

Water Resources of the Edisto Basin

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Edisto River Basin Council – Meeting #4 (Virtual)
September 9th, 2020

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.

Blue Ridge

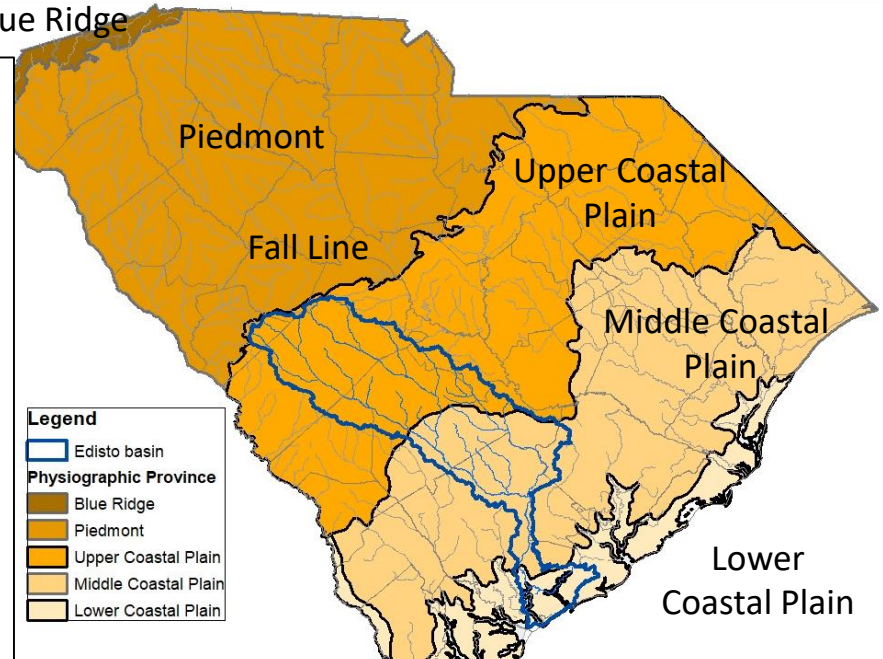


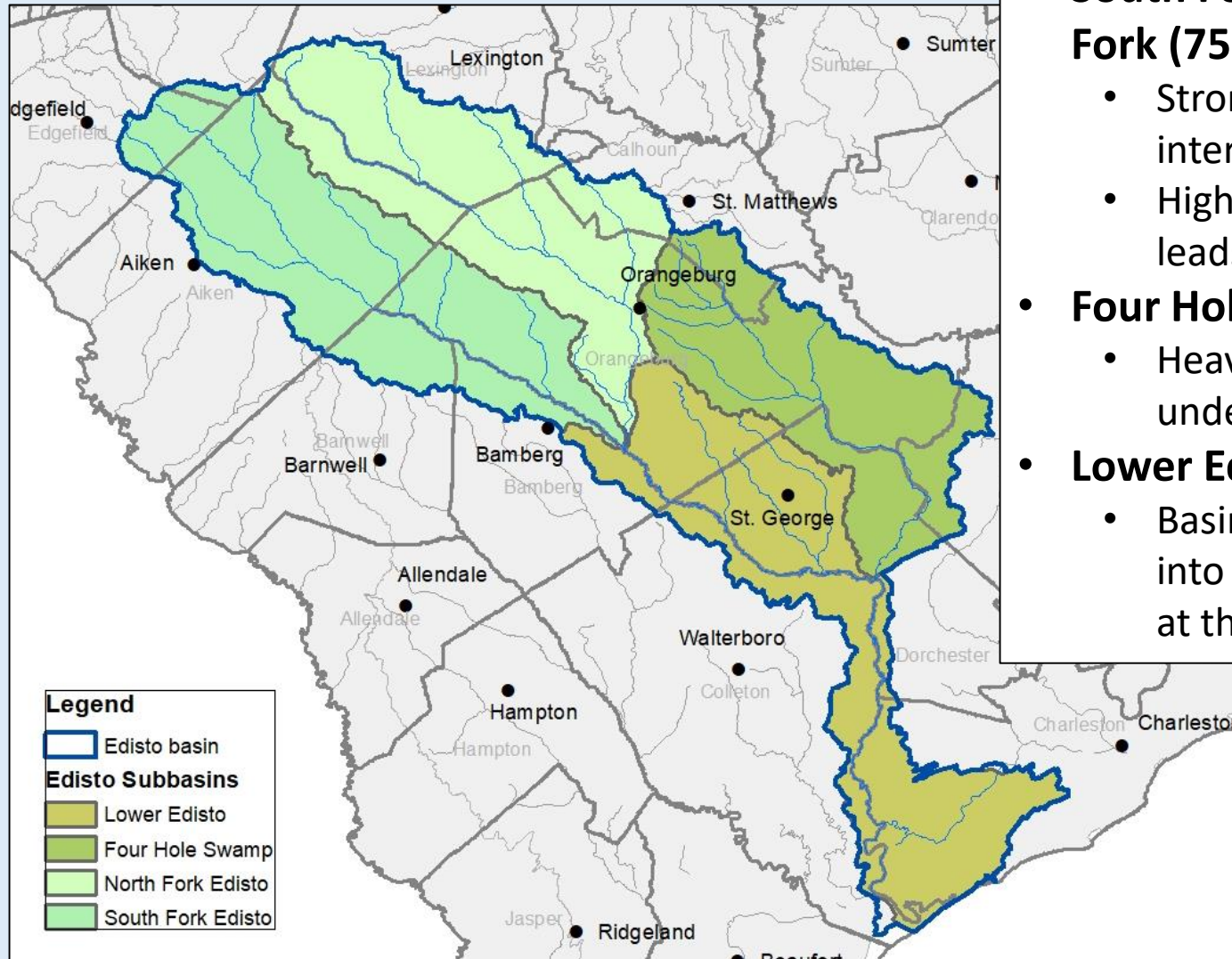
Photo Credit: Tanner Arrington

Edisto Basin – Surface Water Resources



4 major subbasins:

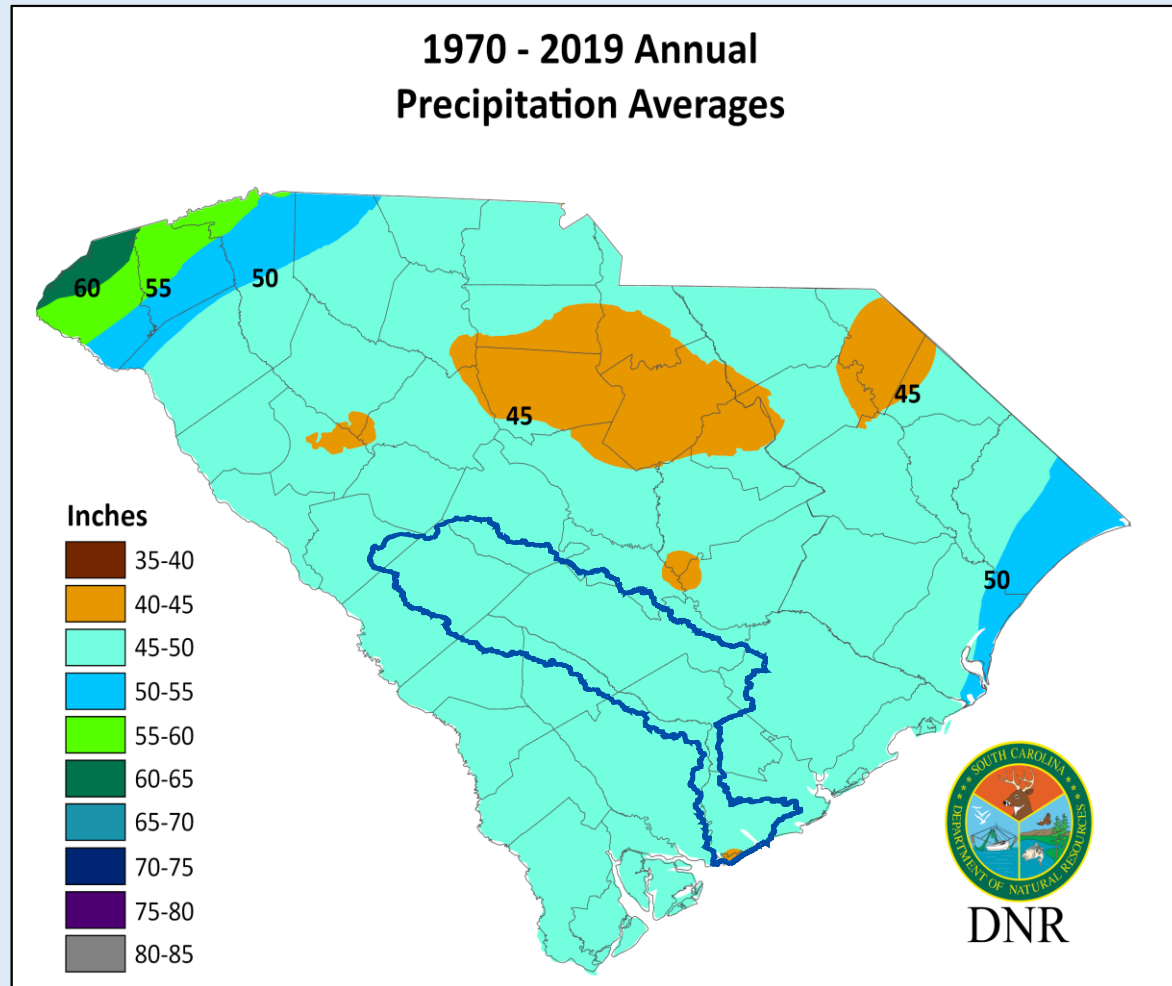
- **South Fork (870 mi²) and North Fork (750 mi²) subbasins:**
 - Strong surface-groundwater interactions.
 - High baseflow contribution leads to well sustained flows.
- **Four Hole Swamp (650 mi²)**
 - Heavily braided, undeveloped.
- **Lower Edisto (850 mi²)**
 - Basin narrows before dividing into North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

