SUMMARY SHEET
SOUTH CAROLINA BOARD OF HEALTH AND ENVIRONMENTAL CONTROL

June 10, 2021

( ) ACTION/DECISION
(X) INFORMATION

I. **TITLE:** Healthcare Quality Administrative and Consent Orders.

II. **SUBJECT:** Healthcare Quality Administrative Orders and Consent Orders for the period of April 1, 2021 through April 30, 2021.

III. **FACTS:** For the period of April 1, 2021 through April 30, 2020, Healthcare Quality reports two (2) Consent Orders totaling $7,500 in assessed monetary penalties and fifty (50) Notices of Violation and Civil Penalty totaling $19,950 in assessed monetary penalties.

Name of Bureau	Facility, Service, Provider, or Equipment Type	Notices of Violation and Civil Penalty	Administrative Orders	Consent Orders	Assessed Penalties
Bureau of Community Care	Community Residential Care Facility	44	0	0	$17,950
	Nursing Home	6	0	0	$2,000
	Intermediate Care Facility for Persons with Intellectual Disabilities	0	0	1	$1,500
Bureau of Radiological Health	Medical Facility	0	0	1	$6,000
TOTAL		**50**	**0**	**2**	**$27,450**

Submitted By:

Gwendolyn C. Thompson

Gwen C. Thompson
Deputy Director
Healthcare Quality

HEALTHCARE QUALITY ENFORCEMENT REPORT
SOUTH CAROLINA BOARD OF HEALTH AND ENVIRONMENTAL CONTROL

June 10, 2021

Bureau of Community Care

1. Facilities in Violation of Public Health Order No. COVID-19-5

Violations: The Department found that the forty-four (44) community residential care facilities (CRCFs) and six (6) nursing homes listed below failed to submit a weekly visitation report to the Department by the mandatory deadline. Failure to submit the report by the deadline is in violation of the Department's October 7, 2020, Public Health Order that requires all nursing homes and CRCFs licensed by the Department to submit a weekly report on their visitation status.

Enforcement Action: In April 2021, the Department issued Notices of Violation and Civil Penalty against forty-four (44) CRCFs and six (6) nursing homes. All of the facilities listed below were required to pay the full amount of their accumulated penalties within twenty (20) days of the dated notices.

Name of Facility	Facility Type	Civil Penalty	Payment Received
A'Lelia Residential Care	CRCF	$450	Yes
Atria Forest Lake	CRCF	$250	Yes
Bayberry of Greer	CRCF	$250	Yes
Blake at Hollingsworth Park	CRCF	$250	Yes
Bloom at Belfair	CRCF	$250	Yes
Bostick's Adult Residential Care Facility	CRCF	$450	Yes
Bowles Community Care Home	CRCF	$350	No
Brookstone Terrace of Woodruff	CRCF	$450	Yes
Canterfield of Bluffton	CRCF	$350	Yes
Carolina Gardens at Garden City	CRCF	$350	Yes
Carriage House of Senior Living Of Sumter	CRCF	$350	Yes
Carriage House Senior Living of Florence	CRCF	$250	No
Carriage House Senior Living of Hartsville	CRCF	$250	Yes
Carson's Community Care	CRCF	$1,000	Yes
Cottonwood Villas	CRCF	$350	Yes
Country Comfort Community Home	CRCF	$350	Yes
Dixon's Community Care Home	CRCF	$450	No
Dreamland Residential Care	CRCF	$250	Yes
Family Residential Care Home I	CRCF	$350	Yes
Family Residential Care Home II	CRCF	$350	Yes

Name of Facility	Facility Type	Civil Penalty	Payment Received
Gracelynn Residential Care Facility	CRCF	$1,000	No
Harbison Shores	CRCF	$250	Yes
Harborchase of Riverwalk	CRCF	$250	Yes
Haven in the Village at Chanticleer	CRCF	$350	No
Ladson's Residential Home Care	CRCF	$350	Yes
Lake Wylie Assisted Living Community	CRCF	$250	Yes
Legacy at Hawthorne Park	CRCF	$250	Yes
Long's Residential Care Center	CRCF	$250	No
Miller Place Residential Care	CRCF	$350	Yes
Morningside of Rock Hill	CRCF	$350	Yes
Oakridge Community Care Home #1	CRCF	$1,000	No
Oakridge Community Care Home #2	CRCF	$1,000	No
Pacifica Senior Living Skylyn	CRCF	$450	Yes
Palmetto Gardens	CRCF	$350	No
Palmetto Ridge Assisted Living & Memory Care	CRCF	$250	Yes
Quiet Acres Retirement Home	CRCF	$350	Yes
Serenity Manor of Holly Hill	CRCF	$450	Yes
Six Mile Retirement Center	CRCF	$250	Yes
Summit Place of Daniel Island	CRCF	$250	Yes
Thorne Retirement Home	CRCF	$350	Yes
Walters Residential Care	CRCF	$350	Yes
Watercrest Fort Mill Assisted Living and Memory Care	CRCF	$250	Yes
Wesley Court Assisted Living Community	CRCF	$1,000	No
Woodland Place	CRCF	$450	No
MUSC Health Mullins Nursing Center	Nursing Home	$250	Yes
Pruitthealth - Blythewood	Nursing Home	$350	No
Ridge Rehabilitation and Healthcare Center	Nursing Home	$250	Yes
Skylyn Nursing and Rehabilitation Center	Nursing Home	$450	Yes
Sumter East Health and Rehabilitation Center	Nursing Home	$450	Yes
White Oak Manor -York	Nursing Home	$250	Yes

Facility Type	Total # of Licensed Facilities	Total # of Licensed Beds
Intermediate Care Facility for Persons with Intellectual Disabilities (ICF-ID)	64	1,632

2. Mulberry Park – Florence, SC

Inspections and Investigations: The Department conduct two complaint investigations on February 4, 2021, and cited the facility for regulatory violations.

Violations: The Department found the facility failed to comply with Regulation 61-13, *Standards for Licensing Intermediate Care Facilities for Individuals with Intellectual Disabilities*, by failing to ensure the residents' safety and the supervision of clients in accordance with their individual program plans and by failing to ensure a client was protected from abuse as outlined in the Bill of Rights for Residents in Long-Term Care Facilities.

Enforcement Action: The parties agreed to resolve the matter with a consent order. In April 2021, the parties executed a consent order imposing a civil monetary penalty of $1,500 against the facility. The facility was required to pay the full amount of the penalty within 30 days of executing the Consent Order. The facility agreed to schedule and attend a compliance assistance meeting with Department representatives within 45 days of executing the Consent Order.

Remedial Action: The facility has made the required payment. The compliance assistance meeting is scheduled to take place in early June.

Prior Actions: None in the past five years.

Bureau of Radiological Health

Facility Type	Total # of Registered Medical X-Ray Facilities
Medical Facility	904

3. Lexington Medical Center Irmo – Columbia, SC

Inspections and Investigations: On July 22, 2020, the Department received a report from the Registrant regarding a radiation dose received by an individual as a result of radiation safety surveys performed by a vendor to evaluate a newly replaced CT scanner. The Department requested additional information, including shielding documents and correspondence for the CT room from 2005 to present, confirmation of equipment capability, occupancy of the reception area, clarification of job duties, and documentation of overexposure notification to the individual. The Department received a response to the request on September 21, 2020 and reviewed the documents.

Violations: The Department found that the registrant failed to comply with Regulation 61-64, *X-Rays*, by failing to conduct operations so that the total effective dose equivalent to individual members of the public from the registered operation does not exceed 0.1 roentgen equivalent man (rem) in a year.

Enforcement Action: The parties agreed to resolve the matter with a consent order. The parties executed a consent order in April 2021 imposing a civil monetary penalty of $6,000 against the registrant.

Remedial Action: The registrant has paid the required civil monetary penalty.

Prior Actions: None in the past five years.

SUMMARY SHEET
BOARD OF HEALTH AND ENVIRONMENTAL CONTROL
June 10, 2021

_____ ACTION/DECISION

__X__ INFORMATION

1. **TITLE:** Administrative and Consent Orders issued by the Office of Environmental Affairs.

2. **SUBJECT:** Administrative and Consent Orders issued by the Office of Environmental Affairs during the period April 1, 2021, through April 30, 2021.

3. **FACTS:** For the reporting period of April 1, 2021, through April 30, 2021, the Office of Environmental Affairs issued eleven (11) Consent Orders with total assessed civil penalties in the amount of forty-seven thousand, nine hundred eighty dollars ($47,980.00). Also, ten (10) Administrative Orders with total assessed civil penalties in the amount of sixty-five thousand, four hundred sixty-one dollars ($65,461.00) were reported during this period.

Bureau and Program Area	Administrative Orders	Assessed Penalties	Consent Orders	Assessed Penalties
Land and Waste Management				
UST Program	8	$55,861.00	2	$1,330.00
Aboveground Tanks	0	0	0	0
Solid Waste	2	$9,600.00	0	0
Hazardous Waste	0	0	0	0
Infectious Waste	0	0	0	0
Mining	0	0	0	0
SUBTOTAL	**10**	**$65,461.00**	**2**	**$1,330.00**
Water				
Recreational Water	0	0	0	0
Drinking Water	0	0	4	$15,500.00
Water Pollution	0	0	1	$1,400.00
Dam Safety	0	0	0	0
SUBTOTAL	**0**	**0**	**5**	**$16,900.00**
Air Quality				
SUBTOTAL	**0**	**0**	**4**	**$29,750.00**
Environmental Health Services				
Food Safety	0	0	0	0
Onsite Wastewater	0	0	0	0
SUBTOTAL	**0**	**0**	**0**	**0**
OCRM				
SUBTOTAL	**0**	**0**	**0**	**0**
TOTAL	**10**	**$65,461.00**	**11**	**$47,980.00**

Submitted by:

Myra C. Reece
Director of Environmental Affairs

ENVIRONMENTAL AFFAIRS ENFORCEMENT REPORT
BOARD OF HEALTH AND ENVIRONMENTAL CONTROL
June 10, 2021

BUREAU OF LAND AND WASTE MANAGEMENT

Underground Storage Tank Enforcement

1) Order Type and Number: Administrative Order 20-0289-UST
Order Date: April 5, 2021
Individual/Entity: **Sean P. Kilcoyne**
Facility: Edisto River Company
Location: 9637 Freedom Road
Branchville, SC 29432
Mailing Address: Same
County: Bamberg
Previous Orders: AO 19-0162-UST ($5,650.00)
Permit/ID Number: 13072
Violations Cited: The State Underground Petroleum Environmental Response Bank Act of 1988 (SUPERB Act), S.C. code Ann., § 44-2-60(A) (2018); and South Carolina Underground Storage Tank Control Regulation, 7 S.C. Code Ann., Regs. 61-92.280.34(c); 280.243(a) (2012 and 2019).

Summary: Sean P. Kilcoyne (Individual/Entity) is the owner of underground storage tanks (USTs) located in Bamberg County, South Carolina. The Department conducted an inspection on February 2, 2021. The Individual/Entity has violated the SUPERB Act and the South Carolina Underground Storage Tank Control Regulation as follows: failed to obtain Class A/B Operator supplemental training by May 26, 2020; failed to provide records to the Department upon request; and, failed to pay annual tank registration fees for fiscal year 2021.

Action: The Individual/Entity is required to: submit proof that the Class A/B Operator has completed the Class A/B Operator supplemental training and pay the annual tank registration fees and associated late fees for the fiscal year 2021 in the amount of three hundred sixty-three dollars ($363.00) by June 8, 2021. The Department has assessed a total civil penalty in the amount of four thousand, eight hundred dollars ($4,800.00). The Individual/Entity shall pay a civil penalty in the amount of four thousand, eight hundred dollars **($4,800.00)** by June 8, 2021.

Updates: No Request for Review was filed.

2) Order Type and Number: Administrative Order 19-0322-UST
Order Date: April 12, 2021
Individual/Entity: **Robert Glenn Sparks**
Facility: Morris Service Station
Location: 1502 Lockhart Highway

Union, SC 29379
Mailing Address: 130 Hightower Lake Road
Union, SC 29379
County: Union
Previous Orders: 18-0287-UST ($350.00)
Permit/ID Number: 14492
Violations Cited: The State Underground Petroleum Environmental Response Bank Act of 1988, S.C. Code Ann. § 44-2-60(A) et seq. (2018) (SUPERB Act) and South Carolina Underground Storage Tank Control Regulation, 7 S.C. Code Ann., Regs. 61-92, 280.93(a), 280.110(c), 280.242(b)(3) (2012 and Supp. 2019).

Summary: Robert Glenn Sparks (Individual/Entity) is the owner of underground storage tanks (USTs) located in Union County, South Carolina. On May 16, 2019, the Department conducted a compliance inspection and issued a Notice of Alleged Violation. The Individual/Entity has violated the SUPERB Act and the South Carolina Underground Storage Tank Regulation, as follows: failed to demonstrate financial responsibility for an UST system; failed to submit evidence of financial assurance to the Department upon request; failed to validate that monthly requirements have been met; and failed to pay annual tank registration fees.

Action: The Individual/Entity is required to submit: a completed Certificate of Financial Responsibility form and evidence of financial assurance; proof that a Class A/B Operator log is being maintained; and, payment of annual tank registration fees and associated late fees for fiscal years 2020 and 2021 by June 12, 2021. The Department has assessed a total civil penalty in the amount of six thousand, eight hundred fifty dollars ($6,850.00). The Individual/Entity shall pay a civil penalty in the amount of six thousand, eight hundred fifty dollars **($6,850.00)** by June 12, 2021.

Updates: No Request for Review was filed.

3) Order Type and Number: Administrative Order 20-0190-UST
Order Date: April 12, 2021
Individual/Entity: **WHF, LLC**
Facility: WHF
Location: 3796 Highway 905
Conway, SC 29526
Mailing Address: P.O. Box 1864
Myrtle Beach, SC 29578
County: Horry
Previous Orders: None
Permit/ID Number: 11766
Violations Cited: The State Underground Petroleum Environmental Response Bank Act of 1988 (SUPERB Act), and South Carolina Underground Storage Tank Control Regulation, 7 S.C. Code Ann., Regs. 61-92, 280.31(b)(1) and 280.70(c) (2012 and Supp. 2019).

Summary: WHF, LLC (Individual/Entity) is the owner of underground storage tanks (USTs) located in Horry County, South Carolina. On July 9, 2020, the Department conducted a compliance inspection and issued a Notice of Alleged Violation. The Individual/Entity has violated the SUPERB Act and the South Carolina Underground

Storage Tank Regulation, as follows: failed to have the cathodic protection system inspected by a qualified tester every three (3) years and failed to permanently close a UST system that has been temporarily out of service for greater than twelve (12) months and does not meet current corrosion protection standards.

Action: The Individual/Entity is required to: submit either a completed Tank and Sludge Disposal Form for the permanent closure of the USTs or passing Sacrificial Anode Cathodic protection system test results for all USTs or proof that UST metal integrity testing has been initiated by June 12, 2021; if the Tank and Sludge Disposal Form is submitted, permanently close the USTs within forty-five (45) days of the Department's approval of the Tank and Sludge Disposal Form; and submit an UST Closure and Assessment Report within sixty (60) days of permanent closure of the USTs. The Department has assessed a total civil penalty in the amount of five thousand, five hundred eighty dollars ($5,580.00). The Individual/Entity shall pay a civil penalty in the amount of five thousand, five hundred eighty dollars **($5,580.00)** by June 12, 2021.

Updates: No Request for Review was filed. The Individual/Entity has removed the tanks from the ground.

4) Order Type and Number: Administrative Order 20-0238-UST
Order Date: April 12, 2021
Individual/Entity: **Kayaan Corporation**
Facility: Old Power Trac 9
Location: 2700 Highway 29 South
Anderson, SC 29626
Mailing Address: P.O. Box 40
Piedmont, SC 29673
County: Anderson
Previous Orders: None
Permit/ID Number: 00737
Violations Cited: The State Underground Petroleum Environmental Response Bank Act of 1988 (SUPERB Act), and South Carolina Underground Storage Tank Control Regulation, 7 S.C. Code Ann., Regs. 61-92, 280.35(a)(1)(ii) and 280.35(a)(2) (2012 and Supp. 2019).

Summary: Kayaan Corporation (Individual/Entity) is the owner of a compartmented underground storage tank (UST) located in Anderson County, South Carolina. On August 21, 2020, the Department conducted a compliance inspection and issued a Notice of Alleged Violation. The Individual/Entity has violated the SUPERB Act and the South Carolina Underground Storage Tank Regulation, as follows: failed to test spill prevention equipment and/or containment sumps used for interstitial monitoring once every three (3) years and failed to test overfill prevention equipment at least once every three (3) years.

Action: The Individual/Entity is required to: submit overfill prevention equipment operability test results for all compartments of the UST; and spill bucket integrity test results for all spill buckets at the facility due by June 14, 2021. The Department has assessed a total civil penalty in the amount of one thousand, five hundred dollars ($1,500.00). The Individual/Entity shall pay a civil penalty in the amount of one thousand, five hundred dollars **($1,500.00)** by June 14, 2021.

Updates: No Request for Review was filed.

5) Order Type and Number: Administrative Order 21-0015-UST
Order Date: April 12, 2021
Individual/Entity: **Parth's, Inc.**
Facility: 5 Star Food Mart 2
Location: 104 McIntyre Street
Mullins, SC 29574
Mailing Address: Same
County: Marion
Previous Orders: None
Permit/ID Number: 10053
Violations Cited: The State Underground Petroleum Environmental Response Bank Act of 1988 (SUPERB Act), S.C. code Ann. § 44-2-140(A) et seq. (2018); and South Carolina Underground Storage Tank Control Regulation, 7 S.C. Code Ann., Regs 61-92, 280.34(c), 280.36(a)(1)(i), 280.36(a)(1)(ii), 280.40(a)(3), 280.44(a), 280.45(b)(1), 280.242(b)(3), and 280.243(a) (2012 & Supp 2019).

Summary: Parth's Inc. (Individual/Entity) owns and operates underground storage tanks in Marion County, South Carolina. The Department issued a Notice of Alleged Violation based on an inspection on November 9, 2020. The Individual/Entity violated the SUPERB Act and the South Carolina Underground Storage Tank Regulation, as follows: failed to provide records to the Department upon request, failed to conduct monthly walk-though inspections, failed to conduct annual walk-through inspections, failed to test UST release detection method annually, failed to conduct annual test of automatic line leak detectors, failed to maintain records for at least one (1) year, failed to validate that monthly requirements have been performed, and failed to physically visit each facility once a quarter.

Action: The Individual/Entity is required to submit: line leak detector function check results for the plus and premium USTs, proof that a monthly and annual walk-through log is being maintained, and proof that a Class A/B Operators have completed supplemental training by June 12, 2021. The Department has assessed a total civil penalty in the amount of seven thousand, two hundred sixty dollars ($7,260.00). The Individual/Entity shall pay a civil penalty in the amount of seven thousand, two hundred sixty dollars **($7,260.00)** by June 12, 2021.

Updates: The Individual/Entity has submitted line leak detector function check results for the plus, which indicated a failure and the premium, which indicated an inconclusive. No Request for Review was filed.

6) Order Type and Number: Administrative Order 19-0523-UST
Order Date: April 22, 2021
Individual/Entity: **Sanjay & Ulka Patel**
Facility: Forestbrook Grocery
Location: 1272 Forestbrook Road
Myrtle Beach, SC 29579
Mailing Address: 2521 Hunters Trail
Myrtle Beach, SC 29588

County: Horry
Previous Orders: AO 17-0439-UST ($10,700.00)
Permit/ID Number: 17398
Violations Cited: The State Underground Petroleum Environmental Response Bank Act of 1988 (SUPERB Act), and South Carolina Underground Storage Tank Control Regulation, 7 S.C. Code Ann., Regs. 61-92, 280.31(a), 280.34(c), 280.40(a), 280.43(h), 280.50, 280.52 (2012 and Supp. 2019).

Summary: Sanjay & Ulka Patel (Individual/Entity) are the owners of underground storage tanks (USTs) located in Horry County, South Carolina. On October 22, 2019, the Department conducted a compliance inspection and issued a Notice of Alleged Violation. The Individual/Entity has violated the SUPERB Act and the South Carolina Underground Storage Tank Regulation, as follows: failed to operate and maintain a corrosion protection system; failed to provide records to the Department upon request; failed to provide an adequate release detection method; failed to conduct proper release detection using statistical inventory reconciliation (SIR); failed to report a suspected release within twenty-four (24) hours; and failed to investigate and confirm a suspected release within a reasonable time period.

Action: The Individual/Entity is required to: submit either tank tightness test results for both USTs and proof both USTs have been emptied to less than one (1) inch of residue or tank tightness test results for both USTs, line tightness test results for both USTs and proof of a valid release detection method for both USTs at the Facility; conduct a site check from the area under dispenser 1/2 and submit the results to the Department; and submit proof that the exposed impressed current system anode wires have been repaired and reburied by July 6, 2021. The Department has assessed a total civil penalty in the amount of nine thousand, four hundred thirteen dollars ($9,413.00). The Individual/Entity shall pay a civil penalty in the amount of nine thousand, four hundred thirteen dollars **($9,413.00)** by June 17, 2021.

Updates: No Request for Review was filed.

7) Order Type and Number: Administrative Order 21-0102-UST
Order Date: April 22, 2021
Individual/Entity: **Jamie Ham**
Facility: Ham's Grill & Grocery
Location: 100 Batchelor Drive
Blacksburg, SC 29702
Mailing Address: 217 Ninety Nine Island
Blacksburg, SC 29702-9640
County: Cherokee
Previous Orders: None
Permit/ID Number: 08618
Violations Cited: The State Underground Petroleum Environmental Response Bank Act of 1988 (SUPERB Act), and South Carolina Underground Storage Tank Control Regulation, 7 S.C. Code Ann., Regs. 61-92, 280.34(c), 280.40(a), 280.43(h), 280.45(b)(1), 280.93(a), and 280.110(c) (2012 and Supp. 2019).

Summary: Jamie Ham (Individual/Entity) is the owner of underground storage tanks (USTs) located in Cherokee County, South Carolina. On September 27, 2019, the Department conducted a compliance inspection and issued a Notice of Alleged Violation. The Individual/Entity has violated the SUPERB Act and the South Carolina Underground Storage Tank Regulation, as follows: failed to provide records to the Department upon request; failed to provide an adequate release detection method; failed to conduct statistical inventory reconciliation (SIR) properly; failed to maintain sampling, testing, or monitoring results for at least one year, or for another reasonable period of time determined by the Department; failed to demonstrate financial responsibility for an UST system; and failed to submit evidence of financial assurance to the Department upon request.

Action: The Individual/Entity is required to submit: either passing SIR results equal to eight (8) of the last twelve (12) months with the two (2) most recent months passing for the 8,000-gallon regular and 4,000-gallon diesel USTs or tank tightness test results for both USTs; either current passing SIR records or other proof that a valid release detection method is in place for both USTs; and a completed Certificate of Financial Responsibility form and evidence of financial assurance by July 6, 2021. The Department has assessed a total civil penalty in the amount of nine thousand, six hundred fifty-eight dollars ($9,658.00). The Individual/Entity shall pay a civil penalty in the amount of nine thousand, six hundred fifty-eight dollars **($9,658.00)** by June 17, 2021.

Updates: No Request for Review was filed. The Individual/Entity has submitted the tank tightness test results.

8) Order Type and Number: Administrative Order 21-0116-UST
Order Date: April 22, 2021
Individual/Entity: **Early W. Dubose**
Facility: K-10 Enterprises DBA Cherryvale Grocery
Location: 1292 Cherryvale Drive
Sumter, SC 29154-1722
Mailing Address: 1300 Cherryvale Drive
Sumter, SC 29154
County: Sumter
Previous Orders: None
Permit/ID Number: 08924
Violations Cited: The State Underground Petroleum Environmental Response Bank Act of 1988 (SUPERB Act), S.C. code Ann. § 44-2-10 et seq. (2018); and South Carolina Underground Storage Tank Control Regulation, 7 S.C. Code Ann., Regs 61-92, 280.21(c), 280.31(b)(1), 280.31(c), 280.70(c), 280.242(b)(3), and 280.242(b)(4) (2012 & Supp 2019).

Summary: Early W. Dubose (Individual/Entity) owns and operates underground storage tanks in Marion County, South Carolina. On March 11,2021, the Department issued a Notice of Alleged Violation based on a file review. The Individual/Entity has violated the SUPERB Act and the South Carolina Underground Storage Tank Regulation, as follows: failed to protect an operating UST system from corrosion; failed to have the cathodic protection system inspected by a qualified tester every three (3) years; failed to inspect the impressed current system every sixty (60) days; failed to permanently close a UST system that has been temporarily out-of-service for greater than twelve (12) months and does not meet current corrosion protection standards; failed to validate that monthly requirements have been performed; and failed to physically visit each facility once a

quarter.

Action: The Individual/Entity is required to submit either: a completed Tank and Sludge Disposal form, permanently close the USTs at the Facility, and submit an UST Closure and Assessment Report to the Department or passing metal integrity testing results, passing tank tightness test results, passing cathodic protection system test results, proof that a rectifier log is being maintained, and proof that a Class A/B Operator log is being maintained by August 5, 2021. The Department has assessed a total civil penalty in the amount of ten thousand, eight hundred dollars ($10,800.00). The Individual/Entity shall pay a civil penalty in the amount of ten thousand, eight hundred dollars **($10,800.00)** by June 22, 2021.

Updates: No Request for Review was filed.

9) Order Type and Number: Consent Order 20-0248-UST
Order Date: April 15, 2021
Individual/Entity: **HMS BP Kershaw, LLC**
Facility: Korner Kupboard BP
Location: 503 North Matson Street
Kershaw, SC 290647
Mailing Address: 3104 Commerce Drive
Richburg, SC 29729
County: Lancaster
Previous Orders: None
Permit/ID Number: 10348
Violations Cited: The State Underground Petroleum Environmental Response Bank Act of 1988 (SUPERB Act), and South Carolina Underground Storage Tank Control Regulation, 7 S.C. Code Ann., Regs. 61-92, 280.40(a)(2) (2012 and Supp. 2019).

Summary: HMS BP Kershaw, LLC (Individual/Entity) owns underground storage tanks (USTs) located in Lancaster County, South Carolina. On August 26, 2020, the Department conducted a compliance inspection and issued a Notice of Alleged Violation. The Individual/Entity has violated the SUPERB Act and the South Carolina Underground Storage Tank Regulation, as follows: failed to properly install, calibrate, operate, and maintain release detection equipment.

Action: The Individual/Entity is required to: submit line leak detector function check test results for the 3,000-gallon kerosene UST and submit release detection operability test results for the 3,000-gallon kerosene UST by May 30, 2021. The Department has assessed a total civil penalty in the amount of three hundred thirty dollars ($330.00). The Individual/Entity shall pay a civil penalty in the amount of three hundred thirty dollars **($330.00)** by May 30, 2021.

Updates: The Individual/Entity has paid the civil penalty.

10) Order Type and Number: Consent Order 21-0069-UST
Order Date: April 15, 2021
Individual/Entity: **Holly Springs Country Store, Inc.**
Facility: Holly Springs Country Store, Inc.

Location: 6491 Highway 11
Pickens, SC 29671
Mailing Address: Same
County: Pickens
Previous Orders: None
Permit/ID Number: 16321
Violations Cited: The State Underground Petroleum Environmental Response Bank Act of 1988 (SUPERB Act), S.C. code Ann., § 44-2-10 et seq. (2018); and South Carolina Underground Storage Tank Control Regulation, 7 S.C. Code Ann., Regs. 61-92.280.20(c)(1)(ii) (2012 and 2018).

Summary: Holly Springs Country Store, Inc. (Individual/Entity) is the owner of underground storage tanks (USTs) located in Pickens County, South Carolina. The Department conducted an inspection on February 2, 2021. The Individual/Entity has violated the SUPERB Act and the South Carolina Underground Storage Tank Control Regulation as follows: failed to maintain overfill prevention equipment on an UST system.

Action: The Individual/Entity corrected the violation prior to the issuance of the Order. The Department has assessed a total civil penalty in the amount of one thousand dollars ($1,000.00). The Individual/Entity shall pay a civil penalty in the amount of one thousand dollars **($1,000.00)** by June 1, 2021.

Updates: The Individual/Entity has paid the civil penalty. This Order has been closed.

Solid Waste Enforcement

11) Order Type and Number: Administrative Order 20-27-SW
Order Date: April 19, 2021
Individual/Entity: **Heirs of Ben Gibbs**
C/O Nathaniel Gibbs
Facility: Annie Rainey Lane, Property
Location: 225 Annie Rainey Lane
Pawleys Island, SC
Mailing Address: 14 Stanley Street
Irvington, NJ 07111
County: Georgetown
Previous Orders: None
Permit/ID Number: N/A
Violations Cited: South Carolina Solid Waste Policy and Management Act of 1991, S.C. Code Ann. §§ 44-96-290(A) (2018 & Supp. 2018) (Act) and the Solid Waste Management: Solid Waste Landfills and Structural Fill Regulation, R.61-107.19, Part III.B.6. (2002 and Supp. 2016) (Regulation)

Summary: Heirs of Ben Gibbs (Individual/Entity), own property located in Pawleys Island, South Carolina. The Department conducted an inspection on February 3, 2020 after receiving a complaint. The Individual/Entity has violated the South Carolina Solid Waste Policy and Management Act and Solid Waste Management: Solid Waste Landfills and

Structural Fill Regulation, as follows: failed to obtain a Department issued permit prior to engaging in Class One landfill activities.

Action: The Individual/Entity is required to: remove all solid waste debris from the Site; dispose of it at a permitted solid waste management facility; and submit disposal receipts to the Department by June 17, 2021. The Department assessed a total civil penalty in the amount of four thousand, eight hundred dollars ($4,800.00). The Individual/Entity shall pay a civil penalty in the amount of four thousand, eight hundred dollars **($4,800.00)** by June 17, 2021.

Updates: No Request for Review was filed.

12) Order Type and Number: Administrative Order 20-26-SW
Order Date: April 22, 2021
Individual/Entity: **Heirs of Jane Byrd**
C/O Kimberly and Leroy Byrd
Facility: Warren Road, Property
Location: 223 Warren Road
Greenwood, SC
Mailing Address: 122 Warren Road
Greenwood, SC 29646
County: Greenwood
Previous Orders: None
Permit/ID Number: N/A
Violations Cited: South Carolina Solid Waste Policy and Management Act of 1991, S.C. Code Ann. §§ 44-96-290(A) (2018 & Supp. 2018) (Act) and the Solid Waste Management: Solid Waste Landfills and Structural Fill Regulation, R.61-107.19, Part IV.A.3. (2002 and Supp. 2016) (Regulation)

Summary: Heirs of Jane Byrd (Individual/Entity), own property located in Greenwood, South Carolina. The Department conducted an inspection on February 7, 2020 after receiving a complaint. The Individual/Entity has violated the South Carolina Solid Waste Policy and Management Act and Solid Waste Management: Solid Waste Landfills and Structural Fill Regulation, as follows: failed to obtain a Department issued permit prior to engaging in Class Two landfill activities.

Action: The Individual/Entity is required to: submit disposal receipts for the solid waste debris removed from the Site between February 7, 2019, and September 30, 2019; remove all remaining solid waste debris from the Site, dispose of it at a permitted solid waste management facility, and submit disposal receipts to the Department by June 17, 2021. The Department assessed a total civil penalty in the amount of four thousand, eight hundred dollars ($4,800.00). The Individual/Entity shall pay a civil penalty in the amount of four thousand, eight hundred dollars **($4,800.00)** by June 17, 2021.

Updates: No Request for Review was filed.

BUREAU OF WATER

Drinking Water Enforcement

13) Order Type and Number: Consent Order 21-013-DW
Order Date: April 2, 2021
Individual/Entity: **INV Performance Surfaces, LLC**
Facility: INV Camden Plant
Location: 643 Highway South
Lugoff, SC 29078
Mailing Address: P.O. Box 7000
Camden, SC 29021
County: Kershaw
Previous Orders: None
Permit/ID Number: 2830001
Violations Cited: S.C. Code Ann. Regs. 61-58.10.I(6)(b)(ii)

Summary: INV Performance Surfaces, LLC (Individual/Entity) owns and is responsible for the proper operation and maintenance of a public water system (PWS) located in Kershaw County, South Carolina. On February 18, 2021, a violation was issued as a result of review of monitoring records. The Individual/Entity has violated the State Primary Drinking Water Regulation as follows: the PWS exceeded the maximum contaminant level for turbidity.

Action: The Individual/Entity is required to: submit a corrective action plan with a schedule to address the turbidity violation by May 3, 2021. The Department has assessed a total civil penalty in the amount of three thousand, six hundred dollars ($3,600.00). The Individual/Entity shall pay a civil penalty in the amount of three thousand, six hundred dollars (**$3,600.00**) by May 3, 2021.

Update: The Individual/Entity submitted a corrective action plan which was approved by the Department, and the civil penalty has been paid.

14) Order Type and Number: Consent Order 21-014-DW
Order Date: April 12, 2021
Individual/Entity: **Prisma Health**
Facility: Palmetto Health Richland
Location: 5 Richland Medical Park Drive
Columbia, SC 29203
Mailing Address: Same
County: Richland
Previous Orders: None
Permit/ID Number: 32851-WS
Violations Cited: S.C. Code Ann. Regs. 61-58.1.J

Summary: Prisma Health (Individual/Entity) owns and is responsible for the proper permitting and construction of a public water system (PWS) located in Richland County, South Carolina. The Department issued a Notice of Alleged Violation/Notice of Enforcement Conference on March 1, 2021, as a result of a review of inspection records.

The Individual/Entity has violated the State Primary Drinking Water Regulation as follows: failed to submit a revised application to the Department and obtain a revised permit prior to deviating from the approved construction permit.

Action: The Individual/Entity is required to: submit to the Department for review and approval a revised application to obtain a revised permit by April 27, 2021; and contact the Department to request a final inspection and obtain written approval to operate within fifteen days of the issuance of the revised permit. The Department has assessed a total civil penalty in the amount of three thousand, four hundred dollars ($3,400.00). The Individual/Entity shall pay a civil penalty in the amount of three thousand, four hundred dollars **($3,400.00)** by May 12, 2021.

Update: The Individual/Entity submitted a revised application to the Department, the revised permit has been issued by the Department, and the civil penalty has been paid.

15)

Order Type and Number:	Consent Order 21-015-DW
Order Date:	April 12, 2021
Individual/Entity:	**Slow and Low Properties, LLC**
Facility:	Niagara Bottling Plant
Location:	2222 Florence Harllee Boulevard Florence, SC 29506
Mailing Address:	1440 Bridgegate Drive Diamond Bar, CA 91765
County:	Florence
Previous Orders:	None
Permit/ID Number:	2174002, 34702-WS, 34889-WS
Violations Cited:	S.C. Code Ann. Regs. 61-58.1.B(1) & 61-58.1.K(1)

Summary: Slow and Low Properties, LLC (Individual/Entity) owns and is responsible for the proper operation and maintenance of a public water system (PWS) located in Florence County, South Carolina. The Department conducted an inspection of the PWS on February 17, 2021 and observed that the PWS was constructed and operating without a permit or approval to operate from the Department. The Individual/Entity has violated the State Primary Drinking Water Regulation as follows: failed to obtain a permit to construct and written approval to operate from the Department prior to the construction and operation of a PWS.

Action: The Individual/Entity is required to: submit to the Department for review and approval a standard operating procedure for obtaining from the Department a water supply construction permit and written approval to operate by May 12, 2021. The Department has assessed a total civil penalty in the amount of eight thousand, five hundred dollars ($8,500.00). The Individual/Entity shall pay a civil penalty in the amount of eight thousand, five hundred dollars **($8,500.00)** by May 12, 2021.

Update: The permit for the PWS has been obtained and final written approval to operate was issued by the Department on March 26, 2021. The civil penalty has been paid.

16)

Order Type and Number:	Consent Order 21-016-DW
Order Date:	April 22, 2021

Individual/Entity: **Bucksport Water System, Inc.**
Facility: Bucksport Water Systems
Location: 2809 4th Avenue
Conway, SC 29527
Mailing Address: P.O. Box 1032
Conway, SC 29528
County: Horry
Previous Orders: None
Permit/ID Number: 2620003
Violations Cited: S.C. Code Ann. Regs. 61-58.5.P(2)(b)

Summary: Bucksport Water System, Inc. (Individual/Entity) owns and is responsible for the proper operation and maintenance of a public water system (PWS) located in Horry County, South Carolina. On March 15, 2021, a violation was issued as a result of review of monitoring records. The Individual/Entity has violated the State Primary Drinking Water Regulation as follows: the PWS exceeded the maximum contaminant level (MCL) for total trihalomethanes.

Action: The Individual/Entity is required to: submit a corrective action plan with a schedule to address the MCL violation by May 22, 2021. The Department has assessed a total civil penalty in the amount of four thousand dollars ($4,000.00). The Individual/Entity shall pay a **stipulated penalty** in the amount of four thousand dollars **($4,000.00)** should any requirements of the Order not be met.

Update: The Individual/Entity submitted a corrective action plan which has been approved by the Department.

Water Pollution Enforcement

17) Order Type and Number: Consent Order 21-018-W
Order Date: April 29, 2021
Individual/Entity: **City of Westminster Sewer Collection System**
Facility: City of Westminster Sewer Collection System
Location: 100 Windsor Street
Westminster, SC 29693
Mailing Address: Same
County: Oconee
Previous Orders: None
Permit/ID Number: SSS000692
Violations Cited: Pollution Control Act, S.C. Code Ann. § 48-1-110(d) and Water Pollution Control Permits Regulation S.C. Code Ann. Regs. 61-9.610.3(a)

Summary: City of Westminster Sewer Collection System (Individual/Entity) owns and is responsible for a satellite sewer collection system located in Oconee County, South Carolina. On July 23, 2020, the Department issued a Notice of Alleged Violation as result of an unsatisfactory inspection of the collection system. The Individual/Entity has violated the Pollution Control Act and the Water Pollution Control Permits Regulation, as follows:

failed to properly maintain operational and maintenance records; failed to take all reasonable steps to prevent, stop and mitigate the impact of releases of wastewater to the environment; and failed to properly document a process for investigating potential releases and reporting significant sewer overflows.

Action: The Individual/Entity is required to: submit a Compliance Attainment Plan (Plan) by June 28, 2021, outlining actions necessary to resolve deficiencies of its collection system and must include: submit a Preliminary Engineering Report (PER) regarding improvements to the collection system by August 27, 2021; development and implementation of a written Operation and Maintenance plan by October 26, 2021; and, submit construction permit applications for necessary upgrades within one hundred twenty (120) days from Department approval of the PER. All construction activities must be completed within two hundred seventy (270) days from issuance of applicable Construction Permits issued by the Department. The Department has assessed a total civil penalty in the amount of one thousand, four hundred dollars ($1,400.00). The Individual/Entity shall pay a civil penalty in the amount of one thousand, four hundred dollars **($1,400.00)** by May 29, 2021.

Update: The civil penalty has been paid.

BUREAU OF AIR QUALITY

18)

Order Type and Number:	Consent Order 21-006-A
Order Date:	April 2, 2021
Individual/Entity:	**Salisbury Electrical Safety, LLC, d.b.a Honeywell Salisbury**
Facility:	Honeywell Salisbury
Location:	4091 Azalea Drive North Charleston, SC 29067
Mailing Address:	Same
County:	Berkeley
Previous Orders:	None
Permit/ID Number:	TV-0560-0032
Violations Cited:	S.C. Code Ann. Regs. 61-62.1, Section II, Permit Requirements

Summary: Salisbury Electrical Safety, LLC d.b.a. Honeywell Salisbury (Individual/Entity) manufactures rubber gloves at its facility located Berkeley County, South Carolina. The Individual/Entity violated South Carolina Air Pollution Control Regulation, as follows: exceeded its plant-wide applicability limit of 452 tons per year of volatile organic compound emissions, calculated as a twelve-month rolling sum, from December of 2018 through December of 2019.

