Water Supply Planning: Current and Future Water Demands

Pee Dee River Basin Council Meeting

August 23, 2022

Water Supply Planning: Current and Future Water Demands

- Statutory Requirements
- Water Use Registration
- Water Use Management
- Yadkin River Basin Water Use Demand and Outlook
- Challenges
- Q&A

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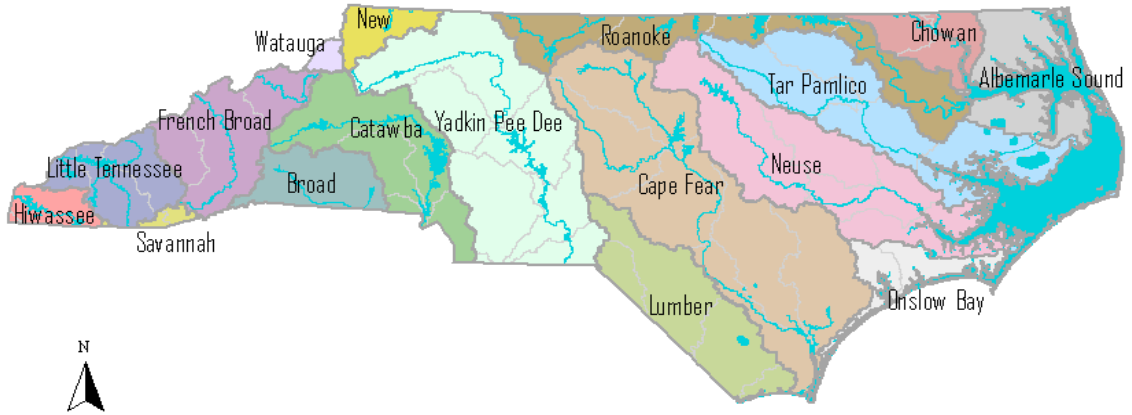
Water Supply Planning

- Assures the availability of adequate supplies of good quality water to protect public health and support economic growth.

- Water supply planning and management requires an understanding of both available water resources (sources of supplies) and demands being placed on those resources.



Water Use Permitting & Registration

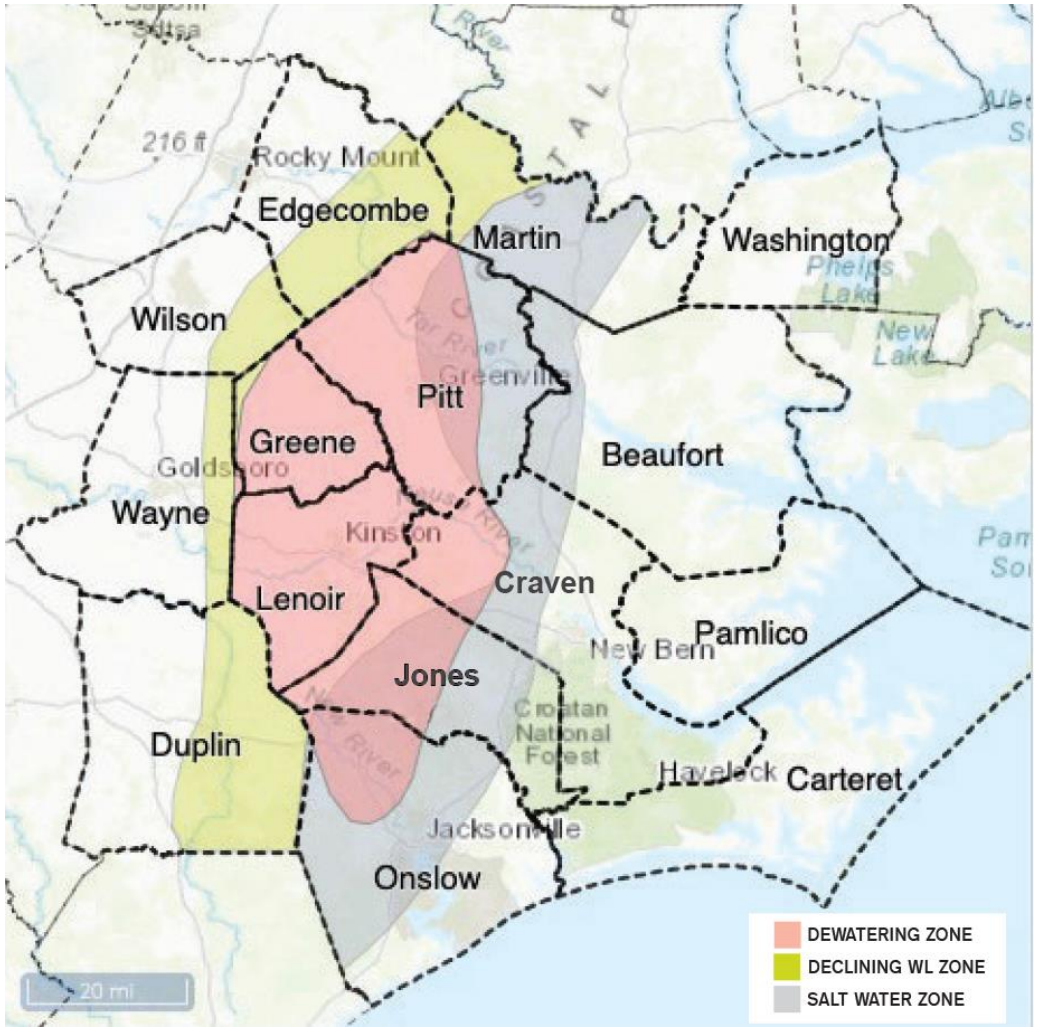
- **No State-wide Water Use Permitting Program**