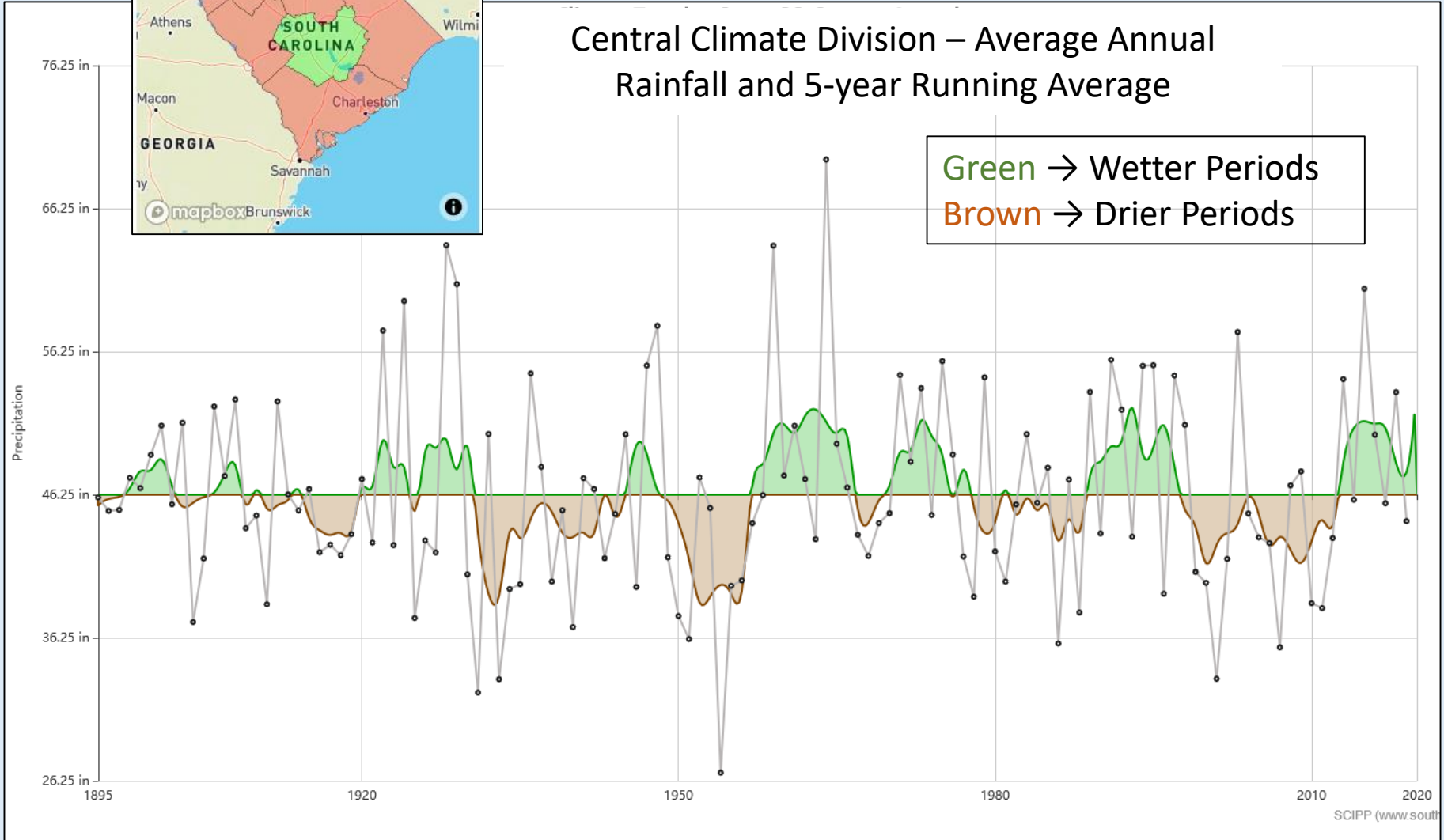


Edisto Basin Rainfall Patterns

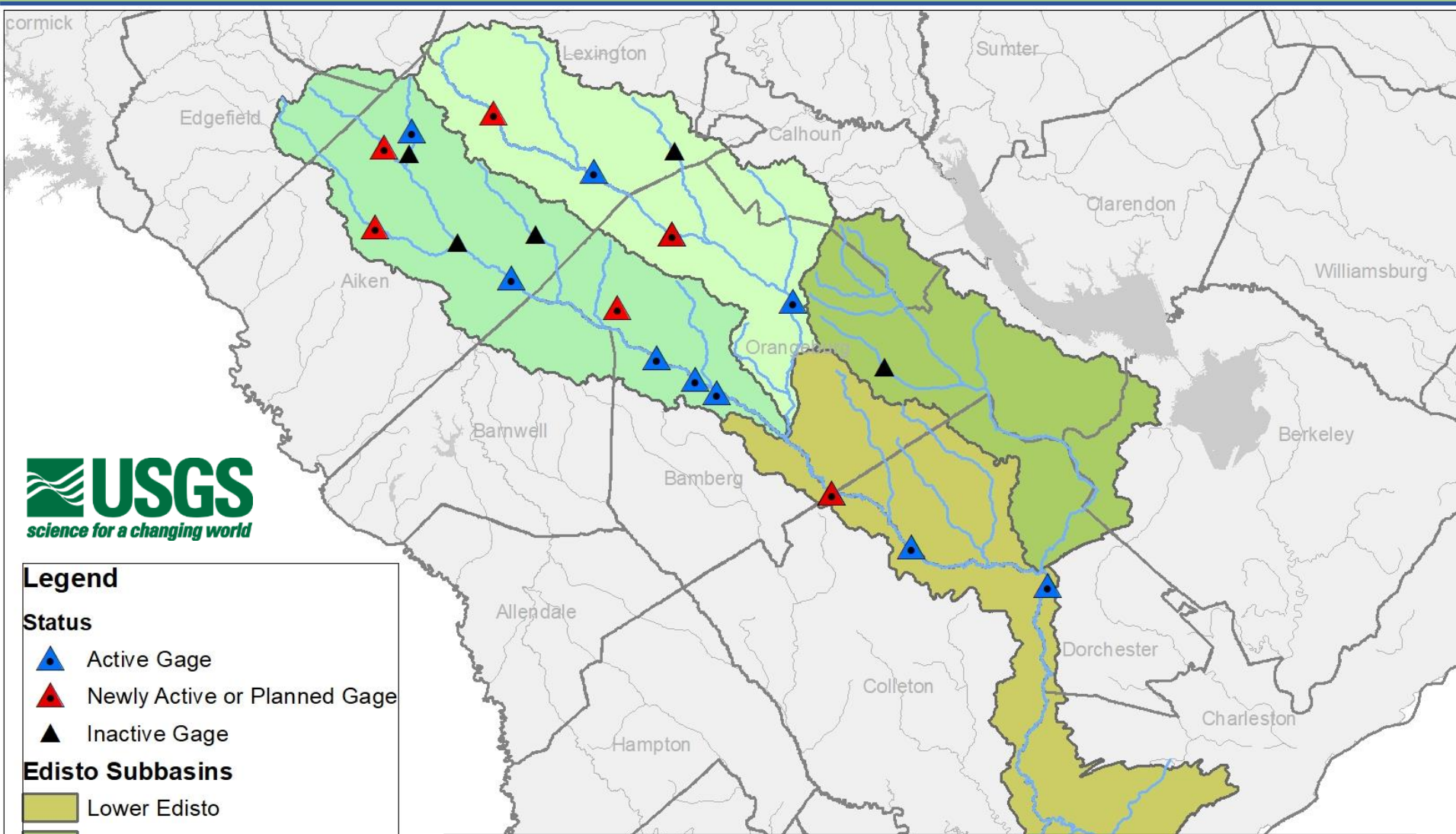


Central Climate Division – Average Annual Rainfall and 5-year Running Average

Green → Wetter Periods
Brown → Drier Periods



Surface Water Monitoring Network



Legend

Status

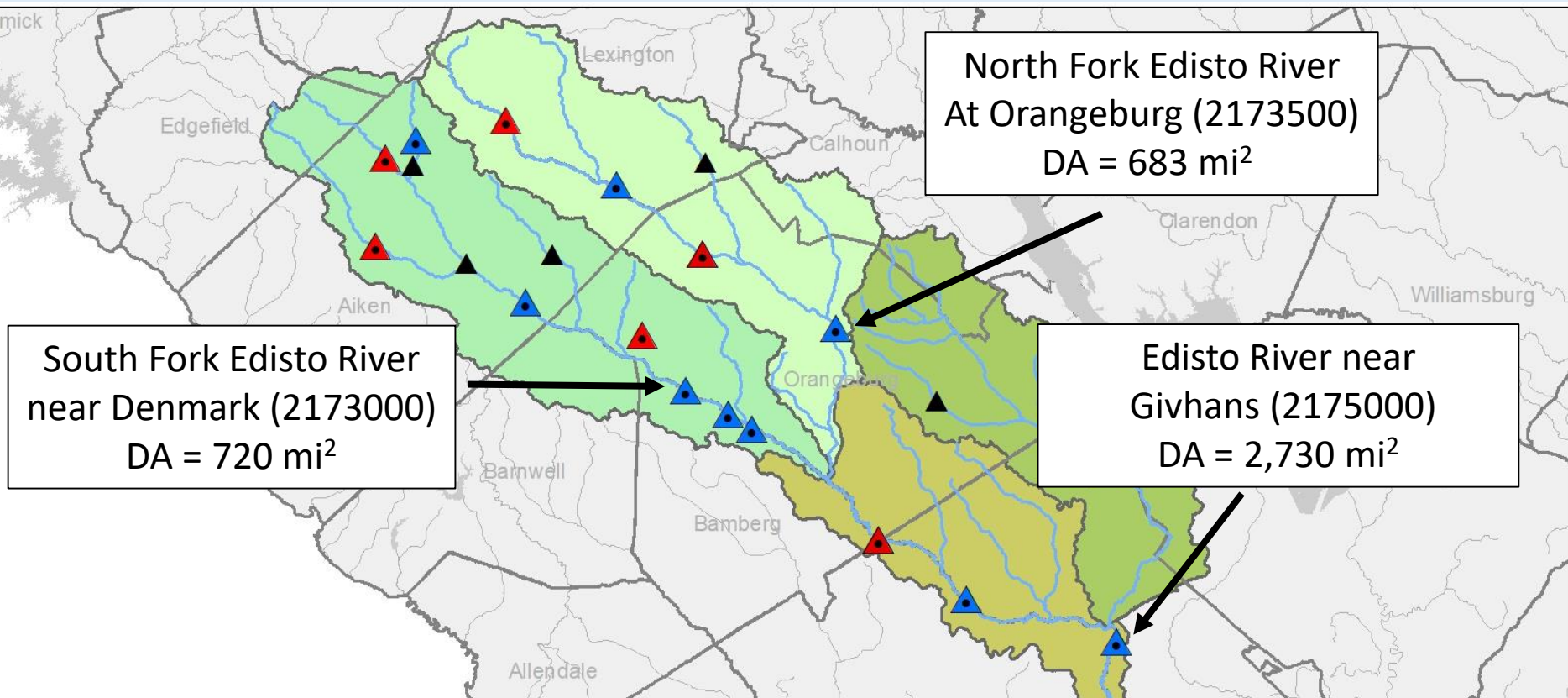
- ▲ Active Gage
- ▲ Newly Active or Planned Gage
- ▲ Inactive Gage

