



SC DEPARTMENT *of*
**ENVIRONMENTAL
SERVICES**

Groundwater Demand and Projected Use in the Santee Basin

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Bureau of Water, South Carolina Department of
Environmental Services

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Santee River Basin Council

Meeting #5

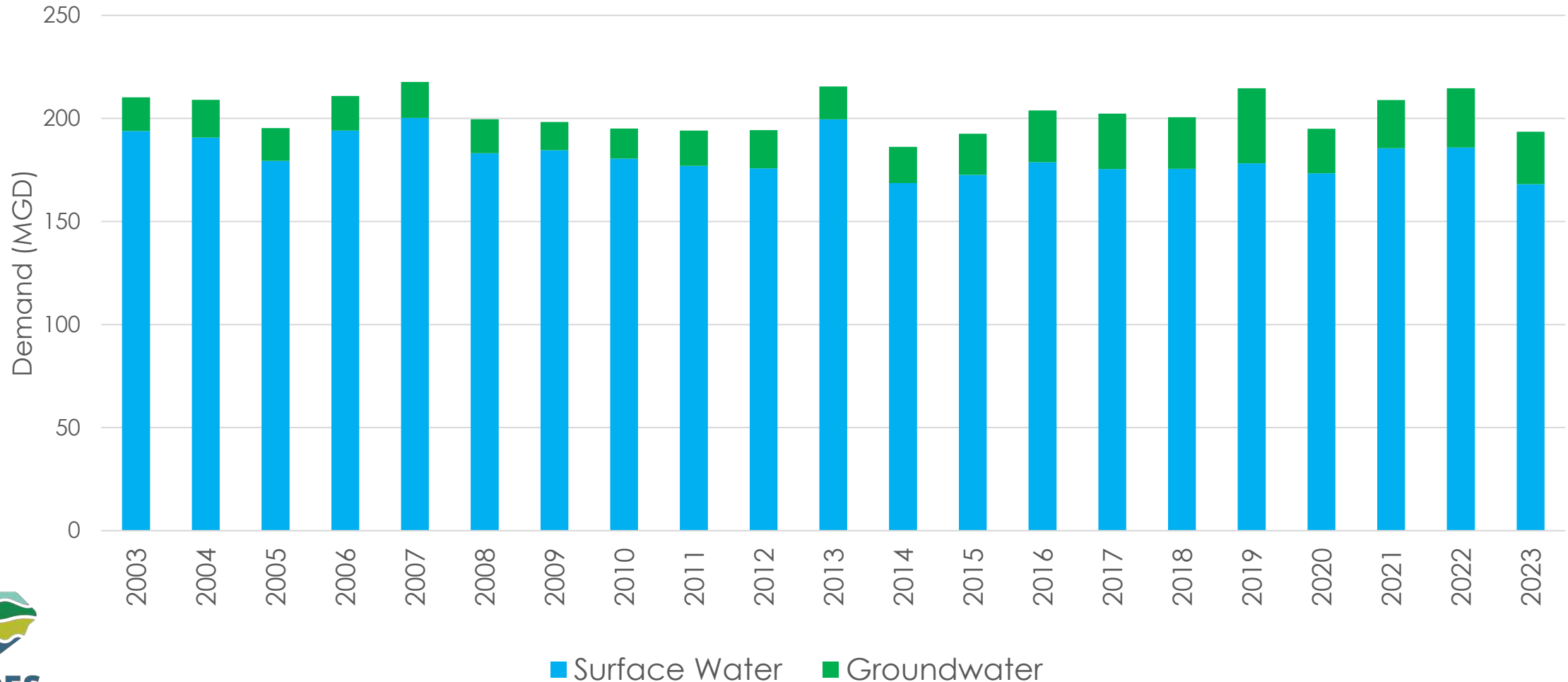


Reported Water Withdrawals (2003 – 2023)

Santee Basin



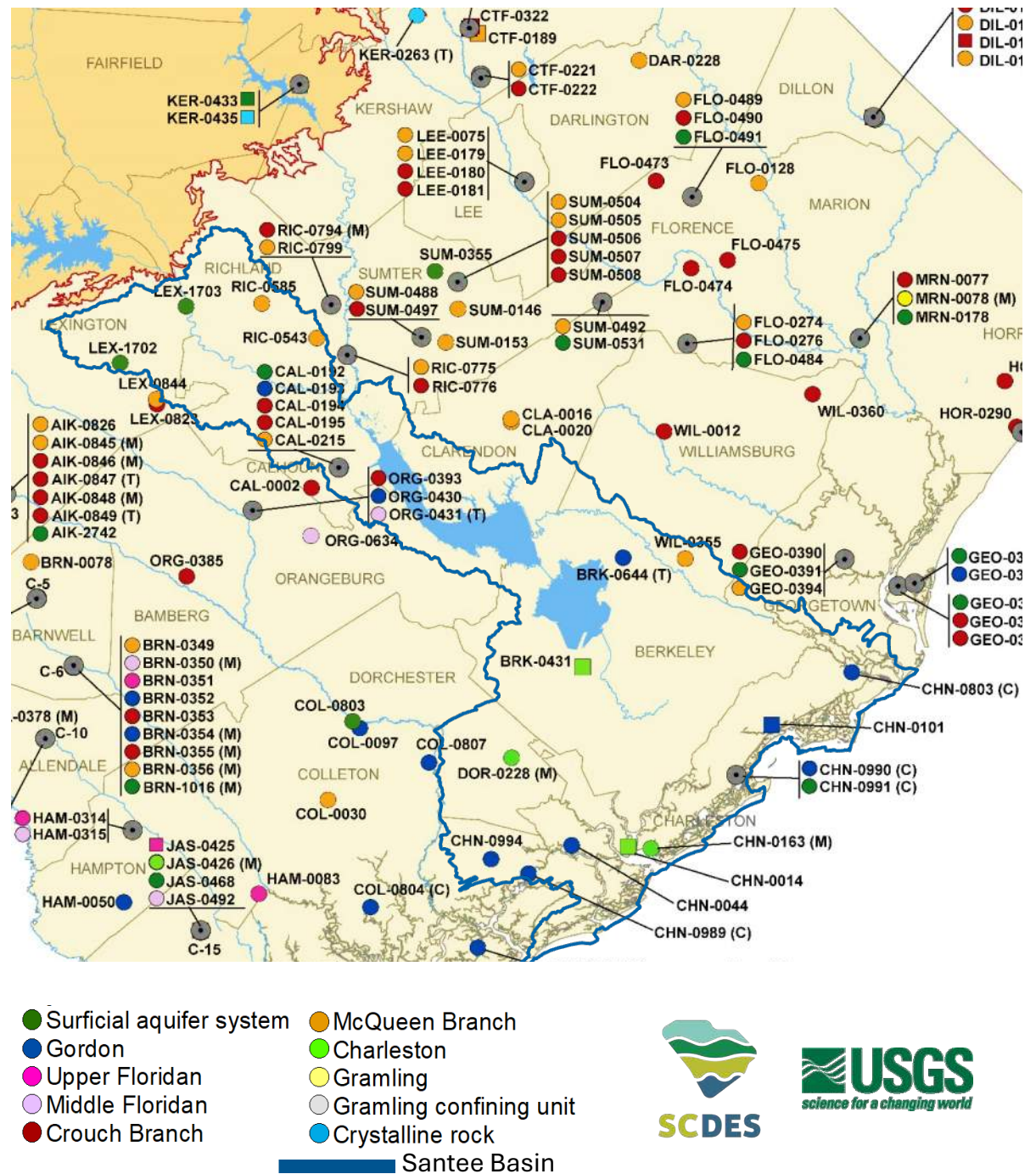
Total Reported Water Withdrawals (Excluding Energy)



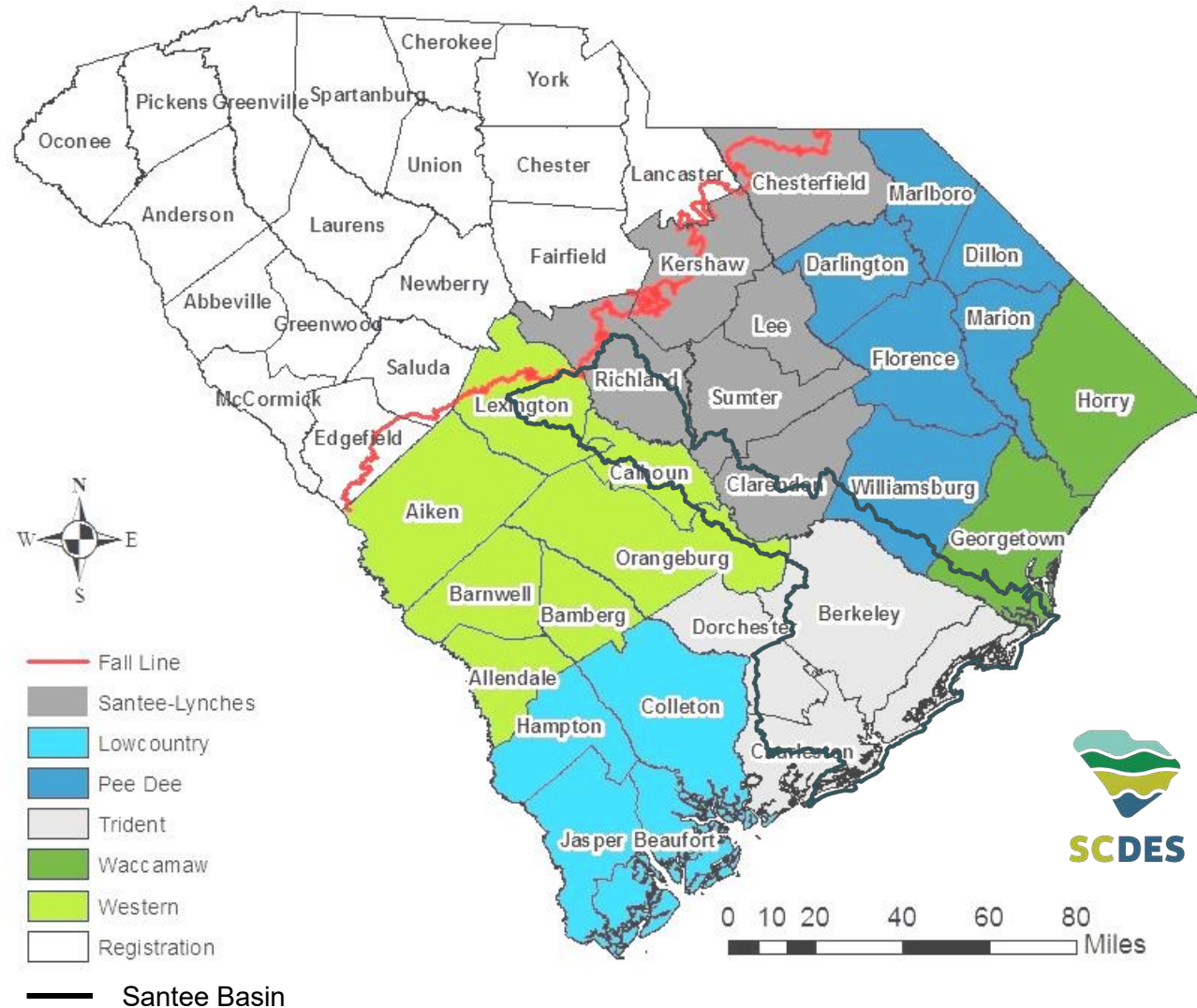
Groundwater Evaluation

- Historical and Current Reported Groundwater Use
- Groundwater Monitoring Network data
- Potentiometric Surface Maps
- Capacity Use Area Groundwater Evaluation Reports
- Groundwater Demand Projections evaluations by water use sector

Estimate the potential for impacts to groundwater resources based on reported groundwater use, aquifer water-level trends, and demand projections



Capacity Use Areas



Capacity Use Areas

Any user who uses 3 million gallons or more in any month of the year within a CUA is required to apply for a permit.

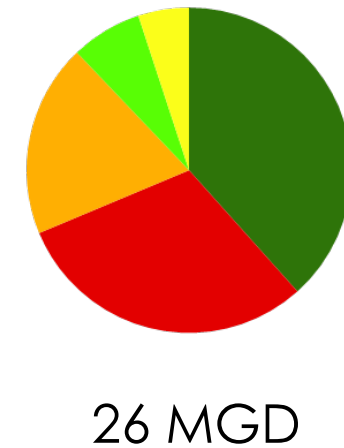
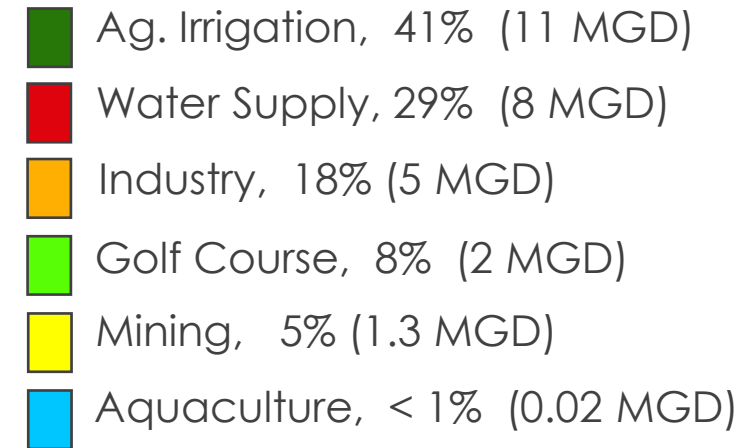
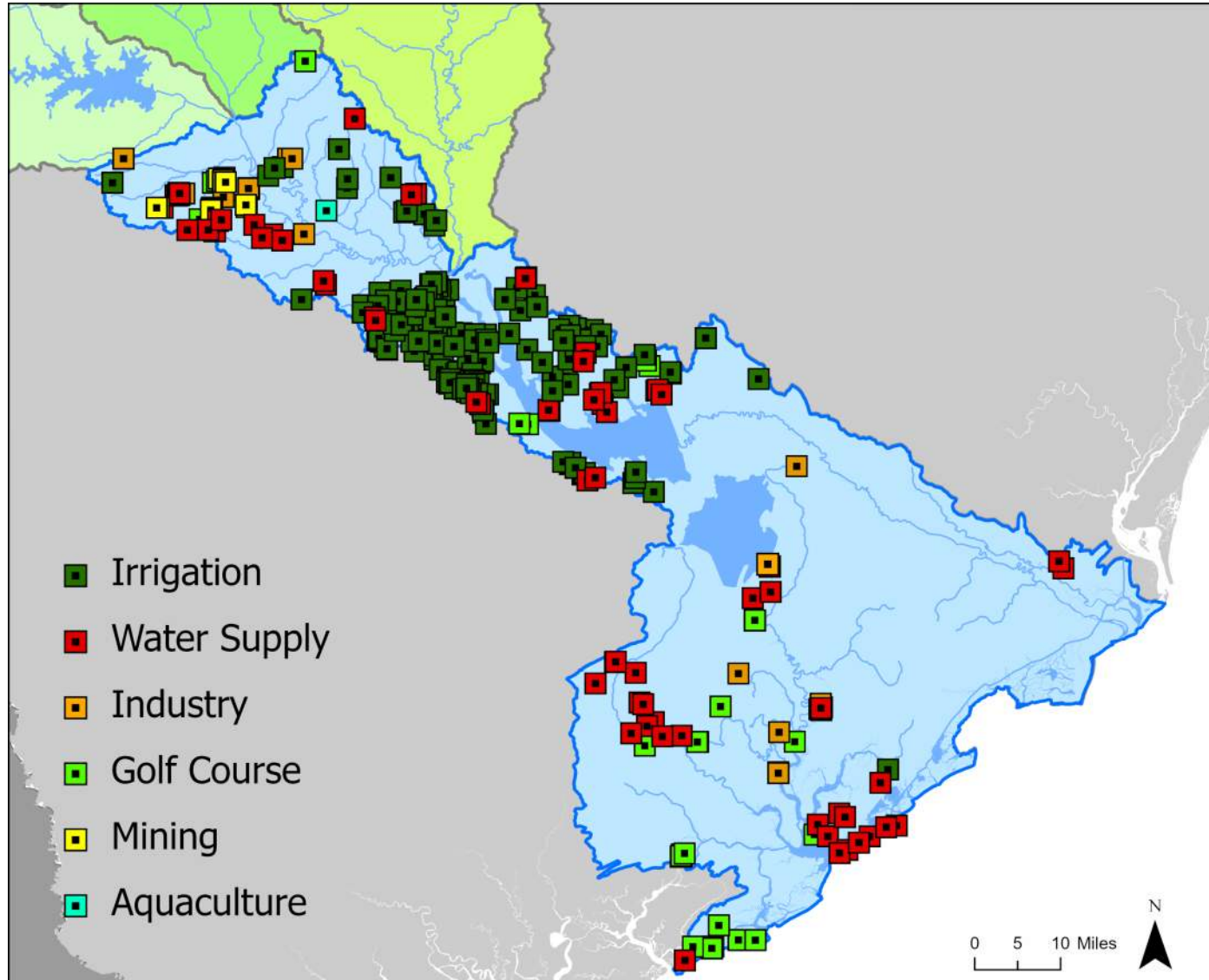
Water Use is evaluated on a 5-year basis in each CUA; recommendations are developed for CUA and aquifer for the next permit cycle.

