Water Resources of the Edisto Basin

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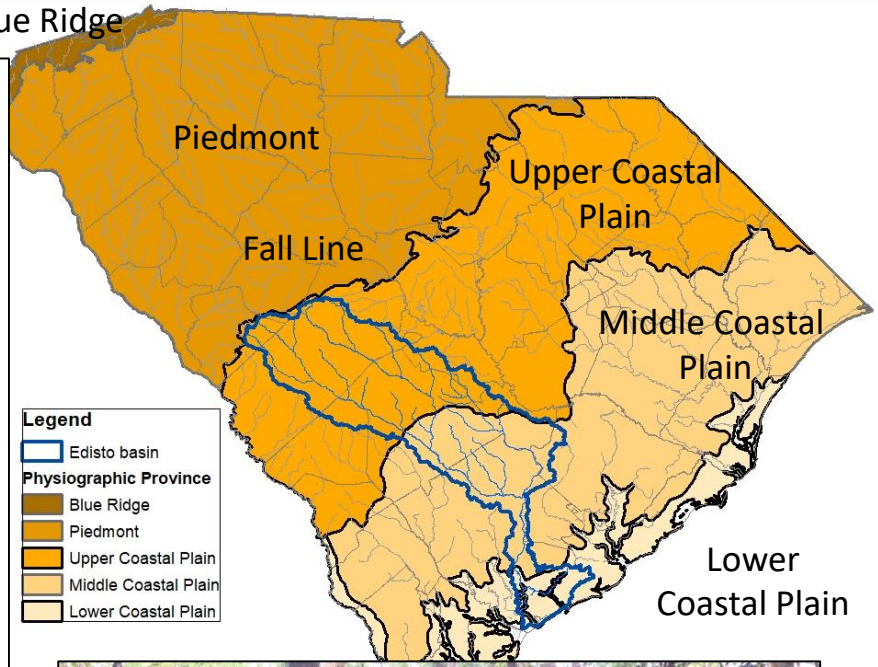
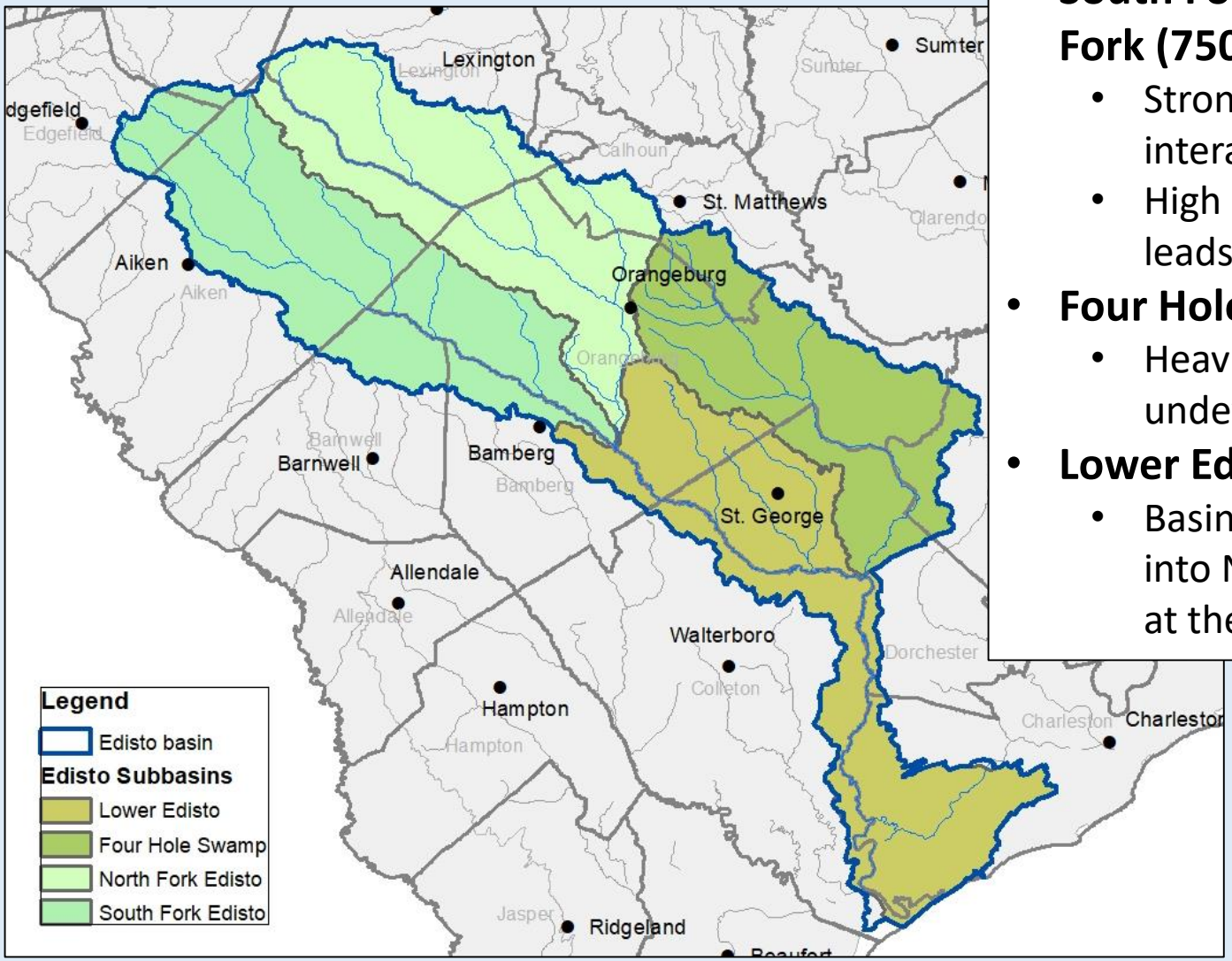
Edisto Basin Overview

Basin Description:

- 3,120 sq. mi. (10% of SC).
- 250 miles in length → over 6800 miles of perennial and intermittent streams.
  - One of the longest freely flowing blackwater streams in the U.S.
- Upper extent approximates the Fall Line.
- Upper Coastal Plain:
  - High local relief with incised streams.
  - Elevations ranging 500-600 ft. on hills to 325 ft. along the rivers.
- Topography flattens out towards Middle and Lower Coastal Plain.
- No large impoundments (ponds on tributary headwaters prevalent).
- Characterized by extensive swamplands and flood plains.



Edisto Basin – Surface Water Resources

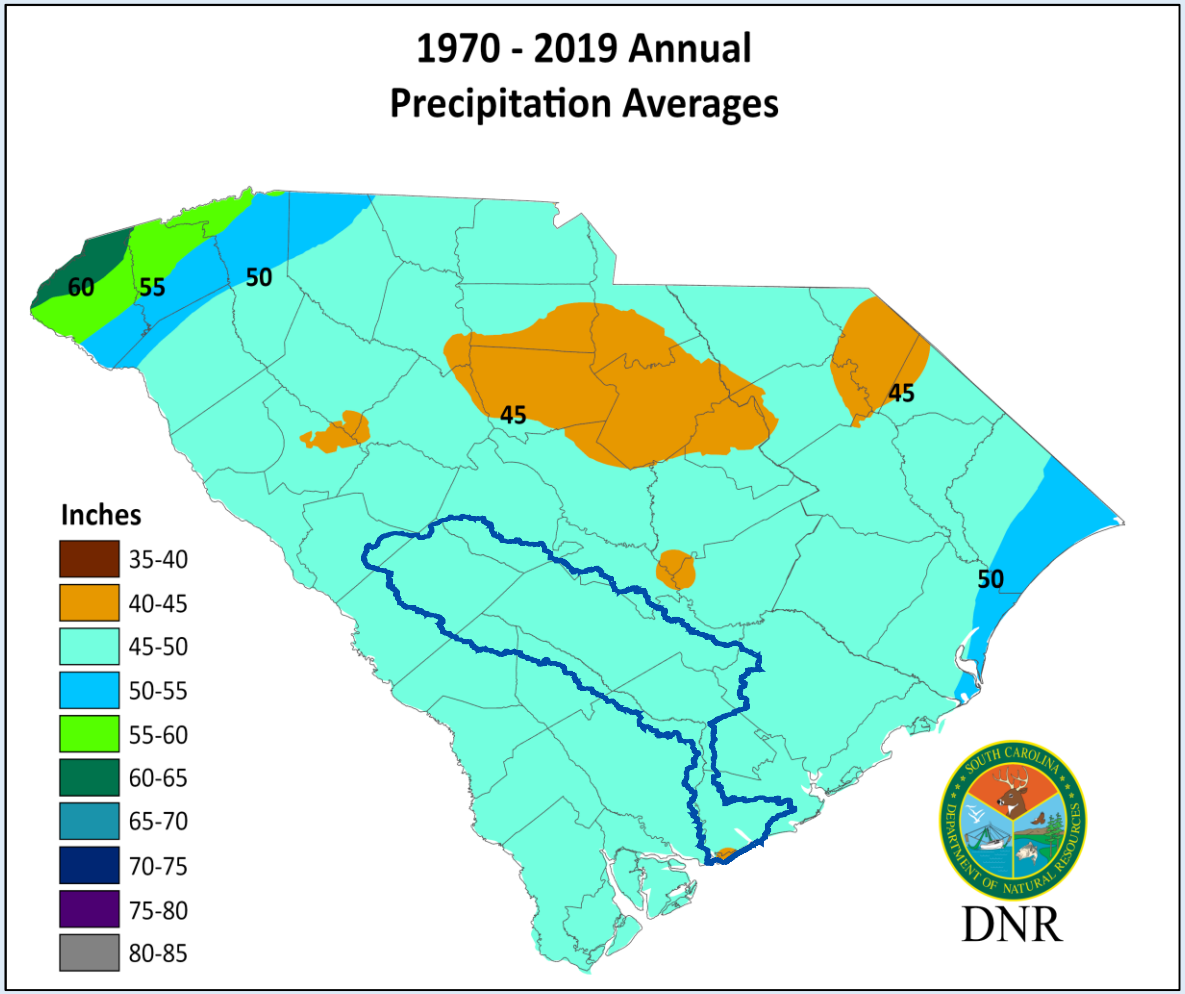


4 major subbasins:

- **South Fork (870 mi²)**and **North Fork (750 mi²)** subbasins:
  - Strong surface-groundwater interactions.
  - High baseflow contribution leads to well sustained flows.
- **Four Hole Swamp (650 mi²)**
  - Heavily braided, undeveloped.
- **Lower Edisto (850 mi²)**
  - Basin narrows before dividing into North and South Edisto at the coast.

