

## SECTION 10. RIVER BASIN SUMMARIES

River basins provide a practical framework for compiling water supply information, especially for surface water supplies. North Carolina General Statute 143-215.22G defines 38 river basins for the state, grouped into 18 major basins. These particular basin delineations were defined for the purposes of implementing two important water management programs — the registration of water withdrawals and transfers and the regulation of surface waters transfers. Figure 10-1 shows the boundaries for these 38 river basins.

The river basin summaries in this section present an overview of water use and water availability for Local Water Supply Plan systems in each of the major river basins. A map showing the LWSP systems in the basin and a table of LWSP data for each system is included with each basin summary. No summary is provided for the Ocoee (13-1) or Savannah (8-1) basins, since no LWSP systems are in these basins.

Appendix A is a River Basin Index that provides a convenient reference to locate the appropriate river basin summary for each water system.

### 10.1 Basin Description

Each basin summary provides a brief geographic description of the river basin, including major tributaries, impoundments, and other features of the basin. A location map is also provided for reference.

### 10.2 Water Use

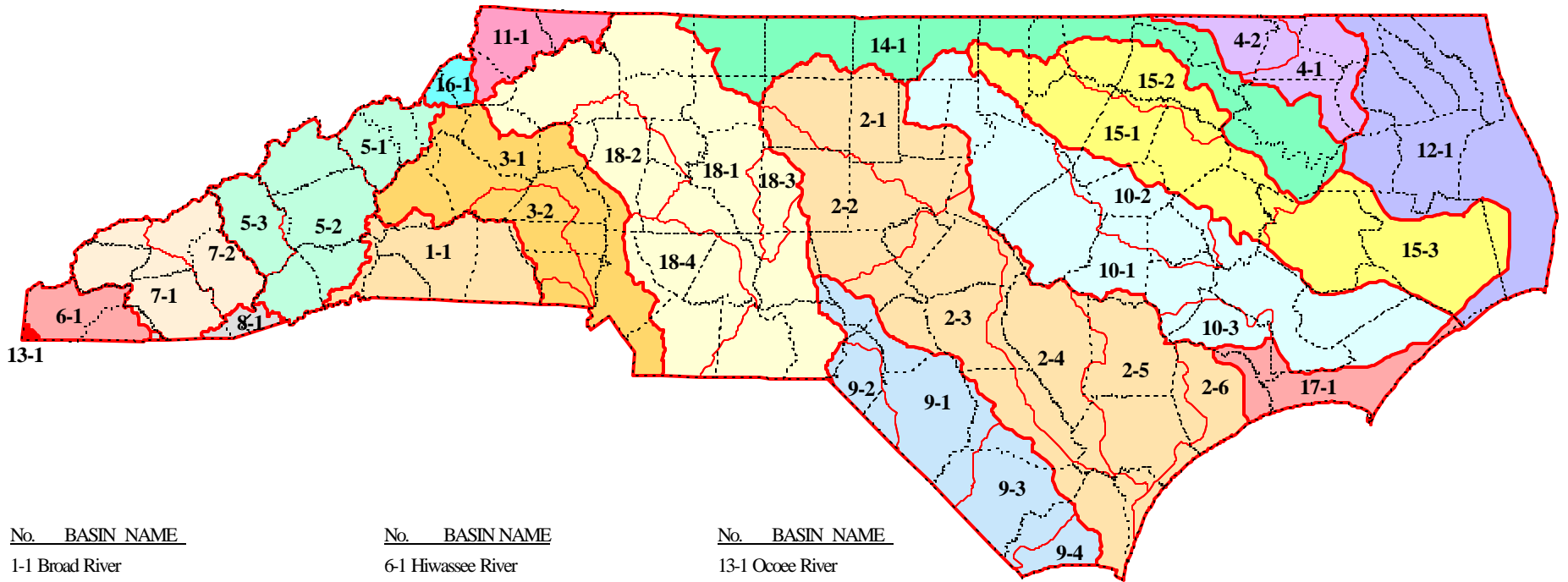
Specific factors affecting water used in each basin is discussed, along with water use information from a variety of sources. All types of water use in each basin are summarized, with detailed water use information from Local Water Supply Plans.

#### 10.2.1 Factors Affecting Water Demand

This section of the basin summaries highlights the specific factors that are affecting water demand in the basin. Population growth, seasonal fluctuations, economy, and other relevant factors are included.

#### 10.2.2 Total Water Use in Basin

Information in this section of the basin summary comes from estimates of statewide water use provided in the U.S. Geological Survey's *Estimated Water Use, by County, in North Carolina, 1995* (Walters, 1997). The total water use amounts presented include residential, commercial, industrial, mining, irrigation, livestock, and public water system losses. Not included are water use for thermoelectric power generation and mine dewatering. USGS estimates for public water system comes primarily from data contained in the 1992 LWSPs.