Goal: Water management to ensure the sustainable and beneficial use of the resource

Recommendations can include;

pumping reductions, no new increases in certain aquifer, drilling to deeper aquifer, Pre-permitting groundwater model assessments, increased use ASR and/or conjunctive surface water use, increased monitoring

Reported Groundwater Lower Santee Water Use 2023

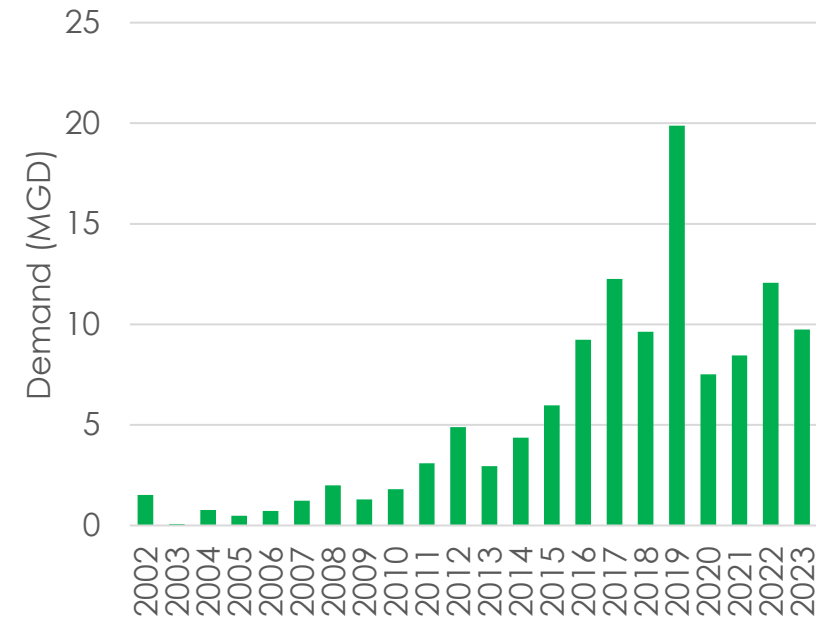


Basin-wide Reported Groundwater Withdrawal

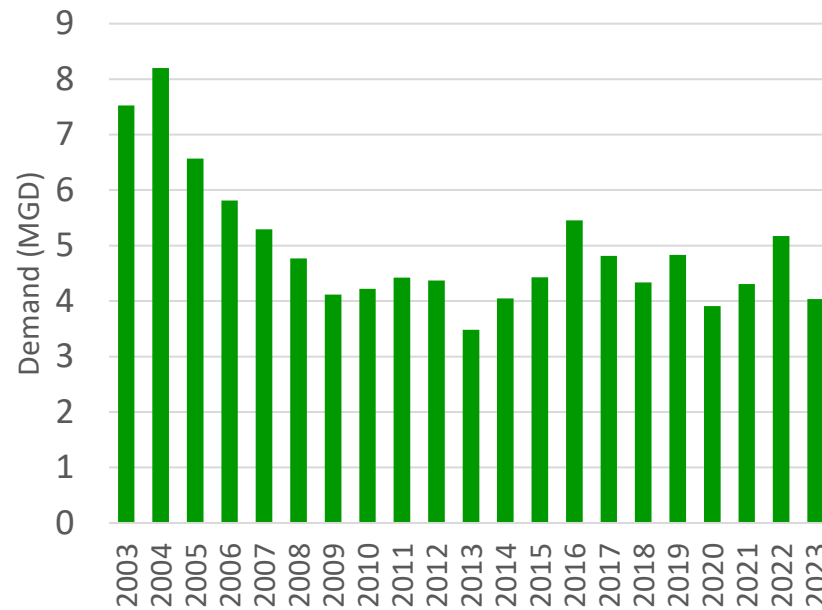
Santee Basin



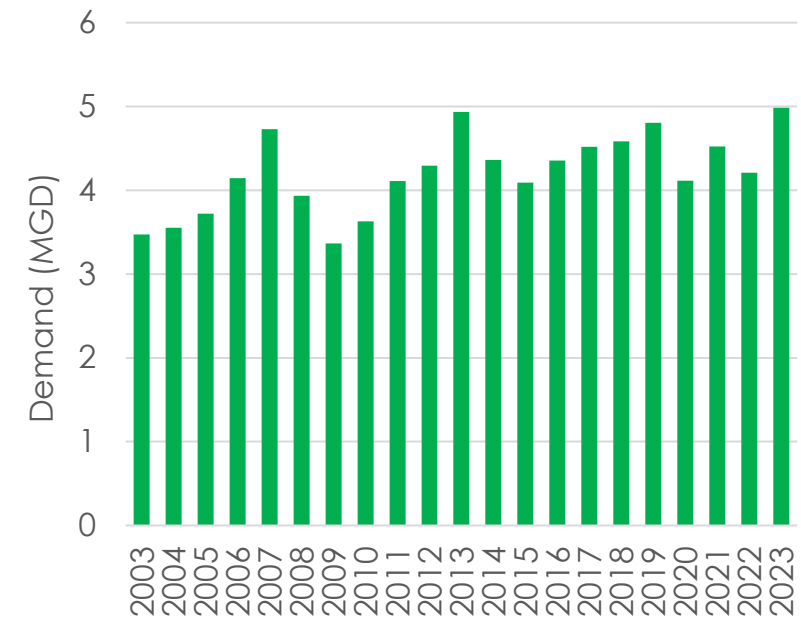
Agricultural Irrigation



Public Water Supply



Industrial Supply

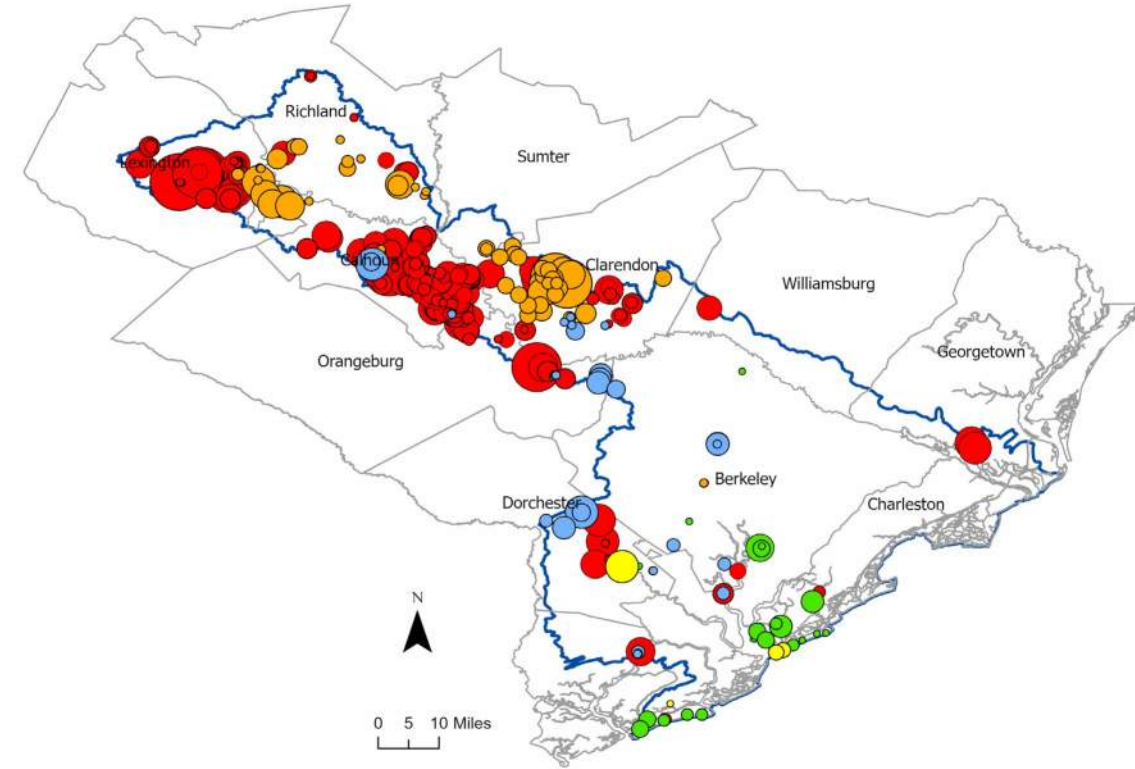


*note different y-axis values

Largest Groundwater Users Santee Basin



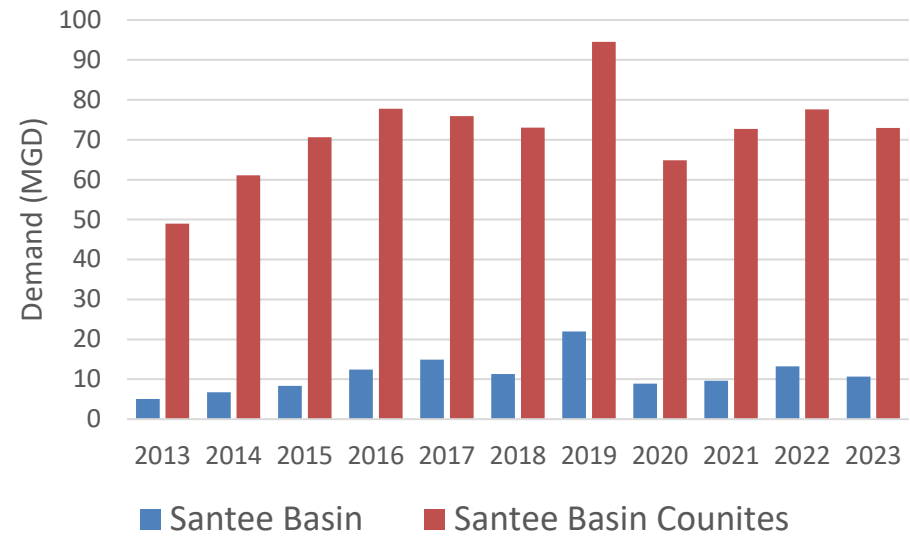
County	Category	Owner	Aquifer(s)	5-yr. Average (MGY)*	5-yr. Average (MGD)*
Charleston	WS	Mt. Pleasant Waterworks	Charleton	1383.2	3.8
Berkeley	IN	Nucor Steel Plant	Charleton	1012.5	2.8
Calhoun	IR	K&R Farms	Crouch Banch	657.0	1.8
Lexington	MI	Edmund Sand Mine	Crouch Banch	412.2	1.1
Lexington	IN	US Silica Company	Crouch Banch	407.3	1.1
Calhoun	IR	Palmetto Farm	Crouch Branch	406.5	1.1
Calhoun	IR	Kendall Wannamaker Farm	Crouch Branch	355.3	1.0
Clarendon	IR	Flowers Farm	McQueen Branch	346.4	0.9
Dorchester	WS	DCWA/Knightsville	Crouch Branch Charleston	240.7	0.7
Lexington	WS	Gaston Rural Community Water District	Crouch Branch	236.6	0.6



- ● Charleston/Gramling Aquifers
- McQueen Branch Aquifer
- Crouch Branch Aquifer
- Gordon Aquifer

* 5-Year average MGY/MGD 2019-2023

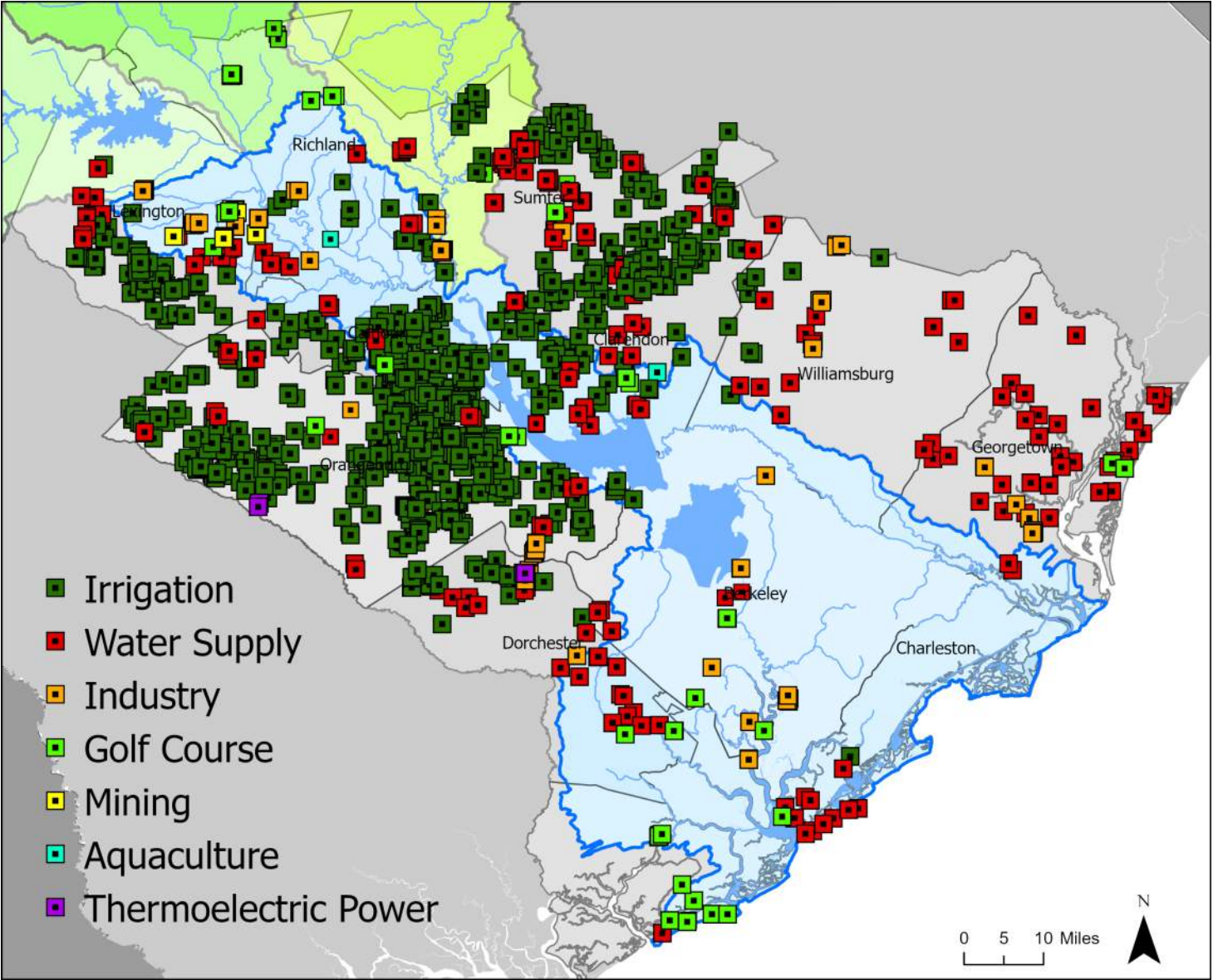
Santee Basin Groundwater Use vs. Santee Counties