- **Limited Regional Permitting**
  - Central Coastal Plain Capacity Use Area (CCPCUA)
  - Eno River Management (Voluntary)

- **Only State-wide Water Use Registration**
  - Local Water Supply Plan (LWSP)
  - Water Withdrawal Registration (WWR)

Central Coastal Plain CUA

- Covers 15 eastern Counties in NC
- Intended to prevent “de-watering” & salt water encroachment in aquifer
- Registration required for withdrawals > 10,000 gpd
- Permit required for withdrawals > 100,000 gpd
- 54 active registrations at this time
- 320 active permits at this time
- Phased reduction of withdrawals were mandated for some water users
- 2018 was the last phase of 3 reductions from 30-75% from initial base rate



Local Water Supply Planning

- Law was established in 1989 by §143-355(l)
- Requires all unit of local governments and large community water systems to prepare a Local Water Supply Plan (LWSP)
  - Applies to systems with >1000 connections or >3000 people

Water Withdrawal Registration Program

- Law was established in 1991 by §143-215.22H
- Agricultural users > 1,000,000 gallons any single day
- Non-agricultural users > 100,000 gallons any single day
- Registered water users have until April 1st to report water usage for the previous year
- Completing the Agricultural Water Use Survey does not fulfill this reporting requirement > 1 mgd

Agricultural Water Use Survey

- **Session Law 2008-143**
- Prior to 2008, no official data set to represent agriculture existed
- Required NCDACS – ASD to collect annual information
- Required for entities that withdraw 10,000 gpd or more in any one day
- Surveys remain confidential & combined with other reports to produce totals
- 9th statewide survey

Data from 2020 NC Agricultural Water Use Survey, NCDACS-ASD

Water Use Management

- Water Users
  - Agricultural
  - Domestic
  - Energy
  - Industrial
  - Mining
  - Public Water Supply Systems
  - Recreational (Golf, Snow making, Water sports, etc.)
  - Aquatic Wildlife, Habitat, and Associated Floodplain
- Future Water Users