Edisto Subbasins

- Lower Edisto
- Four Hole Swamp
- North Fork Edisto
- South Fork Edisto

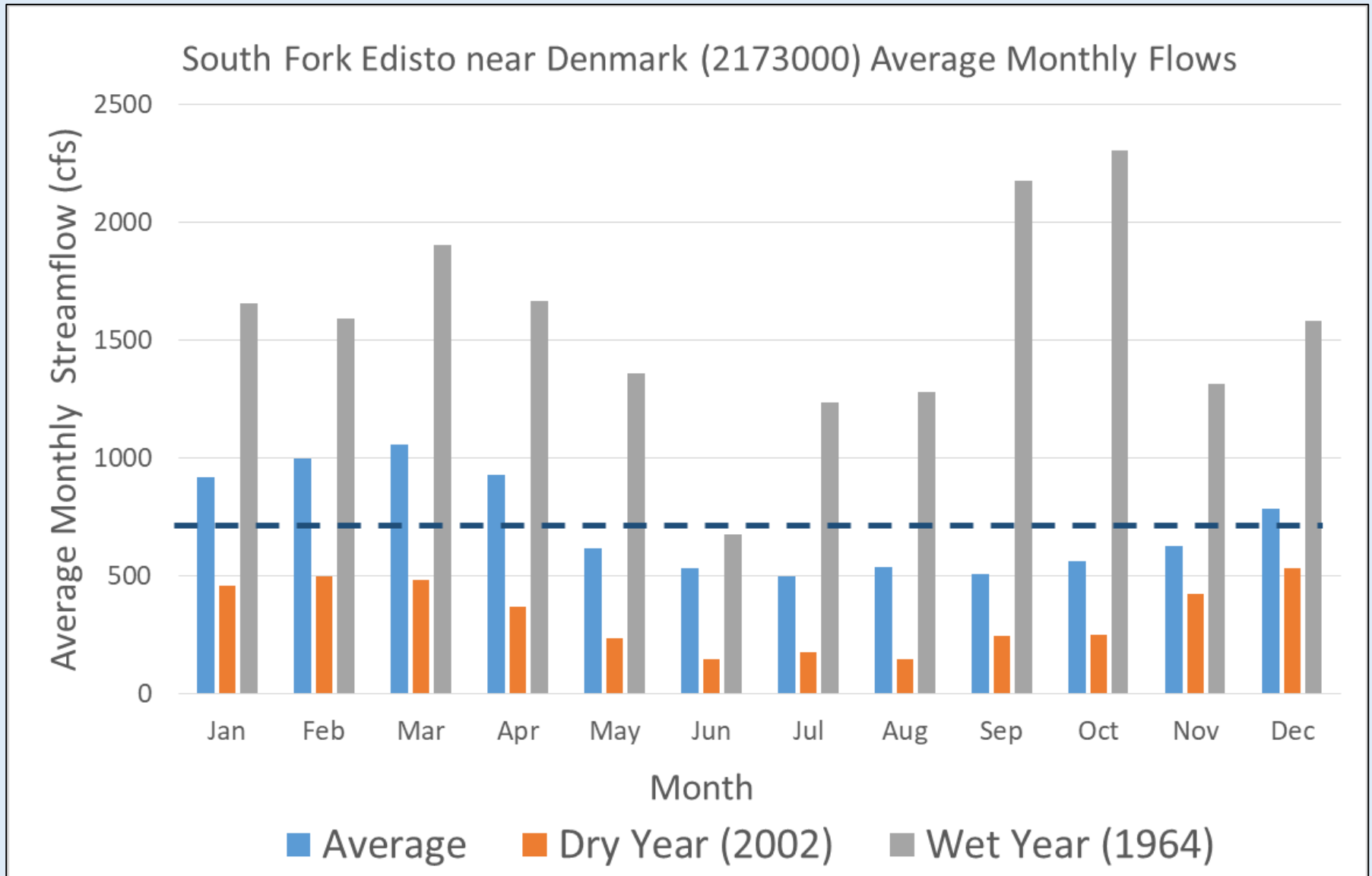
Historic and real-time data available on the SC USGS website:
<https://waterwatch.usgs.gov/?m=real&r=sc&w=real%2Cmap>

Surface Water Monitoring Network

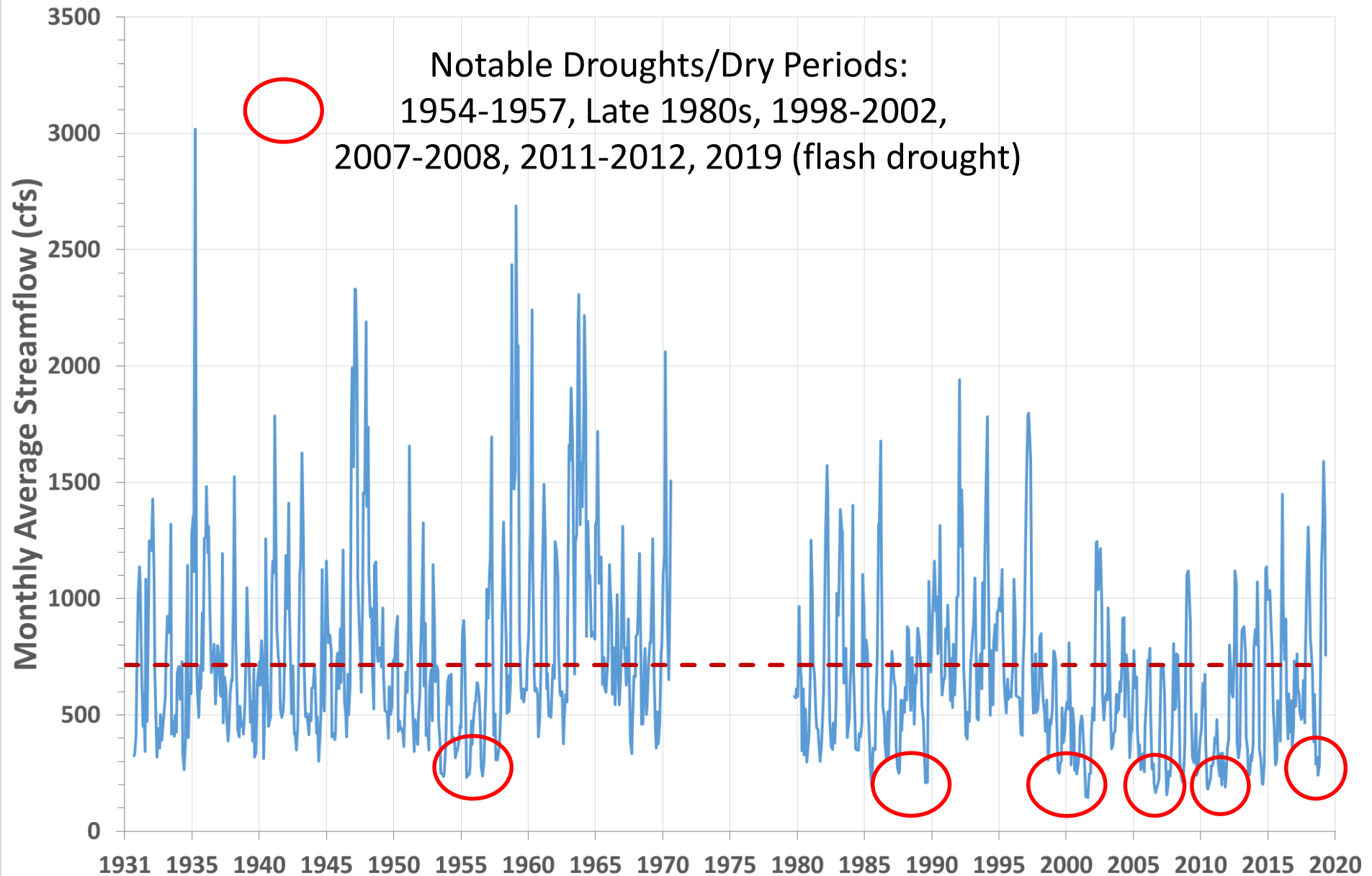


Stream Gage	Period of Record	Mean (cfs)	Minimum (cfs)	Maximum (cfs)
Edisto near Givhans (2175000)	1939-2020	2430	150 (2002)	26,300 (2015)
South Fork Edisto (2173000)	1931-2020	713	110 (2002)	12,700 (1936)
North Fork Edisto (2173500)	1938-2020	718	113 (2002)	8,850 (1945)

Monthly Streamflow Statistics



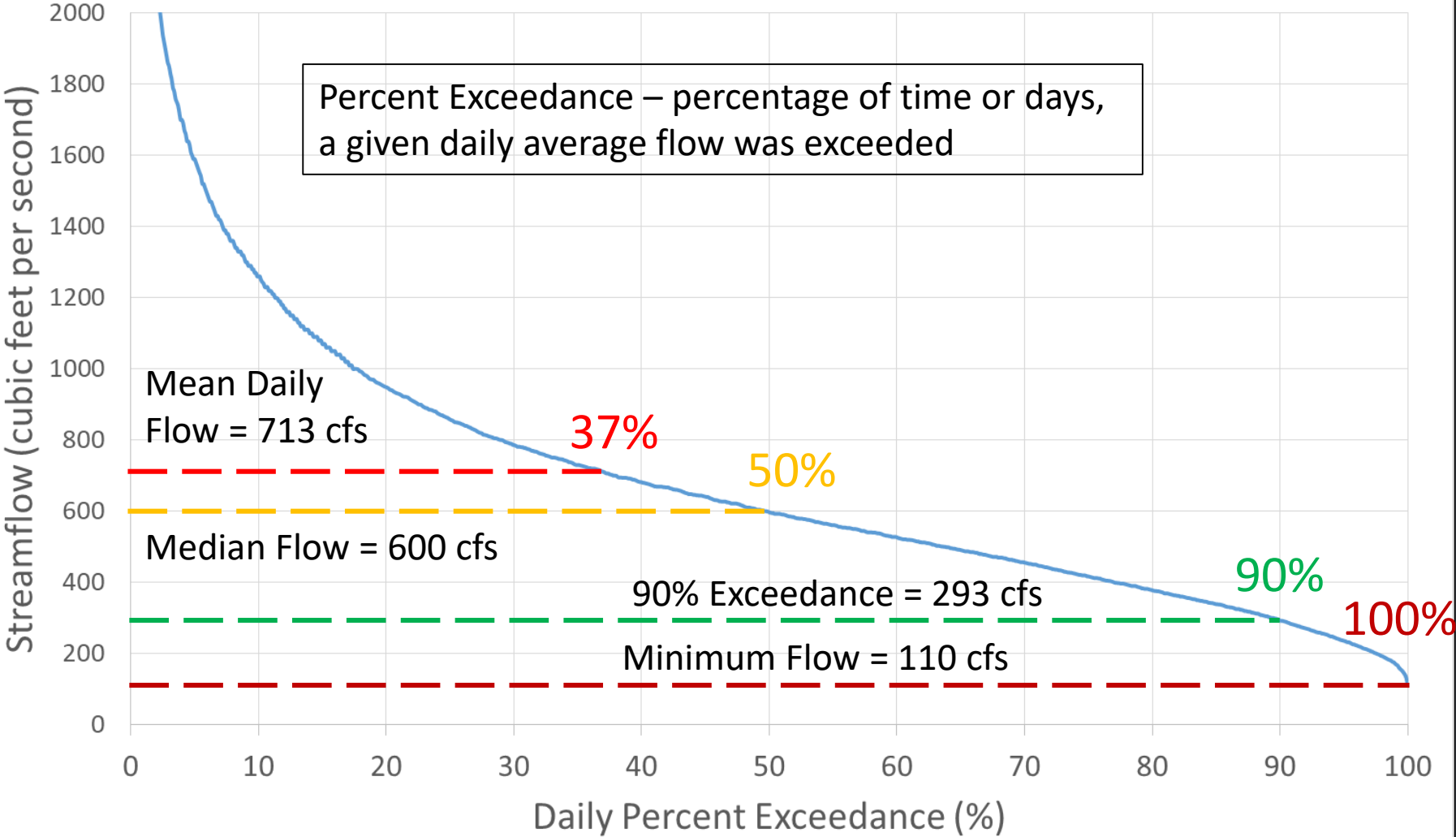
South Fork Edisto near Denmark (2173000) Monthly Average Flows (cfs), 1931-2020



