

BASIN 12 ALBEMARLE SOUND

BASIN DESCRIPTION

The Albemarle Sound Basin comprises 3,906 square miles of low-lying lands and expansive areas of open water in northeastern North Carolina. The basin encompasses Albemarle Sound, Currituck Sound, Croatan Sound, Roanoke Sound, and a portion of Pamlico Sound paralleling the outer banks as far south as Ocracoke Inlet. Albemarle Sound is the receiving waters of the Chowan, Roanoke, and Pasquotank Rivers. Together these basins drain over 18,000 square miles of northern North Carolina and southern Virginia.

WATER USE

Factors Affecting Water Demand

This basin is home to about 2% of the state's residents and contains all or part of 12 municipalities in nine counties. Currituck County is one of the state's 12 major metropolitan areas and is actually part of the Norfolk-Virginia Beach-Newport News Metropolitan Statistical Area. Three counties in this basin had population growth over 10% from 1990 to 1997. Currituck and Dare counties, which include portions of the Outer Banks, experienced population growth of greater than 20% over the same period. In the coastal areas, especially on the Outer Banks, water systems must plan to have adequate water supplies during the summer months when major seasonal peak demands for water occur.

Total Water Use in Basin

The U.S. Geological Survey's (USGS) 1995 summary of water use estimated total water use in the basin at 23.4 million gallons per day (mgd), with just over two-thirds coming from surface water sources. USGS estimated total basin population at 111,830. Residential demand was estimated at 11 mgd, with over 80% of this demand being supplied by public water systems. Overall, public water systems supplied 11.2 mgd from ground water and 0.5 mgd from surface water for both residential and non-residential uses. The remaining residential water demand was met by 1.9 mgd of self-supplied ground water. In addition, about 7.6 mgd of self-supplied water was withdrawn for non-residential water uses.

Local Water Supply Plans (LWSPs)

Units of local government that supply or plan to supply water to the public are required to develop a LWSP. The Division of Water Resources (DWR) reviews LWSPs and maintains a database of the LWSP information. This summary is based on data contained in the 1997 LWSPs.

LWSPs were submitted by 20 public water systems using water from this basin. (Perquimans County has not submitted a 1997 LWSP, so its 1992 LWSP data was used in these summaries.) The following discussion and table summarize the LWSP population served with water from this basin and its water use for 1997.



1997 LSWP System Water Use from Basin (mgd)				
Sub-basin	LWSP Population	Residential Use	Non-resid. Use	Total Use*
Albemarle Sound	86,052	6.35	2.04	18.4

*Total Use also includes unaccounted-for water and system process water

Residential water use accounted for 35% of total water use of these systems, non-residential use accounted for 11%, and 20% of use was unaccounted-for.

The Albemarle Sound Basin supplies water to some of the state's fastest growing counties. LWSP systems expect to supply water to 128,392 persons by the year 2020, a 49% increase over 1997 levels. Their demand is projected to increase 59% to 29 mgd, by 2020.

In the 1997 LWSPs, 10 of the 20 systems using water from this basin reported that their peak demands will exceed their water treatment capacity by 2010.

Water systems should maintain adequate water supplies and manage water demands to ensure that average daily use does not exceed 80% of their available supply. Data for 1997 indicated that nine of the 20 LWSP systems in this basin had average demand above this threshold. By 2020, nine systems still project demand levels that will exceed 80% of their available supply.

Self-supplied Use

The USGS estimated that self-supplied users, excluding power generating facilities, accounted for 272 mgd of the 433 mgd total of water used from this basin, as shown in the table below. Irrigation use accounted for 57% of the self-supplied uses followed by livestock (20%), domestic (20%), industrial (2%), and commercial (1%).

1995 USGS Estimated Self-supplied Water Use in mgd						
Sub-basin	Domestic	Livestock	Industrial	Commercial	Irrigation	Total
Albemarle Sound	1.86	1.91	0.22	0.07	5.36	9.4

Registered Water Withdrawals

Anyone withdrawing 1.0 mgd or more of surface or ground water for agricultural uses or 100,000 gallons per day for other uses is required to register that withdrawal with DWR. Registered withdrawals in this basin are summarized in the table below.

Registered Water Withdrawals for 1999						
Sub-basin	Agricultural		Non-agricultural		Total	
	#	mgd	#	mgd	#	mgd
Albemarle Sound	9	57.6	6	0.62	15	58.2

Six of the registered agricultural water users are irrigators, the largest of which used an average of 49 mgd in 1997. Two of the agricultural users listed drainage as their use; one of these did not report average daily use but has a Capacity Use Area #1 (CUA#1) permit for 345 mgd pumping capacity. Seven of the nine agricultural users are permittees in the existing CUA#1.