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Basinwide Hydrologic Models

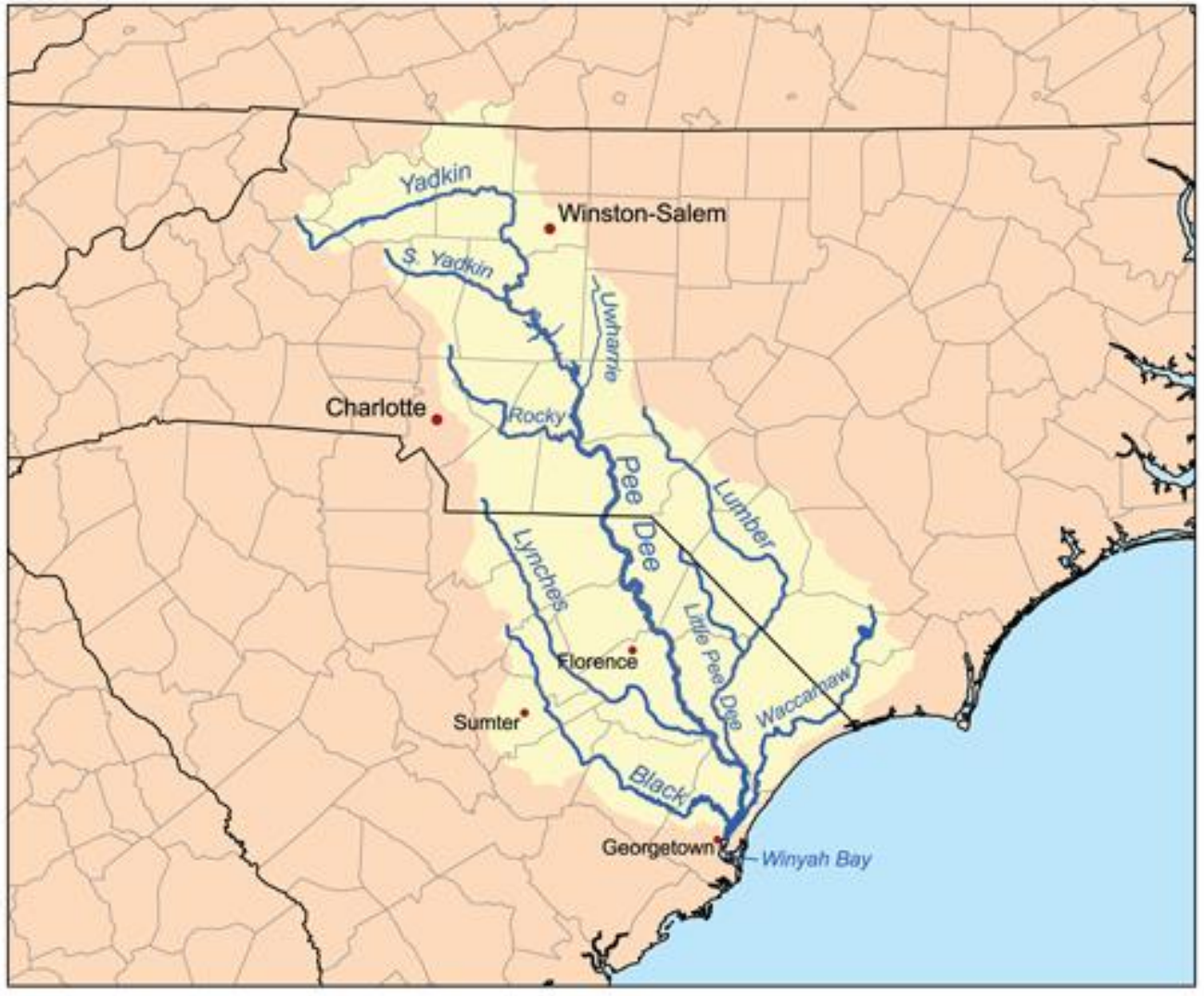
Requirements:

- GS 143-355(o) – Subsection was created by S.L. 2010-143
- The model shall specifically be designed to predict the places, times, frequencies, and intervals at which any of the following may occur:
  - Yield may be inadequate to meet all needs.
  - Yield may be inadequate to meet all essential water uses.
  - Ecological flow may be adversely affected.
- OASIS – Operational and Simulations of Integrated Systems
- A patented, mass balance, water resources simulation/ optimization model
- Limitations – Do not include water quality or groundwater systems