Action: The Individual/Entity is required to: limit volatile organic compounds emissions to 452 tons per year on a twelve-month rolling sum basis in accordance with the Title V Permit. The Department has assessed a total civil penalty in the amount of twenty-one thousand dollars ($21,000.00). The Individual/Entity shall pay a civil penalty in the amount of twenty-one thousand dollars **($21,000.00)** by May 2, 2021.

Update: The Individual/Entity has paid the civil penalty.

19) Order Type and Number: Consent Order 21-007-A
Order Date: April 12, 2021
Individual/Entity: **A&E Auto Electric Inc.**
Facility: A&E Auto Electric Inc.
Location: 425 Foster Street
Cowpens, SC 29330
Mailing Address: Same
County: Spartanburg
Previous Orders: None
Permit/ID Number: N/A
Violations Cited: S.C. Code Ann. Regs. 61-62.1, Section II, Permit Requirements and S.C. Code Ann. Regs. 61-62.5 Section IX.B

Summary: A&E Auto Electric Inc. (Individual/Entity), recycles steel, copper and aluminum metals at its facility in Spartanburg County. The Individual/Entity has violated South Carolina Air Pollution Control Regulation, as follows: failed to limit opacity to twenty (20) percent; and failed to apply for and obtain a construction permit or determine whether its sources of air contaminants (production lines) met the applicable exemption requirements prior to installing and operating the sources.

Action: The Individual/Entity is required to: henceforth operate and maintain all dust collectors and cyclones whenever shredders and associated equipment are in operation; and, maintain any records necessary to determine compliance with the exemption requirements. The Department has assessed a total civil penalty in the amount of four thousand dollars ($4,000.00). The individual shall pay a civil penalty in the amount of four thousand dollars **($4,000.00)** by May 12, 2021.

Update: On February 4, 2021, the Department determined that the Individual/Entity is exempt from permitting requirements.

20) Order Type and Number: Consent Order 21-005-A
Order Date: April 26, 2021
Individual/Entity: **Oliver's Clean Burn LLC d.b.a. Oliver's Clean Burn, Inc.**
Facility: Oliver's Clean Burn LLC d.b.a. Oliver's Clean Burn, Inc.
Location: 39 Schwartz Road
Beaufort, SC 29906
Mailing Address: Same
County: Beaufort
Previous Orders: None
Permit/ID Number: 0360-0082
Violations Cited: U.S. EPA Regulations at 40 CFR 60.2255(b), and South Carolina Code Ann. Regs. 61-62.60.2255(b), Standards of Performance for Commercial and Industrial Solid Waste Incineration Units; U.S. EPA Regulations at 70.5(a)(1)(i), State Operating Permit Programs, and South Carolina

Code Ann. Regs. 61-62.70(a)(1)(i), Title V Operating Permit Program; South Carolina Code Ann. Regs. 61-62.1, Section II, Permit Requirements

Summary: Oliver's Clean Burn LLC d.b.a Oliver's Clean Burn, Incorporated (Individual/Entity), combusts yard waste, clean wood, and untreated wood at its facility in Beaufort County, South Carolina. The Individual/Entity has violated U.S. EPA Regulations and South Carolina Air Pollution Control Regulations, as follows: failed to conduct an initial opacity test within 60 days of the air curtain incinerator reaching its operation charge rate, but no later than 180 days of initial startup; failed to submit a timely Part 70 (Title V) Permit application within 12 months of startup; failed to submit written notification to the Department of the date construction of the air curtain incinerator was commenced within 30 days of such date, and in that it failed to submit written notification to the Department within 15 days of initial startup of the air curtain incinerator.

Action: The Individual/Entity is required to: conduct timely source tests in accordance with Subpart CCCC and the Construction Permit and no later than March 31, 2021, conduct a Department approved source test for opacity using EPA Method 9 to determine compliance with the opacity limitations. The Department has assessed a total civil penalty in the amount of seven thousand five hundred dollars ($7,500.00). The Individual/Entity shall pay a penalty in the amount of seven hundred and fifty dollars **($750.00)** and a stipulated penalty in the amount of six thousand seven hundred fifty dollars ($6,750.00) should any requirement of the Order not be met.

Update: The penalty was stipulated based on financial records provided by the Individual/Entity. The civil penalty has been paid. The Individual/Entity has met all requirements of the Order.

21)

Order Type and Number:	Consent Order 21-008-A
Order Date:	April 26, 2021
Individual/Entity:	**Broad River Materials, Inc.**
Facility:	Broad River Materials, Inc.
Location:	209 Armory Road Union, SC 29379
Mailing Address:	P.O. Box 683 York, SC 29745
County:	Union
Previous Orders:	16-001-A ($8,500.00)
Permit/ID Number:	2180-0047
Violations Cited:	S.C. Code Ann. Regs. 61-62.1, Section II, Permit Requirements

Summary: Broad River Materials, Inc. (Individual/Entity), operates a sand drying operation at its facility in Union County, South Carolina. The Individual/Entity has violated U.S. EPA Regulations and South Carolina Air Pollution Control Regulation, as follows: failed to maintain records of daily pressure drop readings for the baghouse on-site; failed to keep and maintain records of weekly operation and maintenance checks for the baghouse on-site; failed to and maintain records of fuel oil supplier certifications on-site, and submit reports of recorded sulfur content to the Department semiannually; failed to submit a semiannual report for the twelve-month rolling sums of total PM emissions; failed to maintain an onsite implementation log; and failed to conduct an annual facility equipment review.

Action: The Individual/Entity is required to: comply with all terms and conditions of Bureau of Air Quality Permit 2180-0047. The Department has assessed a total civil penalty in the amount of four thousand dollars ($4,000.00). The Individual/Entity shall pay a civil penalty in the amount of four thousand dollars **($4,000.00)** by May 26, 2021.

Update: The Individual/Entity has paid the civil penalty.

* Unless otherwise specified, "Previous Orders" as listed in this report include orders issued by Environmental Affairs Programs within the last five (5) years.

BOARD OF HEALTH AND ENVIRONMENTAL CONTROL
SUMMARY SHEET

June 10, 2021

(X) ACTION/DECISION
( ) INFORMATION

I. TITLE: Proposed Santee-Lynche Capacity Use Area for Chesterfield, Clarendon, Kershaw, Lee, Richland, and Sumter Counties :S.C. Code of Laws, Title 49, Chapter 5, *Groundwater Use and Reporting Act*

Legislative Review is not required.

II. SUBJECT: Request for Capacity Use Area Desgination

III. FACTS:

1. Pursuant to S.C. Code Section 49-5-60(A), the Board of the Department of Health and Environmental Control (Department) is directed to desginate Capacity Use Areas where excessive groundwater withdrawal presents potential adverse effects to the natural resources or poses a threat to public health, safety, or economic welfare or where conditions pose a significant threat to the long-term integrity of a groundwater source

2. 49-5-60 (A) states: "In the State where excessive groundwater withdrawal presents potential adverse effects to the natural resources or poses a threat to public health, safety, or economic welfare or where conditions pose a significant threat to the long-term integrity of a groundwater source, including salt water intrusion, the board, after notice and public hearing, in accordance with the Administrative Procedures Act, shall designate a capacity use area. The department, local government authorities, other government agencies, or groundwater withdrawers may initiate the capacity use area designation process. The notice and public hearing must be conducted such that local government authorities, groundwater withdrawers, or the general public may provide comments concerning the capacity use area designation process. A capacity use area must be designated by the board based on scientific studies and evaluation of groundwater resources and may or may not conform to political boundaries."

3. The Department is proposing an to desginate Chesterfield, Clarendon, Kershaw, Lee, Richland, and Sumter Counties as the Santee-Lynches Capacity Use Area (SLCUA). The Department has completed an initial assessment of the groundwater conditions in the area (Attachment A) and determined that there. is a risk to public health, safety and economic welfare from excessive groundwater withdrawl. Additionally because large portions of the recharge areas for the primary aquifers of the the coastal plain exsist in the SLCUA, faluire to manage groundwater withdrawls pose a significant long term threat to the long term integrity of the groundwater source.

4. The Department engaged with stakeholders to receive feedback on the proposed SLCUA. Two virtual public meetings were held on January 5, 2021 and January 12, 2021. Additionally the meetings were recorded and placed on the Department website for public viewing.

5. A Notice of General Public Interest was published in the State Register on March 26, 2021
A copy of the Notice of General Public Interest is submitted as Attachment B.

4. Department staff requests the Board desginate Chesterfield, Clarendon, Kershaw, Lee, Richland, and Sumter Counties as the Santee-Lynches Capacity Use Area.

IV. ANALYSIS:

The results of this initial assessment indicate groundwater resources in Chesterfield,Clarendon, Kershaw, Lee, and Richland Counties have been developed to the extent that reasonable regulation and a permitting program will provide the benefit of protecting, preserving, and developing the area's groundwater resources. It is the Department's recommendation that these counties be designated as the Santee-Lynches Capacity Use Area.

V. RECOMMENDATION:

Department staff recommends the Board desginate Chesterfield, Clarendon, Kershaw, Lee, Richland, and Sumter Counties as the Santee-Lynches Capacity Use Area.

Submitted By:

Dr. Mike Marcus
Bureau Chief, Bureau of Water Environmental Affairs

Approved By

Myra C. Reece
Director of Environmental Affairs

Attachments:

A. Initial Groundwater Assessment:Chesterfield, Clarendon, Kershaw,Lee, Richland and Sumter Counties
B. South Carolina State Register Notice of General Public Interest, March 26, 2021
C. Public Comments Recived
D. PowerPoint Presentation – Proposed Santee-Lynches Capacity Use Area Designation

E.

ATTACHMENT A

INITIALGROUNDWATER ASSESSMENT: CHESTERFIELD, CLARENDON, KERSHAW, LEE RICHLAND AND SUMTER COUNTIES

Initial Groundwater Assessment: Chesterfield, Clarendon, Kershaw, Lee, Richland and Sumter Counties, South Carolina

Prepared by: Andrea L. H. Hughes, PhD, *Hydrogeologist*
Lance Foxworth, *Hydrogeologist*

Bureau of Water
Dr. James Michael Marcus, *Chief*

Water Monitoring, Assessment, and Protection Division
Robert Devlin, *Director*

Water Quantity Permitting Section
Alexander P. Butler, *Manager*

Technical Report Number: 013-2020

August 2020
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Division Director:

Robert Devlin

August 2020
Rev. 1.0

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Executive Summary

South Carolina's Groundwater Use and Reporting Act[1] declares that *the general welfare and public interest require that the groundwater resources of the State be put to beneficial use to the fullest extent to which they are capable, subject to reasonable regulation, in order to*:

- *Conserve and protect these resources,*
- *Prevent waste, and to*
- *Provide and maintain conditions which are conducive to the development and use of water resources*.

The Act further states *where excessive groundwater withdrawal presents potential adverse effects to the natural resources or poses a threat to public health, safety, or economic welfare or where conditions pose a significant threat to the long-term integrity of a groundwater source, including salt water intrusion, the board, after notice and public hearing, in accordance with the Administrative Procedures Act, shall designate a capacity use area.*[2] At this time, there are five designated Capacity Use Areas that include 22 of the 28 counties in the Atlantic Coastal Plain (ACP) region of the State—known as the South Carolina Coastal Plain (SCCP).

- Waccamaw: Georgetown and Horry Counties
- Low Country: Beaufort, Colleton, Hampton, and Jasper Counties
- Trident: Berkeley, Charleston, and Dorchester Counties
- Pee Dee: Darlington, Dillon, Florence, Marion, Marlboro, and Williamsburg Counties
- Western: Aiken, Allendale, Bamberg, Barnwell, Calhoun, Lexington, and Orangeburg Counties

Groundwater withdrawers[1] in Capacity Use Areas (CUAs) are required to apply for a groundwater withdrawal permit and report their monthly water use to the Water Quantity Permitting Section (the Department) of the South Carolina Department of Health and Environmental Control (SCDHEC) by January 30th of the following year. Groundwater withdrawers within the SCCP but outside of a Capacity Use Area are required to submit a Notice of Intent to the Department 30 days prior to the construction of any new well and to register their wells and report water use.

Chesterfield, Clarendon, Kershaw, Lee, Richland, and Sumter are the six counties remaining in the SCCP that are not part of one of the five existing Capacity Use Areas are (Figure 1). This report provides an initial assessment of the groundwater conditions in these six remaining SCCP counties as the first step toward designating these counties as the Santee-Lynches Capacity Use Area (proposed Santee-Lynches Area or simply Santee-Lynches Area).

[1] A groundwater withdrawer is defined as a person or entity who withdraws in excess of three million gallons in any one month from a single well or multiple wells under common ownership within a one-mile radius from any existing or proposed well(s). Groundwater Use and Reporting Act, S.C. Code Ann. § 49-5-12.

Introduction

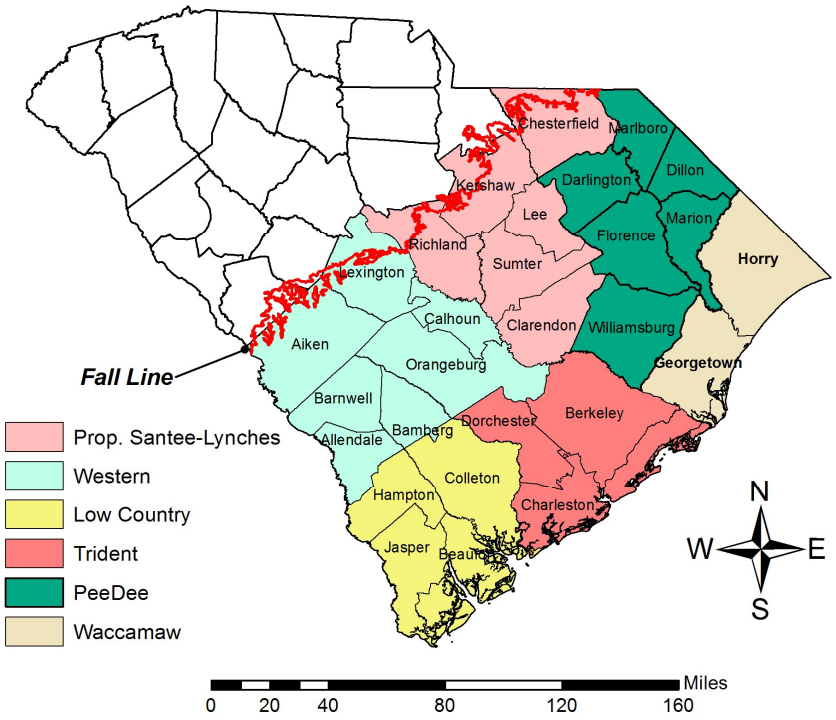


Figure 1: Map of the existing and proposed Capacity Use Areas.

Location, Topography, and Land Use/Cover

The counties in the proposed Santee-Lynches Area are in the northeastern part of the state with Chesterfield County bordering North Carolina and Clarendon County bordering Berkeley County to the south (Figure 1). The topography varies across these counties from the low-relief outer coastal plain through the gently rolling hills of the sandhills region (part of the upper coastal plain at the Fall Line; see the Physiography and Hydrology Section). The total elevation ranges from 25 feet to 720 feet above mean sea level (AMSL).

Chesterfield and Kershaw Counties are largely covered by mixed, deciduous, and evergreen forests (Figure 2). Richland County has the highest concentration of urban/developed land cover reflecting the state capitol of Columbia and the development along SC Highway 1 running to the northeast through Elgin, Lugoff, and Camden in Kershaw County. Cultivated cropland covers a significant portion of Lee, Sumter, and Clarendon Counties.

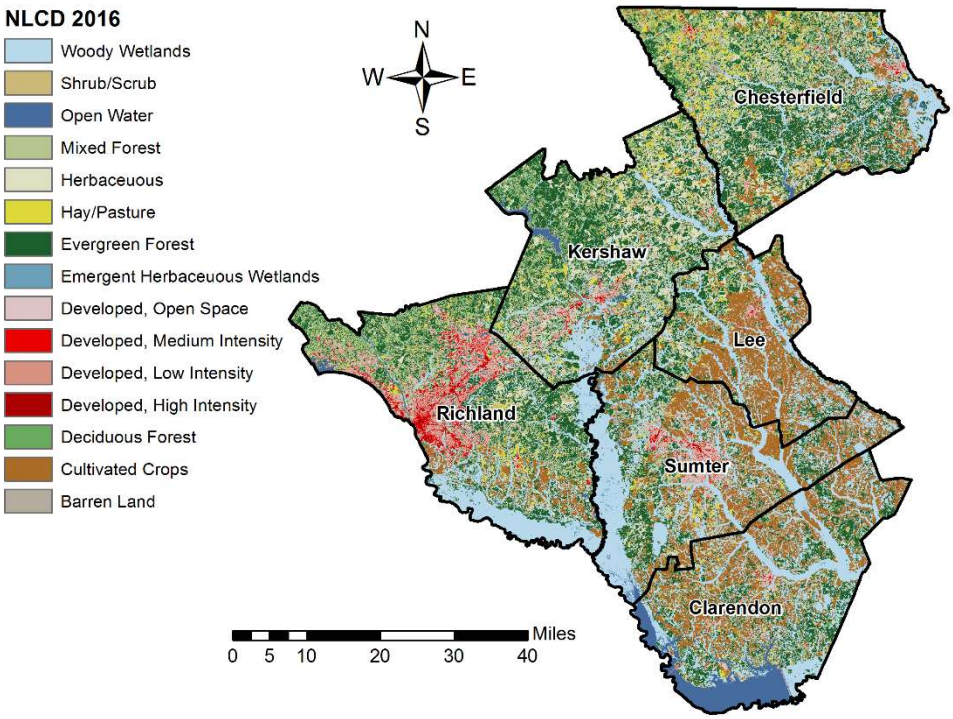


Figure 2: Land Cover from the National Land Cover Database from 2016. Multi-Resolution Land Characteristics Consortium; https://mrlc.gov; accessed February 28, 2020.

Population and Geo-Political Structure

The July 2018 population estimates for the Santee-Lynches Area counties totaled 683,276 (Figure 3). Richland County is the most populous at 61% of this total, and Lee County the least populous at 2%.

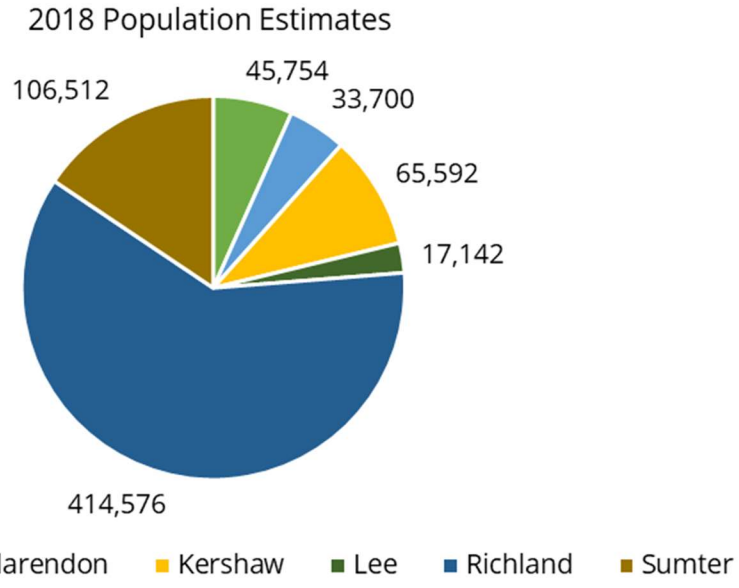


Figure 3: July 2018 population estimates for the proposed Santee-Lynches Area counties. www.census.gov; accessed February 21, 2020.

South Carolina is divided into ten official planning districts known as Councils of Governments (COG). The Mission of the COGs is to "…work collectively to benefit all of South Carolina. We do this by functioning as a valuable extension of county and local governments, serving as a resource for technical assistance, securing state and federal dollars to address critical issues for our communities, and by advocating at a state and national level for economic and quality of life improvements for our state.
Three COGs operate within the proposed Santee-Lynches Area: Chesterfield County is in the Pee Dee Council of Governments (PDCOG), Clarendon, Kershaw, Lee, and Sumter Counties are in the Santee-Lynches Council of Governments (SLCOG), Richland County is in the Central Midlands Council of Governments (CMCOG).

- PDCOG is currently governed by a 27-member Board of Directors from six participating counties and serves 33 incorporated municipalities (8 in Chesterfield County)[3].
- SLCOG is currently governed by a 29-member Board of Directors from four participating counties and serves 12 incorporated municipalities[2].
- CMCOG is currently governed by a 51-member Board of Directors from four participating counties and serves 30 incorporated municipalities including the state capital of Columbia, South Carolina[4].

Chesterfield, Clarendon, Lee and Sumter counties are governed by a Council/Administrator form of government. Kershaw and Richland counties are governed by a Council form of government. Cities, towns, and municipalities in the proposed Santee-Lynches CUA implement various forms of government, including Mayor/Council, Council/Manager, or Council only.

Climate

South Carolina has a humid, sub-tropical climate with summer high temperatures that can exceed 100 degrees and mild winters[5]. Annual averages of temperature and precipitation from long-term meteorological station records across South Carolina are presented in Appendix A, Figures A1 – A3. The record length at each of these stations varies from a few years to more than 100 years[4].

Hydrogeologic Framework

Physiography and Hydrology

The six Santee-Lynches Area counties are diverse in physiography and hydrology resulting from their areal extent within the state. From the northernmost county of Chesterfield to the southernmost county of Clarendon, the Santee-Lynches Area spans three of the four physiographic provinces (Figure 4A). Chesterfield, Kershaw, and Richland Counties cross the Fall Line with portions in the Piedmont and Upper Coastal Plain. Lee and Sumter Counties are divided between the Upper and Lower Coastal Plains, and Clarendon County is entirely within the Lower Coastal Plain.

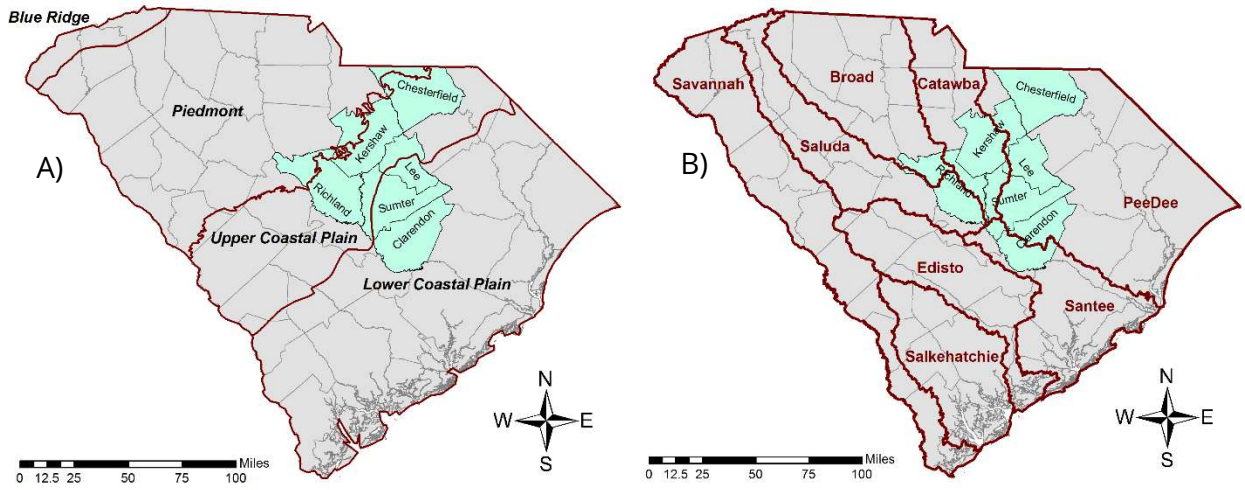


Figure 4: Maps of the proposed Santee-Lynches Area counties in relation to South Carolina's A) Physiographic Provinces and B) Major River Basins. River Basins are simplified from the Hydrologic Unit Code accounting units for the region.

Surface Water

The Santee-Lynches Area is drained by five of the eight major river basins in the northeastern half of the state—the Broad, Catawba, Pee Dee, Saluda and Santee Basins (Figure 4B). Major rivers that pass through or define county boundaries are the Saluda, Broad, Congaree, Wateree, Santee, Lynches, Black, and Pee Dee Rivers. Major lakes in South Carolina are formed by damned river systems, and lakes in this area include Lake Wateree, Lake Murray, Lake Robinson, and Lake Marion (Figure 5). Surface water bodies incise and interact heavily with aquifer systems within the region, especially closest to the Fall Line (Figure 6). In some cases, the incised valleys isolate water-bearing units from the greater regional aquifer(s). The interconnectivity of surface and groundwater in the Santee-Lynches Area is a defining regional characteristic, particularly within the Upper Coastal Plain.

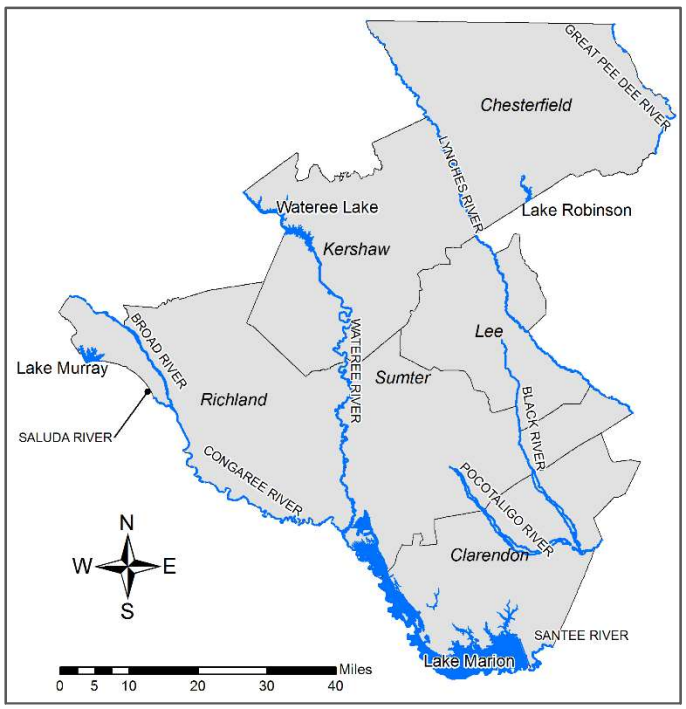


Figure 5: Major Rivers and Lakes of the proposed Santee-Lynches Capacity Use Area.

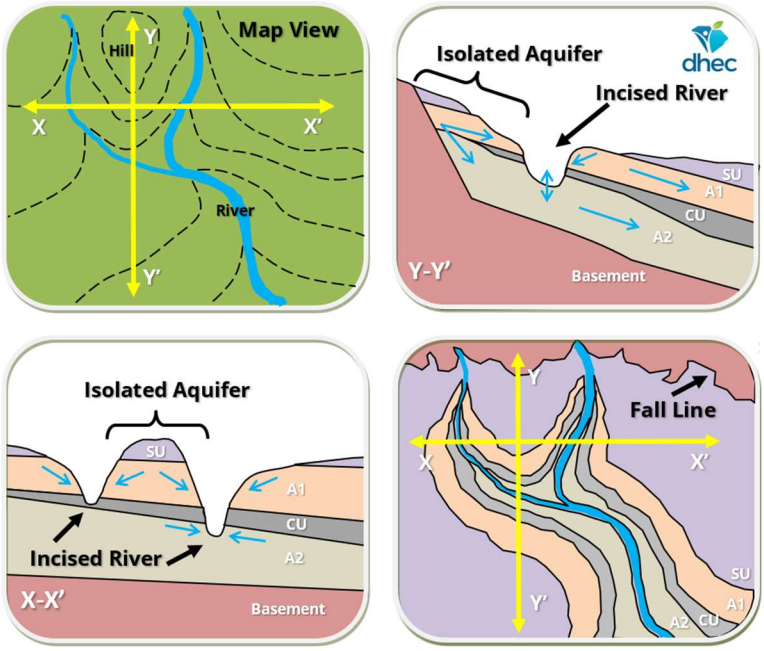
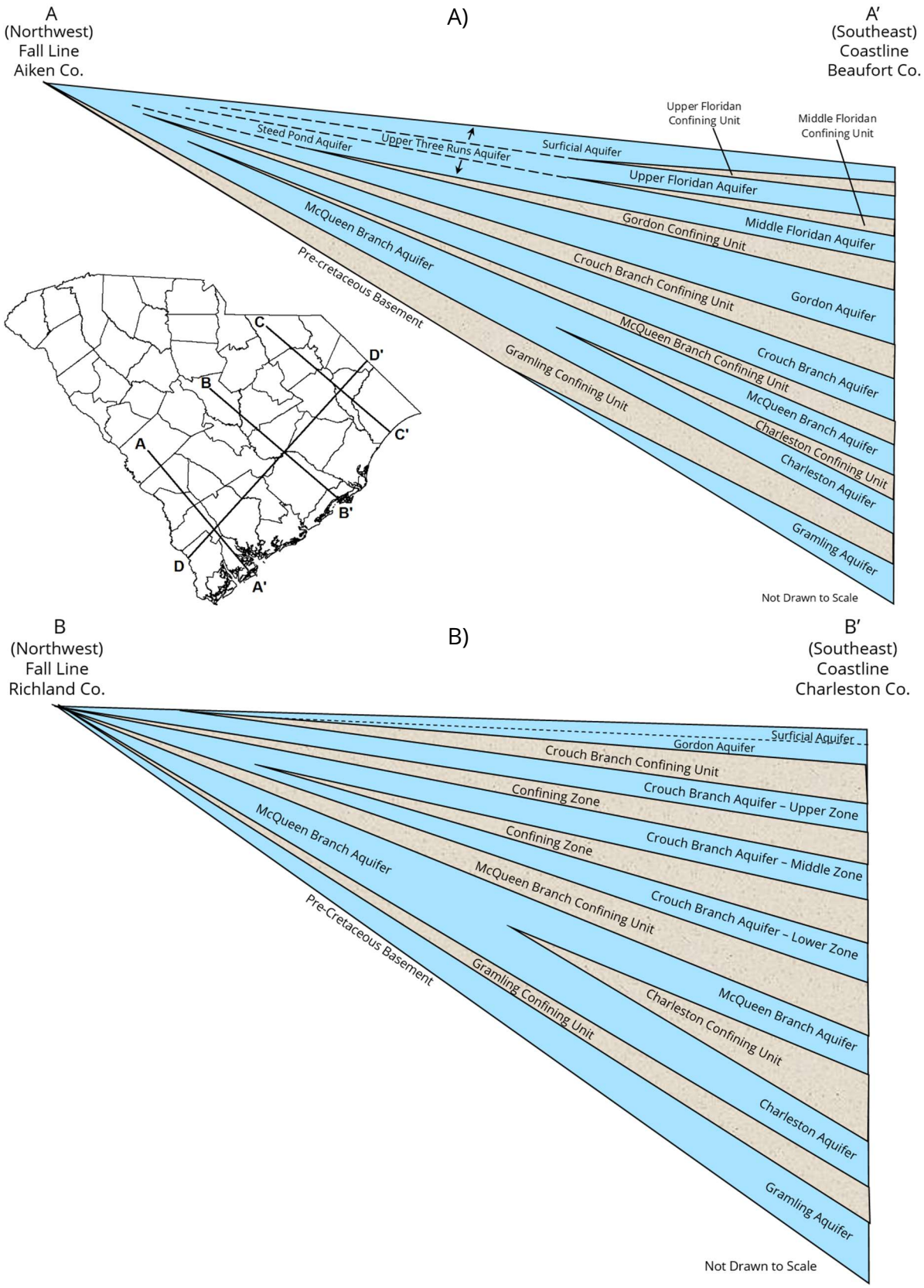


Figure 6: Illustration of the relationship between surface water and groundwater via incised river valleys in the Santee-Lynches Area close to the Fall Line.

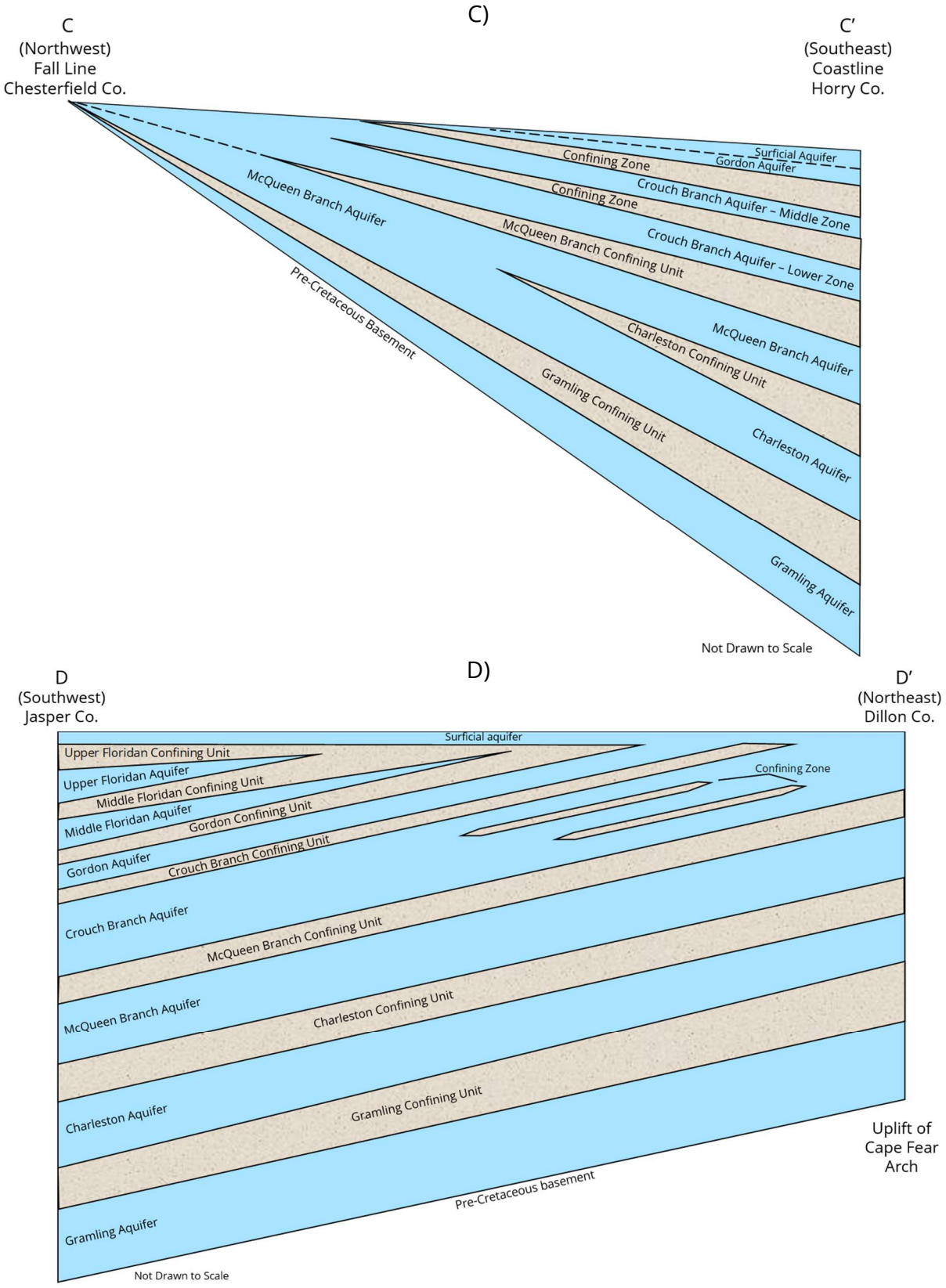
Aquifer Characteristics

The South Carolina Coastal Plain (SCCP) is part of the larger Atlantic Coastal Plain (ACP) hydrogeologic system containing water-bearing, permeable sand or carbonate rock aquifers alternating with low-permeability confining units, usually consisting of clay or silt. The Fall Line (Figure 1) marks the location where the ACP sediments thin and pinch-out over the crystalline rock of the Piedmont physiographic province. Above the Fall Line, water-bearing zones are within the cracks of the crystalline rock and in thicker sections of weathered rock (regolith) at the surface[5].

The ACP aquifers present beneath the proposed Santee-Lynches area are composed of sediments deposited during the late Cretaceous to Tertiary periods. From oldest to youngest, the Cretaceous units are the Gramling, Charleston, McQueen Branch, and Crouch Branch aquifers. The Tertiary unit is the Gordon aquifer, and the Surficial Aquifer is Quaternary in age (Figure 7). In the proposed Santee-Lynches area, the confining units gradually thin and taper out to the northwest (geologically speaking, "up-dip"). Below Chesterfield County, the McQueen Branch and Crouch Branch aquifers coalesce to form the Dublin-Midville Aquifer System, and below Richland and Kershaw Counties, the Crouch Branch aquifer and surficial aquifer combine and ultimately pinch out at the Fall Line (Figures 7B and 7C). As a result, the aquifers closest to the Fall Line are shallower, more interconnected, and show a greater degree of surface water interaction than those in the southern extent of the proposed Santee-Lynches Area where aquifers are more discrete and separated by confining units[6].



Figures 7A and B: General structure of aquifers and confining units in the South Carolina Coastal Plain. Modified from Campbell, B.G., and A.L. Coes, eds. (2010)[8]. Inset map shows locations of the cross-sections.



Figures 7C and D: General structure of aquifers and confining units in the South Carolina Coastal Plain. Modified from Campbell, B.G., and A.L. Coes, eds. (2010)[8].

The Piedmont province (Figure 4A) is composed of pre-Cretaceous age rocks with complex depositional, metamorphic, and intrusion histories that are beyond the scope of this report. Weathering of these metamorphic and igneous rocks has produced a layer of unconsolidated sediment of varying thicknesses at the surface (regolith). In contrast to the SCCP aquifers, groundwater in the Piedmont province is found within the cracks and fractures of the rocks as well as in the thicker packages of unconsolidated sediment at the surface[7].

Aquifer Recharge

South Carolina receives an average of 45 inches or more of precipitation each year (Appendix A, Figure A3). However, most water never infiltrates below the root zone into the deeper subsurface to function as groundwater storage. A significant portion of water is taken up by plants within the root zone or discharged into surface water systems before infiltrating deep enough to enter the groundwater system. Therefore, the amount of water that enters as groundwater storage is a small fraction of precipitation received. Inflow into the groundwater system is also heavily dependent on when and where precipitation occurs. The portions of the state where water infiltrates into the SCCP aquifers are known as recharge areas (Figure 8).

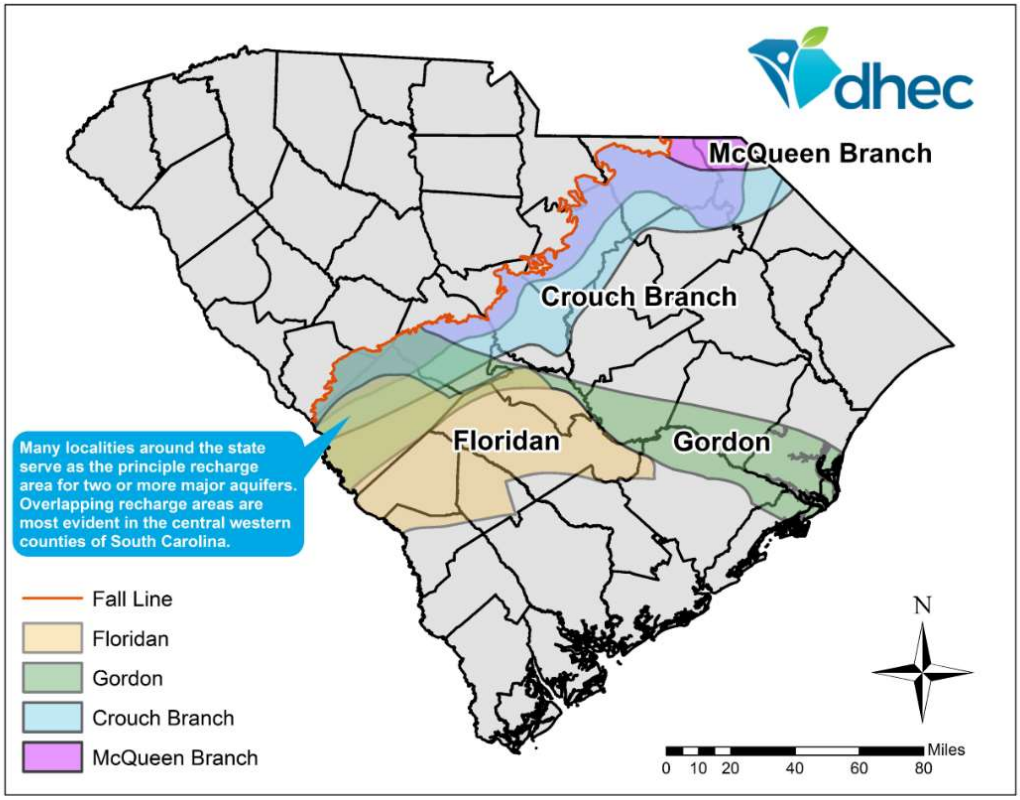


Figure 8: General recharge areas for the major SCCP aquifers. Data provided by SCDNR.

