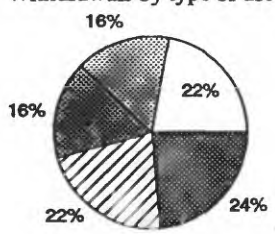
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.10	1.54	0.02	0.04	0.38	0	0	0
Surface water	9.93	0	0	2.21	0.03	0.05	0	9.93
Total	10.03	1.54	0.02	2.25	0.41	0.05	0	9.93

SAMPSON COUNTY

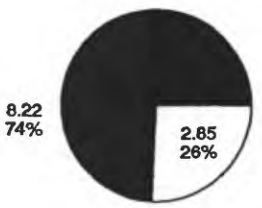
Population: 47,300
Acres irrigated: 8,380

Population served by public supply: 15,230
Hydroelectric power water use: 0 Mgal/d

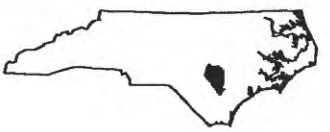
Withdrawals by type of use



Withdrawals by source



County location map



Ground water Surface water

Self-supplied withdrawals, in million gallons per day

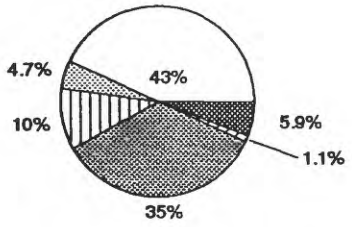
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	2.44	1.76	0	1.82	2.09	0.11	0	0
Surface water	0	0	0	0	0.35	2.50	0	0
Total	2.44	1.76	0	1.82	2.44	2.61	0	0

SCOTLAND COUNTY

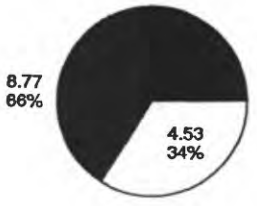
Population: 33,750
Acres irrigated: 1,210

Population served by public supply: 22,250
Hydroelectric power water use: 0 Mgal/d

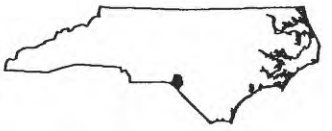
Withdrawals by type of use



Withdrawals by source



County location map



Ground water ■ Surface water □

Self-supplied withdrawals, in million gallons per day

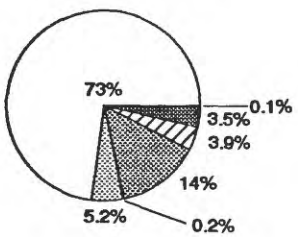
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	5.73	0.63	1.37	0.64	0.12	0.28	0	0
Surface water	0	0	0	4.01	0.02	0.50	0	0
Total	5.73	0.63	1.37	4.65	0.14	0.78	0	0

STANLY COUNTY

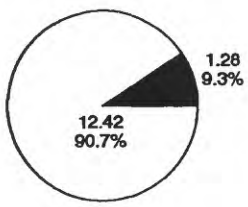
Population: 51,770
Acres irrigated: 1,020

Population served by public supply: 38,860
Hydroelectric power water use: 0 Mgal/d

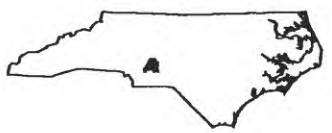
Withdrawals by type of use



Withdrawals by source



County location map



Ground water ■ Surface water □

Self-supplied withdrawals, in million gallons per day

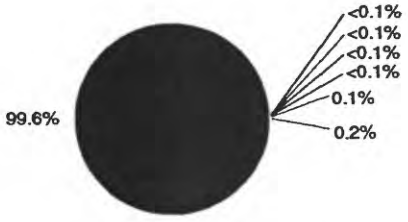
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0	0.71	0.03	0.06	0.46	0	0.02	0
Surface water	9.99	0	0	1.87	0.08	0.48	0	0
Total	9.99	0.71	0.03	1.93	0.54	0.48	0.02	0