Historical Rainfall

- Average annual rainfall varies from 46” in the upper basin to 48” near the coast.
- Parts of basin have experienced annual rainfalls as little as 27” (1954) and as much as 71” (1964) over period of record.



Edisto Basin Rainfall Patterns

Central Climate Division – Average Annual Rainfall and 5-year Running Average

Green → Wetter Periods
Brown → Drier Periods

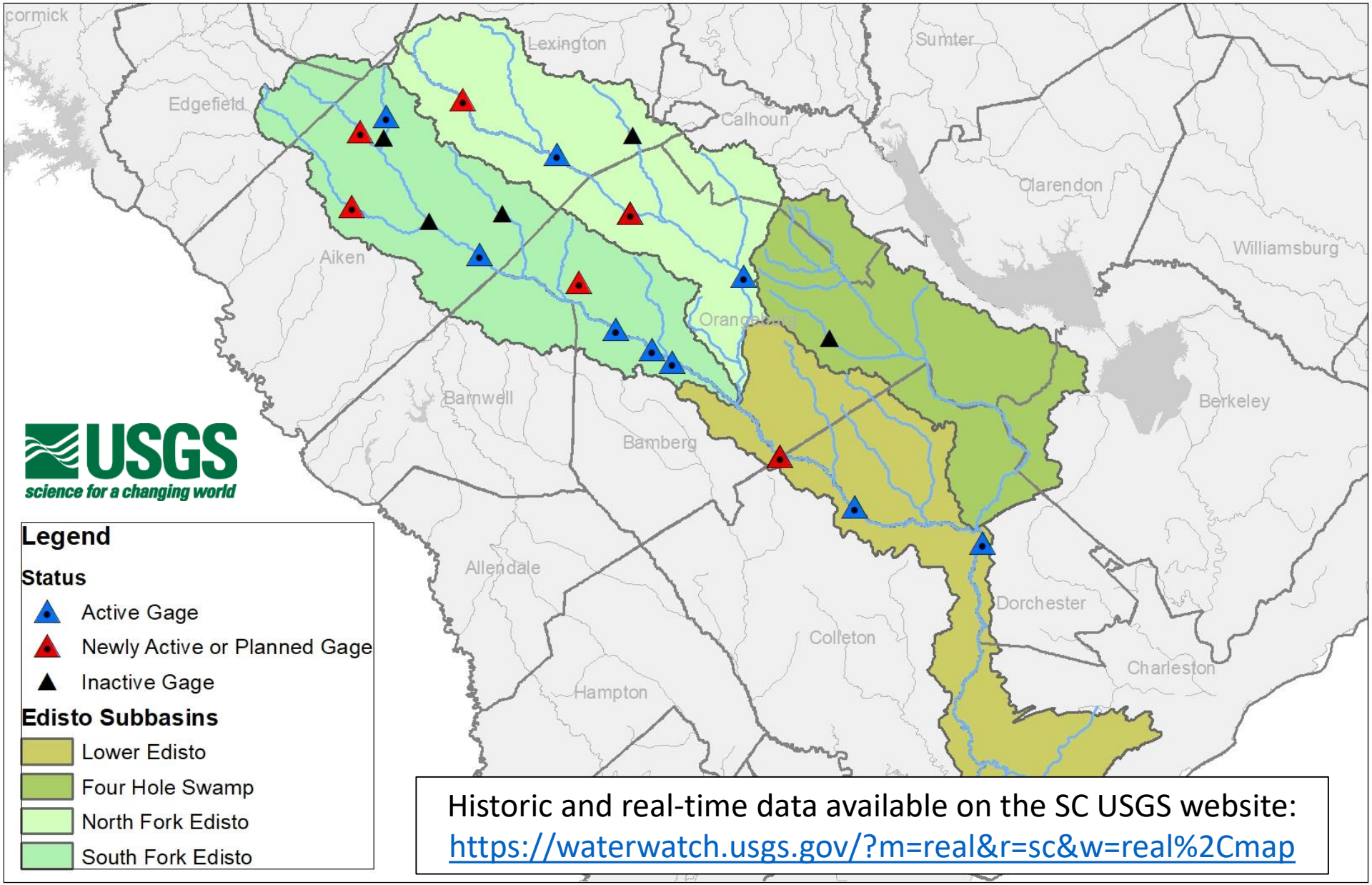
Precipitation

76.25 in
66.25 in
56.25 in
46.25 in
36.25 in
26.25 in

1895
1920
1950
1980
2010
2020

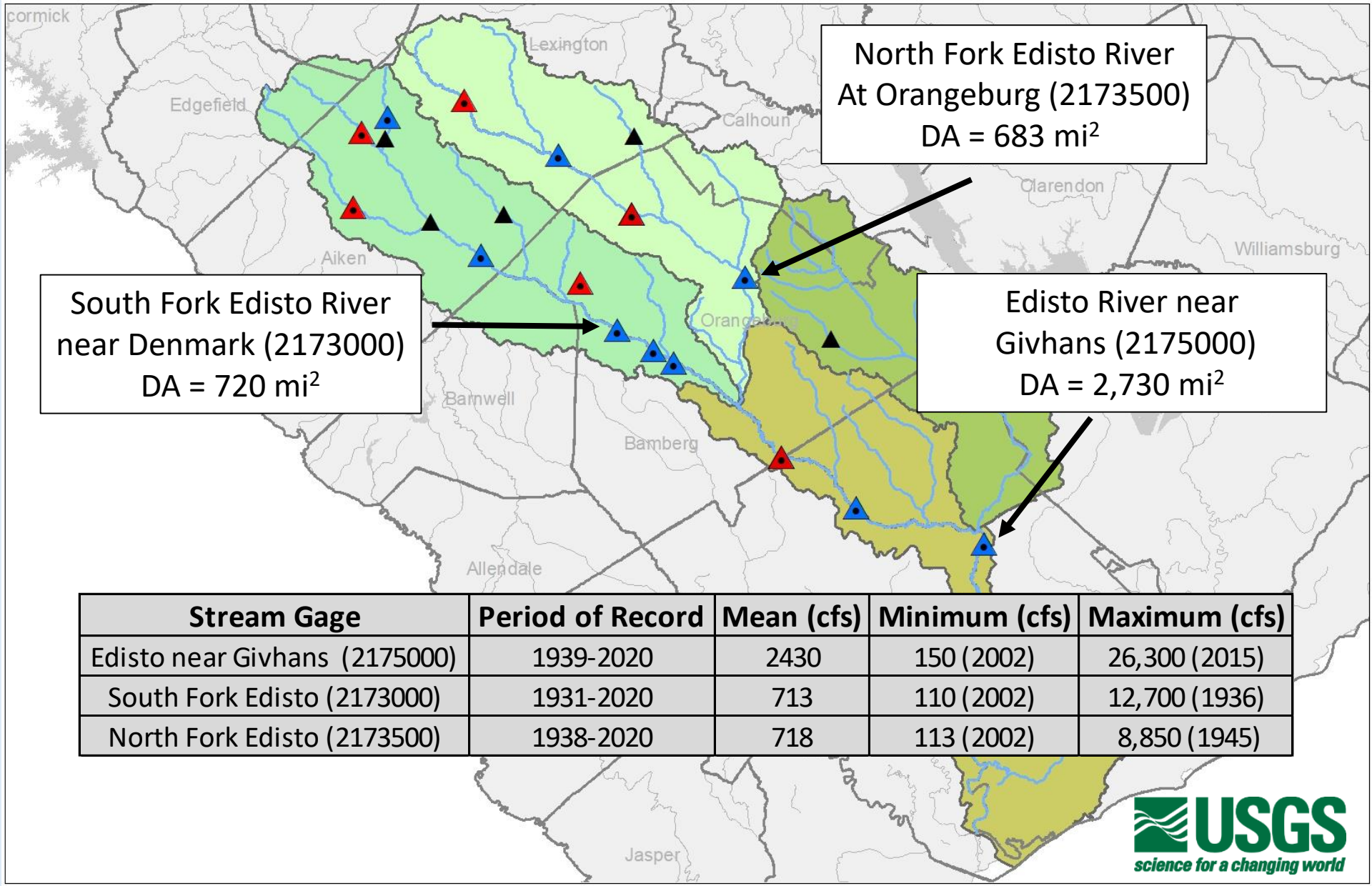
SCIPP (www.south

Surface Water Monitoring Network



Historic and real-time data available on the SC USGS website:
https://waterwatch.usgs.gov/?m=real&r=sc&w=real%2Cmap

Surface Water Monitoring Network



Stream Gage	Period of Record	Mean (cfs)	Minimum (cfs)	Maximum (cfs)
Edisto near Givhans (2175000)	1939-2020	2430	150 (2002)	26,300 (2015)
South Fork Edisto (2173000)	1931-2020	713	110 (2002)	12,700 (1936)
North Fork Edisto (2173500)	1938-2020	718	113 (2002)	8,850 (1945)