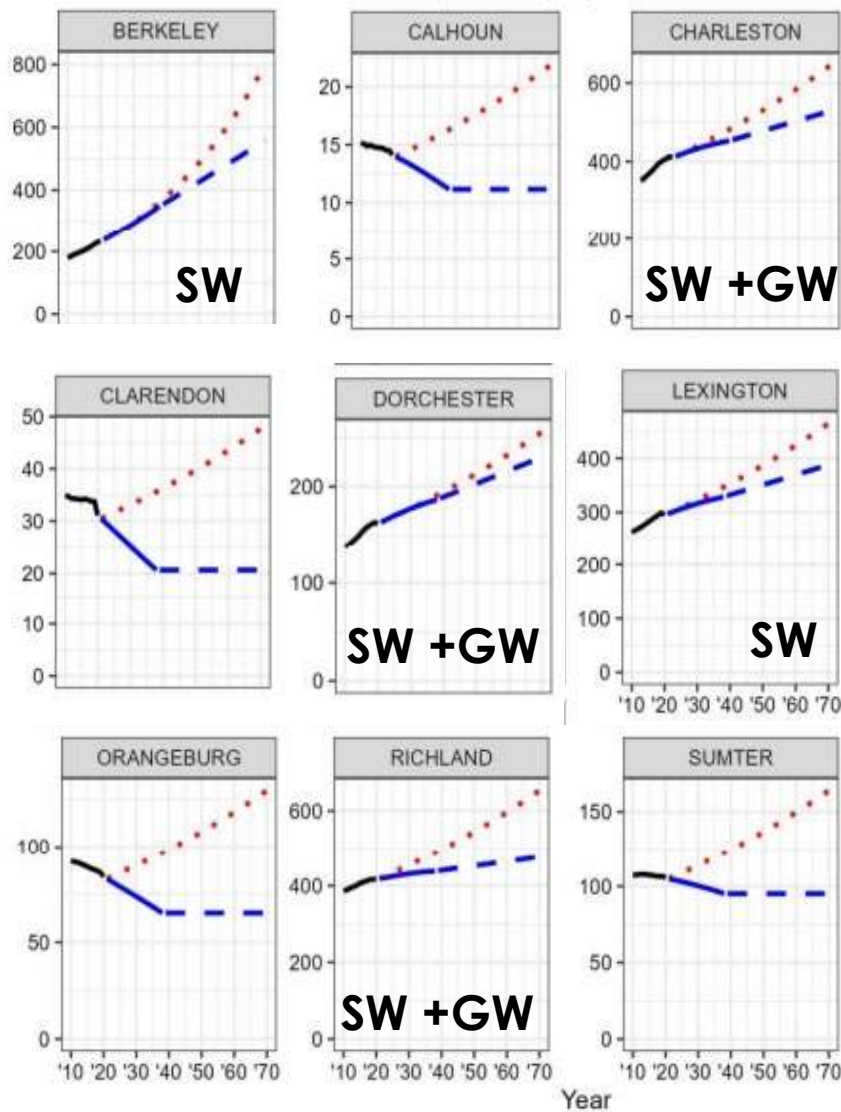
Santee Basin Boundary 83% Irrigation
 14% Water Supply

Santee Counties 60% Irrigation
 26% Water Supply

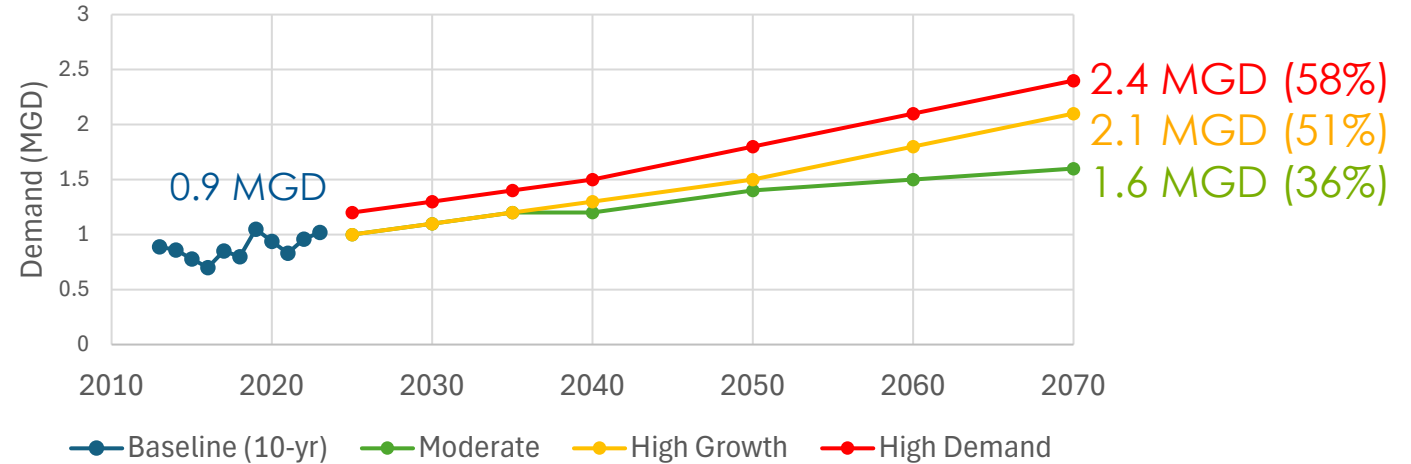
Calhoun, Clarendon, Orangeburg, Sumter



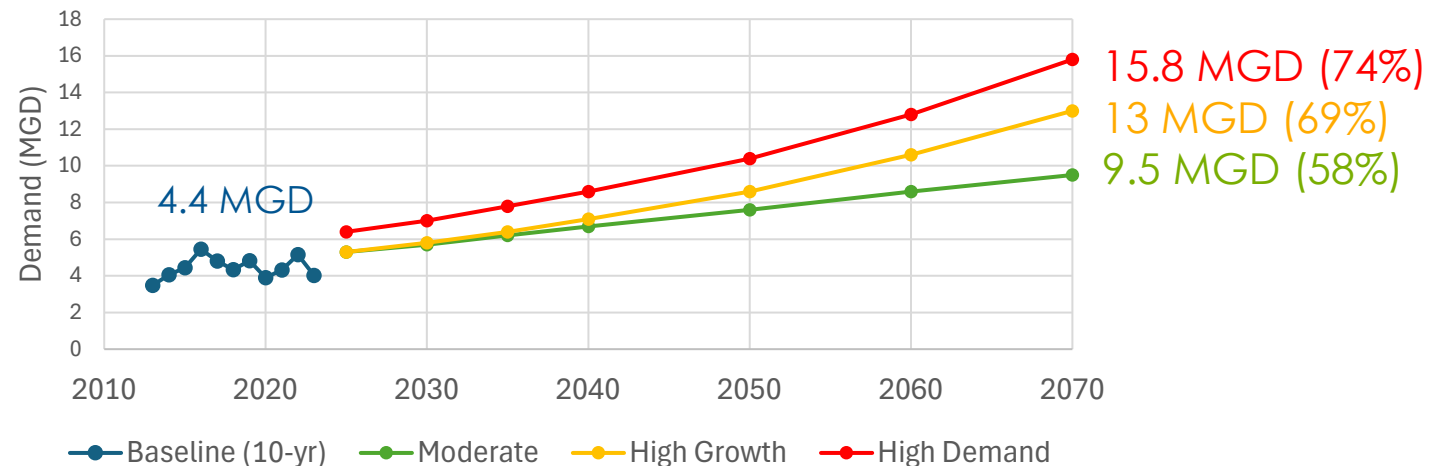
Population Projections and Public Water Supply



Dorchester County - Public Water Supply

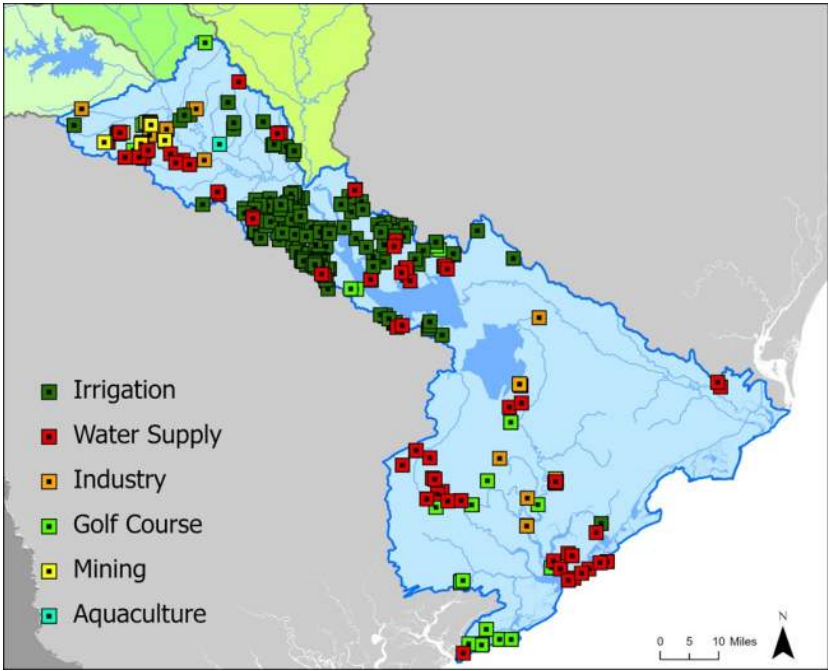
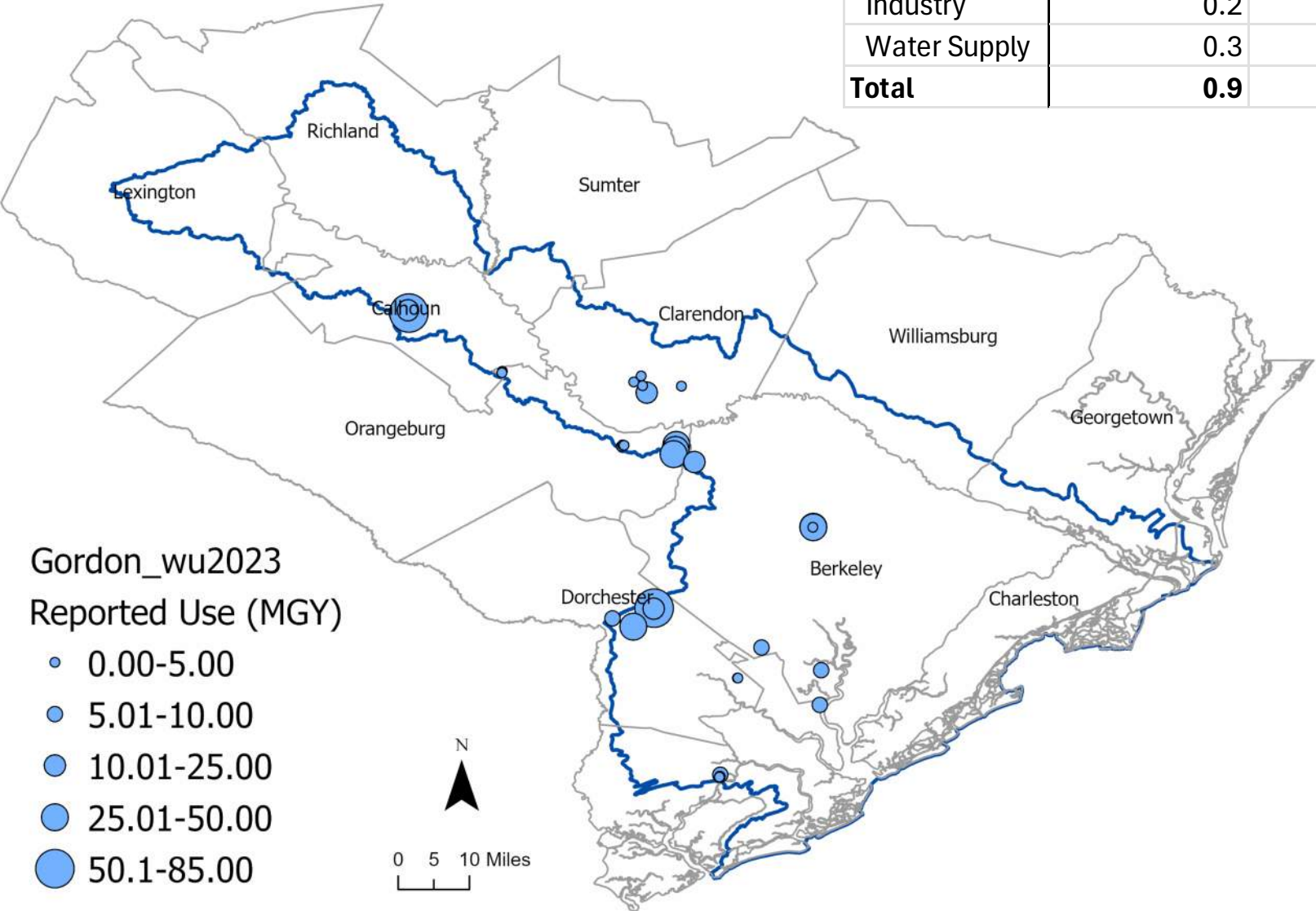
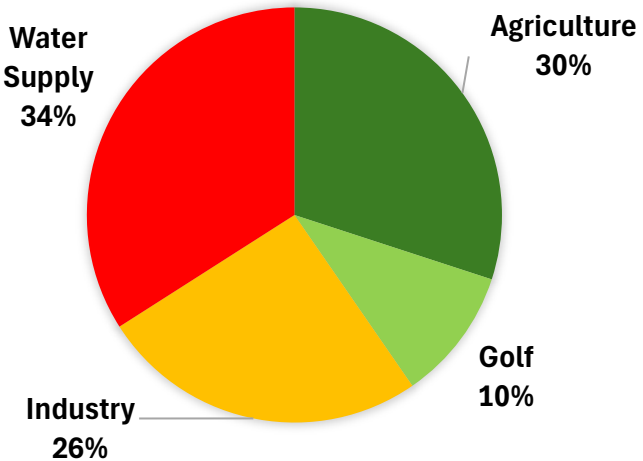


