

Option to Call In

If you are experiencing audio problems, join the virtual meeting by phone:

Phone number: **1 864-558-7311**

Access Code: **967 858 473#**



Exits the meeting. (If you accidentally exit the meeting, you can rejoin.)



**Stay Healthy.
Stay SC Strong.**



**STAY SC
STRONG**

scdhec.gov/stayscstrong
#StopCovidSC #SpreadCaringSC

scdhec.gov/COVID19

Santee-Lynches Proposed Capacity Use Area Designation PUBLIC MEETING



All lines will be muted to avoid echo or feedback



Opportunity for comments following presentation



Meeting will be recorded to share as a resource

How to Participate



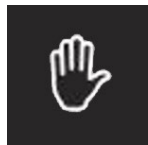
Click the Hand Raise icon to be called on to speak



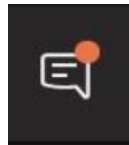
Questions may be typed into the chat & will be addressed as time allows



Unmute with the microphone icon or by dialing *6 on your phone when called on to speak



Hand Raise
(click this icon to indicate you would like to speak)



Chat
(type to share a question)



Unmute
(click the microphone icon to unmute when called upon)





South Carolina Department of Health and Environmental Control

Proposed Santee-Lynches Capacity Use Area

Chesterfield, Clarendon, Kershaw, Lee, Richland, and
Sumter Counties

Agenda

Capacity Use Program Overview

Alex Butler, Manager

Santee-Lynches Area Background

Lance Foxworth, Hydrogeologist

Current and Historic Water Use

Ashley Carothers, Hydrogeologist

Current Groundwater Conditions

Andrea Hughes PhD, Hydrogeologist

Summary and Next Steps

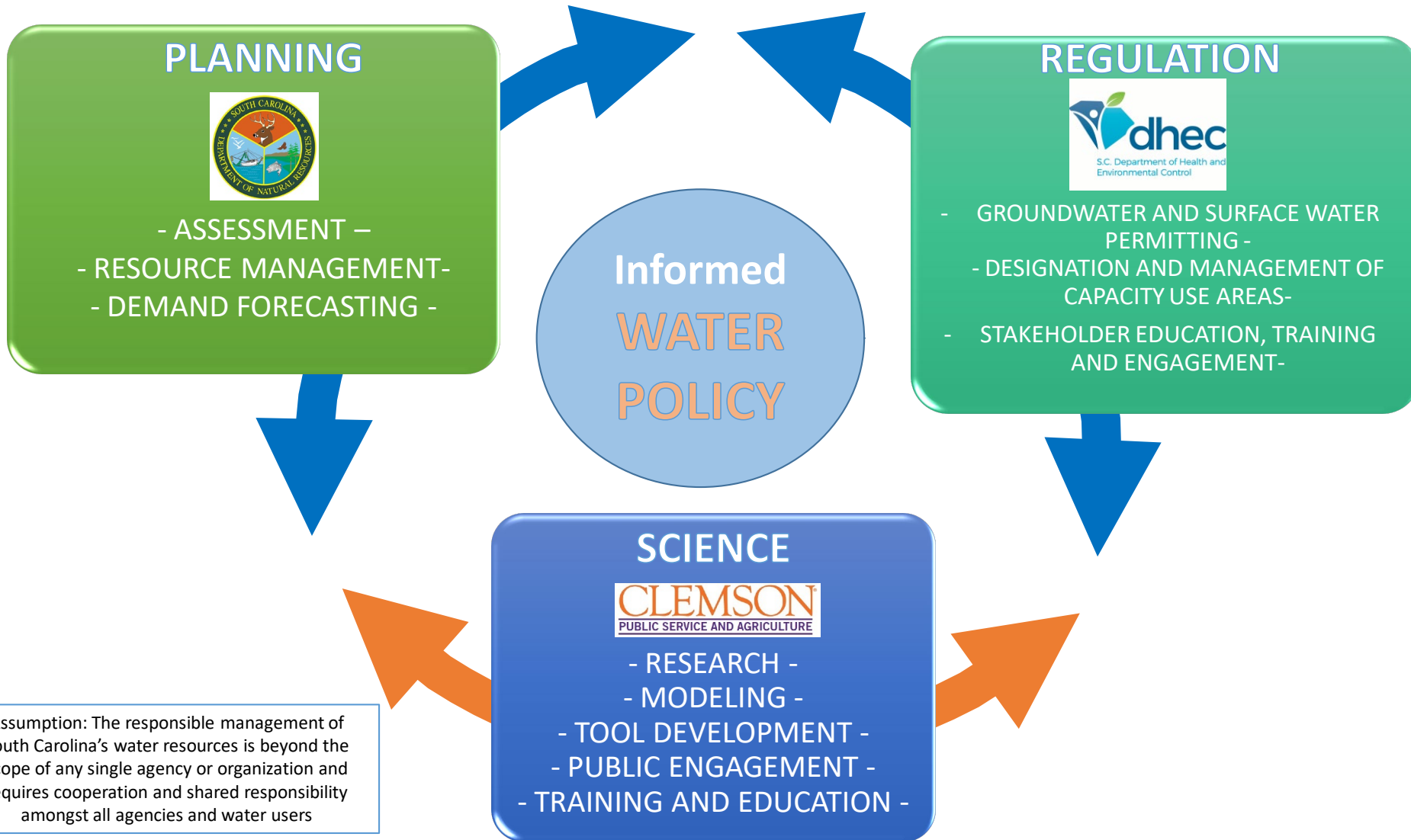
Alex Butler, Manager

Questions



South Carolina Department of Health and Environmental Control

Capacity Use Program Overview



Assumption: The responsible management of South Carolina's water resources is beyond the scope of any single agency or organization and requires cooperation and shared responsibility amongst all agencies and water users



PLANNING



- ASSESSMENT -
- RESOURCE MANAGEMENT -
- DEMAND FORECASTING -



Informed WATER POLICY



REGULATION



- GROUNDWATER AND SURFACE WATER PERMITTING -
- DESIGNATION AND MANAGEMENT OF CAPACITY USE AREAS -
- STAKEHOLDER EDUCATION, TRAINING AND ENGAGEMENT -



SCIENCE



- RESEARCH -
- MODELING -
- TOOL DEVELOPMENT -
- PUBLIC ENGAGEMENT -
- TRAINING AND EDUCATION -



US Army Corps of Engineers



SOUTH CAROLINA GROUND WATER ASSOCIATION



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.”

Prevent
Waste

Conserve
and
Protect

CAPACITY
USE PROGRAM

Maintain for
Development
And Use



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

Groundwater Permitting

Groundwater withdrawal permits are required to ***withdraw and use groundwater equal to or greater than three million gallons in any month*** in a Capacity Use Area.

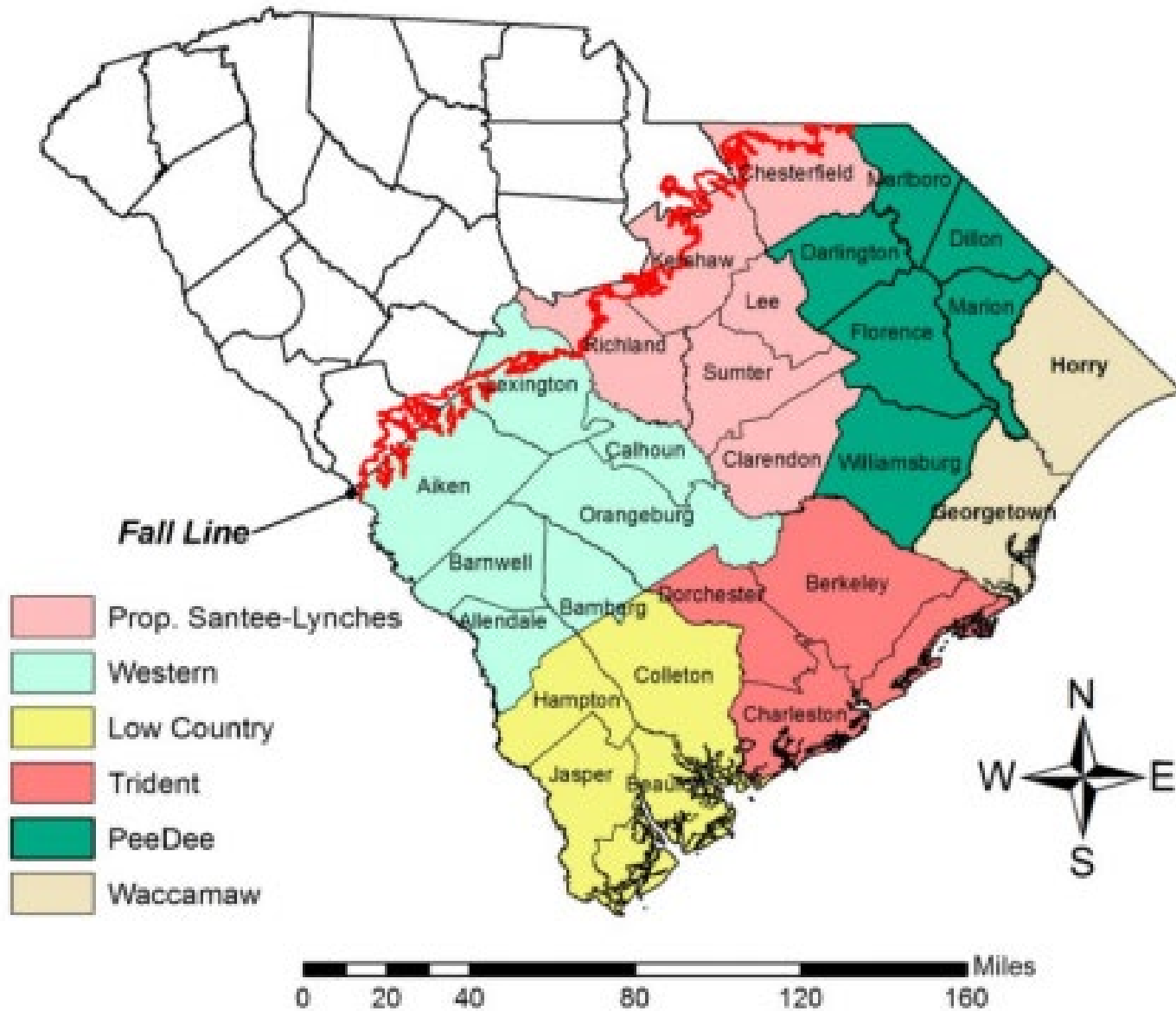
Groundwater use categories that are typically permitted:

- Public Water Supply
- Industry
- Irrigation
- Golf Course
- Mining
- Thermo Power



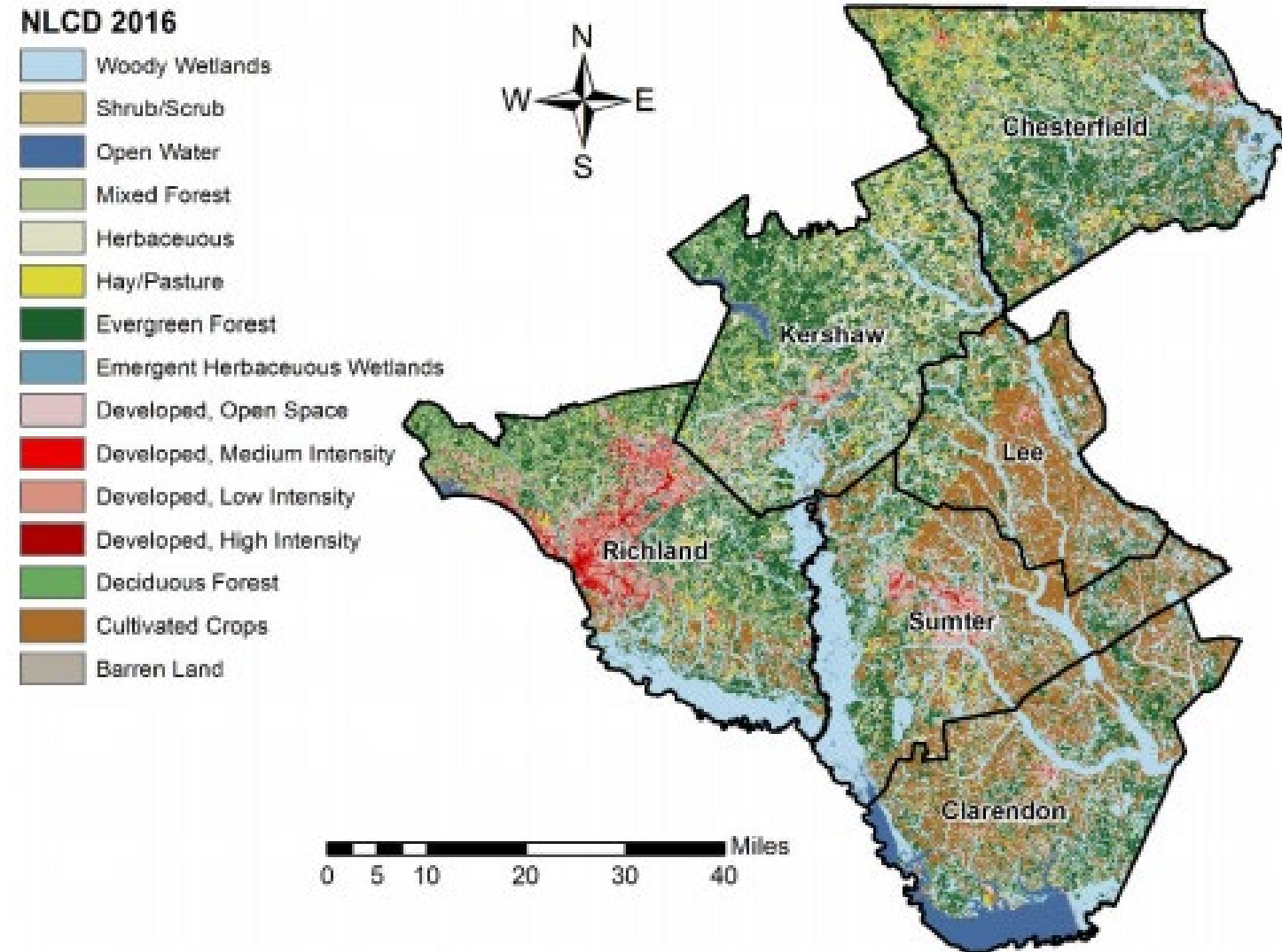
South Carolina Department of Health and Environmental Control

Santee-Lynches Area Background



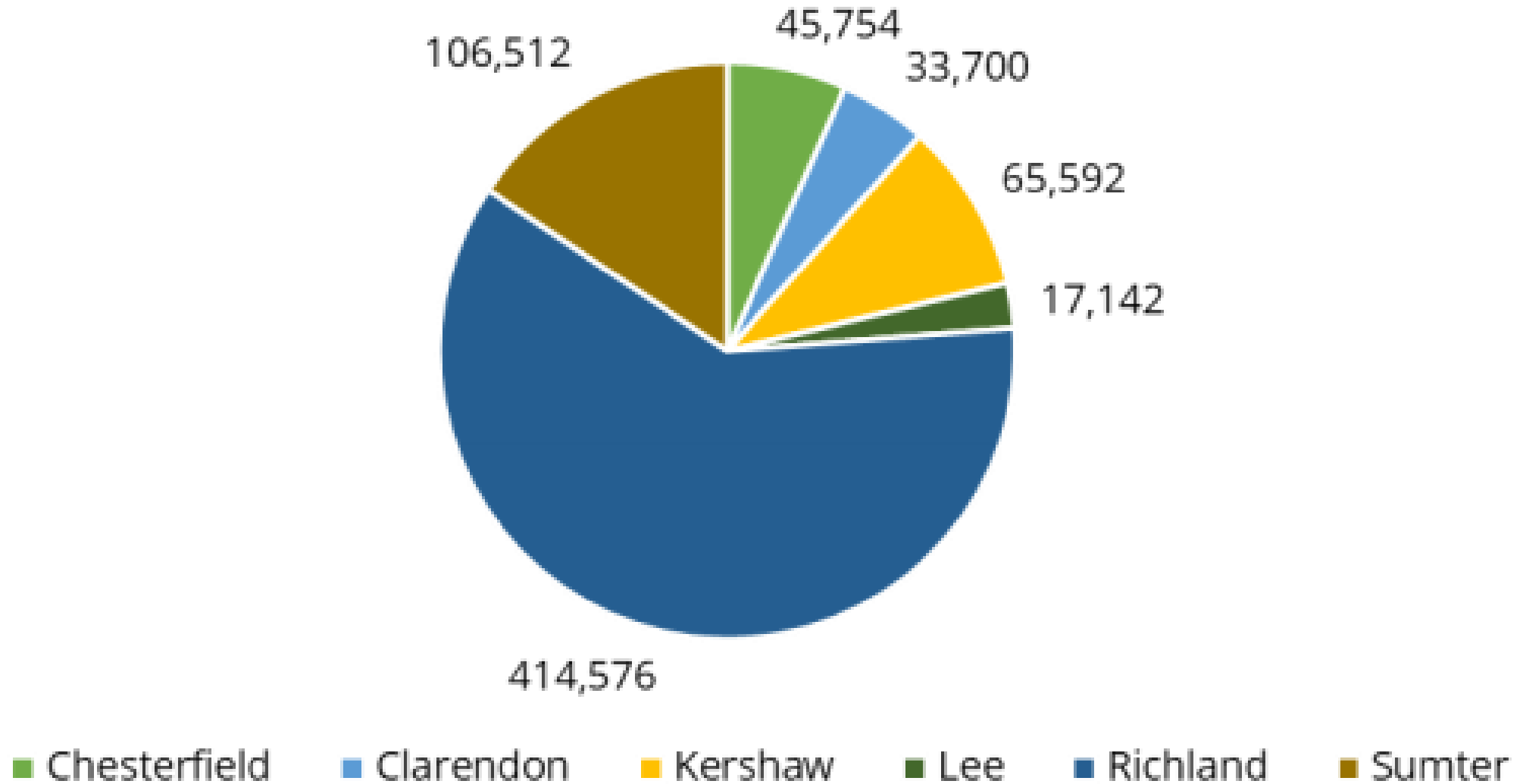
- 6th Capacity Use Area
- Entire Coastal Plain Recommended for Groundwater Management Program in 2004
- 6 County Area: Chesterfield, Clarendon, Kershaw, Lee, Sumter, and Richland Counties

Location, Topography, Land Use

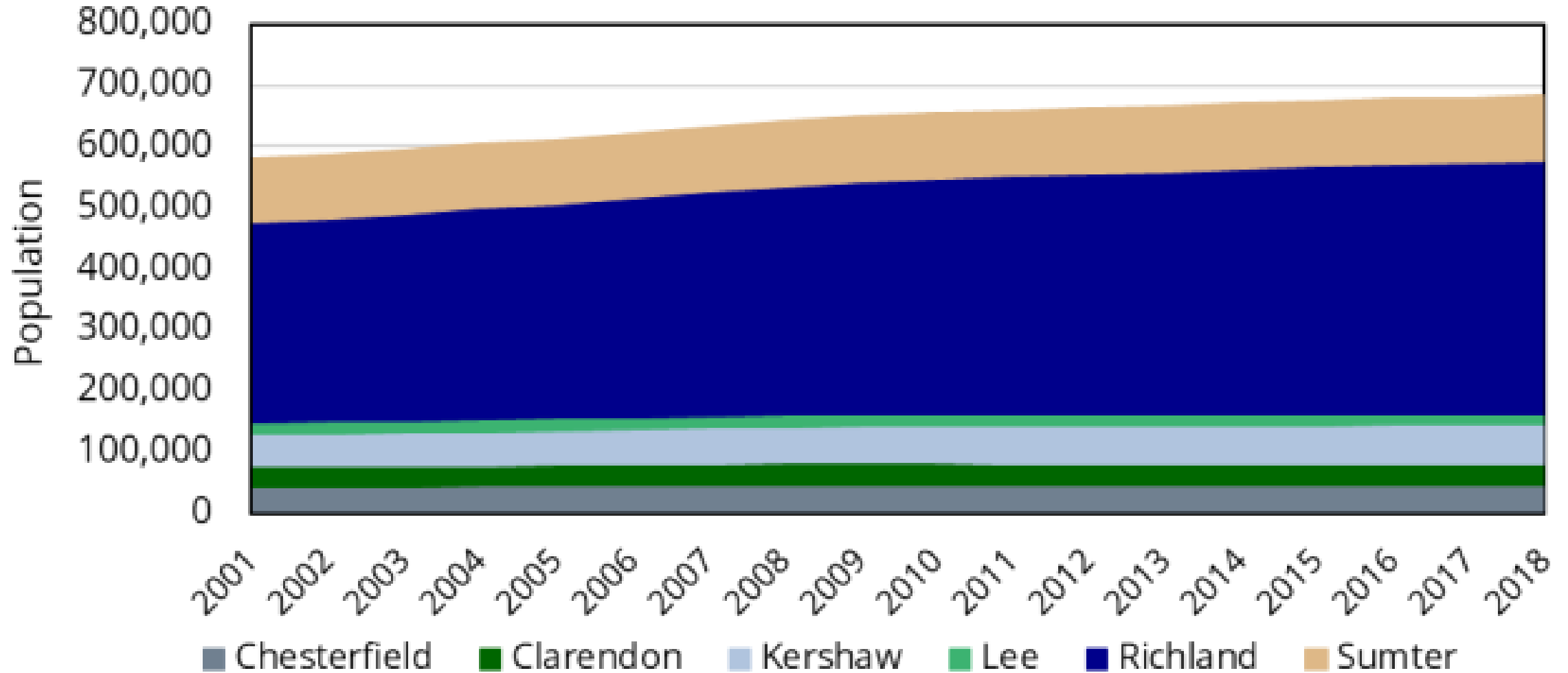


- North East Central part of SC
- 25 feet to 720 feet above mean sea level
- Bounded by Fall Line to North-West and Congaree/Santee System to South-West
- Upper Coastal Plain, Sandhills, Lower Coastal Plain to South-East

Population

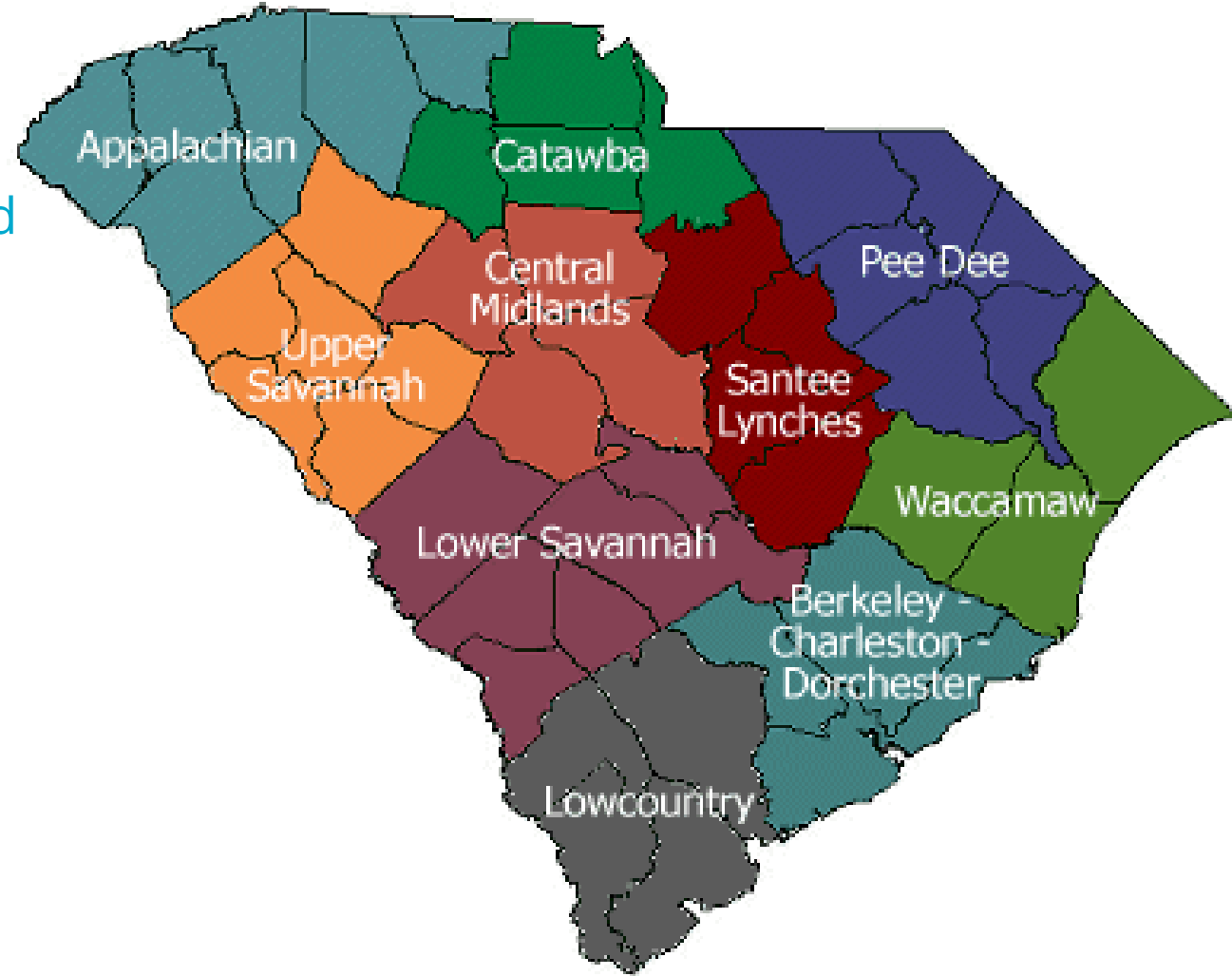


Population



Geopolitical Structure Council of Government (COG)

- PDCOG is currently governed by a 27-member Board of Directors from six participating counties and serves 33 incorporated municipalities (8 in Chesterfield County).
- SLCOG is currently governed by a 29-member Board of Directors from four participating counties and serves 12 incorporated municipalities.
- 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.

