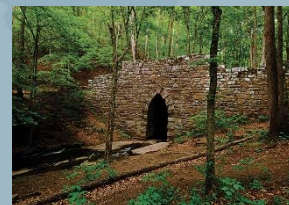
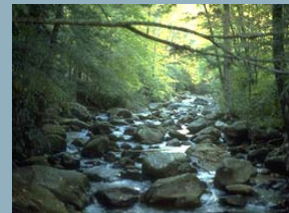


SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES

LAND, WATER, & CONSERVATION DIVISION

Ken Rentiers, Deputy Director

October 17, 2017



MISSION

Provide scientific and reliable information to policy and decision makers and to the public in order to understand, sustain, and protect the State's natural resources for the benefit of all generations. This is achieved through

- planning
- research
- technical assistance
- public education
- development of a comprehensive natural resources database

History of the Land, Water and Conservation Division

1825

The earliest state-sponsored work of a geologic nature in South Carolina was a 1-year “Geological and Mineralogical Survey of South Carolina” made in 1825-1826 by Lardner Vanuxem by order of the Legislature.

1843

Governor Hammond commissioned Michael Toumey to make a “Geological and Agricultural Survey of the State.” Mr. Toumey submitted a Report on the Geology of South Carolina in 1846. The report was published in 1848 and presented the results for the first real study of geology of the State.

1904

Earle Sloan begins service as State Geologist until 1910. His earlier work was instrumental in our understanding of the Charleston earthquake.

1937

President Franklin D. Roosevelt urged states to address soil erosion by creating local conservation districts. The Conservation Districts Law, Act 182, provided for the creation of South Carolina’s 46 soil and water conservation districts and a state agency, the S.C. Soil and Water Conservation Committee, which later merged into the S.C. Land Resources Commission.

1938

The first conservation district farm plan in the nation was initiated in Oconee County.

1967

The S.C. Water Resources Planning and Coordination Act of 1967 established the S.C. Water Resources Committee. The act was amended in 1969 to change the Committee to the S.C. Water Resources Commission which subsequently merged into SCDNR.

1972

The State Soil and Water Conservation Commission was designated the State Land Resources Conservation Commission, which later merged into SCDNR.

1980

The Aquatic Plant Management Council was established to provide statewide coordination of aquatic plant management efforts in public waters. Management of nuisance aquatic plants was further strengthened by law in 1990 when the S.C. Aquatic Plant Management Program and Trust Fund were established.

History of the Land, Water and Conservation Division

1986

The Office of State Climatologist Act provided that the State Climatology Office will serve as the “climatological focal point for state government and its agencies.”

The General Assembly designated revenue from a slight increase in the Real Estate Document Stamp Tax to support the Heritage Land Trust Fund which supports the protection of critical wildlife habitat.

1994

As a result of the Restructuring Act of 1993, the S.C. Department of Natural Resources was formed, made up of the former S.C. Wildlife and Marine Resources Department, S.C. Water Resources Commission, S.C. Land Resources Conservation Commission, S.C. Geological Survey, and S.C. Migratory Waterfowl Committee.

1997

The Water Resources Division, Land Resources Division, and Geological Survey were formally combined into one division—Land, Water and Conservation, by the appropriations act of 1998.

1998

First Edition of the State Water Plan published, making recommendations for Water Resources Management in SC.

2004

Second Edition of the State Water Plan, incorporating lessons learned from the severe drought of 1998-2002.

2014

Initiated the Surface Water Assessment project to consolidate hydrologic information and create computer models for the eight major river basins, the first step in updating the State Water Plan.

2017

Completed the Surface Water Assessment project in support of updating the State Water Plan.



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

Purpose: Provide scientific and reliable information to policy and decision makers and to the public in order to understand, sustain and protect the state's natural resources for the benefit of all generations. This is achieved through planning, research, technical assistance, public education and development of a comprehensive natural resources database.