Charleston County - Public Water Supply



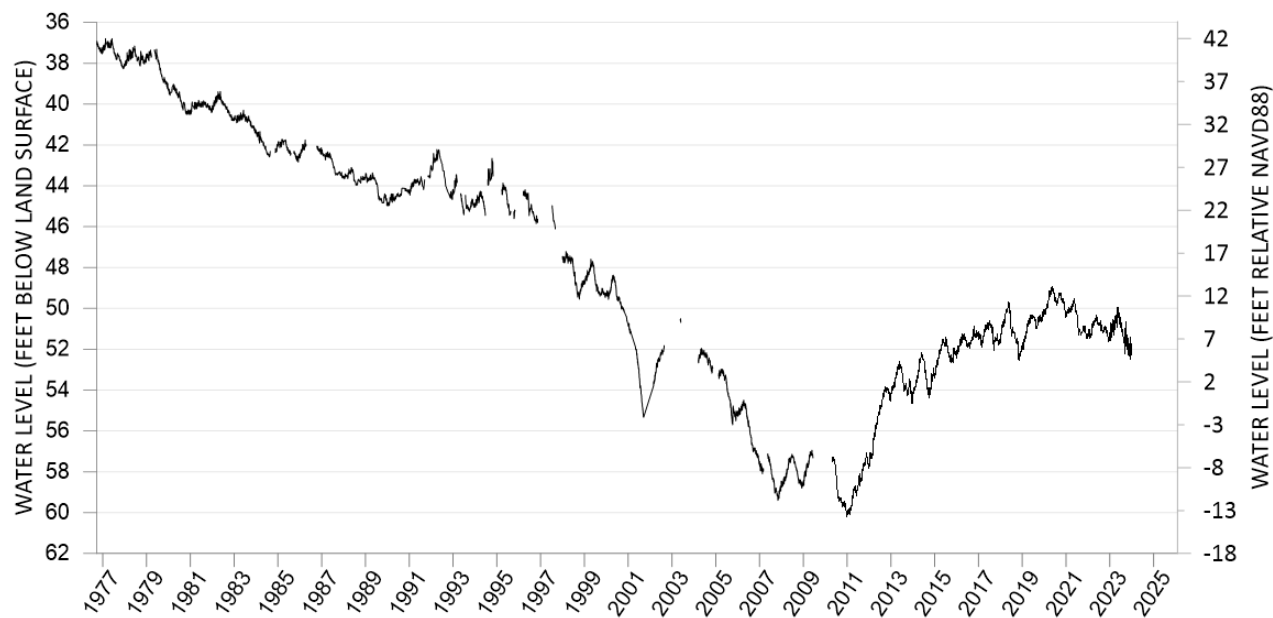
Gordon Aquifer

Gordon	5-yr Ave. MGD	5-yr Ave. MGY
Agriculture	0.3	103.7
Golf	0.1	35.8
Industry	0.2	88.3
Water Supply	0.3	117.5
Total	0.9	345.3



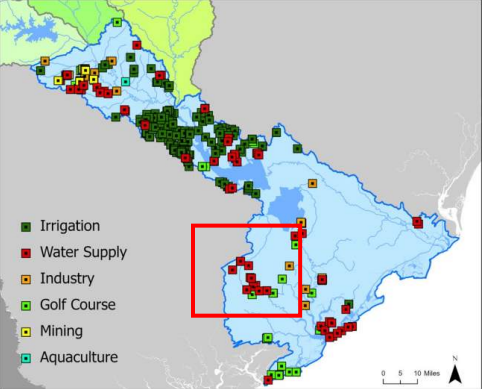
Gordon Aquifer near Ridgeville

COL-97

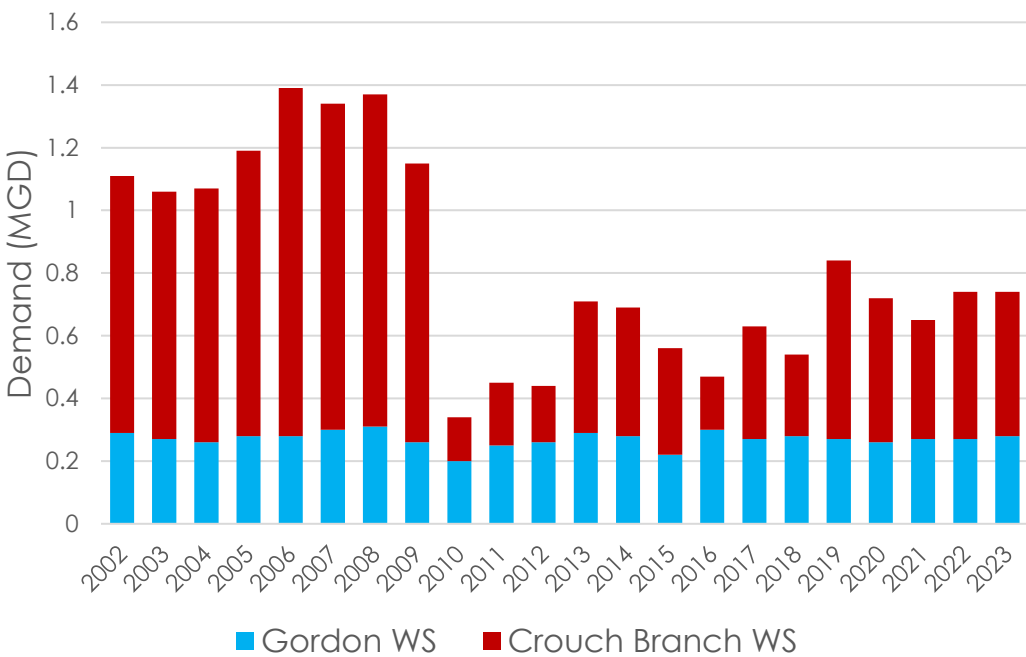


Aquifer: Middle Floridan/Gordon
Elevation: 80 ft
Depth: 342 ft
Open Hole: 134-342 ft

Surficial Aquifer: 0'
Middle Floridan Confining Unit: 58'
Middle Floridan Aquifer: 153'
Gordon Confining Unit: 198'
Gordon Aquifer: 270'
Crouch Branch Confining Unit: 485'

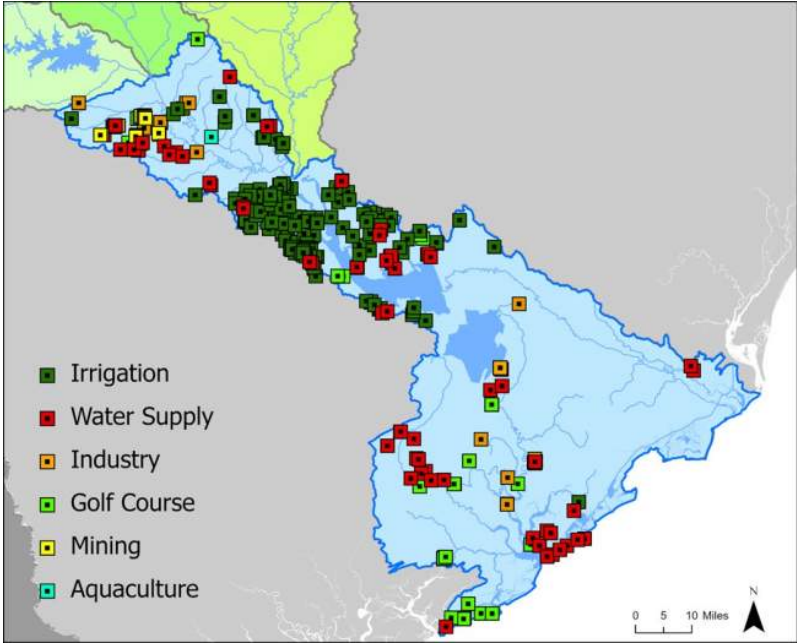
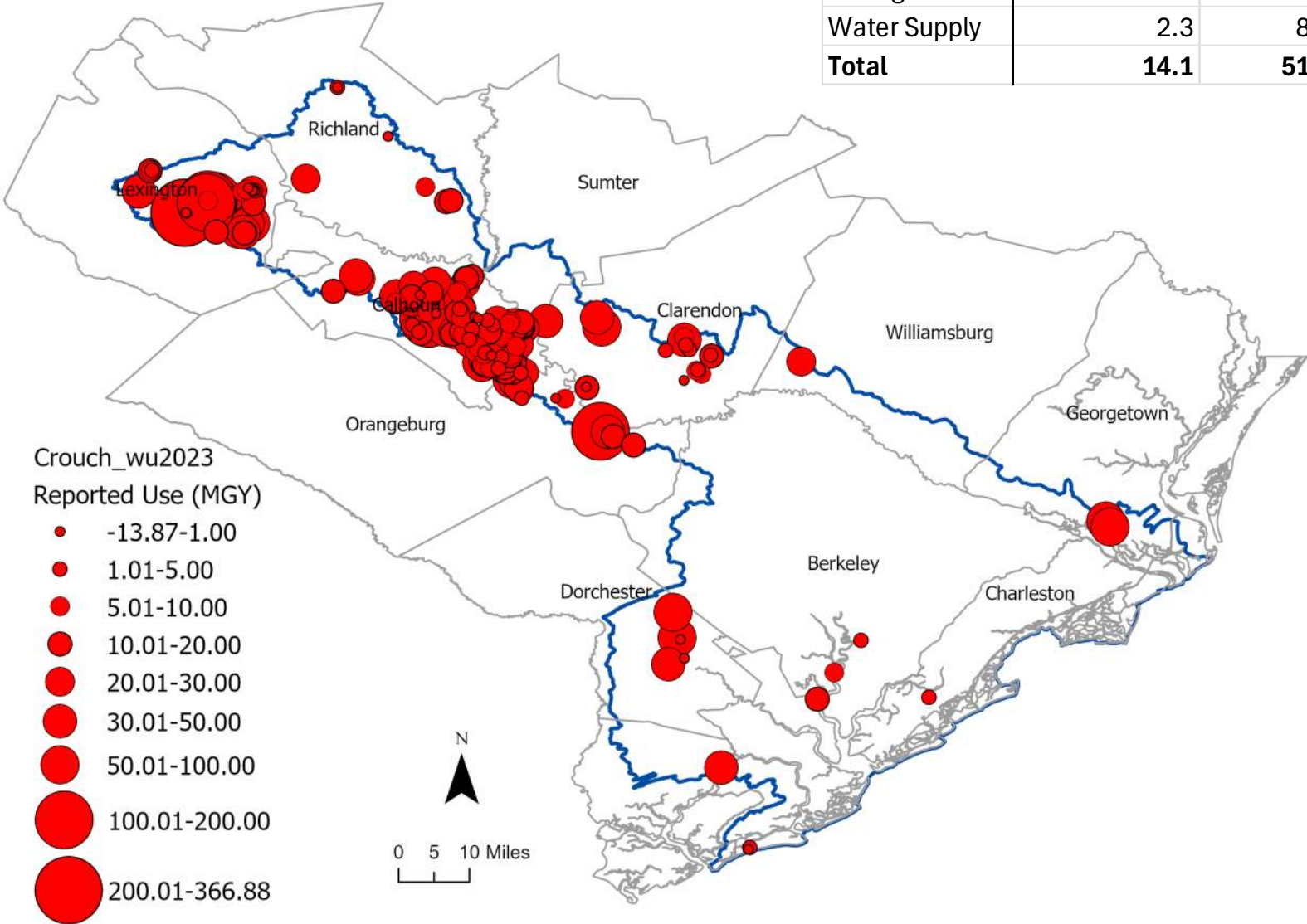
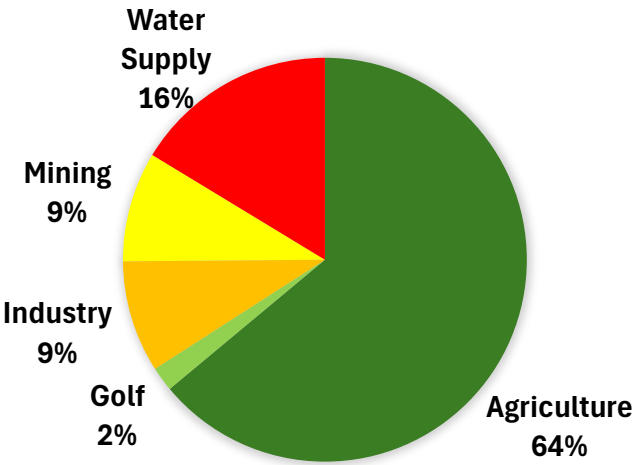