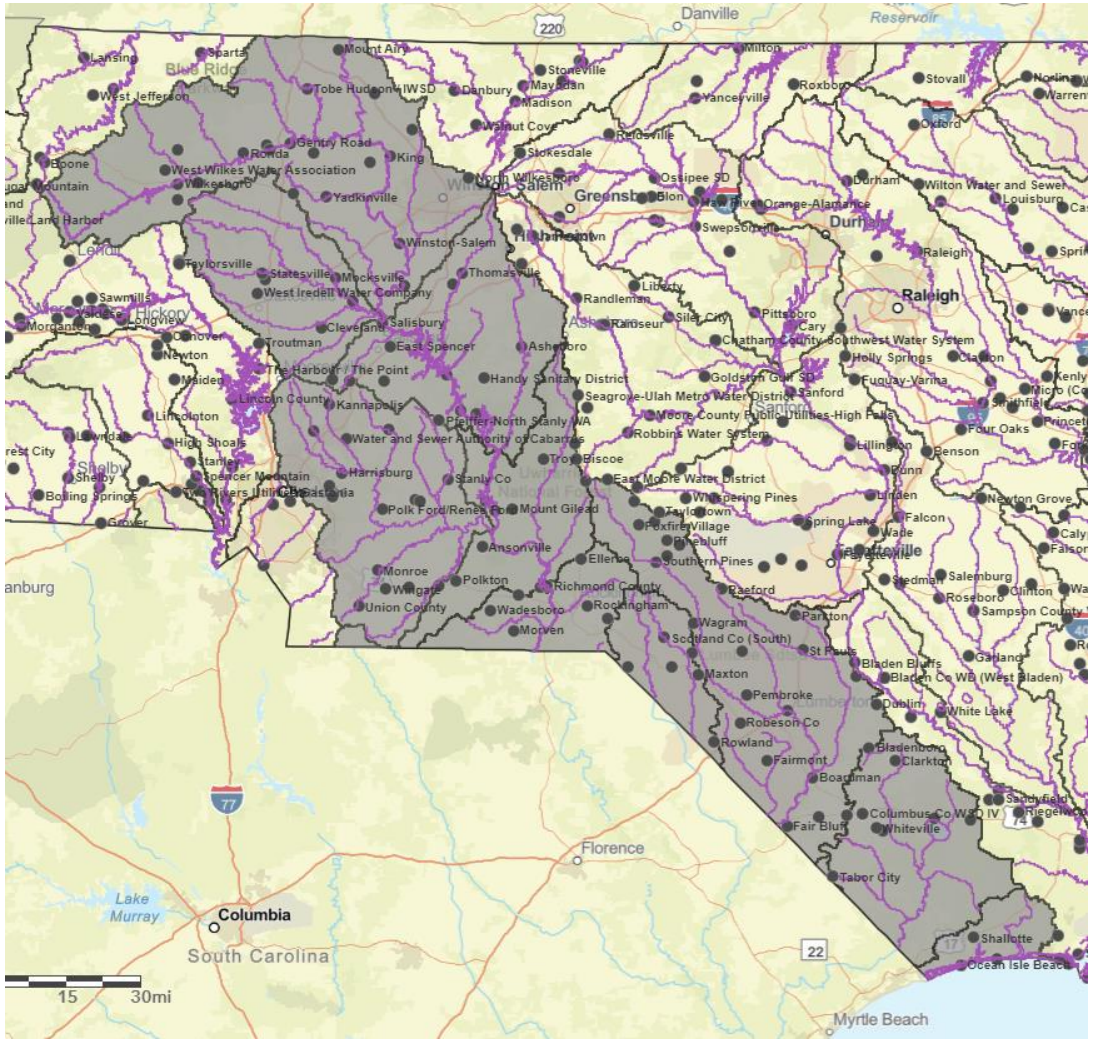
Drought Planning

- Minimize harmful impacts of drought and water supply emergencies on public health and safety, environmental quality, and the economy.
- Establish minimum standards and practices for:
  - water shortage response planning,
  - water use reporting,
  - water conservation, and
  - water reuse during droughts and water supply emergencies.
- Rules governing water use during droughts and water emergencies
- New Water Withdrawal Reporting