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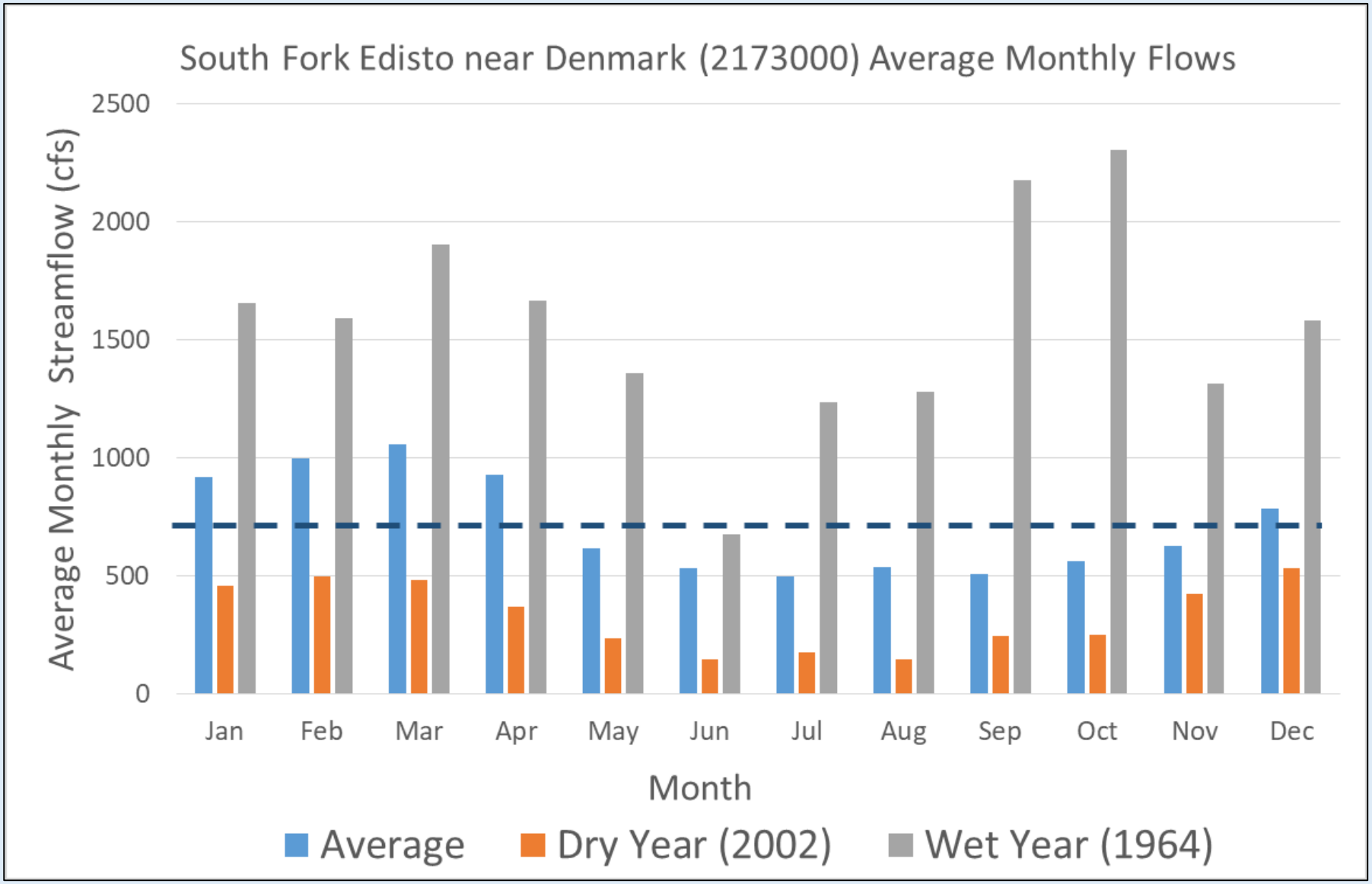
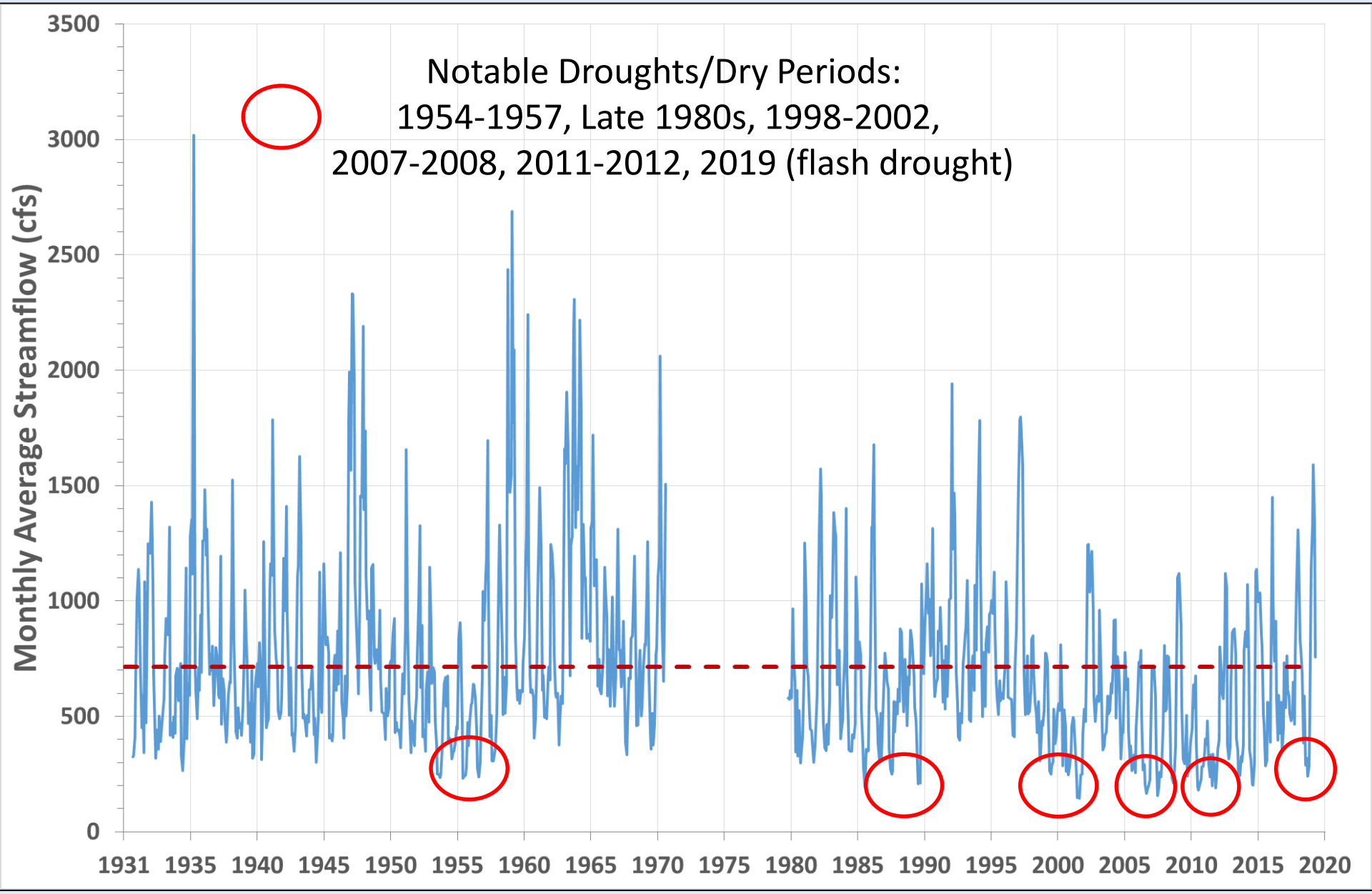
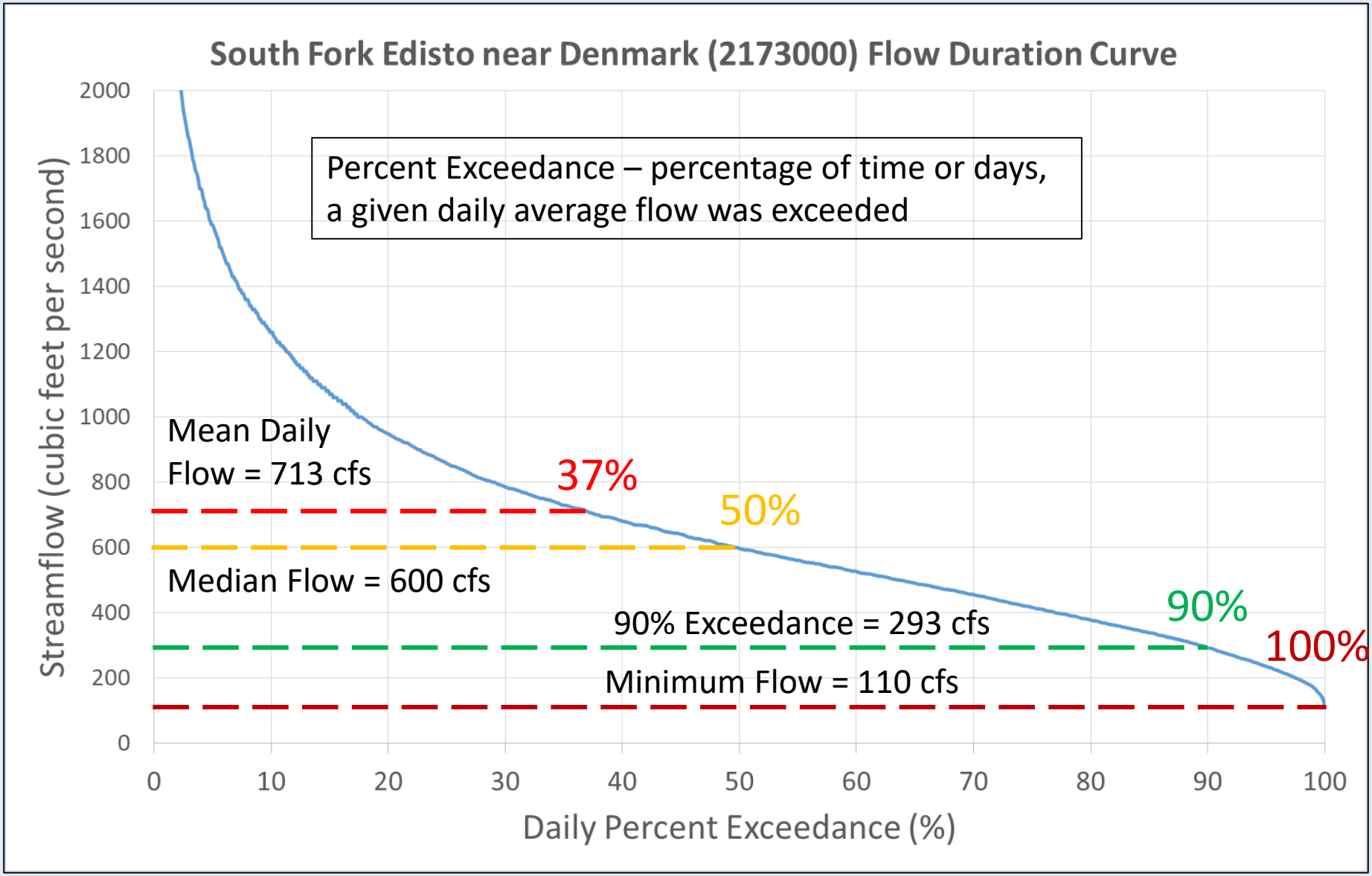
Monthly Streamflow Statistics