Dorchester County - Public Water Supply

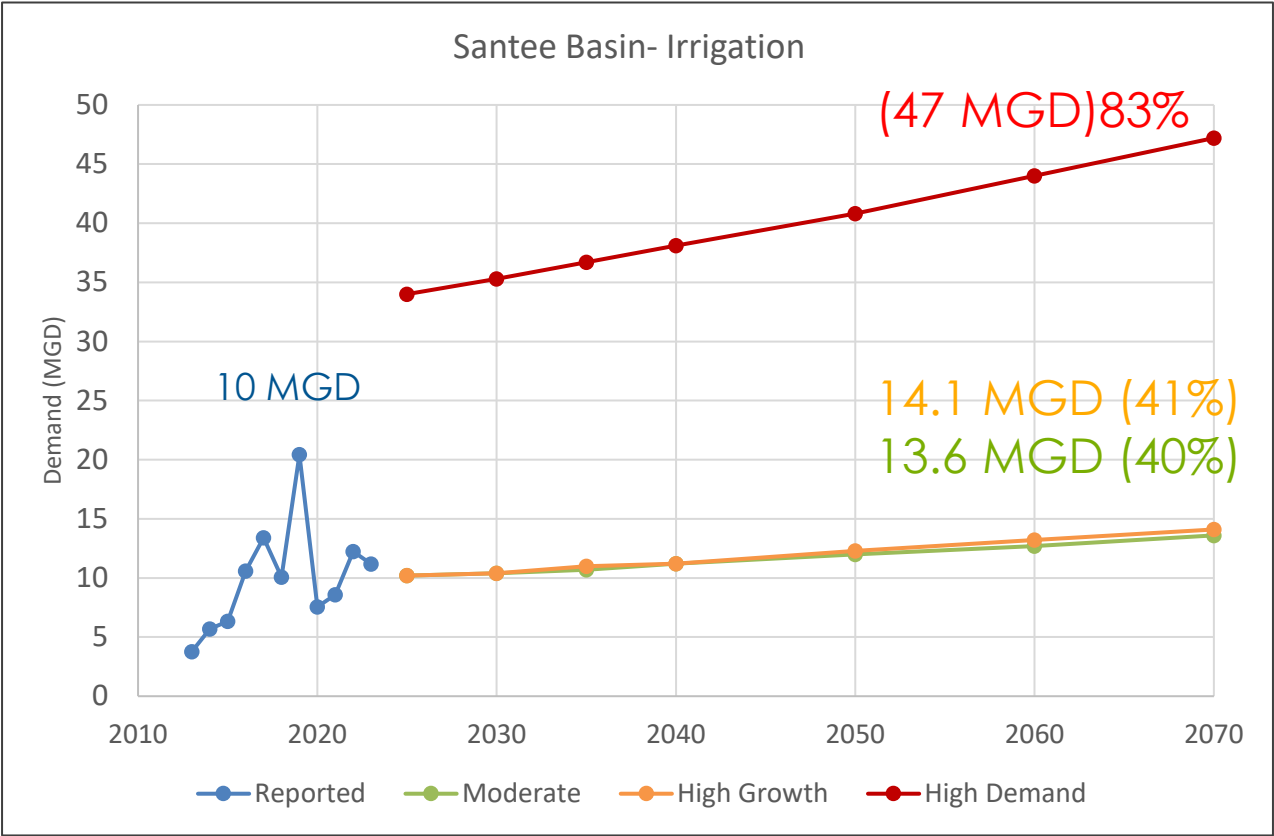
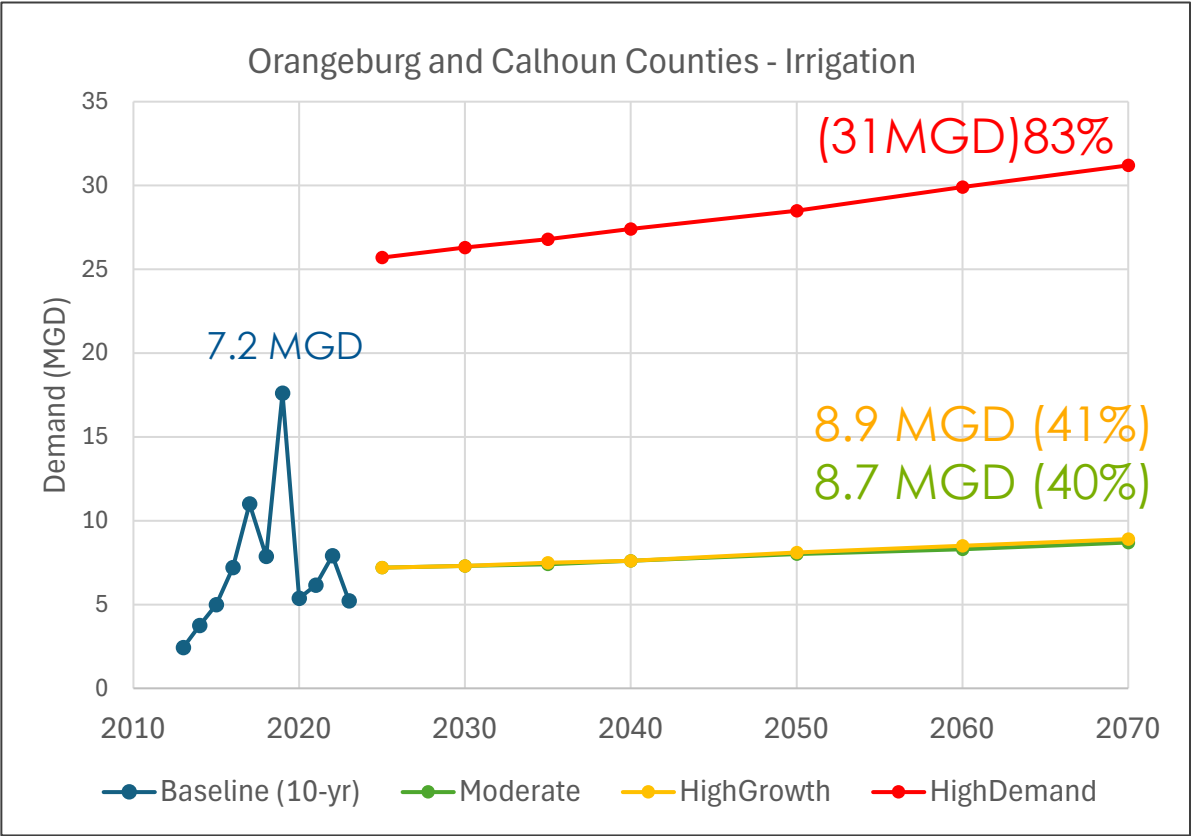


Crouch Branch Aquifer

Crouch Branch	5-yr Ave. MGD	5-yr Ave. MGY
Agriculture	9.0	3281.4
Golf	0.3	100.7
Industry	1.3	459.9
Mining	1.2	451.9
Water Supply	2.3	837.3
Total	14.1	5131.2



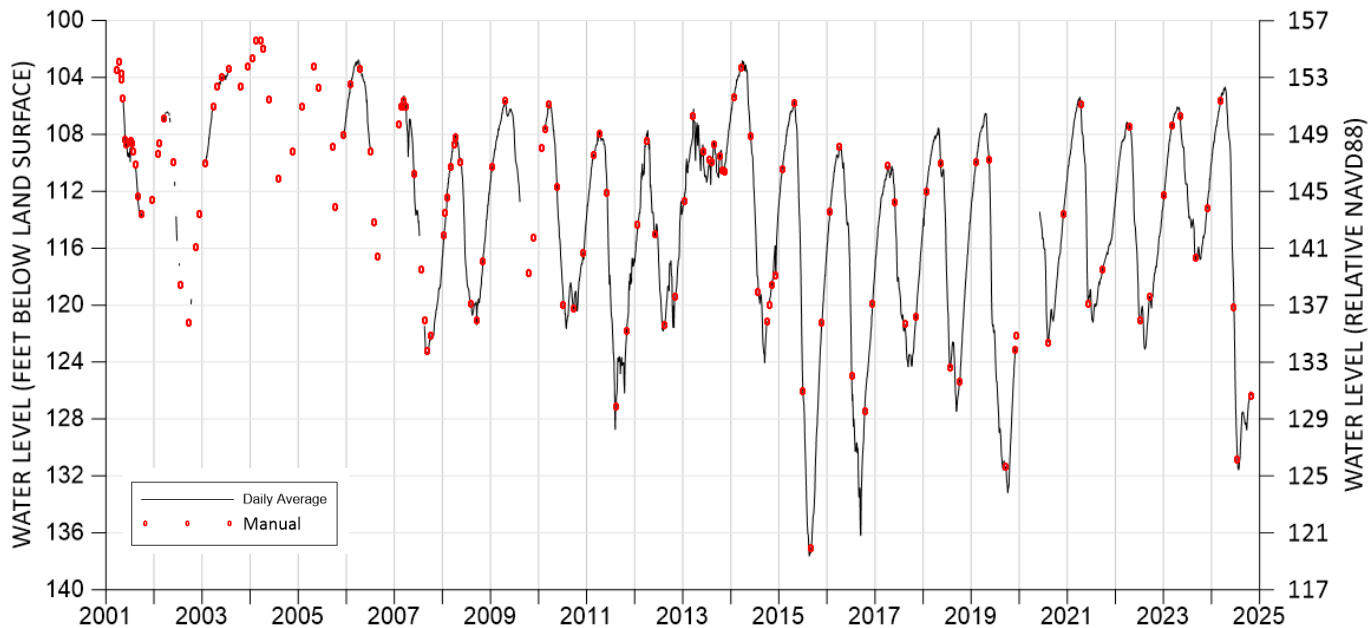
Crouch Branch Irrigation vs. Santee Basin Ag Irrigation



Agricultural Irrigation from the Crouch Branch aquifer in Orangeburg and Calhoun Counties make up 65% of total agricultural irrigation demand for the Santee Basin

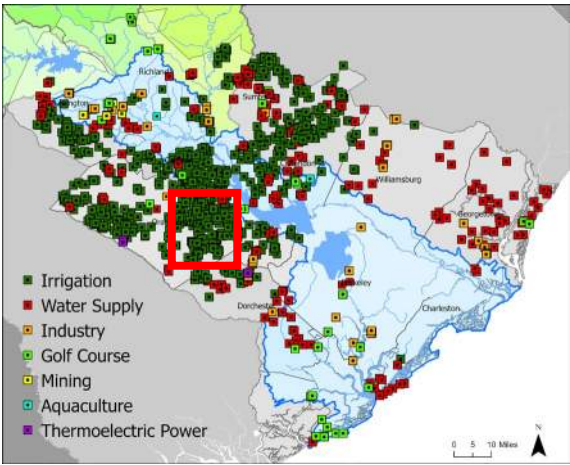
Crouch Branch Aquifer near Orangeburg

ORG-393

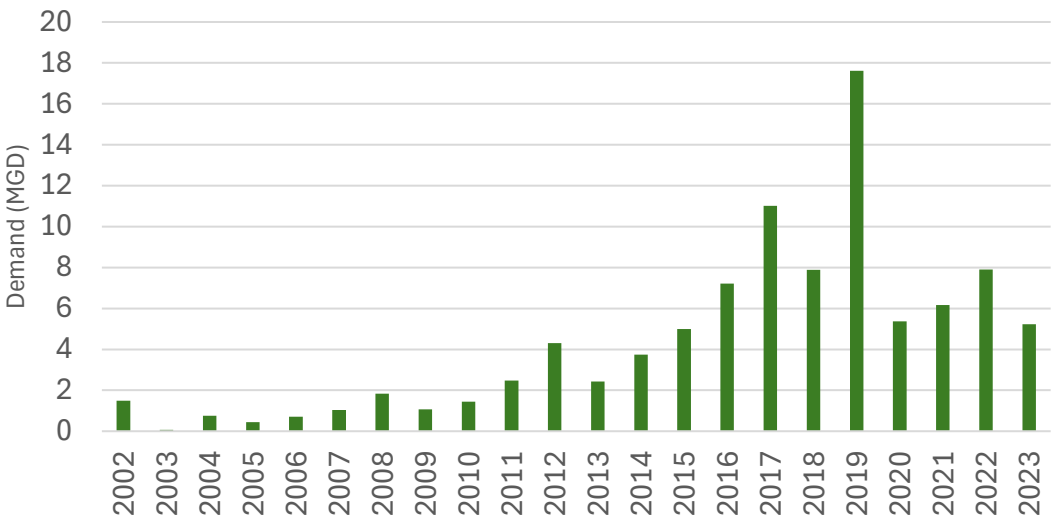


Aquifer: Crouch Branch
Elevation: 257 ft
Depth: 463 ft
Screen: 423-463 ft

Crouch Branch Confining Unit: 273'
Crouch Branch Aquifer: 298'
McQueen Branch Confining Unit: 515'

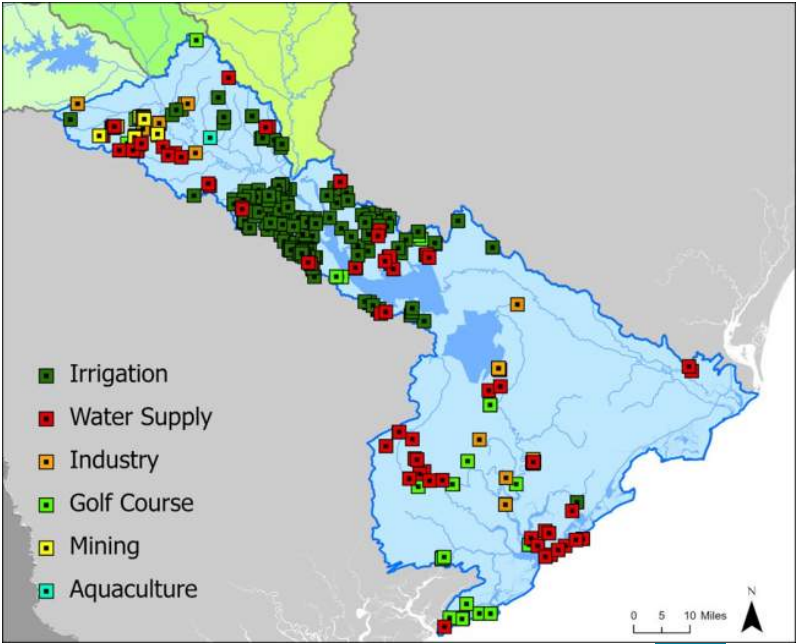
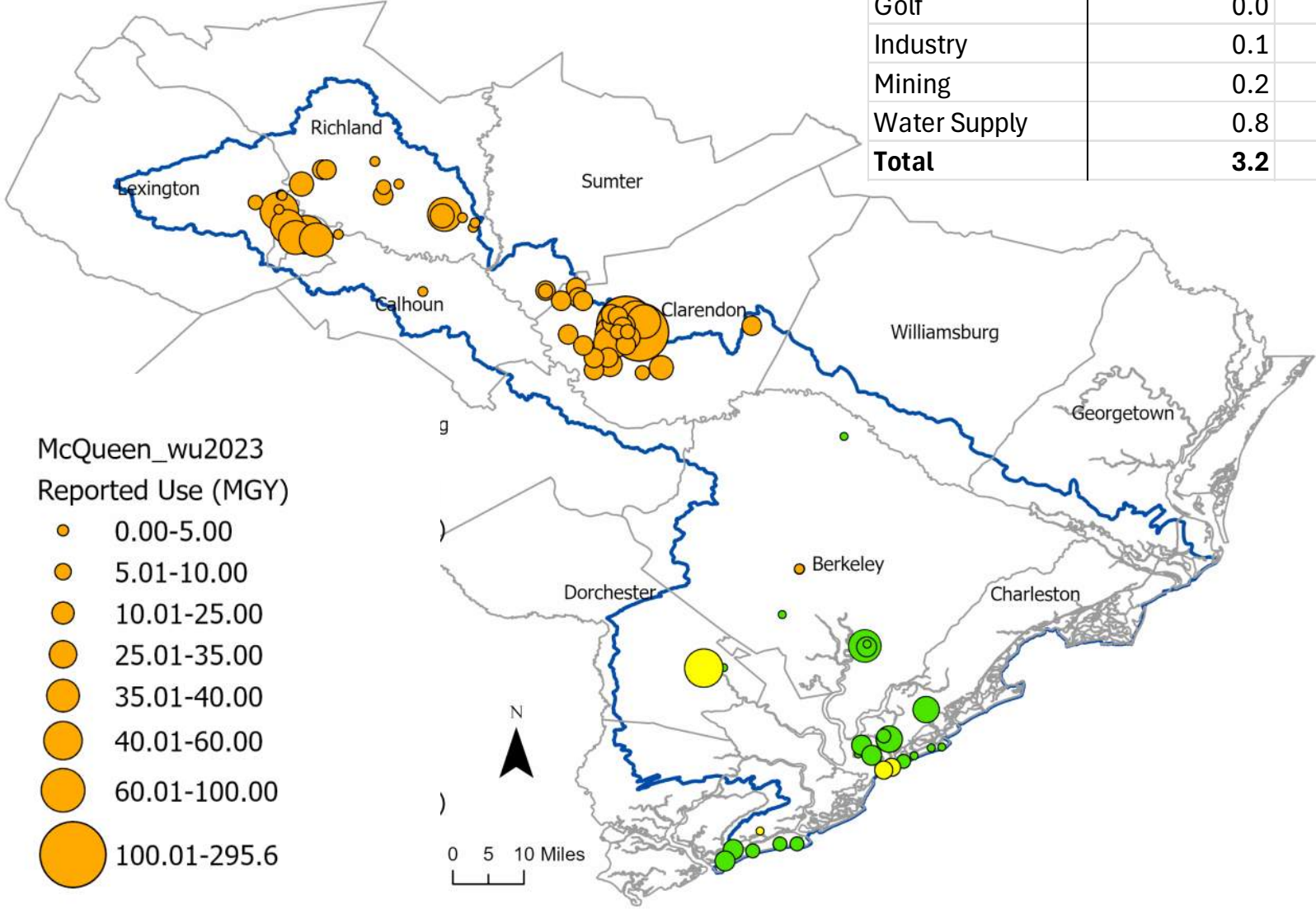
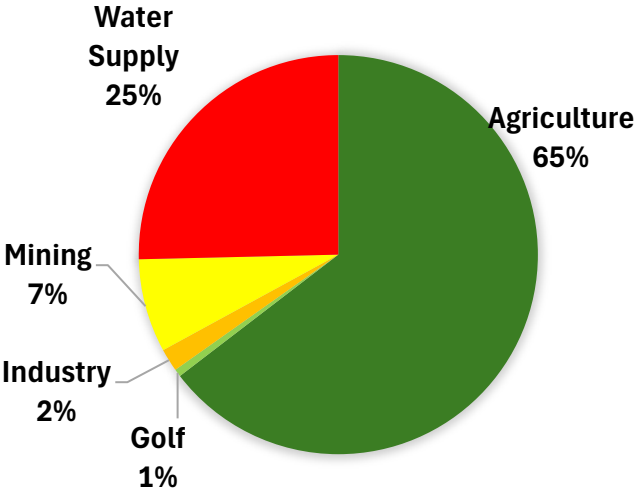