- Surface-water quantity and water-allocation models were completed for each of the eight major river basins in the state.
- Work continued with the USGS on updating a groundwater flow model for the state, and with the USACE on developing water-demand forecasts for the Savannah River basin.
- The SCDNR groundwater monitoring network (169 wells) was linked to the USGS National Ground-Water Monitoring Network (NGWMN).
- Continued monitoring groundwater for aquifer levels and saltwater intrusion.
- New geologic mapping covering 372 square miles has been developed as digital map products using GIS. To date, more than 14,000 square miles (~45%) of the state have detailed geologic map information.
- Processing satellite data for EPA grant to study possible land subsidence related to groundwater withdrawal in Georgetown County.
- Completed the ACE Basin Coastal Vulnerability Project to demonstrate physical change on the shoreline www.dnr.sc.gov/geology/botanybay-coastal-erosion.
- More than 500,000 requests for Geological Survey webpages over the last four years.
- Work began on a grant from Bureau of Ocean Energy Management (BOEM) to analyze both regional and state offshore sand resources.
- South Carolina Core Repository contains over 1,500 cores and 230,000 linear feet of core material from around the State including offshore.
- Provided GIS support for all LWC Programs.
- Enhanced and expanded the Weatheralert notification system (2,937 subscriptions).
- Collected, analyzed and consolidated data on rainfall, streamflow and damage from Hurricane Matthew. Developed an on-line interactive story journal for the event <http://www.dnr.sc.gov/matthew2016>.



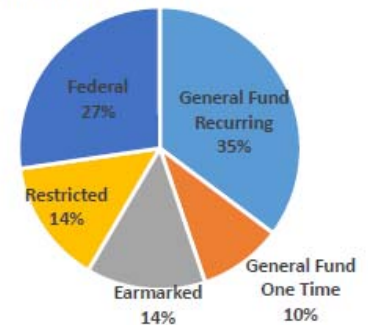
- Collaborated with the Law Enforcement Division in development of flood inundation maps for search and rescue missions.
- Assisted state and federal agencies and the public in data acquisition and forecast interpretation before, during and after tropical events, severe weather, winter weather, droughts and special event planning.
- Chaired and staffed six meetings of the SC Drought Response Committee to take appropriate action on drought status designations.
- Released three preliminary Flood Insurance Rate Maps.
- Conducted five Preliminary Digital Flood Insurance Rate Map Community Coordination meetings and seven public open houses.
- Assisted communities with substantial damage requirements post 2015 flood event and Hurricane Matthew.
- Community participation in the National Flood Insurance Program is 90% (236 communities).
- SCDNR has led the Light Imaging Detection and Range (LiDAR) Consortium since 2007, successfully establishing 28 financial and in-kind partners for the statewide acquisition of LiDAR data. LiDAR data is important to South Carolina as it is used for many purposes, including but not limited to flood modeling, storm water management, transportation planning, natural resources management and economic development.
- Facilitated and cost shared with SCDNR wildlife biologists to restore or improve habitat on SCDNR properties and with USFWS and TNC to improve habitat in and around the ACE Basin.

- Worked cooperatively with Santee Cooper, USFWS and SC Waterfowl Association to improve habitat in the Santee Cooper Lakes.
- Worked with SCDNR biologists and private landowners to restore sensitive Wood Stork habitat.
- Facilitated and/or cost shared with other local and private entities to improve habitat and recreational use by controlling numerous species in other public waters.
- Acquired and outfitted the newly renovated 9,000 square-foot Parker Annex (circa 1910). The Parker Annex Archaeology Center will house the agency's archaeological research program, artifact collections from across the state and offer teachers, students and the public the opportunity to participate in archaeological research projects conducted on SCDNR lands.
- Improved public safety at the Congaree Creek Heritage Preserve trail system.
- Removed Hurricane Matthew debris from six coastal Cultural Heritage Trust Preserves.
- Permitted two external archaeological research projects: Jocassee Gorges Pinnacle Mountain Petroglyph Survey and the Botany Bay Heritage Preserve Pockoy Island Shell Ring Investigation.
- Secured National Historic Preservation Act Section 106 clearance for the Sassafras Mountain Observation Tower project.
- The Flora Carolina project has compiled online over 211,000 herbarium records from eight of the state's larger herbaria with 77,000 specimens photographed at high resolution.
- Cooks Mountain, part of the 3674-acre Wateree River Heritage Preserve and WMA, was surveyed for ecological significance.