No.	BASIN NAME
1-1	Broad River
2	Cape Fear
2-1	Haw River
2-2	Deep River
2-3	Cape Fear River
2-4	South River
2-5	Northeast Cape Fear River
2-6	New River
3	Catawba
3-1	Catawba River
3-2	South Fork Catawba River
4	Chowan
4-1	Chowan River
4-2	Meherin River
5	French Broad
5-1	Nolichucky River
5-2	French Broad River
5-3	Pigeon River

No.	BASIN NAME
6-1	Hiwassee River
7	Little Tennessee
7-1	Little Tennessee River
7-2	Tuckasegee River
8-1	Savannah River
9	Lumber
9-1	Lumber River
9-2	Big Shoe Heel Creek
9-3	Waccamaw River
9-4	Shalotte River
10	Neuse
10-1	Neuse River
10-2	Contentnea Creek
10-3	Trent River
11-1	New River
12-1	Albemarle Sound

No.	BASIN NAME
13-1	Ocoee River
14-1	Roanoke River
15	Tar - Pamlico
15-1	Tar River
15-2	Fishing Creek
15-3	Pamlico River & Sound
16-1	Watauga River
17-1	White Oak River
18	Yadkin
18-1	Yadkin River
18-2	South Yadkin River
18-3	Uwhamie River
18-4	Rocky River

**Legend**

- Major River Basin Boundary
- Sub-Basin Boundary
- County Boundary

**Figure 10-1. River Basins in NC as Defined by General Statute 143-215.22.G**

### 10.2.3 Local Water Supply Plans

Those LWSP systems that use water from the basin are included in the basin summary, even if their service area happens to be located in another basin. A table showing the estimated LWSP service population using water from the basin is included, along with the amount of water used from the basin by type of use. Percentages of residential, non-residential, and unaccounted-for water use is reported. Specific LWSP data for each system is presented in tables at the end of each basin summary.

The Division of Water Resources recommends that water systems maintain demand-to-supply ratios such that average daily demand does not exceed 80 percent of available supply. Systems with demands in excess of this amount may be susceptible to shortages during drought or peak demand periods and should have a specific plan for addressing this problem, including a water conservation program to manage demands and plans for obtaining additional water supply.

The basin summary includes the number of LWSP systems with demand-to-supply ratios that DWR calculated to be greater than 80 percent. Calculated demand-to-supply ratios for each LWSP system are shown in the tables included with each basin summary. Demand-to-supply ratios of 100 percent for purchase-water systems indicate that no purchase contract amount was provided. Adequate future water may be available from the supplier for many of these systems, however, DWR could not assume this when no contract existed. During the LWSP process, the importance of having a water supply contract is stressed. It is important for purchasers to know the amount of water supply that they can reliably depend on from their supplier, and it is equally important for sellers to recognize their contractual obligations to other systems.

### 10.2.4 Self-supplied Use

Many water users have their own self-supplied water sources. Domestic self-supply comes from individual household wells. Self-supplied water for non-residential uses is taken from both ground and surface water sources. The estimates of self-supplied water use presented for each basin are from data compiled by USGS for the report *Estimated Water Use, by County, in North Carolina, 1995* (Walters, 1997).

### 10.2.5 Registered Water Withdrawals

Registered water withdrawals during 1999 are summarized in each basin summary, including the number of withdrawals and the combined withdrawal amounts for both agricultural and non-agricultural uses. Anyone withdrawing 1.0 million gallons or more per day for agricultural uses or 100,000 gallons or more per day for all other uses are required to register those withdrawals with the Division of Water Resources.

### 10.3 Water Availability

Available water supply reported by water systems in their 1997 LWSPs is discussed in this section. Surface and ground water availability are discussed separately. For surface water supplies, reported safe yield estimates are summed for the basin. These safe yield estimates reflect the amount of raw water available from these sources, however, the amount of potable (drinking) water available at any point in time will be limited by the water treatment capacity of the LWSP systems. In addition, surplus available supply in the basin is not necessarily available to those particular individual water systems needing additional supply, because of planned future use by other systems, proximity to the supply, and many other factors.

For ground water systems, the available supply reported in their LWSP is their 12-hour supply, which is the total amount of water that can be pumped from wells in a 12-hour period as specified in the Rules Governing Public Water Systems (NCAC 15A:18C .0100 to .2100). These reported 12-hour supplies for each ground water system are summed for the basin.

Any significant issues affecting water availability in the basin are also discussed, such as the proposed central coastal plain capacity use area.