Orangeburg and Calhoun County (Basin Boundary) -
Irrigation

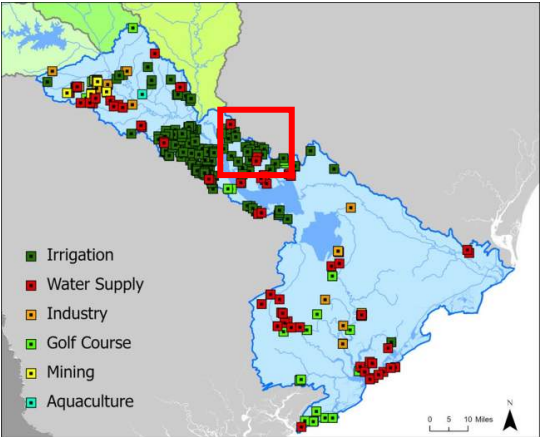


McQueen Branch Aquifer

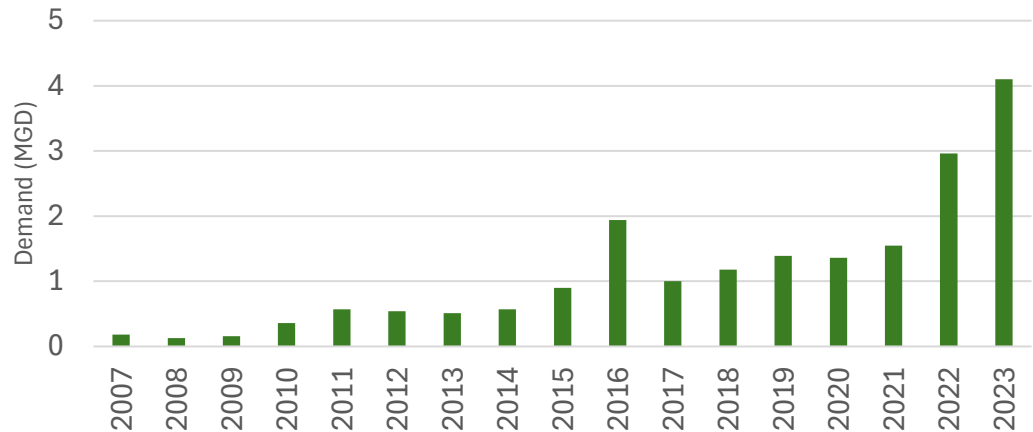
McQueen Branch	5-yr Ave. MGD	5-yr Ave. MGY
Agriculture	2.1	765.8
Golf	0.0	7.3
Industry	0.1	21.9
Mining	0.2	89.8
Water Supply	0.8	300.8
Total	3.2	1185.5



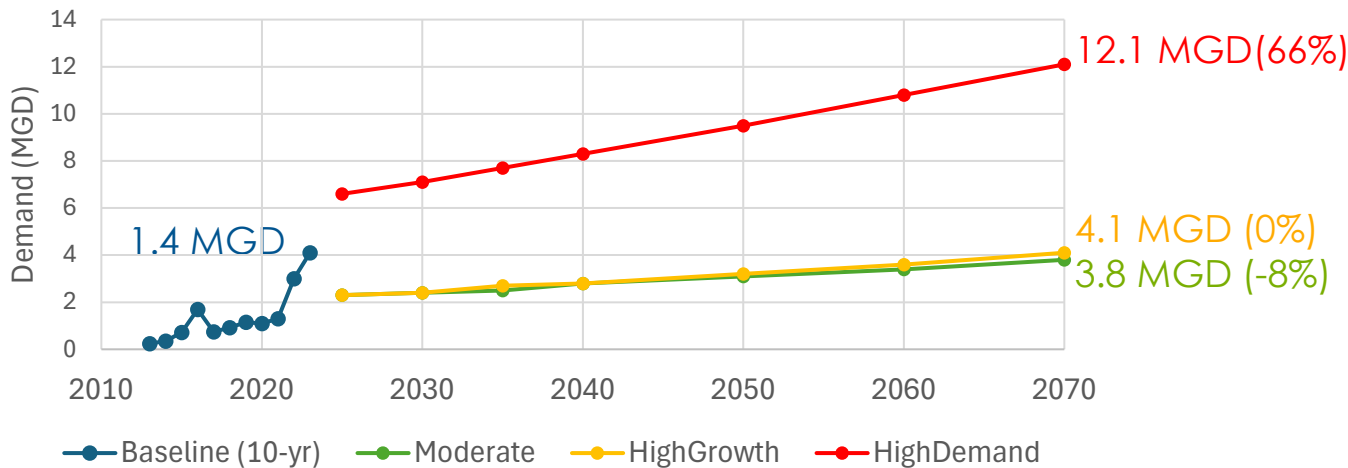
McQueen Branch - Ag Irrigation



Clarendon and Sumter County (Basin Boundary) - Irrigation

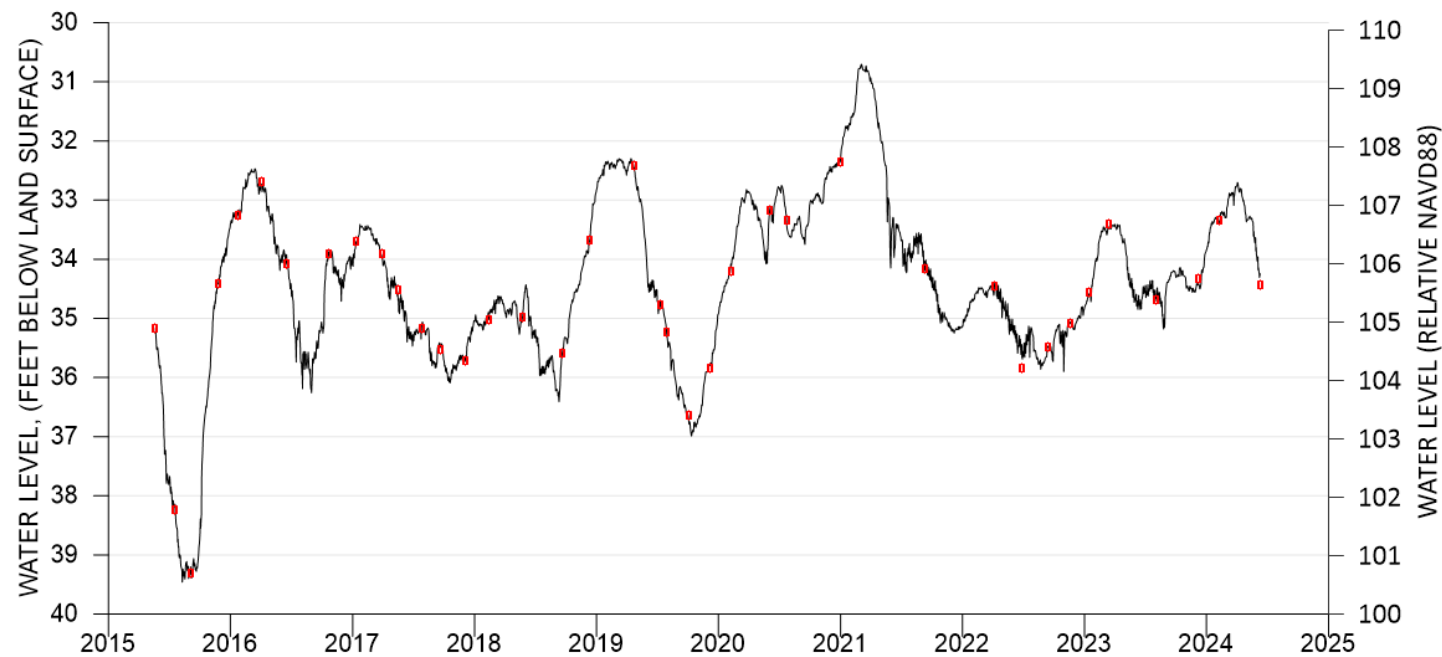


Clarendon and Sumter Counties - Irrigation



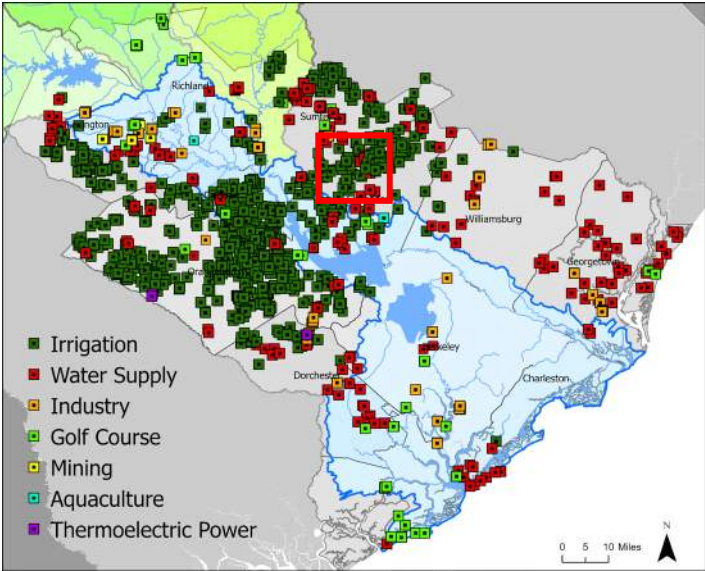
McQueen Branch near Manning

CLA-20

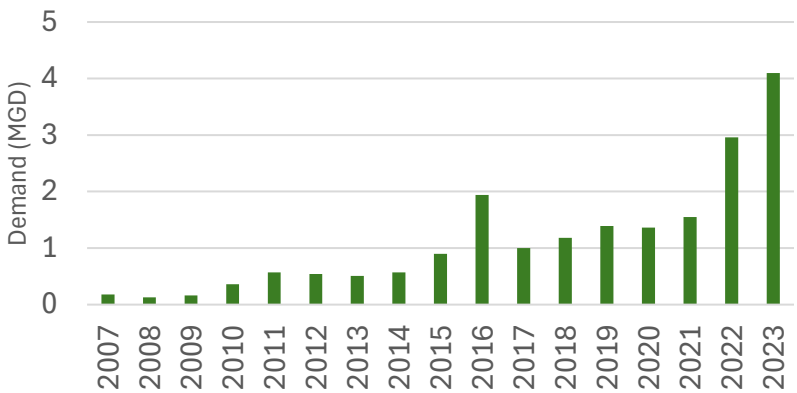


Aquifer: McQueen Branch
Elevation: 130 ft
Depth: 699 ft
Screen: 590-640 ft

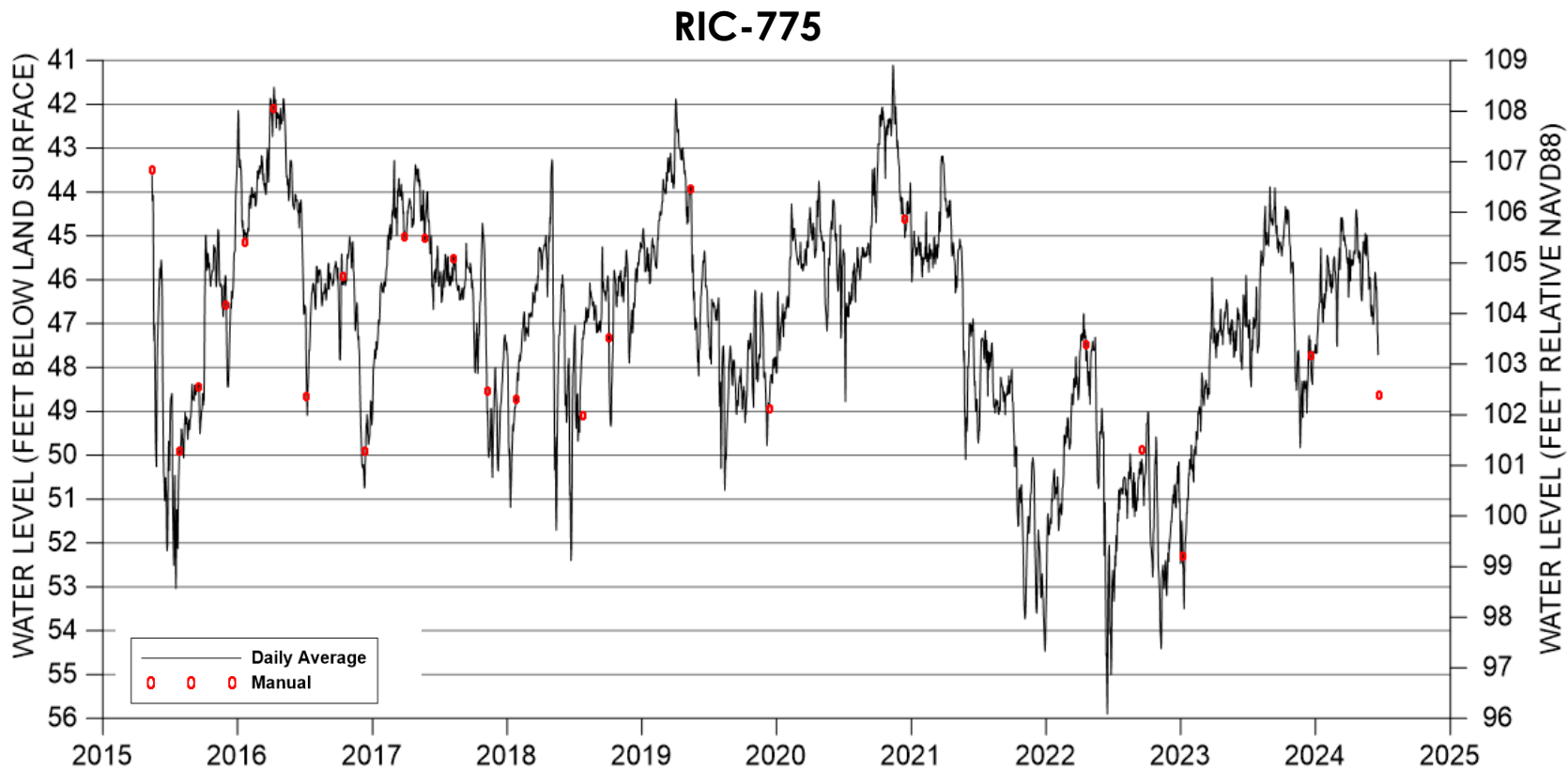
McQueen Branch Confining Unit: 466'
McQueen Branch Aquifer: 515'
Charleston Confining Unit: 668'
Charleston Aquifer: 722'