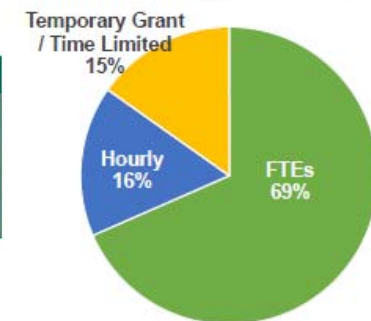


- Processed more than 300 requests for information from the Rare/Threatened/Endangered Species Database.
- Supported four active river conservation projects in 2017 where local partners are working to protect and enhance important river resources.
- Partners and staff collaborated to develop three information products in 2017: 1) HowsMySCRiver.org – a website for recreational water quality of Saluda and Congaree Rivers; 2) GoPaddleSC.com - a website guide to the state's rivers; and 3) the Edisto River Basin Boating Guide.
- 4,750 volunteers participated in Beach Sweep River Sweep and worked to remove litter and debris from public waterways at 120 sites statewide.
- Program staff provided technical assistance to the public in conjunction with the 46 Conservation Districts and the U.S. Department of Agriculture-Natural Resource Conservation Service (NRCS). Technical assistance includes producing conservation management plans. In FY 16-17, staff assisted with 876 conservation plans.
- Staff conducted 14 workshops and field days demonstrating the Rainfall Simulator unit which is an educational tool that illustrates water related soil erosion and runoff. The workshops are in cooperation with conservation districts, the National Grazing Land Coalition and the USDA-NRCS.

Expenses	Amount
General Fund Recurring	\$3,032,598
General Fund One Time	\$823,881
Earmarked	\$1,176,328
Restricted	\$1,224,829
Federal	2,351,793
Total Expenses	\$8,609,429