STOKES COUNTY

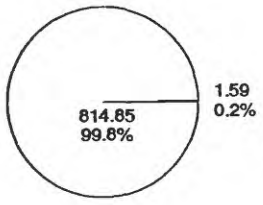
Population: 37,220
Acres irrigated: 90

Population served by public supply: 16,390
Hydroelectric power water use: 0 Mgal/d

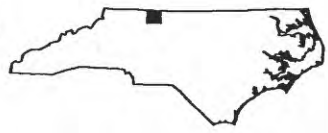
Withdrawals by type of use



Withdrawals by source



County location map



Ground water Surface water

Self-supplied withdrawals, in million gallons per day

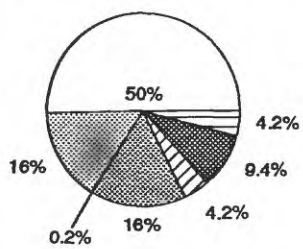
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.15	1.15	0.01	0.16	0.12	0	0	0
Surface water	1.36	0	0	0	0.02	0.05	0	813.42
Total	1.51	1.15	0.01	0.16	0.14	0.05	0	813.42

SURRY COUNTY

Population: 61,700
Acres irrigated: 2,730

Population served by public supply: 18,480
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



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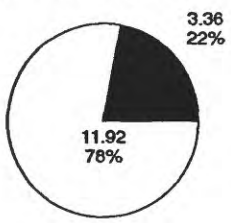
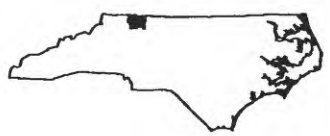


County location map



Ground water Surface water

Self-supplied withdrawals, in million gallons per day

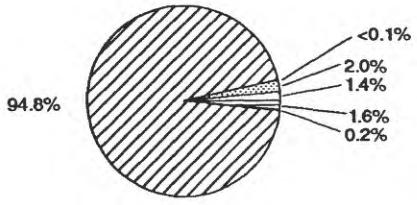
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.09	2.38	0.03	0.08	0.54	0	0.24	0
Surface water	7.60	0	0	2.39	0.10	1.43	0.40	0
Total	7.69	2.38	0.03	2.47	0.64	1.43	0.64	0

SWAIN COUNTY

Population: 11,270
Acres irrigated: 10

Population served by public supply: 2,810
Hydroelectric power water use: 257.47 Mgal/d

Withdrawals by type of use



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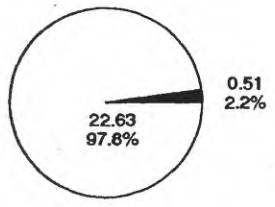


County location map

Ground water Surface water

Self-supplied withdrawals, in million gallons per day

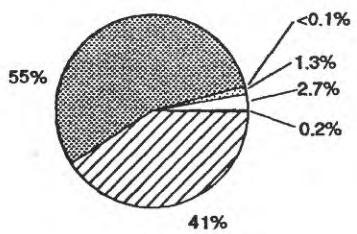
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0	0.47	0.01	0	0.03	0	0	0
Surface water	0.32	0	0	0	21.90	0.05	0.36	0
Total	0.32	0.47	0.01	0	21.93	0.05	0.36	0

TRANSYLVANIA COUNTY

Population: 25,520
Acres irrigated: 30

Population served by public supply: 12,680
Hydroelectric power water use: 54.08 Mgal/d

Withdrawals by type of use



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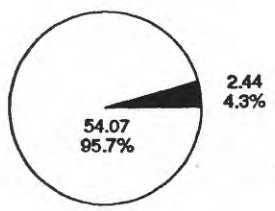


County location map

Ground water Surface water

Self-supplied withdrawals, in million gallons per day

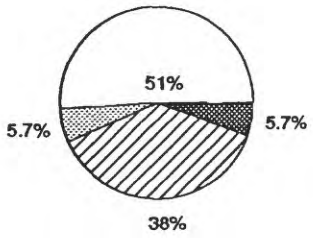
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.29	0.71	0.02	1.37	0.05	0	0	0
Surface water	1.22	0	0	29.74	22.98	0.13	0	0
Total	1.51	0.71	0.02	31.11	23.03	0.13	0	0