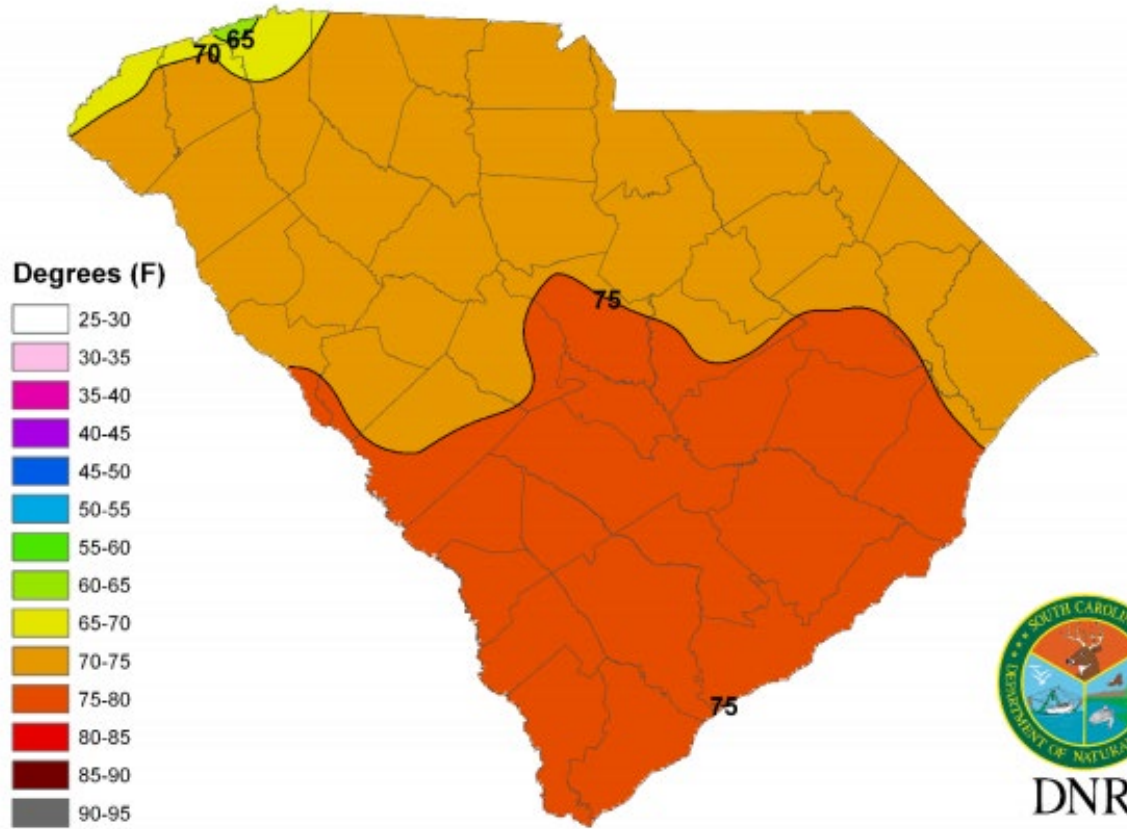


Geopolitical Structure Continued

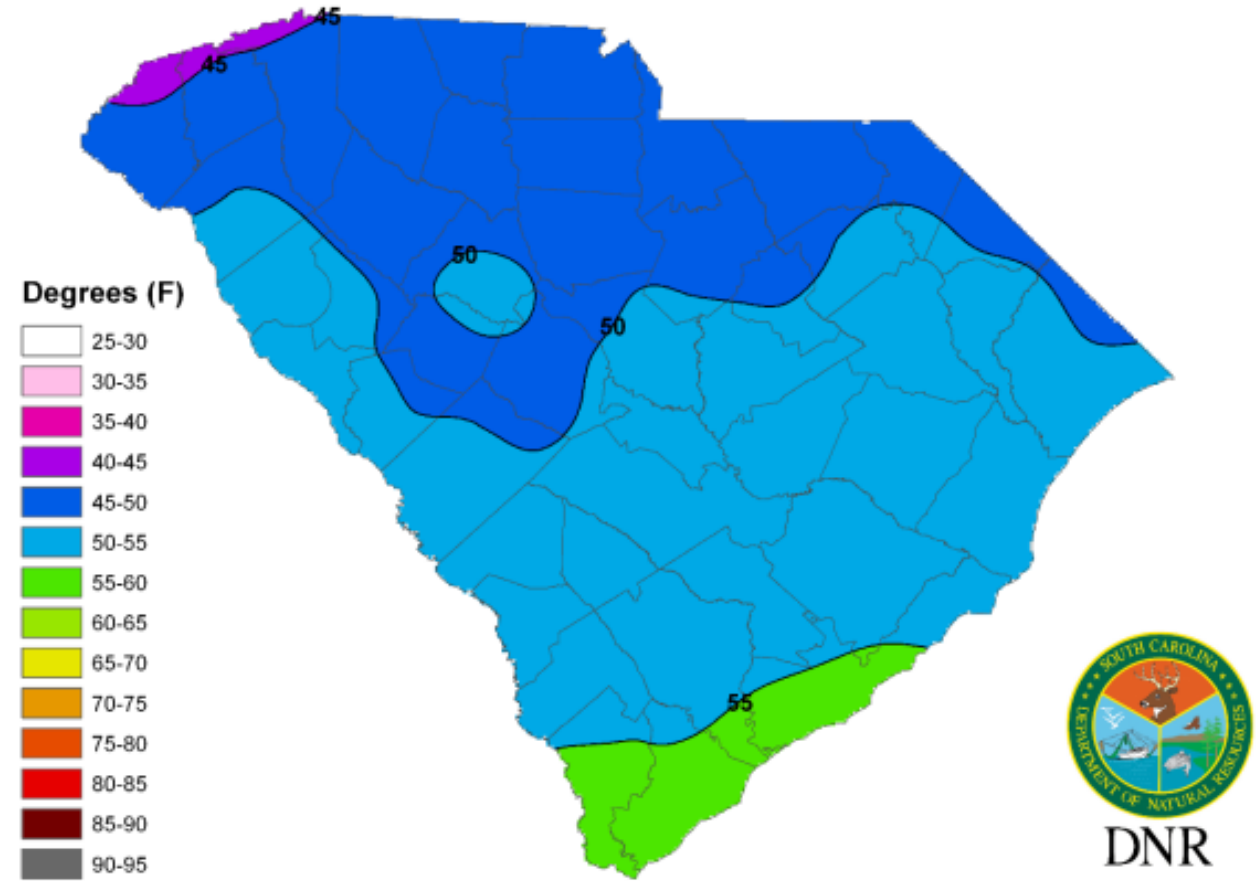
- Chesterfield, Clarendon, Lee and Sumter counties are governed by a Council/Administrator form of government.
- Kershaw and Richland counties are governed by a Council form of government.
- Cities, towns, and municipalities in the proposed Santee-Lynches CUA implement various forms of government, including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

Climate

1981-2010 Climate Normals
Annual Maximum Temperature

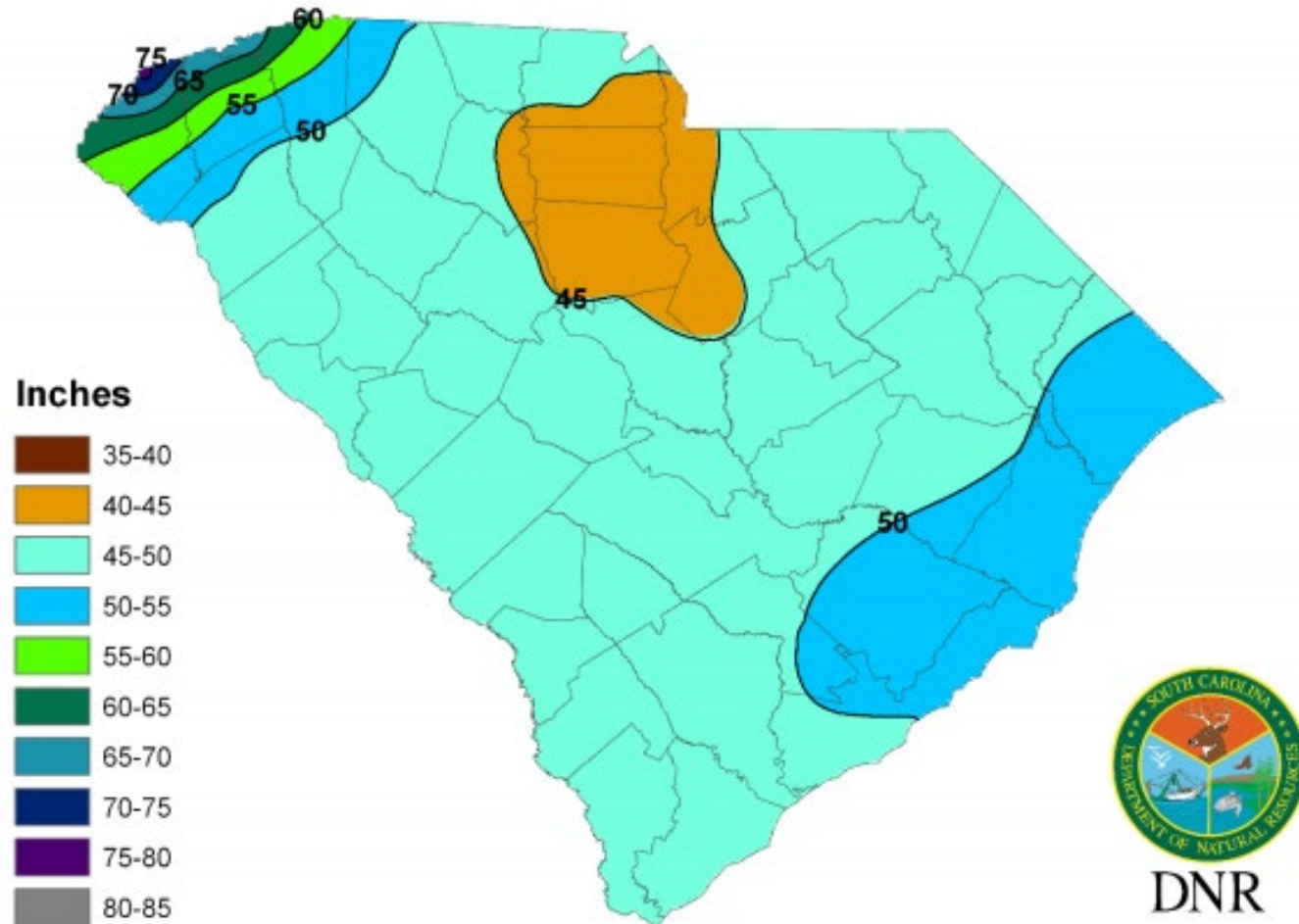


1981-2010 Climate Normals
Annual Minimum Temperature



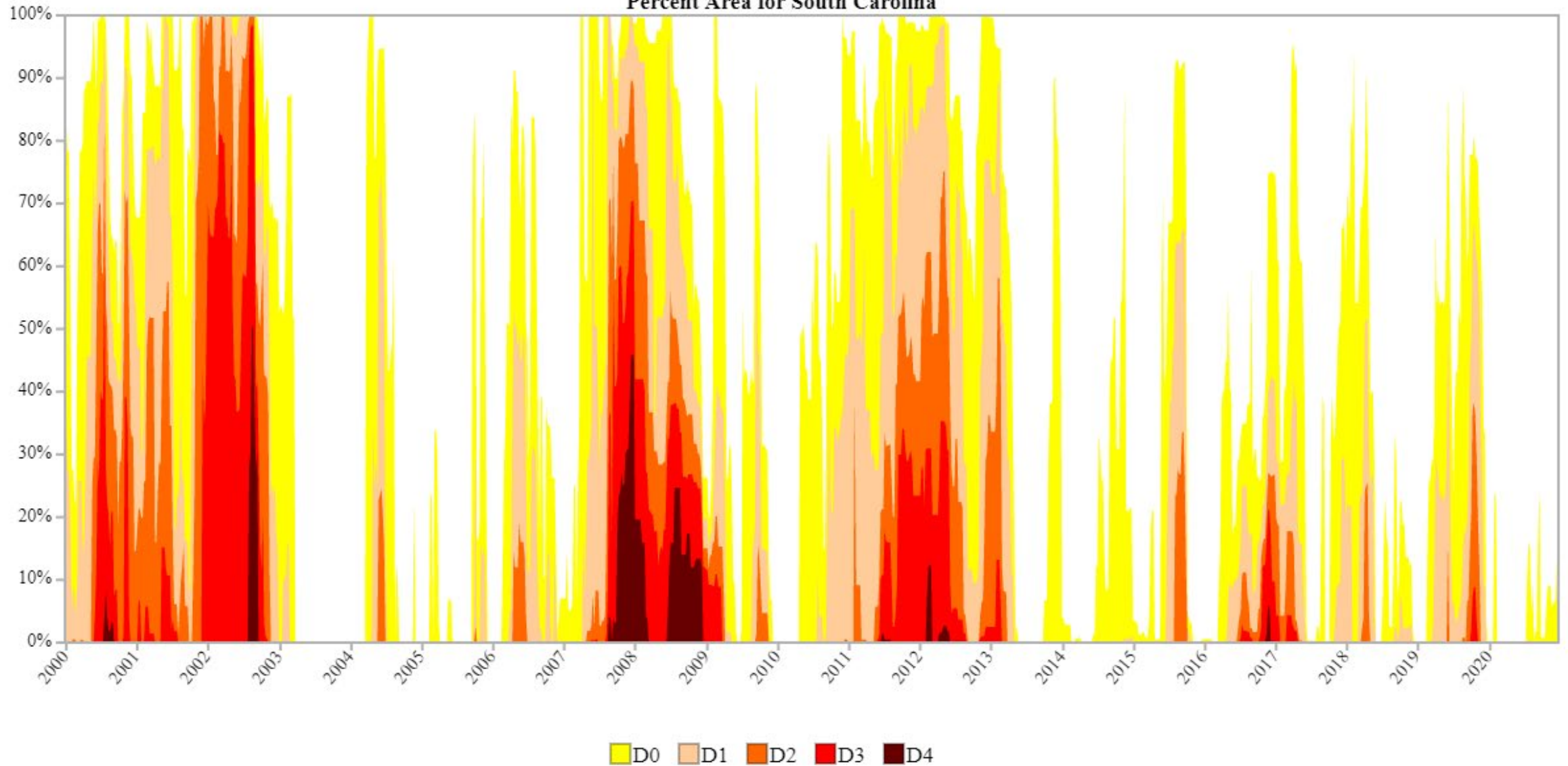
Climate

1981-2010 Climate Normals
Annual Precipitation



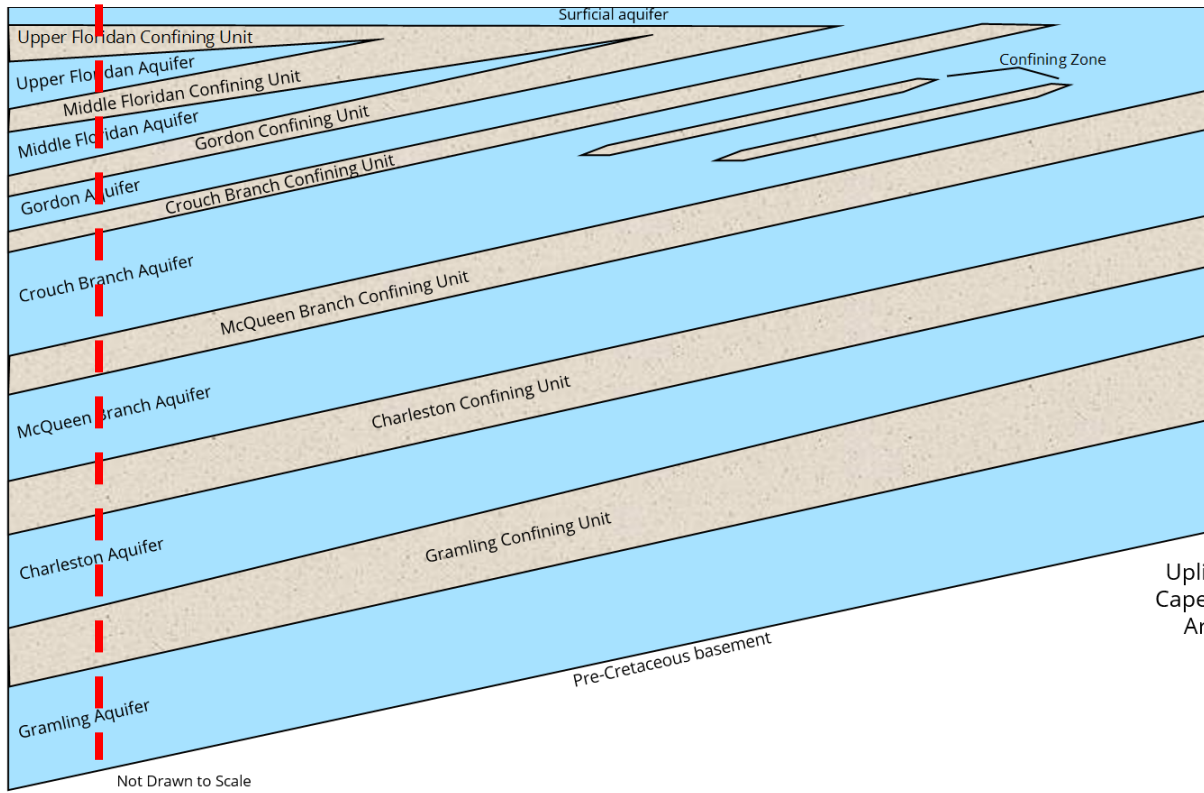
Drought

Percent Area for South Carolina



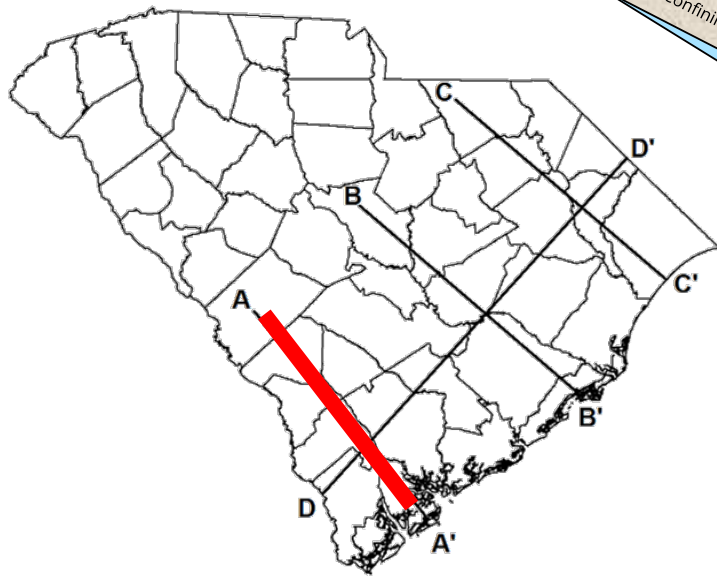
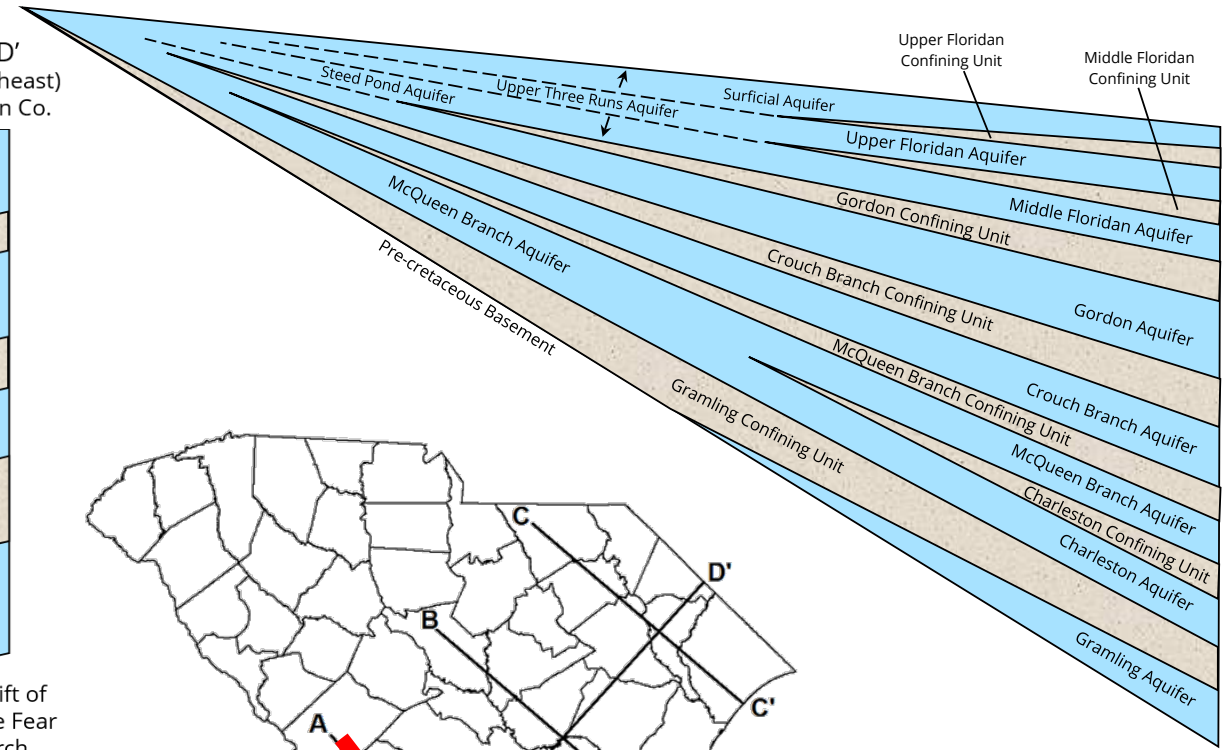
Hydrogeologic Setting

D
(Southwest)
Jasper Co.



A
(Northwest)
Fall Line
Aiken Co.

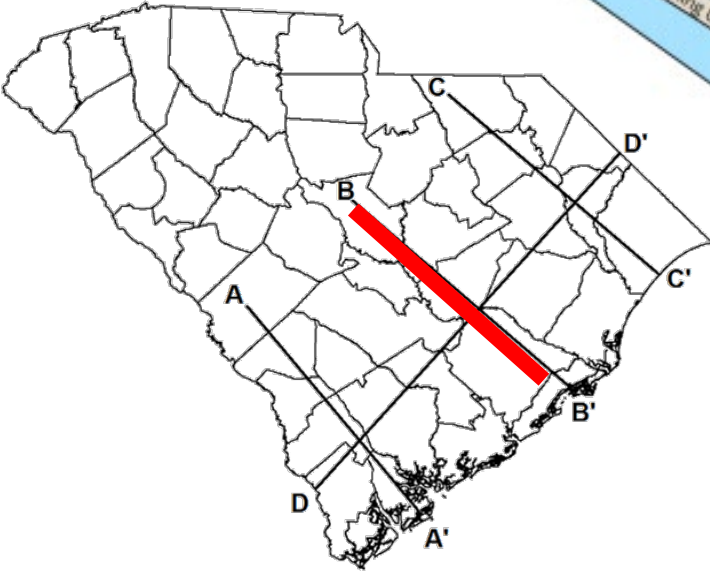
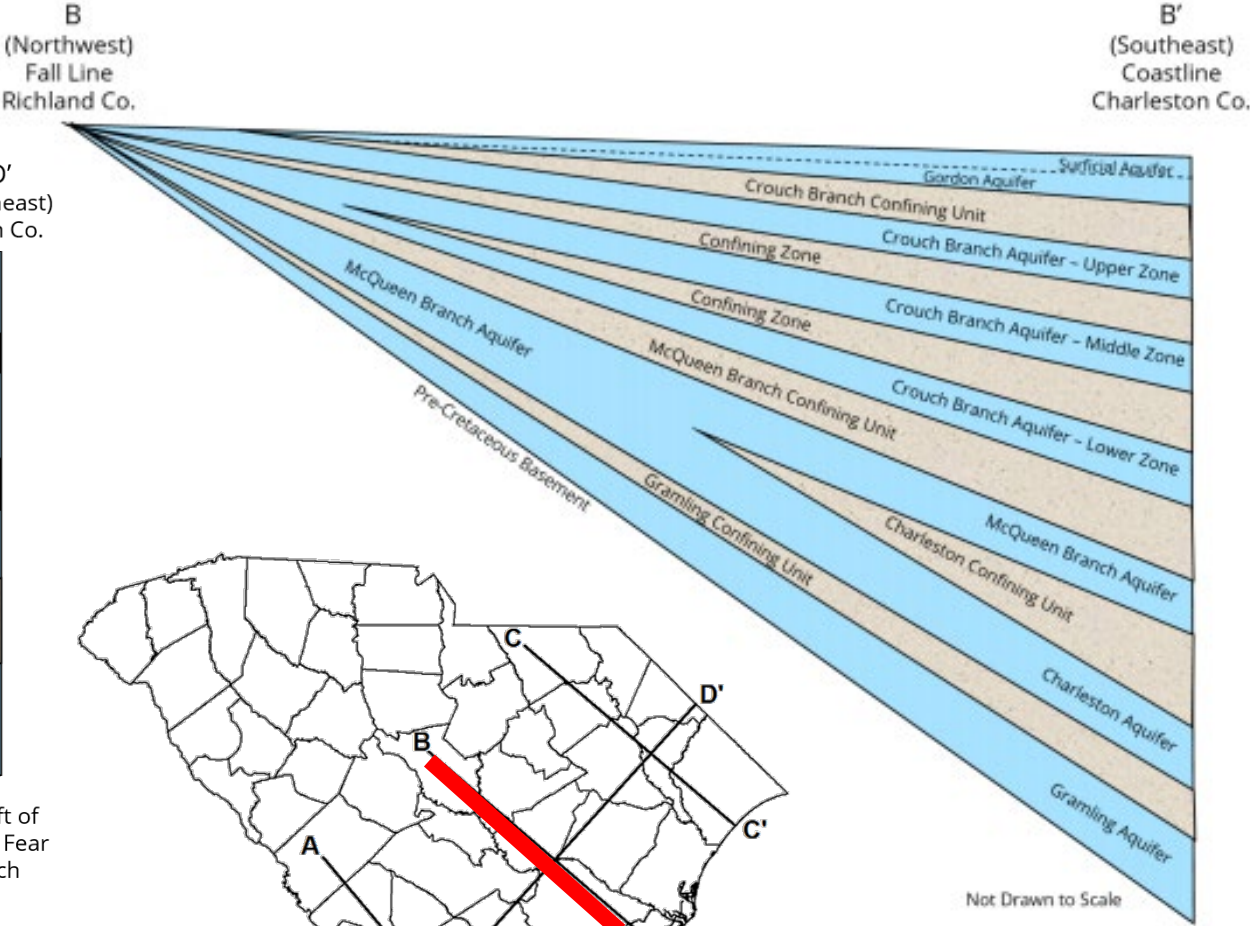
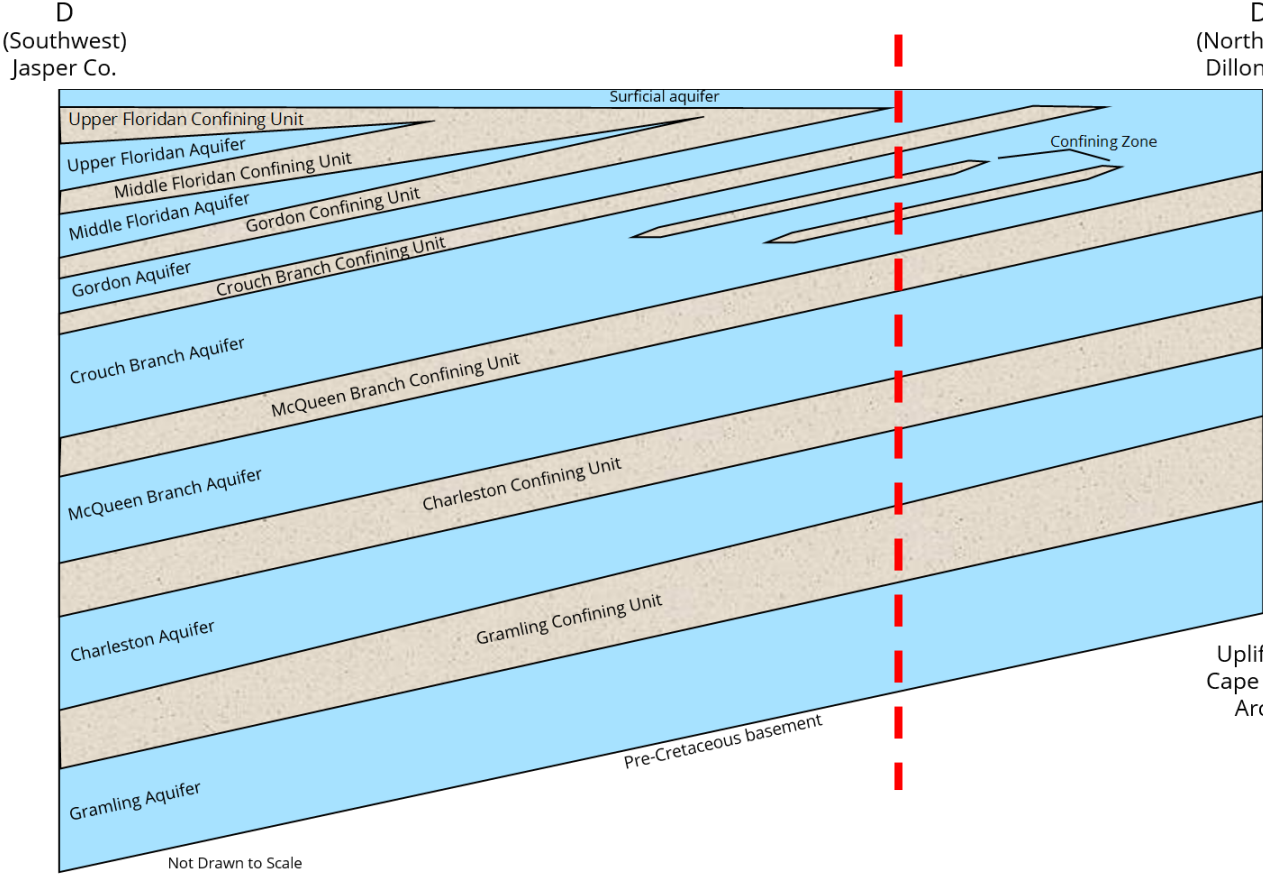
A'
(Southeast)
Coastline
Beaufort Co.