The registered non-agricultural water users include one industrial user and five private water supply systems.

WATER AVAILABILITY

All 20 of the LWSP systems in the basin rely on ground water either from their own wells or through purchases from other ground water systems. LWSPs indicate that 15 of these systems have wells with a total 12-hour ground water supply of 22 mgd.

Ground water for public use is limited due to high chloride concentrations. As a result some coastal systems, such as Dare County and Cape Hatteras, must treat brackish ground water using Reverse Osmosis.

Nags Head is the only system in the basin with a surface water supply, a small fresh water pond with an estimated seasonal supply of about 0.3 mgd.

INTERBASIN TRANSFERS OF SURFACE WATER

Across the state many water systems move surface water between sub-basins to meet their needs. No surface water transfers affect this basin.

SUMMARY OF INFORMATION FROM 1997 LWSPs

! Total average per capita water use for this basin was 214 gallons per day (gpd) in 1997 and is projected to increase to 225 gpd by 2010.

! Seven systems are not connected to another water supply system capable of supplying water in an emergency.

! Nine systems purchased a total of about 3.4 mgd of water from this basin. Three of these systems had no purchase contract.

! Four systems rely on purchase water as their sole supply.

! The reported raw water supply was 0.3 mgd surface water and a 12-hour groundwater supply of 22 mgd.

! Nine systems are planning additional water supplies totaling about five mgd in their 1997 LWSPs.

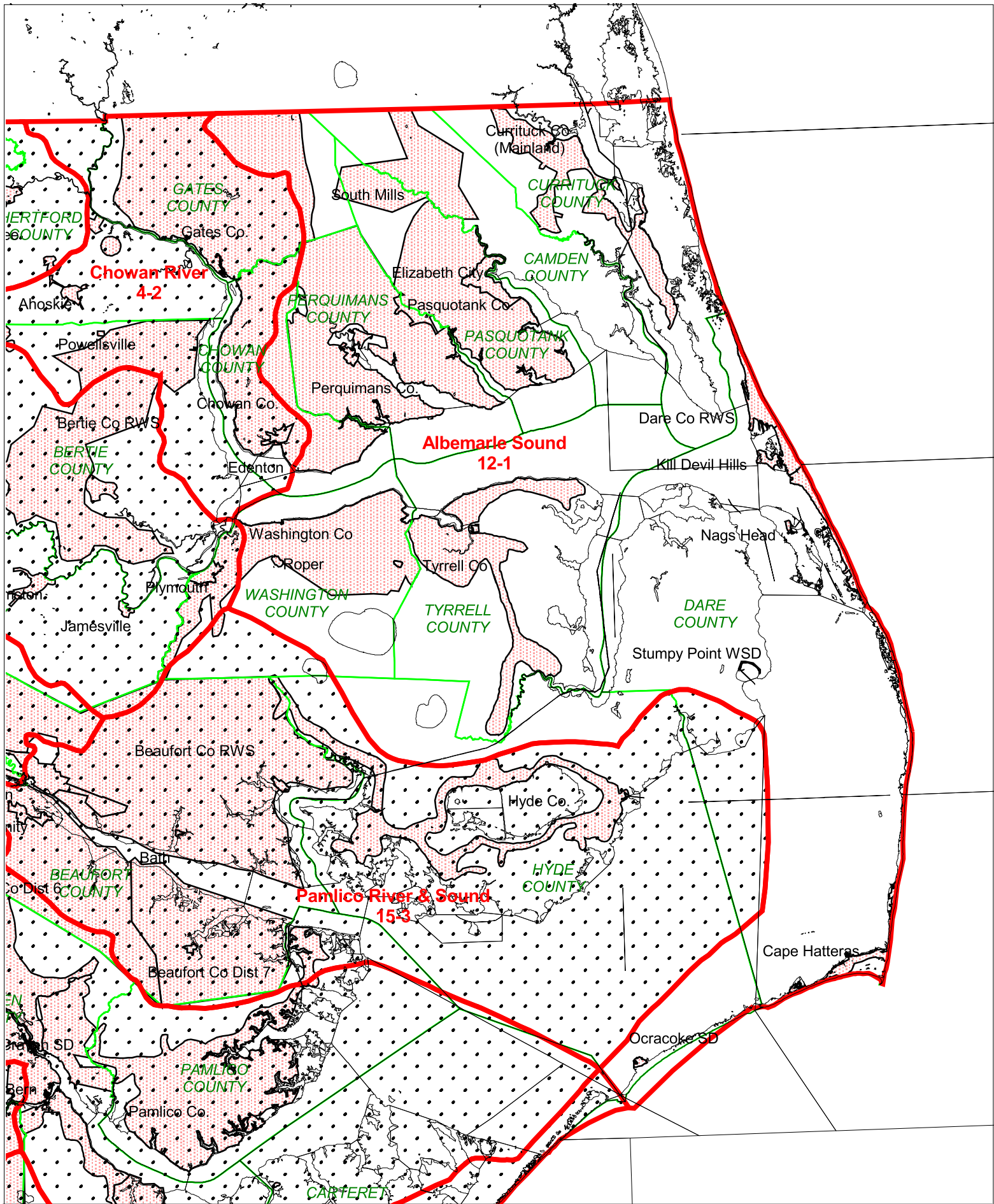
! There are six county-wide systems and one regional water supply system.