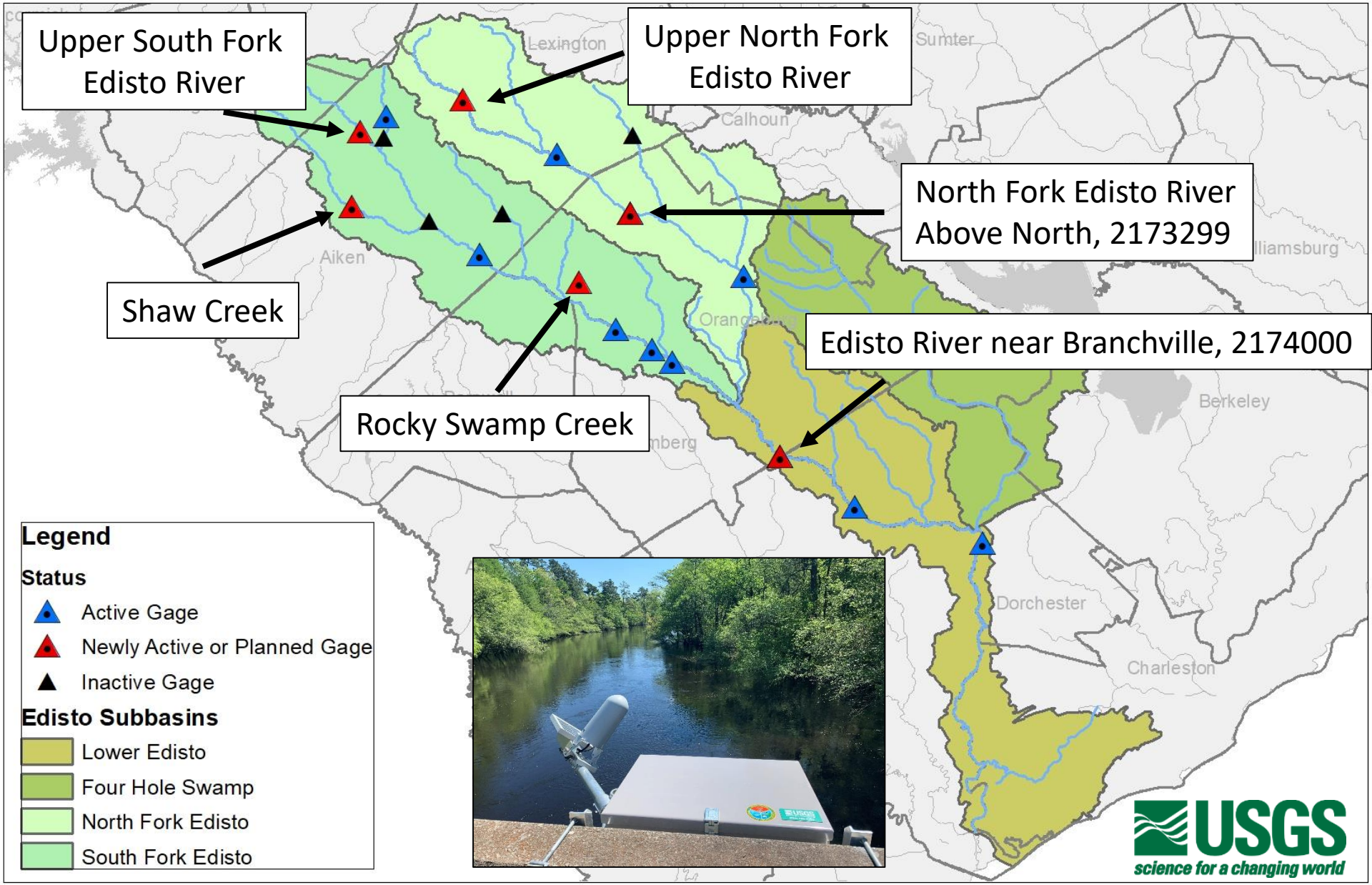
South Fork Edisto near Denmark (2173000)
Monthly Average Flows (cfs), 1931-2020



Flow Duration Curve



New USGS Surface Water Monitoring Sites



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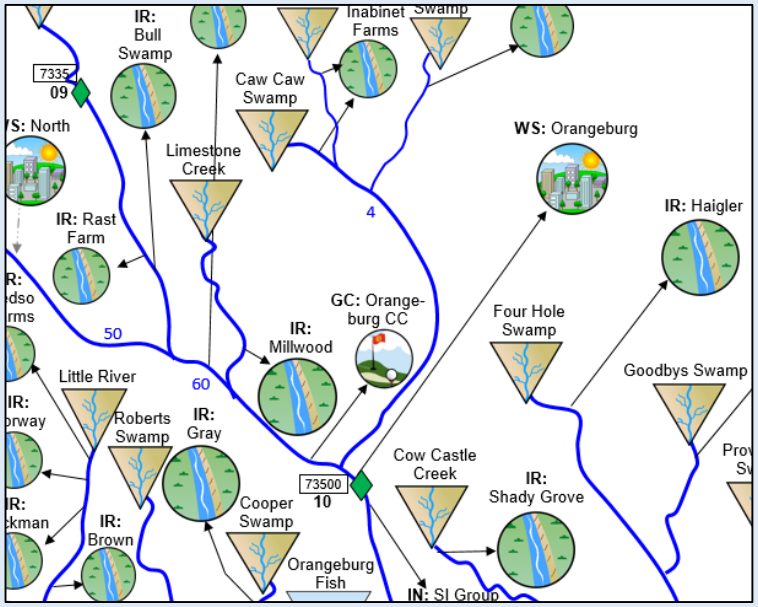
Edisto Surface Water Model (SWAM)

- Simplified Water Allocation Model (SWAM)
- Originally completed in 2017
- Updated in 2020:
  - Inflow period of record extended through 2018.
  - Added new permits and registrations.
  - Removed inactive users.
- RBC will evaluate 4 scenarios:
  - Current Water Use
  - Maximum Permitted and Registered Use
  - Business-As-Usual Water Demand
  - High Water Demand
- 2017 model is available on the SCDNR website
  - *Updated model will be posted soon*

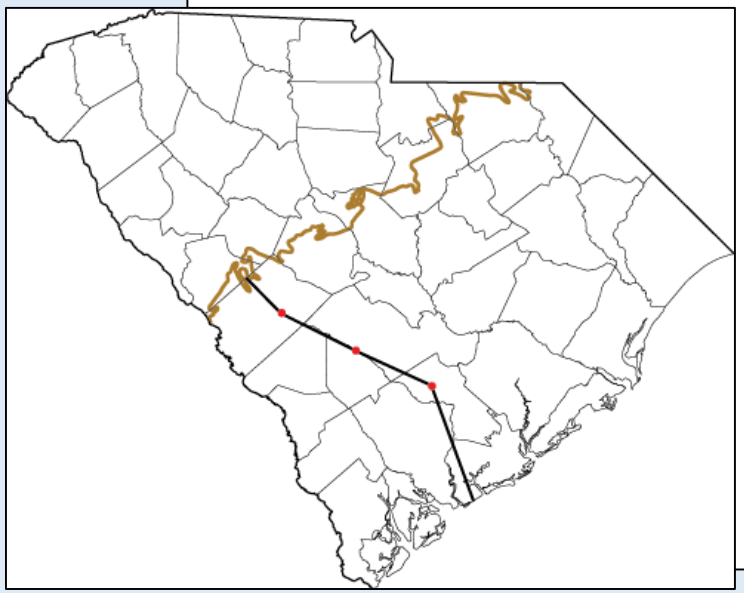


SWAM is a decision-making tool used to assess surface water availability and management strategies, and will support the development of River Basin Plans