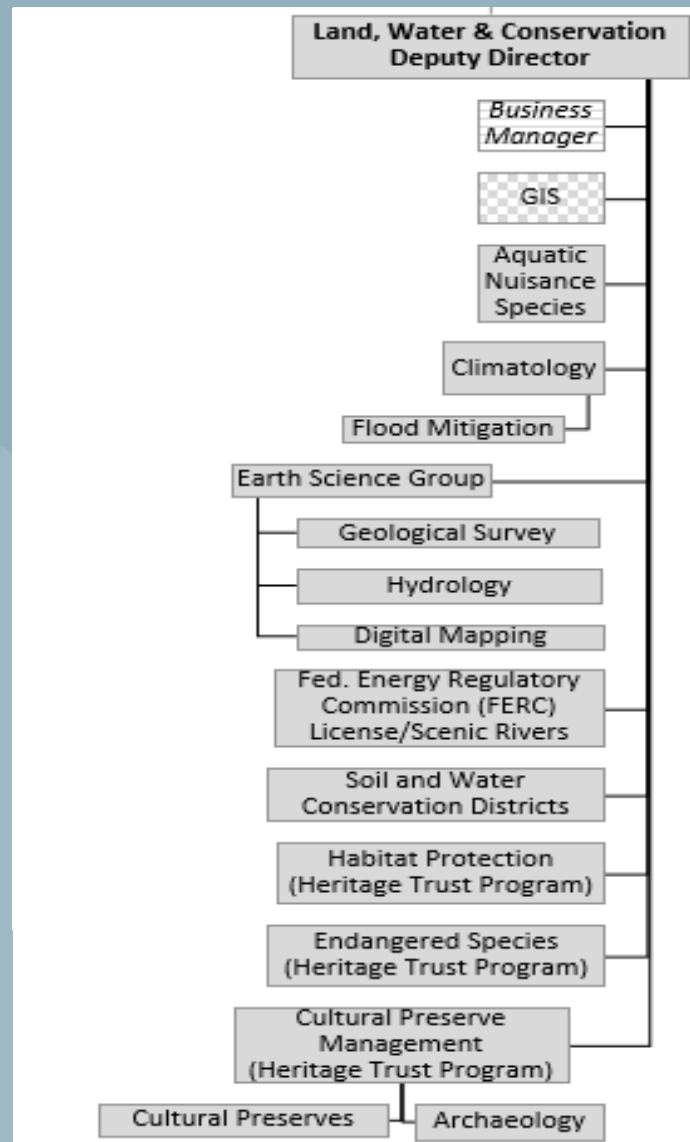


Employees	
FTEs	45
Temporary Grant/Time Limited	10.75
Hourly	10
Total	65.75



*In addition, LWC averages approximately 10 hourly employees at any given time. This number varies throughout the year based on seasonal employment needs.

LWC ORGANIZATIONAL CHART



LWC Organization

<u>Details:</u>	<u>2014-15</u>	<u>2015-16</u>	<u>2016-17</u>
What is the turnover rate?	2.94%	0.00%	5.40%
Is employee satisfaction evaluated?	No	No	No
Is anonymous employee feedback allowed?	No	No	No
Do any positions require a certification (e.g., teaching, medical, accounting, etc.)	Yes	Yes	Yes
Did the agency pay for, or provide classes/instruction needed to maintain all, some, or none of required certifications?	All	All	All

Revenue generated by LWC during FY 2015-16 and 2016-17.

Revenue Source	Recurring or one-time?	State, Federal, or Other?	Does revenue remain with the agency or go to General Fund?	Total revenue generated in 2015-16	Total revenue estimated to generate in 2016-17
Flood Training Registrations, weather certifications, printed products	Recurring	Other	Agency	\$38,462.53	\$81,484.87
Cash Transfer	Recurring	Other	Agency	\$488,425.83	\$493,367.87
Cash Transfers	Recurring	Other	Agency	\$71,811.00	\$219,339.60
Map data, Core Sample logs, mineral rock kits and GIS publications	Recurring	Other	Agency	\$12,440.47	\$(5,333.06)
Revenue passed to USGS for surface water, ground water, water quality station	Recurring	Other	US Geological Survey	\$508,436.00	\$494,656.00
Reimbursements for aquatic weed management	Recurring	Other	Agency	\$169,200.00	\$178,110.37
Heritage Trust Fund-Document Stamp	Recurring	Other	Agency	\$854,185.00	\$297,900.00
Heritage Trust Fund-Document Stamp	Recurring	Other	Agency	\$188,851.00	\$1,247,390.00
Document Stamp Tax portion	Recurring	Other	Agency	\$231,856.00	\$0.00
Document Stamp Tax portion-Bond Repayment	Recurring	Other	Agency	\$3,328,440.00	\$(830,095.85)
Donations	Recurring	Other	Agency	\$253.00	\$0.00
TOTAL				\$5,892,360.83	\$2,176,819.80

[1] Trust Funds

[2] Trust Funds

[3] Trust Funds and Documentary Stamp Tax revenue resumed postings once HT Bond was called in December 2016

[4] Trust Funds and Bond called December 2016, fund closed

[5] Trust Funds

Agency revenue sources utilized by LWC during FY 2016-17 and 2017-18.