! In the coastal areas, especially on the Outer Banks, water systems must plan to have adequate water supplies during the summer months when major seasonal peak demands for water occur.

! About 6.6 mgd of additional water supply will be needed by water systems to ensure that water demands in 2010 do not exceed 80% of available supply.

! Systems reporting high Demand-to-Supply Ratios:

	1997	2010
Demand exceeds available supply	4	3
Demand exceeds 80% of available supply	9	11



Basin 12 Albemarle Sound
(unshaded basin)

LWSP service area
 County Boundary
 Basin Boundary

ALBEMARLE SOUND BASIN (12)									
1997 and 2010 Population and Water Use as reported by LWSP systems using water from this basin.									
Water systems showing "Demand as % of Supply" above 80% should be actively managing demand and pursuing additional supplies.									
mgd = million gallons per day									
Water Systems by County	Water Source or Supplier	Year-round Service Population		Average Daily Demand (mgd)		Available Supply (mgd)		Demand as % of Supply	
		1997	2010	1997	2010	1997	2010	1997	2010
CAMDEN									
S CAMDEN WSD	ELIZABETH CITY	1585	2760	0.154	0.437	0.15	0.15	103%	291%
SOUTH MILLS	Surficial Aquifer	4520	5573	0.255	0.515	0.409	0.584	62%	88%
CURRITUCK									
CURRITUCK CO (MAINLAND)	Surficial & Yorktown Aquifers	8791	11001	0.597	0.689	0.853	0.911	70%	76%
DARE									
CAPE HATTERAS	Surficial Aquifer	7037	11020	1.172	1.835	0.636	2.036	184%	90%
DARE CO RWS	Yorktown Aquifer / NAGS HEAD	7764	10538	11.971	14.456	15.58	16.1	77%	90%
DARE COUNTY RWS-RO PLANT	Yorktown Aquifer	2085	2830	0.185	0.259	0.648	0.648	29%	40%
KILL DEVIL HILLS	DARE CO	5136	7265	1.565	2.214	3	3	52%	74%
MANTEO	DARE CO	1200	1700	0.192	0.306	0.7	0.7	27%	44%
NAGS HEAD	DARE CO/Fresh Pond	2113	2995	2.692	3.272	3.5	3.5	77%	93%
STUMPY POINT WSD	Unspecified Ground Water	0	412	0	0.038	0	0.187	0%	21%
HYDE									
OCRACOKE SD	Castle Hayne Aquifer	720	740	0.438	0.539	0.72	0.806	61%	67%
PASQUOTANK									
ELIZABETH CITY	Surficial Aquifer / PASQUOTANK CO	16921	19172	4.71	5.14	1.58	3.58	0%	0%
PASQUOTANK CO	Surficial & Yorktown Aquifers / ELIZABETH CITY	14229	18876	1.85	2.25	2.01	2.41	298%	144%
PERQUIMANS									
*PERQUIMANS CO	Yorktown Aquifer	6469	7000	0.596	0.68	0.697	0.697	86%	98%
HERTFORD	Yorktown Aquifer	2333	2434	0.231	0.478	0.322	0.61	92%	91%
WINFALL	Yorktown Aquifer	520	560	0.051	0.063	0.059	0.059	86%	107%
TYRRELL									
COLUMBIA	Yorktown Aquifer	980	1020	0.124	0.127	0.352	0.352	35%	36%
TYRRELL CO	Yorktown Aquifer / COLUMBIA	2517	3150	0.214	0.267	0.39	0.39	55%	69%
WASHINGTON (in proposed Central Coastal Plain Capacity Use Area)									
CRESWELL	Yorktown Aquifer	500	500	0.161	0.069	0.15	0.15	0%	0%
ROPER	Castle Hayne Aquifer	643	703	0.247	0.256	0.288	0.288	107%	46%
* 1997 LWSP not submitted -1992 data used in analysis									