Flow Duration Curve

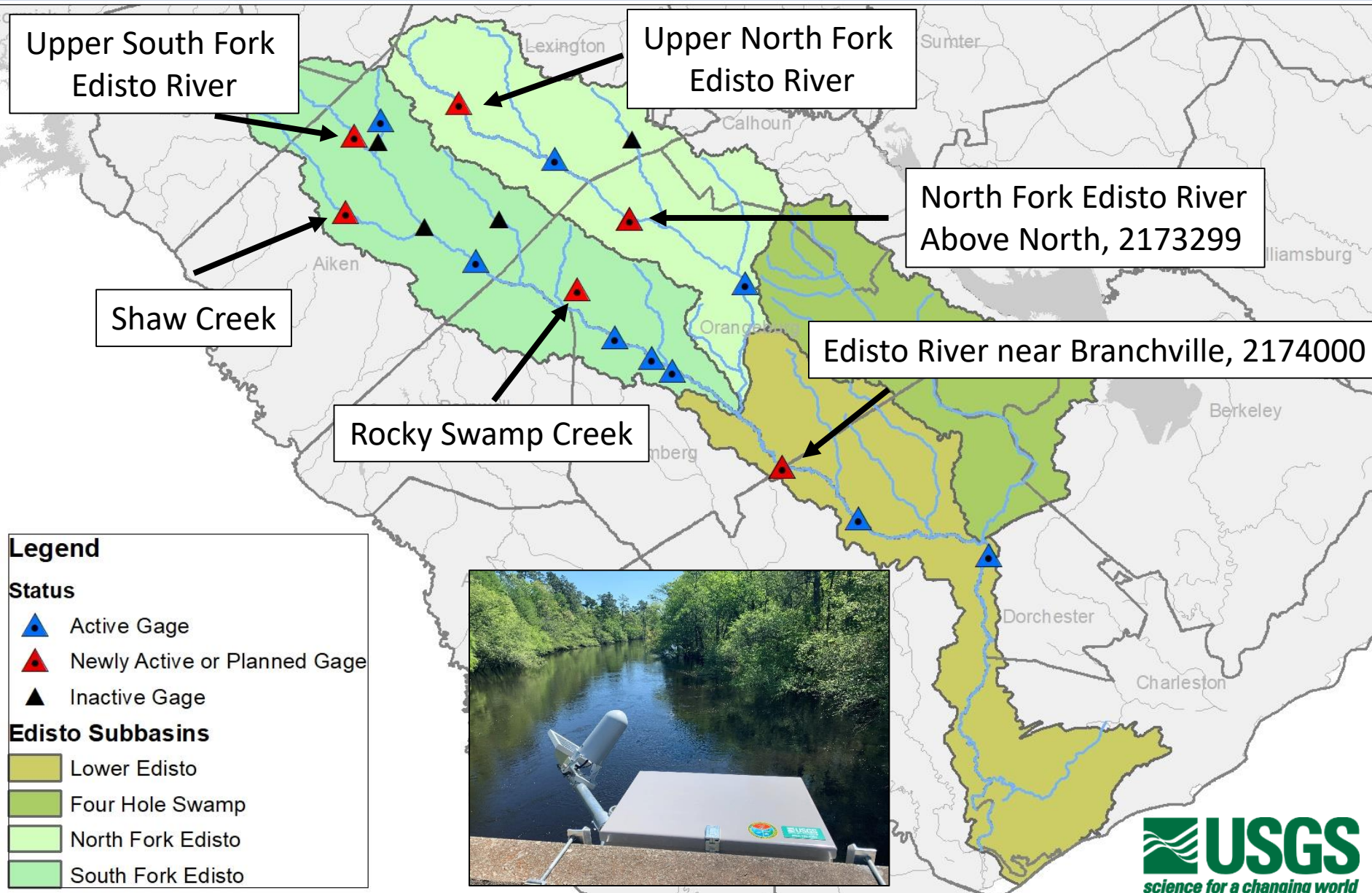


South Fork Edisto near Denmark (2173000) Flow Duration Curve





New USGS Surface Water Monitoring Sites



Legend

Status

- ▲ Active Gauge
- ▲ Newly Active or Planned Gauge
- ▲ Inactive Gauge

Edisto Subbasins

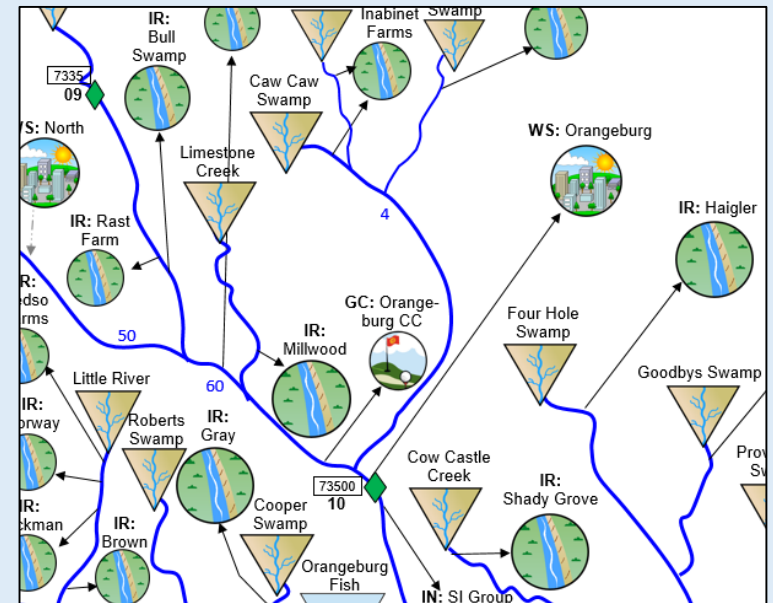
- Lower Edisto
- Four Hole Swamp
- North Fork Edisto
- South Fork Edisto



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*



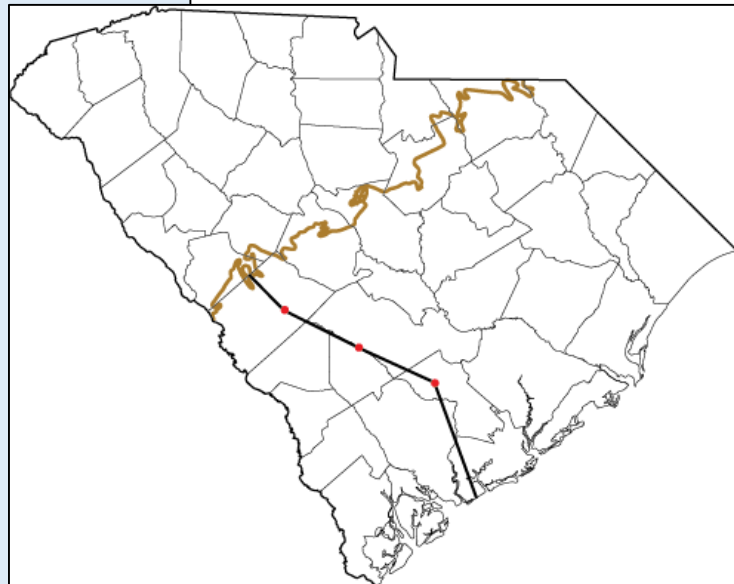
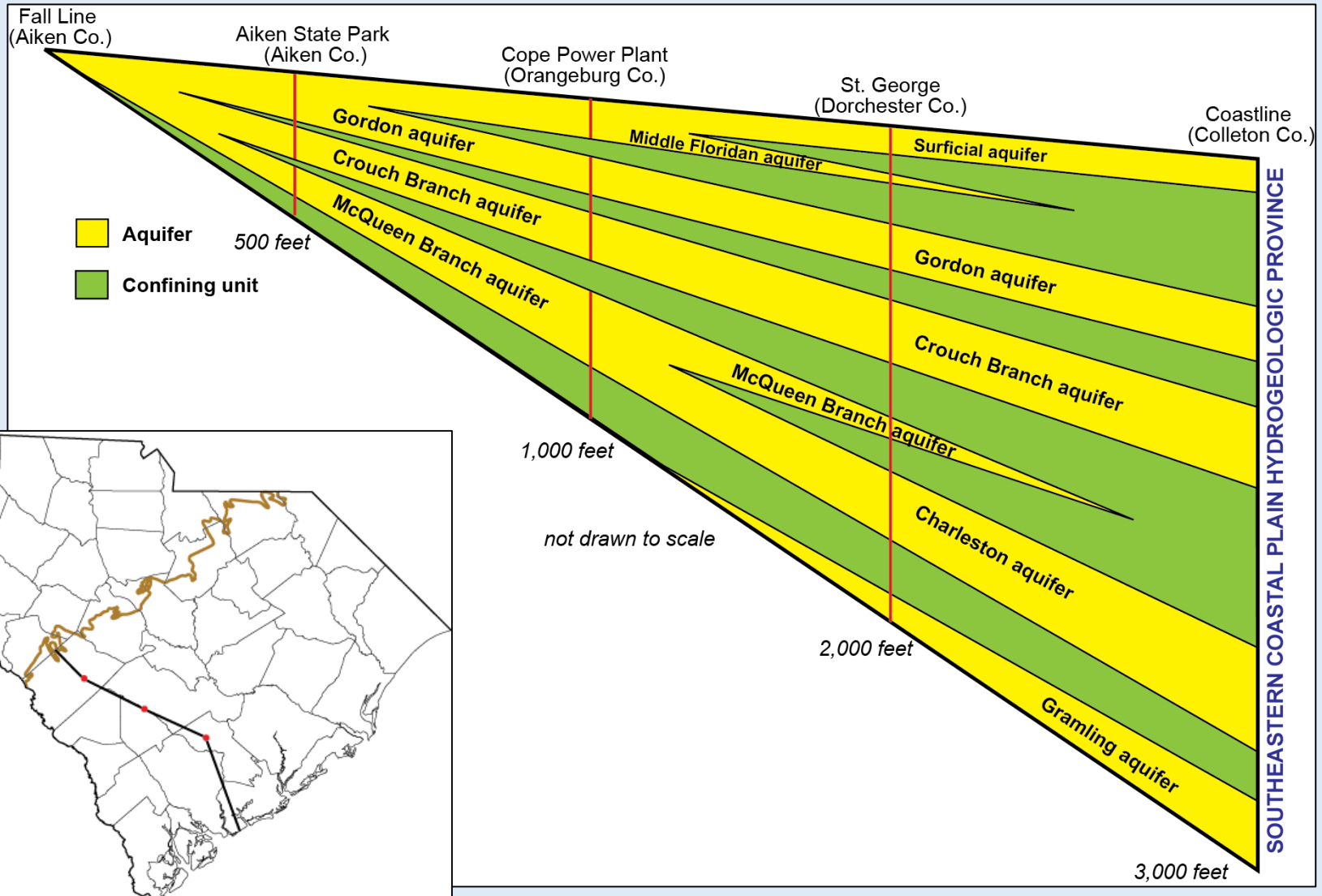
SWAM is a decision-making tool used to assess surface water availability and management strategies, and will support the development of River Basin Plans