http://hydrology.dnr.sc.gov/surface-water-models.html

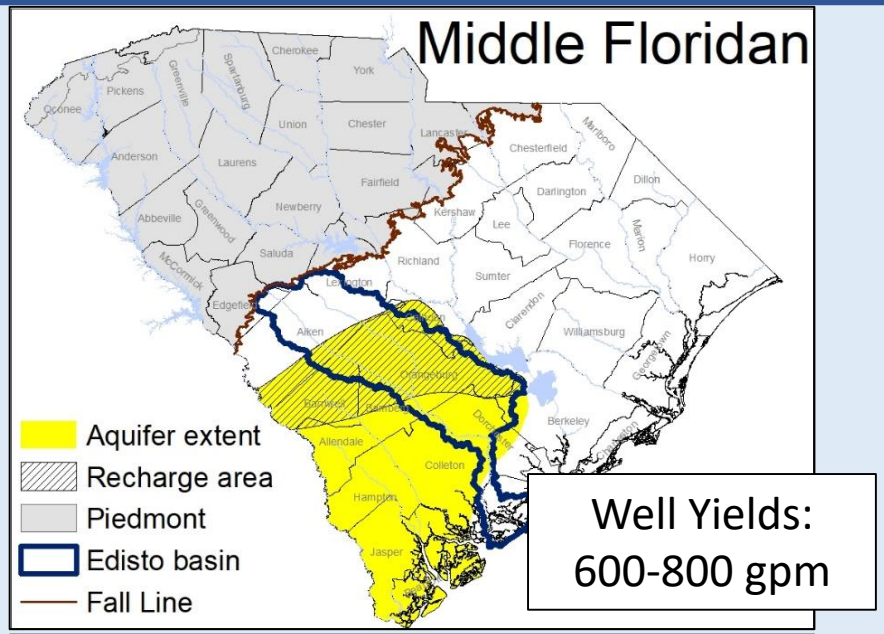
Groundwater Resources

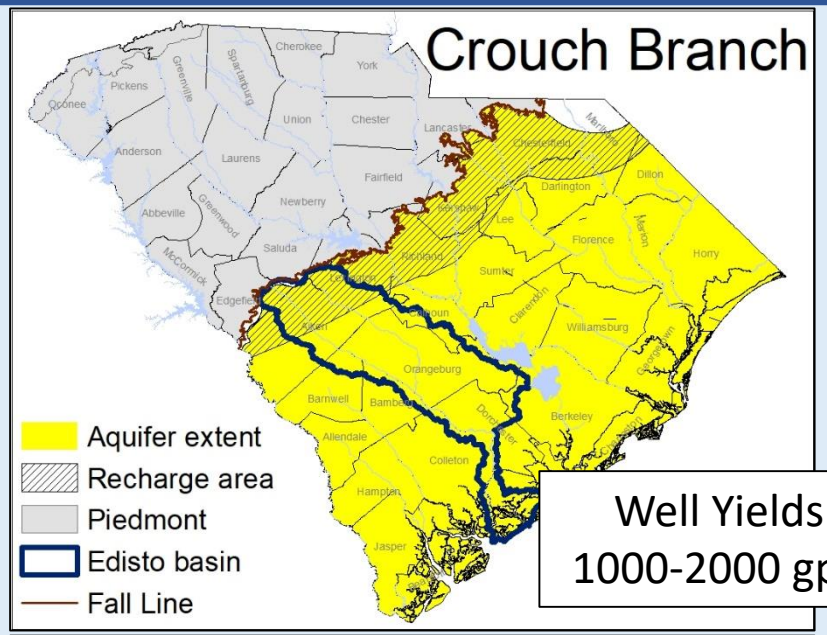
Coastal Plain Aquifer System

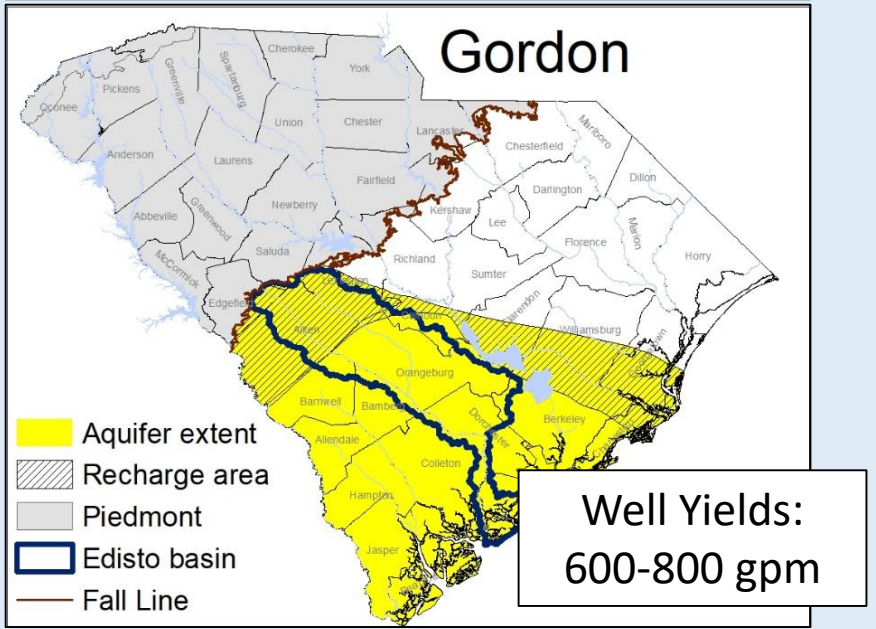


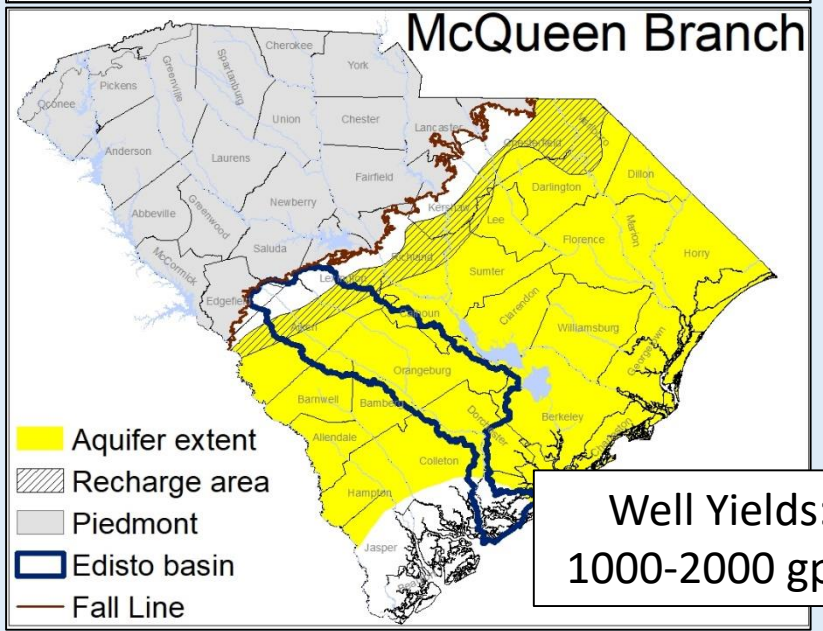
Fall Line (Aiken Co.)
Aiken State Park (Aiken Co.)
Cope Power Plant (Orangeburg Co.)
St. George (Dorchester Co.)
Coastline (Colleton Co.)
Aquifer
Confining unit
500 feet
1,000 feet
2,000 feet
3,000 feet
not drawn to scale
Gordon aquifer
Crouch Branch aquifer
McQueen Branch aquifer
Middle Floridan aquifer
Surficial aquifer
Gordon aquifer
Crouch Branch aquifer
McQueen Branch aquifer
Charleston aquifer
Gramling aquifer
SOUTHEASTERN COASTAL PLAIN HYDROGEOLOGIC PROVINCE