Clarendon and Sumter County (Basin Boundary) - Irrigation

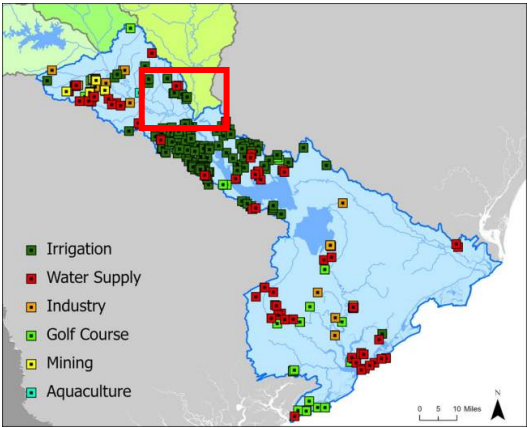


McQueen Branch near Wateree

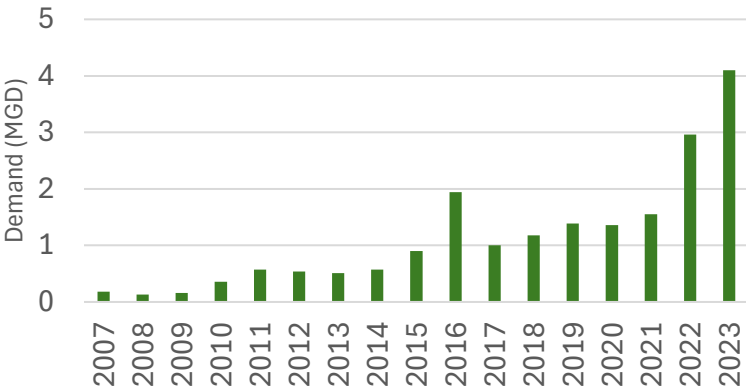


Aquifer: McQueen Branch
Elevation: 150 ft
Depth: 607 ft
Screen: 437-600 ft

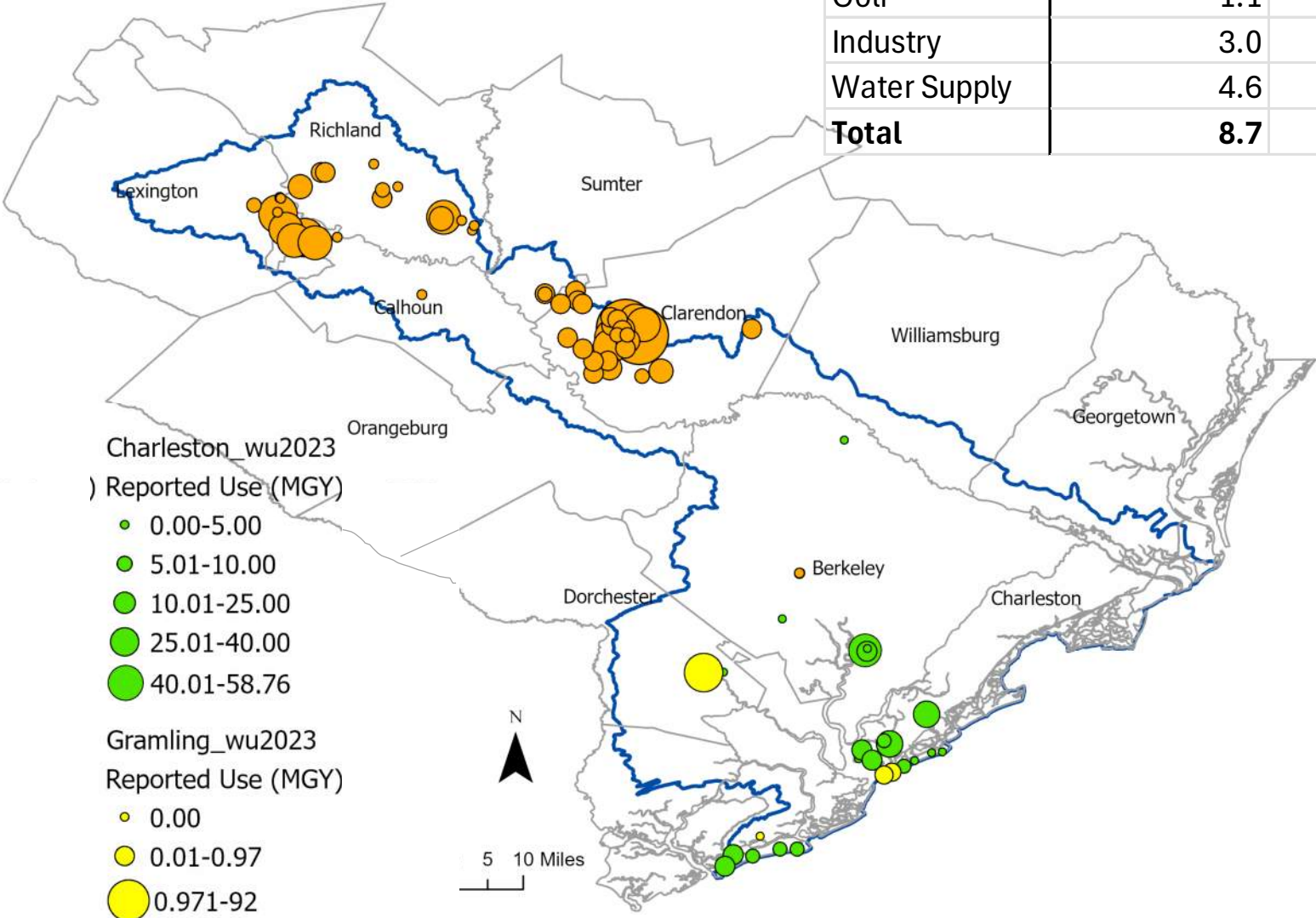
Crouch Branch Aquifer: 0'
McQueen Branch Confining Unit: 348'
McQueen Branch Aquifer: 368'
Gramling Confining Unit: 580'
Bedrock: 650'



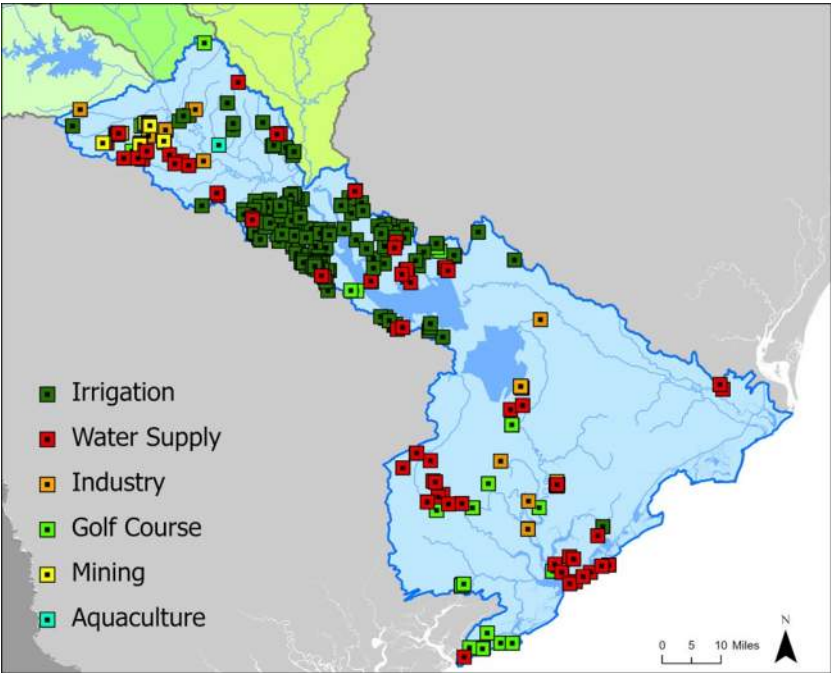
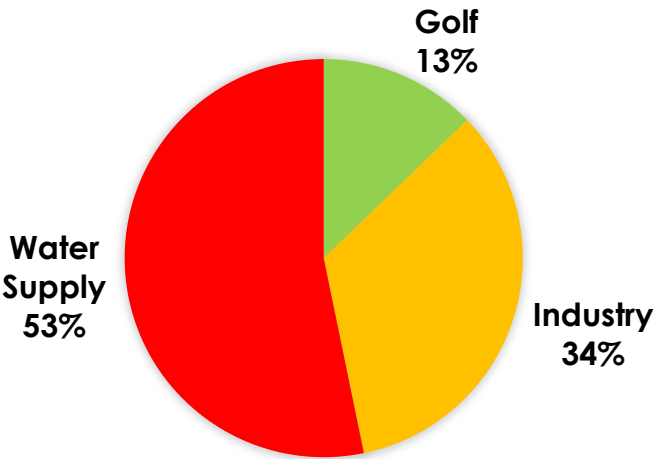
Clarendon and Sumter County (Basin Boundary) - Irrigation



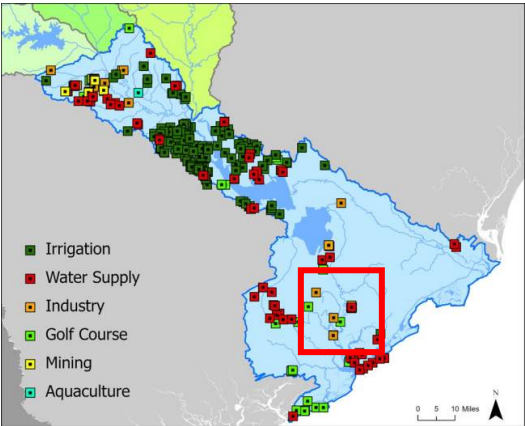
Charleston/Gramling Aquifers



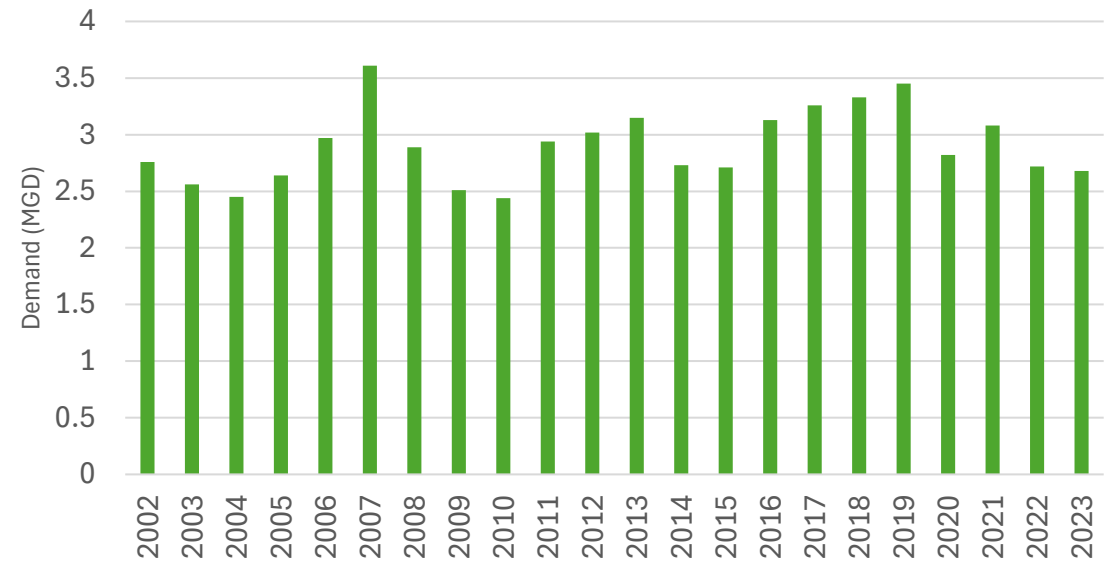
Charleston	5-yr Ave. MGD	5-yr Ave. MGY
Golf	1.1	405.9
Industry	3.0	1076.8
Water Supply	4.6	1687.8
Total	8.7	3170.4