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

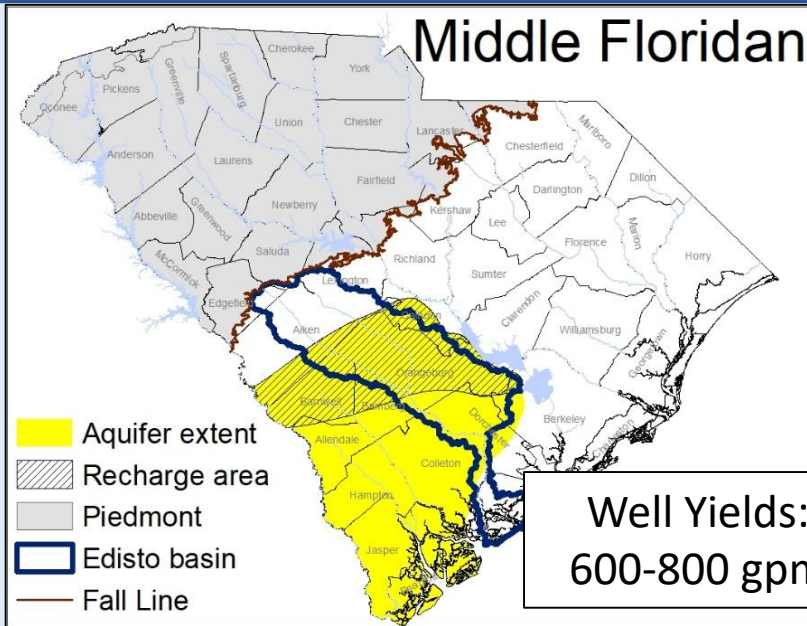


Groundwater Resources

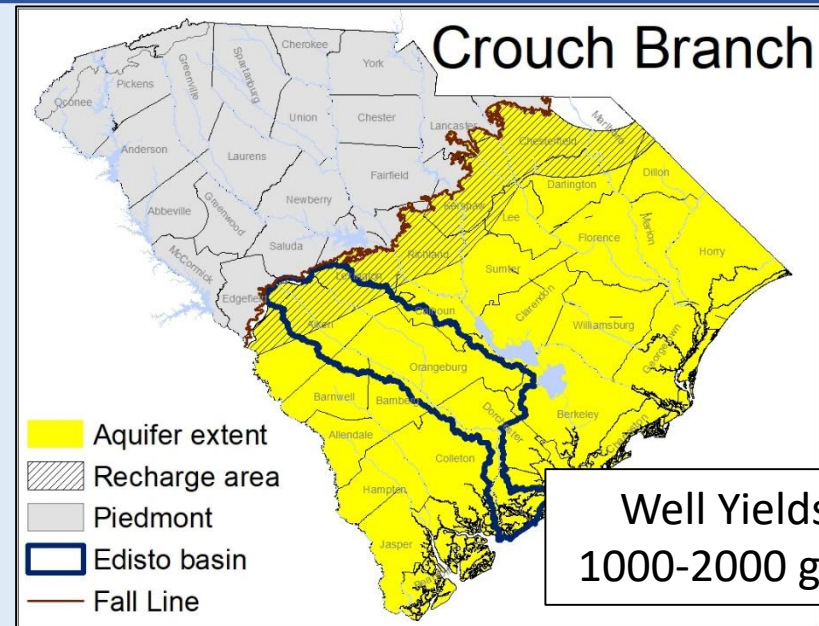
Coastal Plain Aquifer System



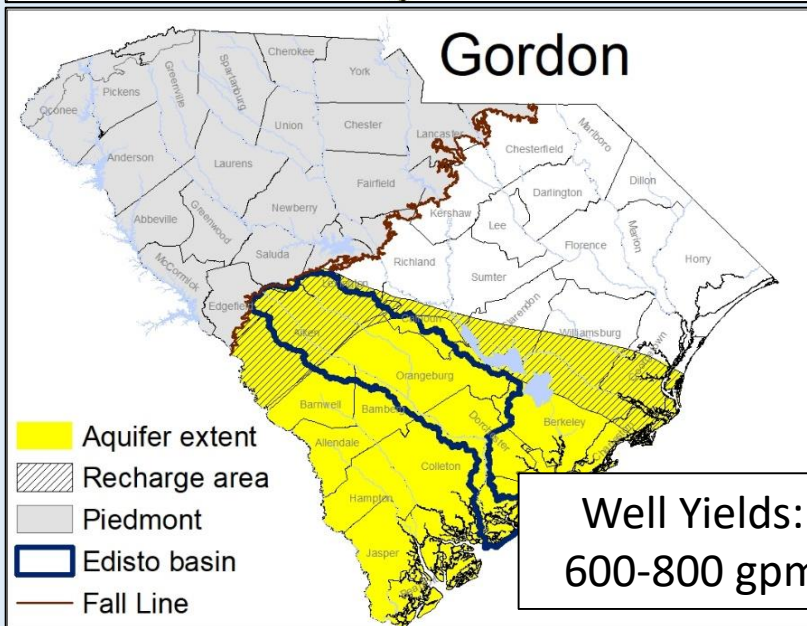
Aquifer Extents and Recharge Areas



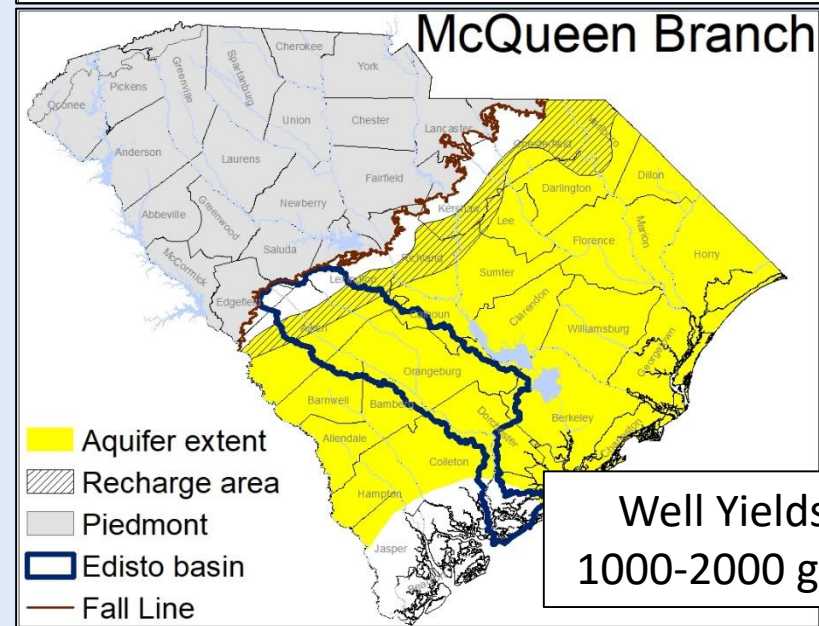