The recharge areas for the state's major aquifers are generally within the Upper Coastal Plain. The exceptions being surficial aquifers, parts of the deeper SCCP aquifers near the Fall Line, and the Gordon Aquifer which has a recharge area that extends to the coast (Figures 7 and 8). As mentioned previously, the SCCP aquifers near the Fall Line are closer to the surface, more interconnected, and have a greater connection to surface water allowing more local recharge. Aquifers extending all the way to the coast (Figure 7) are dependent on precipitation infiltrating in the recharge areas (Figure 8) further "up-dip", then moving slowly "down-dip" (southeast) to continuously replenish groundwater supply to the deeper parts of the aquifers. Consequently, the rate at which groundwater is replenished in the aquifers is controlled by the rate at which groundwater travels from the recharge areas to the coast. Typical groundwater flow rates for silts to well-sorted sands range from 0.003 to 300 feet per day[8]. This means that once water becomes part of the groundwater system, it may take from a few years to tens of thousands of years to reach the deeper aquifers located along the coast.

Drought in South Carolina

Over the past twenty years (January 2000 – January 2020), three major periods of drought occurred in South Carolina—1998 to 2003, 2007 to 2008, and 2011 to 2013 (Appendix A, Figure A4). However, drought conditions varied in severity and extent among the Santee-Lynches Area counties (Figure A5) with no apparent spatial trend. In order to better understand how drought and the consequential increases in groundwater use have impacted the groundwater sources in the proposed Santee-Lynches Area, trends in groundwater levels were examined.

Groundwater Trends

Groundwater in South Carolina is monitored using a network of wells maintained by SCDNR as well as the United States Geological Survey (USGS). A map of the complete SCDNR well network is located in Appendix A (Figure A6). SCDNR maintains 19 wells in the Santee-Lynches Area, and the USGS maintains 7. The Department selected a subset of these 26 wells to present here based on how well the water level records represented the aquifer and county. That is, did the well record reflect the typical hydrograph seen in the remaining wells for a specific area and aquifer. Additionally, wells with the longest monitoring record were chosen in order to understanding groundwater trends for a given county/aquifer combination.

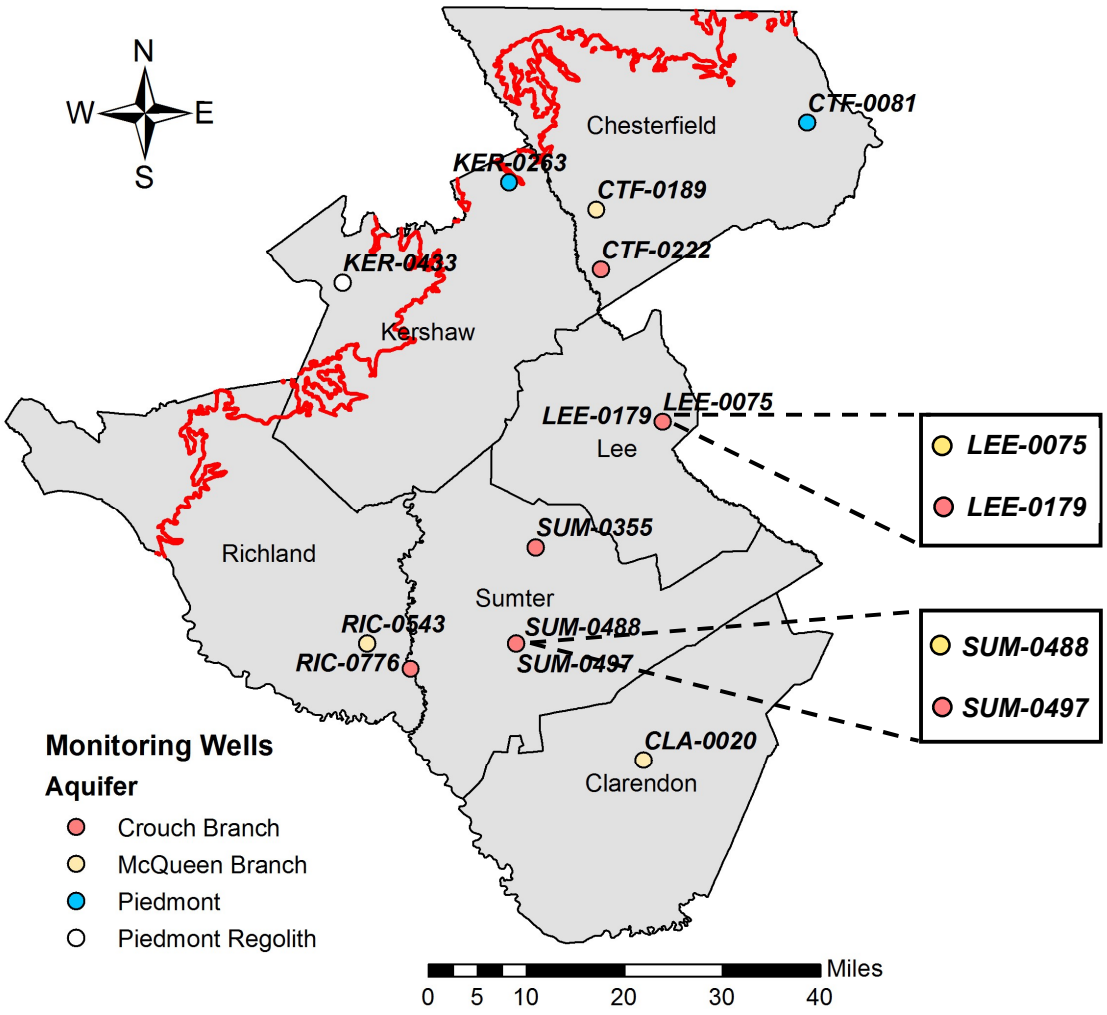
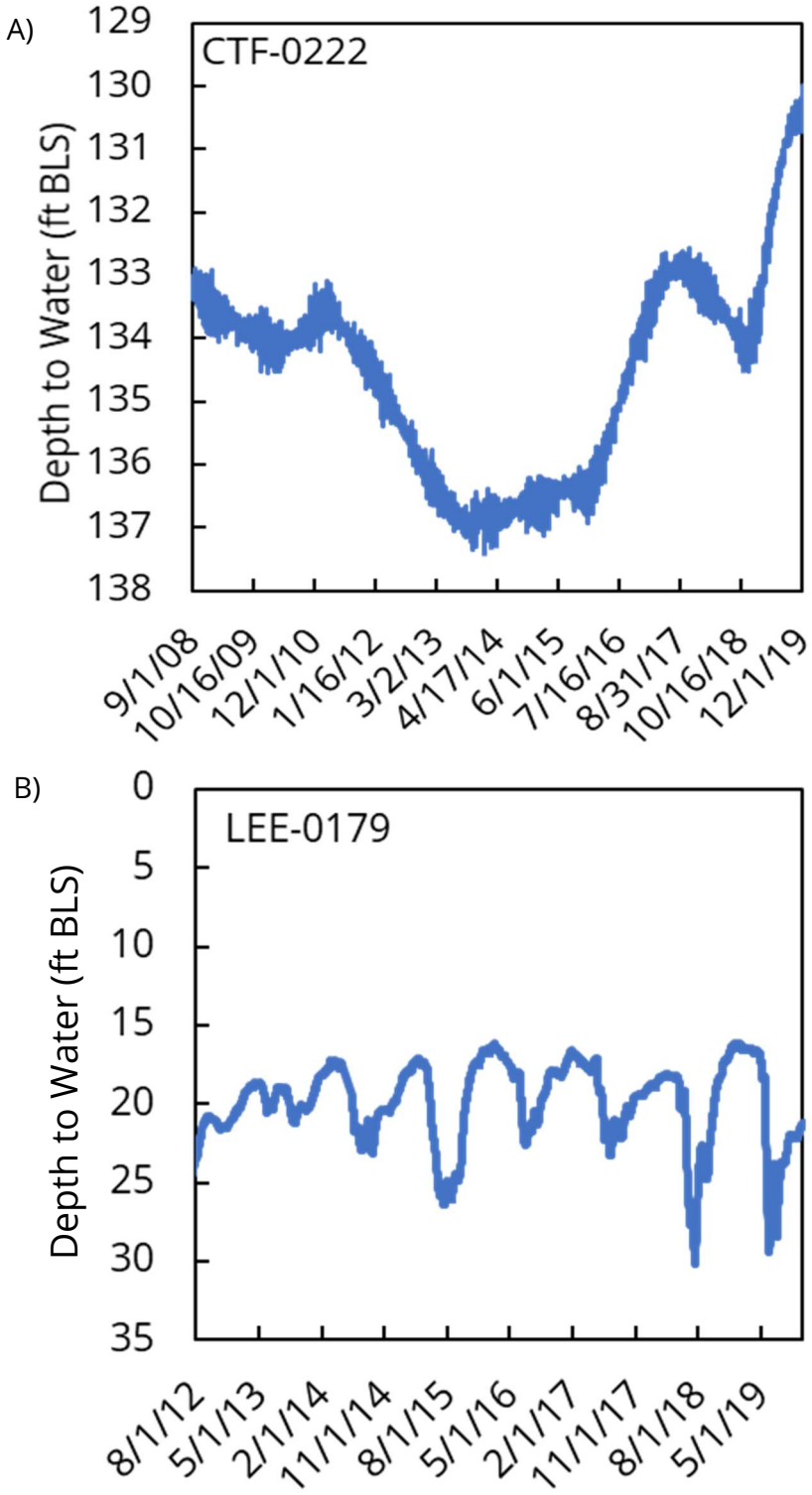


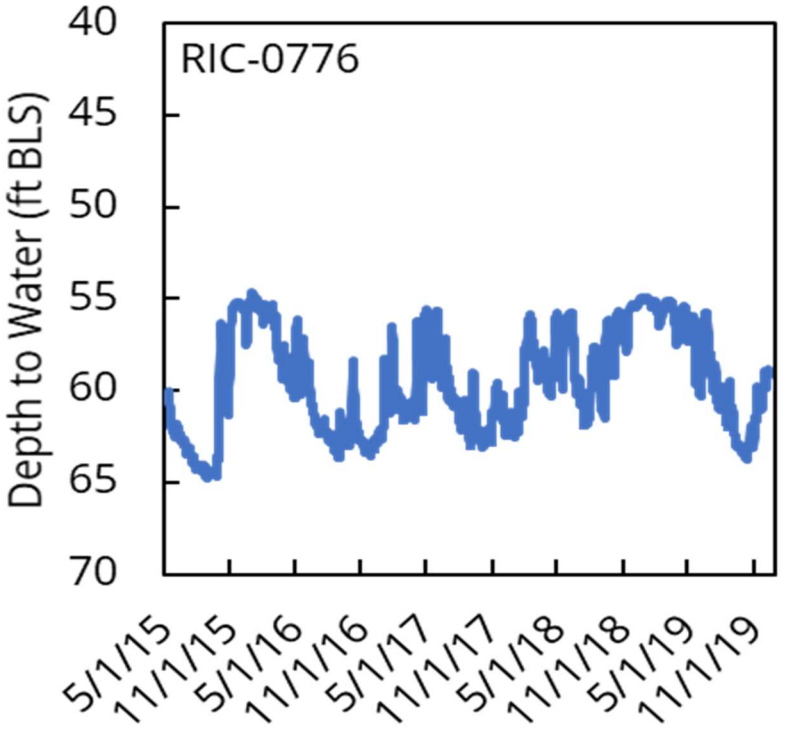
Figure 9: Map showing the locations of the wells used to evaluate groundwater trends. The colors represent the aquifer into which each well is screened. The pop-out boxes provide individual well information for well clusters in Lee and Sumter Counties.

Crouch Branch Aquifer

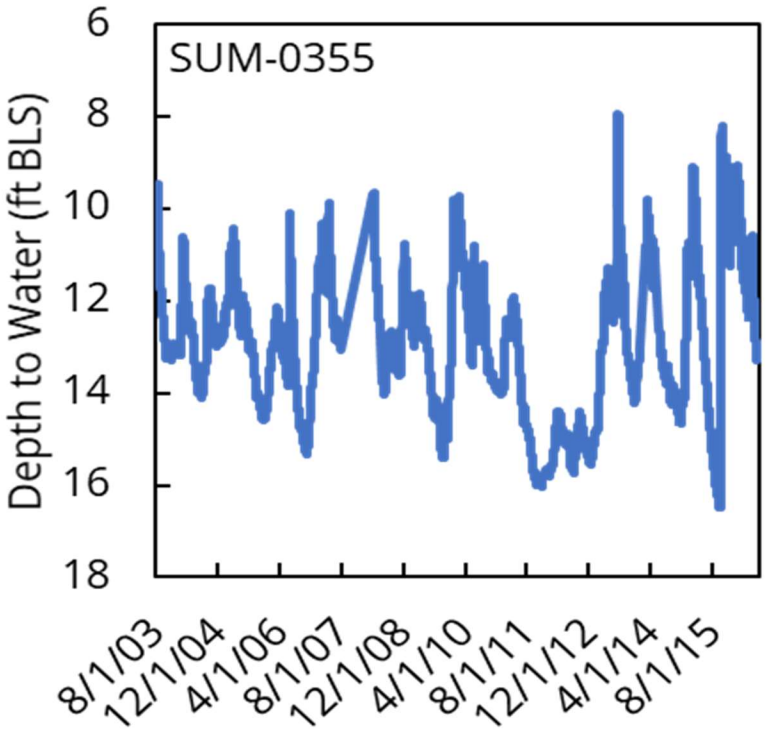


Figures 10A through E: Water levels recorded at monitoring wells screened in the Crouch Branch aquifer. Vertical axes are depth to water in the well below land surface (BLS). Note the differences in the dates for each hydrograph along the horizontal axis. All wells are SCDNR wells except where noted on the individual graphs. A) and B) Monitoring Wells screened in the Crouch Branch Aquifer. See Figure 9 for well locations.

C)



D)



Figures 10C and D: Monitoring wells screened in the Crouch Branch Aquifer. See Figure 9 for well locations.

E)

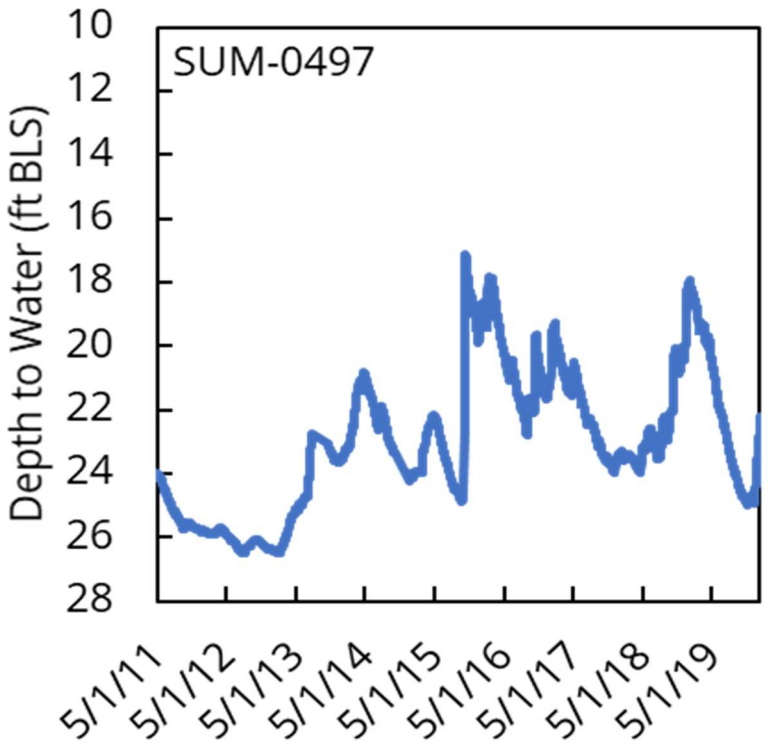
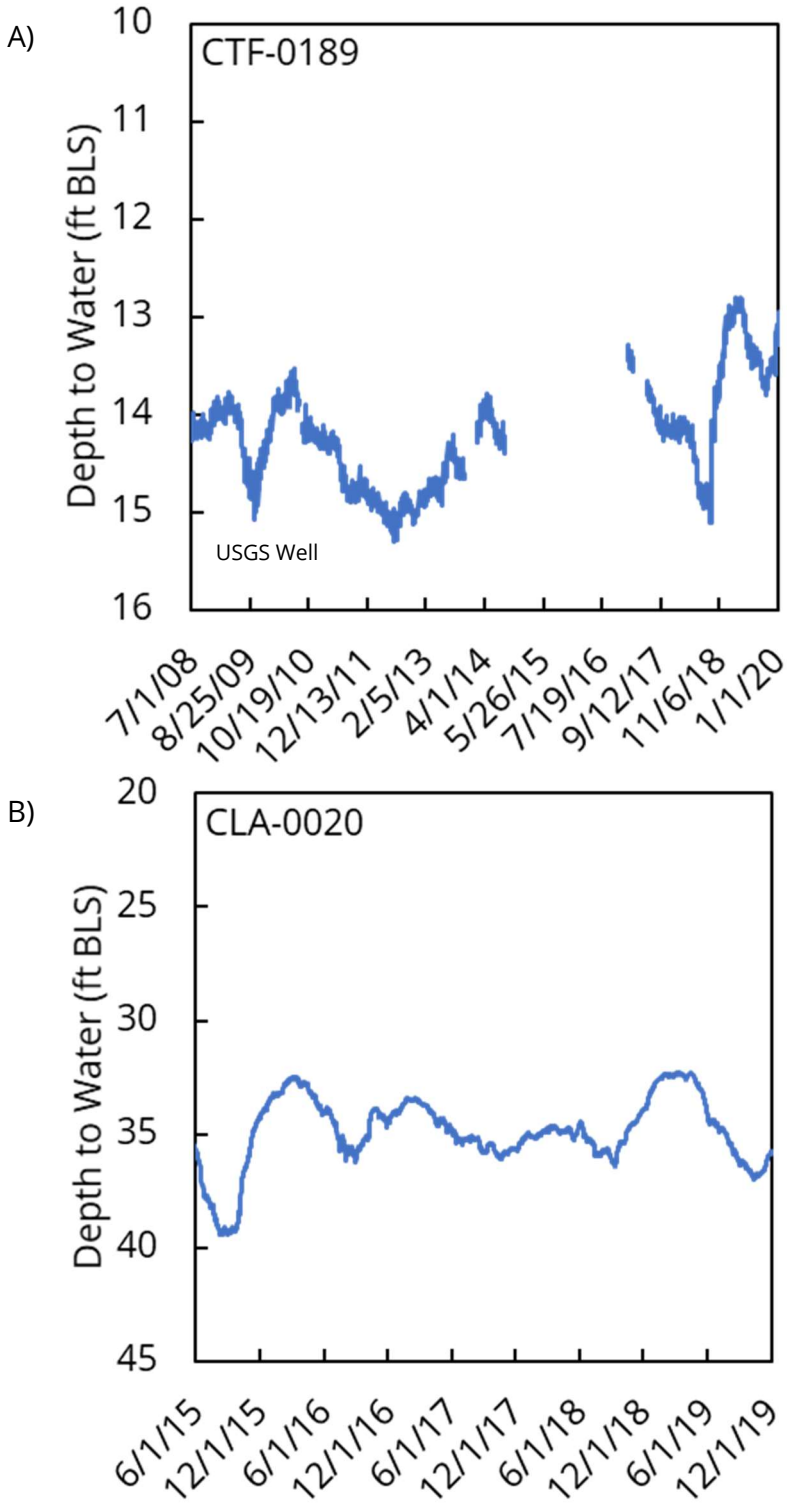


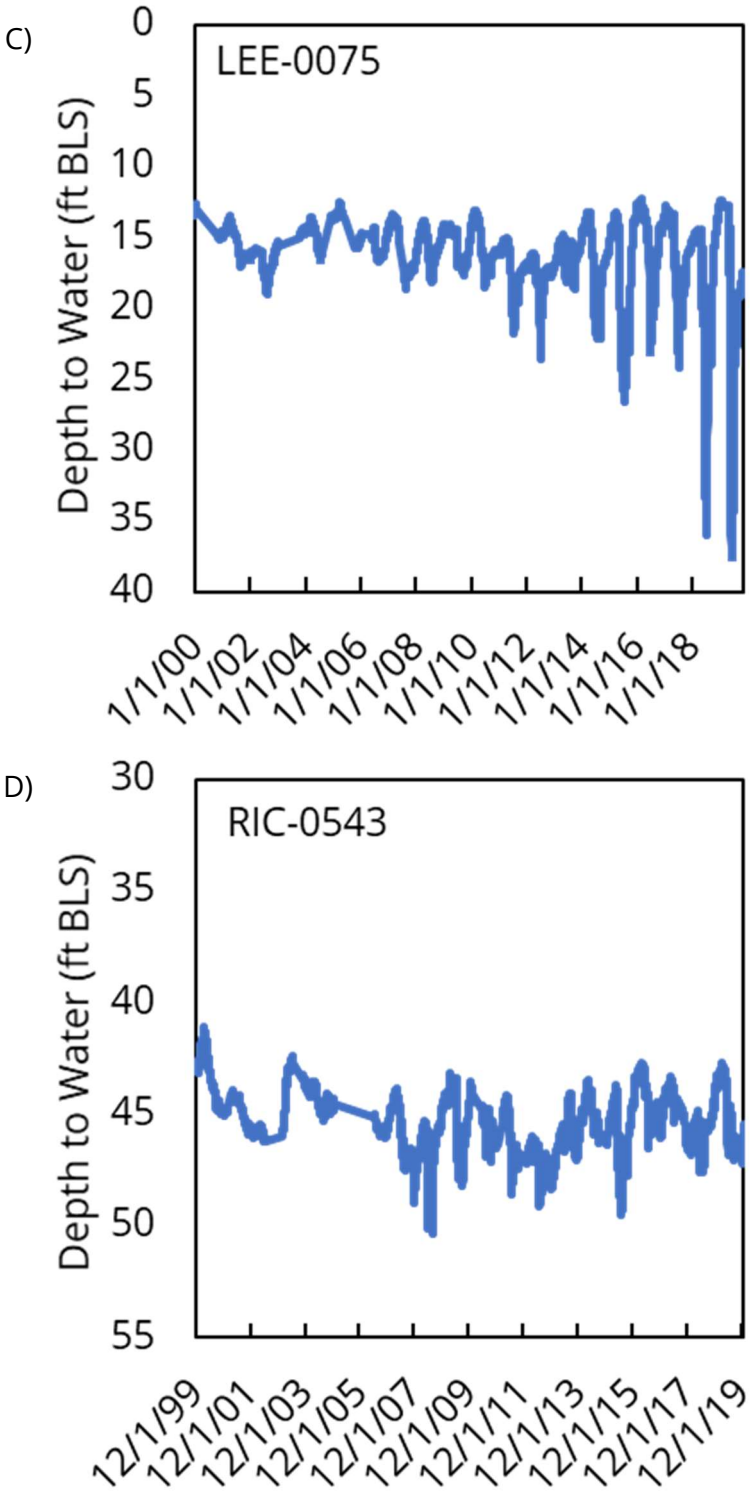
Figure 10E: Monitoring well screened in the Crouch Branch Aquifer. See Figure 9 for well location.

There is no apparent groundwater level trend among the hydrographs for the Crouch Branch aquifer (Figures 10A to E). There is, however, some evidence of the impact of drought. In particular, lowered groundwater levels can be seen in CTF-0222, SUM-0355, and SUM-0497 that coincide with the drought from 2011 to 2013. Note that these monitoring well records do not include the severe state-wide period of drought beginning in 1998 and may not represent total drawdown from levels prior to 1998. As stated previously, the "up-dip" portions of the SCCP aquifers are recharged locally and are affected more rapidly by changes in precipitation and the close connections with surface water. Summer drawdown of groundwater from evapotranspiration (ET) and irrigation can also be seen in the wells in Lee and Sumter Counties (LEE-0179 and SUM-0355). Following each summer or drought-induced drawdown, the groundwater levels have generally rebounded.

McQueen Branch Aquifer



Figures 11A through E: Water levels recorded at monitoring wells screened in the McQueen Branch aquifer. Vertical axes are depth to water in the well below land surface (BLS). Note the differences in the dates for each hydrograph along the horizontal axis. All wells are SCDNR wells except where noted on the individual graphs. A) and B) Monitoring Wells screened in the McQueen Branch Aquifer. See Figure 9 for well locations.



Figures 11C and D: Monitoring wells screened in the McQueen Branch Aquifer. See Figure 9 for well locations.

E)

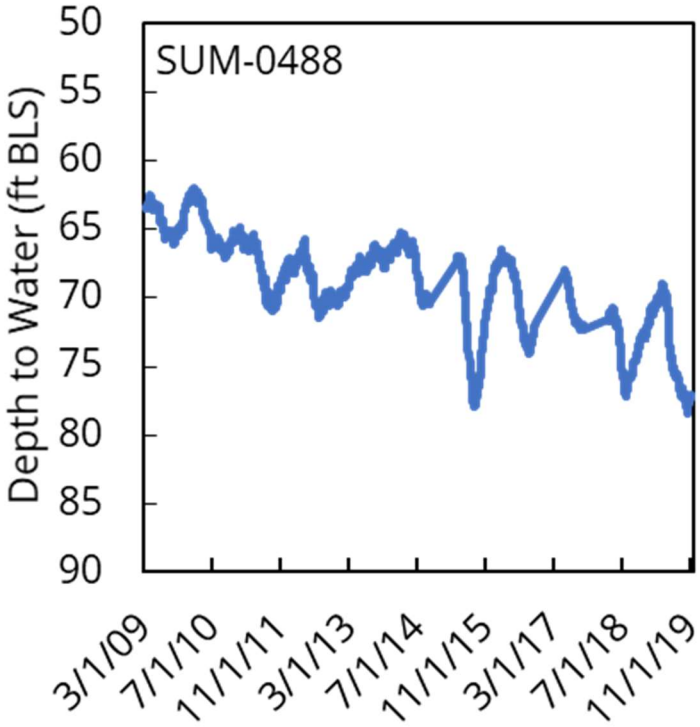


Figure 11E: Monitoring well screened in the McQueen Branch Aquifer. See Figure 9 for well location.

Because the McQueen Branch aquifer is deeper within the stack of SCCP sediments, the effect of drought on groundwater levels is reduced but still visible in the water level records (Figure 11). The seasonal reduction in groundwater levels due to summer water use is clearly seen in the Lee and Sumter County wells (LEE-0075 and SUM-0488). In the Lee County well (LEE-0075), the seasonal drawdown of the water level has deepened significantly over time from less than 5 feet to more than 20 feet during the summer. Also, during the 2011-2013 drought, the fall/winter rebound did not return to previous levels until the fall/winter of 2014 (Fig 11C). Overlying the seasonal trend seen in the Sumter County Well (SUM-0488), there has been an overall decline of approximately 10 feet in the groundwater level since 2009.

Changes to Potentiometric Surfaces

The major aquifers below the proposed Santee-Lynches Area counties are the Crouch Branch and McQueen Branch. The Gordon and Charleston Aquifers only extend to portions of Clarendon County. The McQueen Branch and Charleston aquifers together are known as the Midville Aquifer System (please refer to the Hydrostratigraphic Section of this report) and formerly classified as the Middendorf aquifer under historical nomenclature.

Groundwater flows within an aquifer from areas of high pressure to low pressure. Pressure within an aquifer is a combination of the overburden pressure of the aquifer material (rock, sand, soil, etc.) and water above the point at which the pressure is measured. The pressure of water within an aquifer can be determined by measuring the level of water within a well that has been drilled to and screened within the aquifer. These water level measurements can be combined to generate a contour map of the water levels known as a potentiometric map. Groundwater flows in paths that are perpendicular to (at right angles to) the potentiometric contour lines.

SCDNR has been making water level measurements and publishing potentiometric maps for the aquifers and aquifer systems of South Carolina since 1987—providing a vital, long-term record of the condition of South Carolina's aquifers. SCDHEC uses this record as one tool to determine whether groundwater withdrawals in SCCP aquifers present "potential adverse effects to the natural resources" or "pose a significant threat to the long-term integrity of a groundwater source". Potentiometric maps of groundwater below the proposed Santee-Lynches Area are available for the Crouch Branch and Middendorf (McQueen Branch) aquifers.

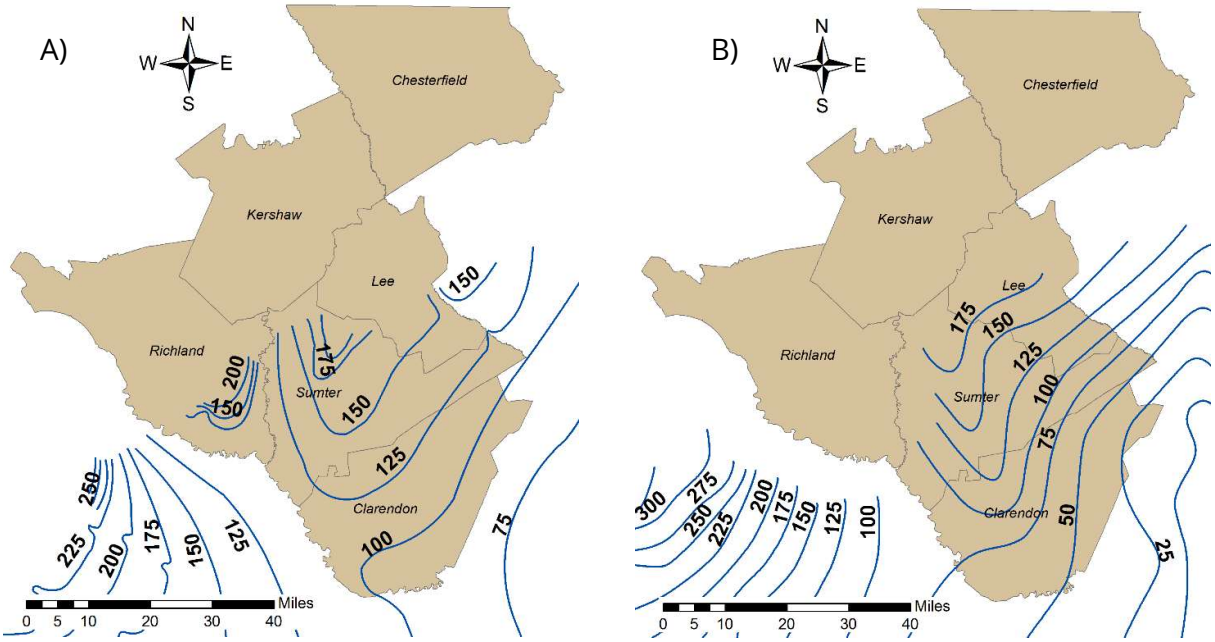


Figure 12: Potentiometric Surface Maps of the Crouch Branch Aquifer. A) Pre-Development (1900) and B) 2016. The dashed lines indicate an approximation of the contour location due to insufficient water level measurements in that area. Contour lines connect points of equal water elevation measurements.

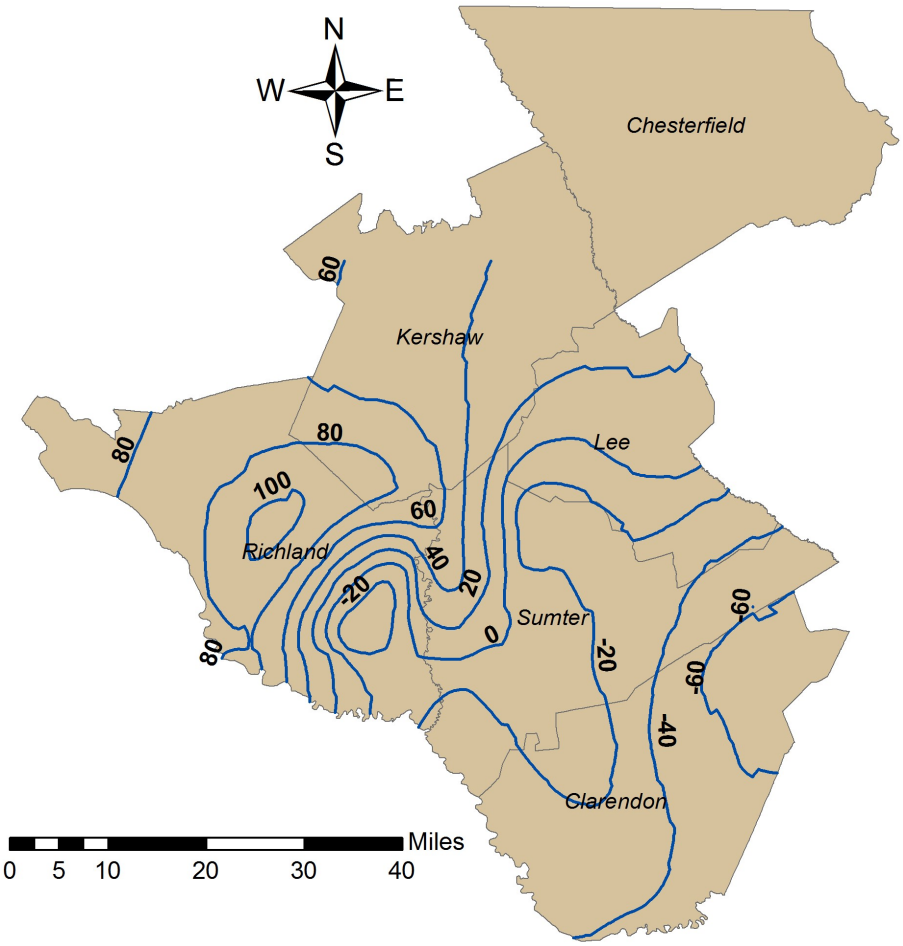


Figure 13: Change in Crouch Branch Aquifer Potentiometric Surface, Pre-Development to 2016. Contour lines represent points of equal change to the potentiometric surface.

A comparison of the pre-development [9] (Figure 12A) and 2016 (Figure 12B) potentiometric surfaces of the Crouch Branch aquifer indicate that the direction of groundwater flow below the Santee-Lynches Area counties is largely unchanged. However, the potentiometric surface has dropped by as much as 60 feet in the south and east portions of Sumter and Clarendon Counties (Figure 13). This is the result of the deepening of the aquifer and thickening of the confining units in the southeast direction from the Fall Line as discussed in the Hydrogeologic Framework section. The counties close to the Fall Line are subject to more rapid, local recharge, whereas the counties to the southeast depend on the natural rate of groundwater flow "down dip" to supply aquifer recharge. The lowering of the potentiometric surface in these areas is an indication that recharge does not keep pace with groundwater demand.

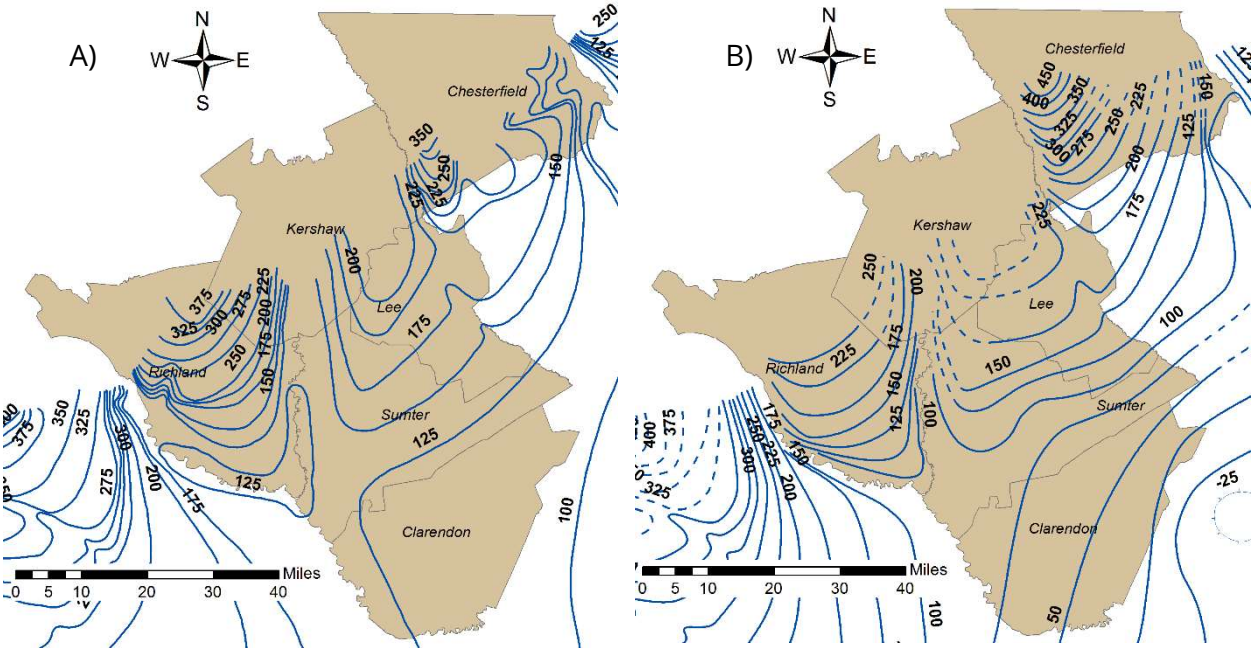


Figure 14: Potentiometric Surface Maps of the Middendorf Aquifer (McQueen Branch Aquifer). A) Pre-Development (1900) and B) 2016. The dashed lines indicate an approximation of the contour location due to insufficient water level measurements in that area. Contour lines connect points of equal water elevation measurements.

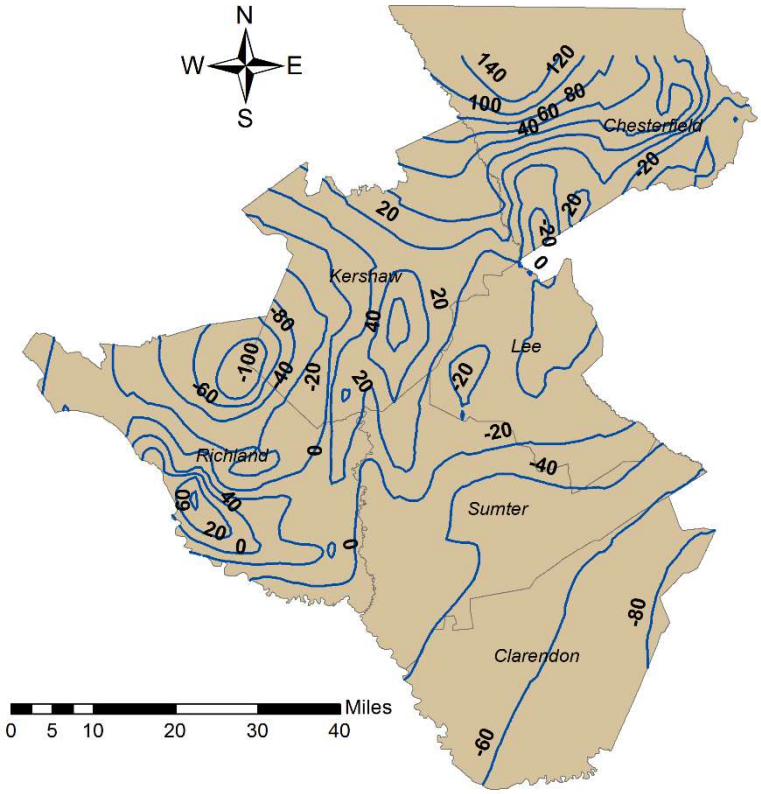


Figure 15: Change in Middendorf Aquifer (McQueen Branch) Potentiometric Surface, Pre-development to 2016. Contour lines represent points of equal change to the potentiometric surface.