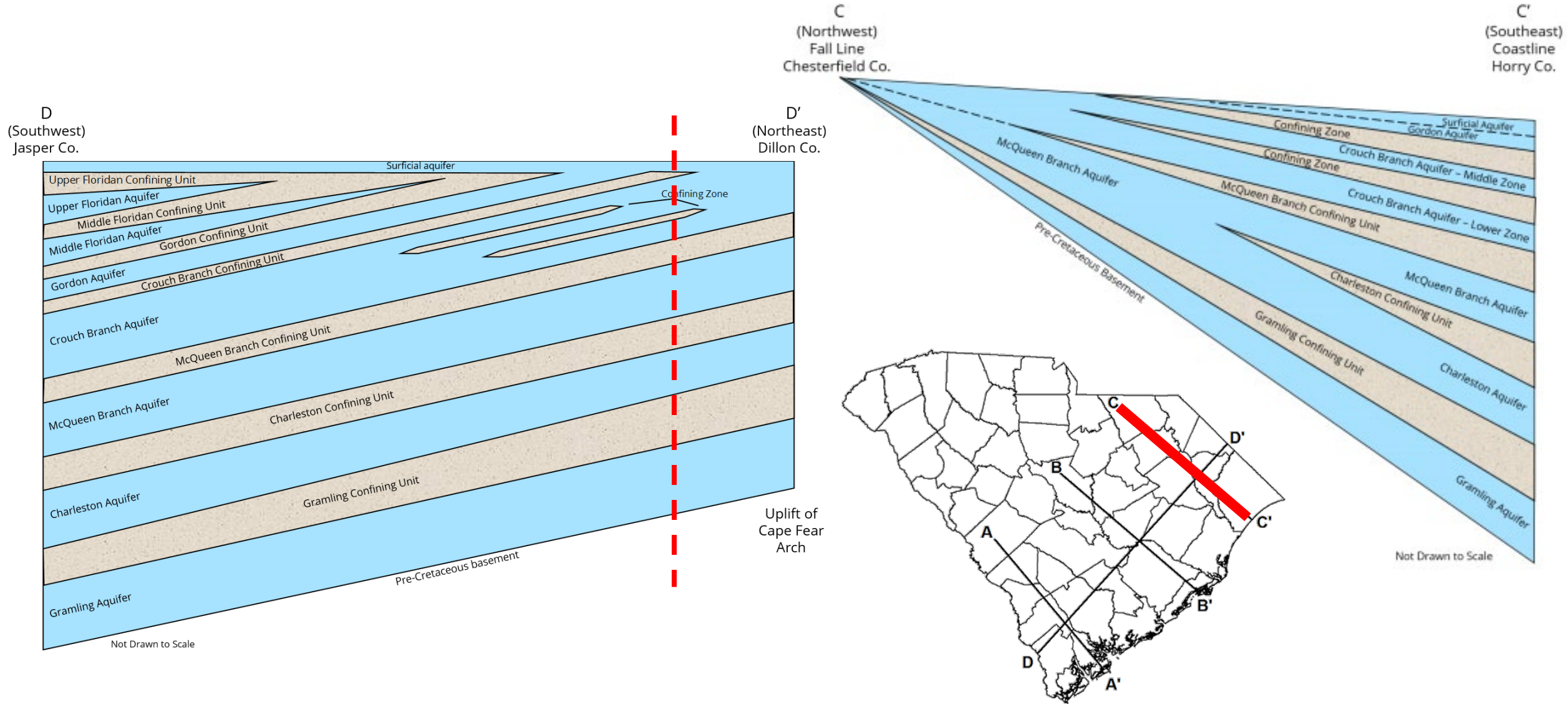
Uplift of
Cape Fear
Arch

Not Drawn to Scale

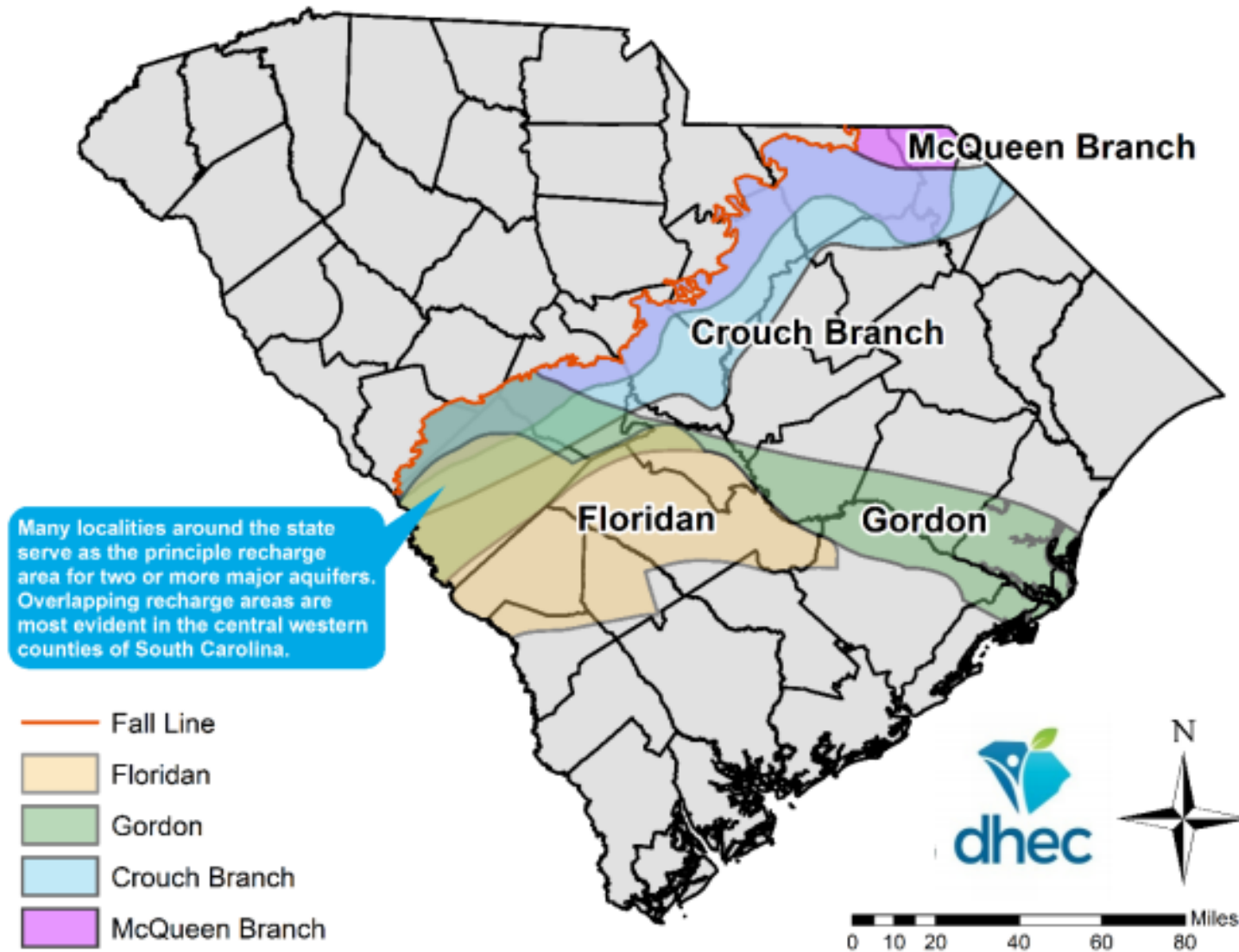
Hydrogeologic Setting



Hydrogeologic Setting



Groundwater Recharge Areas



Surface Water



SC Major River Basins

Groundwater Surface Water Interactions

Generalized Geologic Map of South Carolina

2005

Revised by
Willoughby, Howard, and Nystrom, 2005
Original compilation by
Maybin and Nystrom, 1997

DESCRIPTION OF MAP UNITS

COASTAL PLAIN QUATERNARY

- Holocene
- Pleistocene

TERTIARY

- Pliocene
- Paleocene, Eocene, and Miocene

CRETACEOUS

- Upper Cretaceous

TRIASSIC

- Triassic basins

BLUE RIDGE AND PIEDMONT

- Blue Ridge
- Chauga belt
- Walhalla thrust sheet
- Sixmile thrust sheet
- Laurens thrust stack
- Kings Mountain terrane
- Charlotte terrane
- Carolina terrane (slate belt)
- Savannah River terrane
- Augusta terrane

IGNEOUS ROCKS

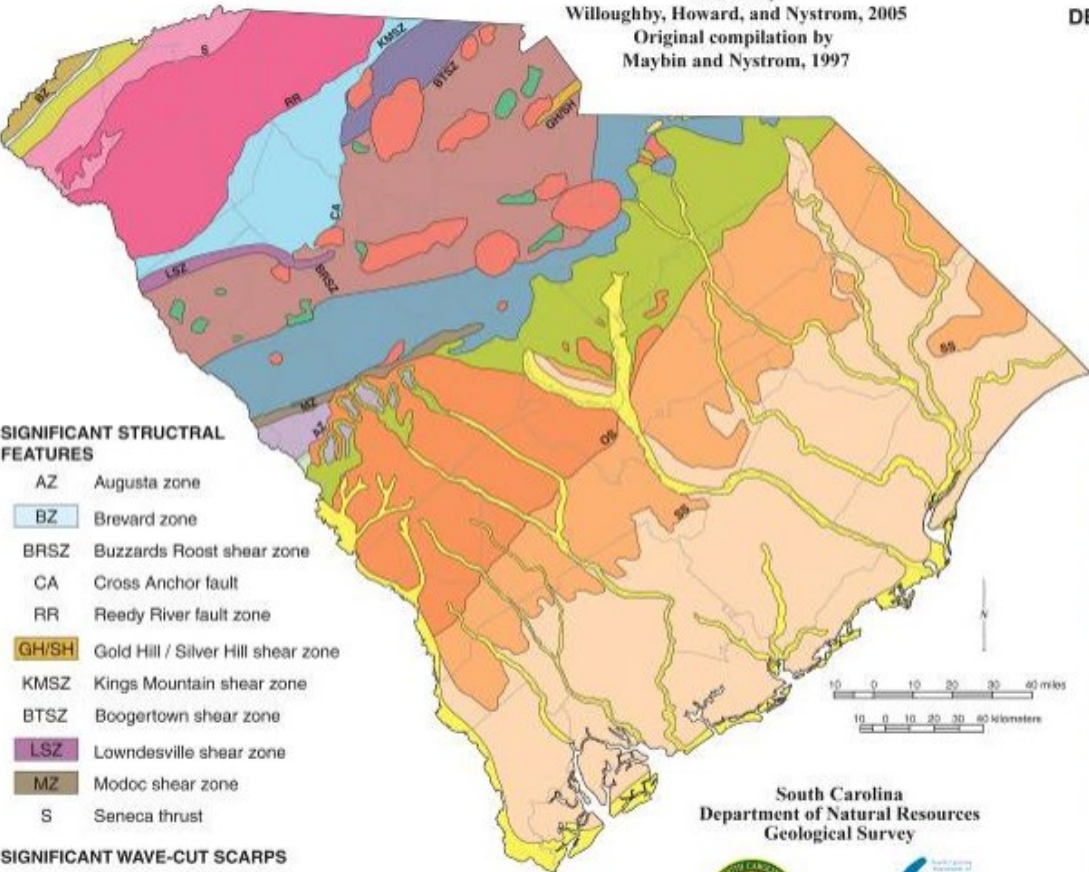
- Gabbro
- Granite

SIGNIFICANT STRUCTURAL FEATURES

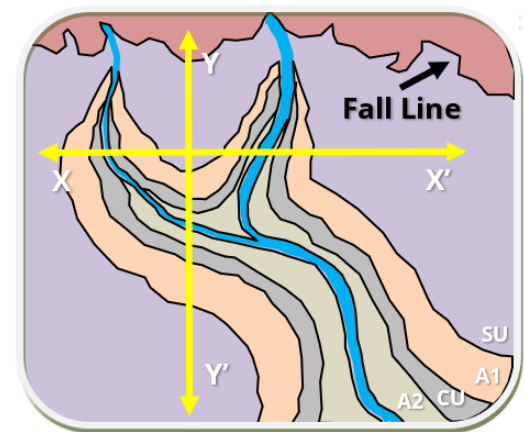
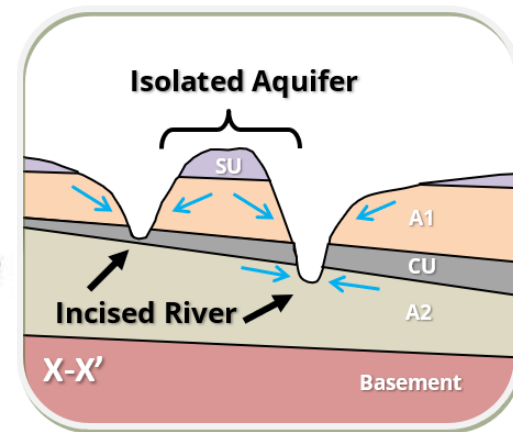
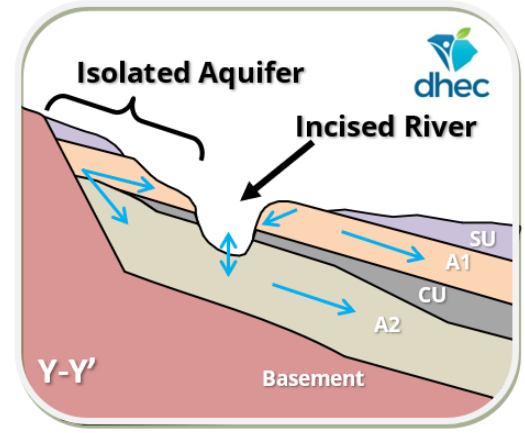
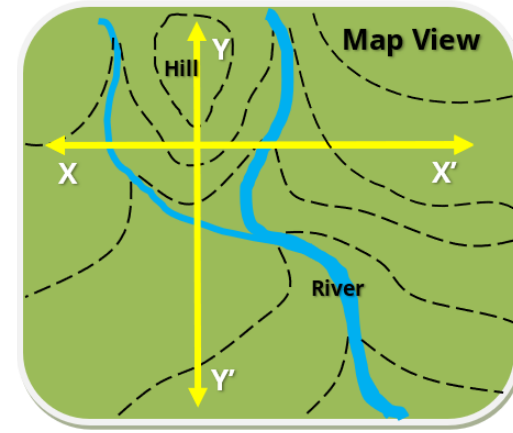
- AZ Augusta zone
- BZ Brevard zone
- BRSZ Buzzards Roost shear zone
- CA Cross Anchor fault
- RR Reedy River fault zone
- GH/SH Gold Hill / Silver Hill shear zone
- KMSZ Kings Mountain shear zone
- BTSZ Boogertown shear zone
- LSZ Lowndesville shear zone
- MZ Modoc shear zone
- S Seneca thrust

SIGNIFICANT WAVE-CUT SCARPS

- OS Orangeburg Scarp
- SS Surry Scarp



South Carolina
Department of Natural Resources
Geological Survey

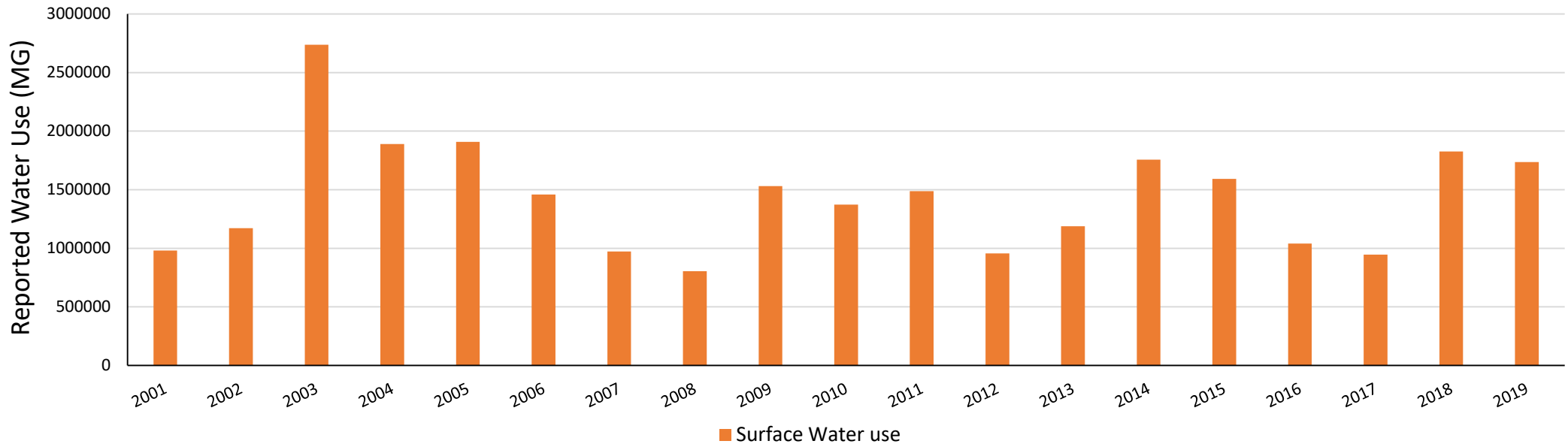
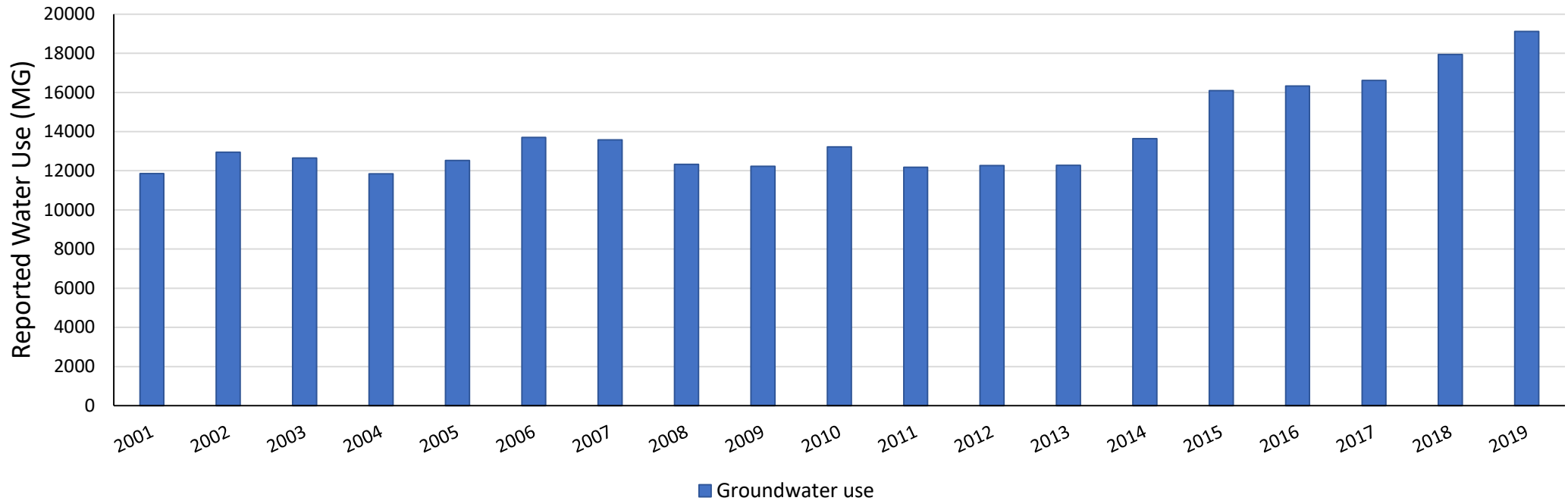


Incising Rivers Isolate Aquifer Units

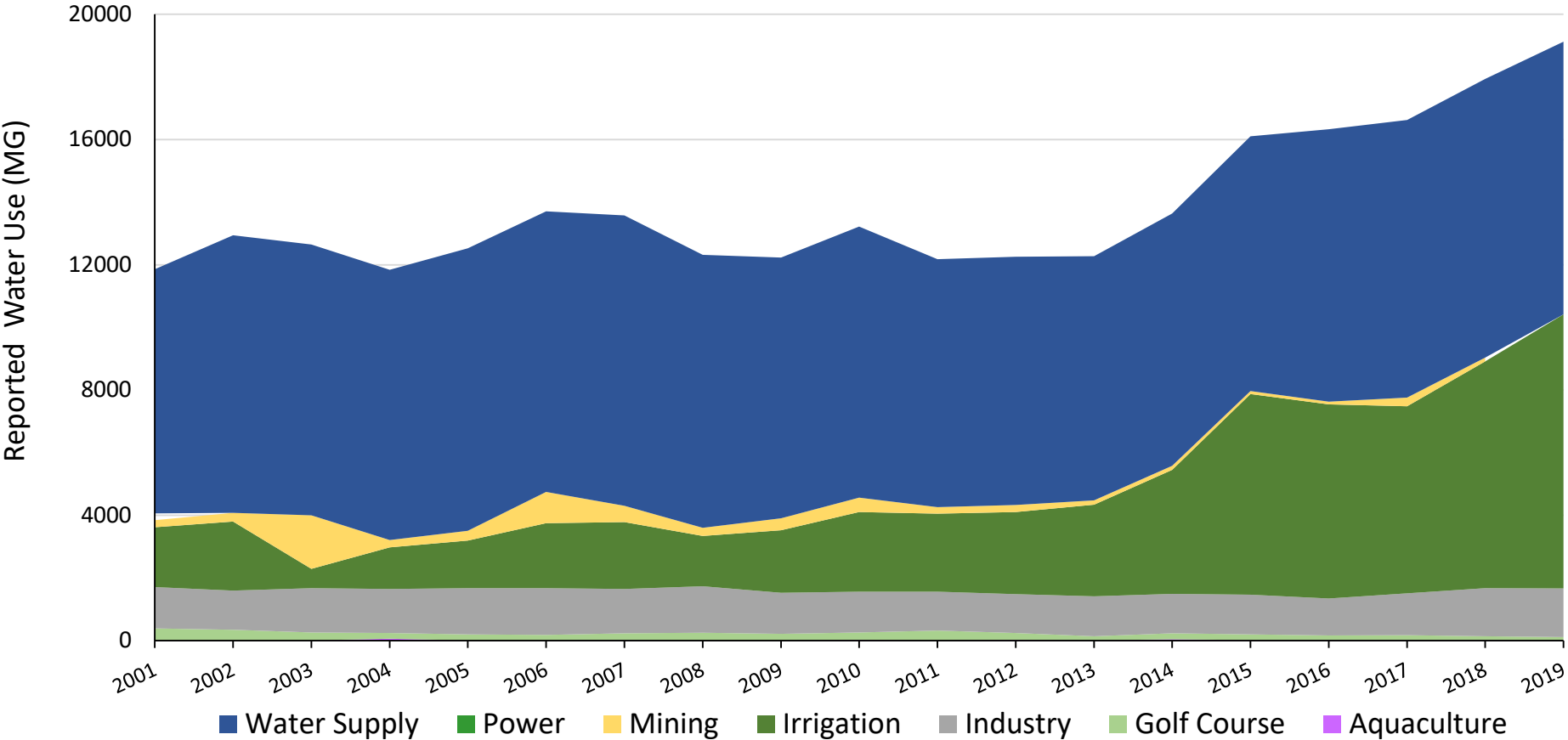


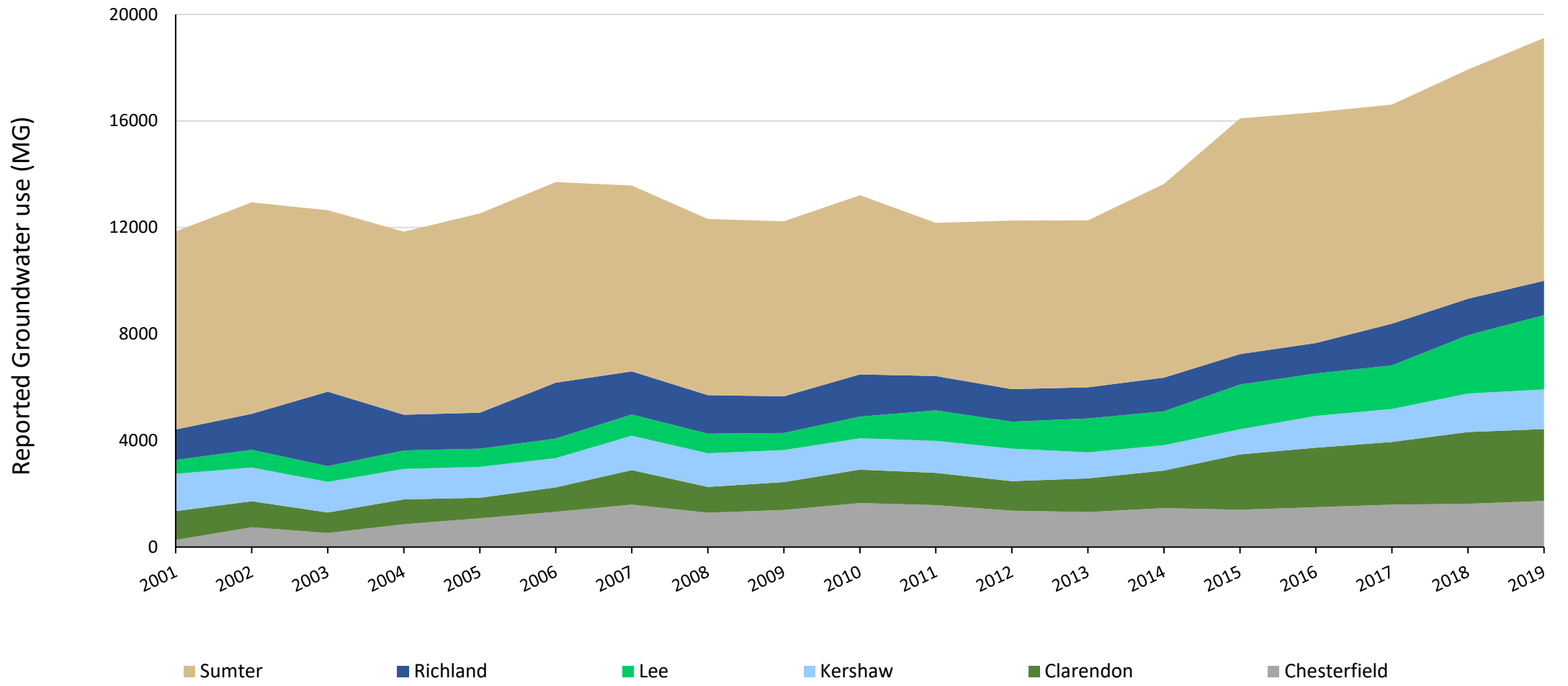
South Carolina Department of Health and Environmental Control