**Well Yields:
600-800 gpm**



**Well Yields:
1000-2000 gpm**

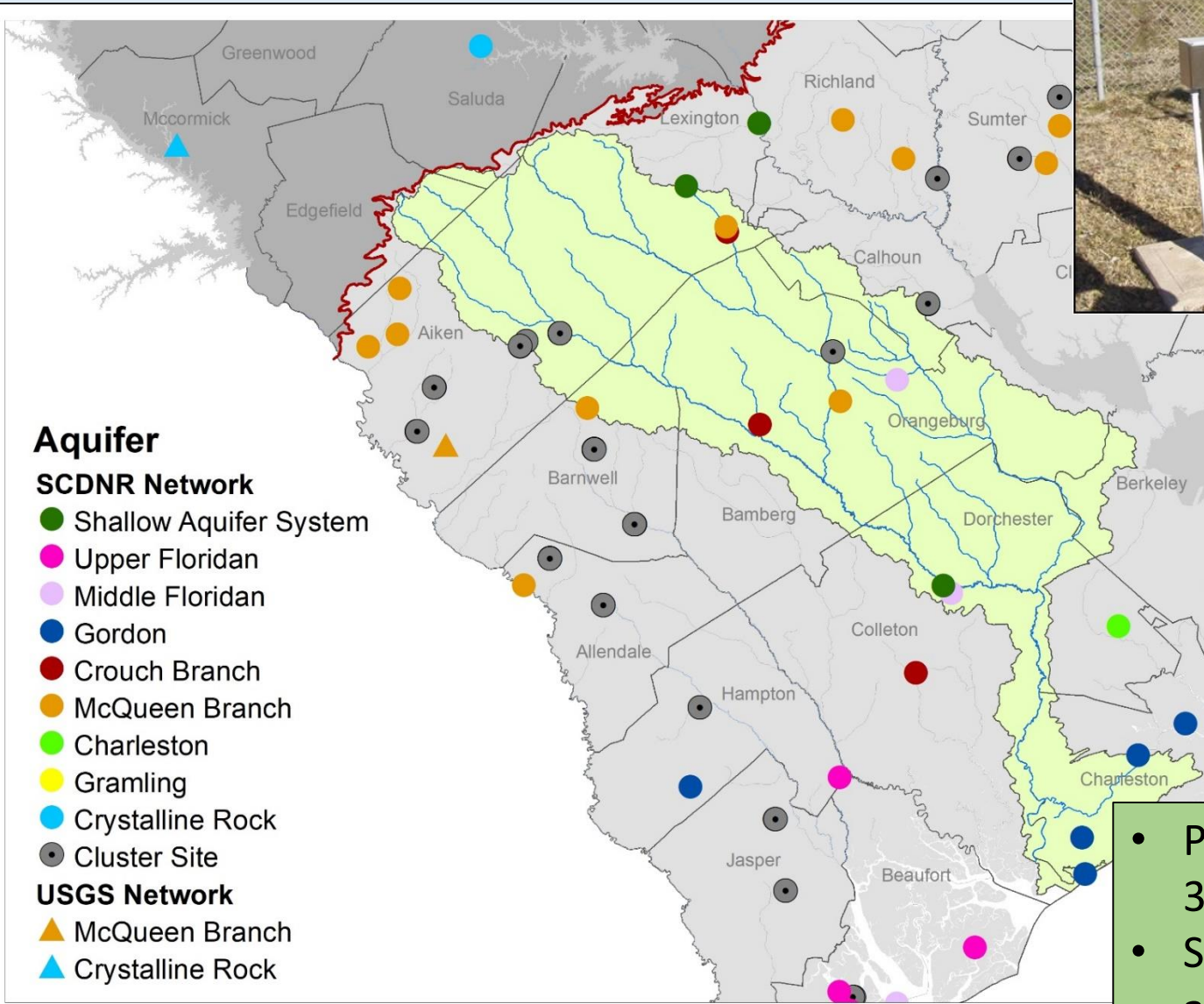


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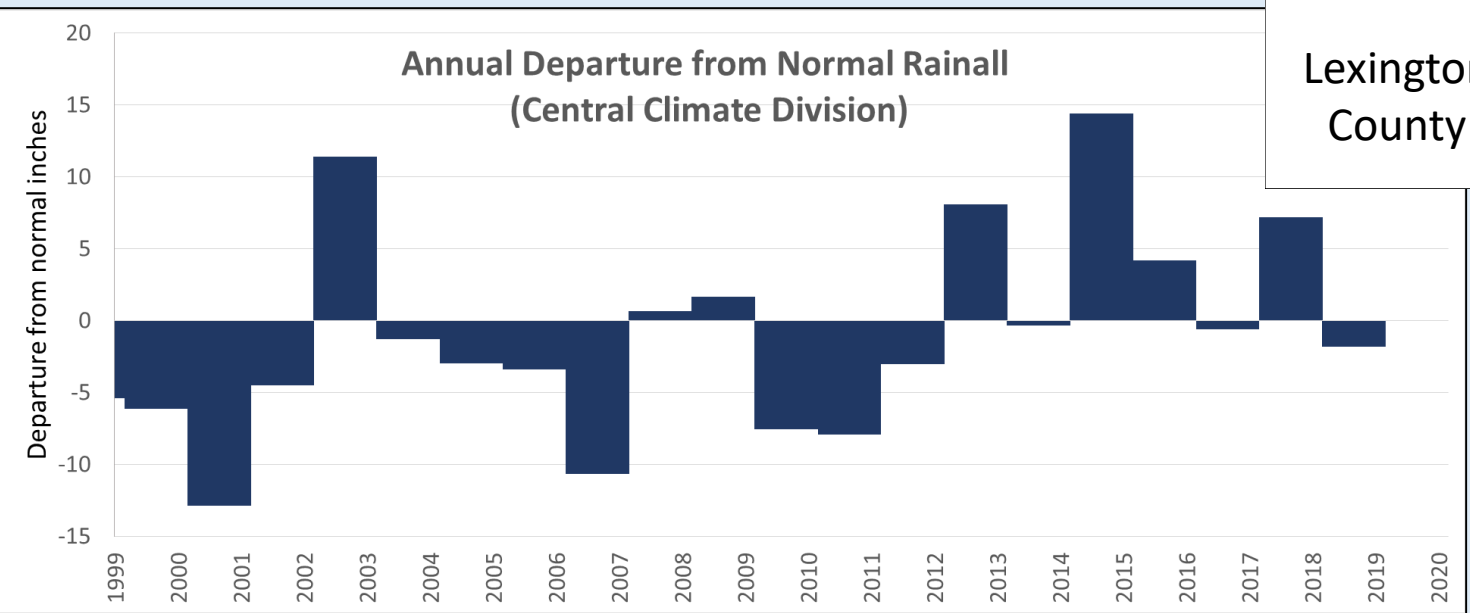
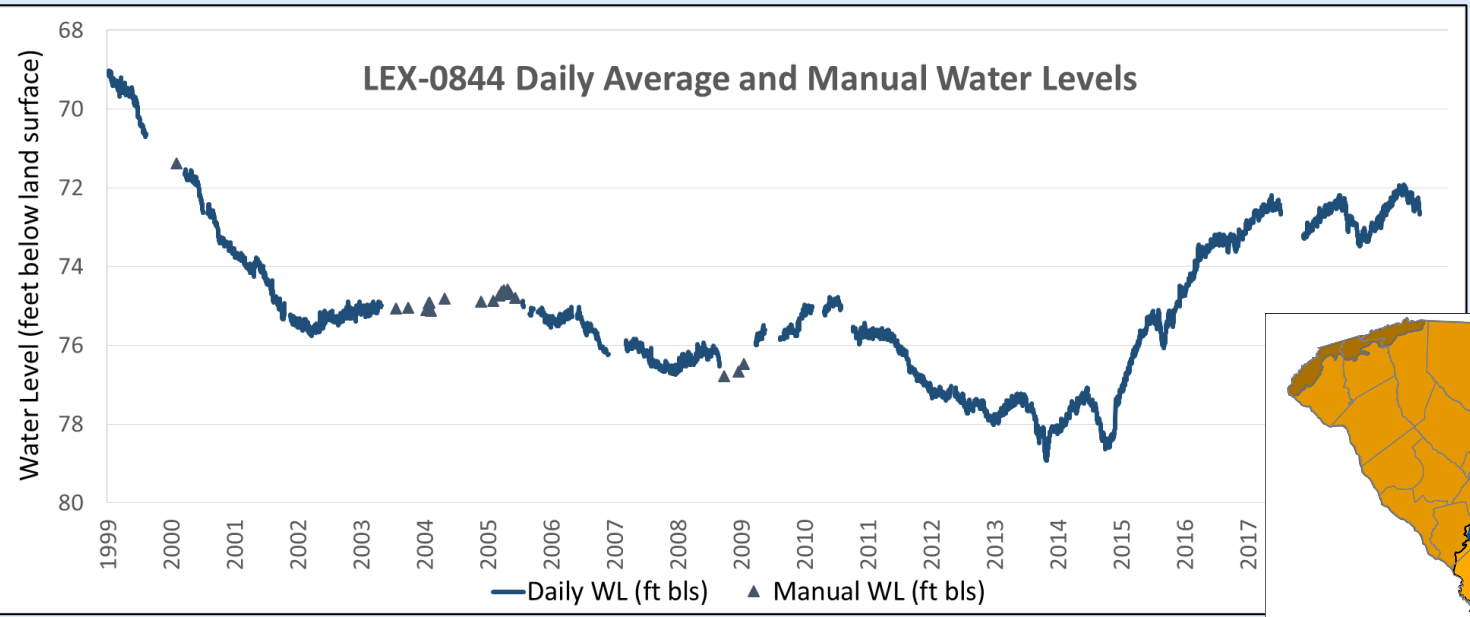
**Well Yields:
1000-2000 gpm**