Yadkin Pee Dee River Basin



Yadkin River Basin



Water Systems in the Yadkin River Basin

Type	Water Systems	County	Service Area Population 2020
LWSPs	71	21 Counties	1,197,266
CWSs (LWSPs not required)	243	21 Counties	51,185
		Total Population	**1,248,451**

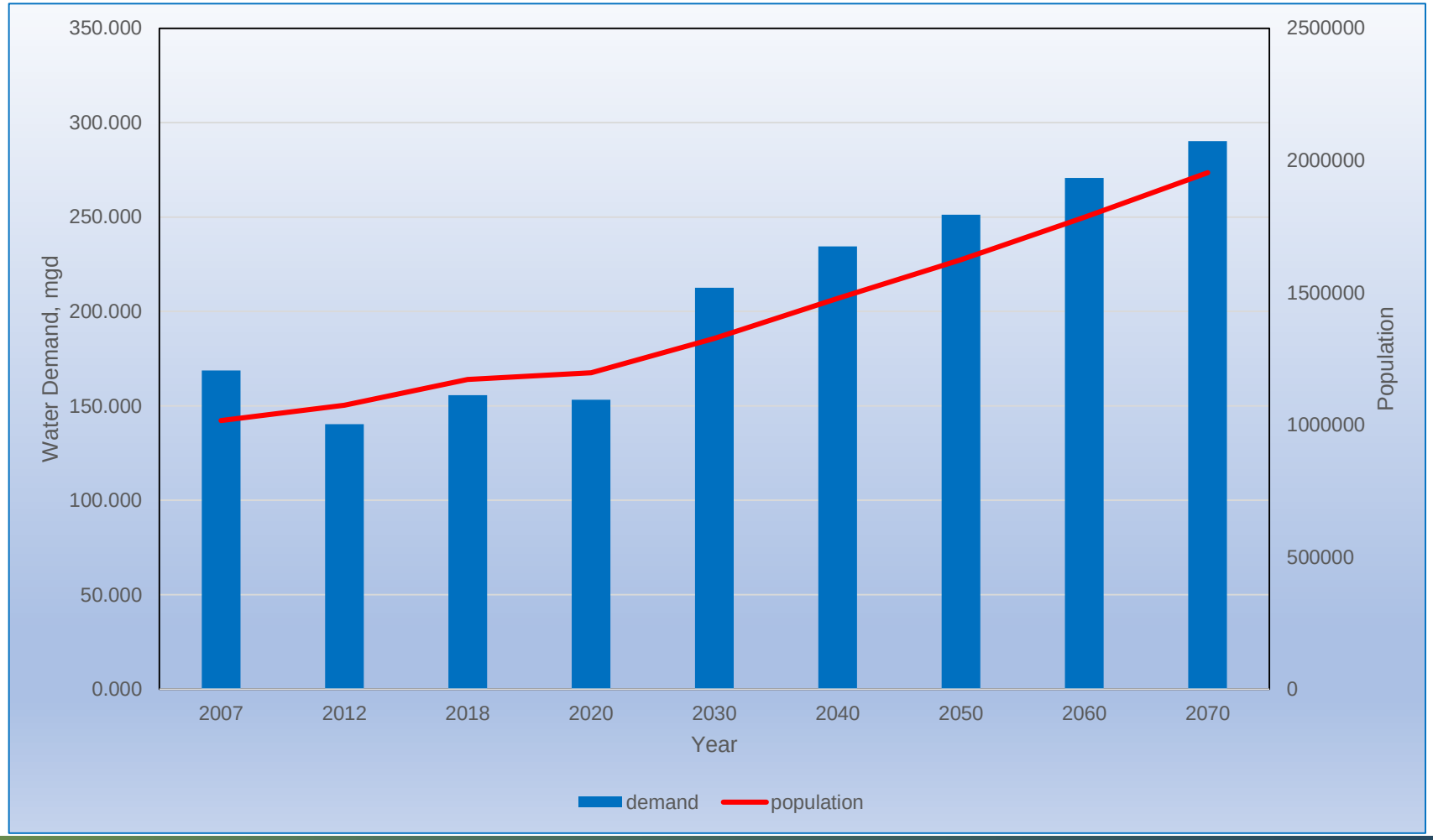
Population, Demand and Supply

2007 - 2070

Year	Population	Demand	Supply	%Demand vs. Supply
2007	1,015,986	168.764	555.364	30.4%
2012	1,073,601	140.313	659.388	21.3%
2018	1,171,545	155.657	766.184	20.3%
2020	1,197,266	153.284	752.779	20.4%
2030	1,327,084	212.526	794.901	26.7%
2040	1,478,043	234.433	800.086	29.3%
2050	1,624,310	251.184	806.086	31.2%
2060	1,784,769	270.758	808.086	33.5%
2070	1,953,989	290.198	808.086	35.9%