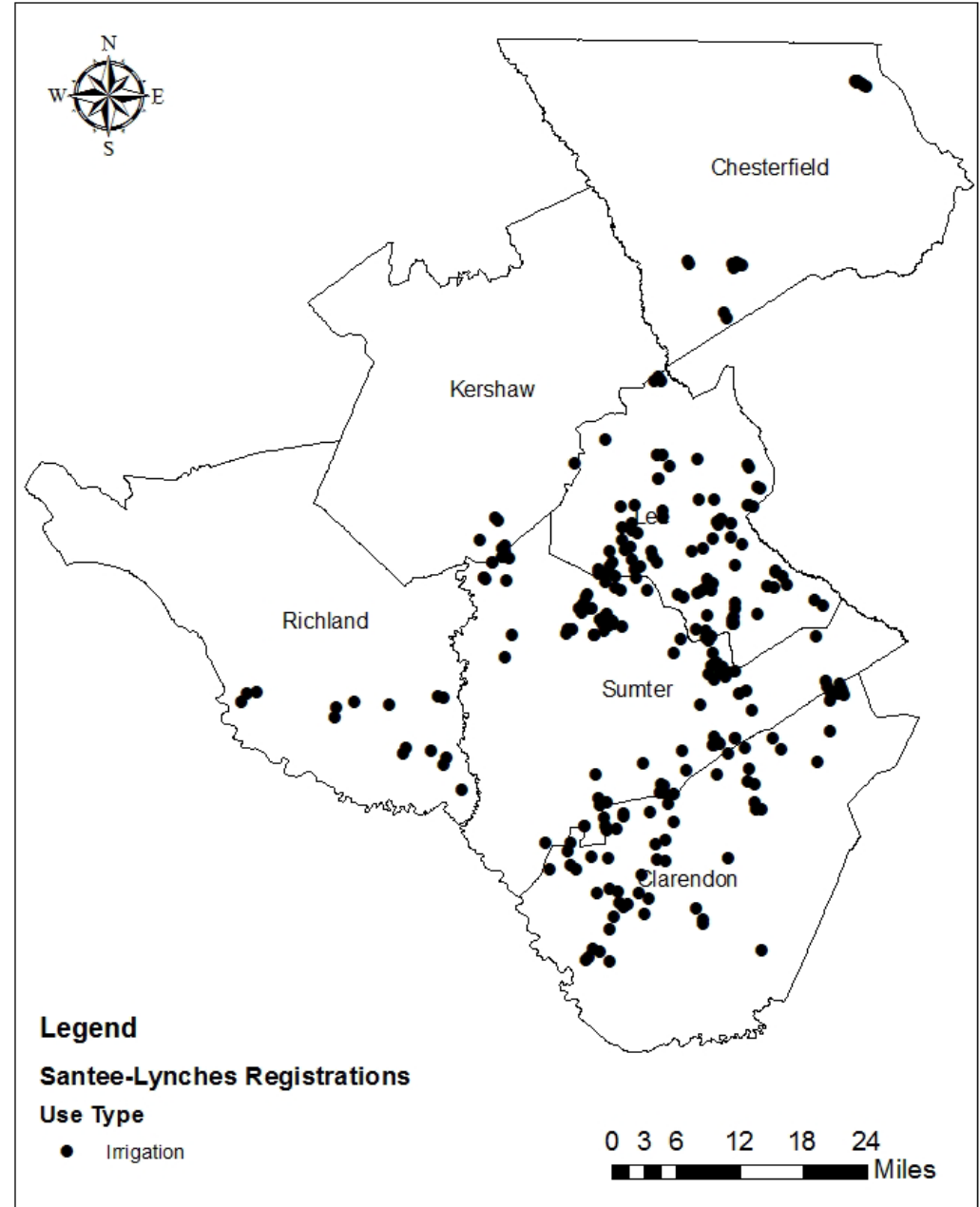
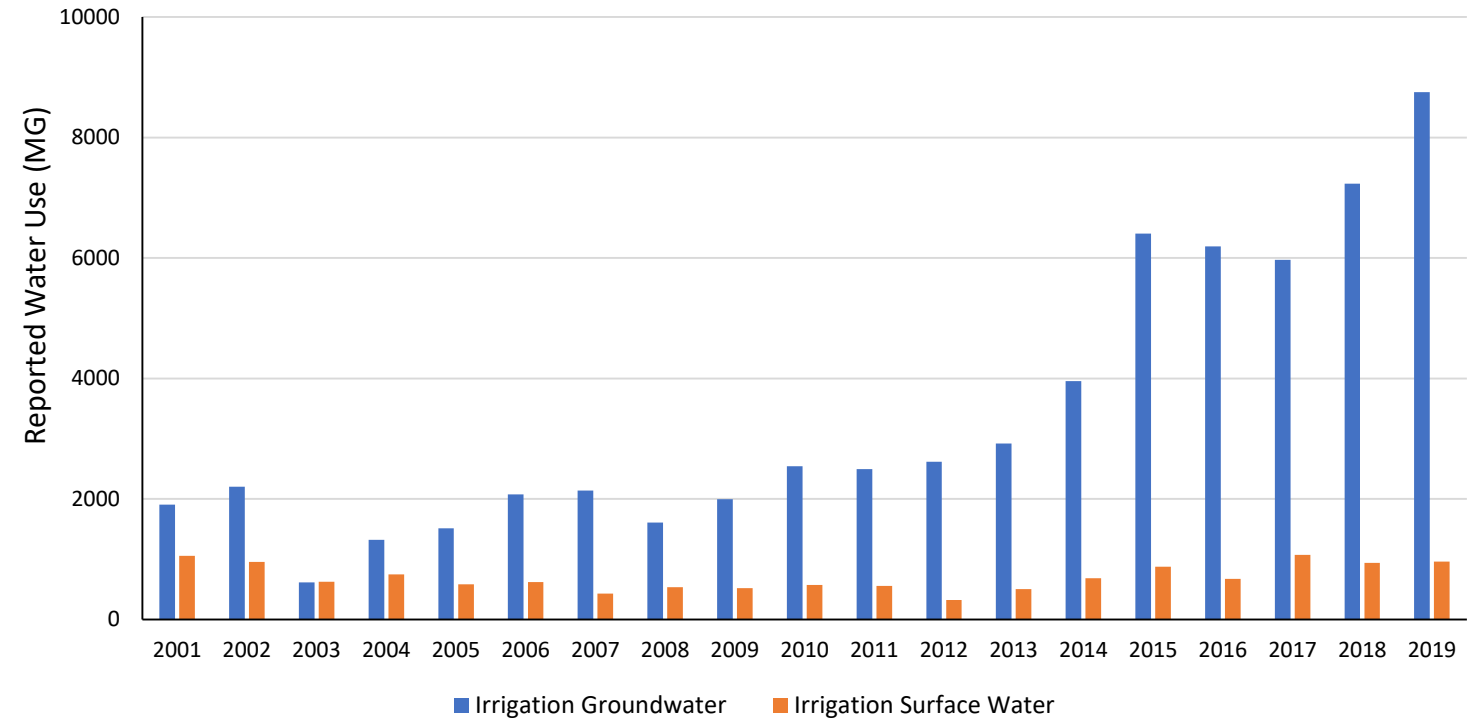
Current and Historic Water Use

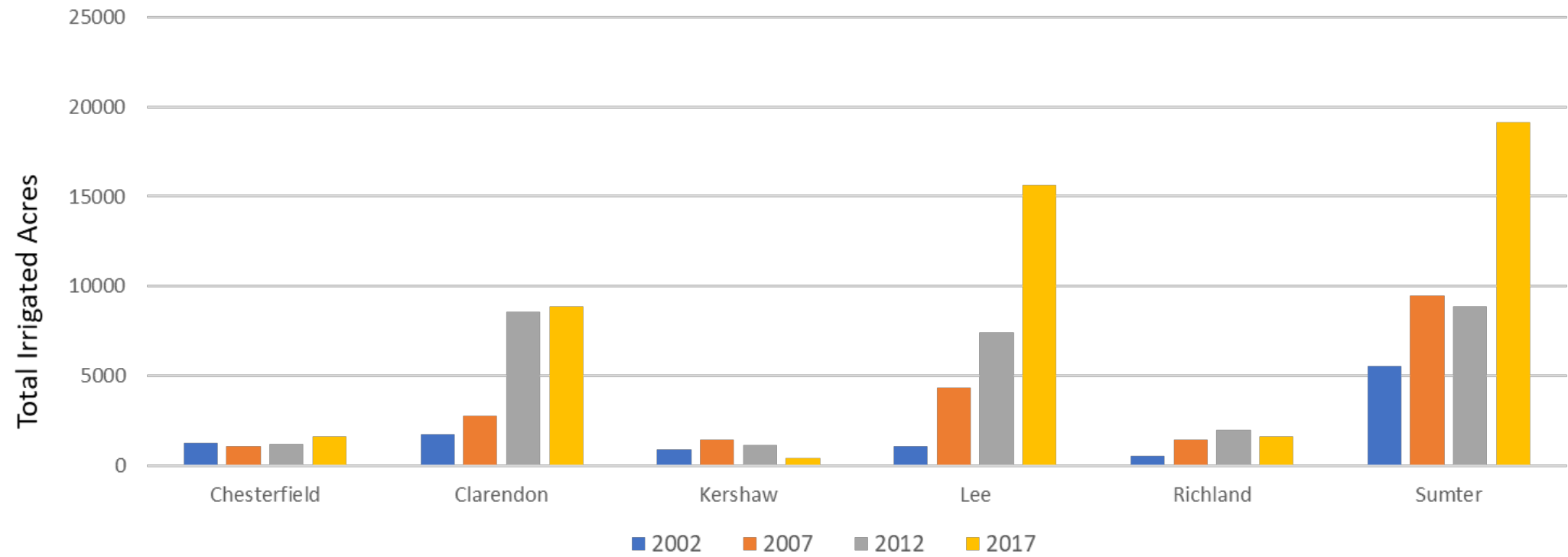


Groundwater Use by Type

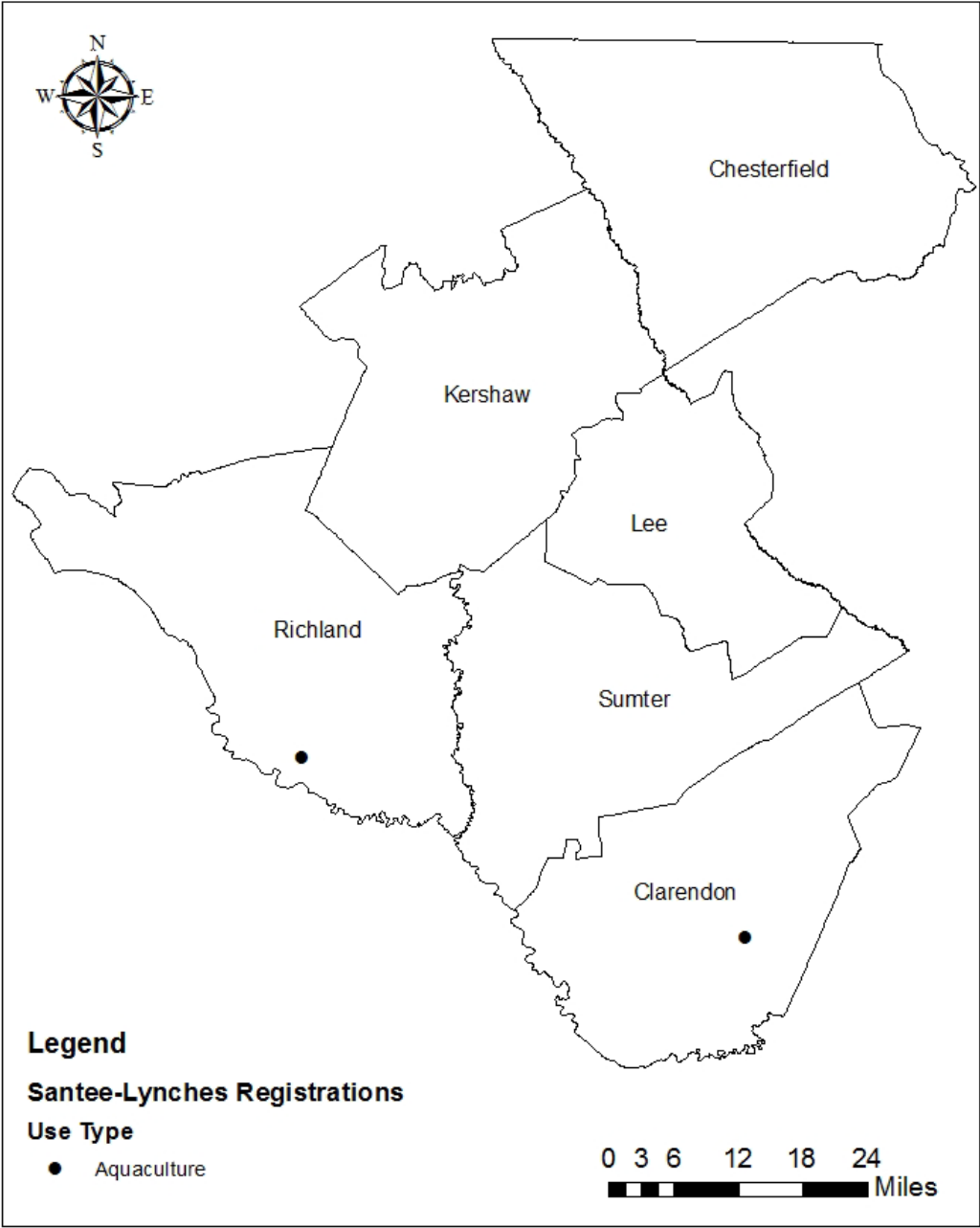
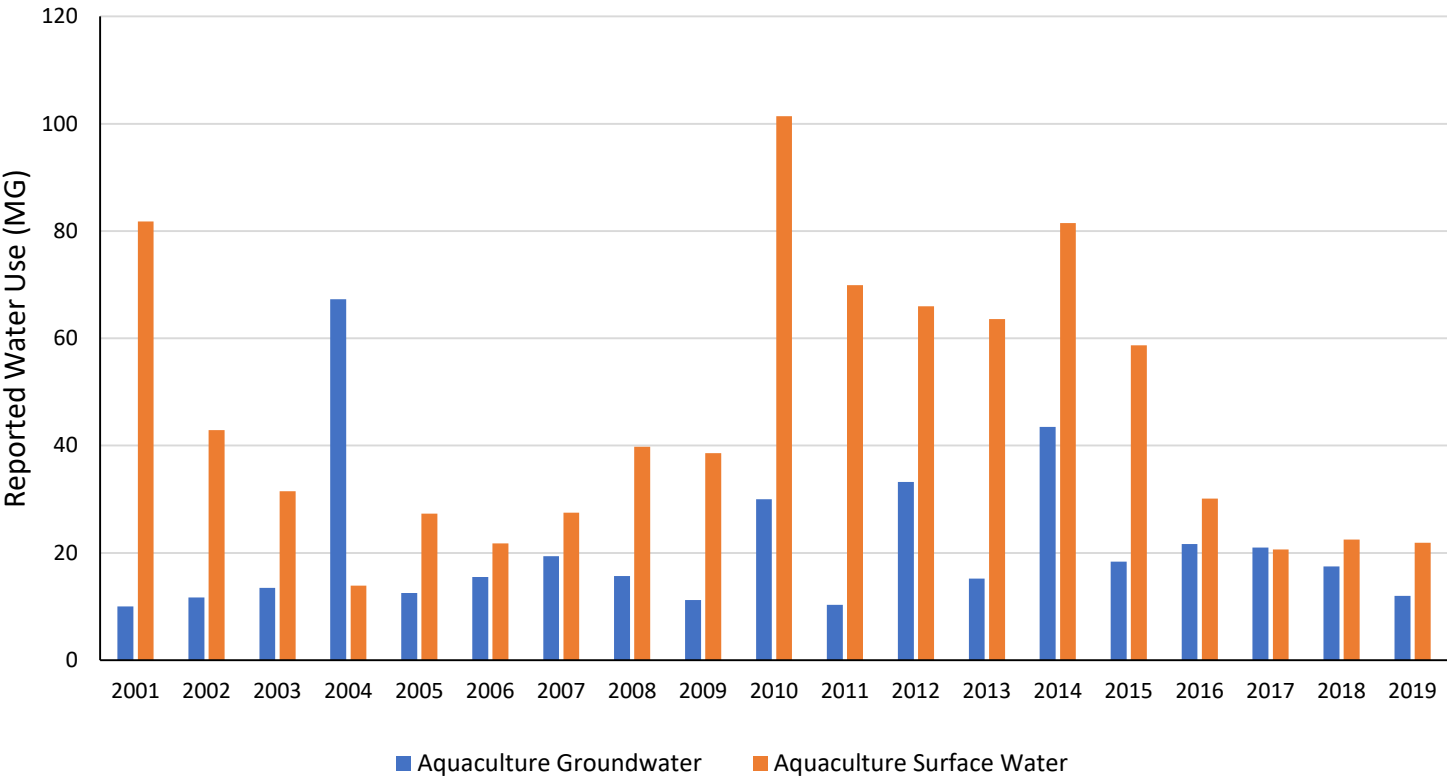


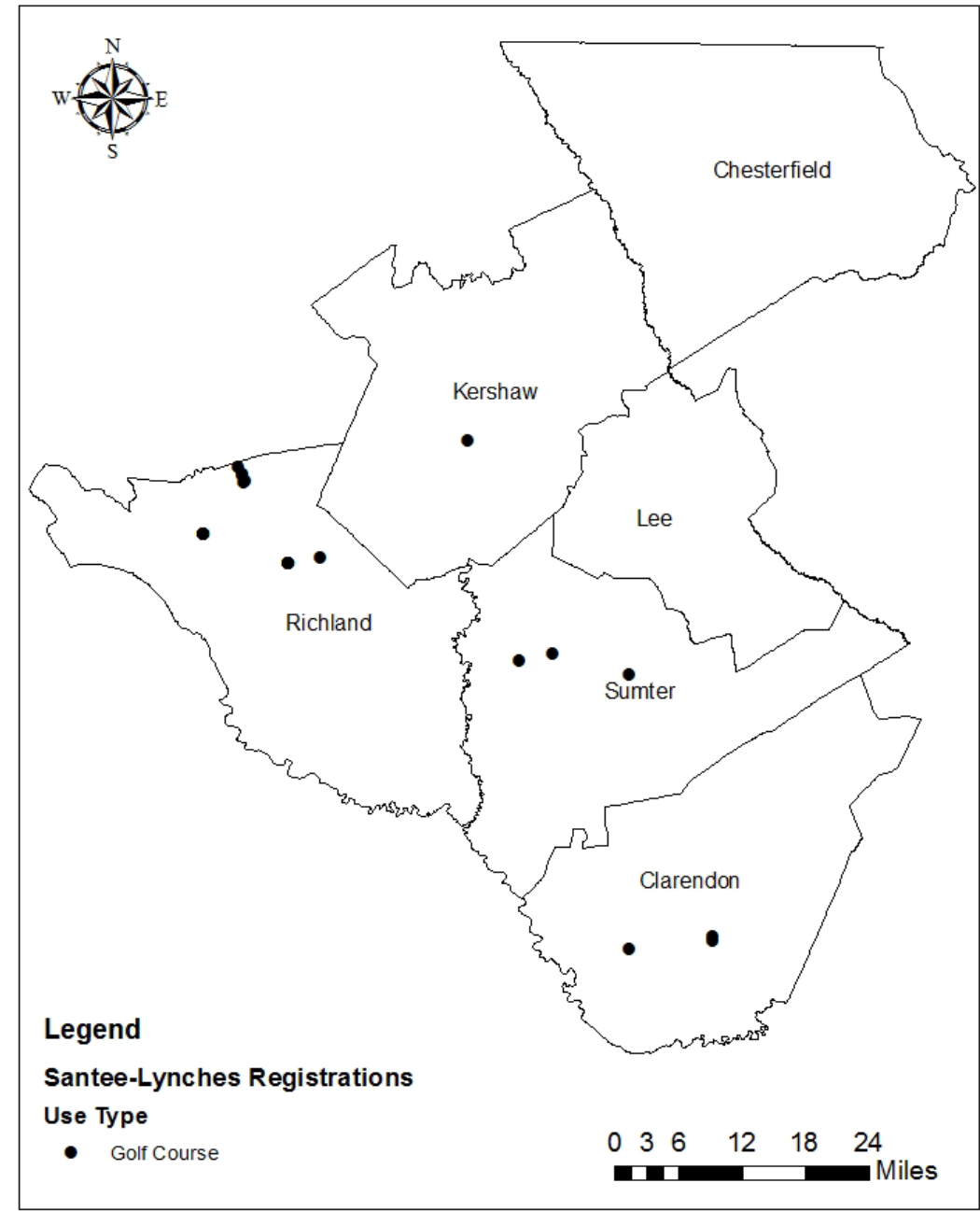
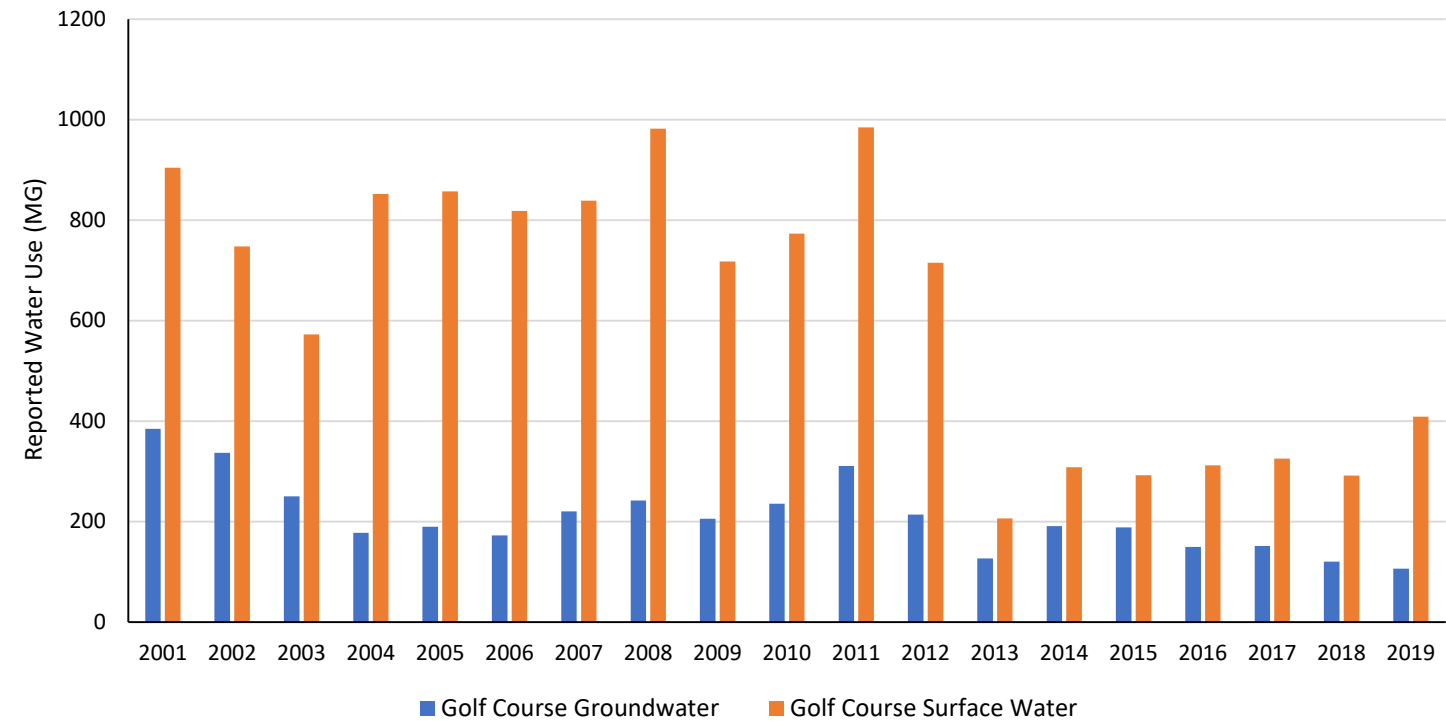


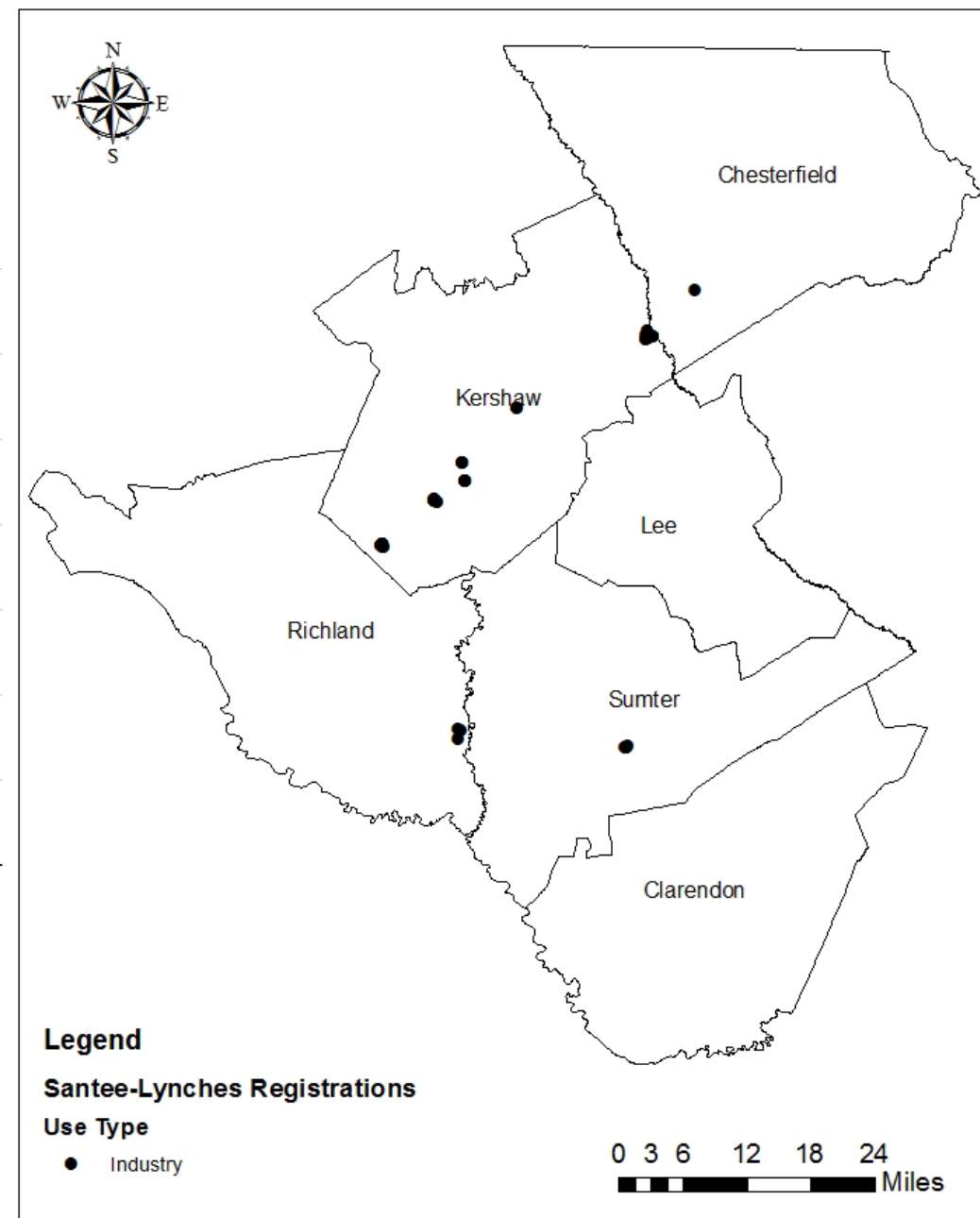
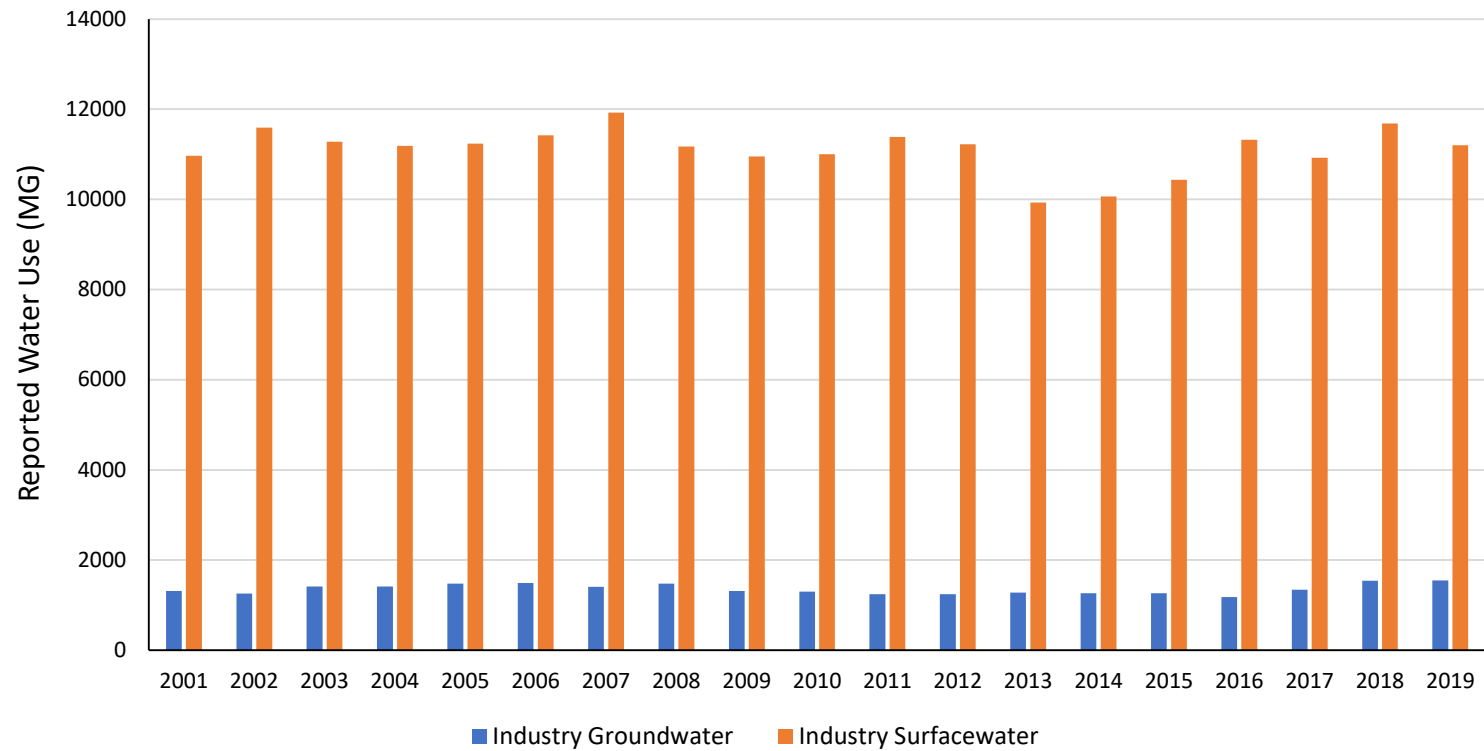