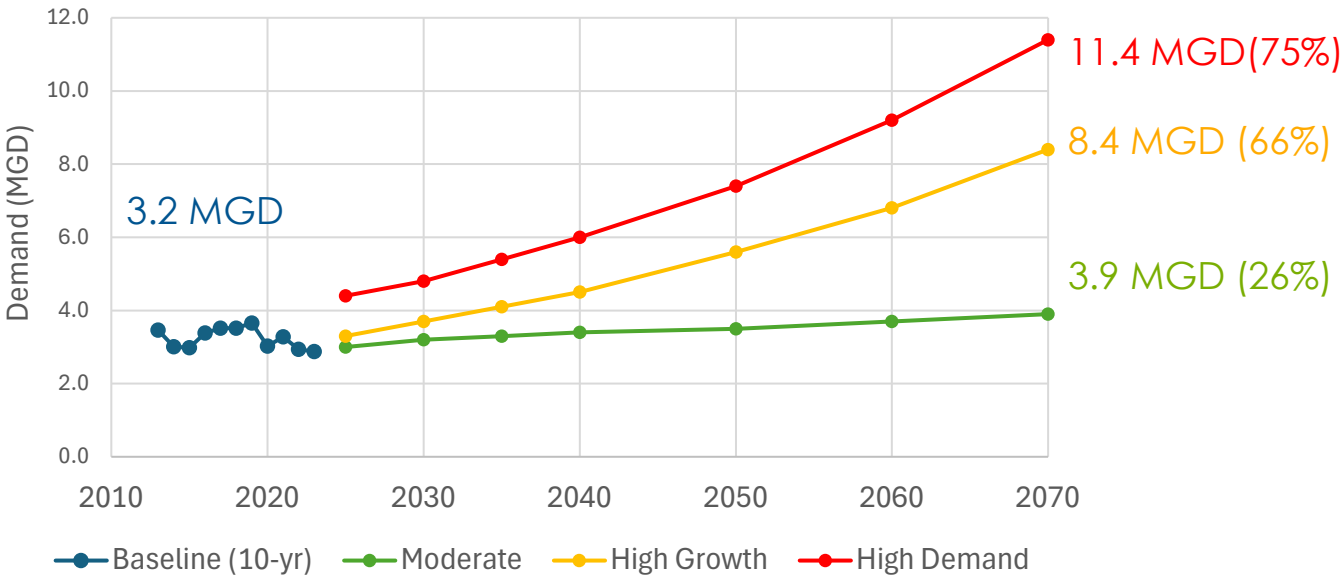
Charleston Aquifer – Industry



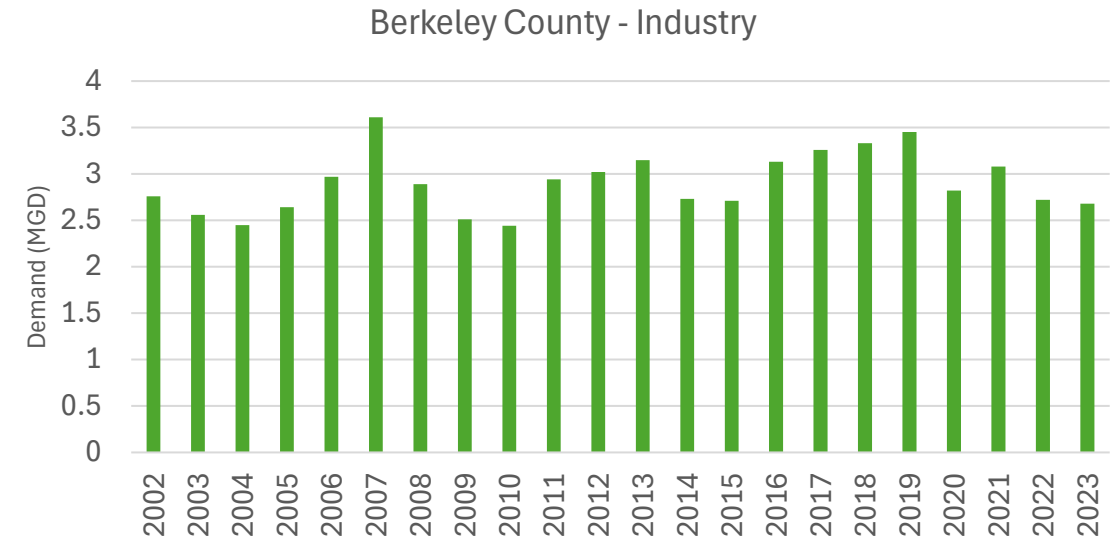
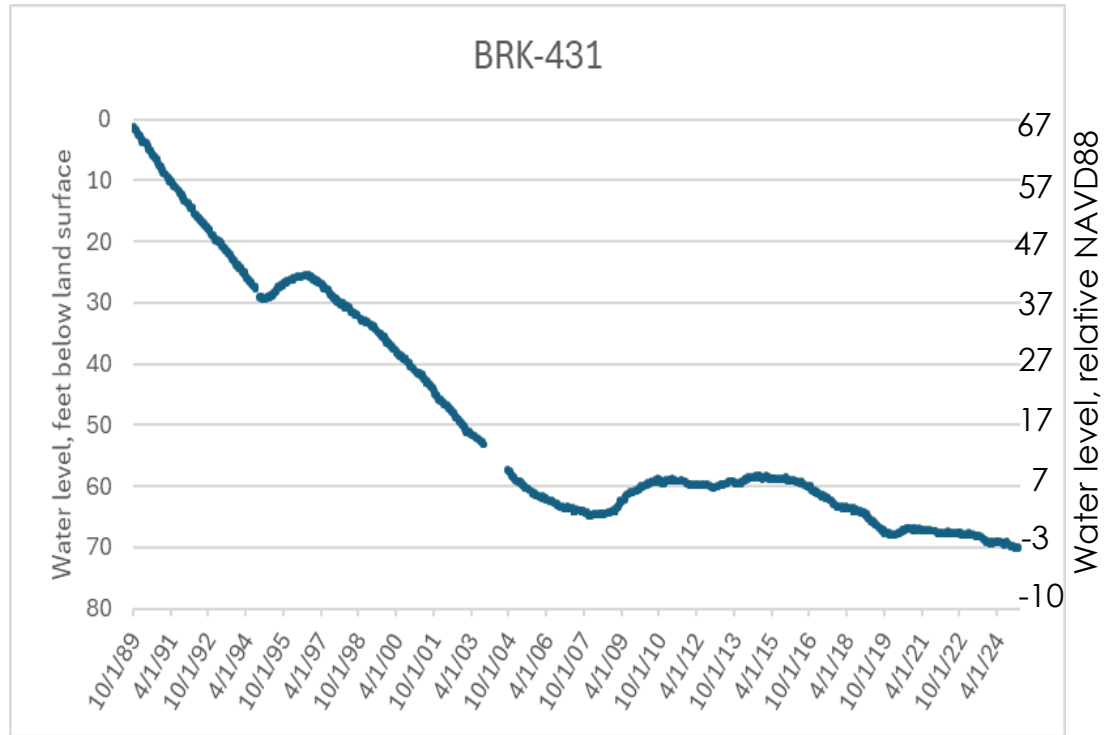
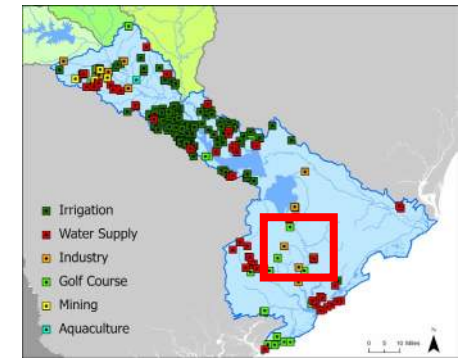
Berkeley County - Industry



Berkeley County - Industry



Charleston Aquifer near Moncks Corner



Depth Completed (ft): 1,607

Screen 1,602 – 1,607



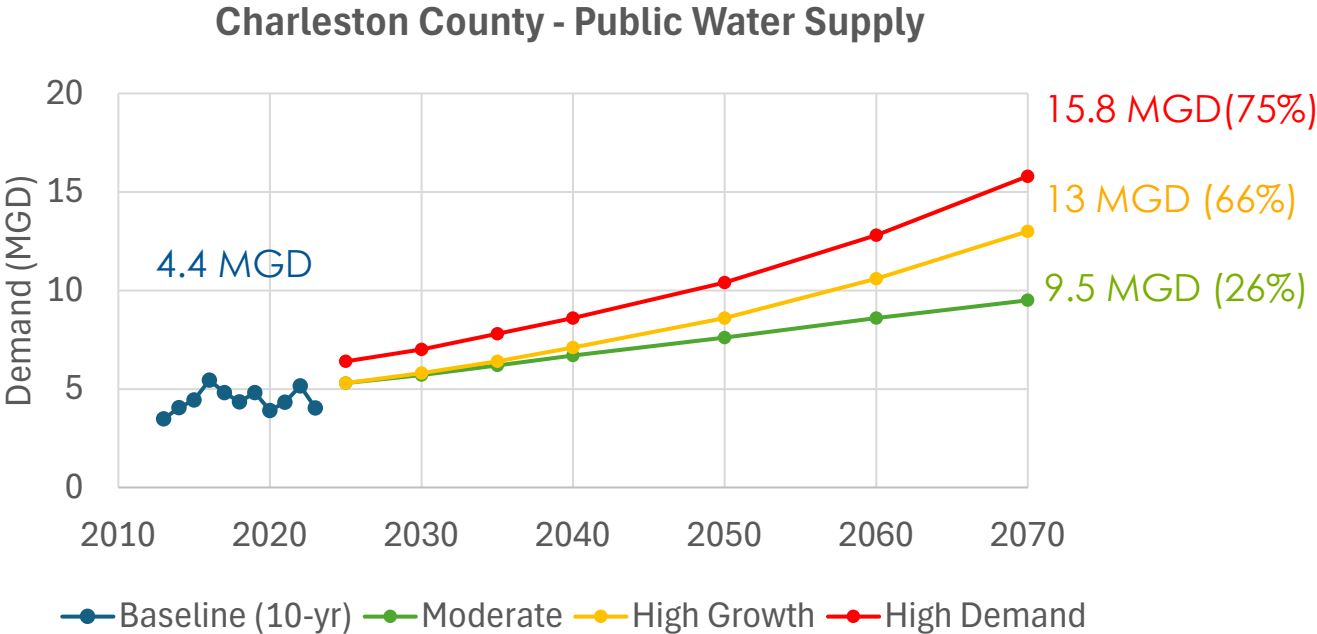
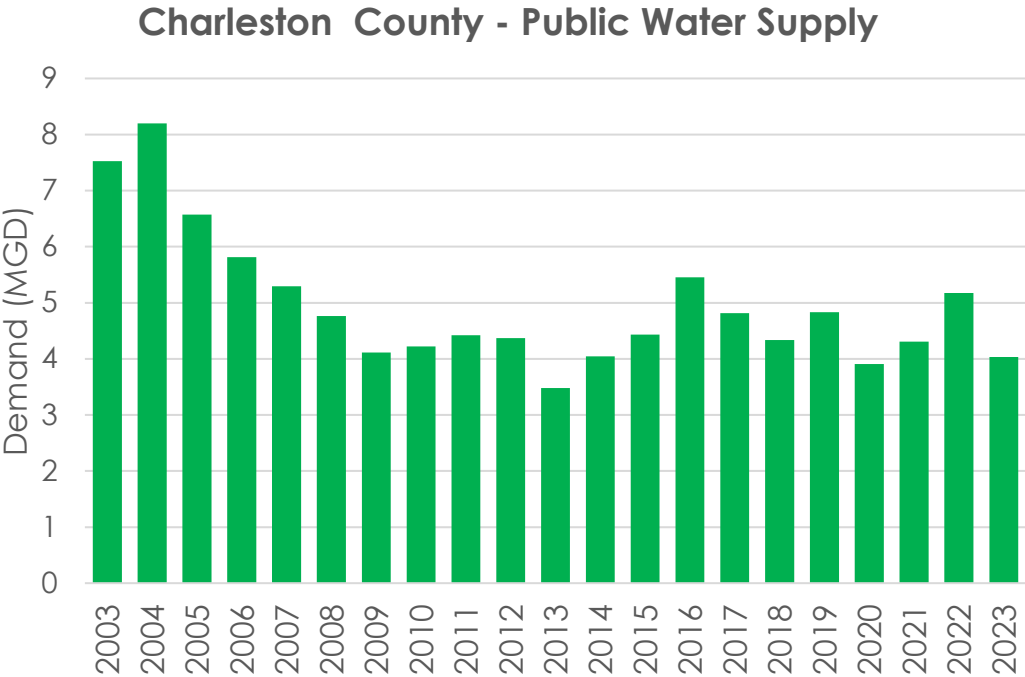
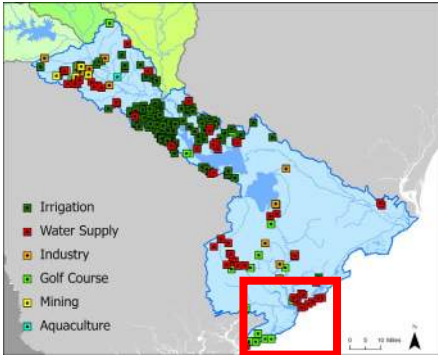
Charleston Confining Unit: 1240'

Charleston Aquifer: 1530'

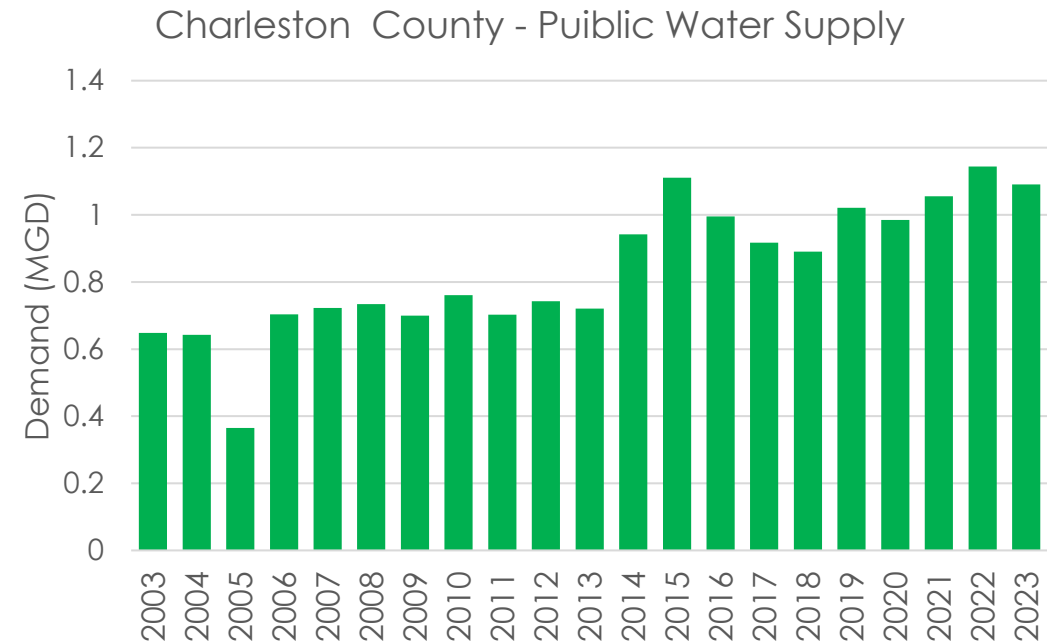
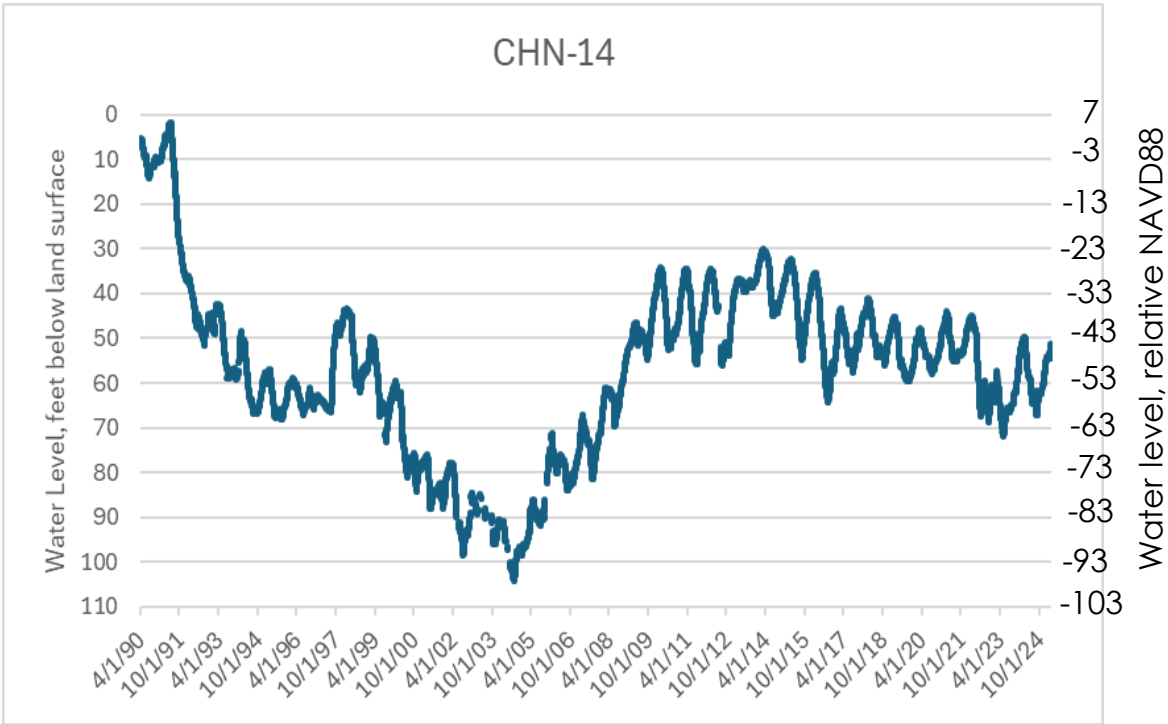
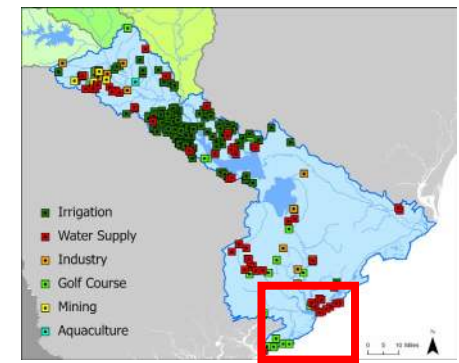
Gramling Confining Unit: 1660'

Gramling Aquifer: 1835'

Charleston Aquifer – Water Supply



Charleston Aquifer in Charleston Area



Depth Completed (ft): 2,001

Screen 1,875 – 2,001



Charleston Confining Unit: 1385'

Charleston Aquifer: 1850'

Gramling Confining Unit: 2050'

Gramling Aquifer: 2300'

Observations

- Under current demand, water levels in the aquifers of Santee Basin aquifer levels are generally stable, declines are minimal (middle to upper basin) or associated with historical water demand (lower basin), water levels generally decline towards the coast, cone of depression persists near coastal Berkeley and Charleston Counties
- The largest water use sectors in the Santee Basin are agricultural irrigation, public water supply, and industry, these sectors expected to increase in several counties
- Current public water supply demand is typically met with supply side management (conjunctive surface water use)
- Agricultural irrigation from the Crouch Branch and McQueen Branch is expected to increase up to 83% in High Demand Scenario mid-basin; expanding projected use outside basin boundaries is needed
- Monitoring wells with continuous records are spatially limited especially in Crouch Branch aquifer to estimate potential some current use and future impacts



Questions?

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