Groundwater Monitoring

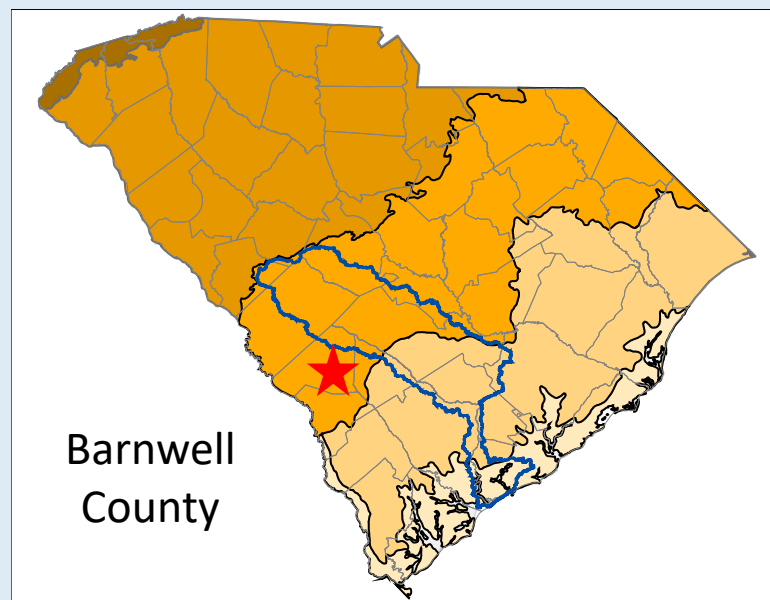
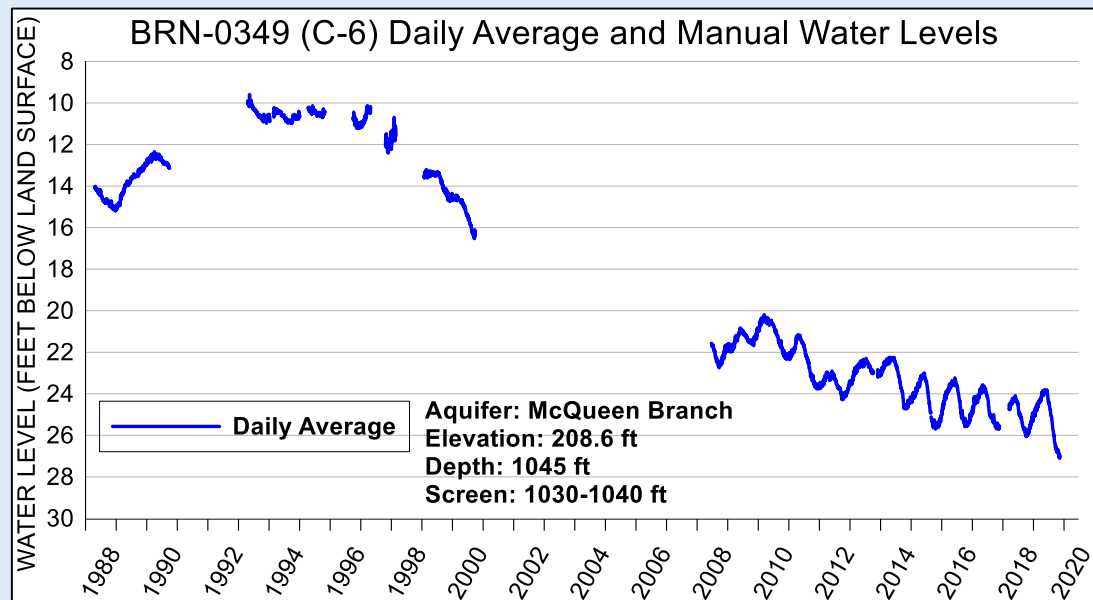
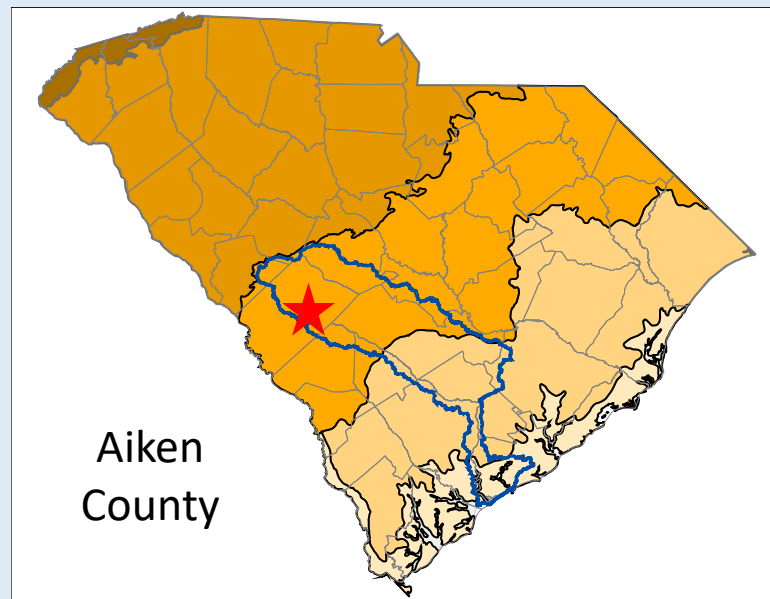
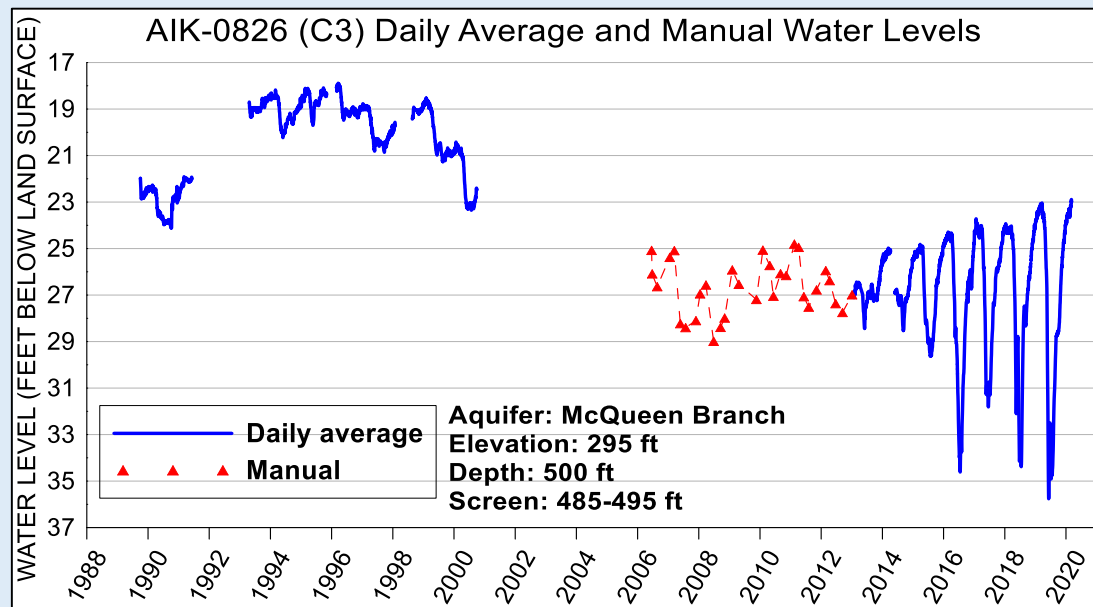


- Period of Record: 1 to 30+ years.
- SCDNR Data Reports available.

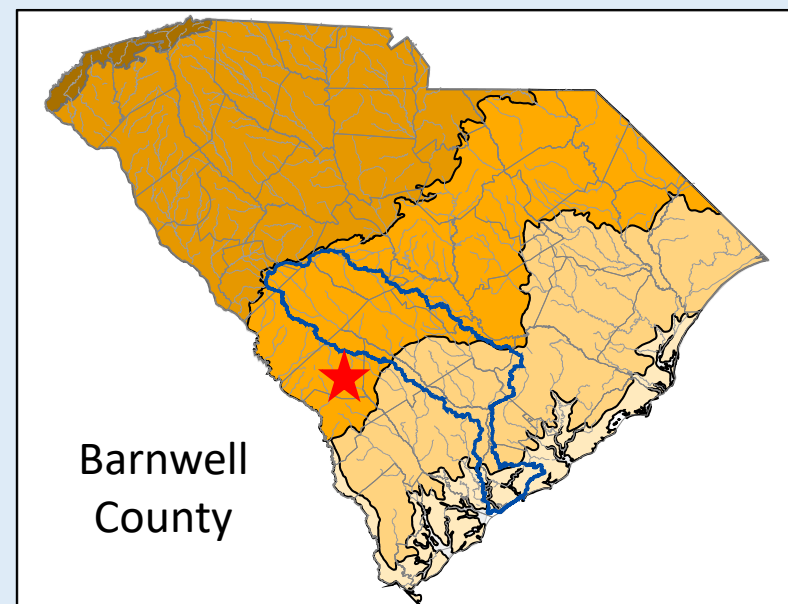
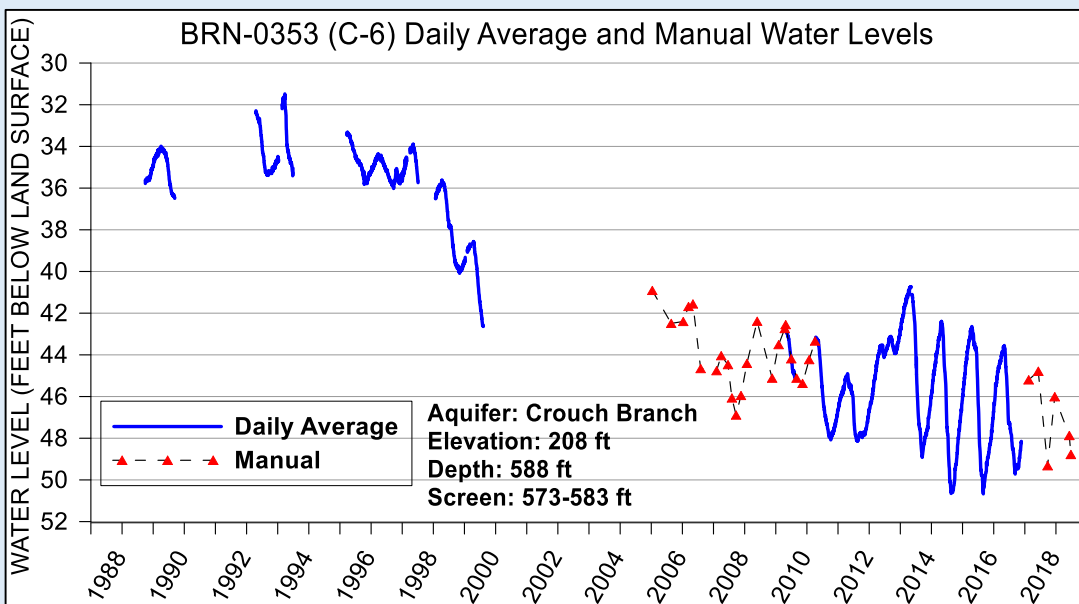
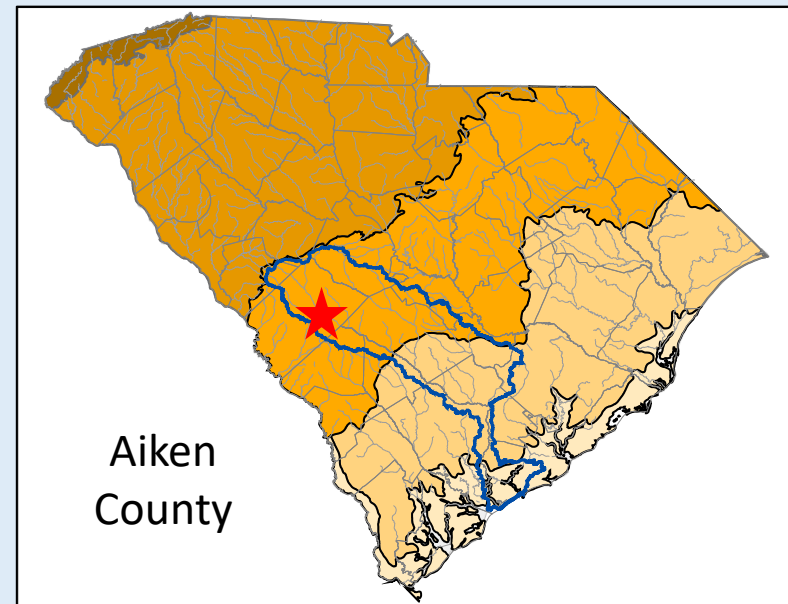
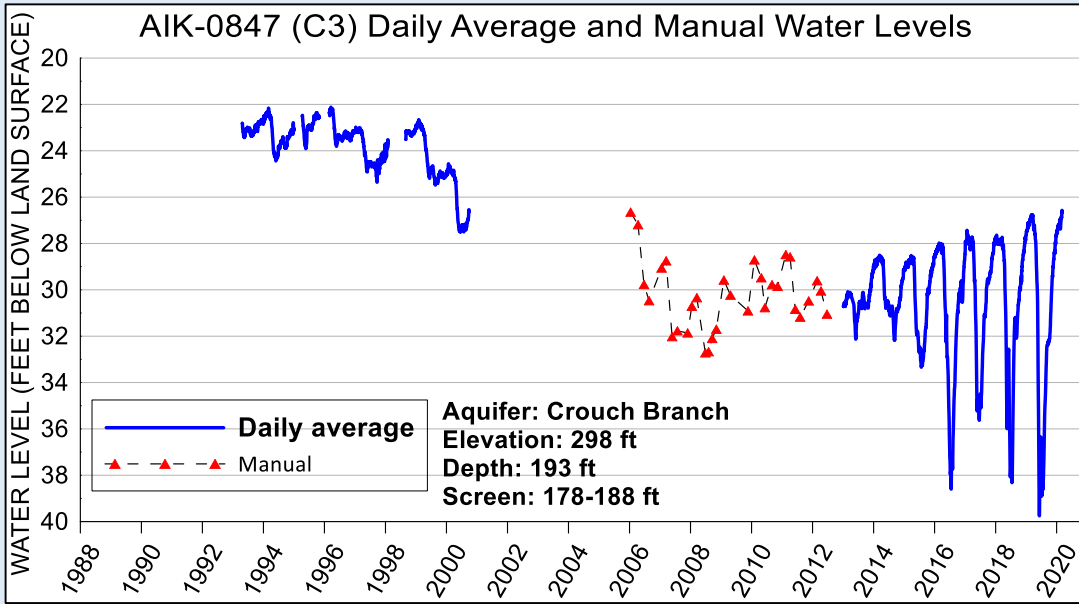
Groundwater Levels and Recharge