<u>Revenue Sources utilized</u>	<u>Recurring or one-time?</u>	<u>State, Federal, or Other?</u>	<u>Organization al Unit</u>	<u>2016-17 - Spent to Achieve Agency's Comprehensive Strategic Plan</u>	<u>2017-18 - Budgeted to spend to Achieve Agency's Comprehensive Strategic Plan</u>
General Fund	Recurring	State	Agency	\$3,032,598	\$2,998,139
General Fund	One-Time	State	Agency	\$823,881	\$248,500
Federal Awards	Recurring	Federal	Agency	\$2,351,792	\$2,936,676
Flood Training Registrations, weather certifications, printed products	Recurring	Other	LWC	\$23,255	\$23,246
Cash Transfer	Recurring	Other	LWC	\$525,142	\$525,142
Cash Transfers	Recurring	Other	LWC	\$120,566	\$113,736
Map data, Core Sample logs, mineral rock kits and GIS publications	Recurring	Other	LWC	\$12,709	\$12,709
Revenue passed to USGS for surface water, ground water, water quality station	Recurring	Other	LWC	\$494,656	\$494,656
Reimbursements for aquatic weed mgmt	Recurring	Other	LWC	\$152,342	\$152,342
Heritage Trust Fund-Document Stamp	Recurring	Other	LWC	\$302,090	\$302,090
Heritage Trust Fund-Document Stamp	Recurring	Other	LWC	\$770,397	\$770,397
	<u>2016-17 Totals (Percent of Total)</u>		<u>2017-18 Totals (Percent of Total)</u>		
Recurring General Fund	\$3,032,598 (35.22%)		\$2,998,139 (34.95%)		
One-Time General Fund	\$823,881 (9.57%)		\$248,500 (2.90%)		
Recurring Federal	\$2,351,792 (27.32%)		\$2,936,676 (34.24%)		
Recurring Other	\$2,401,157 (27.89%)		\$2,394,318 (27.91%)		
GRAND TOTAL	\$8,609,428		\$8,577,633		

EARTH SCIENCE GROUP

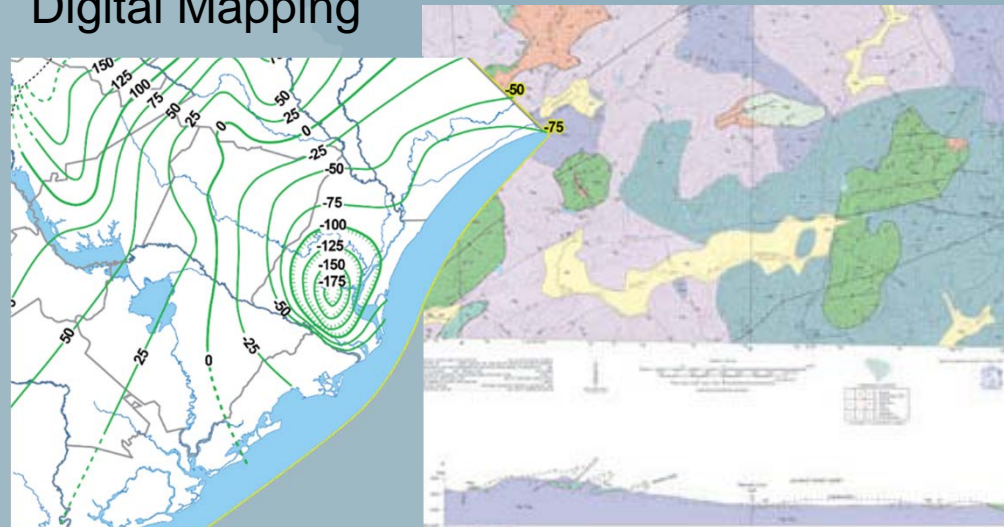
Hydrology Section



Geological Survey



Digital Mapping



Hydrology Section

The DNR Hydrology Section shall advise the Governor and General Assembly on formulating and establishing a comprehensive water resources policy to assure adequate supplies of surface and groundwaters of suitable quality are available.