As seen in the Crouch Branch Aquifer, the groundwater flow directions in the McQueen Branch Aquifer have not changed significantly from pre-development conditions (Figure 14A) to 2016 (Figure 14B). Mapping the change in the McQueen Branch potentiometric surface (Figure 15) indicates that it has dropped from between 20 and 80 feet below Sumter and Clarendon Counties. The reason for this observed decline is identical to that found for the Crouch Branch Aquifer (groundwater withdrawal rate exceeds the recharge rate through "down dip" groundwater flow). In addition, the McQueen Branch aquifer is deeper within the stack of aquifers and confining units of the SCCP, which means that the travel time of groundwater within the aquifer is longer than in the shallower Crouch Branch aquifer to the same vertical location below each county.

Current Demand

Under the Groundwater Use and Reporting Act[10], a groundwater withdrawer is defined as a person or entity who withdraws in excess of three million gallons in any one month from a single well or multiple wells under common ownership within a one-mile radius from any existing or proposed well(s). In the proposed Santee-Lynches Area, groundwater withdrawers are required to register their wells with the Department. For 2018, 502 registered wells reported water use in the proposed Santee-Lynches Area (Figure 16; Table 1).

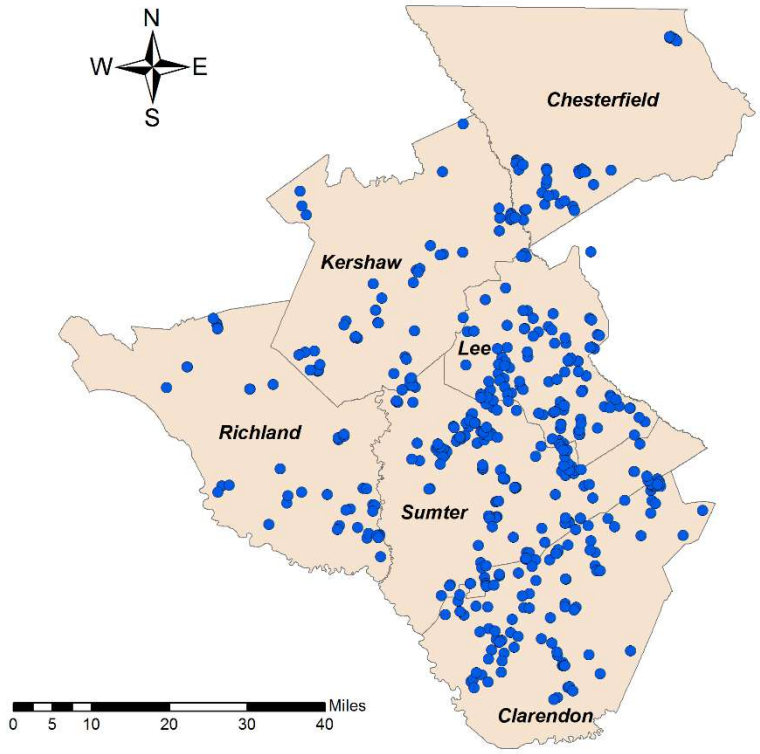


Figure 16: Map of the Registered Well Locations in the proposed Santee-Lynches Area Counties Reporting 2018 Water Use.

Table 1: Number of Wells Reporting Water Use in 2018: Santee-Lynches Area

Use Category	Chesterfield	Clarendon	Kershaw	Lee	Richland	Sumter	*Total (Percent)*
Aquaculture (AQ)	0	1	0	0	1	0	***2 (0.4%)***
Golf Course (GC)	0	3	1	0	18	3	***25 (5.0%)***
Industry (IN)	1	0	41	0	3	17	***62 (12.4%)***
Irrigation (IR)	17	76	4	73	12	87	***269 (53.6%)***
Mining (MI)	0	0	0	0	1	0	***1 (0.2%)***
Other (OT)	0	0	0	0	0	0	***0 (0.0%)***
Hydro Power (PH)	0	0	0	0	0	0	***0 (0.0%)***
Nuclear Power (PN)	0	0	0	0	0	0	***0 (0.0%)***
Thermal Power (PT)	0	0	0	0	0	0	***0 (0.0%)***
Water Supply (WS)	18	30	33	7	10	45	***143 (28.5%)***
Total (Percent)	***36 (7.2%)***	***110 (21.9%)***	***79 (15.7%)***	***80 (15.9%)***	***45 (9.0%)***	***152 (30.3%)***	***502 (100.0%)***

Sumter and Clarendon Counties had the greatest number of registered wells, and Chesterfield and Richland Counties had the fewest. Irrigation and water supply use wells made up the majority in most counties except for Kershaw (industry and water supply) and Richland (golf course, irrigation, and water supply). More than half of the wells reporting water use for 2018 were irrigation wells (269 out of 502: 54%).

In a similar pattern to the number of registered wells, Sumter County reported the highest groundwater use for 2018 at 8,743 million gallons (MG) (Table 2). Clarendon County reported the next highest use (2,706 MG) followed by Lee (2,126 MG), Chesterfield (1,626 MG), Kershaw (1,451), and Richland Counties (1,367). For Chesterfield, Clarendon, Lee, and Sumter Counties, the majority of 2018 reported water use fell into the irrigation and water supply use categories. Kershaw and Richland Counties were the exceptions to this trend in that the highest reported water use categories were water supply and industry.

Table 2: 2018 Reported Water Use by County and Use Category (millions of gallons: MG)[a]

Use Category	**Chesterfield**	**Clarendon**	**Kershaw**	**Lee**	**Richland**	**Sumter**	***Total (Percent)***
Aquaculture (AQ)	0	0	0	0	17	0	***17 (0.1%)***
Golf Course (GC)	0	26	22	0	43	29	***120 (0.7%)***
Industry (IN)	0	0	671	0	697	174	***1,542 (8.6%)***
Irrigation (IR)	451	1,930	7	1,636	200	3,095	***7,319 (40.6%)***
Mining (MI)	0	0	0	0	117	0	***117 (0.6%)***
Other (OT)	0	0	0	0	0	0	***0 (0.0%)***
Hydro Power (PH)	0	0	0	0	0	0	***0 (0.0%)***
Nuclear Power (PN)	0	0	0	0	0	0	***0 (0.0%)***
Thermal Power (PT)	0	0	0	0	0	0	***0 (0.0%)***
Water Supply (WS)	1,174	750	751	490	292	5,444	***8,902 (49.4%)***
Total (Percent)	***1,626 (9.0%)***	***2,706 (15.0%)***	***1,451 (8.1%)***	***2,126 (11.8%)***	***1,367 (7.6%)***	***8,743 (48.5%)***	***18,018 (100.0%)***

[a]Water use is reported in millions of gallons. For example, 451 is 451 million gallons (MG) or 451,000,000 gallons. 1,636 MG is 1,636,000,000 gallons.

Historic Groundwater Use

The department reviews historic water use in order to better understand significant changes over time among counties and among use categories. Reported groundwater use across all of the Santee-Lynches Area counties increased from 11,856 MG in 2001 to 18,018 MG in 2018 (Figure 17). It should be noted that from 2001 through 2013, reported use remained relatively constant (averaging 12,500 MG). A sharp increase in water use occurred from 2013 to 2015 to just over 16,000 MG followed by a slight increase to the high volume reported in 2018 (the last complete water use reporting year). Sumter County consistently reported the highest water use of all the Santee-Lynches Area counties with an average from 3 to 6 times greater than the remaining five counties.

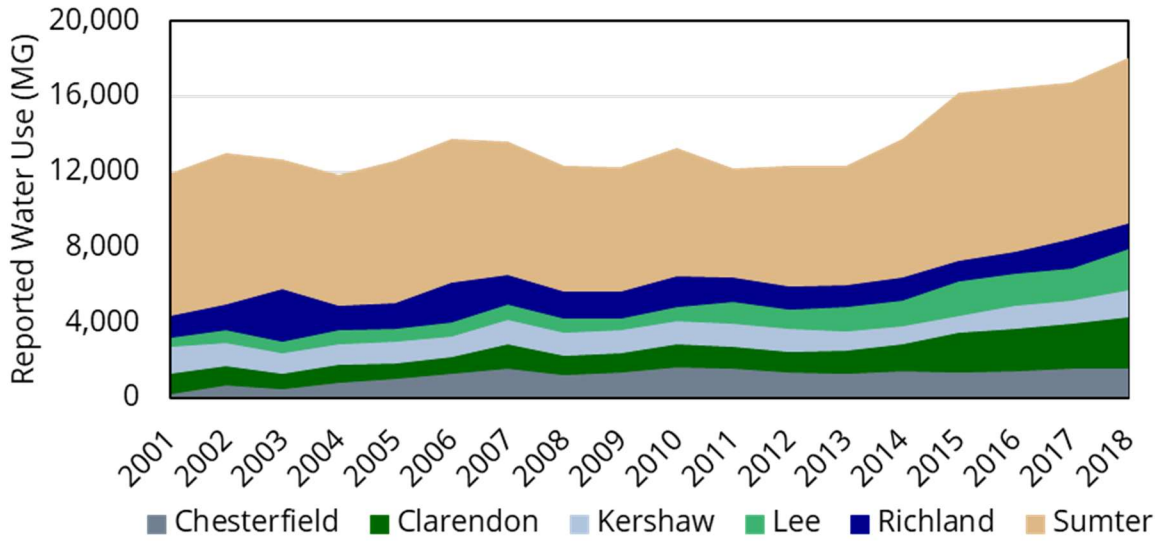


Figure 17: Reported Groundwater Use for the Santee-Lynches Area Counties from 2001 through 2018. Each county's reported water use is stacked on the other such that the top line of the upper area forms a line which is the total water use across all counties. For example, the total water use for the 6 counties for 2001 is approximately 12,000 MG.

From 2001 to 2013, the water supply use category comprised the majority of reported water use for the Santee-Lynches Area counties (Figure 18). Beginning in 2013, reported water use for the irrigation category increased through 2018, at which time the volumes came close to that reported for water supply (IR: 7,319 MG; WS: 8,902 MG). This increase in irrigation water use resulted in the increased total water use for the Santee-Lynches Area from 2013 to 2018. It should be noted that the sharp increase in groundwater use (2013 to 2015) immediately followed a period of significant drought (see Appendix A, Figure A4).

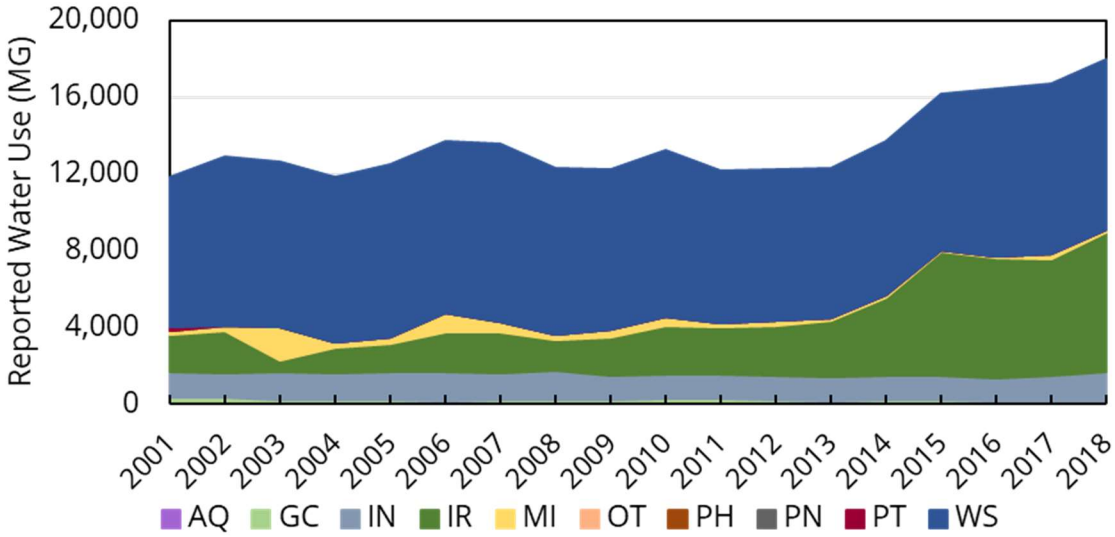


Figure 18: Reported Water Use for the proposed Santee-Lynches Area by Use Category - 2001 through 2018.

Changes in population may be one factor driving the variations seen in reported groundwater use. For the Santee-Lynches Area, the overall population has increased from 581,732 in 2001 to 682,276 in 2018 (Figure 19). An increase in the population in Richland County is the primary reason for the overall population increase in the area, but Richland County does not report the greatest groundwater use for the Santee-Lynches Area. Comparing historic reported water use (Figure 17) with historic population (Figure 19), it is clear that the population trends do not account for changes in reported groundwater use. Because the majority of the increase in reported water use fell within the irrigation category, trends in agricultural irrigation were reviewed.

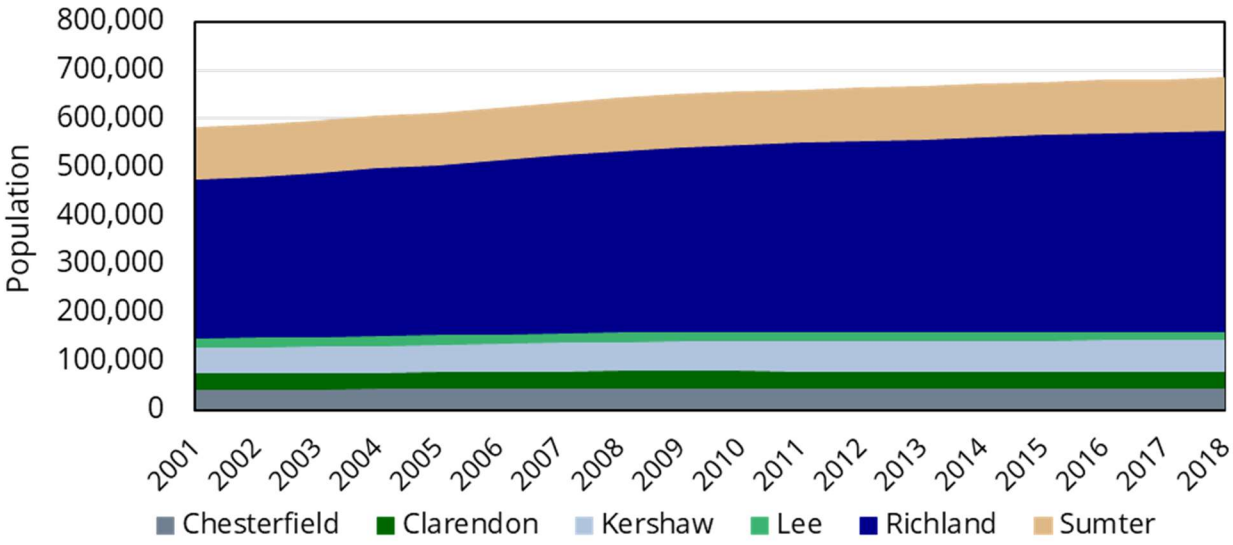
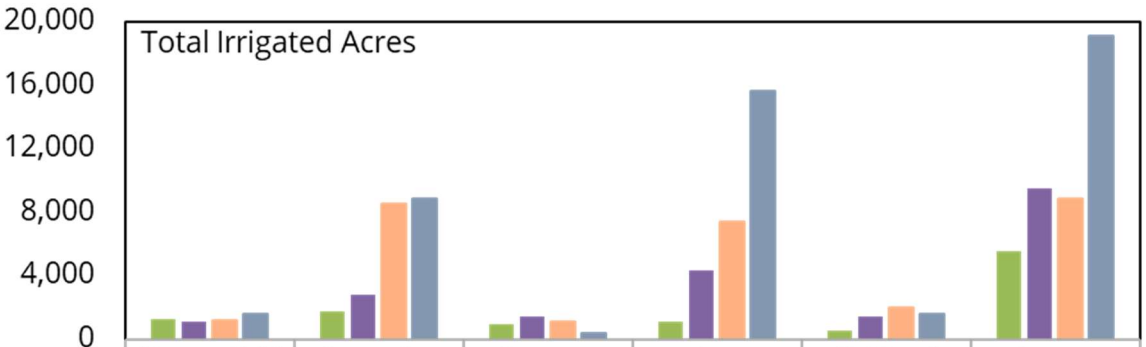


Figure 19: Population by County for the proposed Santee-Lynches Area from 2001 to 2018. Numbers presented are either census data (2010) or population estimates (www.census.gov; accessed February 3, 2020.)



	Chesterfield	Clarendon	Kershaw	Lee	Richland	Sumter
2002	1,269	1,704	903	1,072	516	5,537
2007	1,083	2,761	1,438	4,322	1,425	9,486
2012	1,169	8,533	1,134	7,414	1,951	8,863
2017	1,584	8,871	386	15,602	1,611	19,133

Figure 20: Total Irrigated Acres from the USDA NASS Agriculture Census 2007 (2002 and 2007 data) and 2017 (2012 and 2017 data). Irrigated acres in this report include both crop and pasture land.

The water use category of Irrigation, for the purposes of permitting, includes every form of irrigation with the exception of golf courses—which has its own water use category. Irrigators in South Carolina are primarily agricultural, although there are some ornamental landscape irrigation wells, too. Trends in irrigated acres can be found in the United States Department of Agriculture's (USDA) National Agricultural Statistics Service (NASS) publication--Census of Agriculture[11]. This report is published every five years, and data available from this report include the number of irrigated acres by county (Figure 20). Since 2002, the number of irrigated acres has increased significantly in Clarendon, Lee, and Sumter Counties and has remained comparatively stable for Chesterfield and Richland Counties. The number of irrigated acres in Kershaw county decreased significantly from 2012 to 2017.

Both surface and groundwater are used for irrigation in South Carolina. A comparison was made between reported surface water and groundwater irrigation use. For the Santee-Lynches Area, groundwater use for irrigation has consistently been greater than surface water (Figure 21) with the exception of reported use in 2003—a "wet" year in terms of precipitation ending the drought of 2000 through the end of 2002.

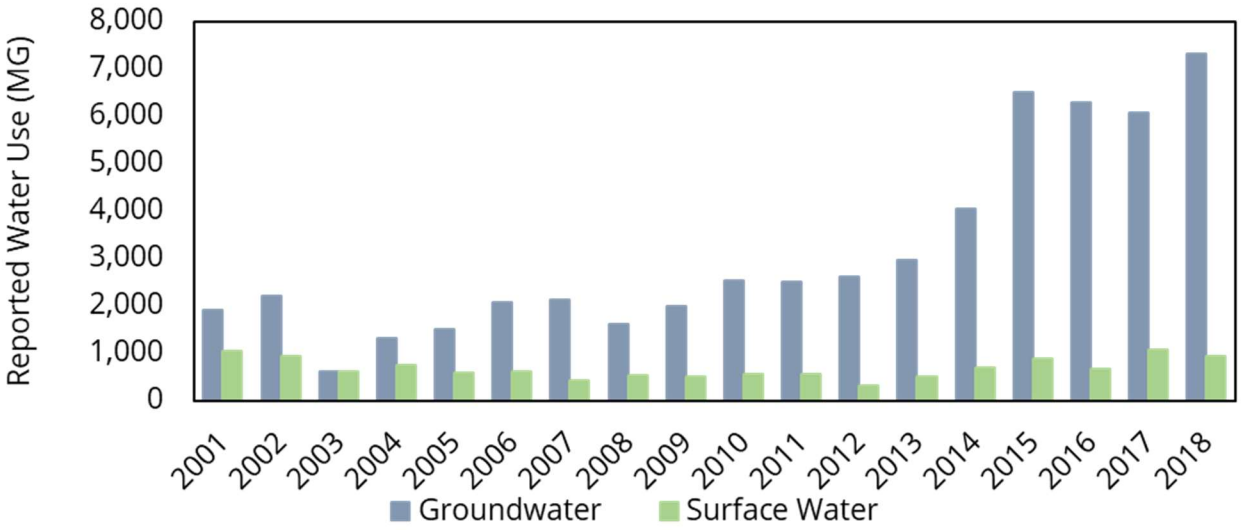


Figure 21: Reported Groundwater and Surface Water Irrigation Use for the proposed Santee-Lynches Area from 2001 through 2018. Note: there was no water use reported for irrigation in 2000.

Although the number of registered irrigation wells has increased from fewer than 10 (2001) to 269 (2018), the average reported water use per well has remained roughly the same since 2004 (average of 27 MG/Well) (Figure 22). The maximum value of water use per well occurred in 2001, which was the height of that particular drought period. It should be noted that this is a rough calculation as a large number of smaller capacity wells could result in an under-estimation. However, this result is likely due to improvements in agricultural irrigation efficiency in recent years. Even though the use per well for irrigation has remained stable, the significant increase in active irrigation wells accounts for the overall increase in reported water use for the Santee-Lynches Area.

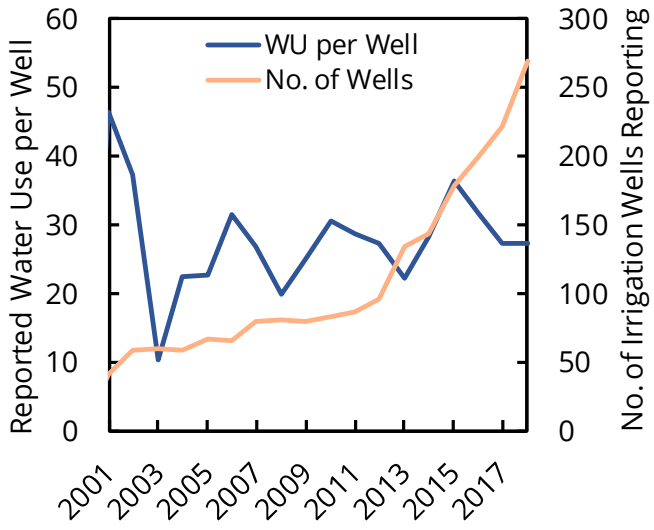


Figure 22: Reported Irrigation Water Use (MG) per Reporting Well and the Number of Registered Irrigation Wells from 2000 through 2018 in the proposed Santee-Lynches Area.

Aquifer Demand

The Department typically analyzes the demand trends for each SCCP aquifer in a Capacity Use Area to better understand how groundwater withdrawal is impacting that resource. For the Santee-Lynches Area counties, details of well depth and screened interval were not sufficiently available because it is not required information for a well registration. Of the 502 registered wells (2018 reporting year) in the Santee-Lynches Area, the Department has drill depth information for 288 wells and screened interval information for only 101 wells. Therefore, groundwater demand cannot be assigned to specific aquifers. It is anticipated that this dataset would improve if the Santee Lynches Area is designated a Capacity Use Area

Groundwater Evaluation and Recommendations

Both water level measurements in the monitoring network and the change to the potentiometric surfaces in the Santee-Lynches Area indicate that groundwater levels have fallen up to 60 feet in the Crouch Branch aquifer and 80 feet in the McQueen Branch aquifer below both Sumter and Clarendon Counties. These declines in water level suggest that groundwater withdrawal from these aquifers exceeds the rate at which they recharge. Groundwater use for the Santee-Lynches Area reported to the Department has also increased by 50% from 2013 through 2018, with the greatest increases reported in the irrigation use category. This corresponds to an increase in irrigated acres reported by the USDA and an increase in the number of registered irrigation wells.

An additional concern are the increases in groundwater use corresponding to periods of drought in South Carolina. Prior drought research and models have suggested that drought frequency in the southeastern United States may increase in the coming decades due to increasing evapotranspiration over precipitation resulting from climate change[12,13,14]. The prior increases in groundwater demand in response to drought combined with predictions of increased drought frequency suggests that the State's groundwater resources will be further stressed in the coming decades.

Finally, as the counties in the proposed Santee-Lynches Area are only required to register their large-capacity wells, the Department lacks sufficient well data to determine which aquifer is most utilized for groundwater demand. Therefore, no determination can be made as to the overuse of any particular groundwater source for the area.

The results of this initial assessment indicate groundwater resources in Chesterfield, Clarendon, Kershaw, Lee, Richland, and Sumter Counties have been developed to the extent that reasonable regulation and a permitting program will provide the benefit of protecting, preserving, and developing the area's groundwater resources. It is the Department's recommendation that these counties be designated as the Santee-Lynches Capacity Use Area. This report is the first step to facilitate public comment and coordination among counties, COGs, and interested stakeholders.

Appendix A

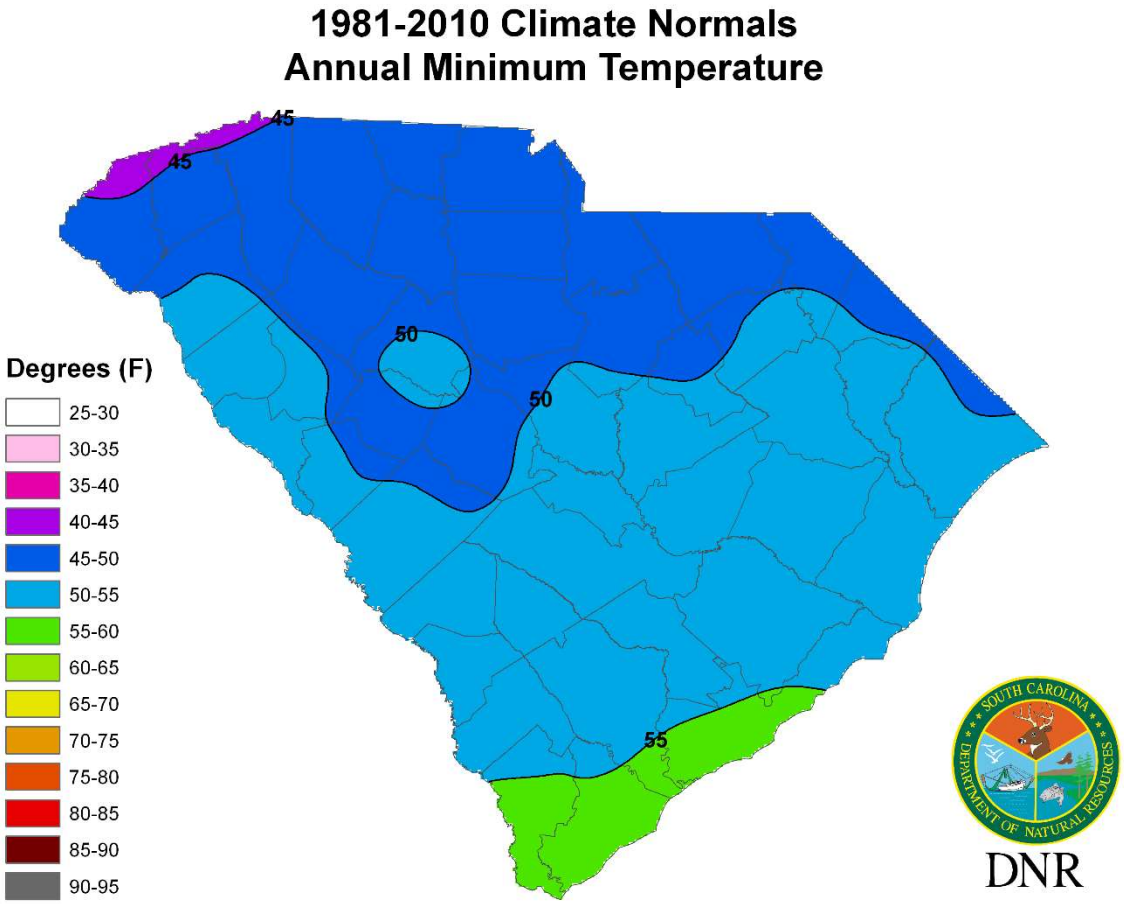


Figure A1: Average of the daily minimum temperatures from 1981 to 2010. South Carolina State Climatology Office, www.portal.dnr.sc.gov/climate.

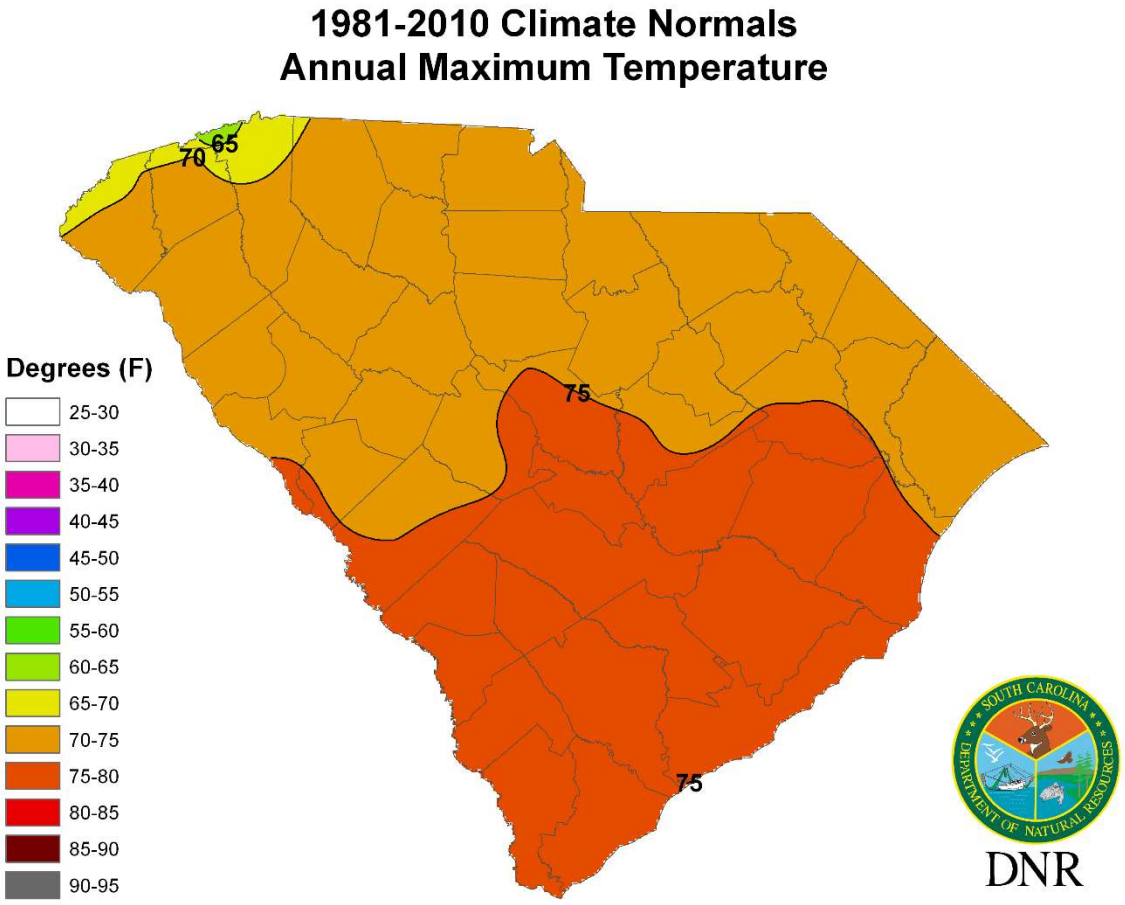


Figure A2: Average of the daily maximum temperatures from 1981 to 2010. South Carolina State Climatology Office, www.portal.dnr.sc.gov/climate.

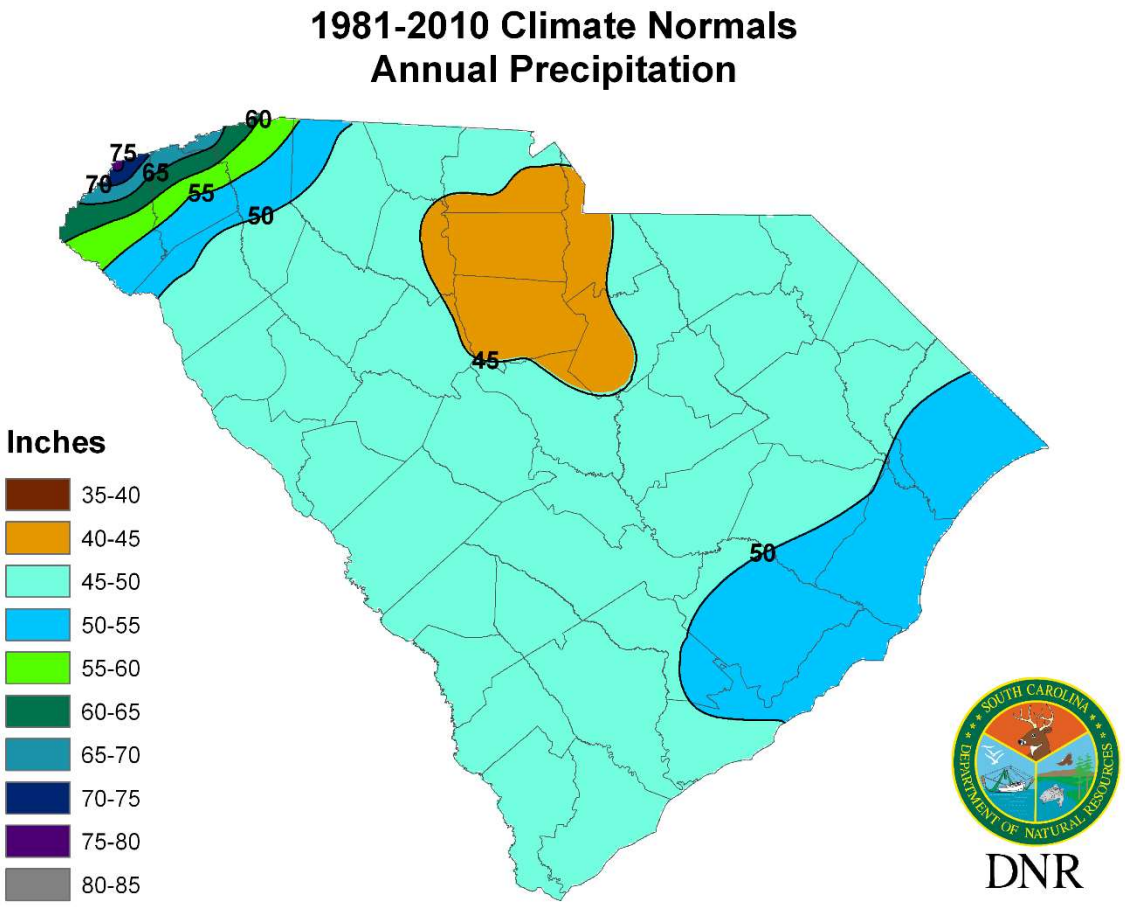
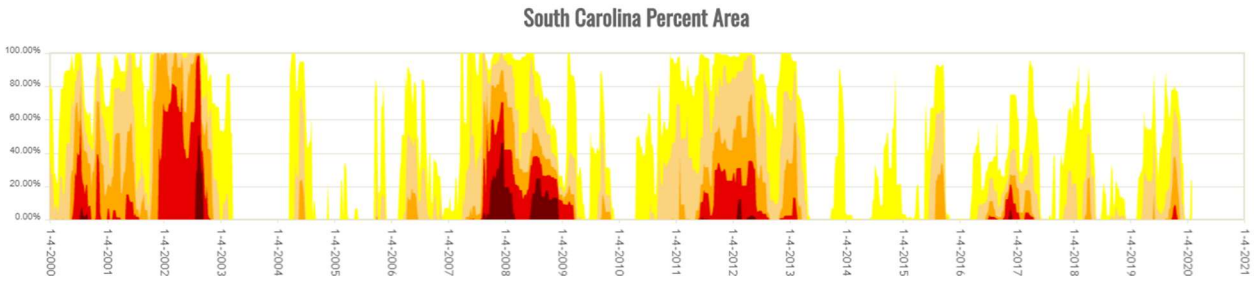


Figure A3: Average annual precipitation from 1981 to 2010. South Carolina State Climatology Office, www.portal..sc.gov/climate.



D0: Abnormally Dry

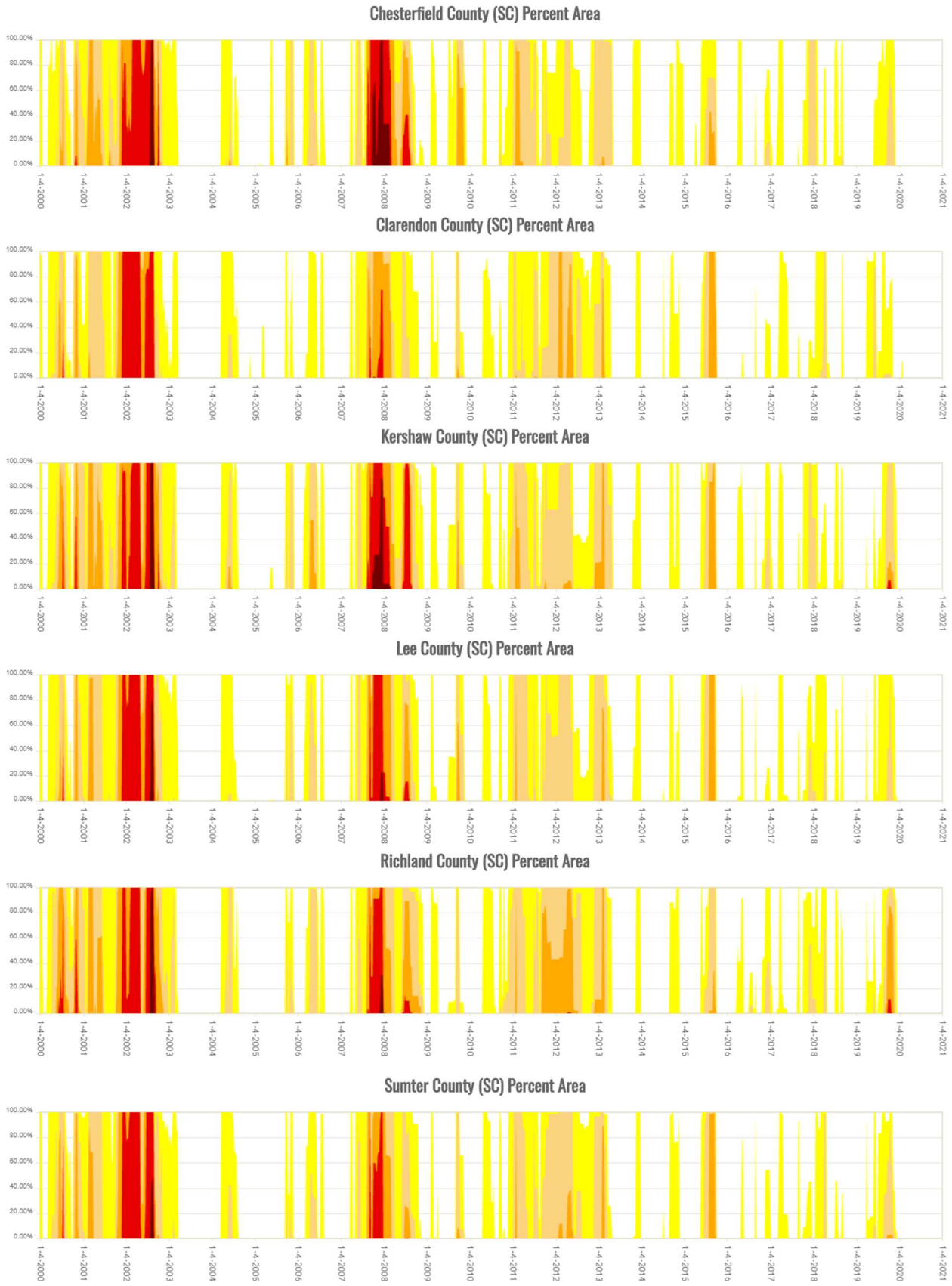
D1: Moderate Drought

D2: Severe Drought

D3: Extreme Drought

D4: Exceptional Drought

Figures A4 (above) and A5 (next page): Drought Severity and Coverage Index (DSCI) timeseries for South Carolina as well as each county in the proposed Santee-Lynches Area. The colors represent drought severity, and the extent of areal coverage of the state (as a percent) is indicated on the vertical axis from 0 to 100%. United States Drought Monitor, https://droughtmonitor.unl.edu; accessed February 14, 2020.