TYRRELL COUNTY

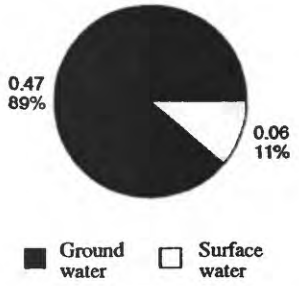
Population: 3,860
Acres irrigated: 80

Population served by public supply: 3,400
Hydroelectric power water use: 0 Mgal/d

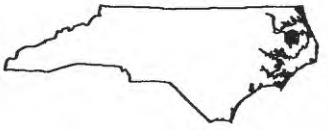
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

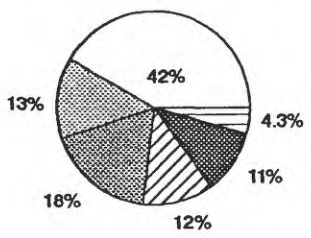
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.27	0.03	0	0	0.17	0	0	0
Surface water	0	0	0	0	0.03	0.03	0	0
Total	0.27	0.03	0	0	0.20	0.03	0	0

UNION COUNTY

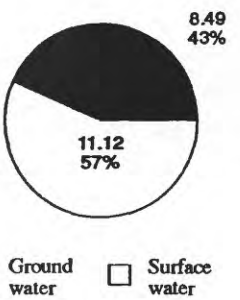
Population: 84,210
Acres irrigated: 410

Population served by public supply: 36,170
Hydroelectric power water use: 0 Mgal/d

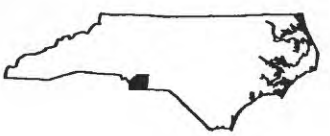
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

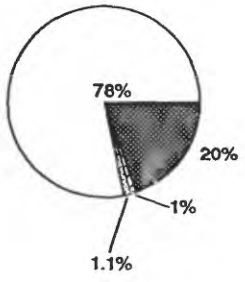
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	3.53	2.64	0	0.34	1.98	0	0	0
Surface water	4.63	0	0	3.20	0.33	2.11	0.85	0
Total	8.16	2.64	0	3.54	2.31	2.11	0.85	0

VANCE COUNTY

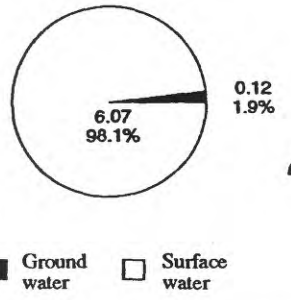
Population: 38,890
Acres irrigated: 4,060

Population served by public supply: 37,600
Hydroelectric power water use: 0 Mgal/d

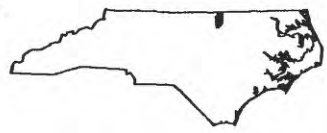
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

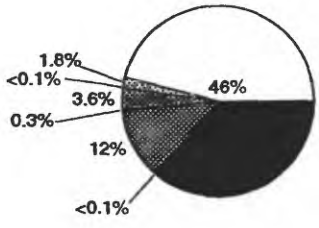
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0	0.07	0	0	0.05	0	0	0
Surface water	4.84	0	0	0	0.01	1.22	0	0
Total	4.84	0.07	0	0	0.06	1.22	0	0

WAKE COUNTY

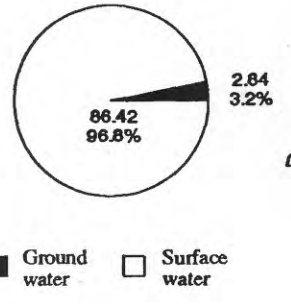
Population: 423,370
Acres irrigated: 5,540

Population served by public supply: 394,070
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Self-supplied withdrawals, in million gallons per day

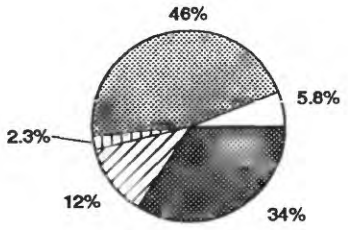
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.34	1.61	0.02	0.13	0.23	0.51	0	0
Surface water	40.60	0	0	3.05	0.04	10.25	0.03	32.45
Total	40.94	1.61	0.02	3.18	0.27	10.76	0.03	32.45