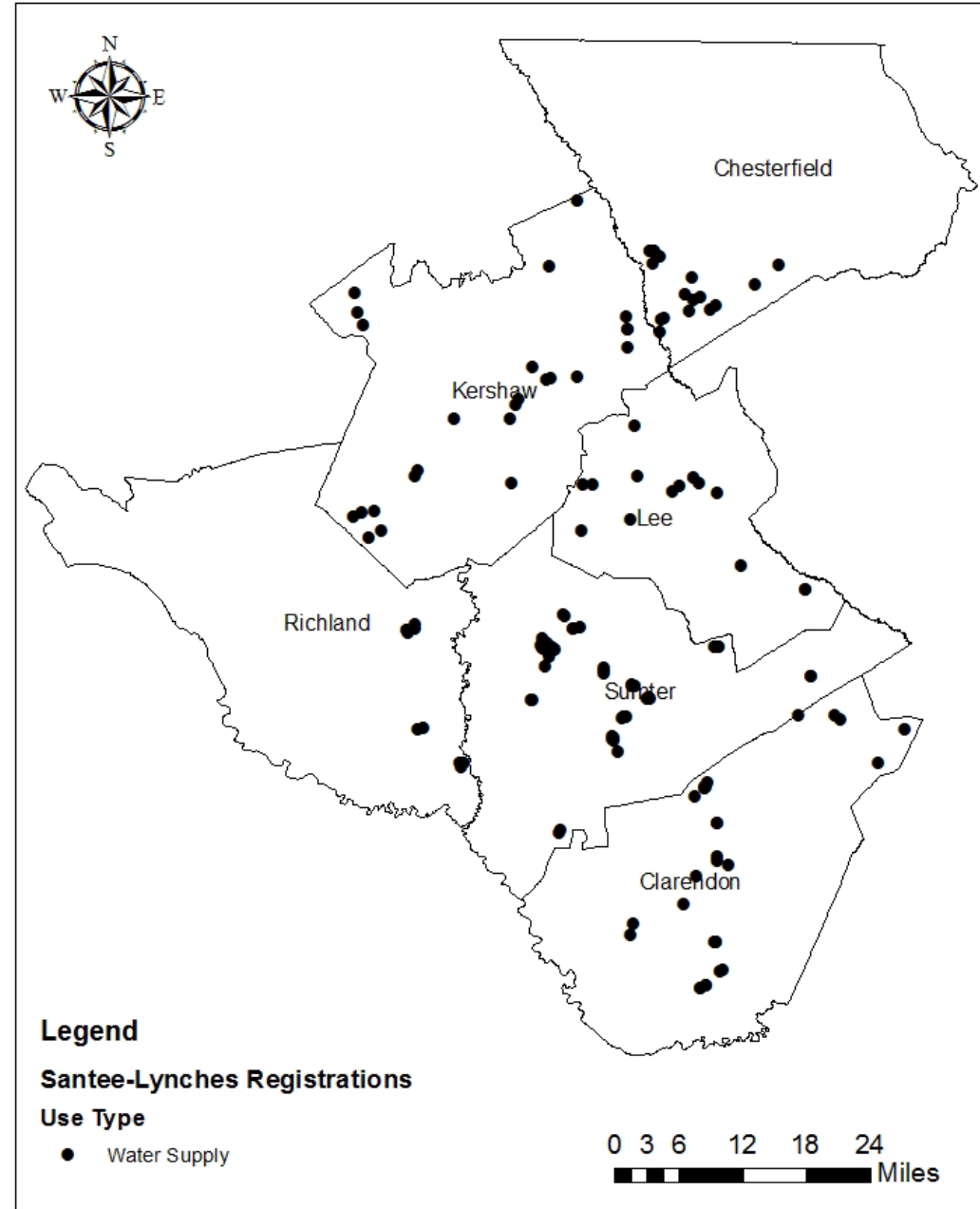
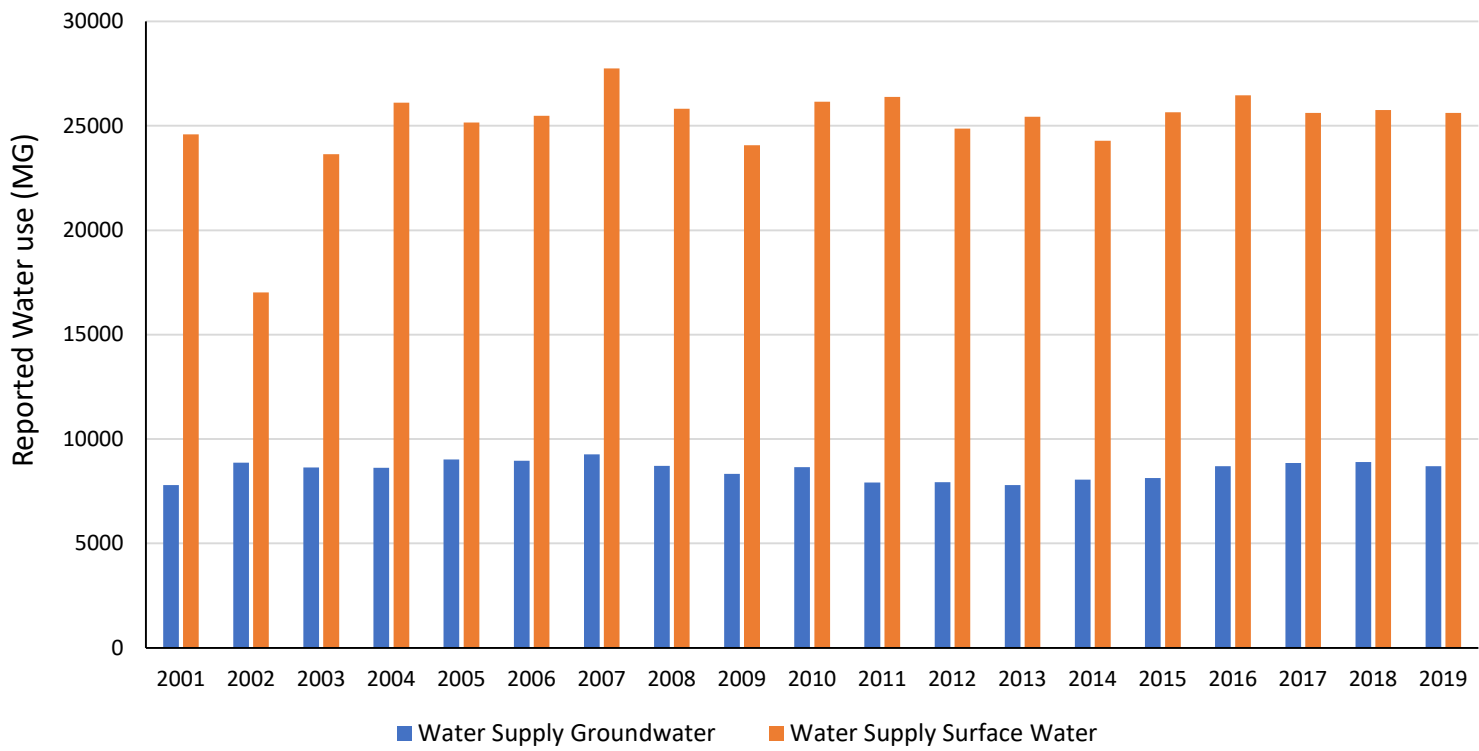


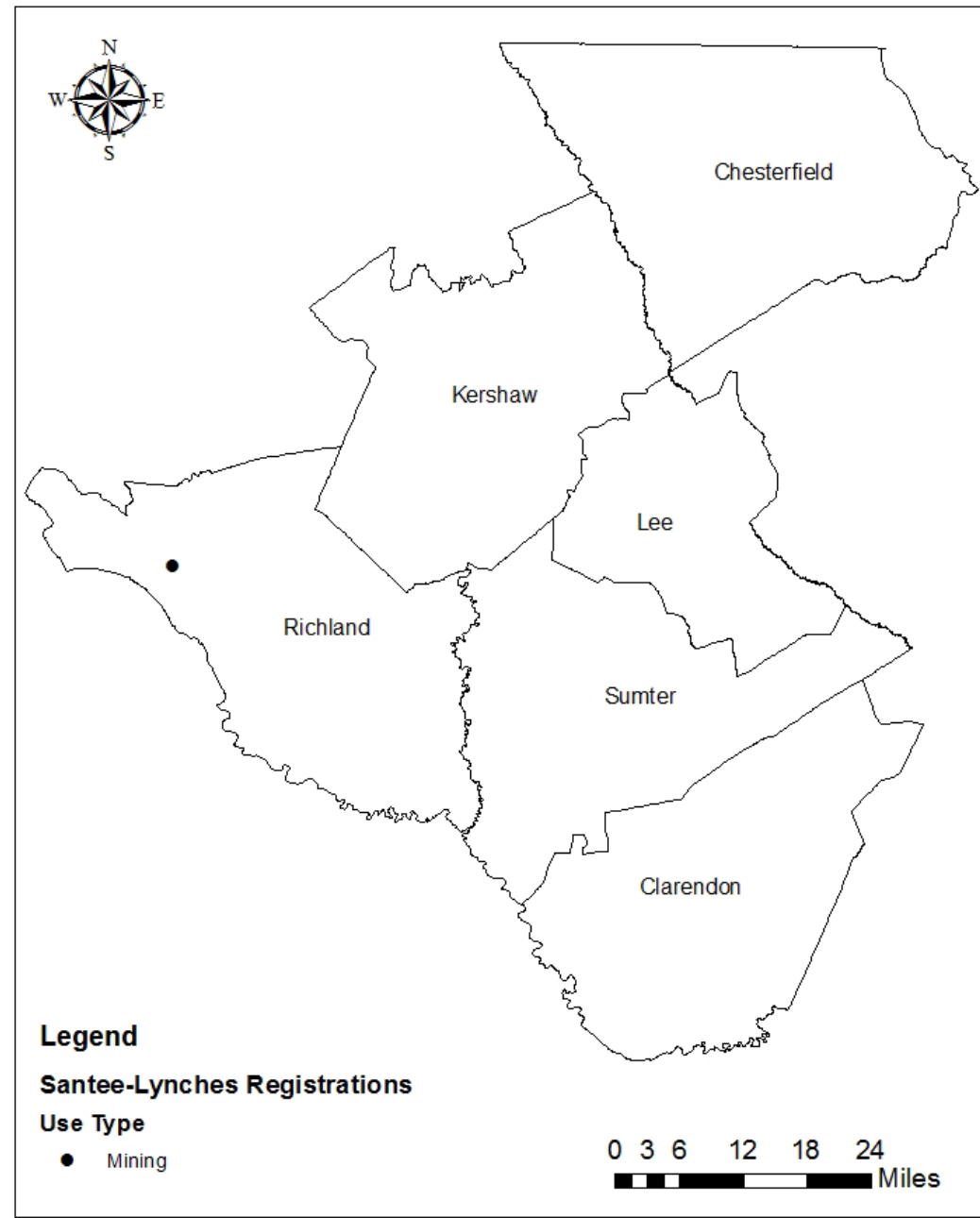
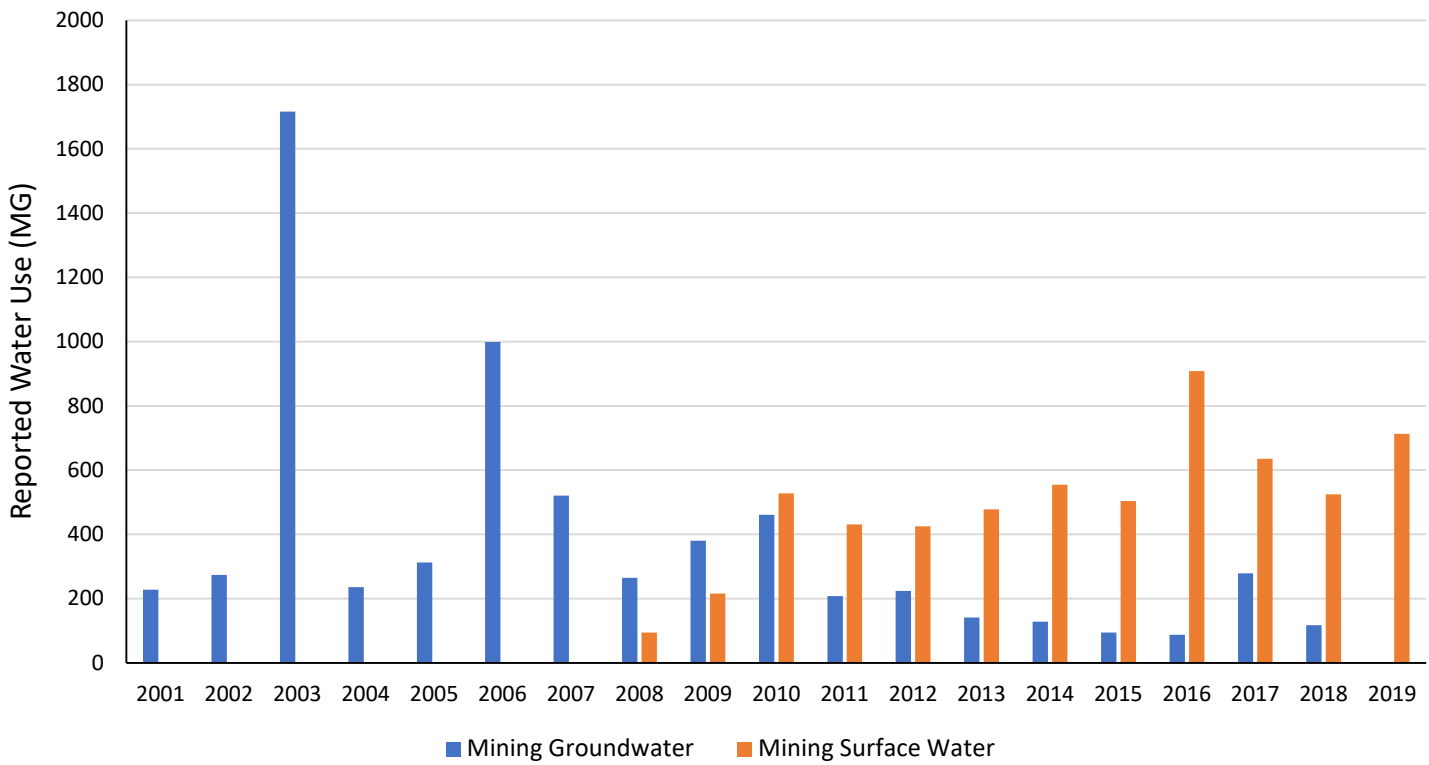
National Agricultural Statistics Service (USDA)





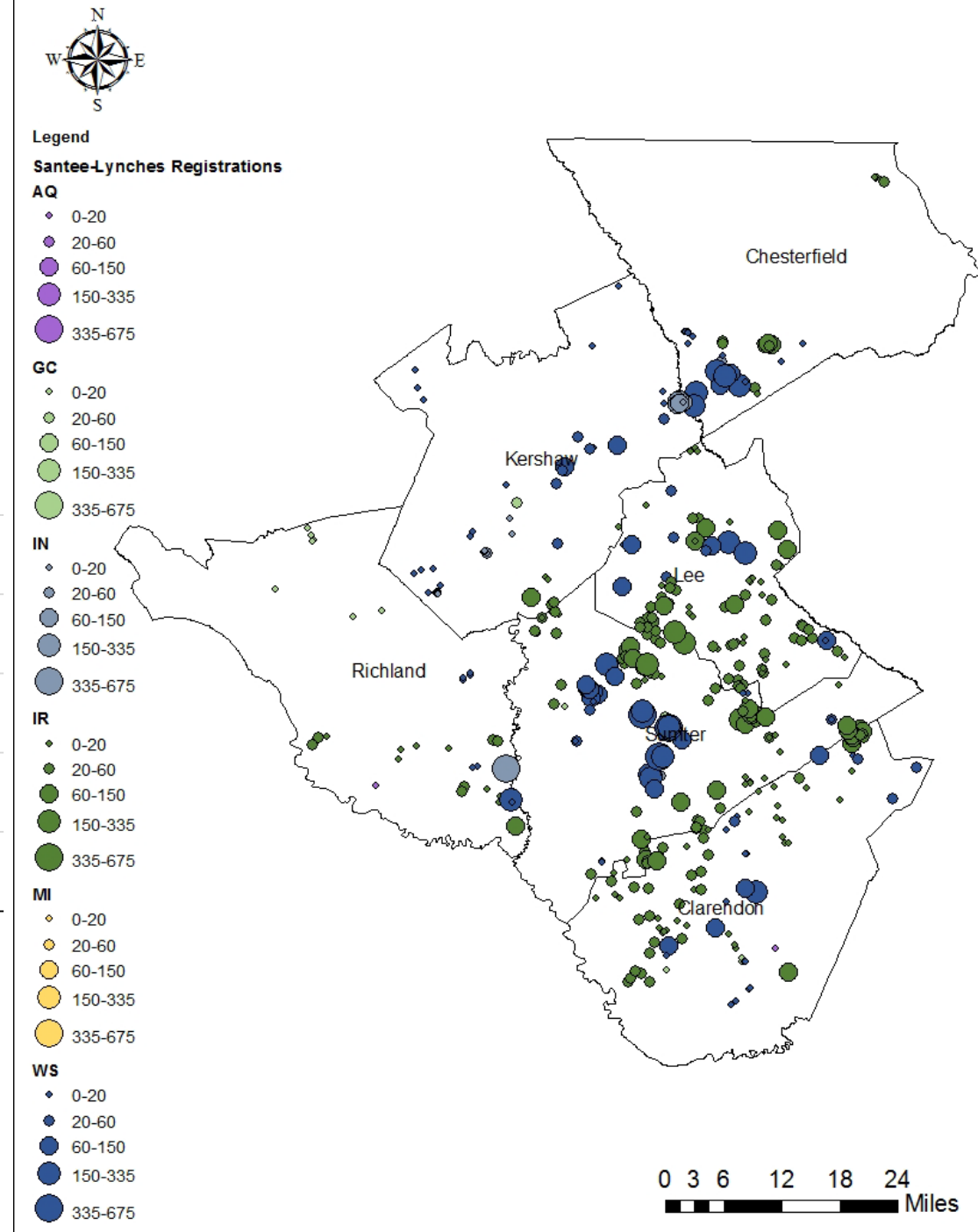
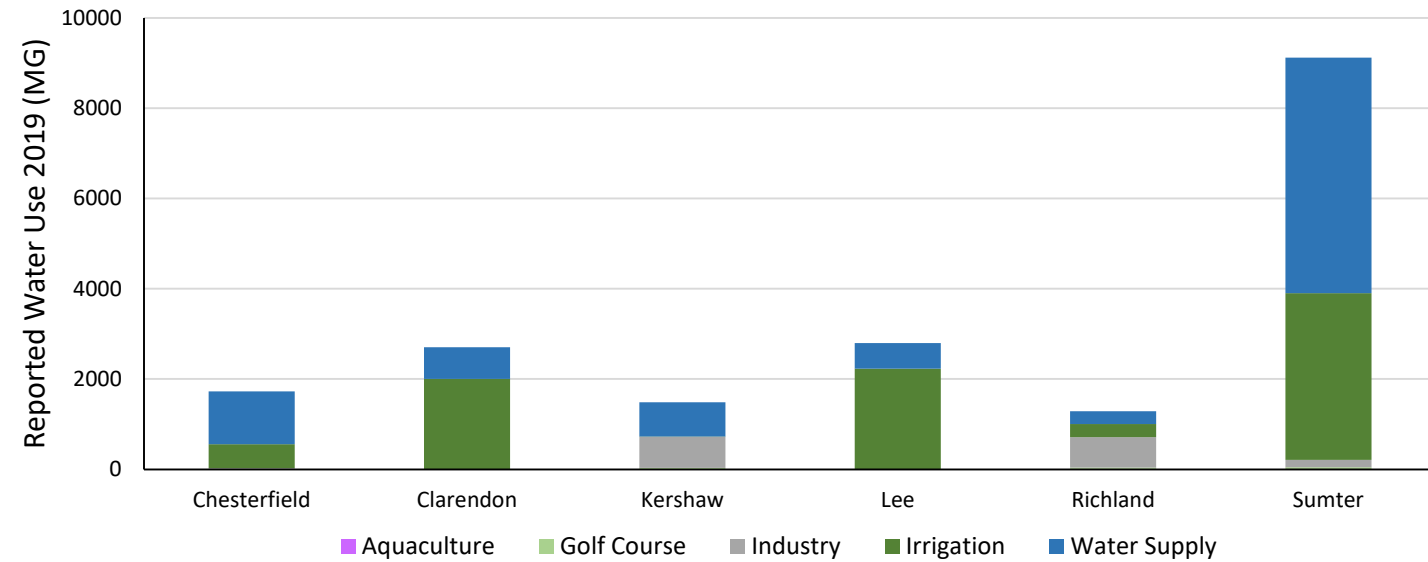






There are currently 510 registered Groundwater wells reporting water use in the Santee-Lynches proposed area.

2019 Groundwater Type Use by County





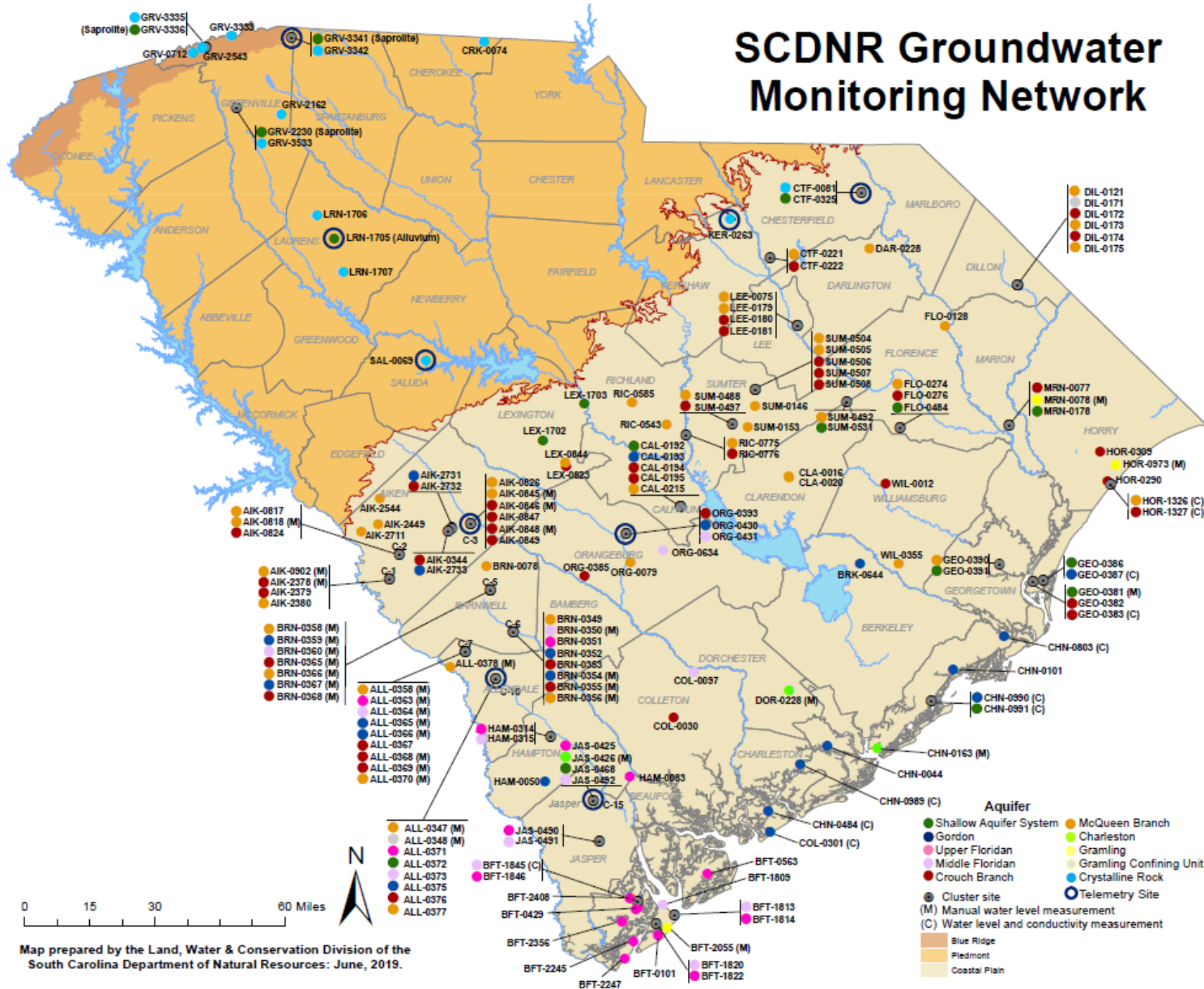
South Carolina Department of Health and Environmental Control

Current Groundwater Conditions

Water Level Measurements

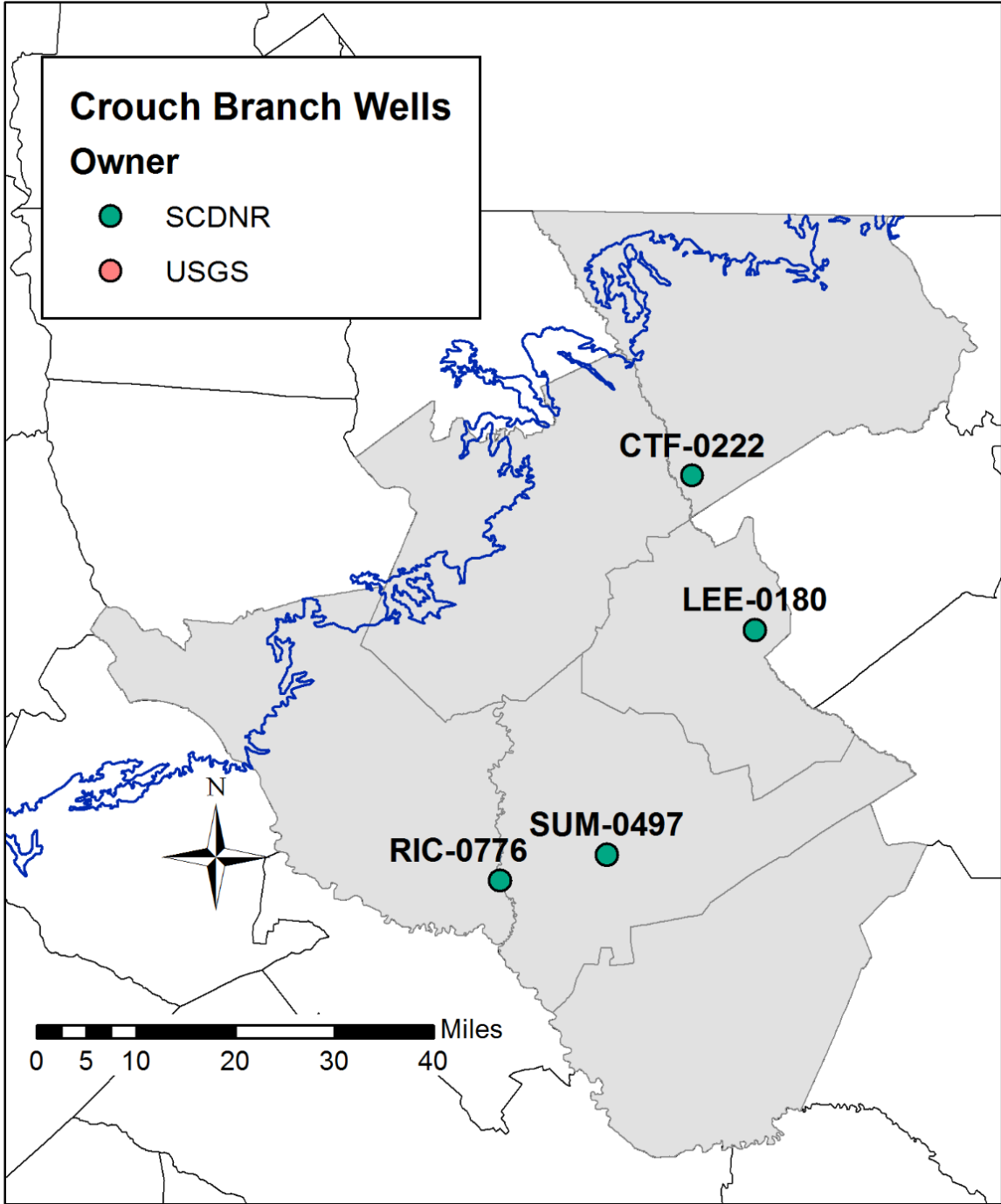
- Time-series measurements of the water level below land surface (BLS) at a specific place.
 - How has the water level at this location changed over time?
- 'Snapshot' of water level in wells screened in an aquifer.
 - What is the current condition of groundwater over a large area?
- Wells maintained by SCDNR and USGS.