			CUSTOMERS			COSTS	
Item #	<u>Product/Service Components</u>	Does law require, allow, or not address it?	Does agency know the annual number of potential customers?	Does agency know the annual number of customers served?	Does the agency evaluate customer satisfaction?	Does the agency know the cost it incurs, per unit, to provide the product or service?	Does the law allow the agency to charge for it to cover the agency's costs?
1A	Formulate and establish a comprehensive water resources policy.	Require	No	No	No	No	No
1B	Develop and establish policies and proposals designed to meet and resolve special problems of water resources use and control.	Require	No	No	No	No	No
1C	Review actions and policies of State agencies and US Army Corps of Engineers with water resource responsibilities to determine consistency with the comprehensive water policy.	Require	No	No	No	No	No
1D	Conduct/arrange for studies, inquires, surveys, or analyses relevant in the implementation of policy and in developing recommendations to the General Assembly.	Require	No	No	No	No	No
1E	Consult with other government agencies relating to the use and control of water resources of the State.	Require	No	No	No	No	No
1F	Authorized to appoint interdepartmental and public advisory boards to advise in developing policies.	Allow	No	No	No	No	No
1G	Encourage, assist, and advise other State agencies responsible for water planning.	Require	No	No	No	No	No
1H	Determine if adequate supplies of surface and groundwaters of suitable quality for domestic, municipal, agricultural, and industrial uses are available.	Require	No	No	No	No	No
1I	Publish reports, including the results of studies, inquiries, surveys, and analyses.	Allow	No	Yes	No	Yes	Yes

Item numbers are the ones utilized in agency's program evaluation report.

Hydrology Section

GOAL 1 Develop and Implement programs that study, manage and conserve the State's Land and Water Resources through planning, research, technical assistance, public education and the development of a comprehensive natural resources database.

Strategy 1.1 Water Resource Management and Earth Science research, as well as review of proposed environmental impacts as published in the regulatory arena to provide reliable, science-based information to decision makers and the public.

Objective 1.1.1 Conduct or arrange for studies, inquires, surveys, or analysis; prepare reports; review actions; and appoint advisory boards as may be relevant in implementation of water policy.

	<u>FTE equivalents utilized</u>	<u>Total spent / budgeted</u>
2016-17	11.75 FTE	\$1,725,645 (2.33%)
2017-18	11.75 FTE	\$1,663,833 (2.35%)