WARREN COUNTY

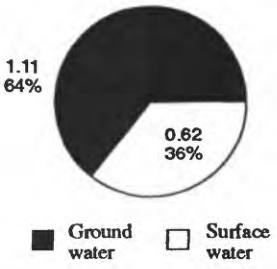
Population: 17,270
Acres irrigated: 1,910

Population served by public supply: 2,920
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Self-supplied withdrawals, in million gallons per day

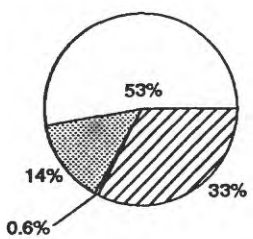
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.10	0.79	0.04	0	0.18	0	0	0
Surface water	0	0	0	0	0.03	0.59	0	0
Total	0.10	0.79	0.04	0	0.21	0.59	0	0

WASHINGTON COUNTY

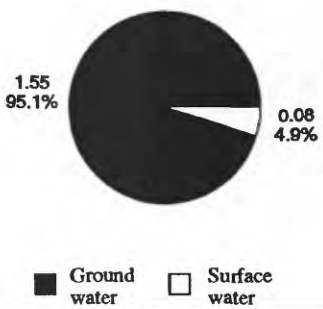
Population: 14,000
Acres irrigated: 0

Population served by public supply: 9,850
Hydroelectric power water use: 0 Mgal/d

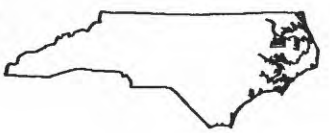
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

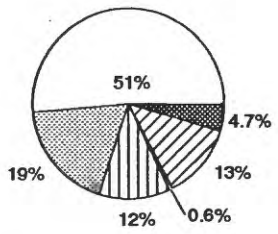
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.86	0.23	0.01	0	0.45	0	0	0
Surface water	0	0	0	0	0.08	0	0	0
Total	0.86	0.23	0.01	0	0.53	0	0	0

WATAUGA COUNTY

Population: 36,950
Acres irrigated: 100

Population served by public supply: 19,030
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



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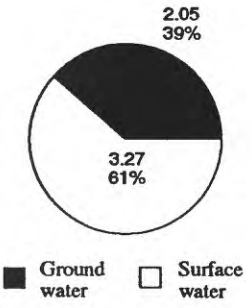
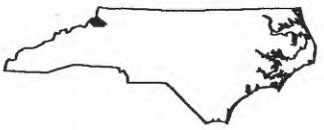


County location map



Self-supplied withdrawals, in million gallons per day

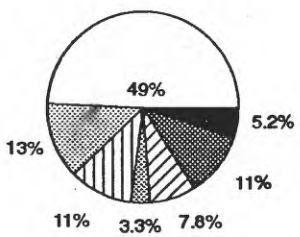
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.23	0.99	0.64	0.03	0.16	0	0	0
Surface water	2.50	0	0	0	0.52	0.25	0	0
Total	2.73	0.99	0.64	0.03	0.68	0.25	0	0

WAYNE COUNTY

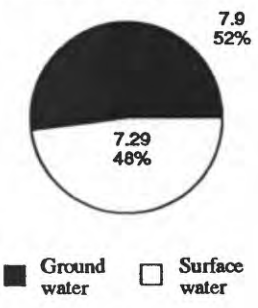
Population: 104,670
Acres irrigated: 1,190

Population served by public supply: 68,970
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source



County location map

Self-supplied withdrawals, in million gallons per day

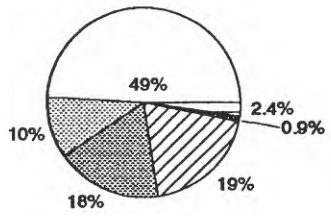
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	2.34	1.96	1.64	0.50	0.99	0.47	0	0
Surface water	5.13	0	0	0	0.19	1.18	0	0.79
Total	7.47	1.96	1.64	0.50	1.18	1.65	0	0.79