SCDNR Groundwater Monitoring Network

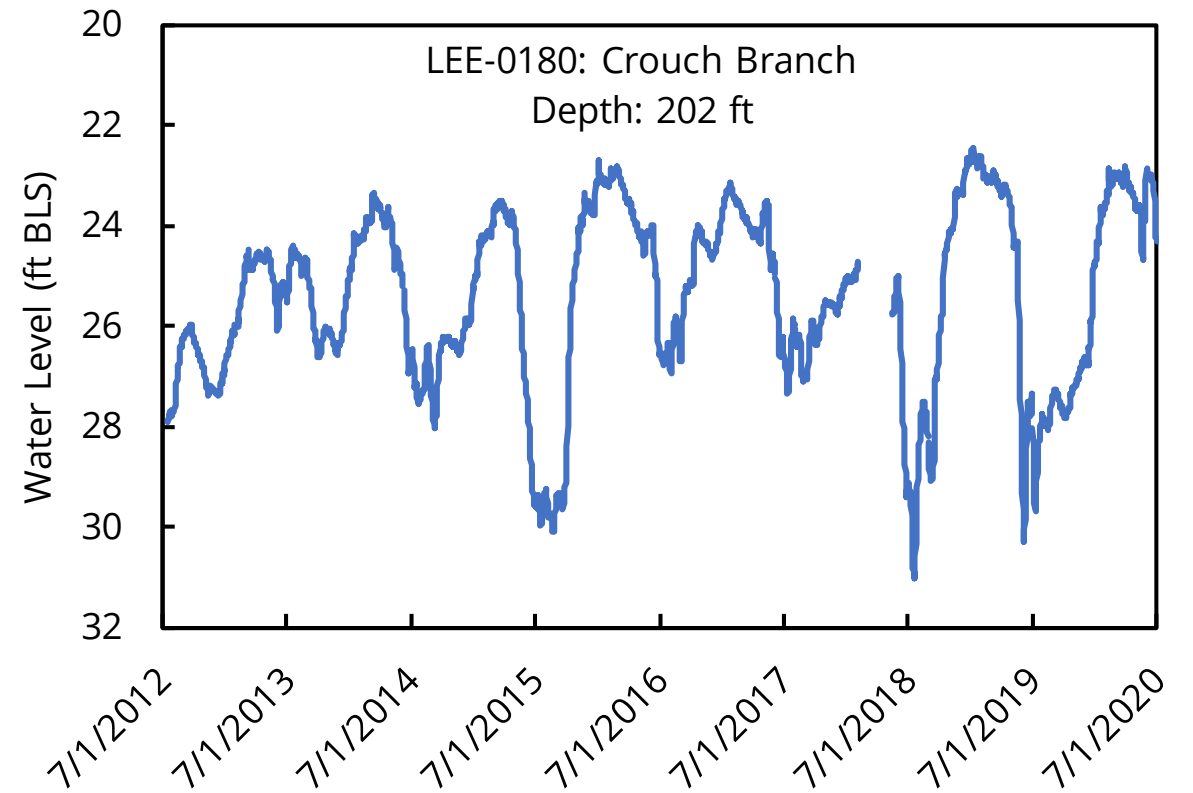
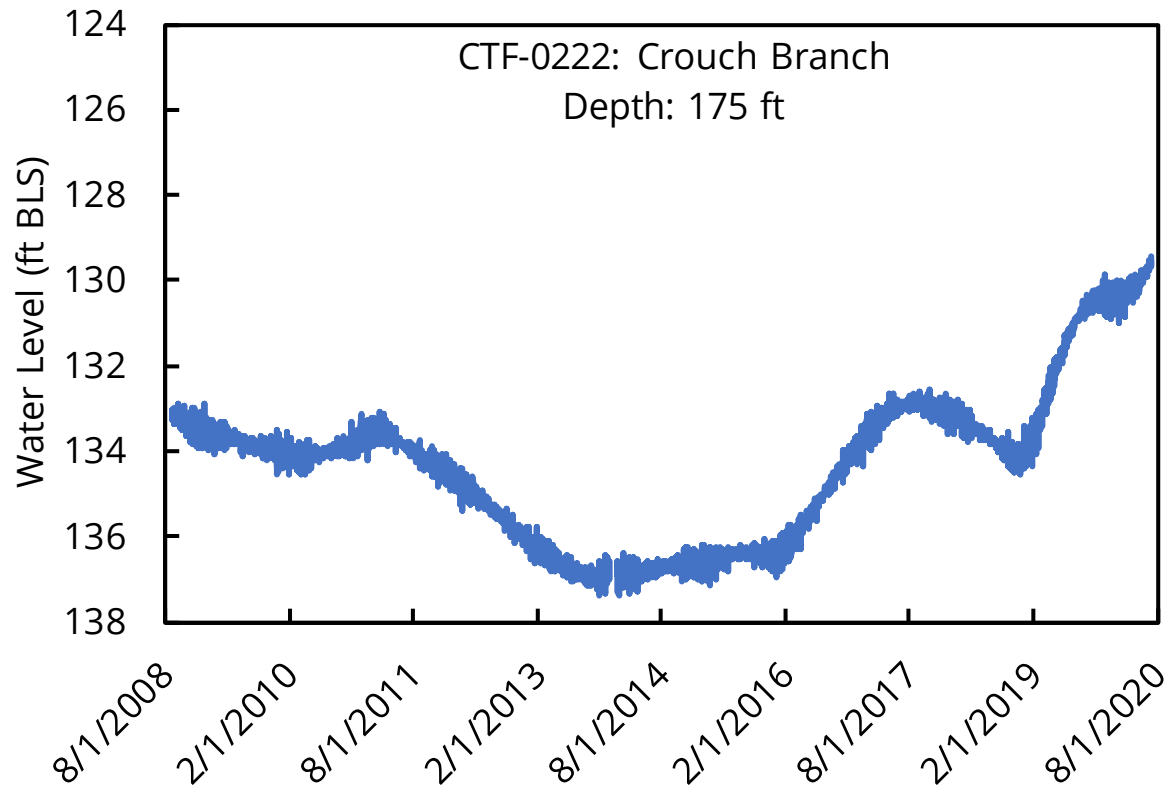


Map prepared by the Land, Water & Conservation Division of the South Carolina Department of Natural Resources: June, 2019.

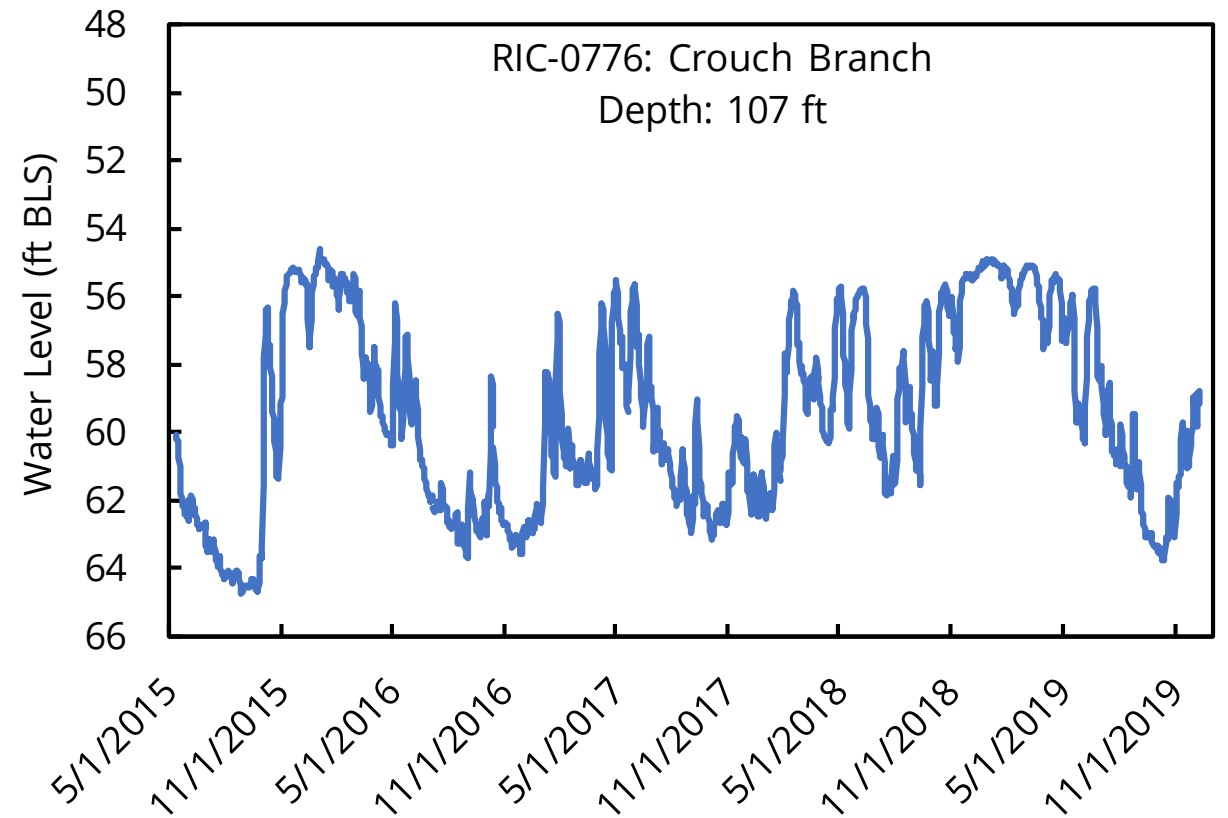
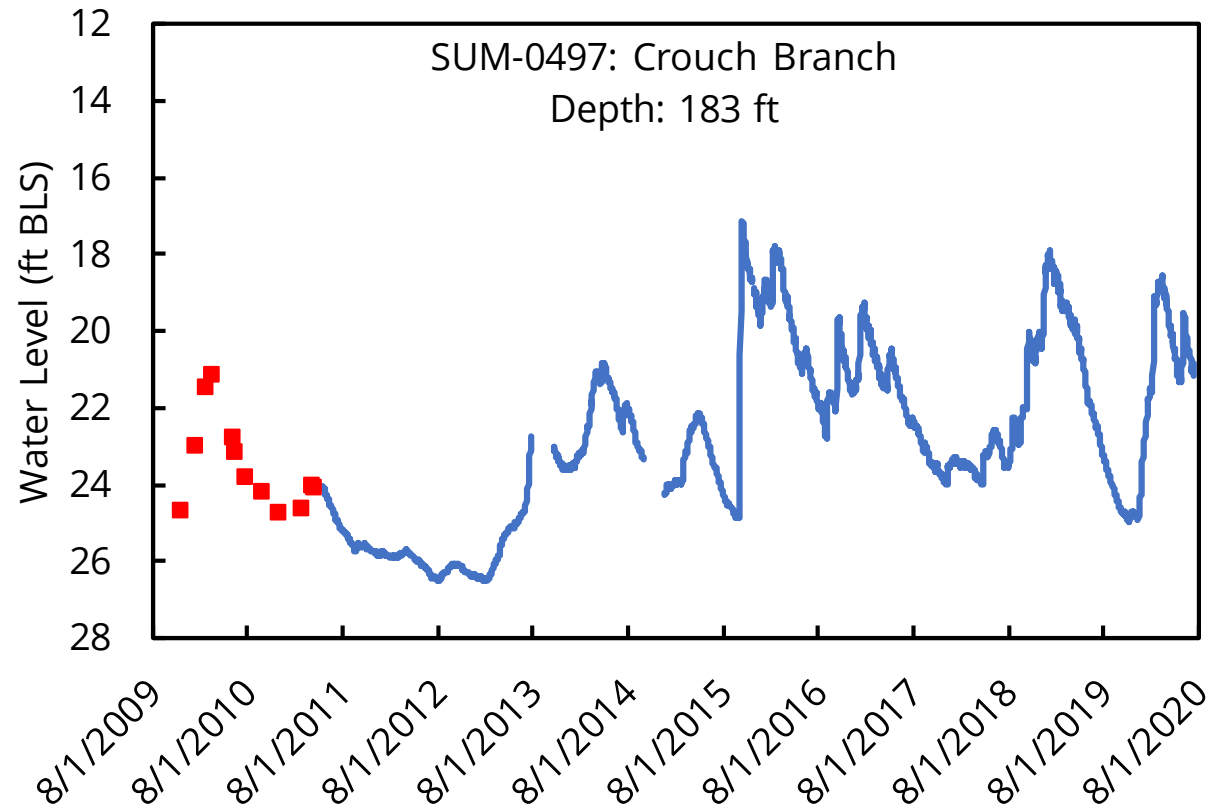
Crouch Branch Aquifer



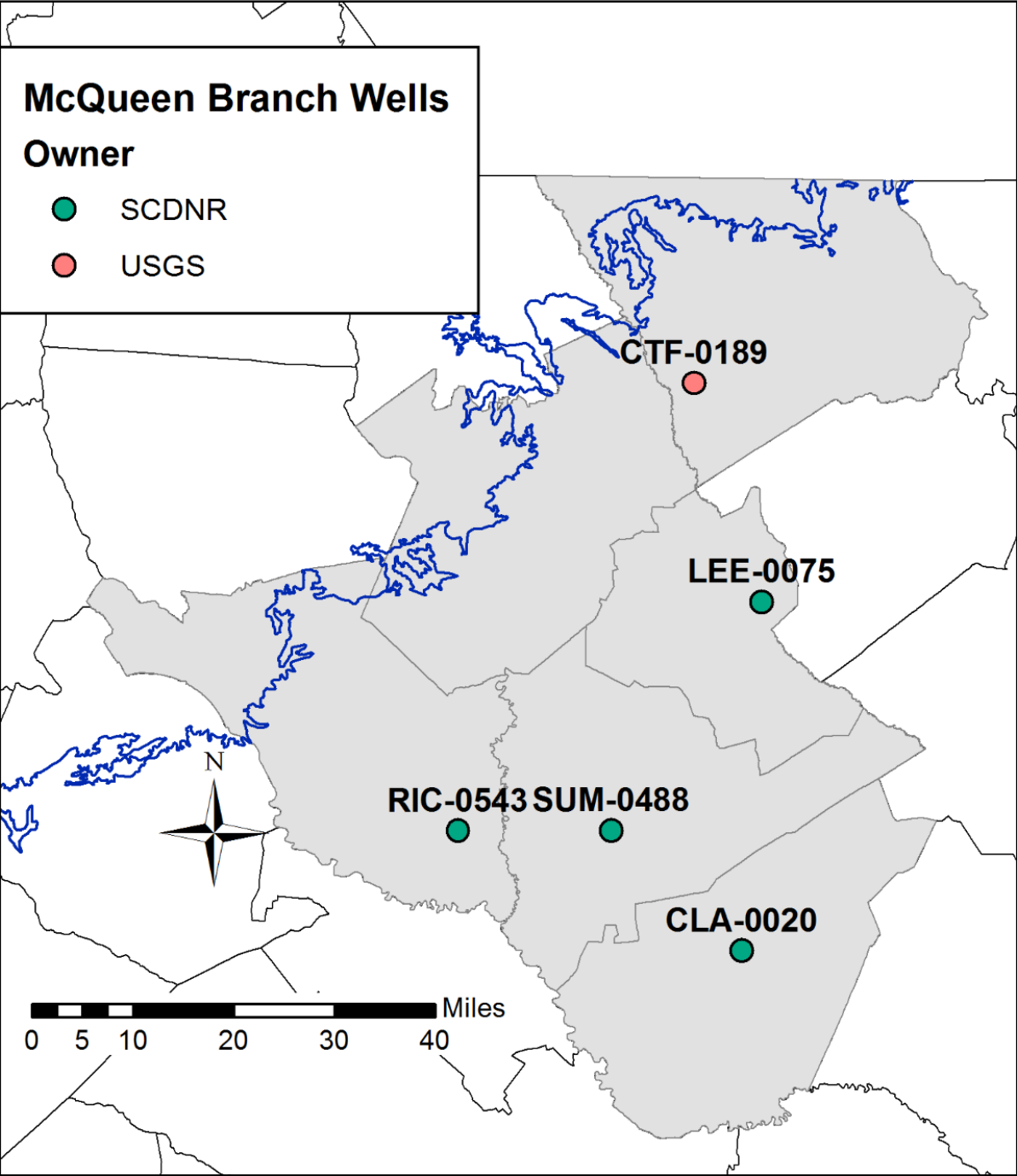
Crouch Branch Aquifer



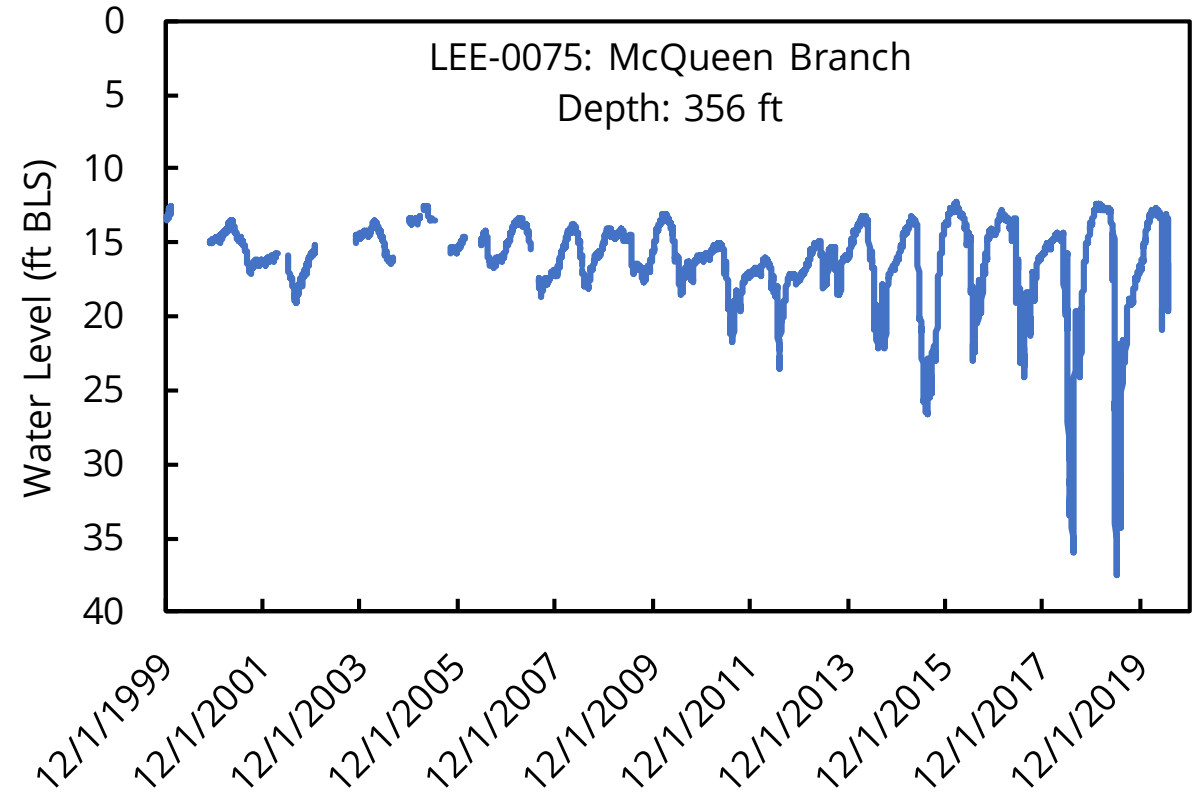
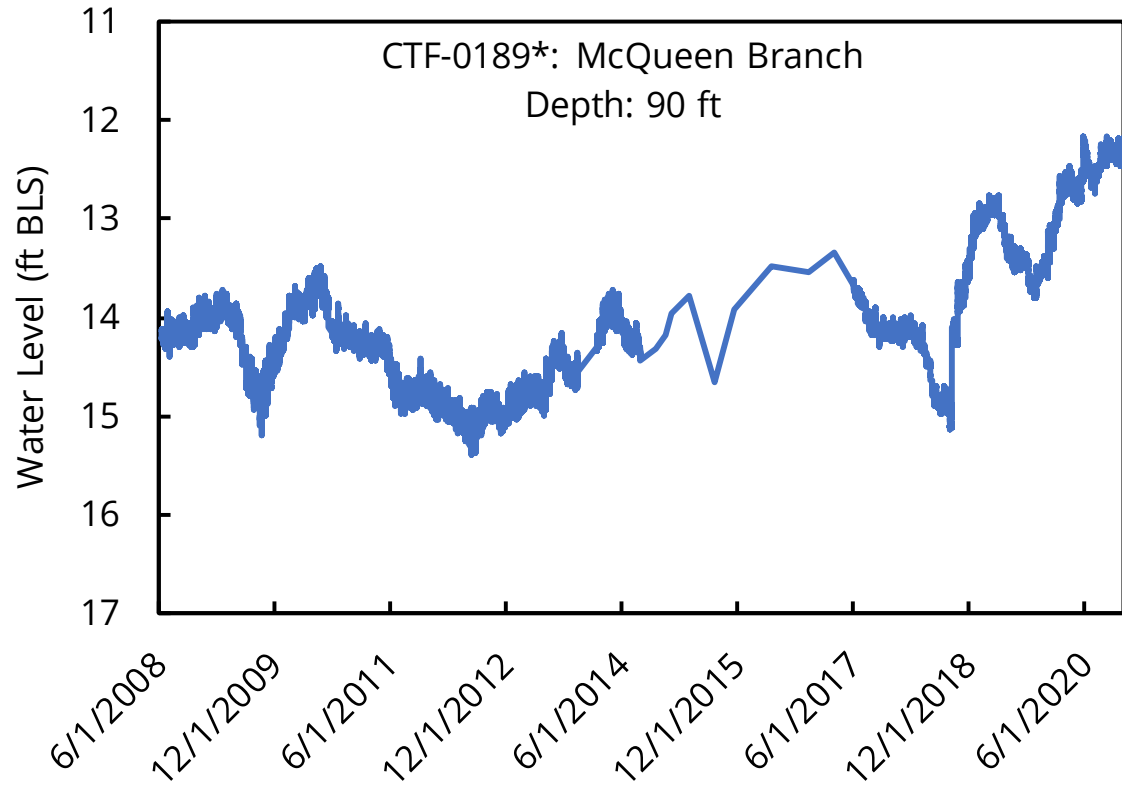
Crouch Branch Aquifer



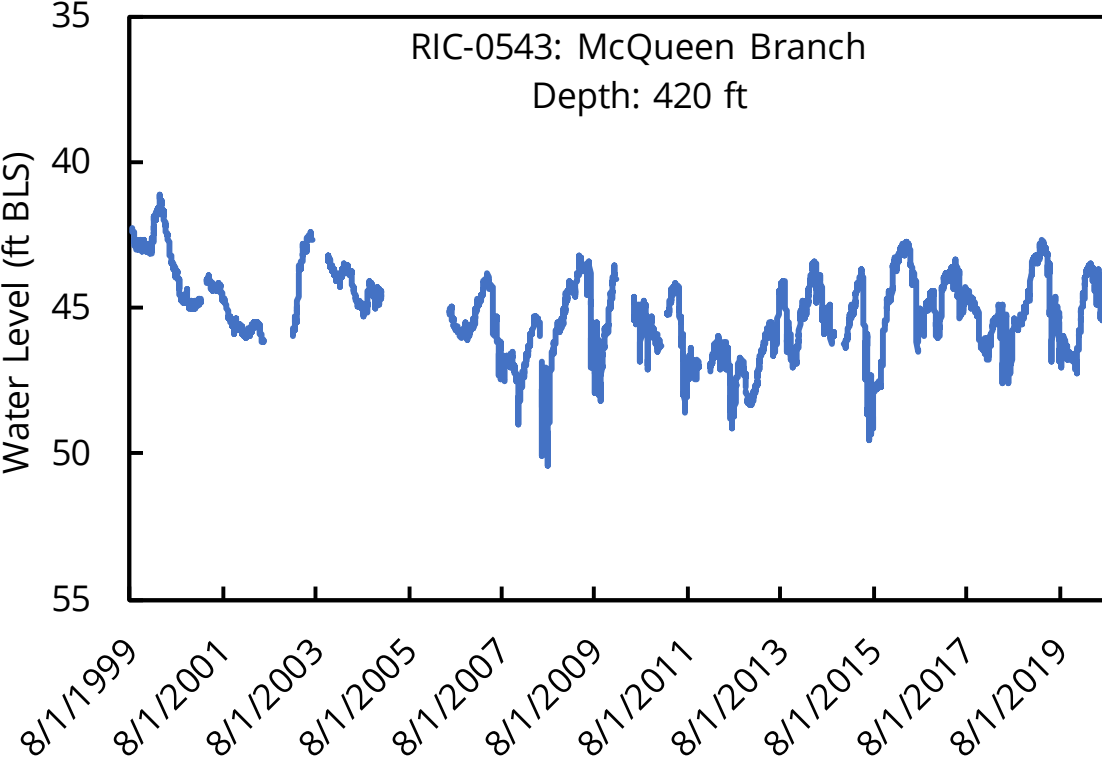
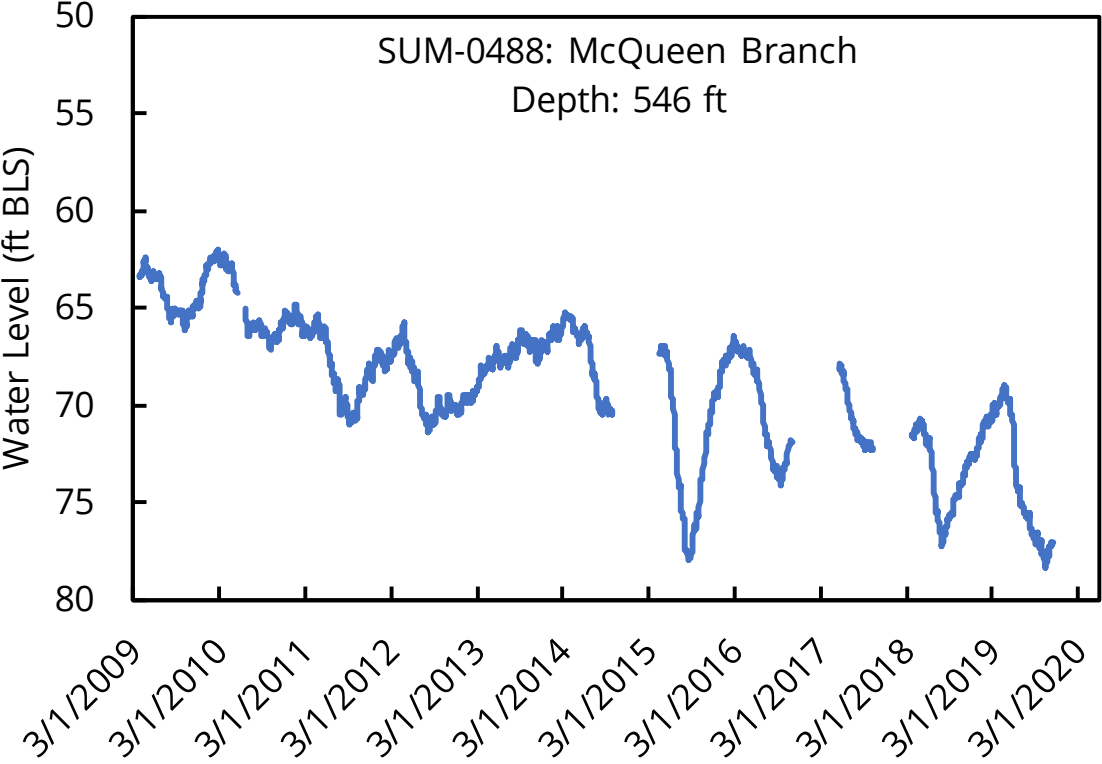
McQueen Branch Aquifer