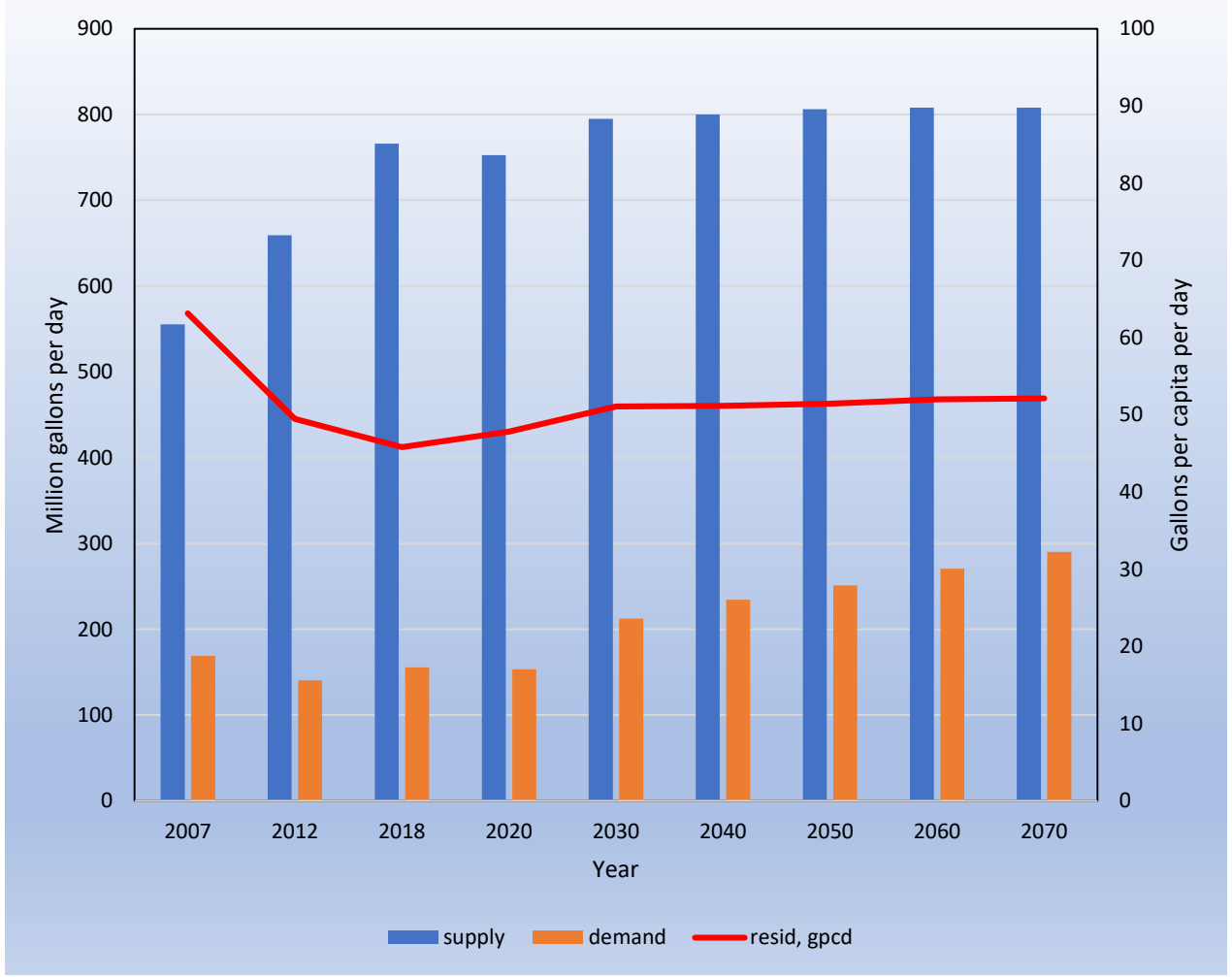
Water Demand & Population

2007-2070



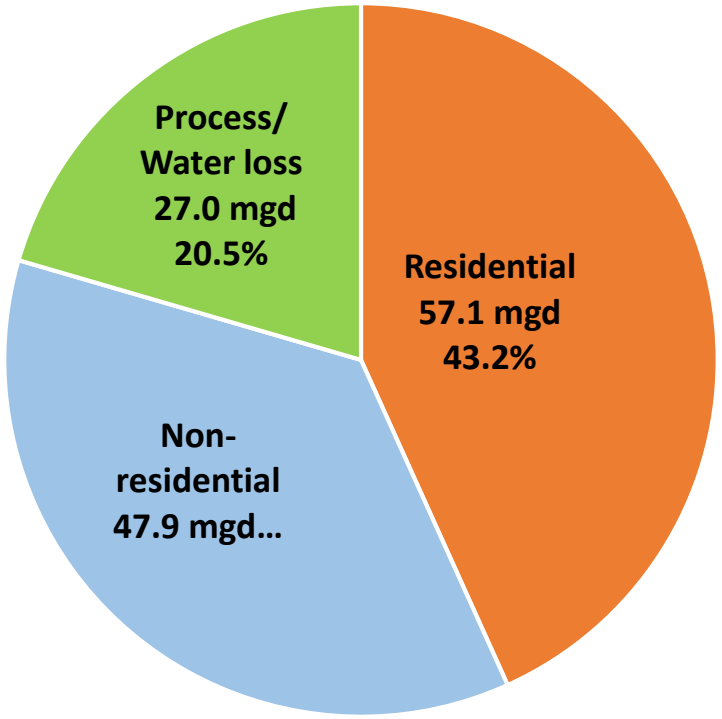
Supply, Demand and Residential use rate

2007-2070



Water Demand by Category

(2020 LWSP data)