Aquifer Extents and Recharge Areas

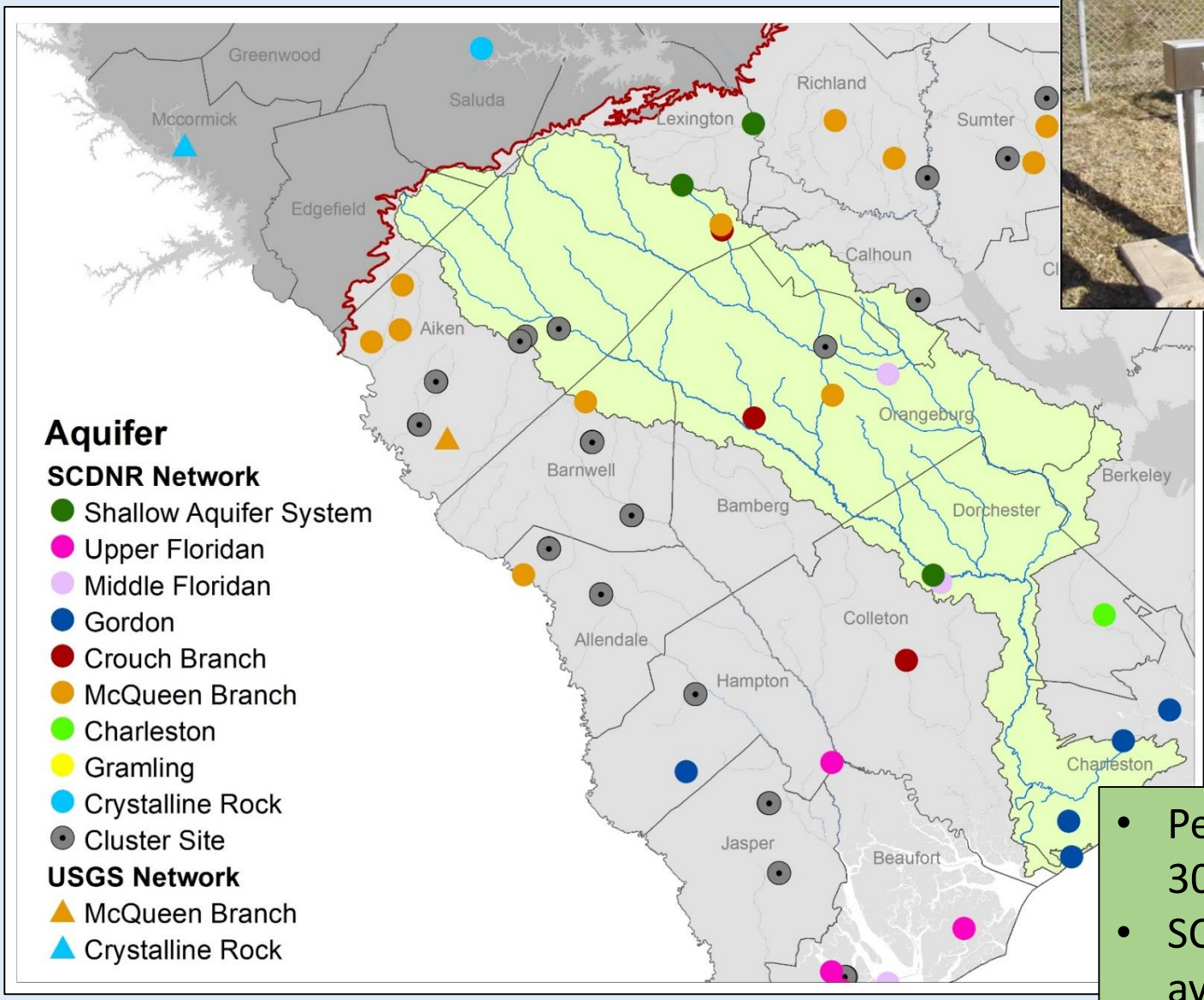






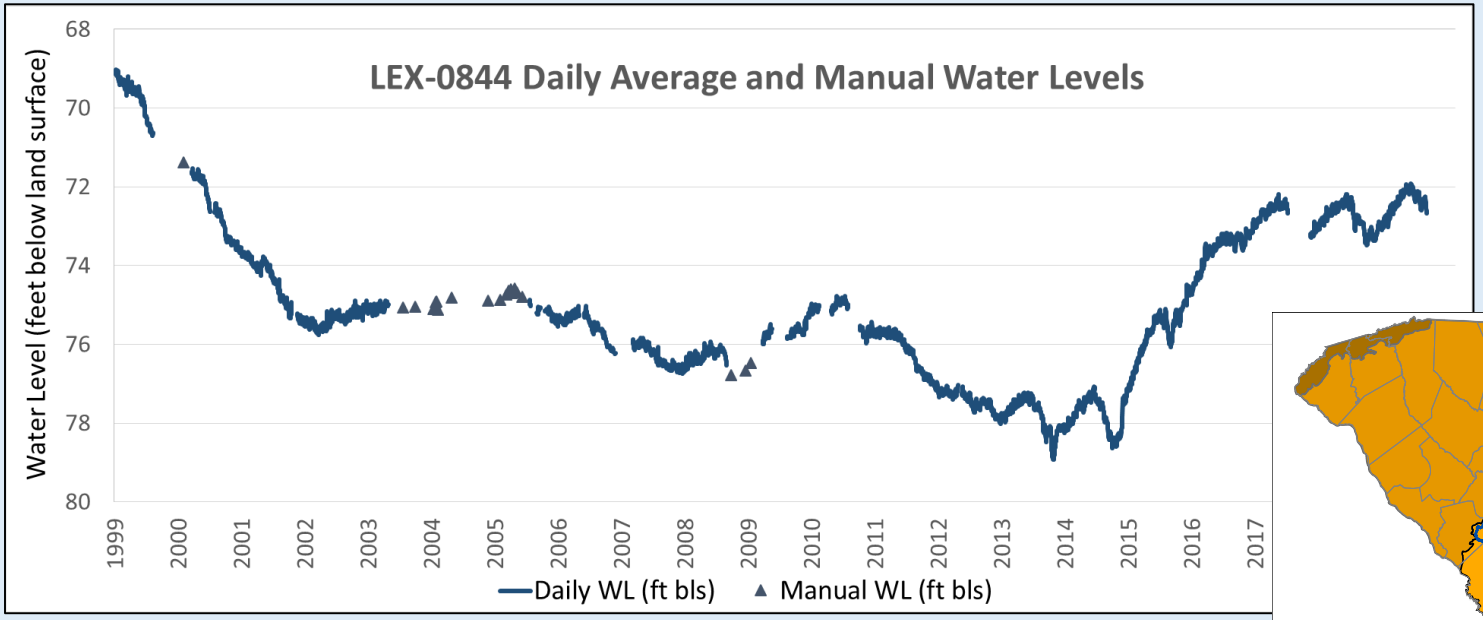


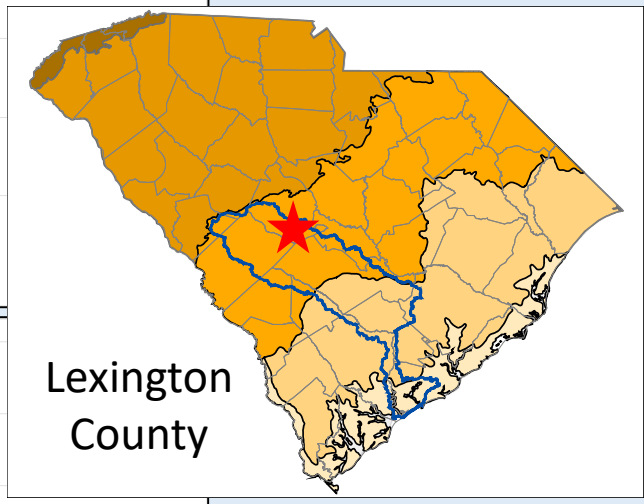
Groundwater Monitoring

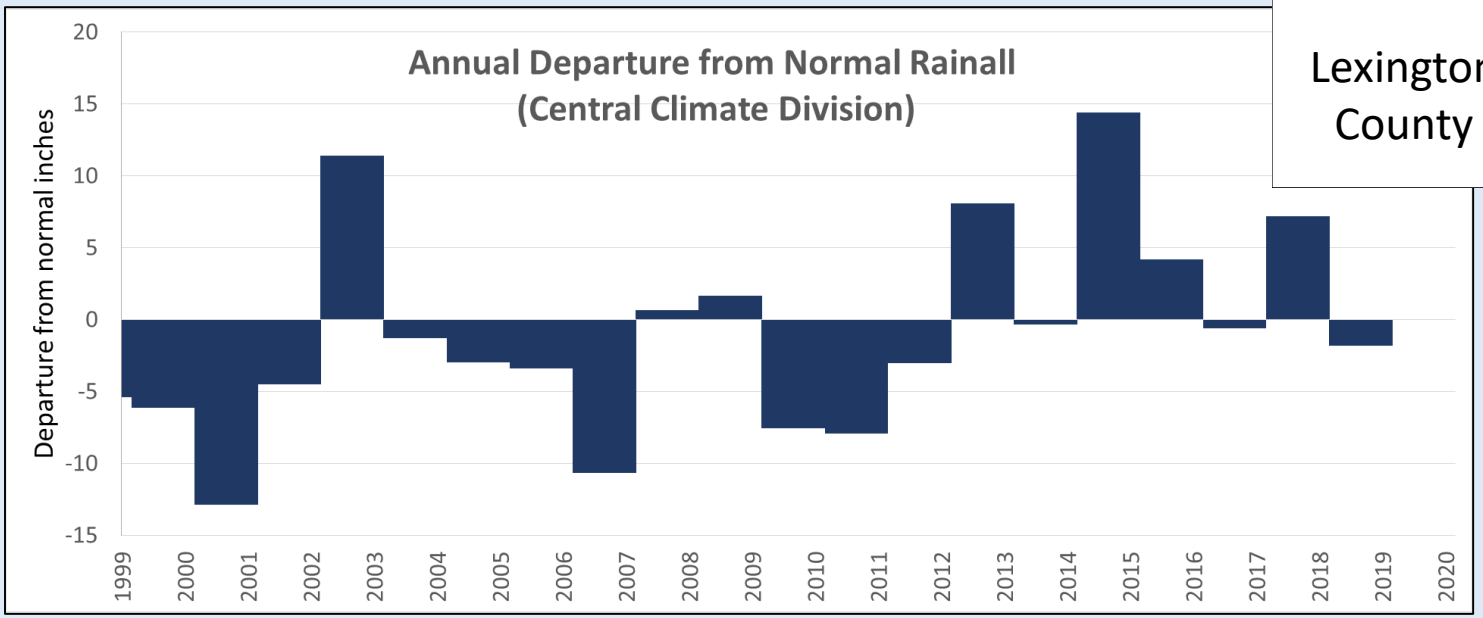


- Period of Record: 1 to 30+ years.
- SCDNR Data Reports available.