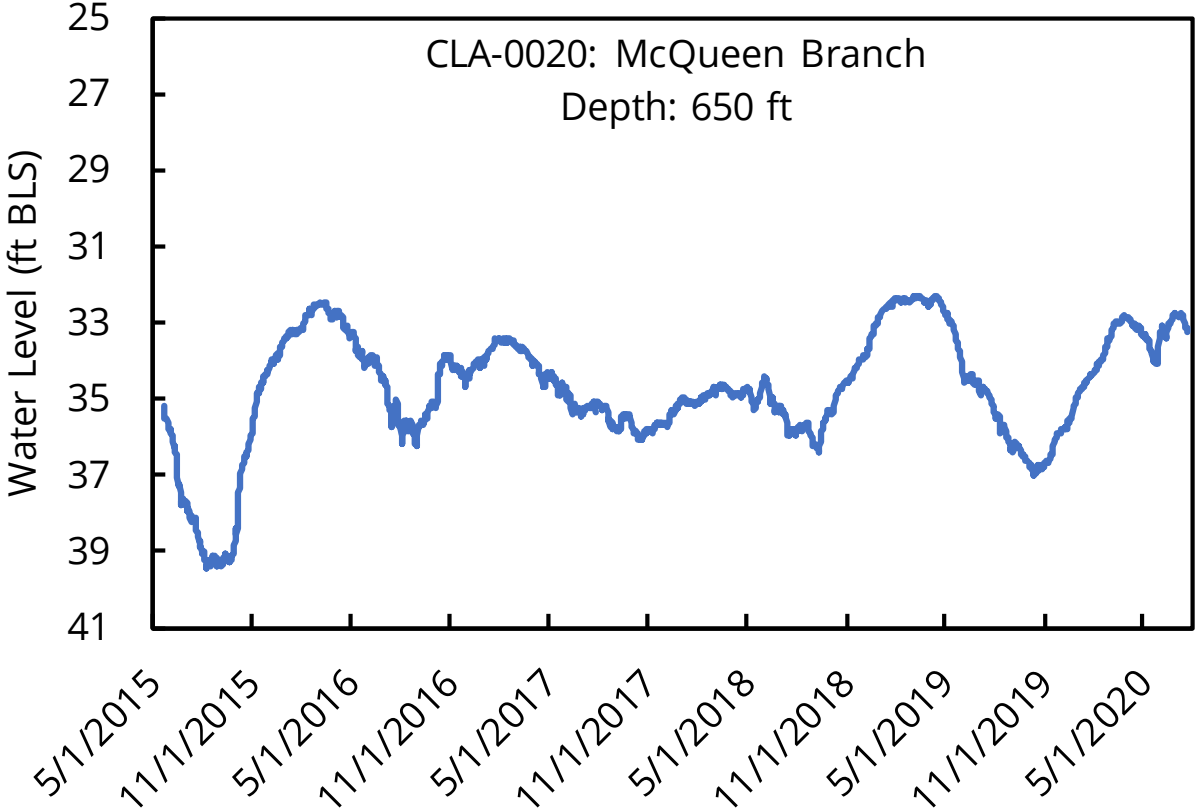
McQueen Branch Aquifer



McQueen Branch Aquifer



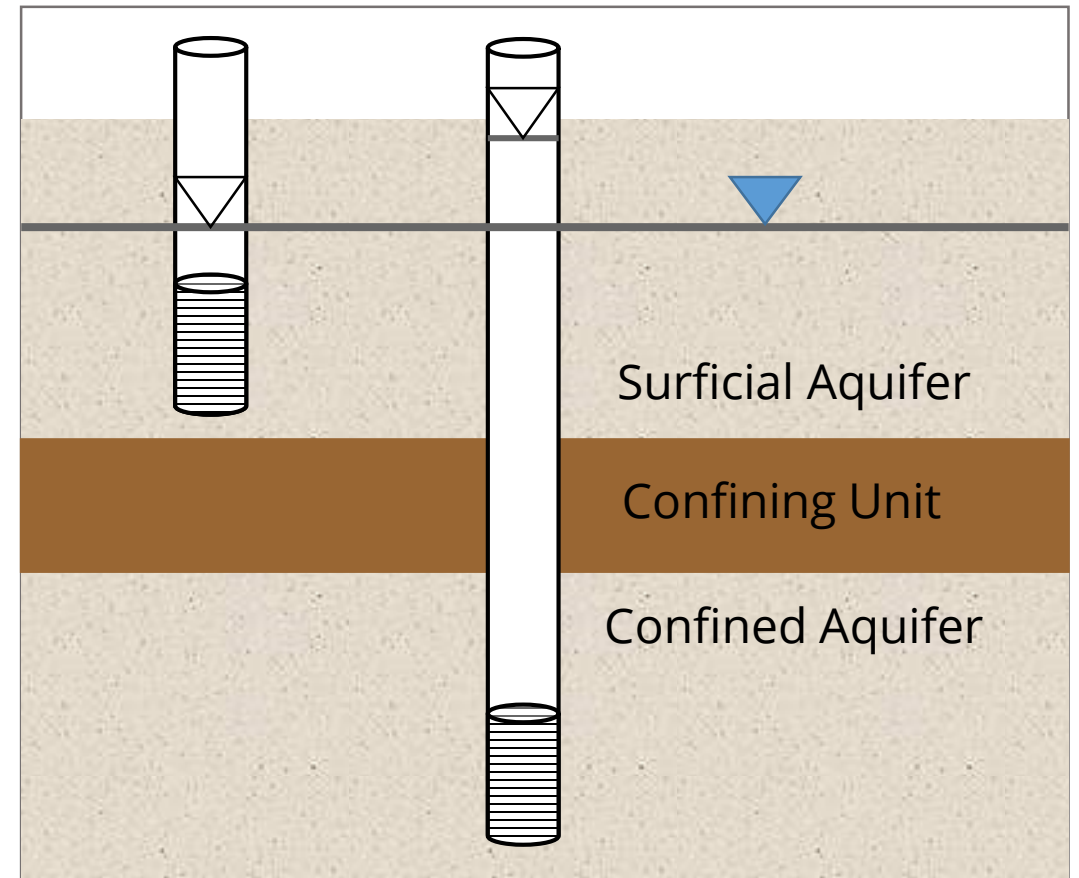
McQueen Branch Aquifer



Impact of Groundwater Withdrawal

Measuring Water Levels and Potentiometric Surfaces

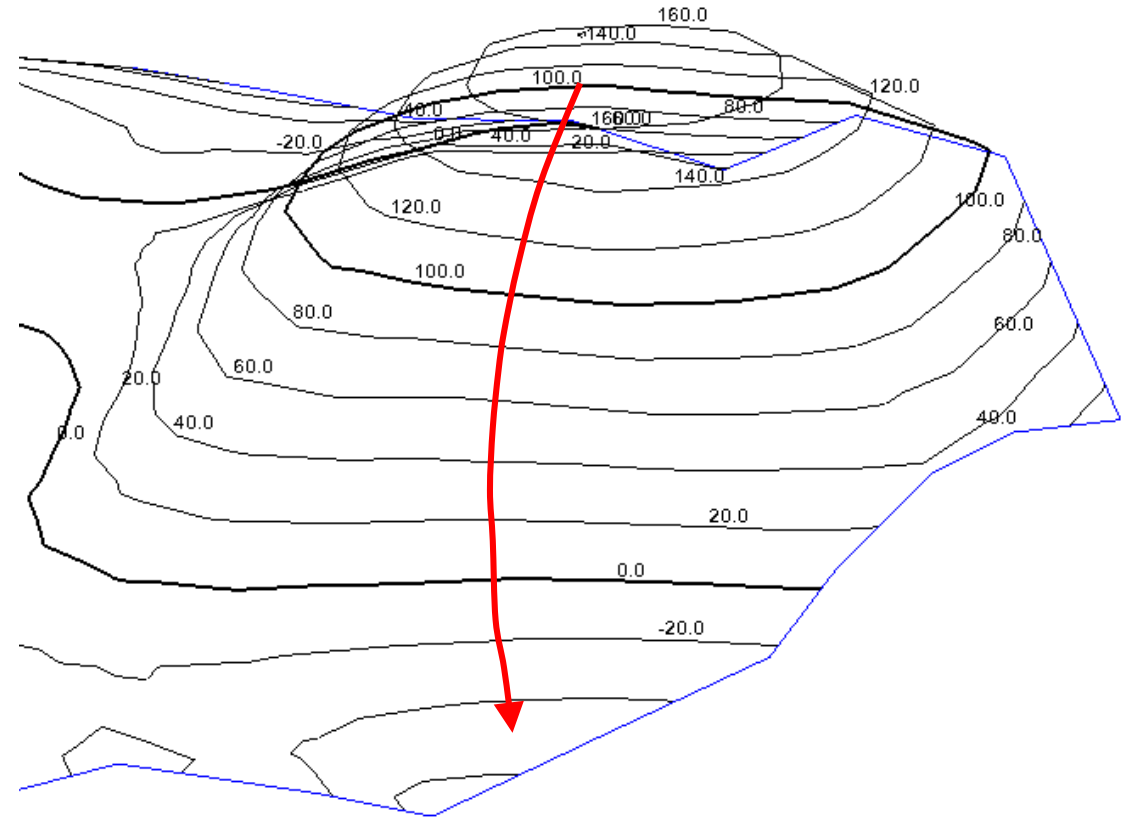
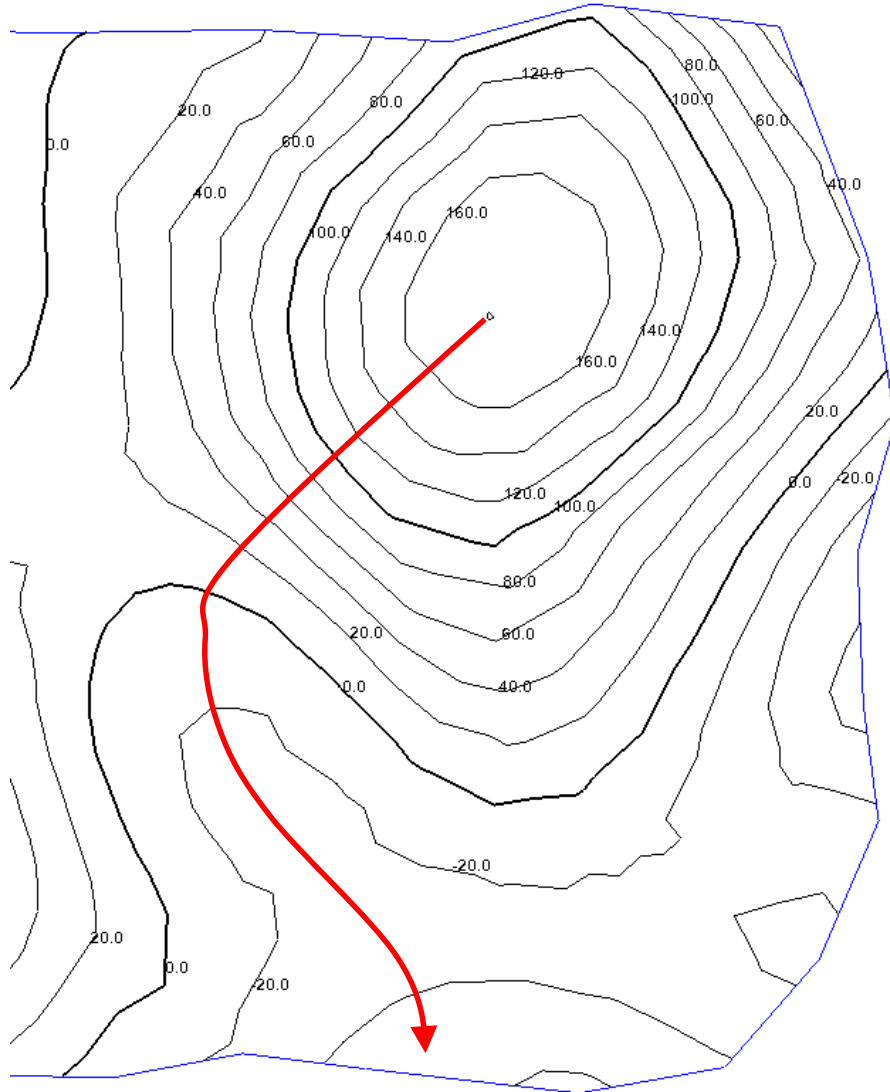
- ❑ Water Table (free surface of the groundwater)
- ❑ Potentiometric Surface (pressure surface of groundwater in the confined aquifer)
- ❑ Water flows from high to low water levels (or hydraulic head)

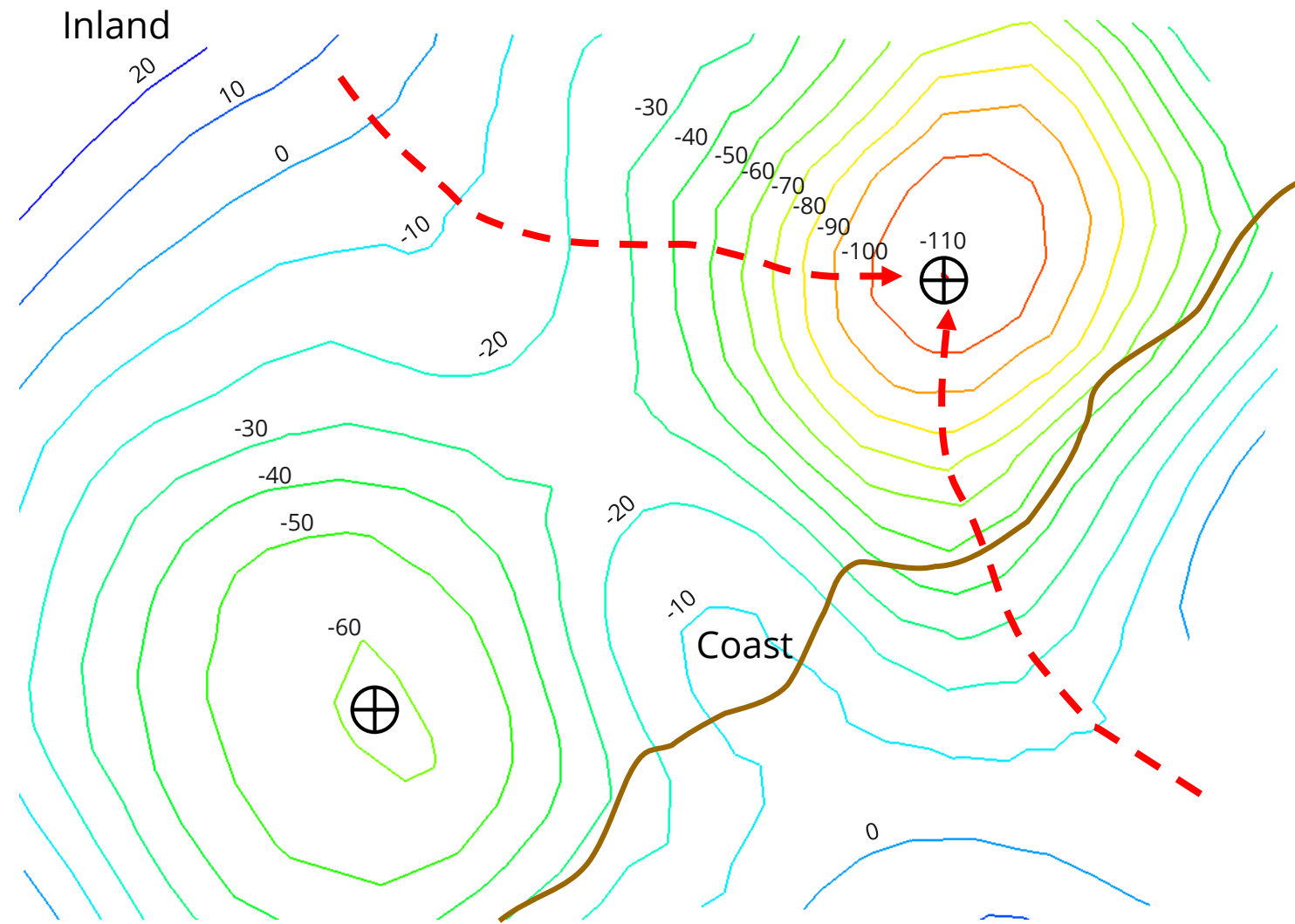


Contour Lines and Groundwater Flow Directions

Closely spaced contour lines represent a steeper gradient.

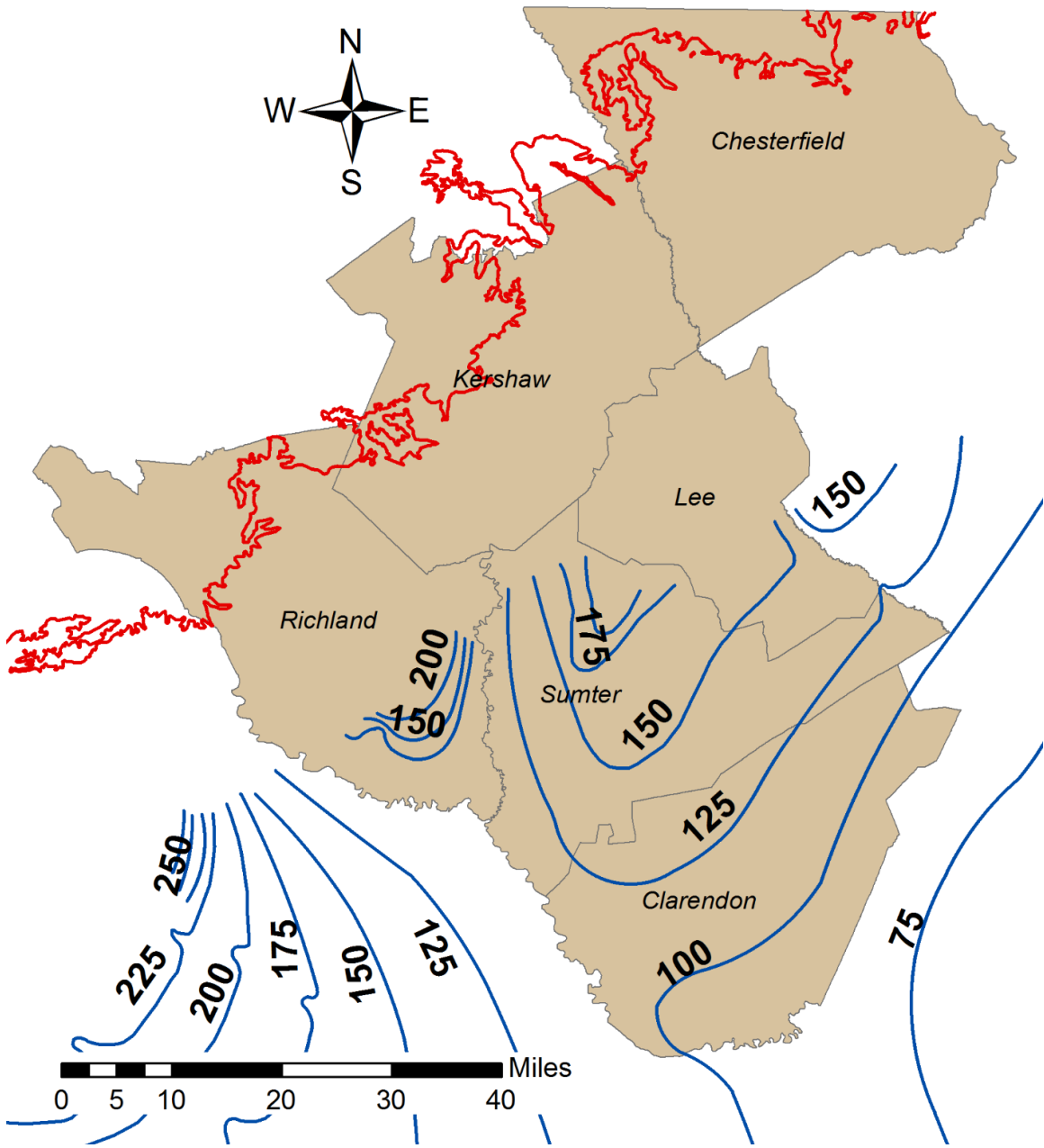
Groundwater flows “downhill” at 90° to the contour lines.



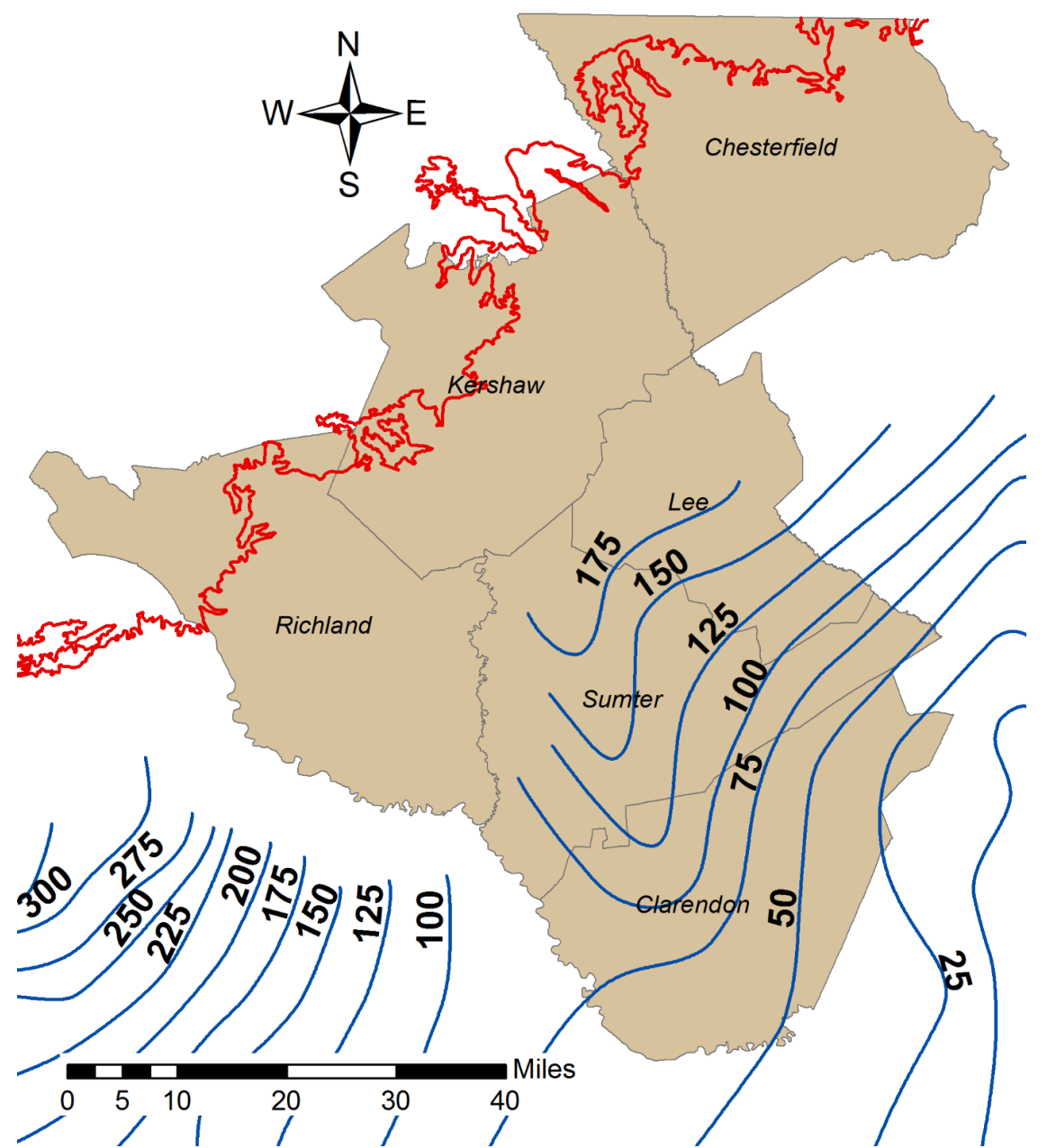


Pumping Cones (Cones of Depression)

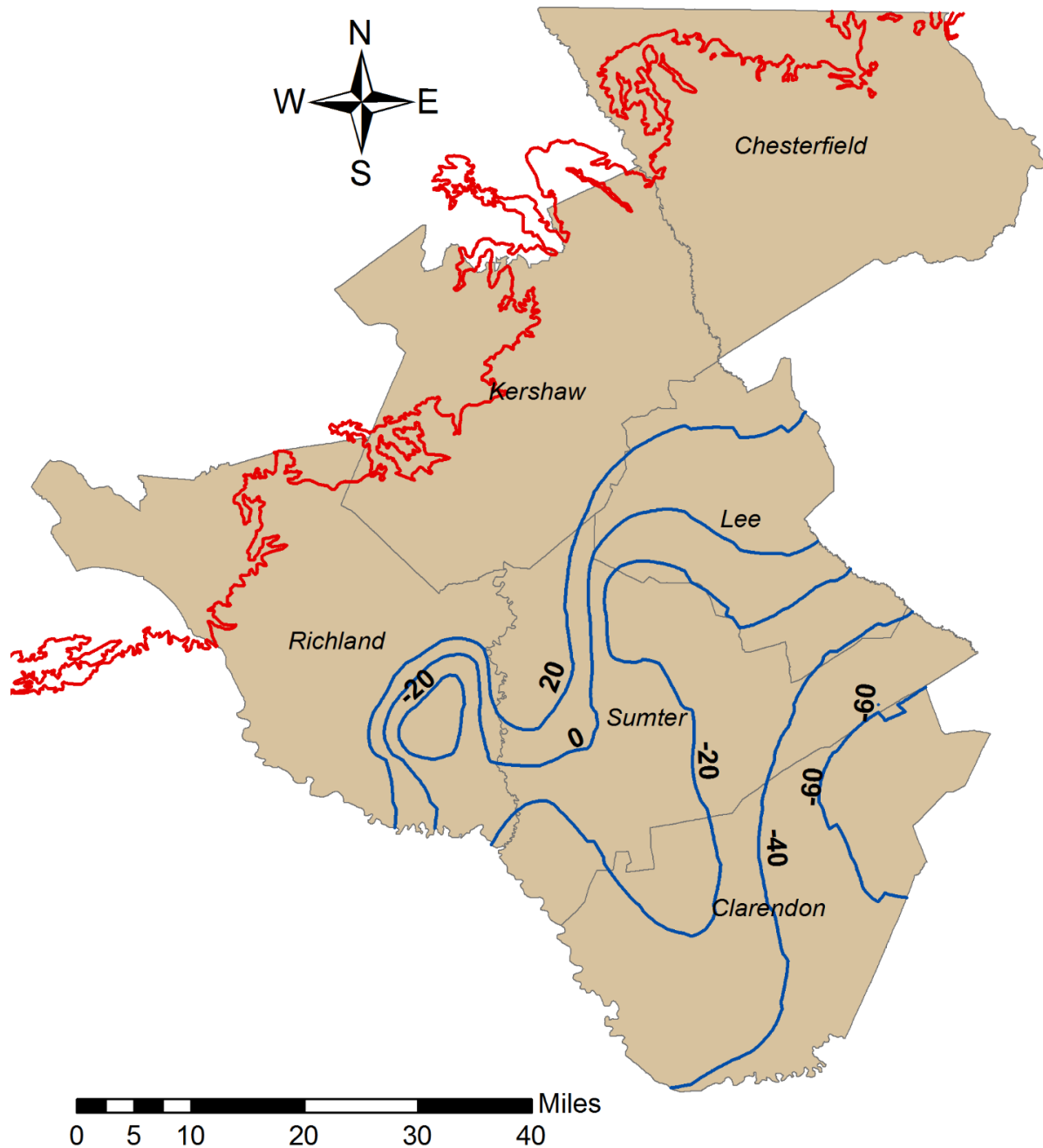
- Excessive groundwater withdrawal alters the water table or potentiometric surface resulting in:
 - changes to inland flow paths.
 - reverses in the normal off-shore direction of net groundwater flow.
- Reversal of groundwater flow at the coast can cause coastal water supply (and other) wells to become salty.