Groundwater-Level Data for McQueen Branch



Groundwater-Level Data for Crouch Branch





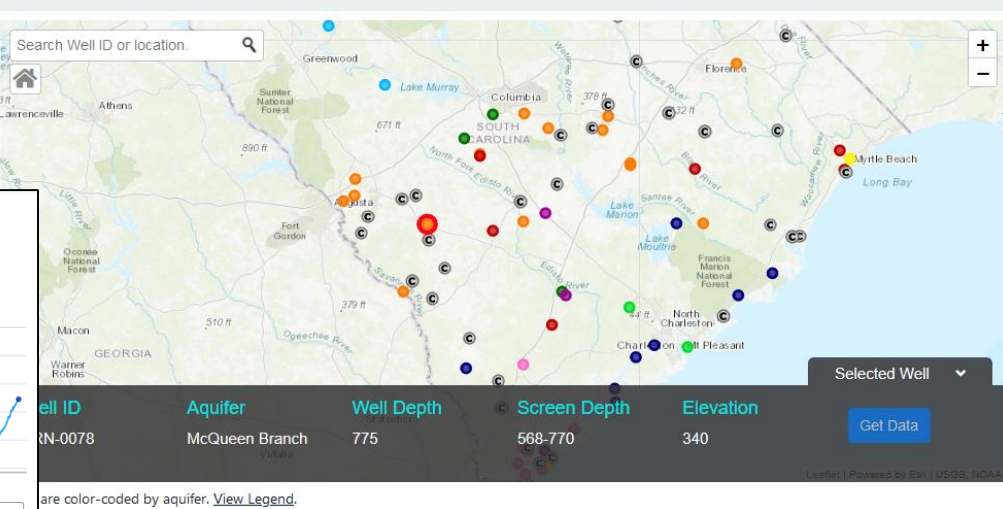
Groundwater Data Viewer

View and download groundwater data

Overview

Use the data viewer below to view or download groundwater data from the SCDNR groundwater monitoring network. Daily average groundwater levels are provided in feet below land surface and are calculated for each day missing 7 or fewer hourly measurements. Manual measurements in feet below land surface also are available for review and download. In the case of flowing wells, where water levels rise above land surface, negative water-level values indicate water levels are above rather than below land surface. Data downloaded from this site are saved in a CSV file format.

Note: This application works best in modern web browsers such as Chrome, Firefox, and Microsoft Edge. If you have issues viewing or downloading groundwater data, please contact Josh Williams (williamsjm@dnr.sc.gov).

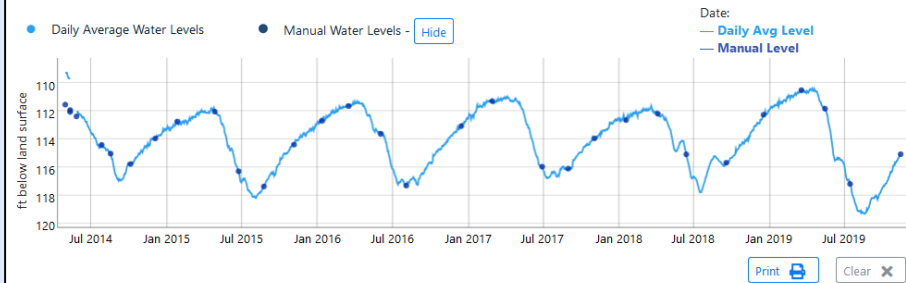


are color-coded by aquifer. [View Legend](#).

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

Hydrograph

BRN-0078 --- McQueen Branch



Custom Axis Options

Set custom range values for the X and Y axes of the hydrograph. You can click and drag your cursor on the hydrograph to select a custom date range. Double-click the chart to return to the full period of record.

Date Range (X-Axis)

Start Date

End Date

Value Range (Y-Axis)

Upper

Lower

Download Data

Daily water level and manual measurement data are downloaded in a CSV format. If 'Selected Period Only' is chosen, the downloaded data will correspond to the dates shown in the Date Range option and X-Axis on the hydrograph.

- Full Period of Record
- Selected Period Only (dates above)




Potentiometric Mapping

Maps showing groundwater elevations of the major aquifers.

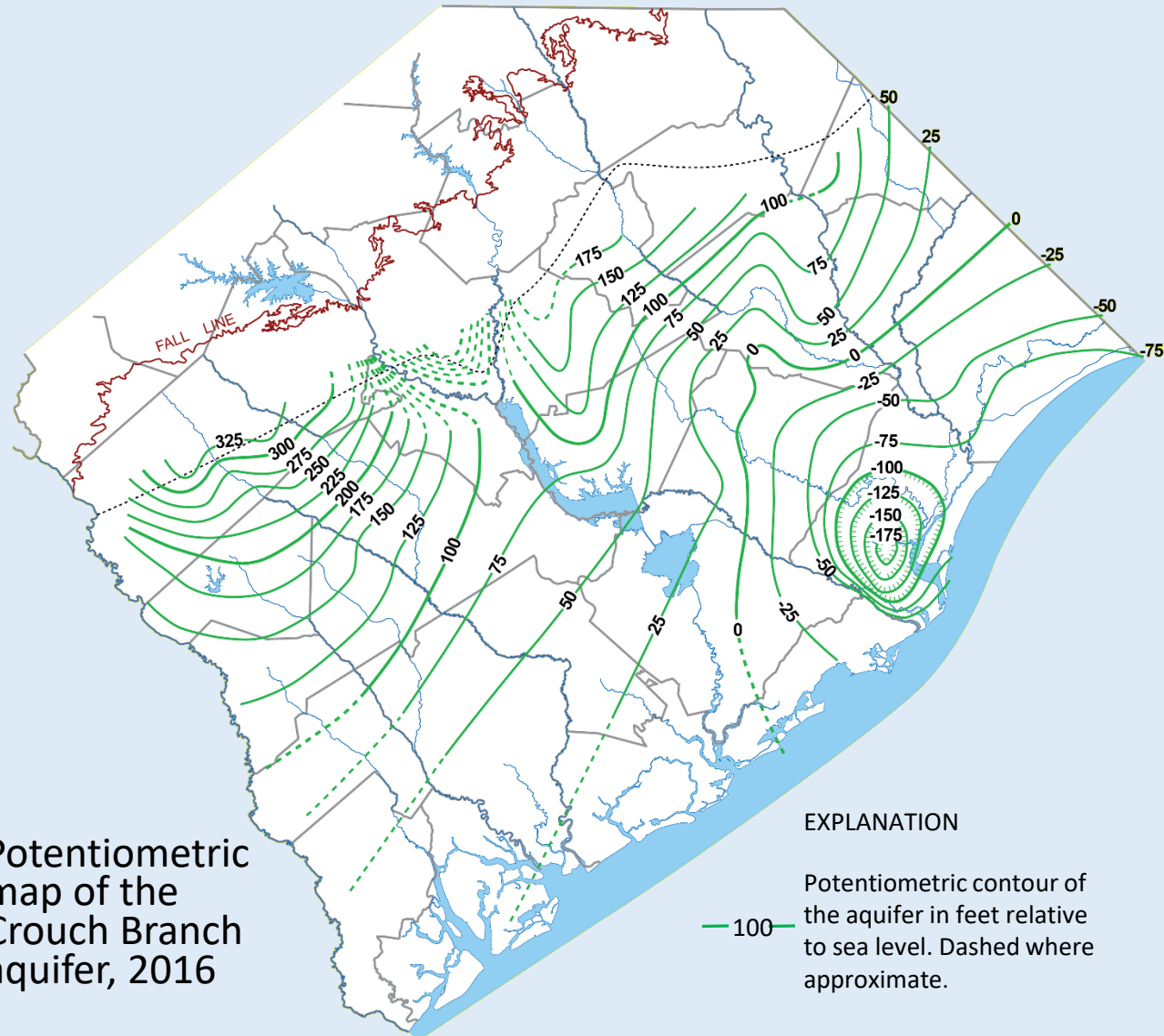
POTENTIOMETRIC SURFACE MAPS
OF THE SOUTH CAROLINA
COASTAL PLAIN AQUIFERS
NOVEMBER–DECEMBER 2016

STATE OF SOUTH CAROLINA
DEPARTMENT OF NATURAL
RESOURCES

LAND, WATER AND
CONSERVATION DIVISION



WATER RESOURCES
REPORT 60
2017



Potentiometric map of the Crouch Branch aquifer, 2016

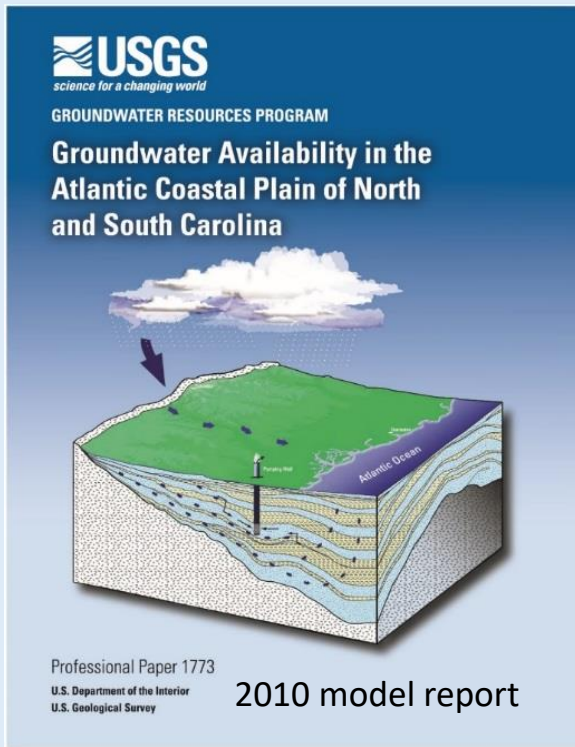
EXPLANATION

- 100 — Potentiometric contour of the aquifer in feet relative to sea level. Dashed where approximate.

Groundwater Model



- 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.***



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.