WILKES COUNTY

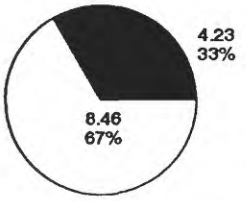
Population: 59,390
Acres irrigated: 270

Population served by public supply: 35,420
Hydroelectric power water use: 0 Mgal/d

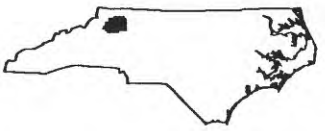
Withdrawals by type of use



Withdrawals by source



County location map



Self-supplied withdrawals, in million gallons per day

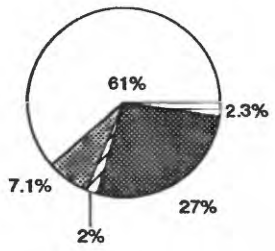
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.13	1.32	0	0.68	2.10	0	0	0
Surface water	6.09	0	0	1.59	0.36	0.12	0.30	0
Total	6.22	1.32	0	2.27	2.46	0.12	0.30	0

WILSON COUNTY

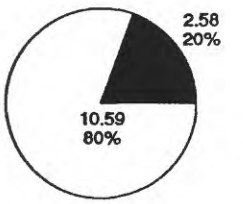
Population: 66,060
Acres irrigated: 3,410

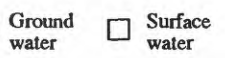
Population served by public supply: 48,910
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use



Withdrawals by source





County location map

Self-supplied withdrawals, in million gallons per day

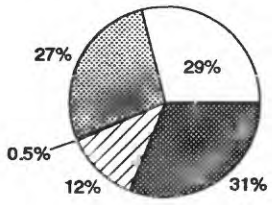
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.40	0.94	0	0	0.22	1.02	0	0
Surface water	7.69	0	0	0	0.04	2.56	0.30	0
Total	8.09	0.94	0	0	0.26	3.58	0.30	0

YADKIN COUNTY

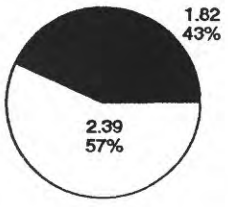
Population: 30,490
Acres irrigated: 4,240

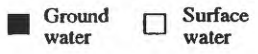
Population served by public supply: 9,680
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use

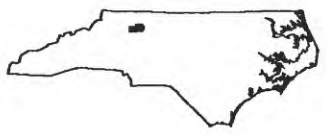


Withdrawals by source





County location map



Self-supplied withdrawals, in million gallons per day

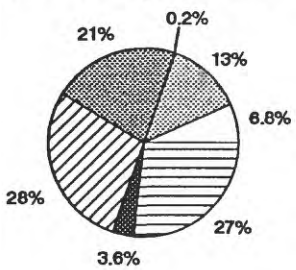
Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0.21	1.14	0.02	0	0.45	0	0	0
Surface water	1.01	0	0	0	0.07	1.31	0	0
Total	1.22	1.14	0.02	0	0.52	1.31	0	0

YANCEY COUNTY

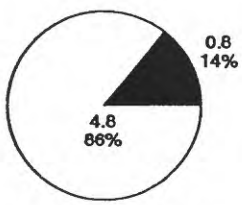
Population: 15,420
Acres irrigated: 30

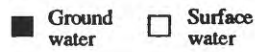
Population served by public supply: 2,300
Hydroelectric power water use: 0 Mgal/d

Withdrawals by type of use

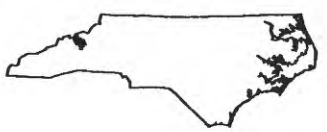


Withdrawals by source





County location map



Self-supplied withdrawals, in million gallons per day

Source	Public supply	Domestic	Commercial	Industry	Livestock	Irrigation	Mining	Thermoelectric
Ground water	0	0.72	0.01	0	0.07	0	0	0
Surface water	0.38	0	0	1.20	1.52	0.20	1.50	0
Total	0.38	0.72	0.01	1.20	1.59	0.20	1.50	0