Chesterfield County (SC) Percent Area
Clarendon County (SC) Percent Area
Kershaw County (SC) Percent Area
Lee County (SC) Percent Area
Richland County (SC) Percent Area
Sumter County (SC) Percent Area
100.00%
80.00%
60.00%
40.00%
20.00%
0.00%
1-4-2000
1-4-2001
1-4-2002
1-4-2003
1-4-2004
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1-4-2007
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1-4-2021

Figure A5

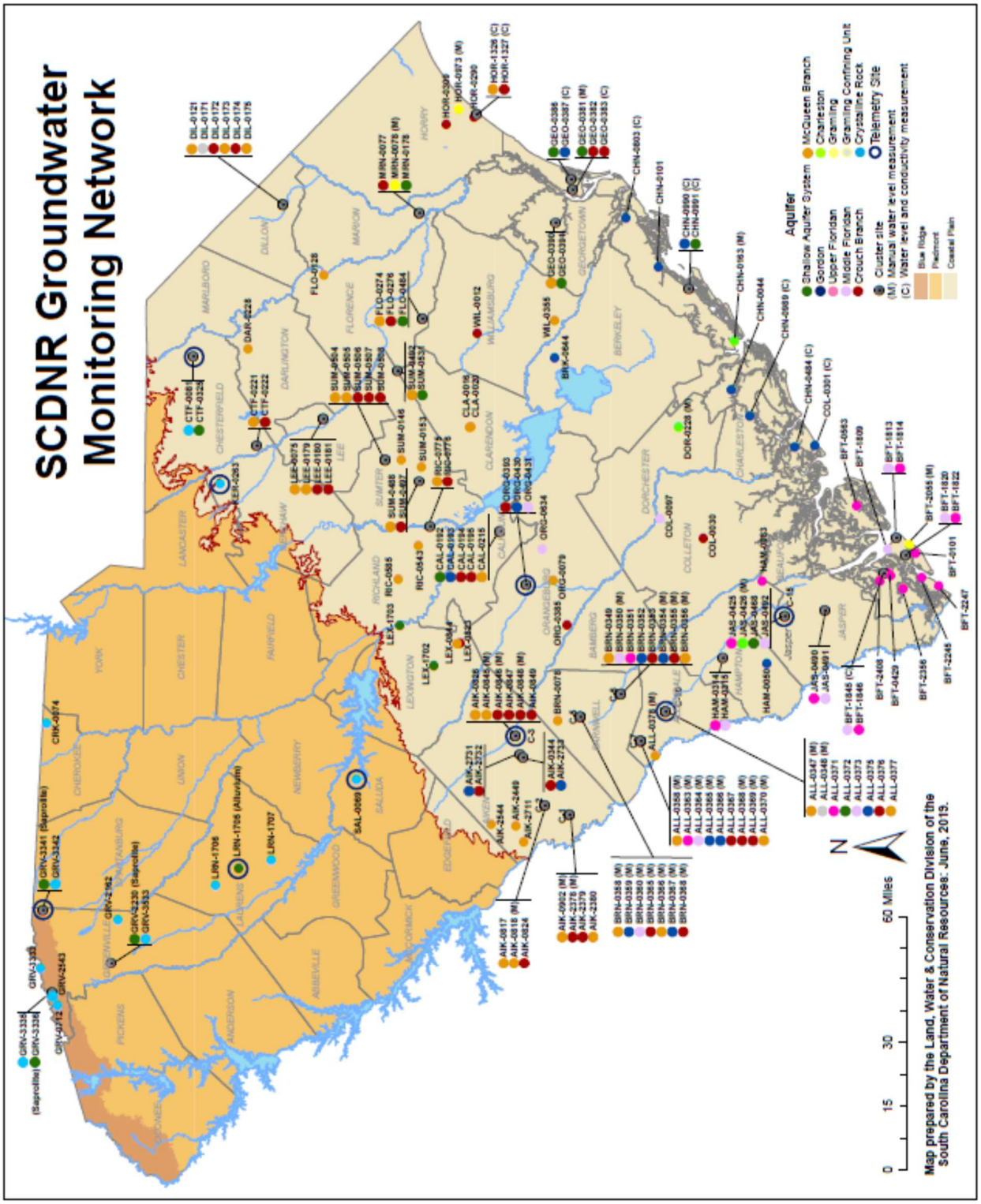


Figure A6: Map of the SCDNR Monitoring Well Network (June 2019).

Revision History

Document's original release was June 2020.

Date	Rev. No.	Change Description	Page No.
August 2020	1.0	Figure 10E: Corrected caption text to refer to appropriate map figure.	15
August 2020	1.0	Figure 20: revised caption to clarify dates of source data.	27
August 2020	1.0	Figures 21 and 22: Added "Irrigation" to captions to clarify data presented in the figures.	28
August 2020	1.0	Corrected list of counties to include Sumter County in the last paragraph of the Groundwater Evaluation and Recommendations Section.	29
August 2020	1.0	Figure A6: Added map publication date to caption.	35
August 2020	1.0	Added Revision History table to document and updated Table of Contents.	36

References

[1] Groundwater Use and Reporting Act (2000) S.C. Code Ann. § 49-5-20.
[2] Groundwater Use and Reporting Act (2000) S.C. Code Ann. § 49-5-60.
[3] Municipal Association of South Carolina, www.masc.sc, Accessed February 4, 2020.
[4] South Carolina Department of Natural Resources, South Carolina State Climatology Office, http://portal.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php, Accessed February 11, 2020.
[5] The Geology of the Carolinas, Carolina Geological Society Fiftieth Anniversary Volume, 2001. Ed. J. Wright Horton, Jr. and Victor A. Zullo, The University of Tennessee Press, Knoxville.
[6] Gellici, J.A., and Lautier, J.C., (2010), Hydrogeologic Framework of the Atlantic Coastal Plain, North and South Carolina, Chapter B, in Campbell, B.G., and Coes, A.L., eds., 2010, Groundwater Availability in the Atlantic Coastal Plain of North and South Carolina: U.S. Geological Survey Professional Paper 1773, 241 p., 7 pls.
[7] Campbell, B.G., and Coes, A.L., eds., (2010), Groundwater availability in the Atlantic Coastal Plain of North and South Carolina: U.S. Geological Survey Professional Paper 1773, 241 p., 7 pls.
[8] Fetter, C.W. (2001). Applied Hydrogeology, 4th ed., Prentice Hall, Upper Saddle River, NY.
[9] Aucott, W.R. (1988), Predevelopment ground-water flow system and hydrologic characteristics of the Coastal Plain aquifers of South Carolina: U.S. Geological Survey Water-Resources Investigations Report 86-4347, 66 p.
[10] Groundwater Use and Reporting Act (2000) S.C. Code Ann. § 49-5-12.
[11] USDA NASS (2007, 2017). Census of Agriculture. https://www.nass.usda.gov/AgCensus/; accessed February 26, 2020.
[12] Seager, R., T. Tzanova, and J. Nakamura (2009), Drought in the Southeastern United States: Causes, Variability over the Last Millennium, and the Potential for Future Hydroclimate Change. *Journal of Climate*, Vol. 22, p. 5021-5045.
[13] Park Williams, A., Cook, B.I., Smerdon, J.E., Bishop, D.A., Seager, R., and Mankin, J.S., (2017). The 2016 southeastern U.S. drought: An extreme departure of centennial wetting and cooling. *Journal of Geophysical Research: Atmospheres*, Vol. 122, p. 10,888-10,905.
[14] D. Keellings and J. Engström (2019). The Future of Drought in the Southeaastern U.S.: Projections from Downscaled CMIP5 Models. *Water*, Vol. 11, 9 p.

ATTACHMENT B

STATE REGISTER NOTICE OF GENERAL PUBLIC INTEREST, MARCH 26, 2021

DOCUMENT TRANSMITTAL FORM

This form must be completed and submitted with each
document filed with the Editor of the *State Register* in the Legislative Council

1. Agency Name	2. Chapter Number	3. Date of Filing
SC DHEC	61	3/11/21
4. Regulation Number	5. Subject of Regulation	
6. Statutory Authority		

7. Type of Filing

___X___ NOTICE OF GENERAL PUBLIC INTEREST: Public Hearing and Public Comment on Proposed Designation of Santee-Lynches Capacity Use Area

_____ NOTICE OF DRAFTING

_____ PROPOSED REGULATION

_____ EMERGENCY REGULATION

_____ FINAL REGULATION FOR GENERAL ASSEMBLY REVIEW

_____ RESUBMISSION OF WITHDRAWN REGULATION FOR GENERAL ASSEMBLY REVIEW

_____ RESUBMISSION OF WITHDRAWN REGULATION FOR GENERAL ASSEMBLY REVIEW WITH NO SUBSTANTIVE CHANGES

_____ FINAL REGULATION EXEMPT FROM GENERAL ASSEMBLY REVIEW

8. For Additional Information, Contact		9. Telephone Number
Kayla A. David		(803) 898-3651
10. Typed Name of Official	11. Signature of Official	12. Date
Kayla A. David, Editor DHEC Regulation Development	Kayla A. David	3/11/21

SOUTH CAROLINA STATE REGISTER USE ONLY	
13. For publication in SR Volume _____ Issue____ Document Number _____ Verification:_____	OFFICIAL FILING STAMP

DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

NOTICE OF GENERAL PUBLIC INTEREST

NOTICE OF PUBLIC HEARING AND OPPORTUNITY OF PUBLIC COMMENT ON PROPOSED DESIGNATION OF CAPACITY USE AREA PURSUANT TO S.C. CODE SECTION 49-5-60

March 26, 2021

The South Carolina Department of Health and Environmental Control proposes the designation of all of Chesterfield County, Clarendon County, Kershaw County, Lee County, Richland County, and Sumter County as part of the Santee-Lynches Capacity Use Area. Interested persons are invited to make oral or written comments on the proposed Capacity Use Area at a public hearing to be conducted by the Board of Health and Environmental Control at its regularly scheduled meeting on June 10, 2021. The public hearing will be held in the Board Room of the Department of Health and Environmental Control at 2600 Bull Street, Columbia, S.C. 29201. The Board meeting commences at 10:00 a.m. The Board's agenda will be published 24 hours in advance of the meeting. Persons desiring to make oral comments at the hearing are asked to limit their statements to five minutes and, as a courtesy, are asked to provide written comments of their presentations for the record. Due to ongoing COVID-19 concerns, interested persons who do not wish to appear in person may participate in the public hearing by calling in through an assigned conference line. These participants may register in advance by visiting the DHEC Events webpage (www.scdhec.gov/events) and selecting the appropriate Board meeting date. A link to register will be provided on the accompanying meeting information page.

Interested persons are also provided an opportunity to submit written comments on the proposed Capacity Use Area to Mr. Robert Devlin at SCDHEC, Bureau of Water, 2600 Bull Street, Columbia, S.C. 29201. Written comments must be received no later than 5:00 p.m. on April 26, 2021. Comments received by the deadline date will be submitted in a Summary of Public Comments and Department Responses for the Board's consideration at the public hearing.

SCDHEC's technical report on groundwater conditions in Chesterfield, Clarendon, Kershaw, Lee, Richland, and Sumter counties is available on the Internet at https://scdhec.gov/sites/default/files/media/document/Santee-LynchesAssessment_June2020%20-%20signed.pdf. A copy of the report may be obtained by contacting Mr. Alex Butler at 803-898-3575.

ATTACHMENT C

PUBLIC COMMENTS RECIVED

South Carolina Farm Bureau Federation
PO Box 754 • Columbia, SC • 29202.0754
803.796.6700 • Fax 803.936.4496
www.scfb.org

March 9, 2021

Marshall J. Taylor, Jr., Esquire
S.C. Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29202

Re: Proposed Santee-Lynches Capacity Use Area

The South Carolina Farm Bureau Federation (SCFB) is a statewide organization that brings together farmers, ranchers, entrepreneurs, agribusiness professionals and food enthusiasts to strengthen the future of agriculture in South Carolina. Agriculture is one of the largest industries in South Carolina contributing over $46 billion and 225,000 jobs to the economy. Over half the wells located in the proposed Santee-Lynches report to be for irrigation for agricultural purposes.

SCFB believes that implementing a regulatory program should always be the last resort for a governmental entity unless it is proven necessary to protect the health of people and/or the environment. Regulations by their very nature are burdensome on business, but reasonable regulation is a burden SCFB members are willing to bear when appropriate. However, the decision to impose a regulatory burden should be made with the utmost care and consideration. As such, SCFB respectfully requests that the SCDHEC board accept public comment through a public hearing and then take time, at least two weeks, for thoughtful consideration of all testimony, evidence, and opinions presented before coming back as a Board to formally vote on the proposal. This will allow for more meaningful and thoughtful consideration of the public testimony, rather than a process that appears to be just a cursory nod to the public input process.

SCDHEC has always been willing to work with the regulated community on issues and we look forward to continuing this collaborative relationship as we work through the regulatory process. We will gladly meet with SCDHEC to discuss these issues further.

Respectfully,

Gary Spires
Director, Government Relations
South Carolina Farm Bureau Federation

GMS/bss

dhec
Healthy People. Healthy Communities.

February 26,2021

South Carolina Farm Bureau Federation
Attn: Mr. Gary Spires
PO Box 754
Columbia, SC 29202

Re: Comments on Proposed Santee Lynches Capacity Use Area

Dear Mr. Spires

The Department has received and appreciates your comments dated February 10, 2020, regarding the proposed Santee Lynches Capacity Use Area. With regards to your comments the Department is pleased to provide the following responses:

SCFB **Comment:** *Length of Permit is too short and creates financial uncertainty for small farm operations. The length of the permit is set out in the R.61-113.*

The permit length of five years is defined in the regulation. This a separate issue from the Department's recommendation to request the designation of the proposed Santee Lynches Capacity Use Area. The five year permit length gives the Department the ability to re-evaluate the long term effects of pumping within an aquifer; the ability to react and adjust to changing conditions for resource-protective and resource-beneficial outcomes. The Capacity Use Program renews all permits contemporaneously within a designated capacity use area every five years. Prior to the renewal of the permits, the Department completes a study of the water levels and uses within each aquifer and compares them to historical water levels. This comprehensive regional analysis is compiled into a report and shared during a public information forum. This proactive approach is designed to be transparent and protective of all permitted users.

SCFB Comment: *The groundwater permitting structure doesn't take into account the uniqueness of agricultural uses compared to other users.*

As stated in the Groundwater Use and Reporting Act, *general welfare and public interest require that the groundwater resources of the State be put to beneficial use to the fullest extent to which they are capable, subject to reasonable regulation, in order to conserve and protect these resources, prevent waste, and to provide and maintain conditions which are conducive to the development and use of water resources.* The Department reviews all permit applications based on: the intended use of the applicant; the reasonableness of the withdrawal request to the intended use; the effect on the groundwater resource; and, adverse effects on current permittees. The Department recognizes the seasonal nature of agricultural needs for irrigation. Capacity Use Areas are designed to protect all uses from negative impacts from overuse of the groundwater resources.

The Department appreciates Farm Bureau's engagement in the regulatory process and looks forward to continued collaboration on issues moving forward.

Sincerely,

Alexander Butler, Manager
Water Quantity Permitting, Underground Injection Control
S.C. Dept. of Health & Environmental Control
Office: (803) 898-3575

South Carolina
Farm Bureau Federation
PO Box 754 • Columbia, SC 29202.0754
803.796.6700 • Fax 803.936.4496
www.scfb.org

RECEIVED
FEB 18 2021
Water Monitoring, Assessment & Protection Division

February 10, 2021

S.C. Department of Health and Environmental Control (SCDHEC)
Attn: Alex Butler, Bureau of Water
2600 Bull Street
Columbia, SC 29201

Re: Comments on Proposed Santee-Lynches Capacity Use Area

Dear Mr. Butler,

The South Carolina Farm Bureau (SCFB) is a statewide organization that brings together farmers, ranchers, entrepreneurs, agribusiness professionals and food enthusiasts to strengthen the future of agriculture in South Carolina. Agribusiness in South Carolina has a total annual economic impact of over $46 billion, making it one of the largest industries of the state. We represent nearly 25,000 family farms that are subject to regulations at the local, state, and federal level. We appreciate the opportunity to provide comments on the proposed Santee-Lynches Capacity Use Area. SCFB does not oppose or support the proposed Santee-Lynches Capacity Use Area, but we do oppose how ground water will be regulated within the Santee-Lynches Capacity Use Area, if adopted.

SCFB believes that implementing a regulatory program should always be the last resort for a governmental entity unless it is proven necessary to protect the health of people and/or the environment. Regulations by their very nature are burdensome on business, but reasonable regulation is a burden SCFB members are willing to bear when appropriate. However, a regulatory program should be drafted with care to have the least negative impact on the regulated community, and should be written to take into account the normal business practices of the regulated community. The Groundwater Use and Reporting Regulations, R. 61-113, do not meet this standard.

A significant issue within the regulations are the length of time of a permit. A groundwater permit is only good for a mere five years which creates a problem for the family-farms of South Carolina. The five-year period of a permit is not long enough a time to provide the security an agricultural bank lender may need to provide a loan to a farmer to be able to afford the many input costs and investments necessary to grow a crop yearly. Investing in irrigation equipment is a significant cost for farmers, and it may take around 15 years before a farmer sees a return on such a high investment.

Without a guarantee that a farmer will have the water they need over the life of a loan and to make it financially worth the investment, it will be harder for a farmer to obtain the necessary loans to plant their crops. Business decisions, not just in agriculture, are made forecasting out far longer than a mere five years. This flaw in the current groundwater permitting process needs to be addressed before more agricultural users are subject to the uncertainty created by having to obtain a permit.

Finally, the groundwater permitting structure does not take into account the uniqueness of agricultural water use compared to other uses. Unlike other users of groundwater, agricultural water use is only seasonal and only used when a crop is not getting the water it needs from rain. The majority of farmers are not pumping water to use every day or even every month. Agricultural water use is intermittent and infrequent and only during the growing season. This allows an aquifer to recharge when used for irrigation. This distinct difference in use is not accounted for within the regulatory structure for groundwater use. An agricultural user of water is not making widgets that can just be stopped when DHEC asks everyone to reduce water amounts per groundwater regulations. Crops need a specific amount of water and often that is in times when rain is at the least and water tables are at their lowest. Without the right amount of water on a crop, it dies and both farmer and consumer loses. This is a fundamental flaw with the groundwater permitting laws that further highlight why placing more family-farms under this regulatory structure should be done only as a last resort to protect this natural resource as dictated by science.

SCDHEC has always been willing to work with the regulated community on issues and we look forward to continuing this collaborative relationship as we work through the regulatory process. We will gladly meet with SCDHEC to discuss these issues further.

Respectfully,

Gary Spires
Director, Government Relations
South Carolina Farm Bureau Federation

ATTACHMENT D

POWERPOINT PRESENTATION – PROPOSED SANTEE-LYNCHES CAPACITY USE AREA DESGINATION

South Carolina Department of Health and Environmental Control

Proposed Santee - Lynches Capacity Use Area Designation

Bureau of Water

- Capacity Use Program Background
- Proposed Santee -Lynches Designation Timeline and Comments Received
- Geographical and Hydrogeological Setting
- Reported Water Use
- Groundwater Levels in Proposed Santee -Lynches Capacity Use Area
- Potential Impacts and Management Strategies
- Summary

Capacity Use Background

Water Quantity Programs

- Groundwater Use and Reporting
  - Since the 1970s
  - Issue permits in designated capacity areas of the coastal plain over for use over **3 million gallons in any month** (~1in of water per week for 28 acres or average use for 1000 people)
  - Users outside of Capacity Use Areas must register wells if well or well system will use over 3 million gallons in any month
  - All registered and permitted groundwater withdrawers report their annual water use to the Department
- Surface Water Withdrawal, Permitting and Reporting
  - Since June 2012
  - Issue permits / registrations statewide if over 3 million gallons in any month
  - All registered and permitted surface water withdrawers report their annual water use to the Department

Groundwater Use and Reporting Act
Legislative Declaration of Policy

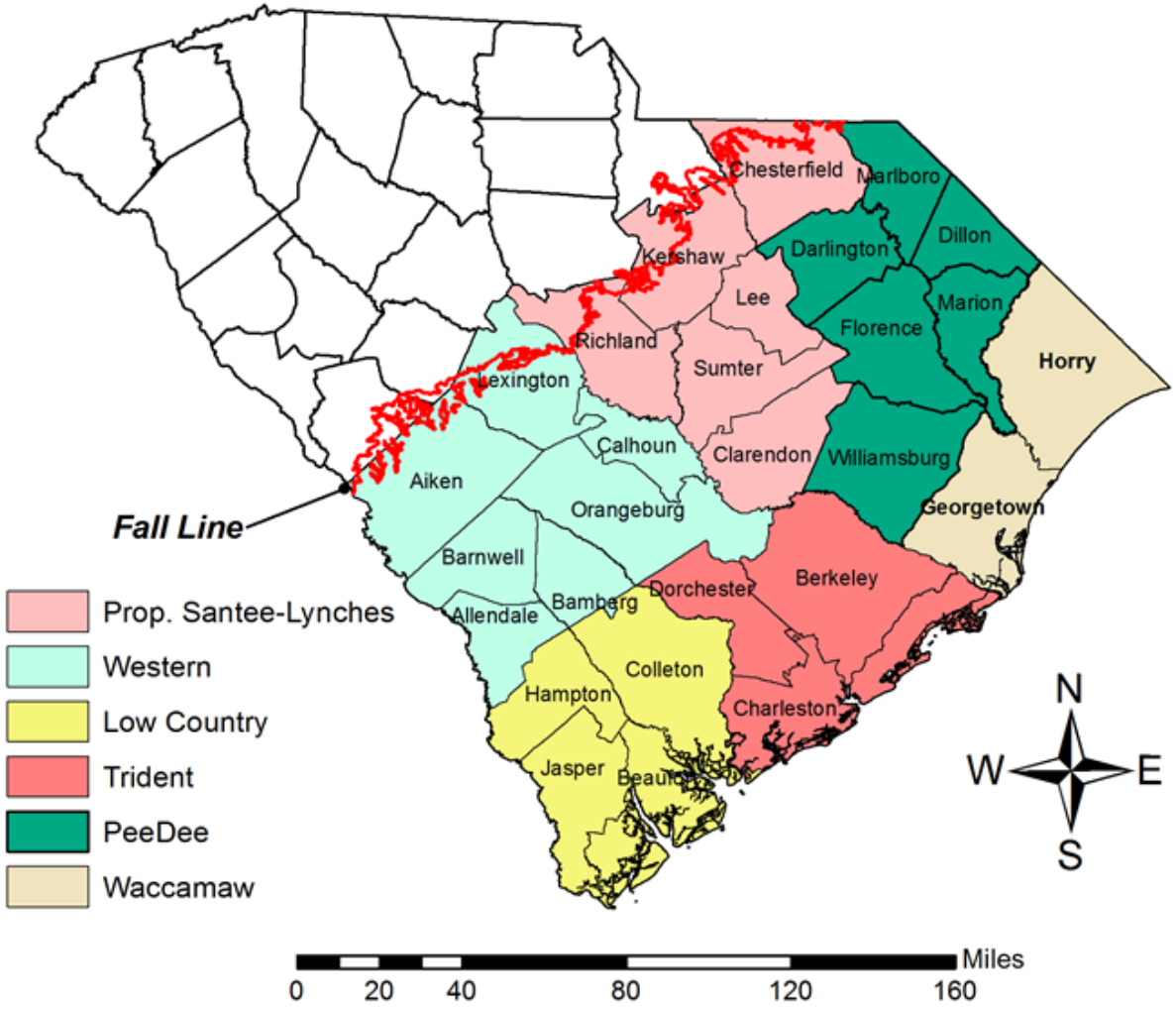
"The General Assembly declares that the general welfare and public interest require that the groundwater resources of the State **be put to beneficial use to the fullest extent to which they are capable**, subject to reasonable regulation, in order to conserve and protect these resources, prevent waste, and to provide and maintain conditions which are conducive to the development and use of water resources."

Groundwater Use and Reporting Act
Capacity Use Area Designation

Where groundwater withdrawal :

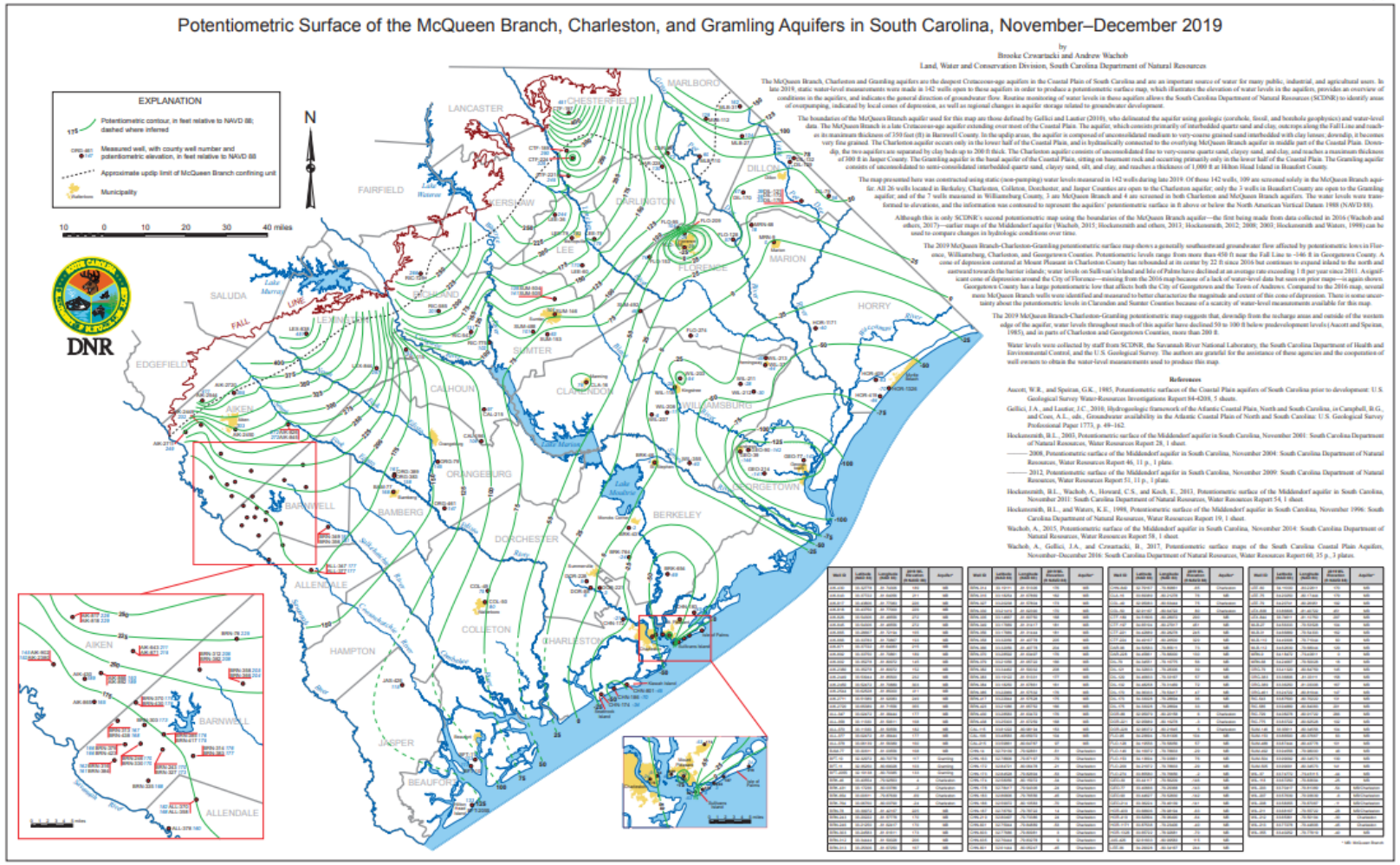
- Presents potential adverse effects to the natural resources
- Poses a threat to public health, safety, or economic welfare
- Poses a significant threat to the long term integrity of the groundwater source

The Department, local government or groundwater withdrawers may initiate a Capacity Use Area designation process



- **Waccamaw - June 22, 1979**
  - Georgetown & Horry Counties
- **Lowcountry - July 24, 1981**
  - Beaufort , Colleton, Jasper
  - Hampton (added in 2008)
- **Trident – August 8, 2002**
  - Berkeley, Charleston, Dorchester
- **Pee Dee – February 12, 2004**
  - Darlington, Dillon, Florence, Marlboro, Marion, Williamsburg
- **Western - November 8, 2018**
  - Aiken, Allendale, Bamberg, Barnwell, Calhoun, Lexington, Orangeburg

Groundwater Evaluation



Bounded to the southwest by the Santee River System

Bounded to the east by the Pee Dee Capacity Use Area

Bounded to the northwest by the Fall Line

Northern Boundary at N.C. State Line

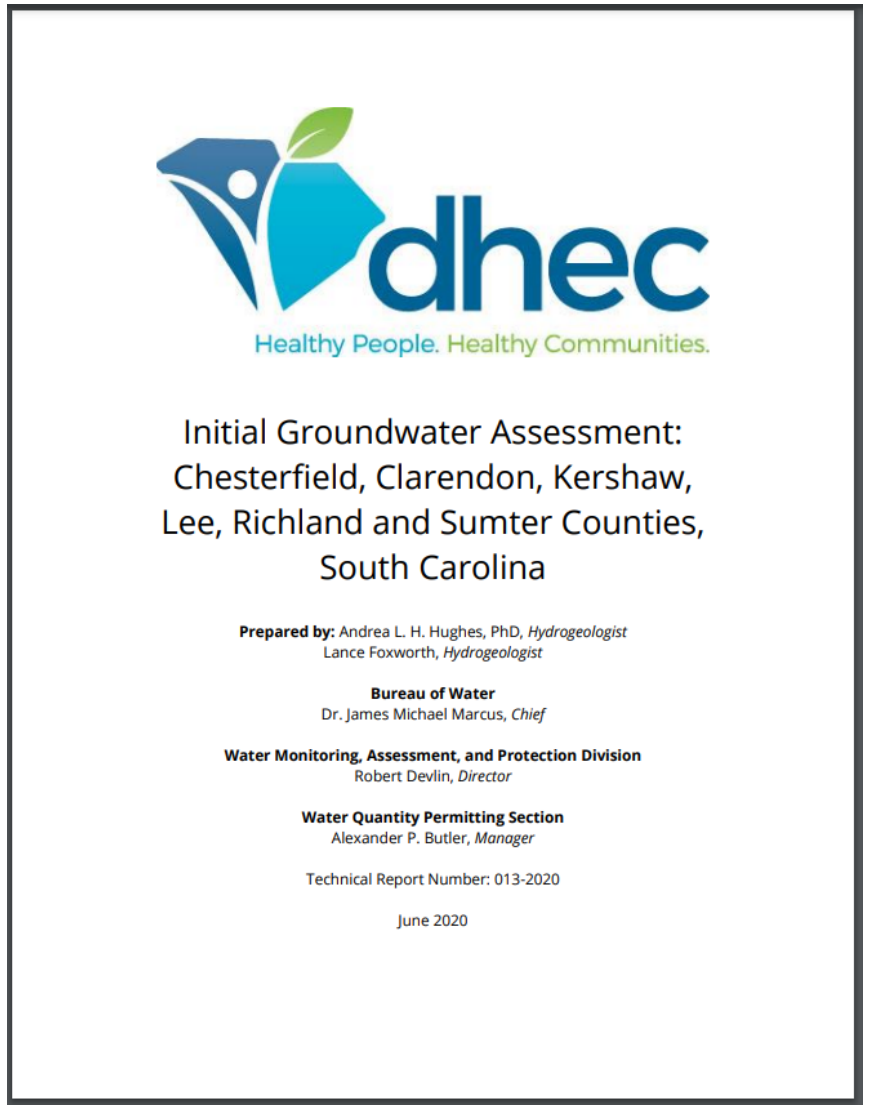
Proposed Santee - Lynches Capacity Use Area Timeline

2004 State Water Plan - Recommended entire coastal plain be designated Capacity Use Area

June 2020-Department released the Initial Groundwater Assessment for the six-county area

January 2020- Held two virtual Public Meeting. Meetings were recorded and placed on the DHEC website for public review and comment.

March 2020 - Notice of proposed designation published in State Register.



dhec
Healthy People. Healthy Communities.

Initial Groundwater Assessment: Chesterfield, Clarendon, Kershaw, Lee, Richland and Sumter Counties, South Carolina

Prepared by: Andrea L. H. Hughes, PhD, *Hydrogeologist*
Lance Foxworth, *Hydrogeologist*

Bureau of Water
Dr. James Michael Marcus, *Chief*

Water Monitoring, Assessment, and Protection Division
Robert Devlin, *Director*

Water Quantity Permitting Section
Alexander P. Butler, *Manager*

Technical Report Number: 013-2020

June 2020

Comments Received

- Only Comments were from SC Farm Bureau
  - February 10th 2021
  - March 9th 2021

(Attachment C in Board Package)

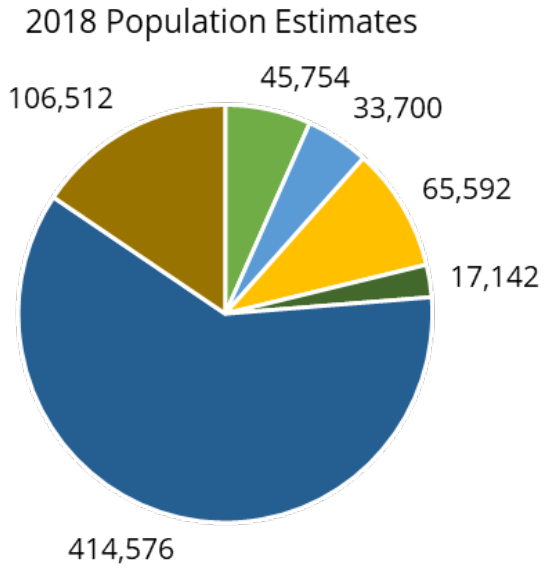
- Concerned that the length of the permits is too short
  - The length of the permits (up to 5yrs) is defined in Regulation 61 -113
  - The five year permit allows the program to utilize an adaptive management approach and make small changes over time to reduce the need for more draconian measures in the future.

- Concerned that the groundwater permitting structure doesn't take into account the uniqueness of agricultural use compared to other users
  - The Department reviews all permit applications based on: the intended use of the applicant, the effect on the groundwater resource and any adverse effects on current water users. Capacity Use Areas are designed to protect all uses from negative impacts from overuse.

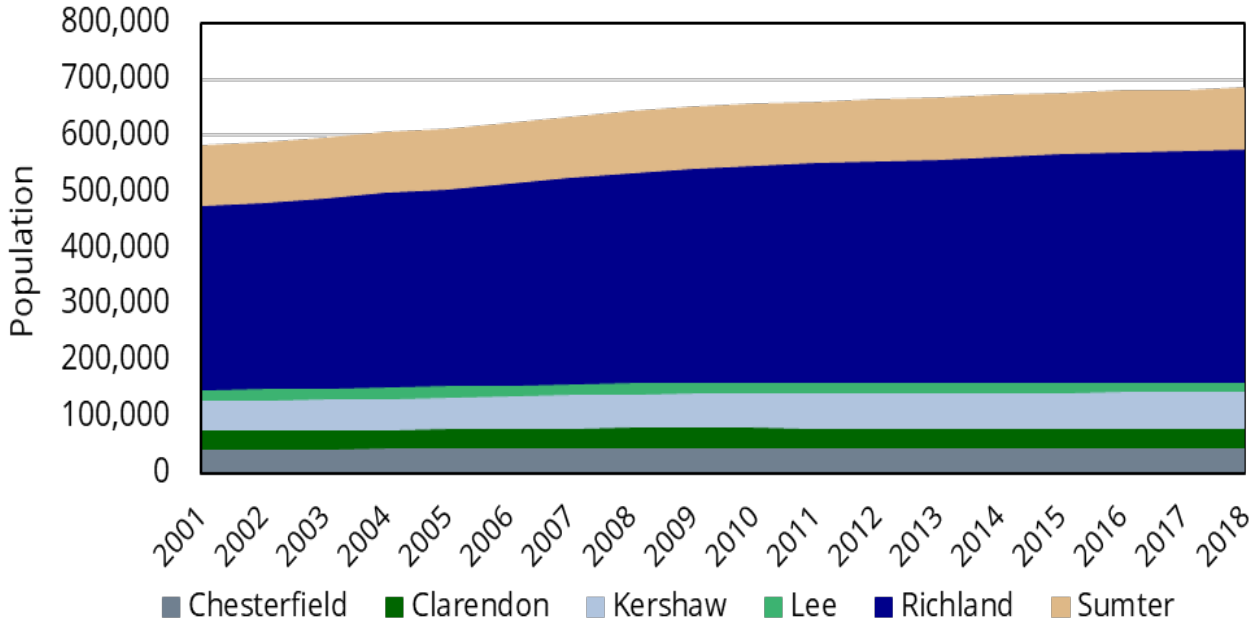
- Requested that the SCDHEC Board take at least two weeks between public hearing and formal vote.