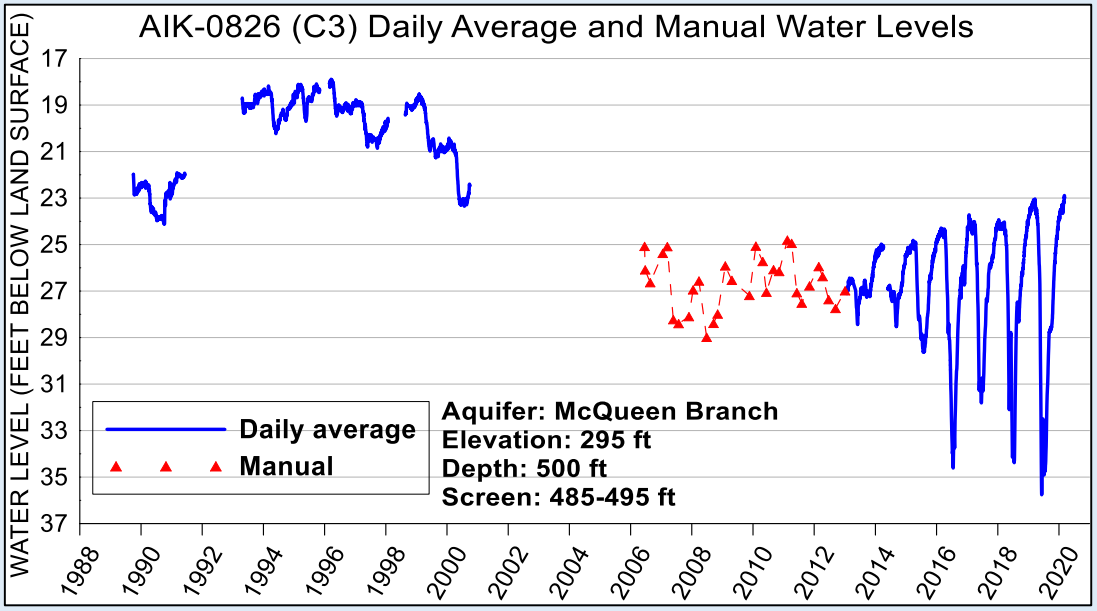
Groundwater Levels and Recharge

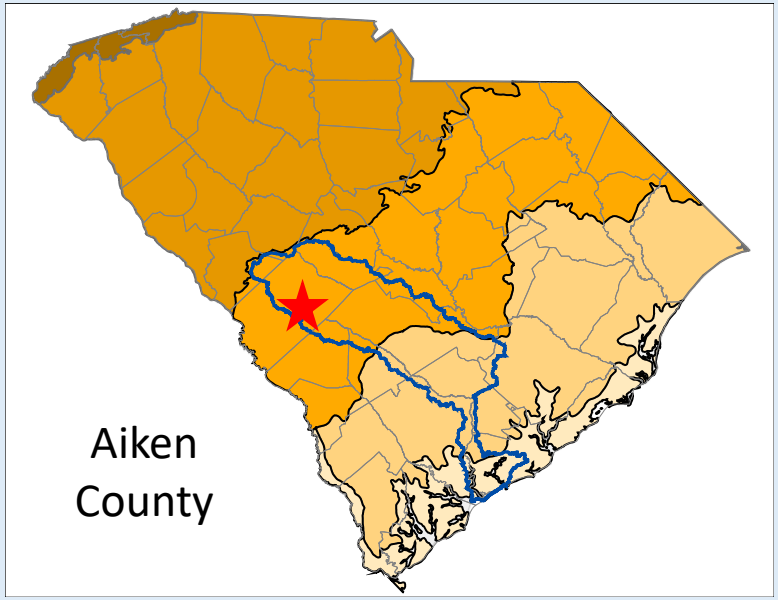


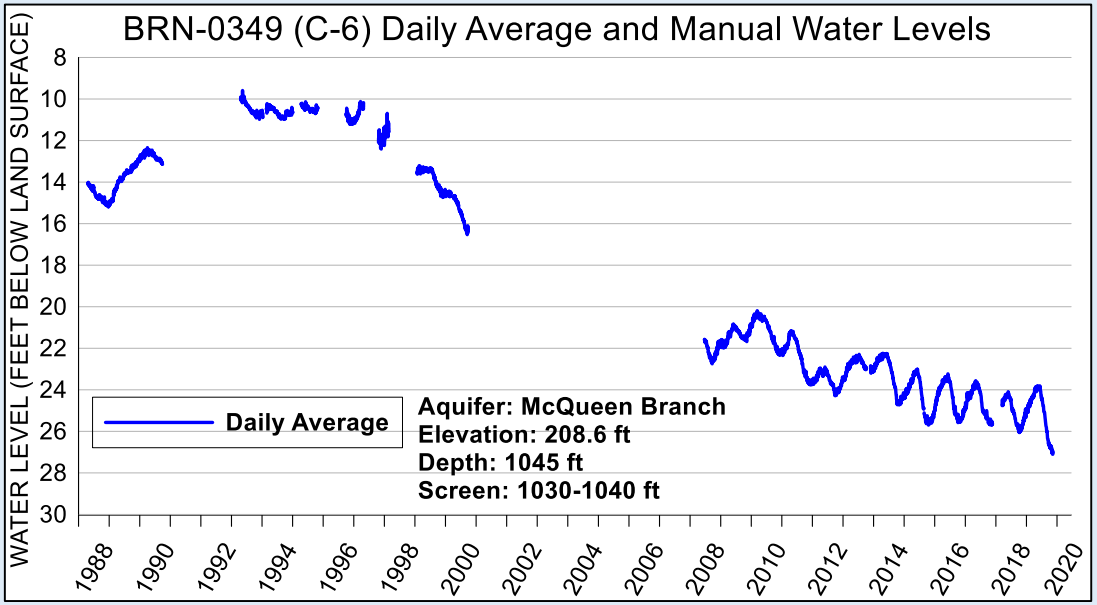


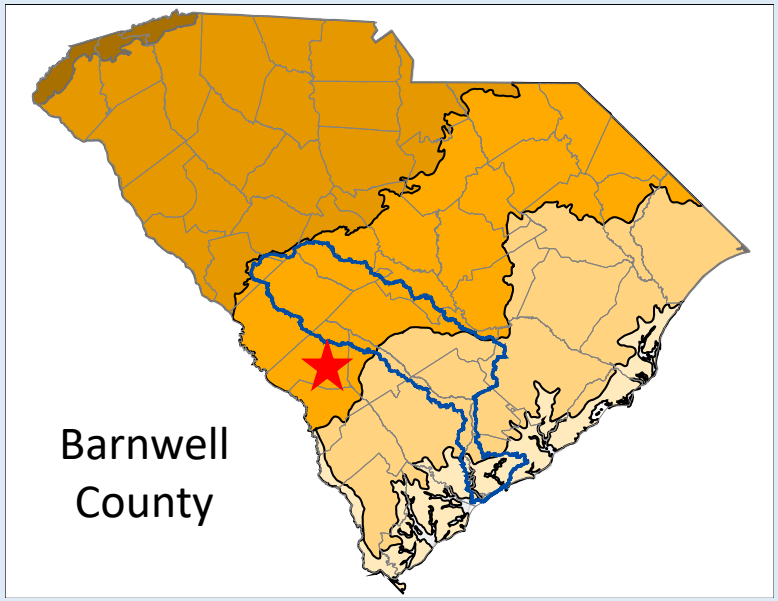


Groundwater-Level Data for McQueen Branch

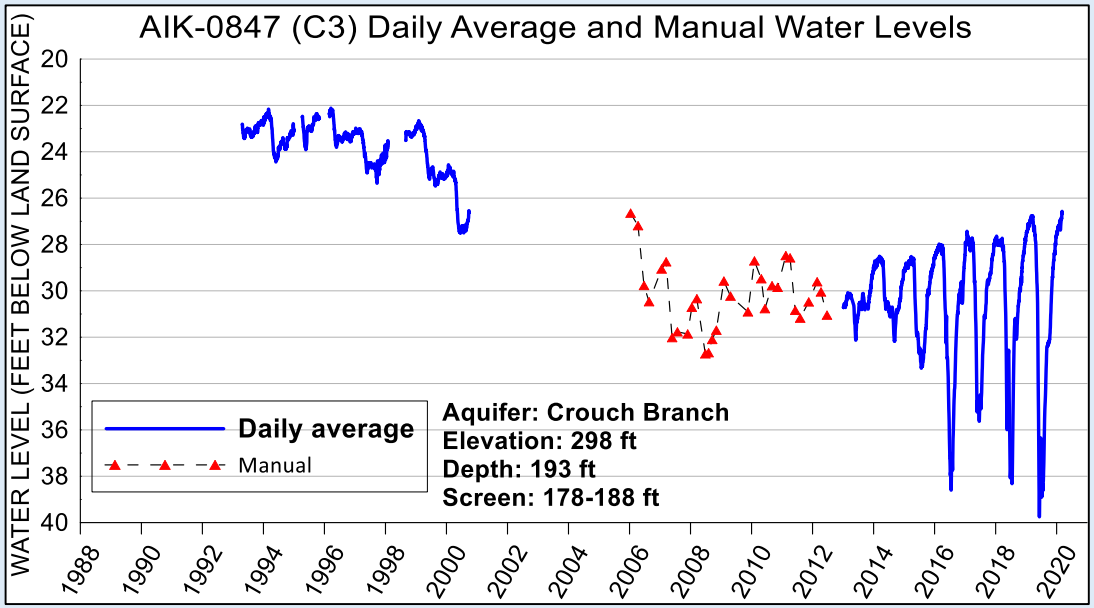


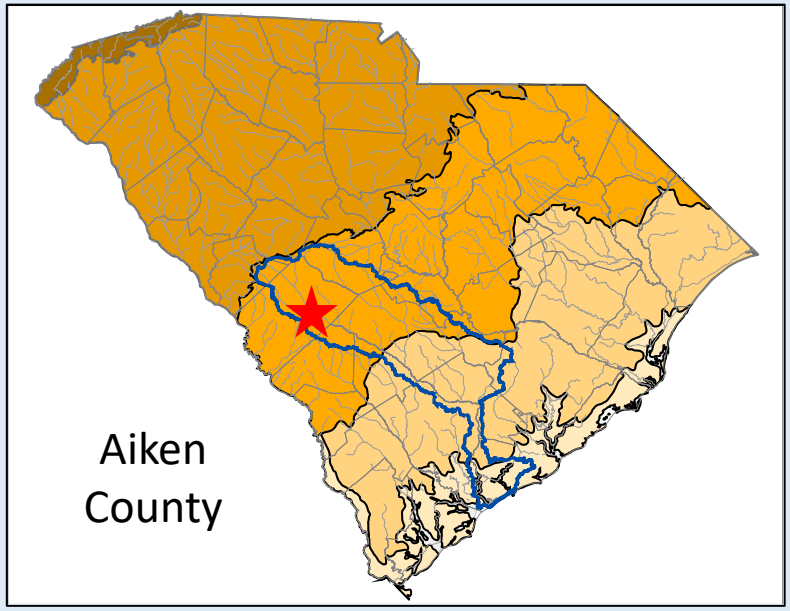


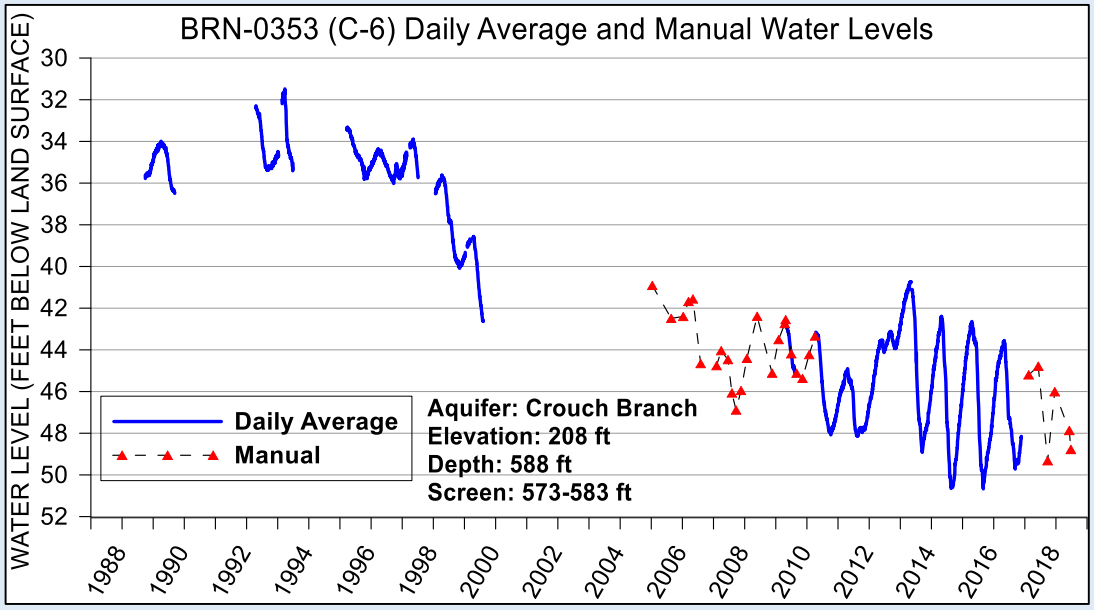


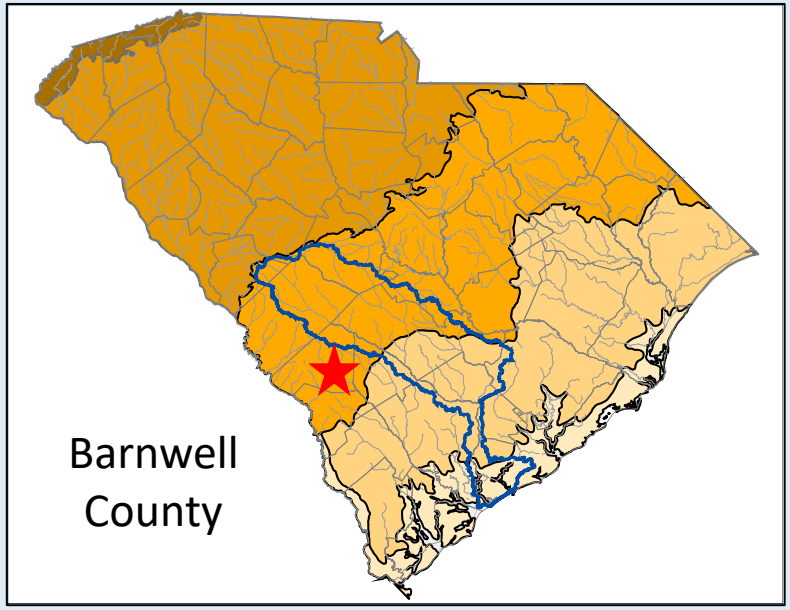


Groundwater-Level Data for Crouch Branch



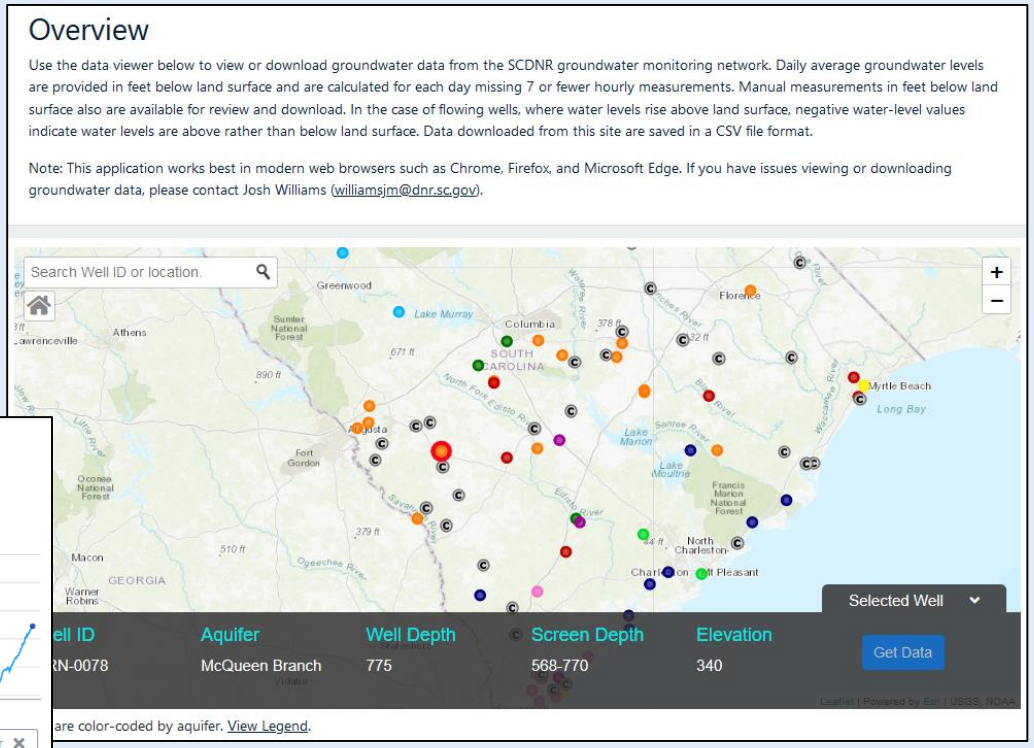


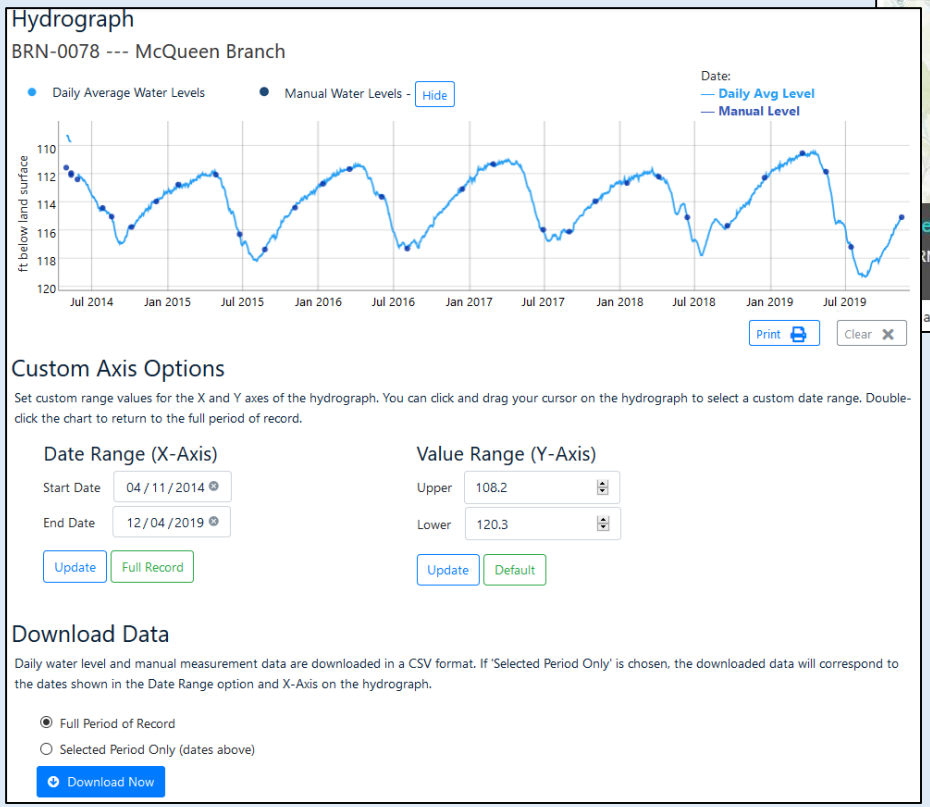




Groundwater Data Viewer

View and download groundwater data

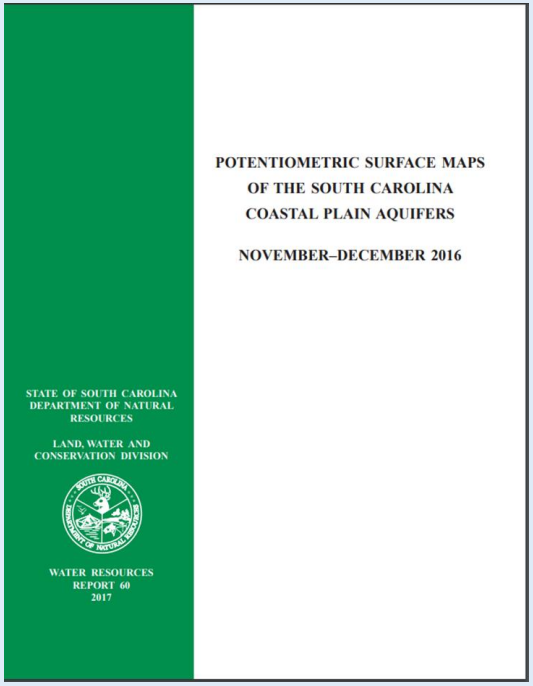


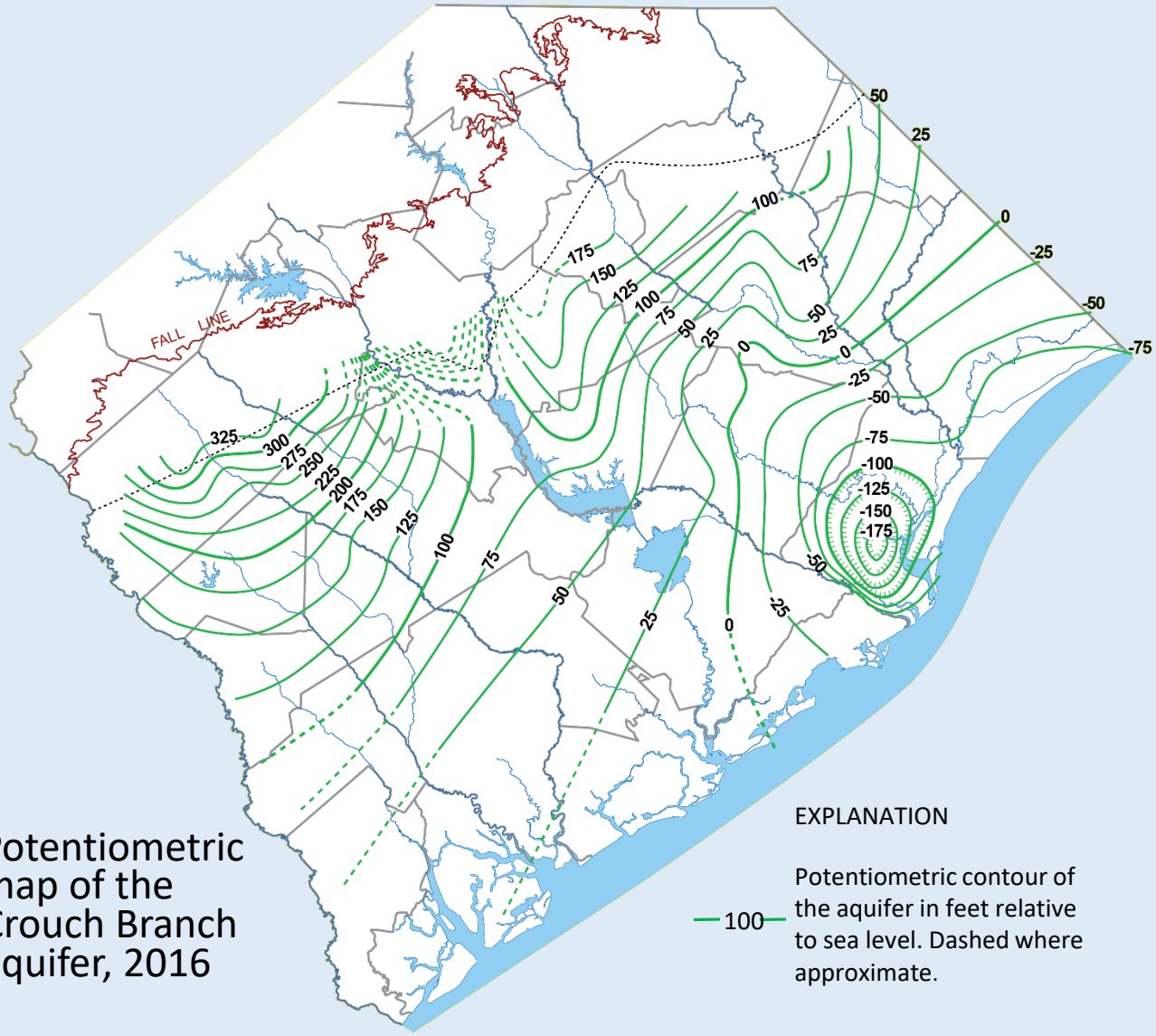


http://hydrology.dnr.sc.gov/groundwater-data/

Potentiometric Mapping

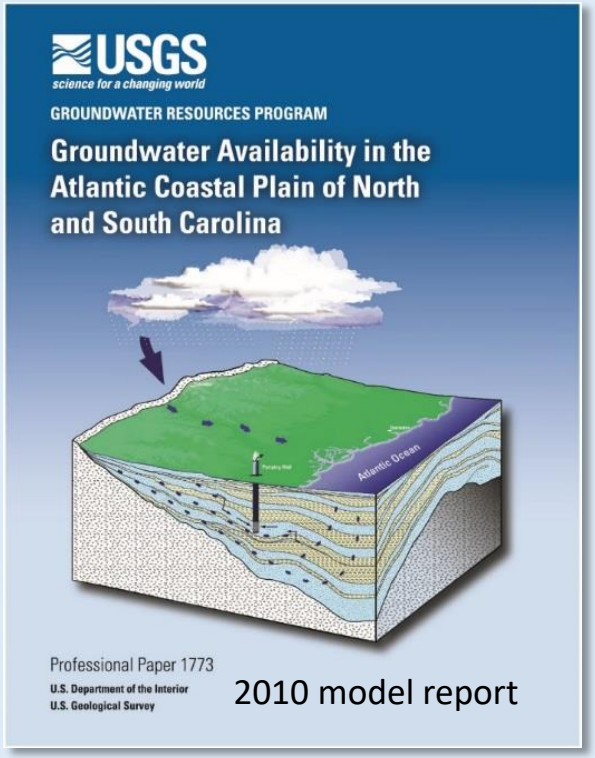
Maps showing groundwater elevations of the major aquifers.





Potentiometric map of the Crouch Branch aquifer, 2016

Groundwater Model



2010 model report

- Developed by the USGS, 4-year project (2016-2019).
- Update of a 2010 groundwater flow model.
- Final report in review.
- ***Model is a decision-making tool used to assess groundwater availability and management strategies and will support the development of River Basin Plans.***

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Technical Advisory Committees

- Planning Framework calls for permanent Groundwater and Surface Water Technical Advisory Committees.
- Purpose: to provide the State agencies and River Basin Councils with technical assistance and support during the development of River Basin Plans and the new State Water Plan.
  - Advise state agencies on any new data, model revisions or extensions, and alternative modeling platforms that could be used for planning purposes.
  - Approve the use of supplemental modeling platforms in the planning process.
  - Advise RBCs on model scenarios and assist in the interpretation of modeling results.
- Primarily serves as a “reactive” body as opposed to “proactive”.
  - TACs respond to technical questions/issues that arise in the planning process as needed.