Crouch Branch: Pre-Development

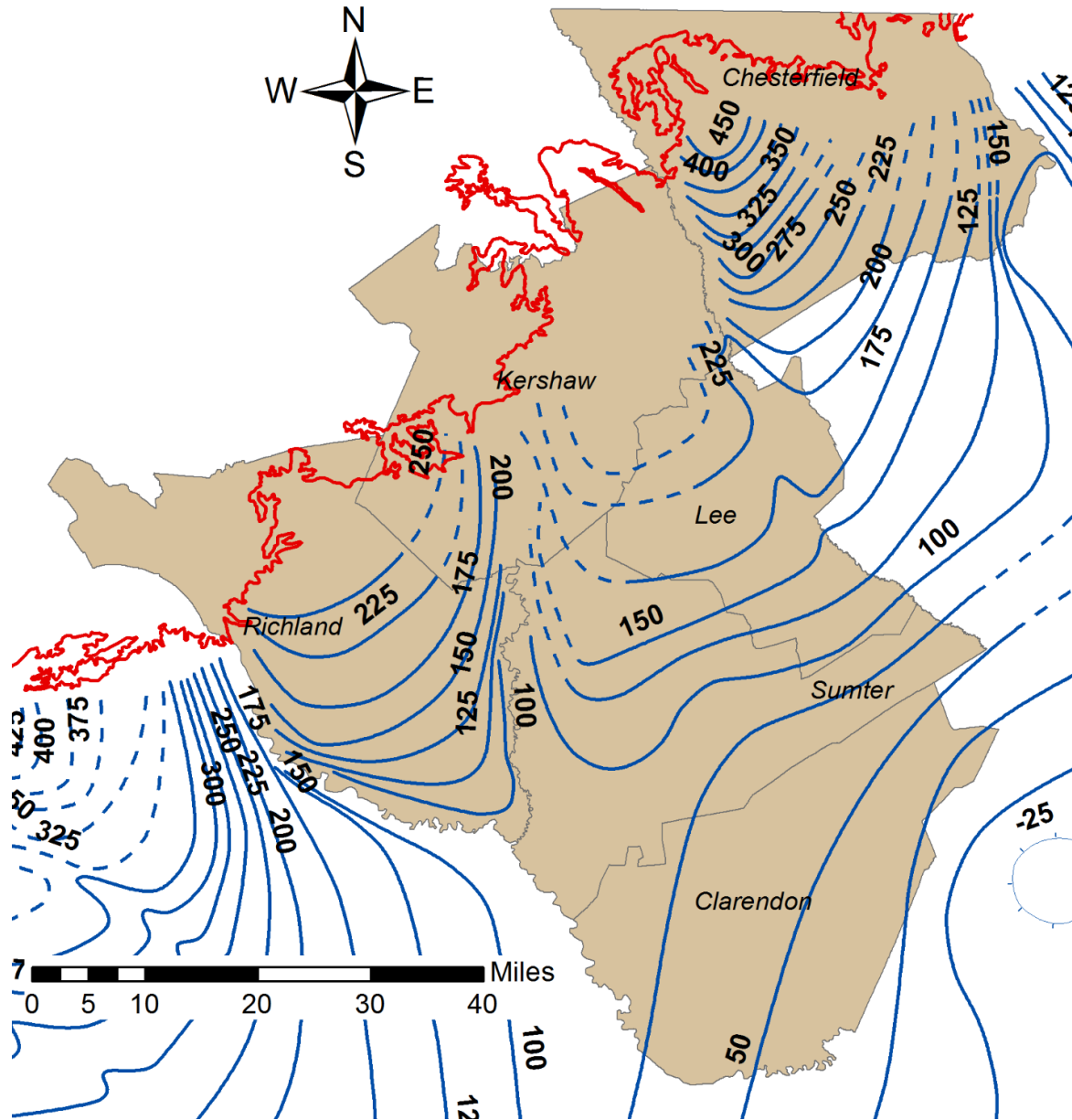


Crouch Branch: 2016

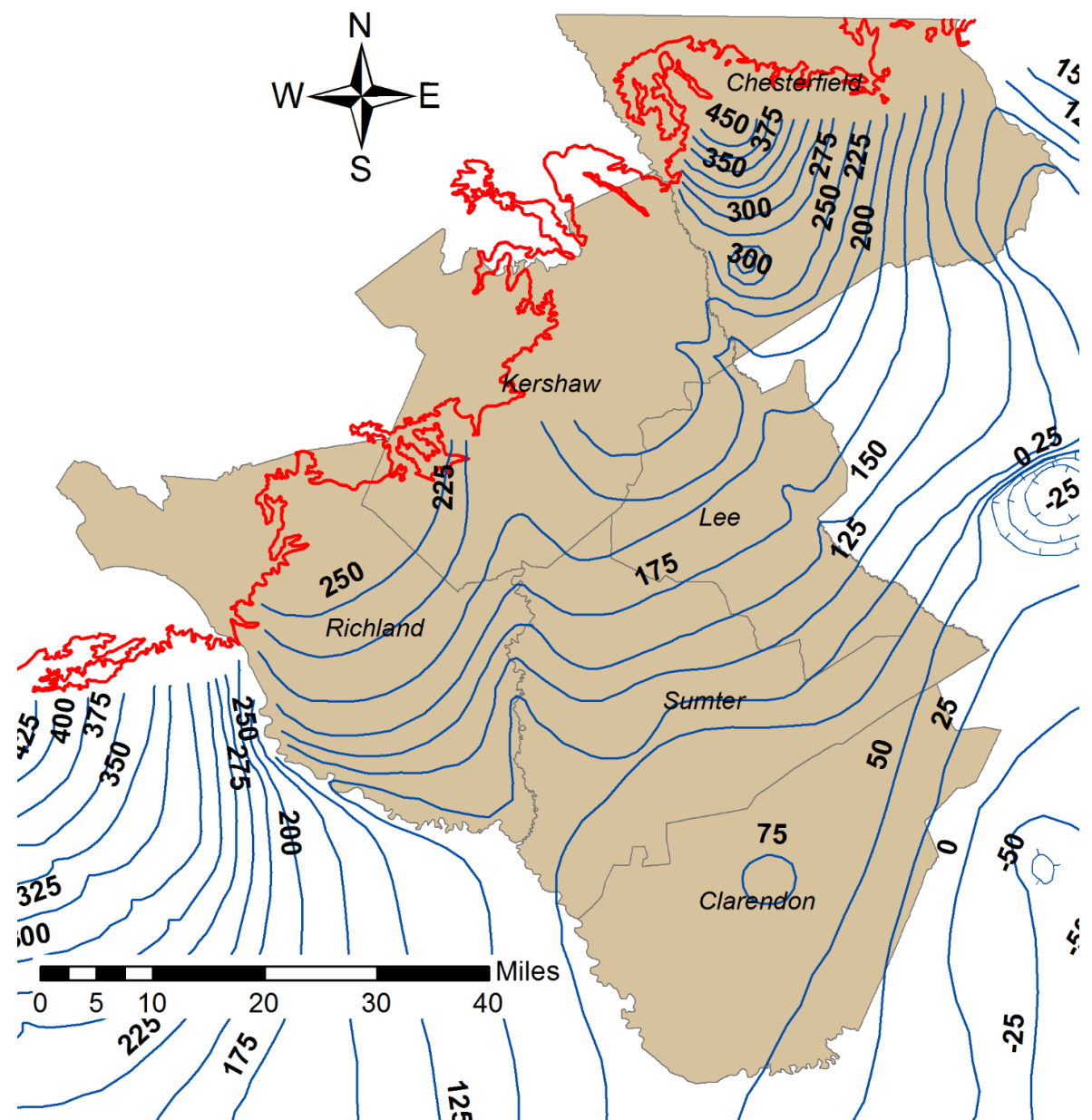


Crouch Branch Change in Water Level: Pre-Development to 2016

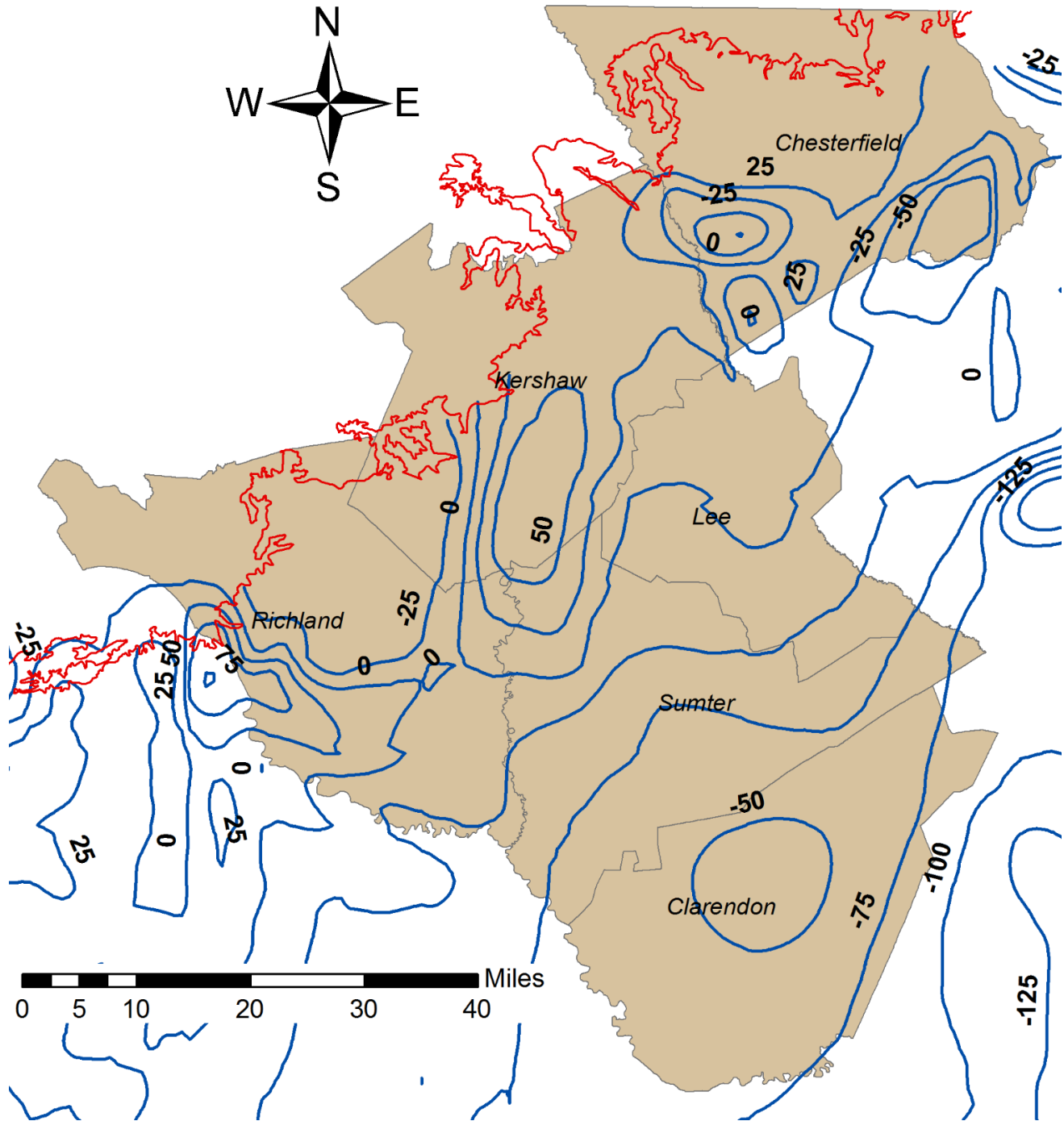
Potentiometric surface has declined in Sumter and Clarendon Counties more than 60 feet.



McQueen Branch (Middendorf): Pre-Development



McQueen Branch: 2019



McQueen Branch Change in Water Level: Pre-Development to 2019

Potentiometric surface has declined in south Richland, Sumter and Clarendon Counties more than 75 feet.



South Carolina Department of Health and Environmental Control

Summary and Next Steps

Groundwater Balance

Groundwater Deposits

Recharge
Surface water inflow
Water injection



Change in Groundwater Storage (Savings)

Lowering of water table
System compaction



Natural Withdrawals

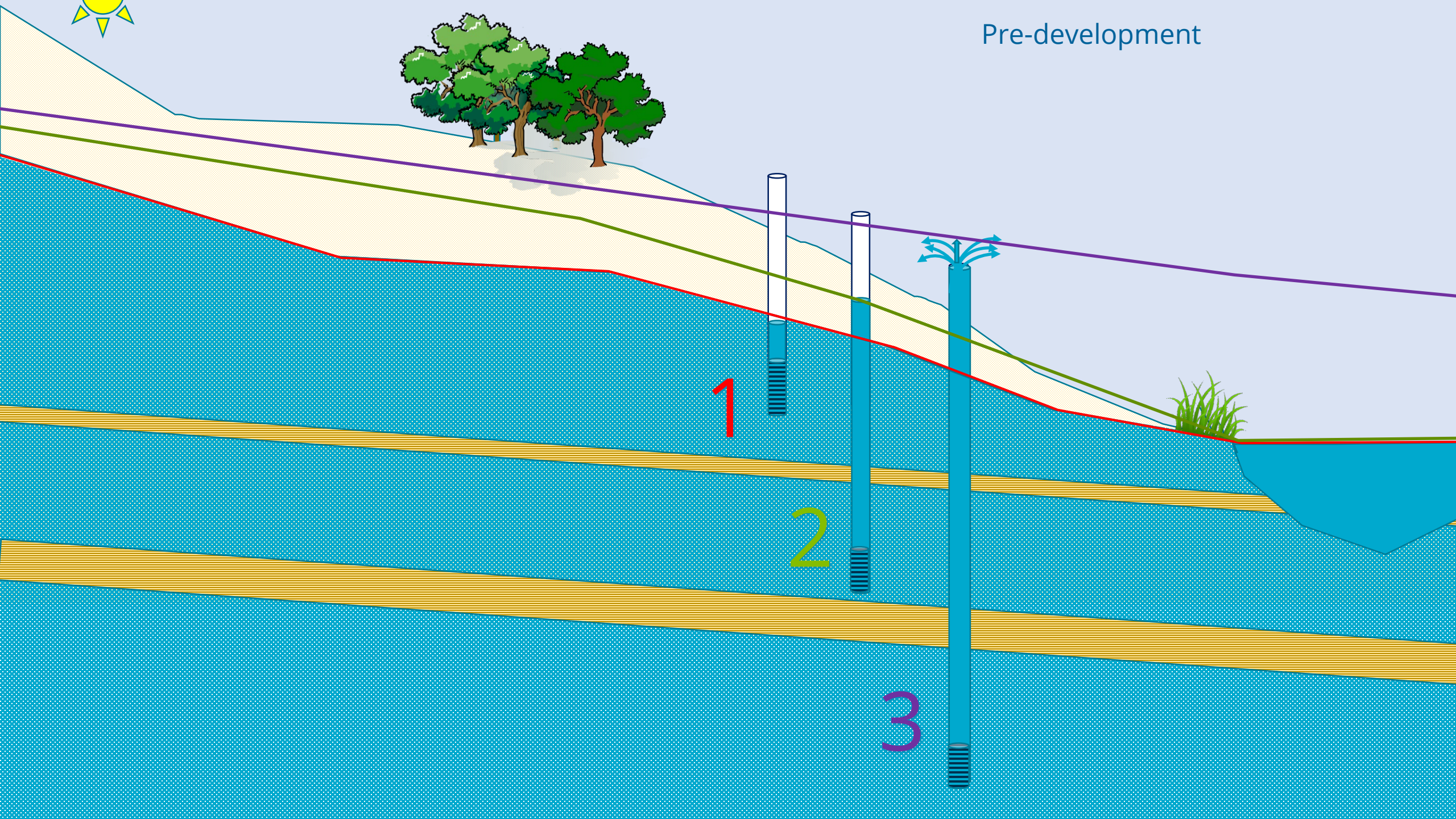
Surface water discharge
Springs
Evapotranspiration



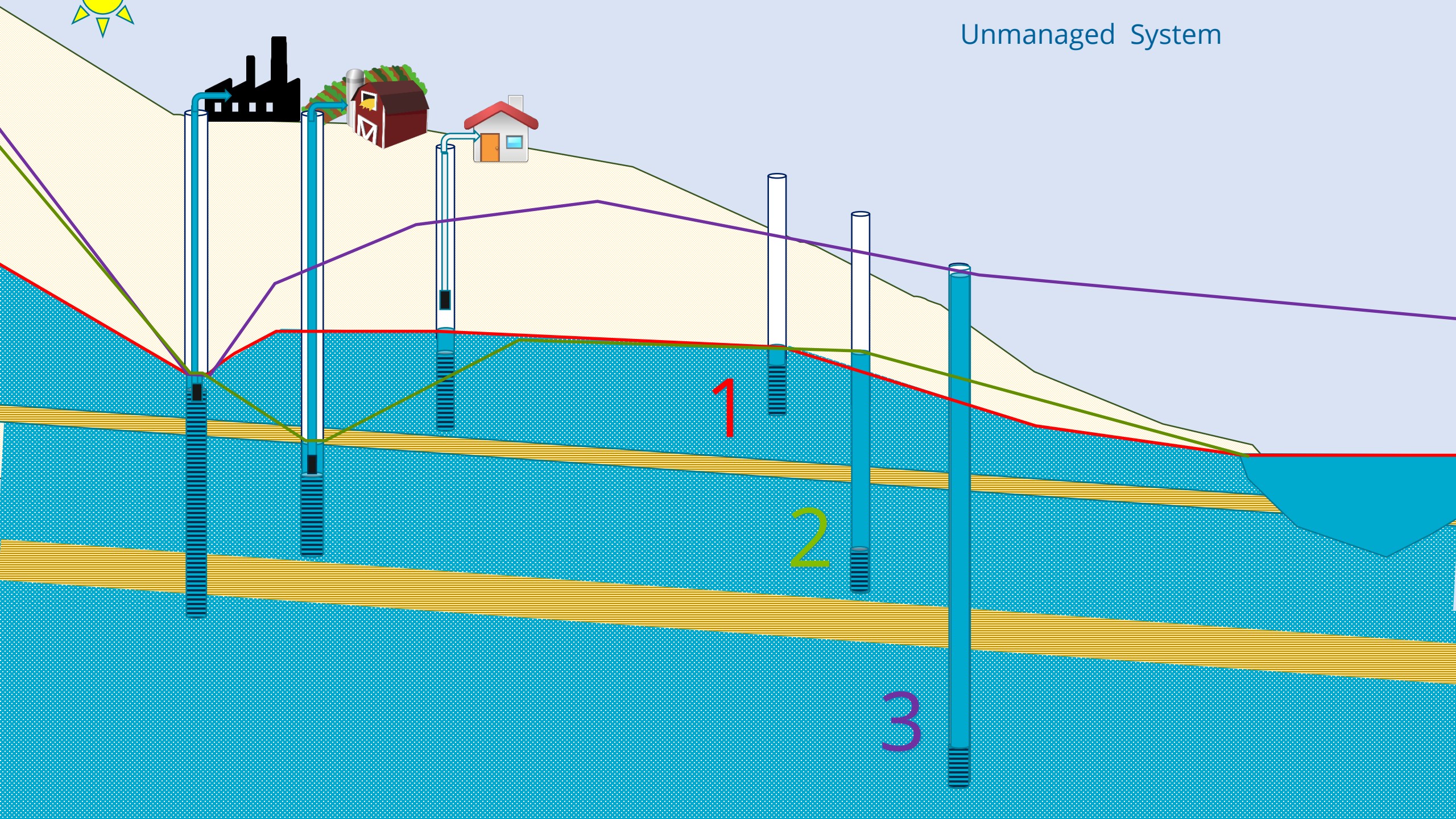
Well Withdrawals

Water supply
Industrial
Irrigation

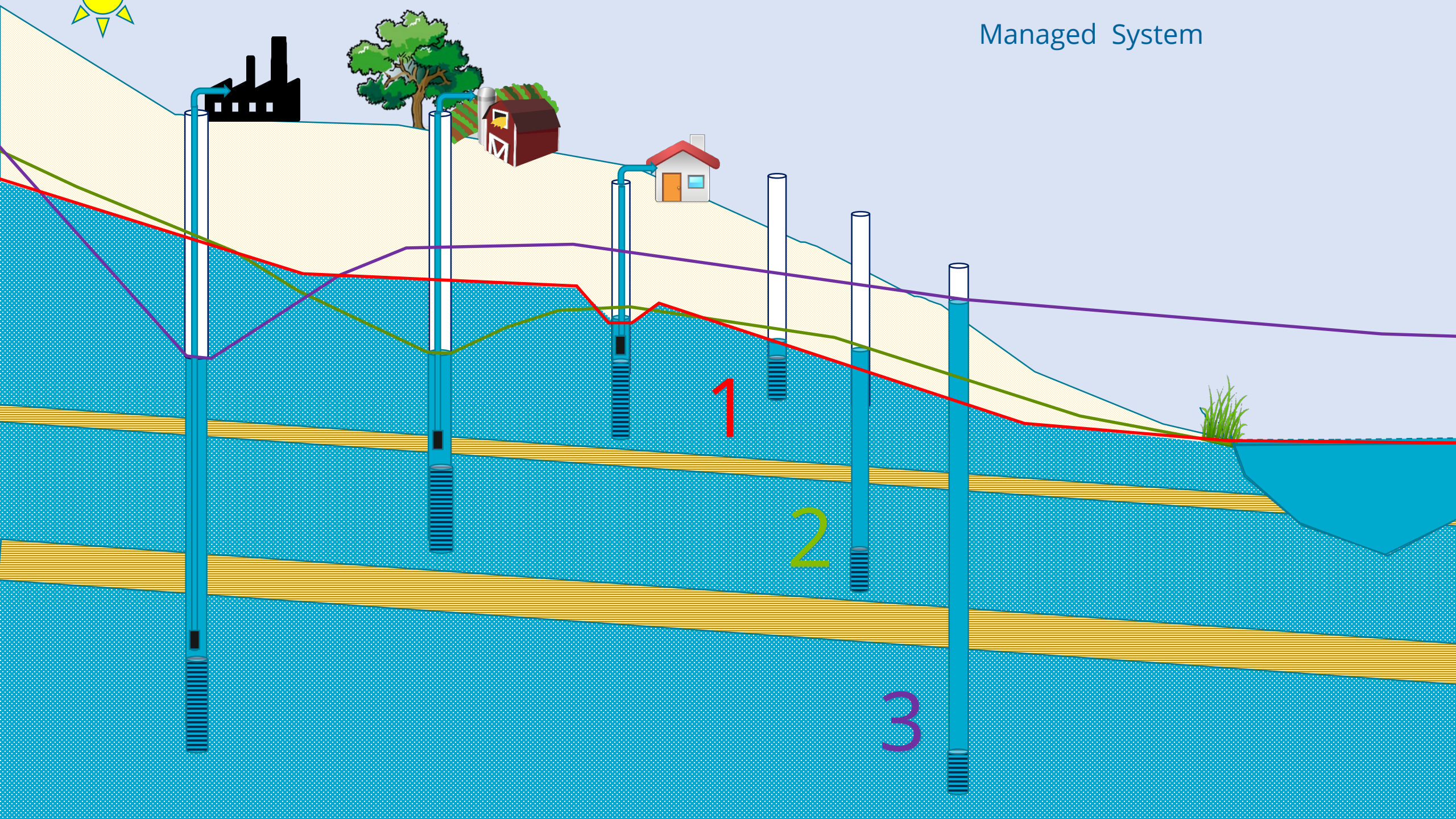
Pre-development



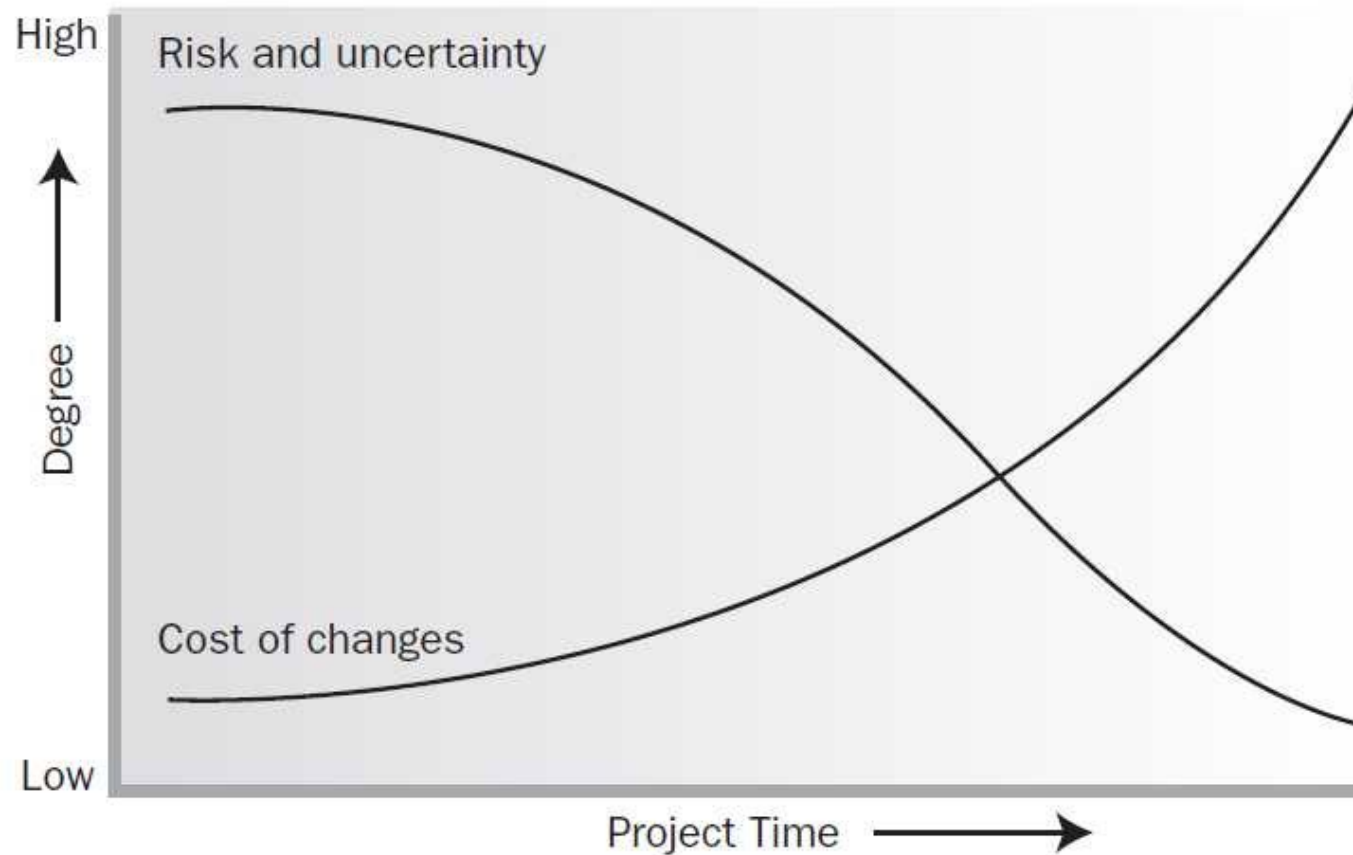
Unmanaged System



Managed System



Project Lifecycle



Capacity Use Designation is Appropriate

- Number of high capacity wells has 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

- Department will receive comments until February 13
- Notice of Public Hearing will be placed in State Register
- Public Hearing/ Presentation to the DHEC Board

Proposed Capacity Use Area Timeline *



* Subject to DHEC Board Approval

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

CONTACT US

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Stay Connected



How to Participate



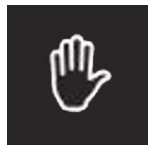
Click the Hand Raise icon to be called on to speak



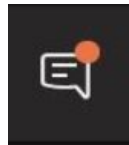
Questions may be typed into the chat & will be addressed as time allows



Unmute with the microphone icon or by dialing *6 on your phone when called on to speak



Hand Raise
(click this icon to indicate you would like to speak)



Chat
(type to share a question)



Unmute
(click the microphone icon to unmute when called upon)