Geographical and Hydrogeological Setting

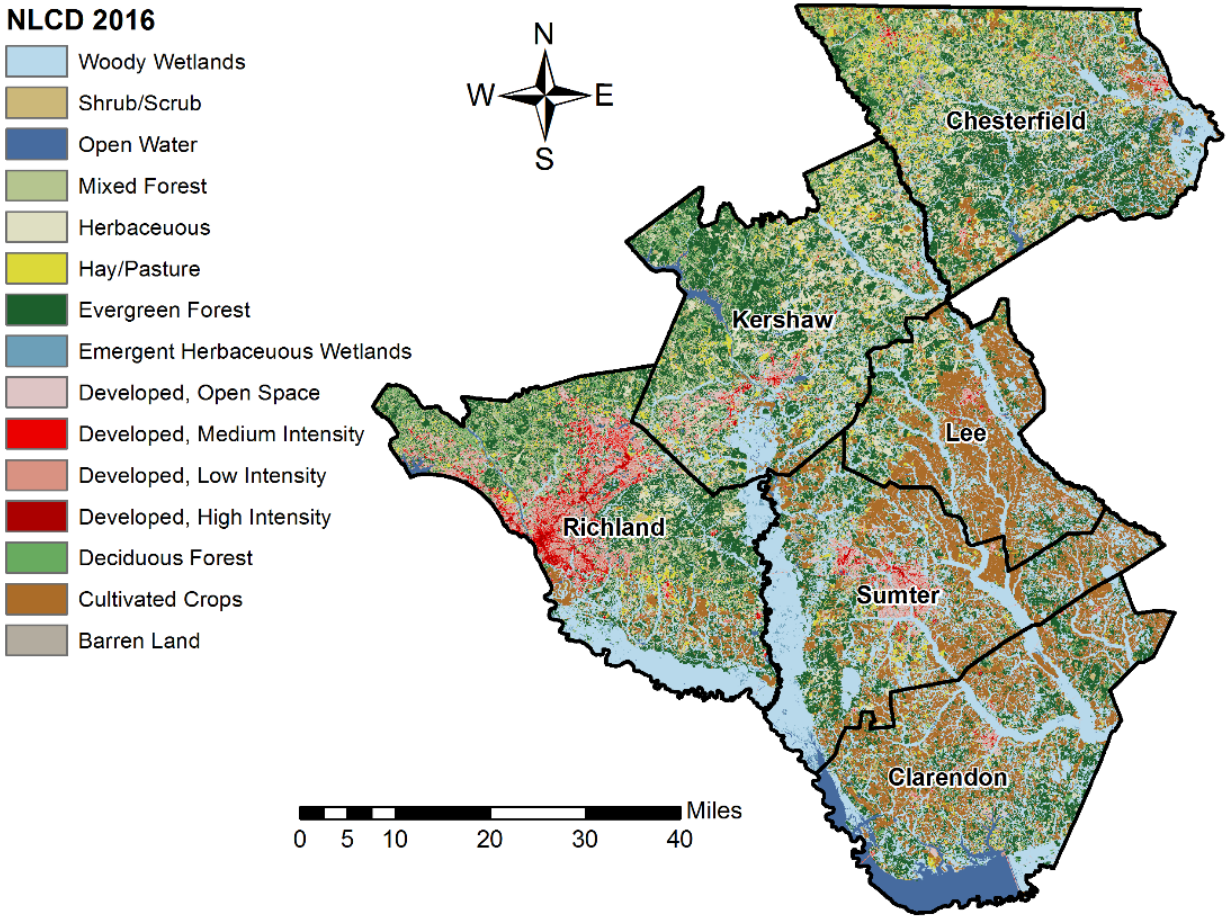
Population



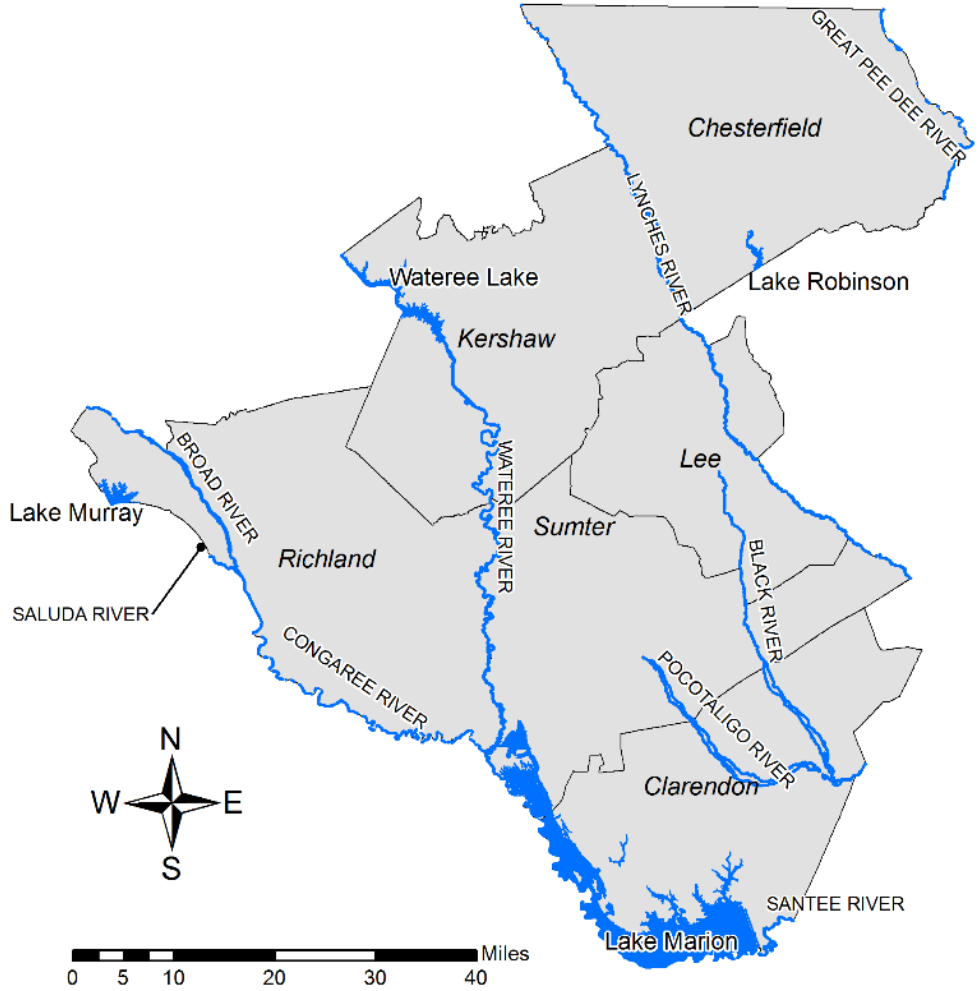
July 2018 population estimates for the proposed Santee-Lynches Area counties. www.census.gov; accessed February 21, 2020.



Population by County for the proposed Santee-Lynches Area from 2001 to 2018. Numbers presented are either census data (2010) or population estimates (www.census.gov; accessed February 3, 2020.)



Land Cover from the National Land Cover Database from 2016. Multi-Resolution Land Characteristics Consortium; https://mrlc.gov; accessed February 28, 2020.



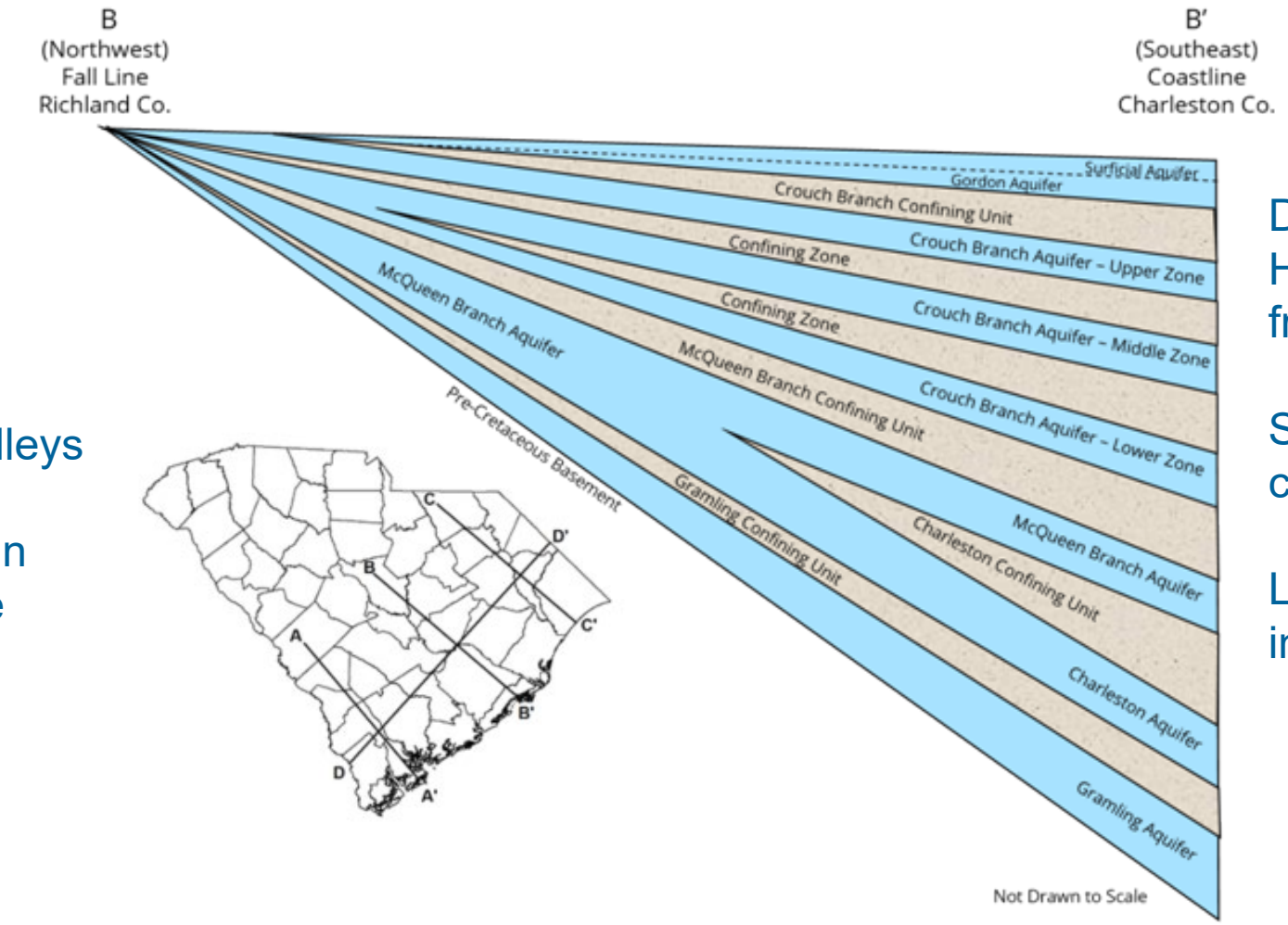
Major Rivers and Lakes of the proposed Santee-Lynches Capacity Use Area.

Groundwater in the Coastal Plain of SC

Groundwater and surface water are highly interconnected

Aquifer confining units are variable and incised by valleys

Less available drawdown in aquifer “shallow end of the pool”



Figures 7A and B: General structure of aquifers and confining units in the South Carolina Coastal Plain. Modified from Campbell, B.G., and A.L. Coes, eds. (2010)[8]. Inset map shows locations of the cross-

Deep Units are Hydrologically separated from surface systems

Saltwater intrusion is a concern

Land subsidence could increase coastal flooding

Aquifers and Confining Units

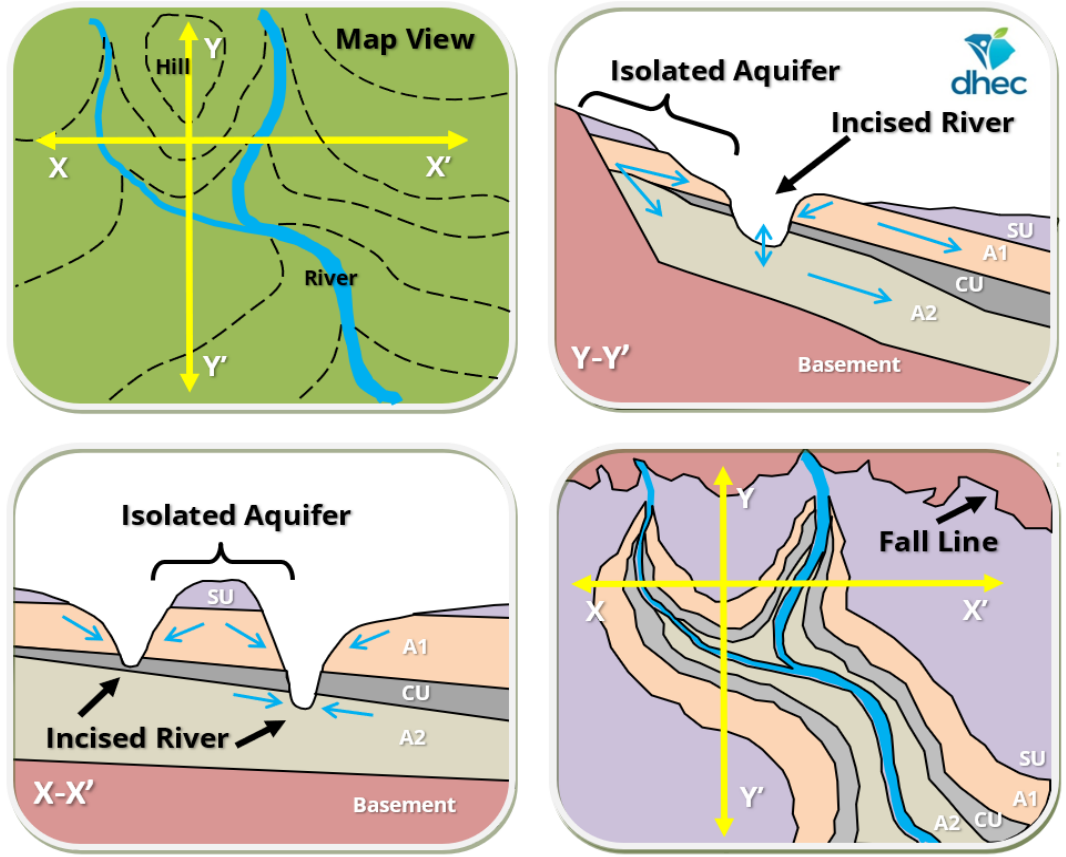


Illustration of the relationship between surface water and groundwater via incised river valleys in the Santee-Lynches Area close to the Fall Line.

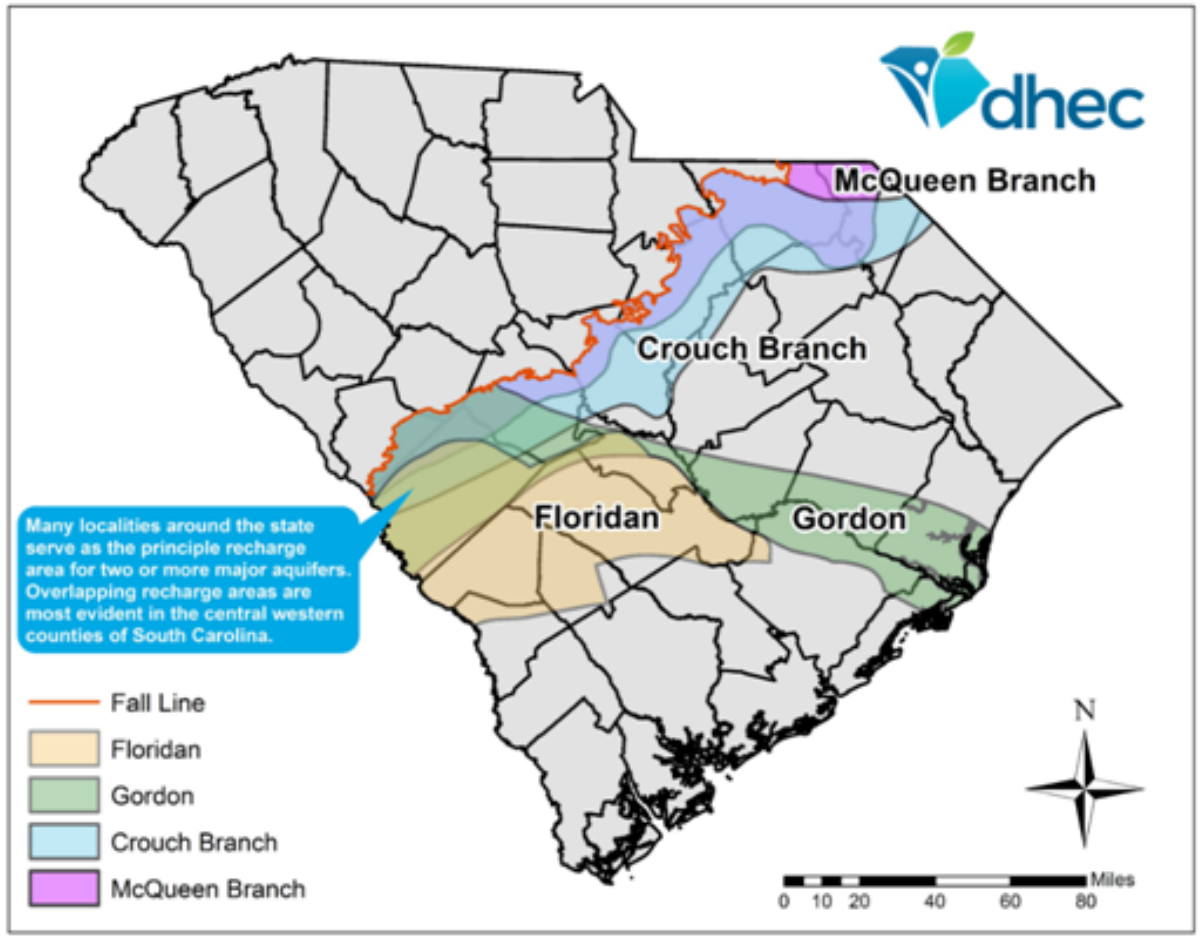
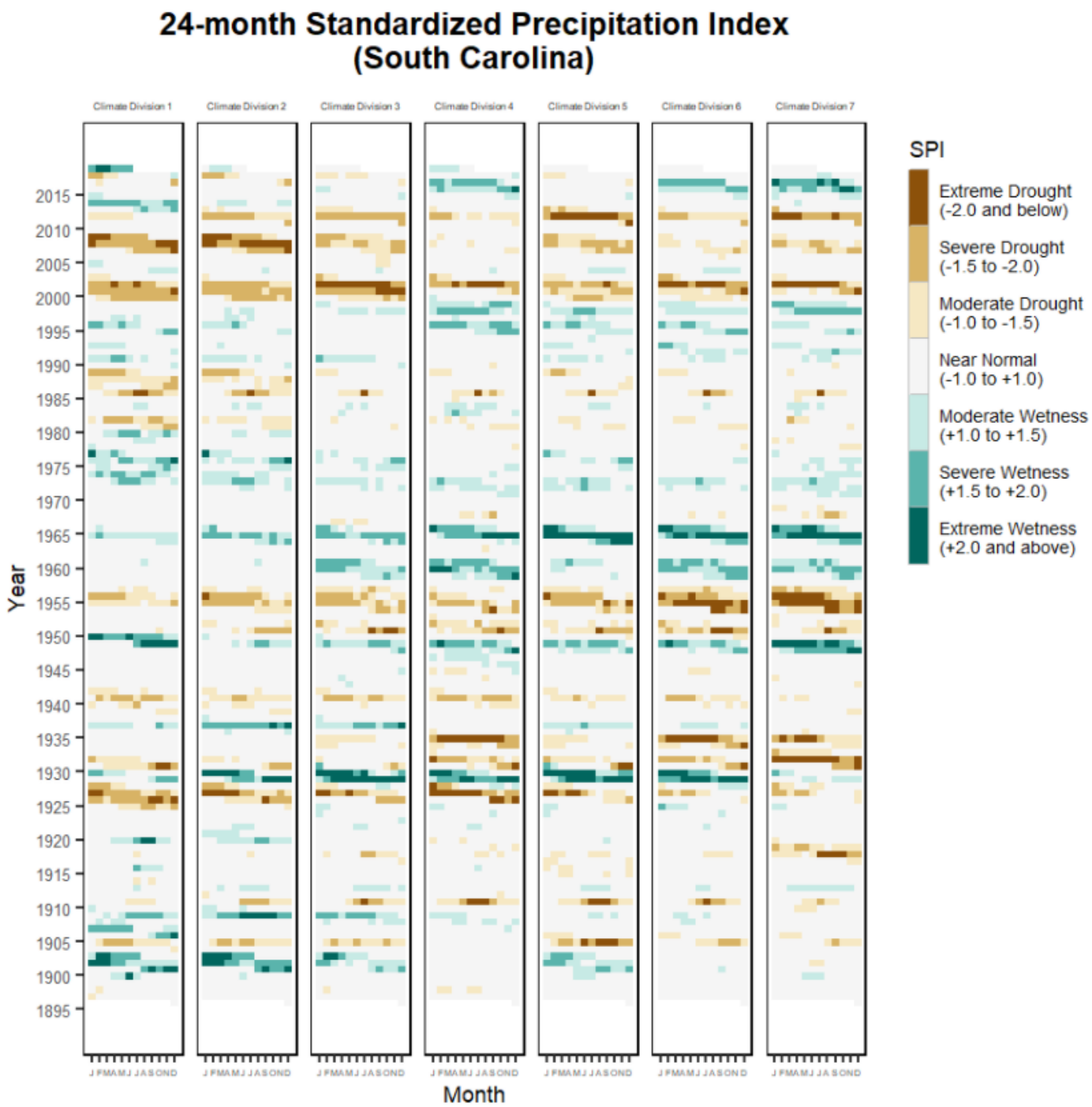
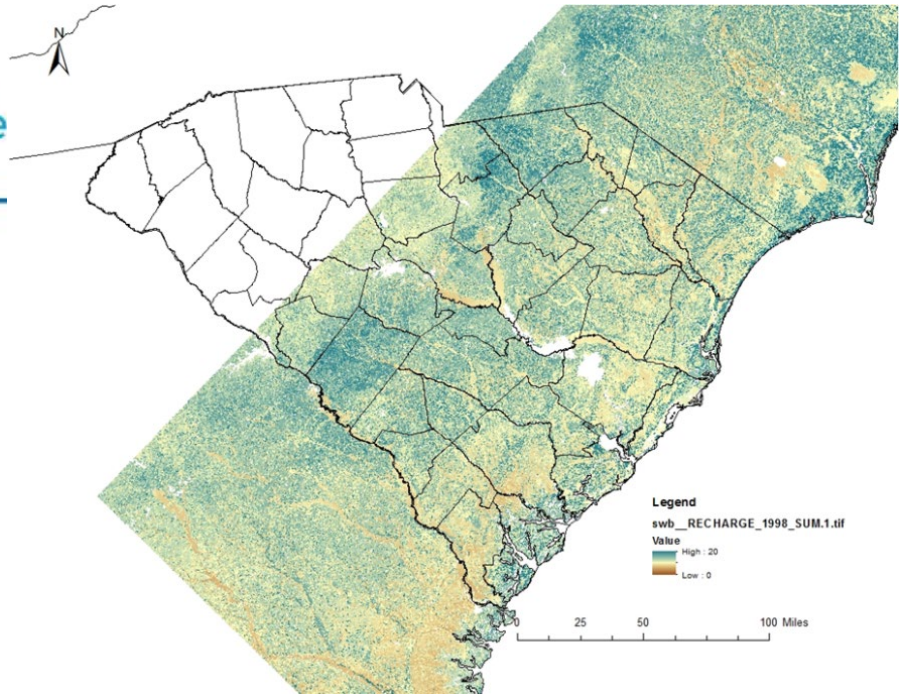
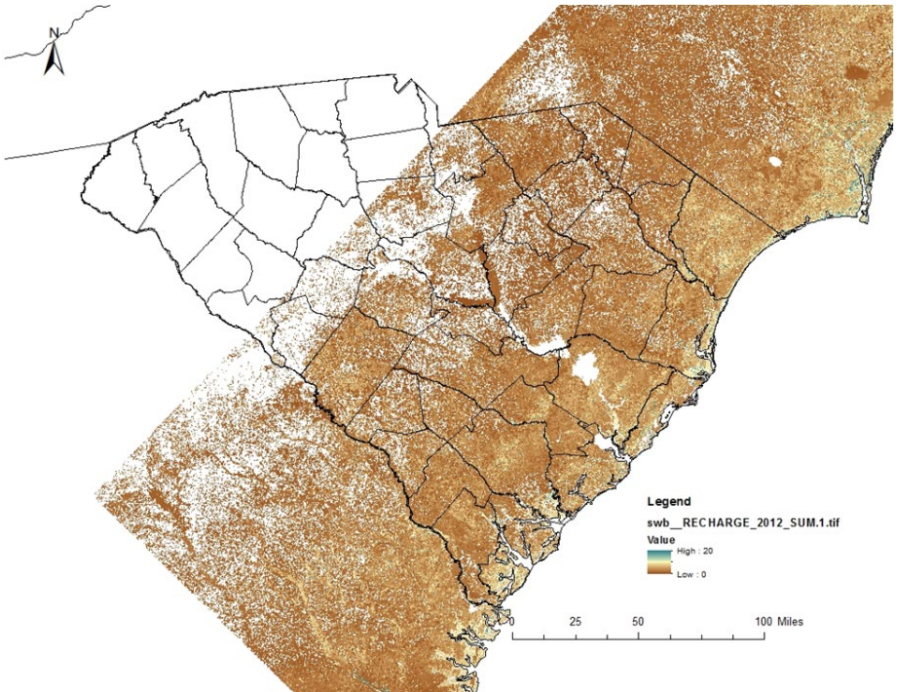


Figure 8: General recharge areas for the major SCCP aquifers. Data provided by SCDNR.


24-month Standardized Precipitation Index
(South Carolina)
Climate Division 1
Climate Division 2
Climate Division 3
Climate Division 4
Climate Division 5
Climate Division 6
Climate Division 7
Year
2015
2010
2005
2000
1995
1990
1985
1980
1975
1970
1965
1960
1955
1950
1945
1940
1935
1930
1925
1920
1915
1910
1905
1900
1895
J FMAMJ JASOND
Month
SPI
Extreme Drought
(-2.0 and below)
Severe Drought
(-1.5 to -2.0)
Moderate Drought
(-1.0 to -1.5)
Near Normal
(-1.0 to +1.0)
Moderate Wetness
(+1.0 to +1.5)
Severe Wetness
(+1.5 to +2.0)
Extreme Wetness
(+2.0 and above)

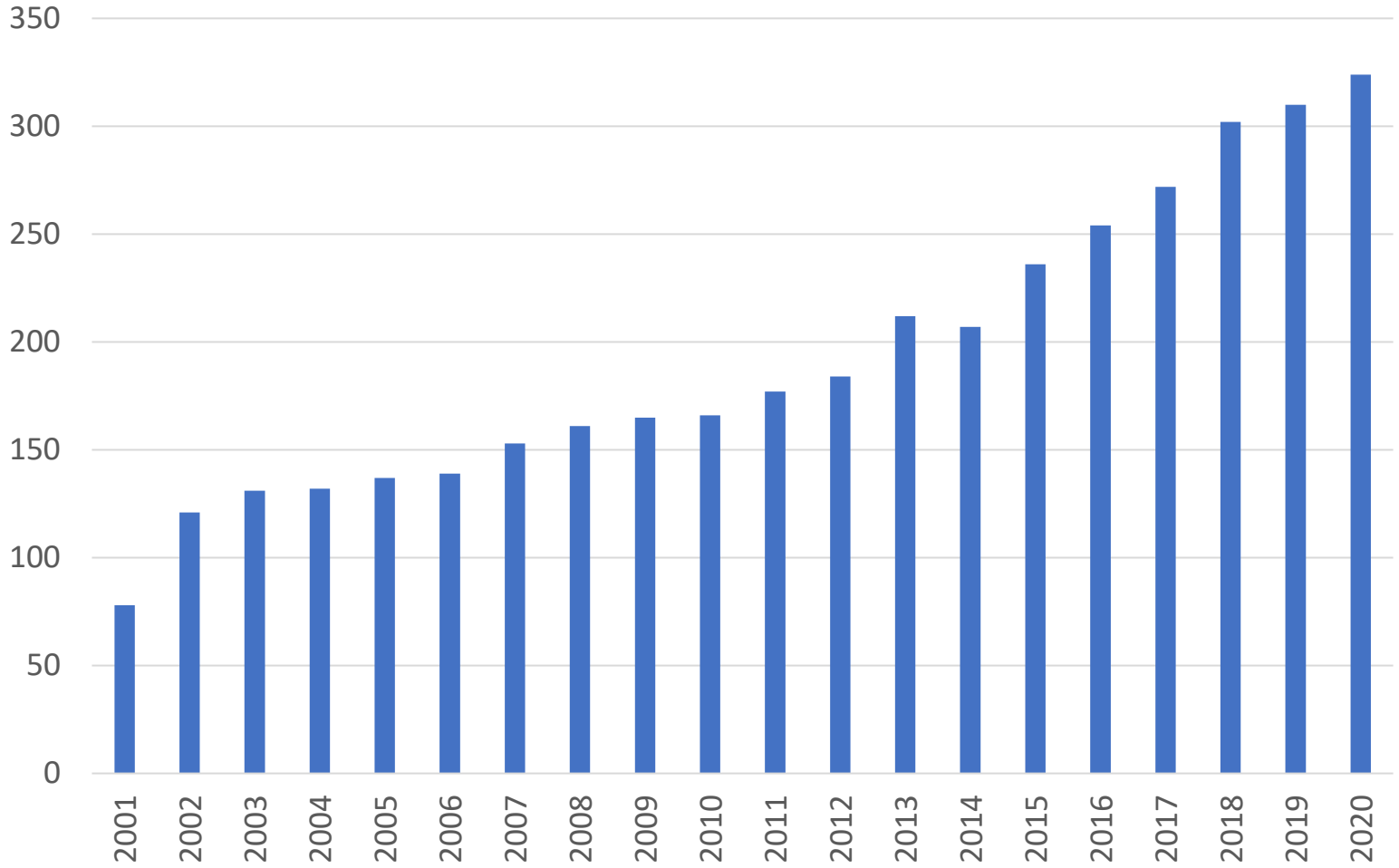

N
Legend
swb__RECHARGE_1998_SUM.1.tif
Value
High : 20
Low : 0
0
25
50
100 Miles

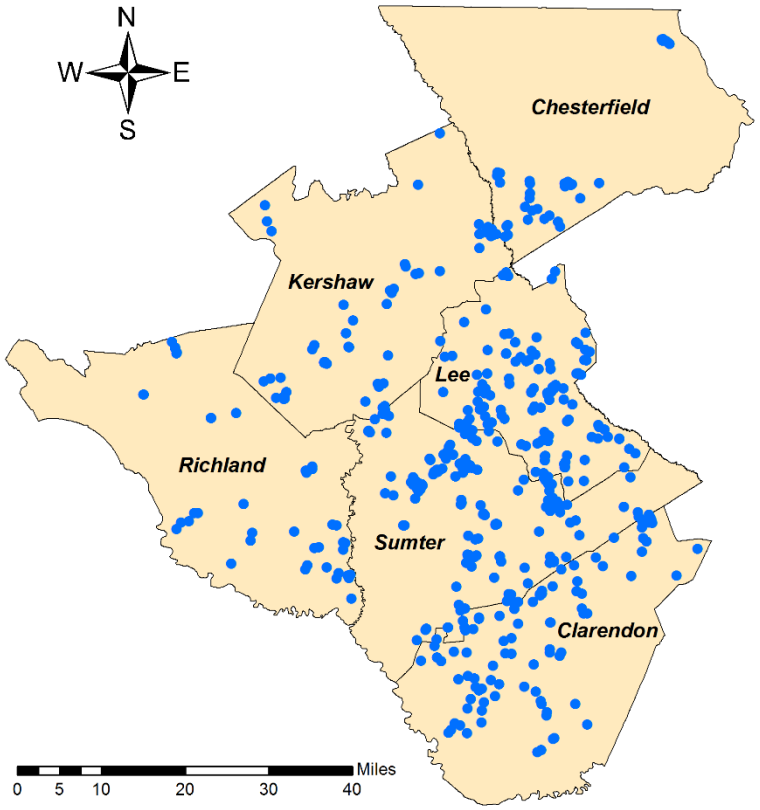

N
Legend
swb__RECHARGE_2012_SUM.1.tif
Value
High : 20
Low : 0
0
25
50
100 Miles

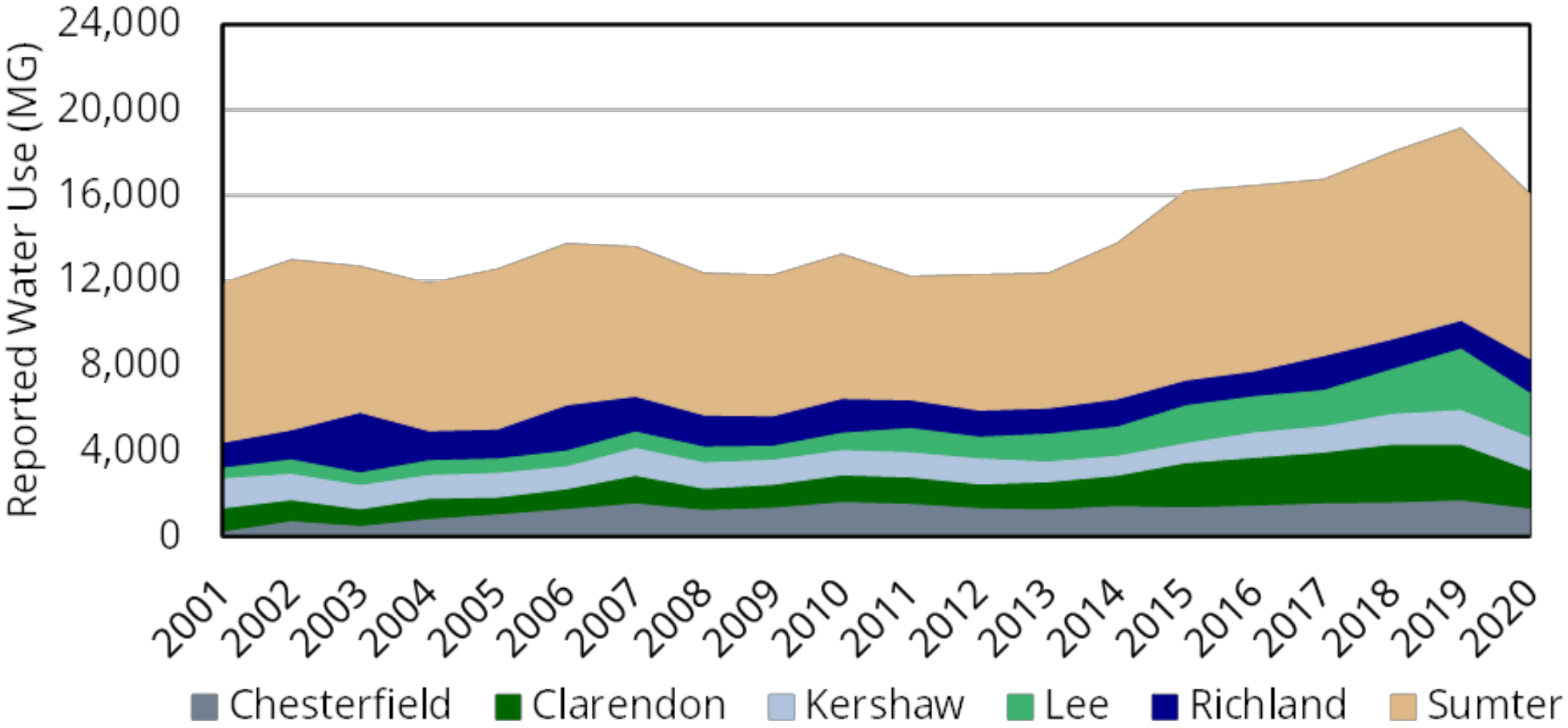
South Carolina Department of Health and Environmental Control

Groundwater Use in the Proposed Santee-Lynches Capacity Use Area

Registered Wells in the Proposed Santee-Lynches CUA

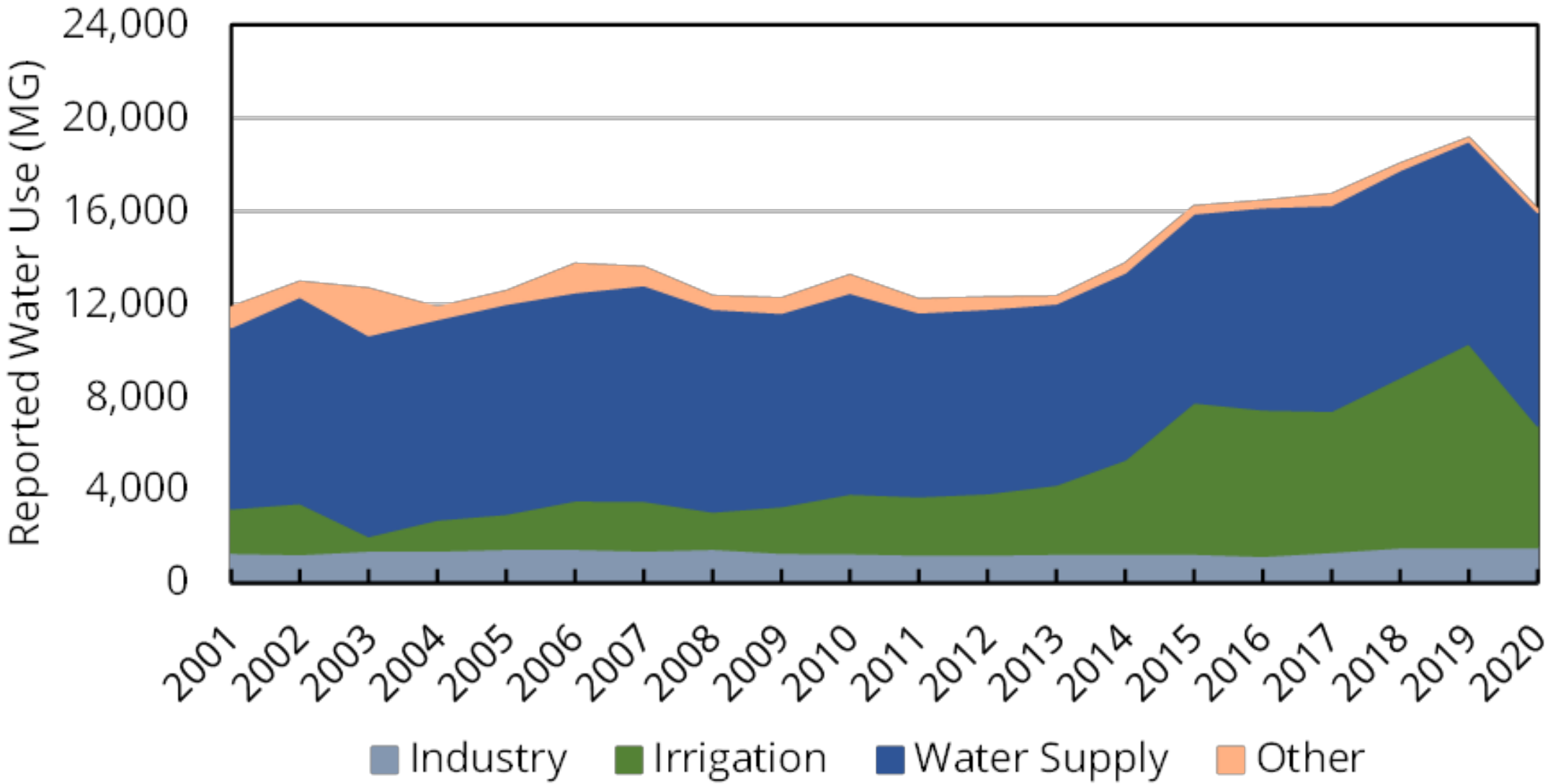


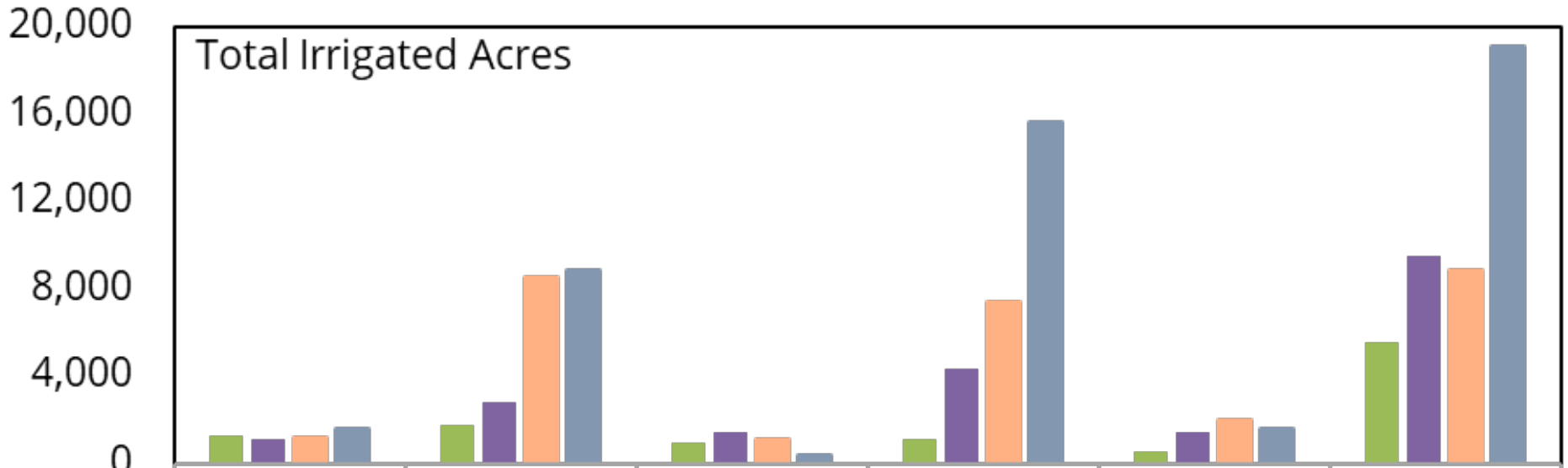




Reported Groundwater Use for the Santee-Lynches Area Counties from 2001 through 2020. Each county's reported water use is stacked on the other such that the top line of the upper area forms a line which is the total water use across all counties. For example, the total water use for the 6 counties for 2001 is approximately 12,000 MG.