Total demand = 132.0 mgd

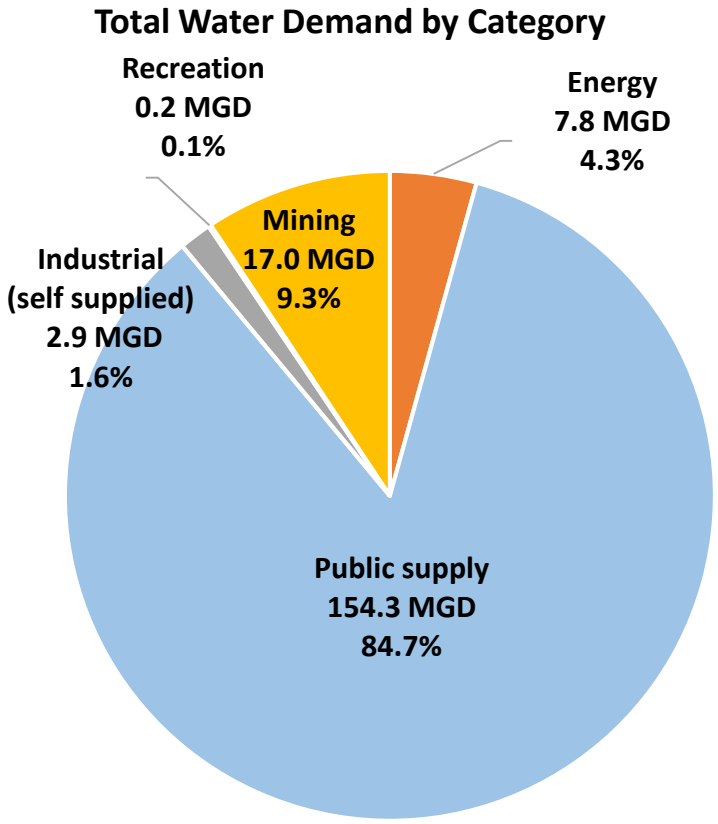
WW&TR Water Use and Sources

2020

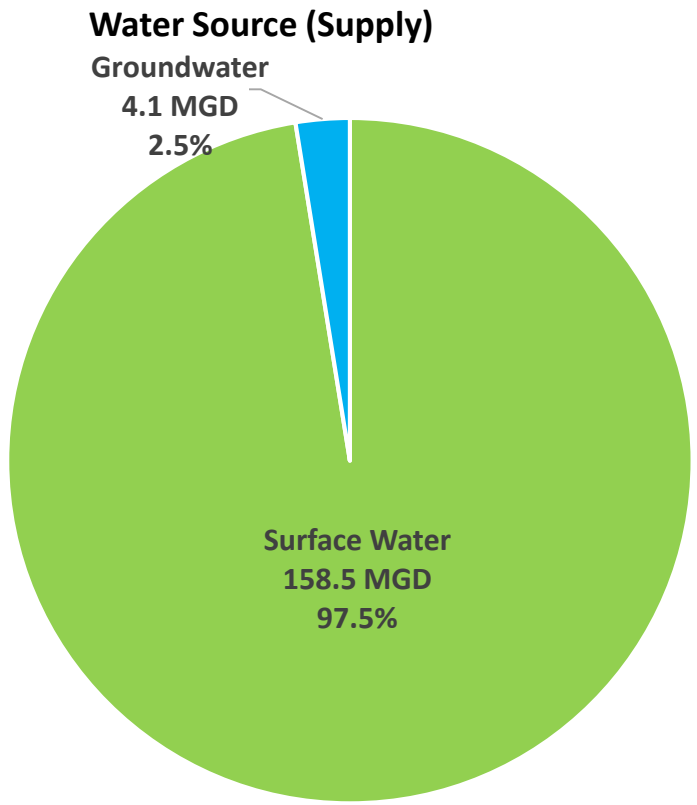
WW&TR Category	Total Use (mgd)	Surface Water (mgd)	Ground Water (mgd)	Number of Facilities	Total Ground & Surface Water Sources
Energy	7.838	7.838	0.000	5	6
Mining	16.950	7.665	9.285	24	28
Industrial	2.931	2.787	0.144	4	8
Public Water Supply	0.988	0.000	0.988	100	188
Recreation	0.226	0.215	0.011	8	17
Total	28.933	18.505	10.428	141	247

Water Demand by Use Type*

2020



Total demand = 182.2 MGD



*Includes both LWSP & WW&TR data

Challenges to NC Water Supply Planning

NC Water Law – Riparian Rights State

- No comprehensive plan for water quantity management in NC
- No federal oversight of / nor federal requirements for water quantity management
- No permitting program

- **Pros**
  - Less government regulation & permitting
  - Equal right to the water for all “reasonable use”
- **Cons**
  - No plan to ensure availability of water for future water supply, agriculture, industry, continued economic growth, & ecological health on NC’s water bodies
  - Courts would have to make the determination of reasonable use

Challenges to NC Water Supply Planning

- Lack the ability to plan and manage all water uses
  - Water use must be reported (especially large users)
  - Need better agricultural data
  - Need to consider Ecological flows (Instream uses)
- Difficult to quantify availability of water supply
  - How much surface water will be available?
  - How much ground water will be available?
- Coordination between water users

Water Supply Planning or Drought Response?

Manage our limited water supply for sustainability…

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