### 10.4 Interbasin Transfers of Surface Water

The estimated amount of interbasin transfers into and out of each river basin are summarized based on 1997 LWSP data. This information is presented to indicate the extent to which communities in these basins currently depend on interbasin transfers of surface water to meet their water demands. Minor transfers less than 100,000 gallons per day were typically not quantified in the LWSPs. As a result, these minor transfers are counted in the number of transfers, but their transfer amount is not part of the transfer total amounts in and out of the basin. Only transfers of 2 MGD or more, or transfers that have exceeded their grandfathered transfer amount, are subject to the interbasin transfer certification requirements. More details on these requirements and a listing of interbasin transfers occurring in 1997 can be found in Section 6, Regulations Affecting Water Supply Planning.

### 10.5 Summary of Water Supply Information from 1997 LWSPs

The last section of each basin summary captures some of the key water supply information from the 1997 LWSPs for water systems using water from each basin. For convenience and ease of comparison, much of this information is compiled in Table 10-1. Each basin summary discussion is followed by a map showing the service areas of the LWSP systems in that particular basin.

The map is followed by a table that shows the population, water use, and water availability for each of the LWSP systems included in the summary discussion for that basin. The columns entitled "Demand as % of Supply" show the Demand/Supply ratios for each system as a percentage of available supply, based on demand and supply data provided in the 1997 LWSPs. Available supply

was calculated by adding the available supplies from 12-hour well yield, surface water safe yield, and total purchase contracts and then subtracting total sales contracts. Systems that have 100% demand-to-supply ratios for 1997 are those that provided no contract amount for water purchases. For those systems, the amount of water purchased in 1997 was used as the amount available for purchase. Therefore, the system appeared to use all of its available supply in that year. Some systems have negative percentages listed in the table; these systems had sales contracts that exceeded their available water supply for regular use. DWR is working closely with these systems to resolve contract discrepancies.

Appendix B contains supplemental water supply planning information for each water system submitting a 1997 LWSP, listed by county. The first column after the system name indicates the status of each system's 1997 LWSP. The code used indicates whether the 1997 LWSP is complete, ready to adopt, draft, or if no plan was submitted by the system. A "Y" in the second or third columns indicates that average daily demand is greater than 80 percent of available supply in 1997 or 2010, respectively, for that system. A "Y" in the fourth column indicates the system answered yes to the question: "Are peak day demands expected to exceed the water treatment plant capacity by 2010?" The next two columns indicate whether or not a system has an active leak detection program or an ordinance in place to deal with water shortages during a drought. The right-most column on the page indicates whether or not the system currently relies on interbasin transfers for all or part of their water supply, including systems that purchase transfer water from another system.

Local Water Supply Plan information for each system can also be found on the DWR web site at: <http://www.ncwater.org>.

**Table 10-1. Summary of 1997 Local Water Supply Plan Information by River Basin**

Major River Basin	# of systems using water from basin	1997 population served using water from basin	1997 water use from basin (MGD)	1997 Per Capita Use based on total system use (gallons/person/day)	Available Supply (MGD)		# of systems with Demand > 80% of Supply			Projected Growth from 1992 to 2020		Supply needed by 2010 to keep demand less than 80% of supply (MGD)	# of systems planning additional supplies
					Ground water	Surface Water	1997	2010	# with peak demand > treatment capacity by 2010	Population	Demand		
Broad	15	100,887	24.8	246	0.6	88	1	1	4	40%	63%	0.03	3
Cape Fear	125	1,367,084	217.8	159	63.6	418	21	35	19	65%	73%	37.56	32
Catawba	47	937,391	175.9	188	1.0	386	7	15	10	63%	58%	7.82	10
Chowan	21	41,851	5.3	126	13.6	0	2	3	1	16%	21%	0.22	4
French Broad	23	223,402	41.0	184	1.7	75	9	8	1	53%	40%	1.53	10
Hiwassee	4	9,070	1.8	200	0.3	13.8	2	2	0	37%	40%	0.29	2
Little	7	18,397	3.6	194	0.3	22.2	0	0	2	95%	114%	0	3
Lumber	37	169,685	32.5	192	40.4	20	4	5	5	50%	68%	2.07	9
Neuse	68	896,823	130.6	146	47.2	185	22	16	12	70%	70%	6.19	26
New	6	19,135	2.9	153	0.7	17.4	2	2	3	30%	76%	0.78	1
Albemarle	20	86,063	18.4	214	22.1	0.3	9	11	9	49%	59%	6.64	9
Roanoke	36	123,889	29.0	234	7.2	113	5	4	2	38%	55%	0.41	9
Tar- Pamlico	43	205,776	39.2	191	11.5	72	8	15	7	76%	55%	2.45	18
Watauga	5	3,784	0.7	184	0.7	1	1	0	0	63%	87%	0	2
White Oak	8	22,538	3.3	148	8.8	0	1	1	0	38%	66%	0.01	4
Yadkin	68	803,281	148.0	184	2.4	744	17	23	11	43%	49%	2.83	18