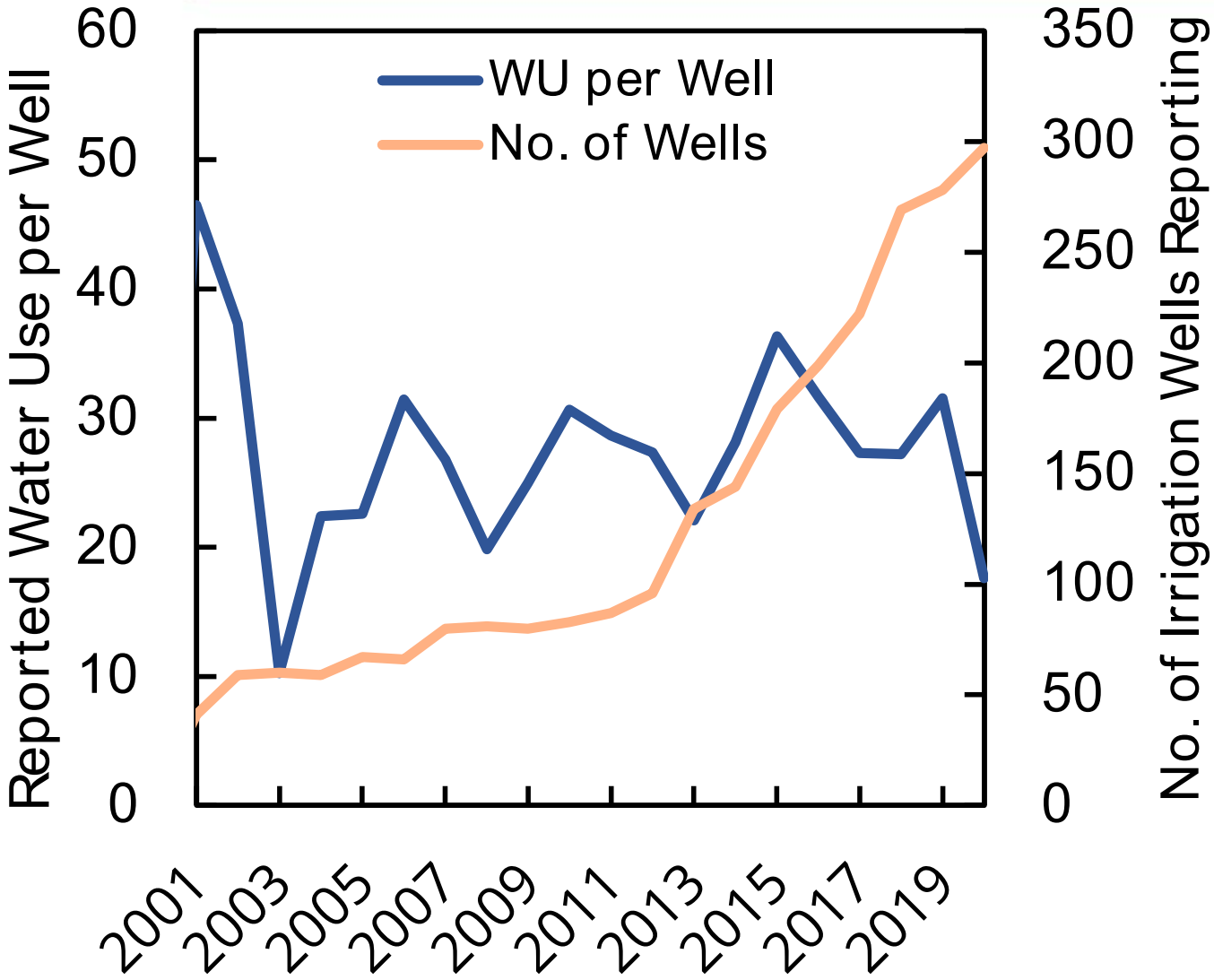
South Carolina Department of Health and Environmental Control



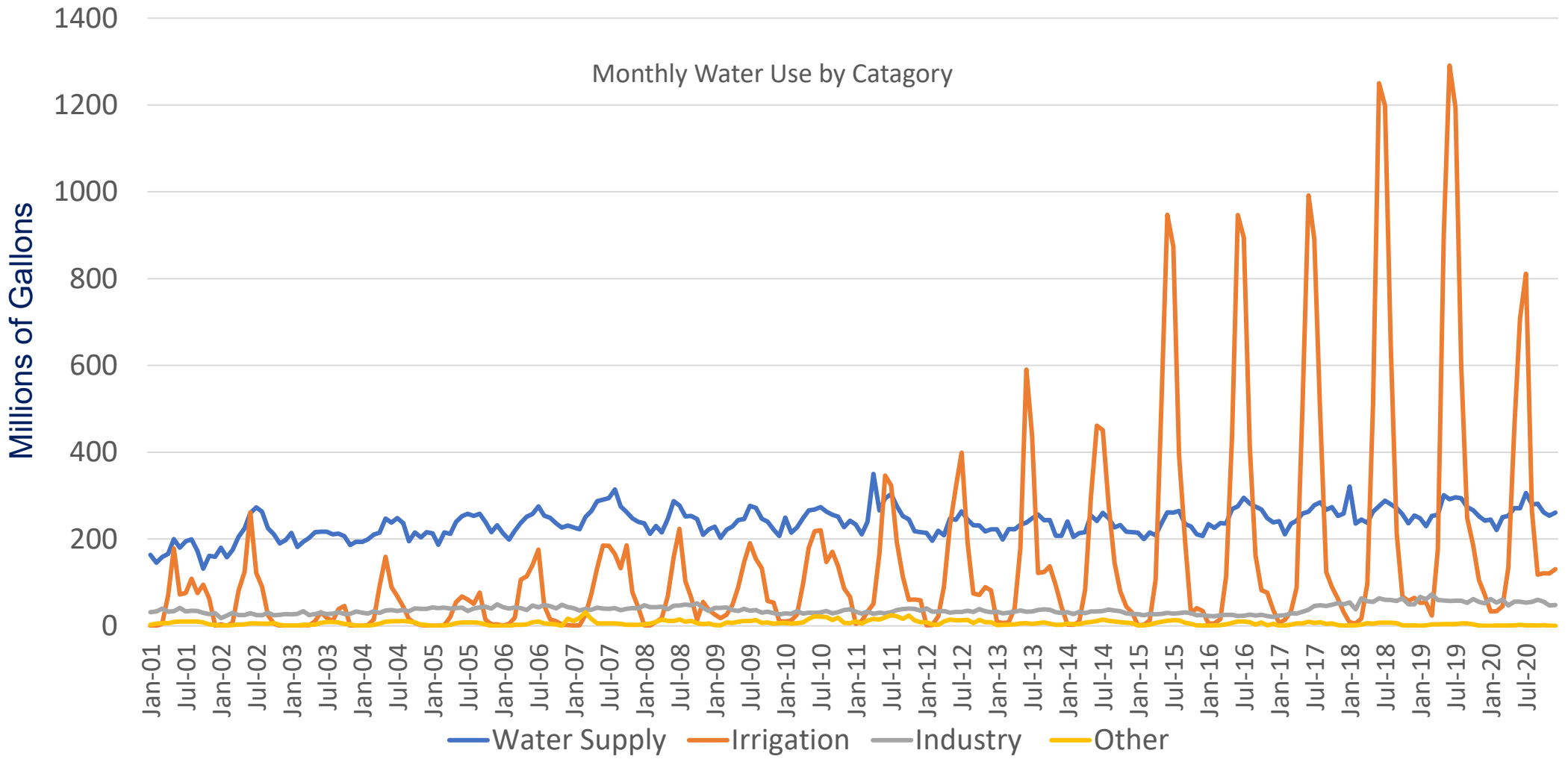


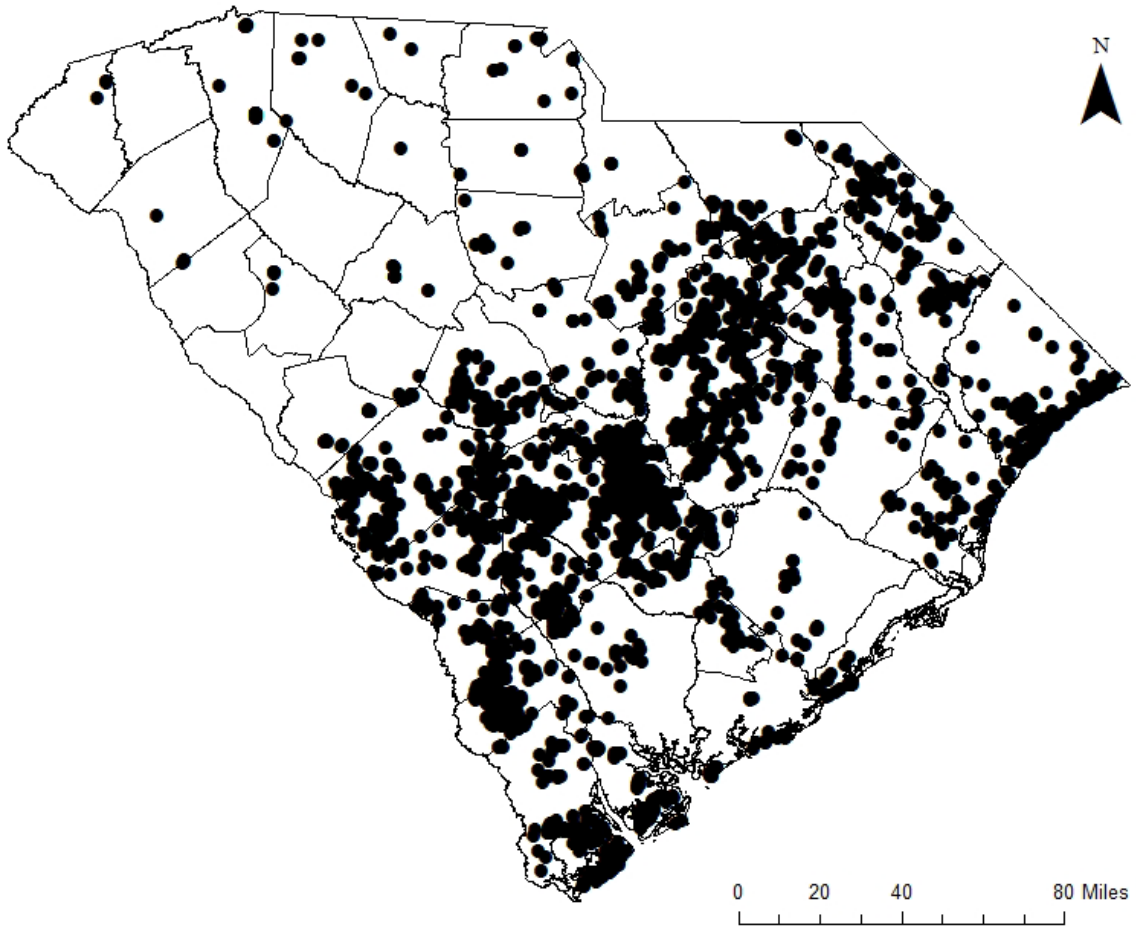
	Chesterfield	Clarendon	Kershaw	Lee	Richland	Sumter
2002	1,269	1,704	903	1,072	516	5,537
2007	1,083	2,761	1,438	4,322	1,425	9,486
2012	1,169	8,533	1,134	7,414	1,951	8,863
2017	1,584	8,871	386	15,602	1,611	19,133

Total Irrigated Acres from the USDA NASS Agriculture Census 2007 and 2017. Irrigated acres in this report include both crop and pasture land.

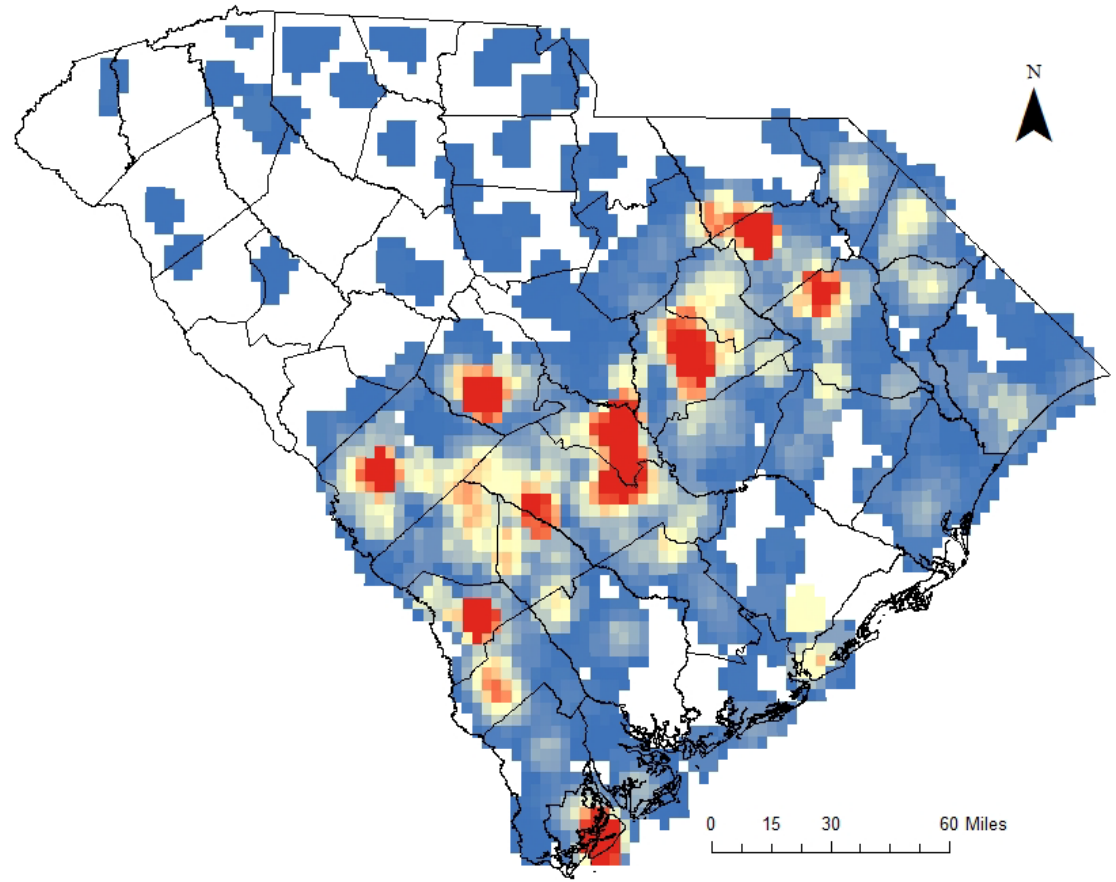


Reported Water Use (MG) per Reporting Well and the Number of Registered Wells from 2000 through 2020.


Monthly Water Use by Catagory
Millions of Gallons
1400
1200
1000
800
600
400
200
0
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Water Supply
Irrigation
Industry
Other



- 2019 Wells



2019 Local Area Groundwater Use

High

Low

South Carolina Department of Health and Environmental Control

Groundwater Levels in Proposed Santee-Lynches Capacity Use Area

South Carolina Groundwater Monitoring Network

DNR

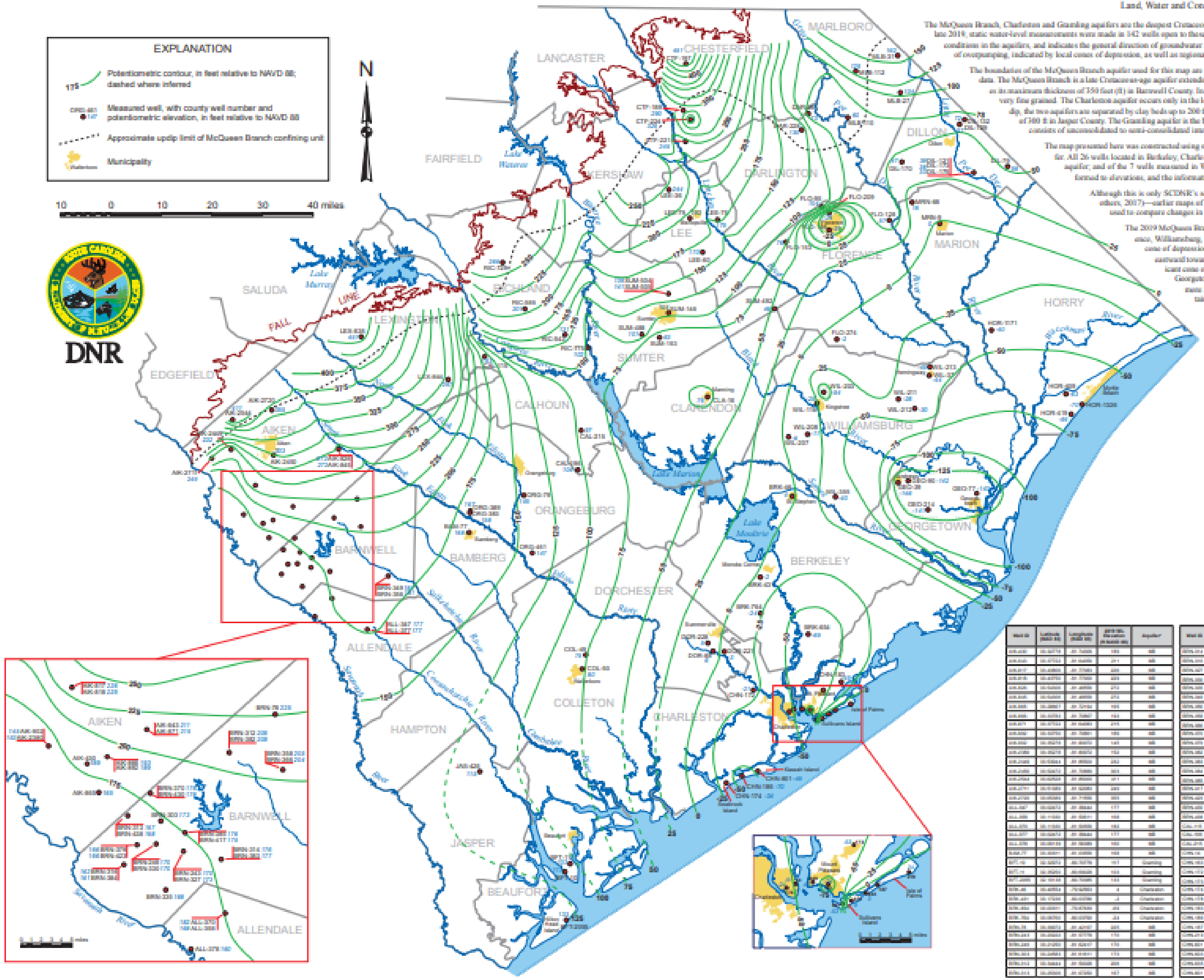
Map prepared by the Land, Water & Conservation Division of the South Carolina Department of Natural Resources: Nov. 2017

Potentiometric Surface of the McQueen Branch, Charleston, and Gramling Aquifers in South Carolina, November–December 2019

by

Brooke Czwartacki and Andrew Wachob

Land, Water and Conservation Division, South Carolina Department of Natural Resources



The McQueen Branch, Charleston and Gramling aquifers are the deepest Cretaceous-age aquifers in the Coastal Plain of South Carolina and are an important source of water for many public, industrial, and agricultural users. In late 2019, static water-level measurements were made in 142 wells open to these aquifers in order to produce a potentiometric surface map, which illustrates the elevation of water levels in the aquifers, provides an overview of conditions in the aquifers, and indicates the general direction of groundwater flow. Routine monitoring of water levels in these aquifers allows the South Carolina Department of Natural Resources (SCDNR) to identify areas of overpumping, indicated by local cones of depression, as well as regional changes in aquifer storage related to groundwater development.

The boundaries of the McQueen Branch aquifer used for this map are those defined by Gellici and Lautier (2010), who delineated the aquifer using geologic (corehole, fossil, and borehole geophysics) and water-level data. The McQueen Branch is a late Cretaceous-age aquifer extending over most of the Coastal Plain. The aquifer, which consists primarily of interbedded quartz sand and clay, outcrops along the Fall Line and reaches its maximum thickness of 350 feet (ft) in Barnwell County. In the updip areas, the aquifer is composed of unconsolidated medium to very-coarse grained sand interbedded with clay lenses; downdip, it becomes very fine grained. The Charleston aquifer occurs only in the lower half of the Coastal Plain, and is hydraulically connected to the overlying McQueen Branch aquifer in middle part of the Coastal Plain. Downdip, the two aquifers are separated by clay beds up to 200 ft thick. The Charleston aquifer consists of unconsolidated fine to very-coarse quartz sand, clayey sand, and clay, and reaches a maximum thickness of 300 ft in Jasper County. The Gramling aquifer is the basal aquifer of the Coastal Plain, sitting on basement rock and occurring primarily only in the lower half of the Coastal Plain. The Gramling aquifer consists of unconsolidated to semi-consolidated interbedded quartz sand, clayey sand, silt, and clay, and reaches a thickness of 1,000 ft at Hilton Head Island in Beaufort County.

The map presented here was constructed using static (non-pumping) water levels measured in 142 wells during late 2019. Of these 142 wells, 109 are screened solely in the McQueen Branch aquifer. All 26 wells located in Berkeley, Charleston, Colleton, Dorchester, and Jasper Counties are open to the Charleston aquifer; only the 3 wells in Beaufort County are open to the Gramling aquifer; and of the 7 wells measured in Williamsburg County, 3 are McQueen Branch and 4 are screened in both Charleston and McQueen Branch aquifers. The water levels were transformed to elevations, and the information was contoured to represent the aquifers' potentiometric surface in ft above or below the North American Vertical Datum 1988 (NAVD 88).

Although this is only SCDNR's second potentiometric map using the boundaries of the McQueen Branch aquifer—the first being made from data collected in 2016 (Wachob and others, 2017)—earlier maps of the Middendorf aquifer (Wachob, 2015; Hockensmith and others, 2013; Hockensmith, 2012; 2008; 2003; Hockensmith and Waters, 1998) can be used to compare changes in hydrologic conditions over time.

The 2019 McQueen Branch-Charleston-Gramling potentiometric surface map shows a generally southeastward groundwater flow affected by potentiometric lows in Florence, Williamsburg, Charleston, and Georgetown Counties. Potentiometric levels range from more than 450 ft near the Fall Line to -146 ft in Georgetown County. A cone of depression centered at Mount Pleasant in Charleston County has rebounded at its center by 22 ft since 2016 but continues to expand inland to the north and eastward towards the barrier islands; water levels on Sullivan's Island and Isle of Palms have declined at an average rate exceeding 1 ft per year since 2011. A significant cone of depression around the City of Florence—missing from the 2016 map because of a lack of water-level data but seen on prior maps—is again shown. Georgetown County has a large potentiometric low that affects both the City of Georgetown and the Town of Andrews. Compared to the 2016 map, several more McQueen Branch wells were identified and measured to better characterize the magnitude and extent of this cone of depression. There is some uncertainty about the potentiometric levels in Clarendon and Sumter Counties because of a scarcity of water-level measurements available for this map.

The 2019 McQueen Branch-Charleston-Gramling potentiometric map suggests that, downdip from the recharge areas and outside of the western edge of the aquifer, water levels throughout much of this aquifer have declined 50 to 100 ft below predevelopment levels (Aucott and Speiran, 1985), and in parts of Charleston and Georgetown Counties, more than 200 ft.

Water levels were collected by staff from SCDNR, the Savannah River National Laboratory, the South Carolina Department of Health and Environmental Control, and the U.S. Geological Survey. The authors are grateful for the assistance of these agencies and the cooperation of well owners to obtain the water-level measurements used to produce this map.

References

Aucott, W.R., and Speiran, G.K., 1985, Potentiometric surfaces of the Coastal Plain aquifers of South Carolina prior to development: U.S. Geological Survey Water-Resources Investigations Report 84-4208, 5 sheets.

Gellici, J.A., and Lautier, J.C., 2010, Hydrogeologic framework of the Atlantic Coastal Plain, North and South Carolina, in Campbell, B.G., and Coes, A.L., eds., Groundwater availability in the Atlantic Coastal Plain of North and South Carolina: U.S. Geological Survey Professional Paper 1773, p. 49–162.

Hockensmith, B.L., 2003, Potentiometric surface of the Middendorf aquifer in South Carolina, November 2001: South Carolina Department of Natural Resources, Water Resources Report 28, 1 sheet.

——— 2008, Potentiometric surface of the Middendorf aquifer in South Carolina, November 2004: South Carolina Department of Natural Resources, Water Resources Report 46, 11 p., 1 plate.

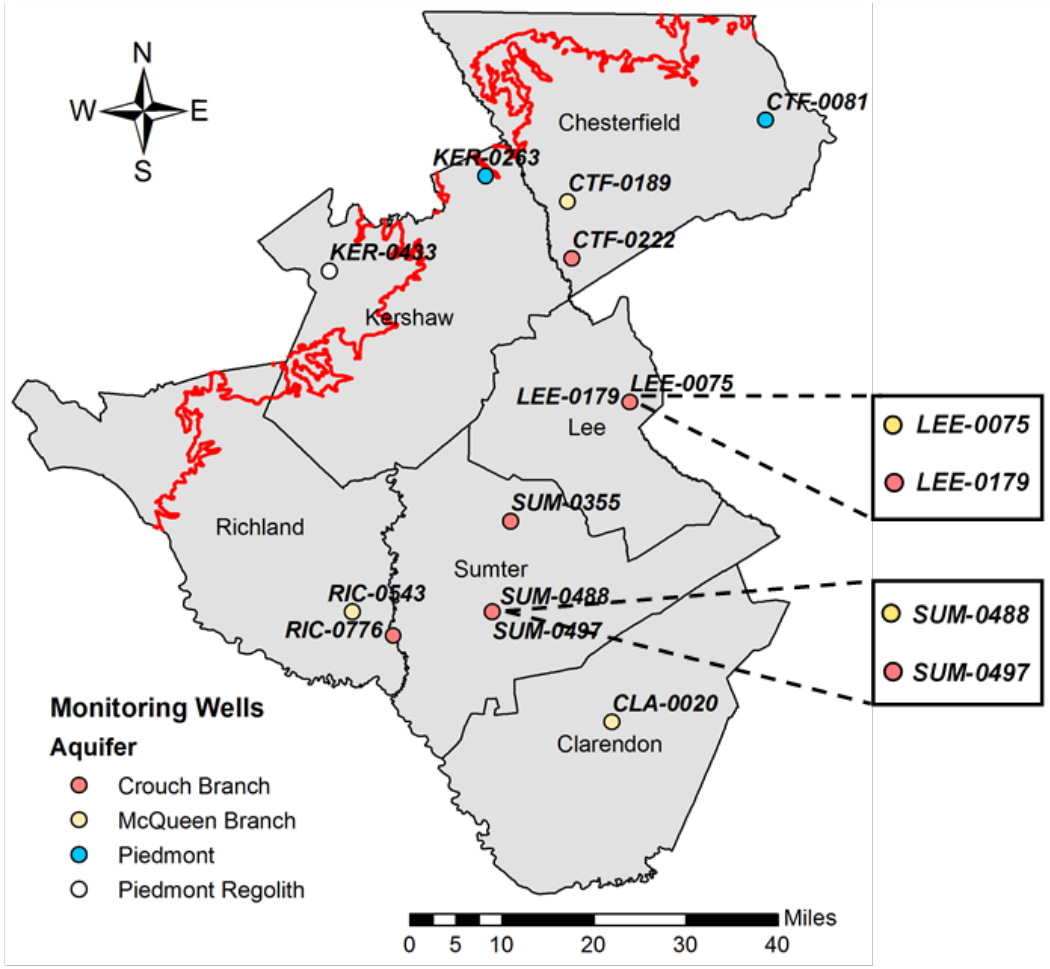
——— 2012, Potentiometric surface of the Middendorf aquifer in South Carolina, November 2009: South Carolina Department of Natural Resources, Water Resources Report 51, 11 p., 1 plate.

Hockensmith, B.L., Wachob, A., Howard, C.S., and Koch, E., 2013, Potentiometric surface of the Middendorf aquifer in South Carolina, November 2011: South Carolina Department of Natural Resources, Water Resources Report 54, 1 sheet.

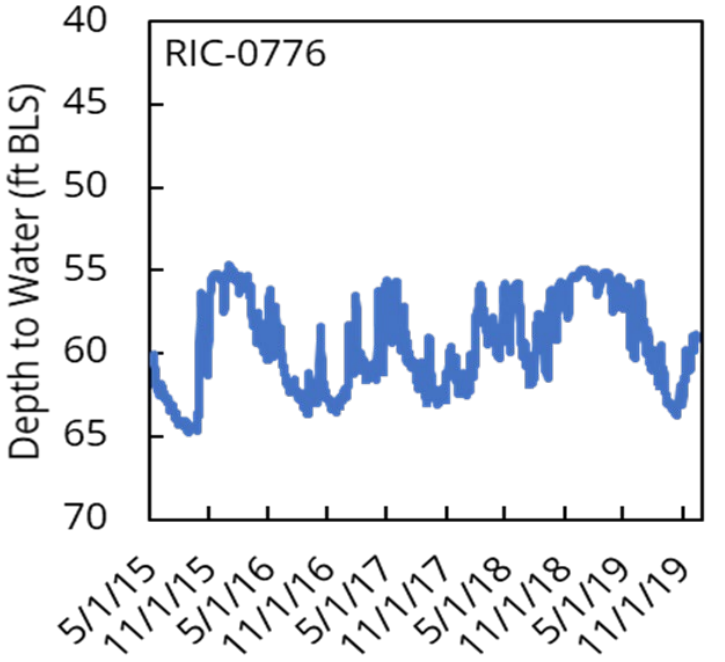
Hockensmith, B.L., and Waters, K.E., 1998, Potentiometric surface of the Middendorf aquifer in South Carolina, November 1996: South Carolina Department of Natural Resources, Water Resources Report 19, 1 sheet.

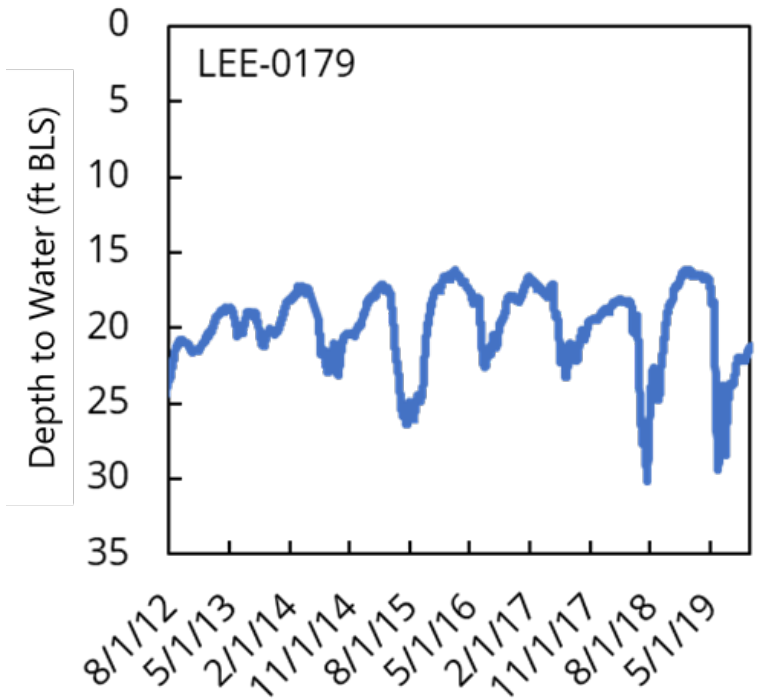
Wachob, A., 2015, Potentiometric surface of the Middendorf aquifer in South Carolina, November 2014: South Carolina Department of Natural Resources, Water Resources Report 58, 1 sheet.

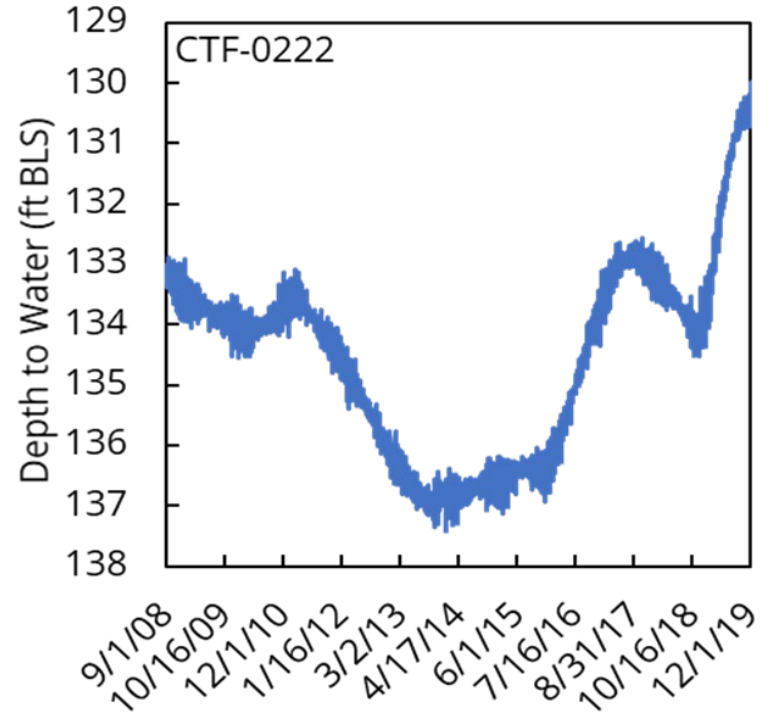
Wachob, A., Gellici, J.A., and Czwartacki, B., 2017, Potentiometric surface maps of the South Carolina Coastal Plain Aquifers, November–December 2016: South Carolina Department of Natural Resources, Water Resources Report 60, 35 p., 3 plates.

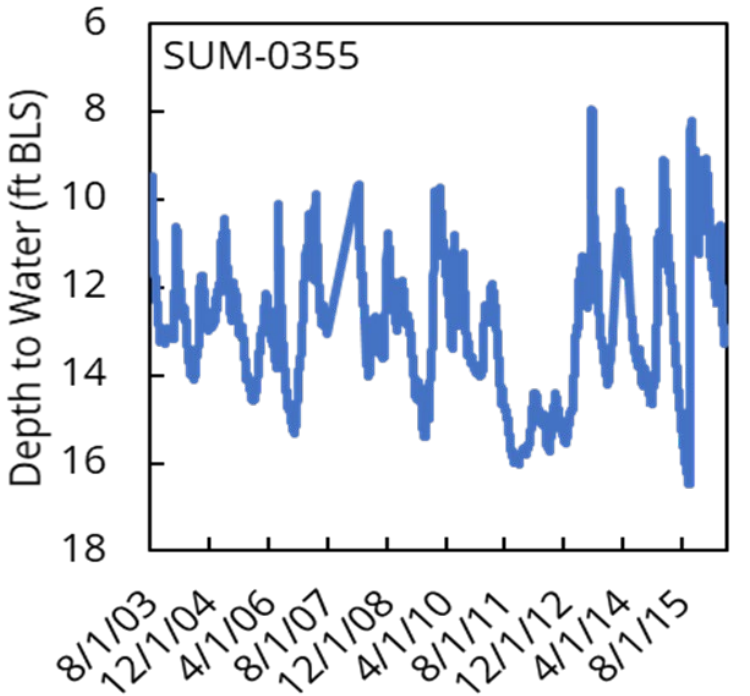


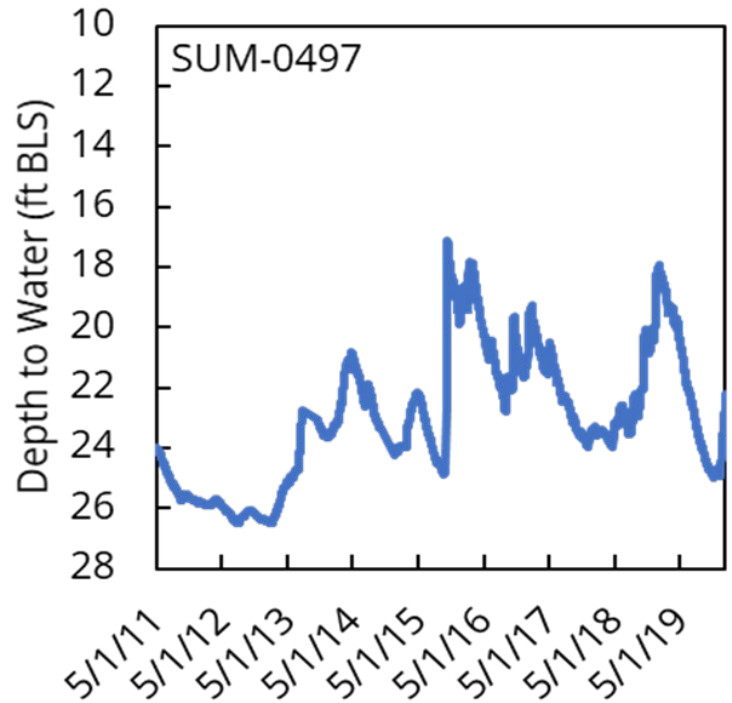
Map showing the locations of the wells used to evaluate groundwater trends. The colors represent the aquifer into which each well is screened. The pop-out boxes provide individual well information for well clusters in Lee and Sumter Counties.

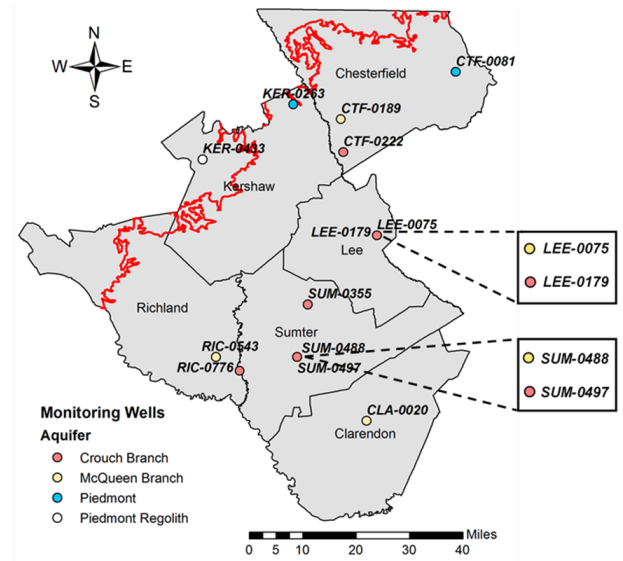












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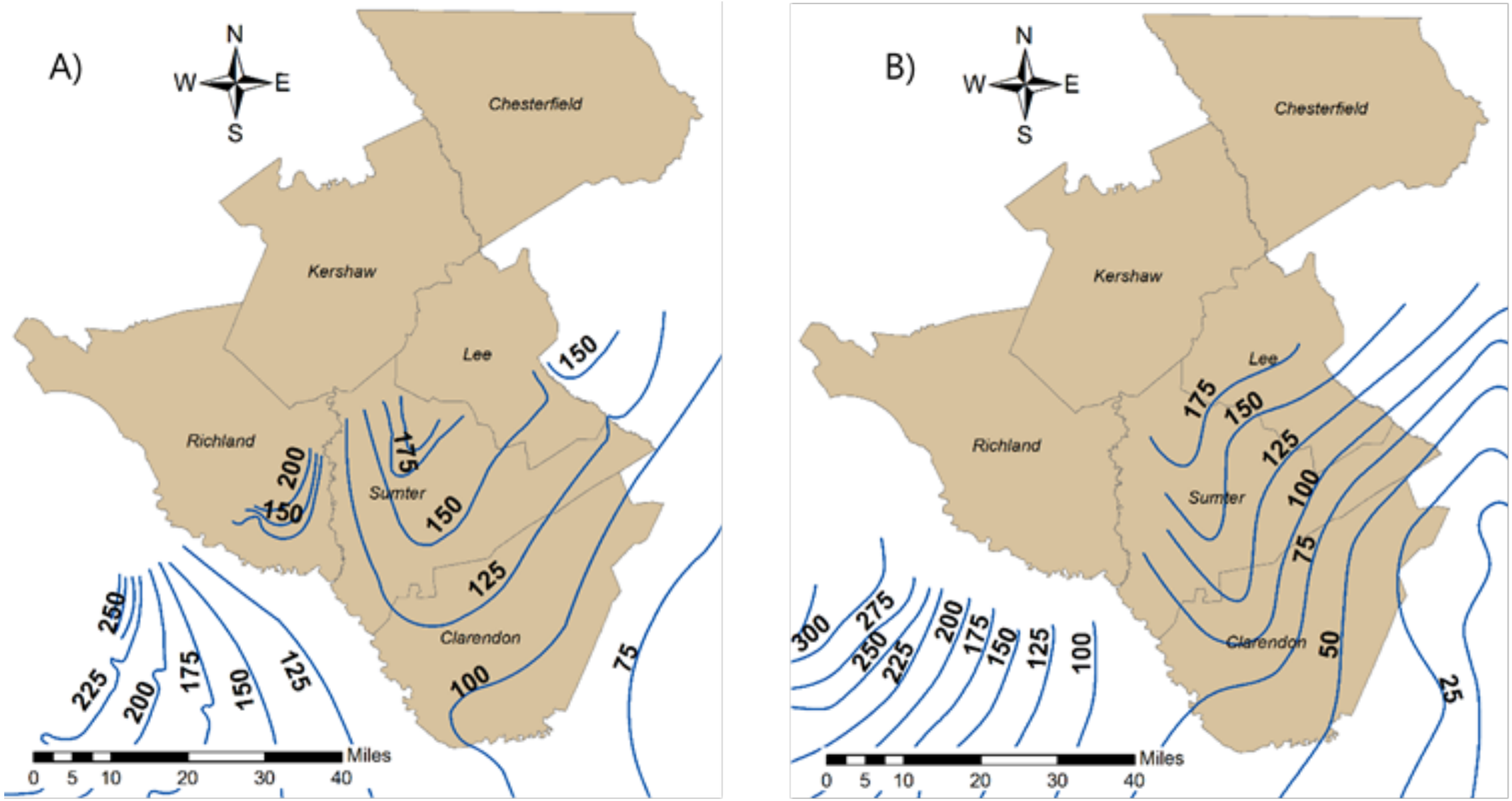
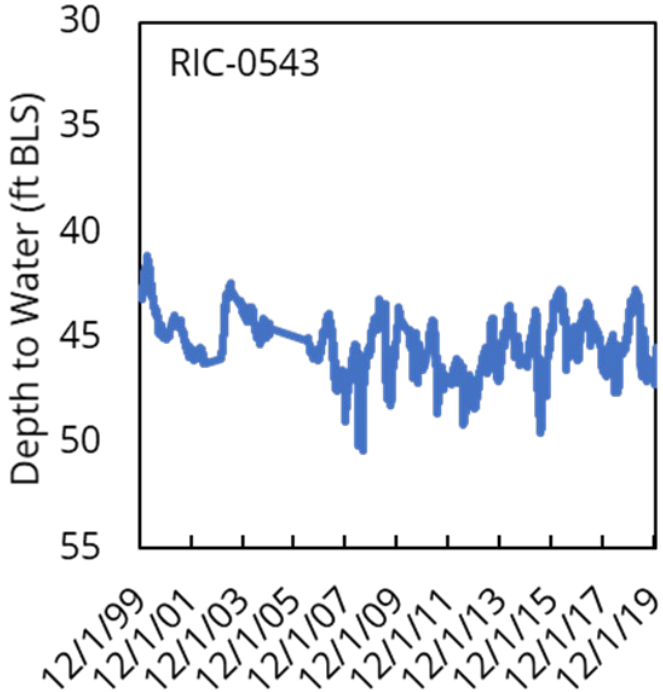
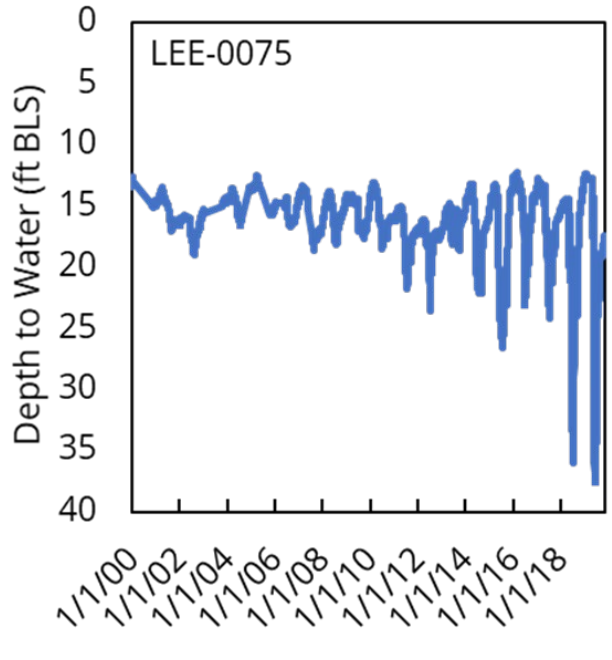
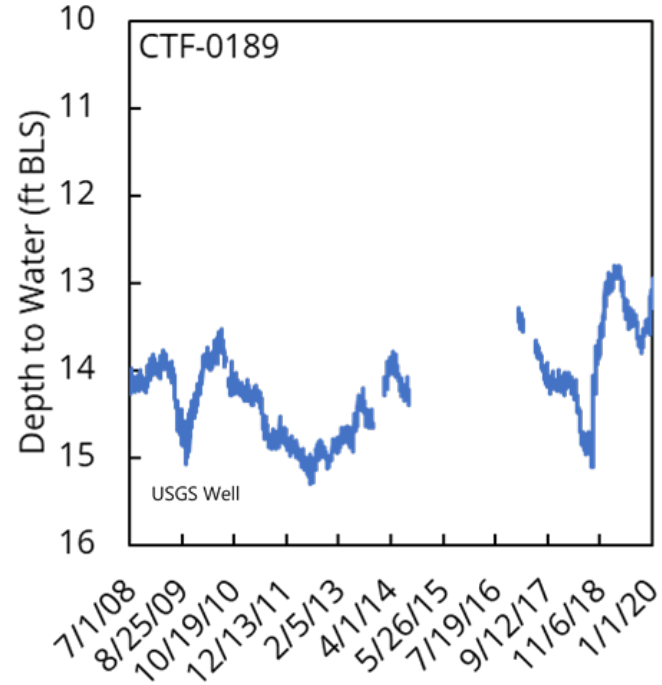
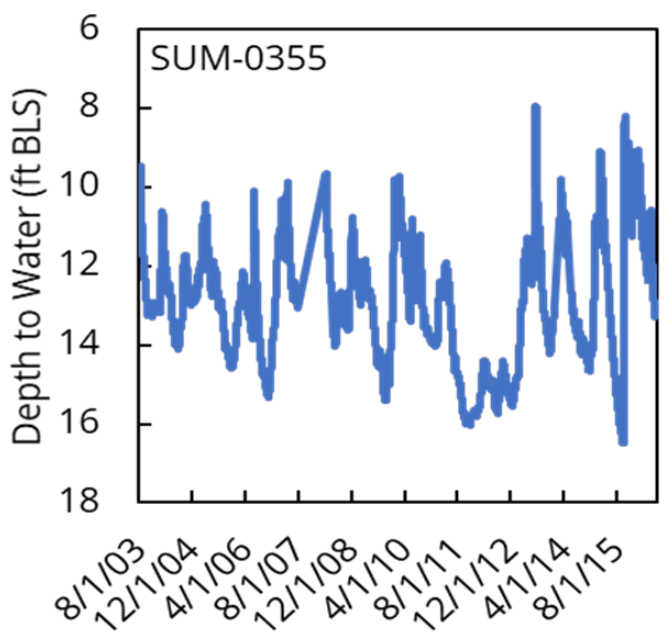


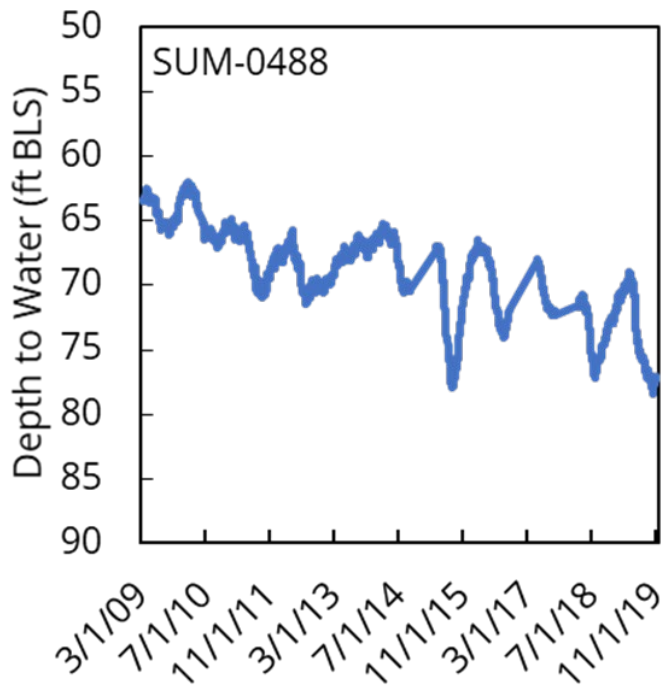
Change in Crouch Branch Aquifer Potentiometric Surface, Pre-Development (A) to 2016 (B).

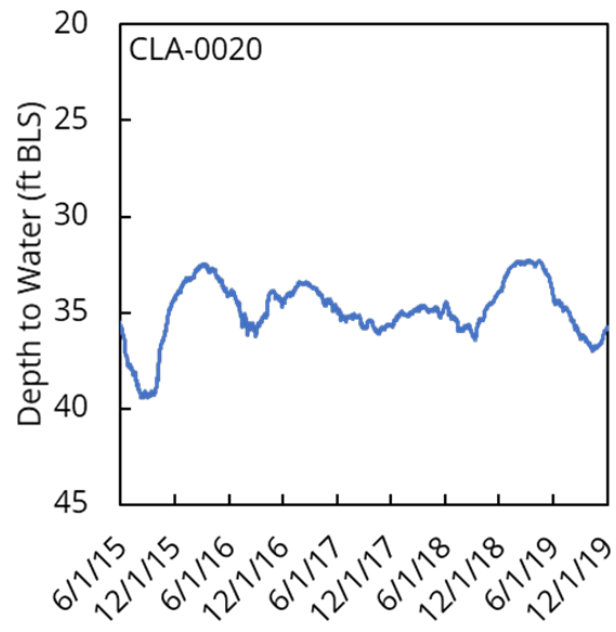


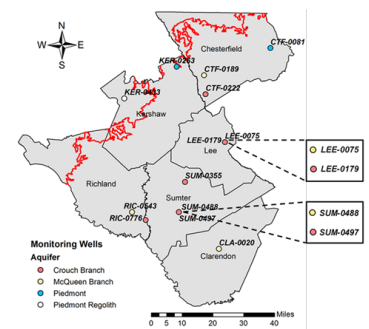




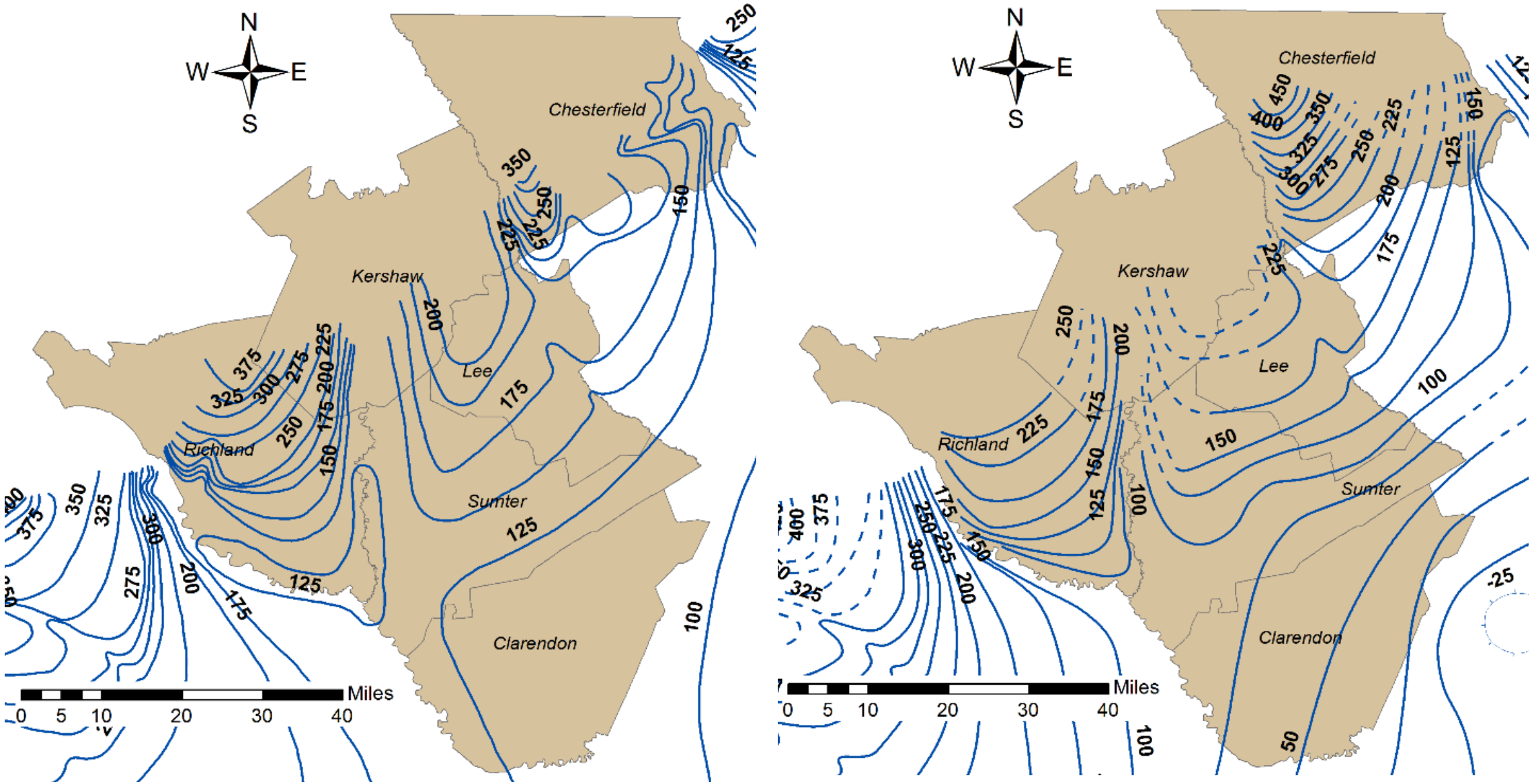




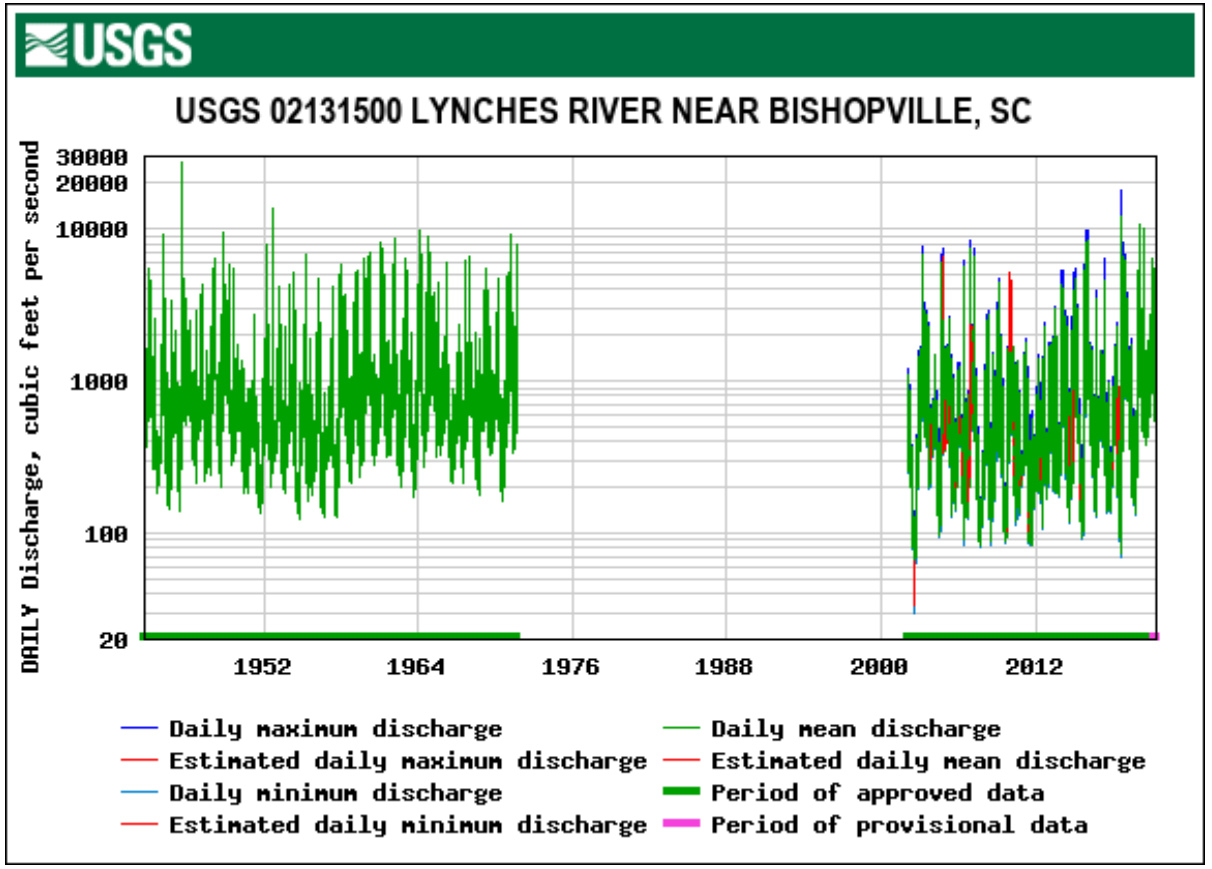




Map showing the locations of the wells used to evaluate groundwater trends. The colors represent the aquifer into which each well is screened. The pop-out boxes provide individual well information for well clusters in Lee and Sumter Counties.



Potentiometric Surface Maps of the Middendorf Aquifer (McQueen Branch Aquifer). PreDevelopment (1900) and 2016.



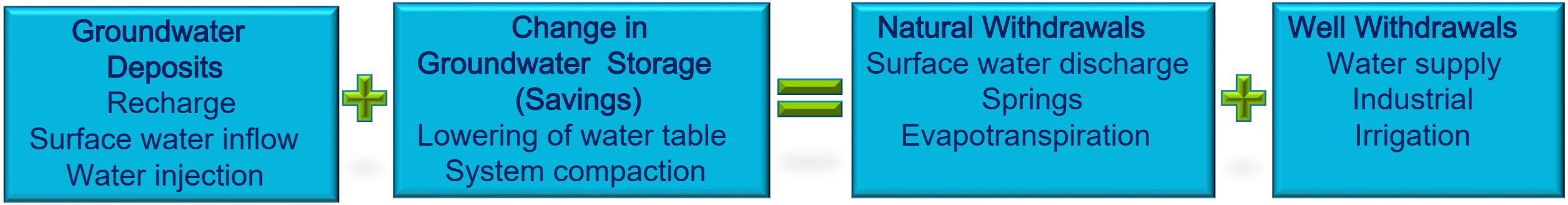
7Q10 has decreased 16.4% from 1979 to 2007 (USGS, 2009)

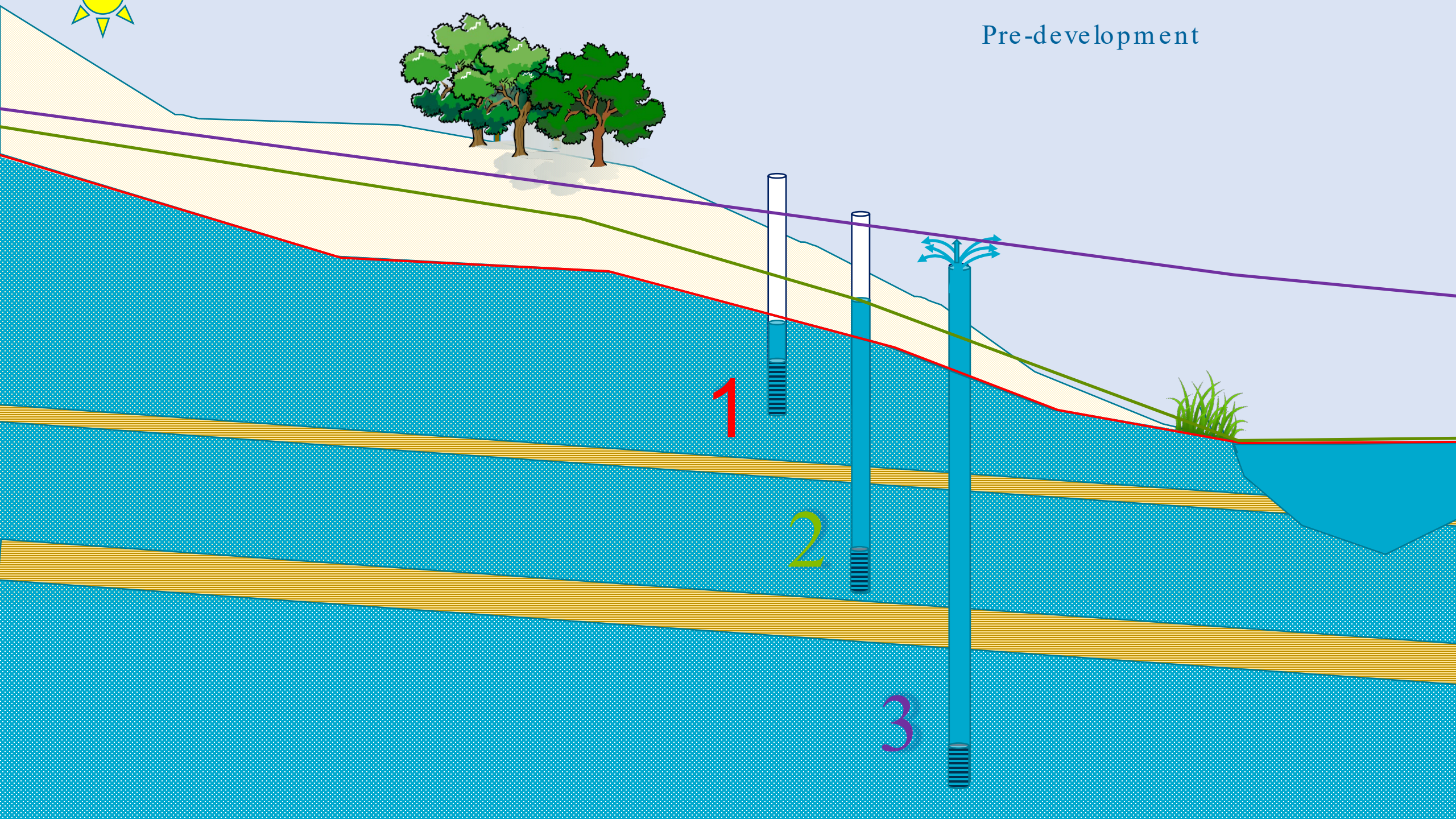
7Q10 is the lowest 7-day average flow that occurs (on average) once every 10 years

dhec Healthy People. Healthy Communities. South Carolina Department of Health and Environmental Control

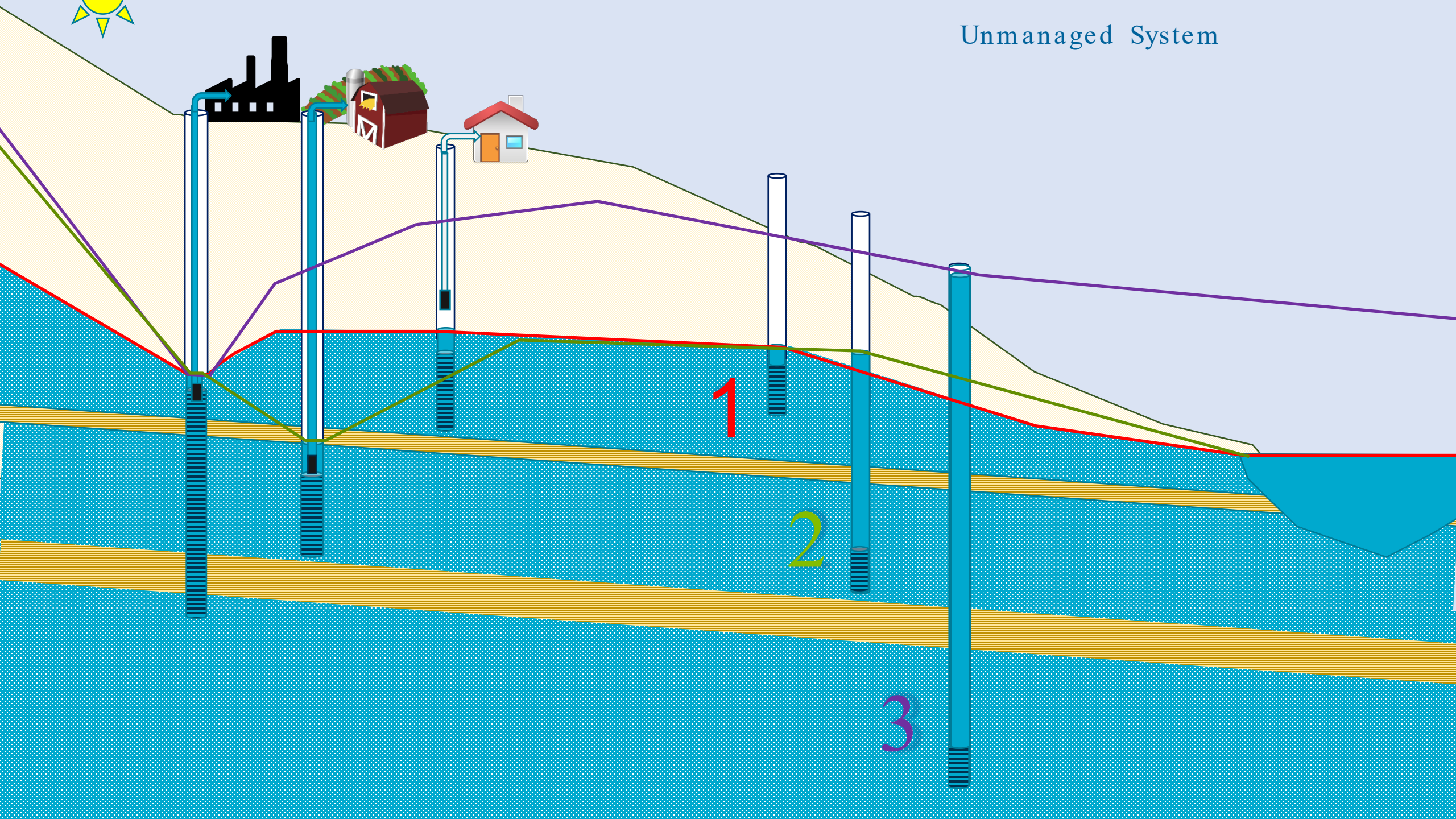
Potential Negative Impacts of Over Pumping in the Proposed Santee-Lynches Capacity Use Area

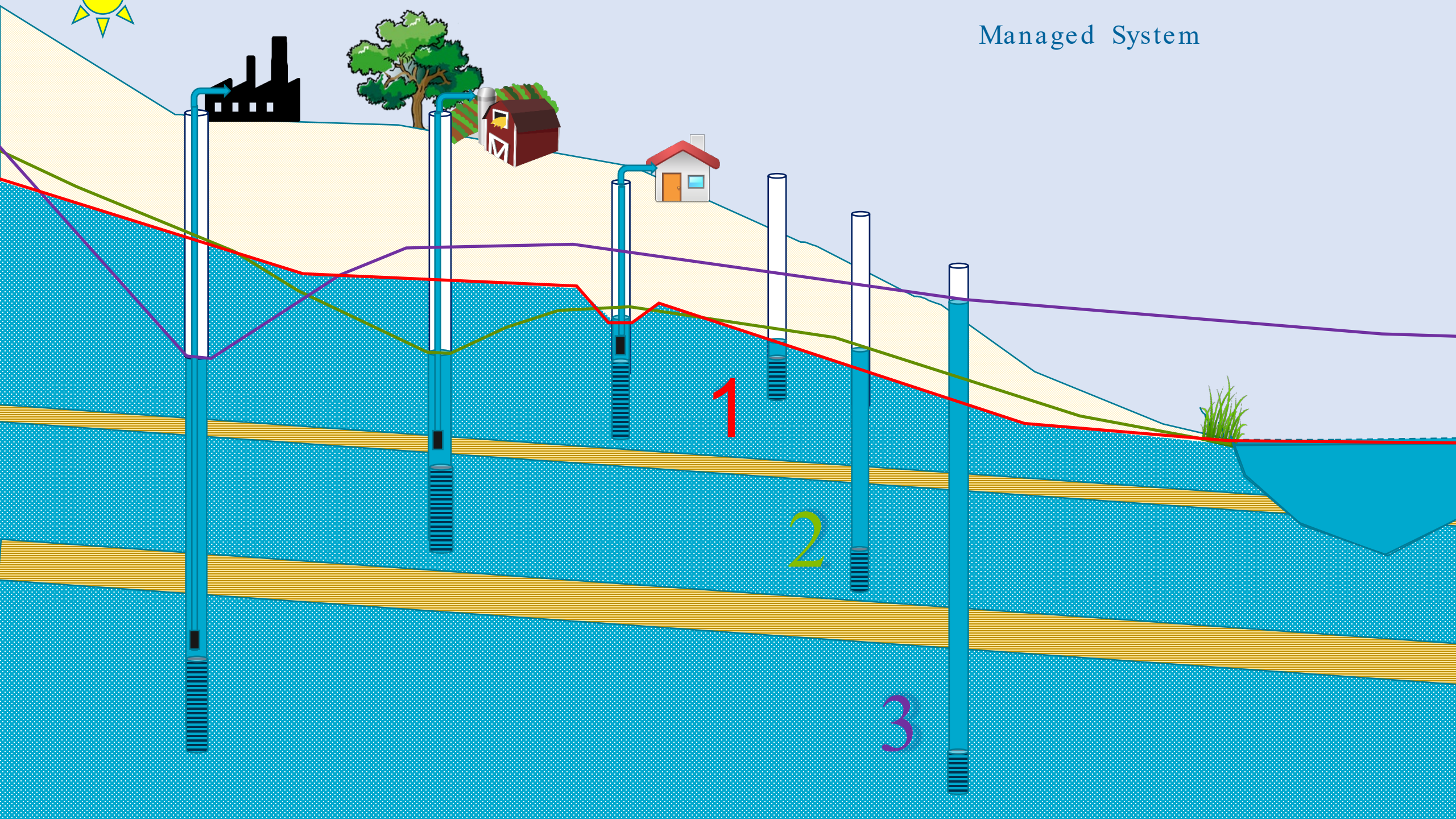
Groundwater Balance




Pre-development
1
2
3

Unmanaged System




Managed System
1
2
3

Capacity Use Designation is Appropriate

- Number of high capacity wells have increased
- Increased demand on groundwater system has occurred and is expected to continue
- Potential for negative impacts to existing users and the natural system
- Management of the resource will get more difficult in the future

Next Steps if Designation Approved

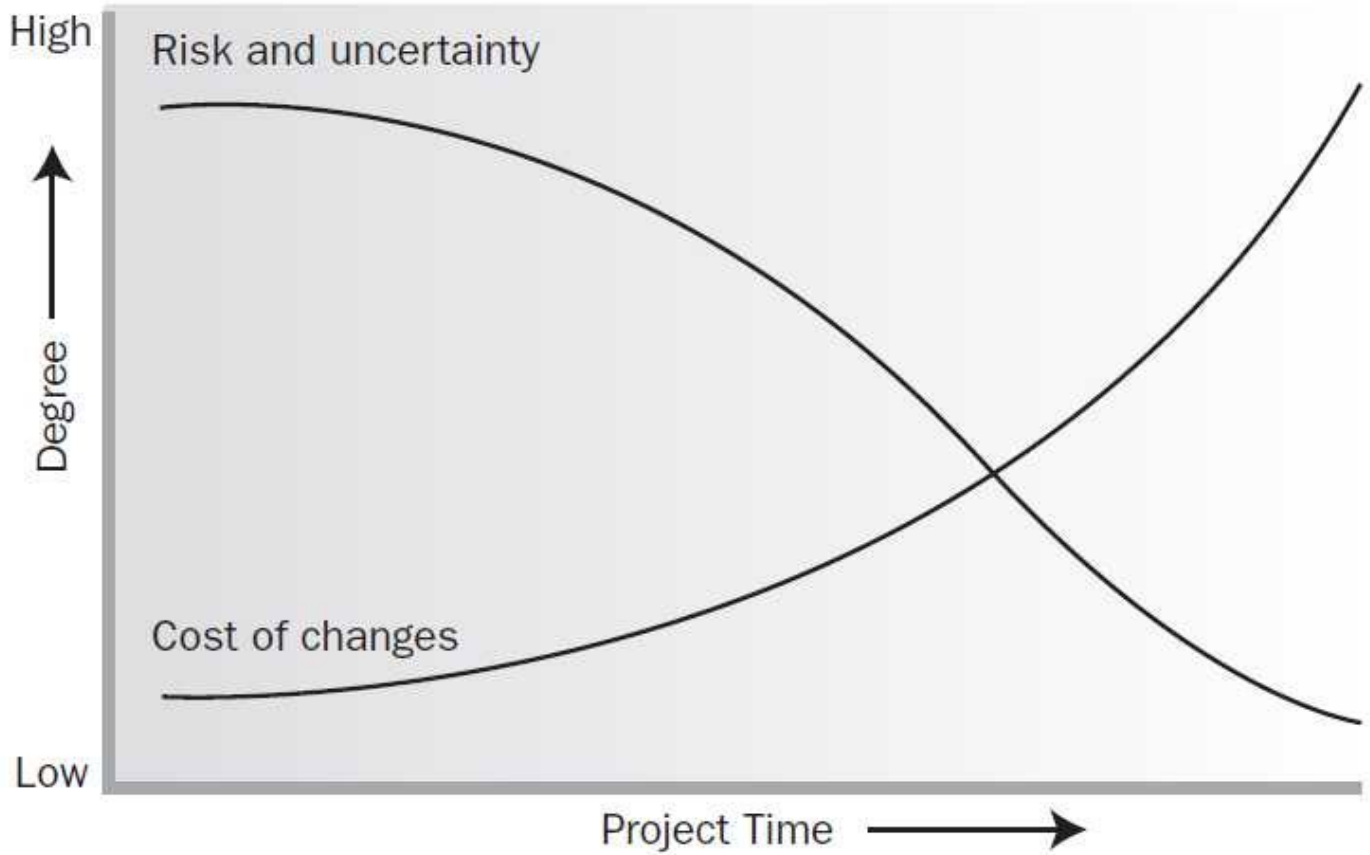
- Engage stakeholders to develop a local Groundwater Management Plan
- Bring the local Groundwater Management Plans before the DHEC Board for approval
- Evaluate and issue permits in accordance with Board approved Groundwater Management Plans
  - Existing users would be issued permits based on demonstrated past demand and industry standards

Permitting Process

1. An application and required documentation is submitted to the Department by a potential groundwater withdrawer
2. Department reviews application for completeness
3. Department performs a technical review of permit
4. All new and modified permits are Public Noticed
5. A Permit to Construct is issued if new wells are requested to be installed
   - Is not a Permit to Withdraw, only authorized construction of the well(s)
6. Permit to Withdraw is issued
   - If a new well was installed, the Department requires well records be submitted prior to issuance of a permit

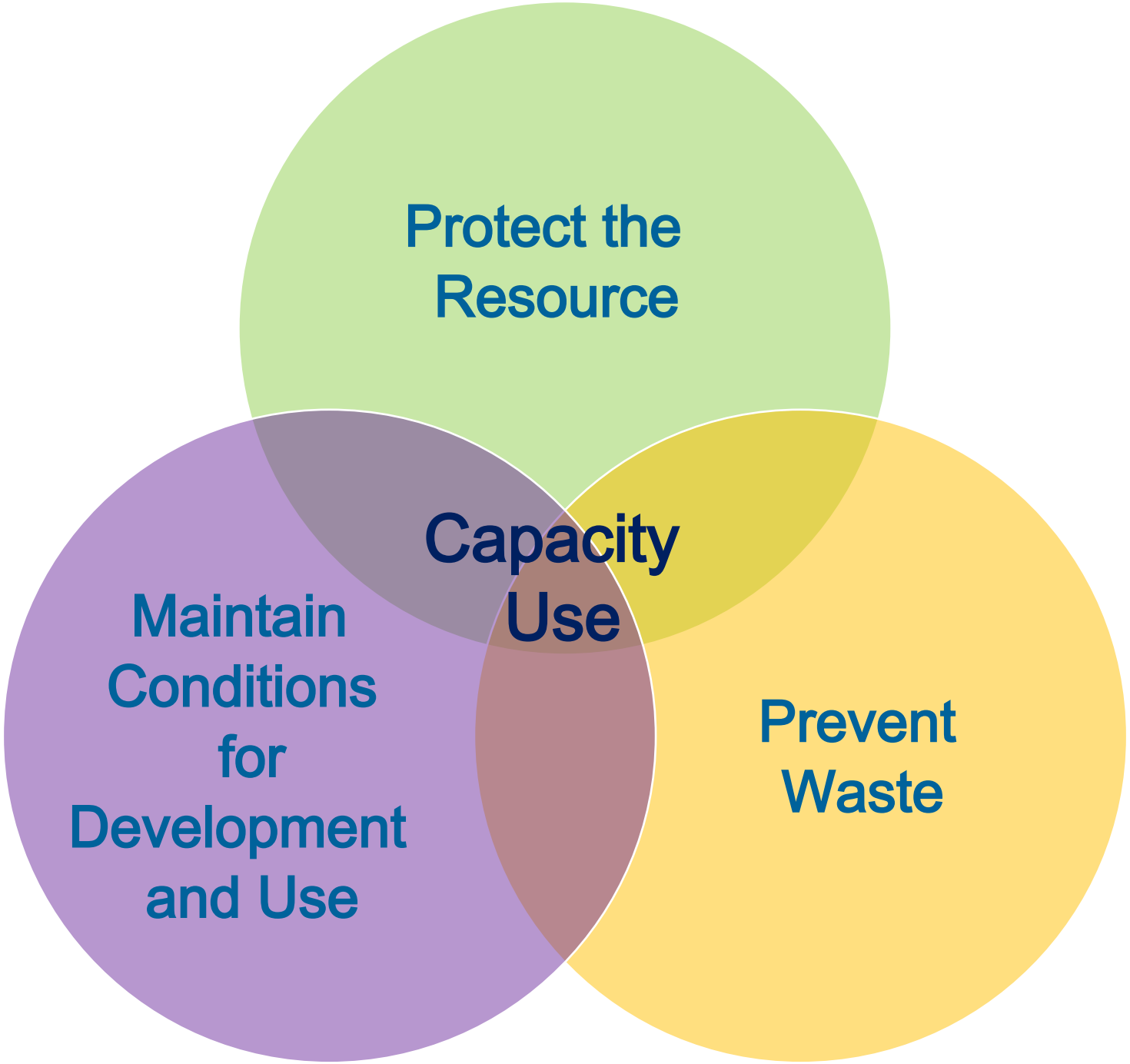
Summary

Project Lifecycle



Groundwater Use and Reporting Act
Legislative Declaration of Policy

"The General Assembly declares that the general welfare and public interest require that the groundwater resources of the State be put to beneficial use to the fullest extent to which they are capable, subject to reasonable regulation, in order to conserve and protect these resources , prevent waste , and to provide and maintain conditions which are conducive to the development and use of water resources ."


Protect the Resource
Capacity Use
Maintain Conditions for Development and Use
Prevent Waste

South Carolina Department of Health and Environmental Control

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