Hydrology Section

Performance Measures	Type of Measure	2013-14	2014-15	2015-16	2016-17	2017-18
Use hydrology information to develop plans to ensure surface and groundwater of suitable quality is available for all uses <u>Required by:</u> State government <u>Best in the Country:</u> Texas	Outcome	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> Updated State Water Plan
Develop surface-water quantity models for each of the State's eight major river basins for regional water planning <u>Additional Notes:</u> Models have been completed, will be used in the future for water planning and will be updated as new data becomes available. <u>Required by:</u> State government <u>Best in the Country:</u> CDM Smith, Inc.	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 2 models <u>Actual:</u> 0 models	<u>Target:</u> 4 models <u>Actual:</u> 4 models	<u>Target:</u> 4 models <u>Actual:</u> 4 models	<u>Target:</u> No longer tracked
Develop a groundwater-quantity model and a groundwater-recharge model of the Coastal Plain for regional water planning <u>Required by:</u> State government <u>Best in the Country:</u> USGS/SCDNR	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 3-year project with the USGS begins February 2016	<u>Target:</u> On schedule <u>Actual:</u> On schedule	<u>Target:</u> Both models scheduled to be completed by Feb. 2019
Develop water-demand forecasts for each of the State's eight major river basins for regional water planning <u>Required by:</u> State government <u>Best in the Country:</u> Private consultants	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 1½-year project with the USACE begins May 2016 for one forecast (Savannah River basin)	<u>Target:</u> Final report due for the Savannah River basin
Meet and consult with agricultural, industrial, and municipal interest groups to propose policies for developing water-demand forecasts for regional water planning <u>Additional Notes:</u> Meetings were used to gather input from stakeholders on how forecast water-demand, which will be included in the water plan. <u>Required by:</u> State government <u>Best in the Country:</u> SCDNR	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 5 meetings <u>Actual:</u> 5 meetings	<u>Target:</u> No longer tracked
Develop a groundwater-quantity model and a groundwater-recharge model for Aiken County to determine groundwater availability <u>Required by:</u> State government <u>Best in the Country:</u> USGS/SCDNR	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 4-year project with the USGS begins December 2014	<u>Target:</u> On schedule <u>Actual:</u> Delays in project due to funding	<u>Target:</u> On schedule <u>Actual:</u> Project extended 6 months to include 2016 water-use data	<u>Target:</u> Both models scheduled to be completed by June 2019
Meet and consult with stakeholders, government agencies, water utilities, and other water-user groups to discuss water plans, policies, programs, and projects <u>Additional Notes:</u> Some meetings were not relevant to the section. <u>Required by:</u> State government <u>Best in the Country:</u> SCDNR	Output	<u>Target:</u> % of Requested <u>Actual:</u> 85% (37 meetings)	<u>Target:</u> % of Requested <u>Actual:</u> 85% (82 meetings)	<u>Target:</u> % of Requested <u>Actual:</u> 85% (161 meetings)	<u>Target:</u> % of Requested <u>Actual:</u> 85% (148 meetings)	<u>Target:</u> % of Requested
Add 105 stream gages to the State's surface water monitoring network as a result of recommendations made at the workshops <u>Additional Notes:</u> New gages cost approximately \$16,000/year, the USGS has agreed to pay for installation if we maintain the gage for five years. <u>Required by:</u> State government <u>Best in the Country:</u> USGS	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 105 gages <u>Actual:</u> 20 gages (SCDOT funded)	<u>Target:</u> 85 gages
Produce potentiometric maps of the three major aquifers in the State to determine changes in groundwater availability <u>Additional Notes:</u> DNR typically makes one map per year, but last year made maps of all three aquifers as the information was needed to assist DNR in calibrating the groundwater model, which is used for water planning. DNR would like to add more wells to the network before making an additional map. <u>Required by:</u> State government <u>Best in the Country:</u> SCDNR	Output	<u>Target:</u> 1 map <u>Actual:</u> 1 map	<u>Target:</u> 1 map <u>Actual:</u> 1 map	<u>Target:</u> 1 map <u>Actual:</u> 1 map	<u>Target:</u> 1 map <u>Actual:</u> 3 maps	<u>Target:</u> 0

Hydrology Section

<p>Add 233 wells to the DNR groundwater monitoring network as required to produce accurate potentiometric maps</p> <p>Additional Notes: Adding wells to the DNR groundwater network depends on the availability of the well (is the owner willing to turn it over to the state) and on its location, depth and condition. When DNR has funding available, we contract well drilling out to a company to drill new wells on DNR or state-owned properties. If there is not money for drilling new wells, we try to recruit wells that are being abandoned by their owners, which saves the state money.</p> <p>Required by: State government Best in the Country: SCDNR</p>	Output	<u>Target:</u> 228 wells <u>Actual:</u> 11 wells	<u>Target:</u> 217 wells <u>Actual:</u> 28 wells	<u>Target:</u> 189 wells <u>Actual:</u> 2 wells	<u>Target:</u> 187 wells <u>Actual:</u> 6 wells	<u>Target:</u> 181 wells
<p>Visit sites of the statewide DNR groundwater monitoring network, currently 137 sites and 169 wells, to measure groundwater levels and download water-level data from data recorders</p> <p>Required by: State government Best in the Country: SCDNR</p>	Output	<u>Target:</u> 660 site visits <u>Actual:</u> 660 site visits	<u>Target:</u> 810 site visits <u>Actual:</u> 810 site visits	<u>Target:</u> 792 site visits <u>Actual:</u> 792 site visits	<u>Target:</u> 822 site visits <u>Actual:</u> 822 site visits	<u>Target:</u> 822 site visits
<p>Conduct geophysical surveys of water wells to determine groundwater availability</p> <p>Additional Notes: Determined by the number of requests.</p> <p>Required by: State government Best in the Country: SCDNR</p>	Output	<u>Target:</u> % of Requested <u>Actual:</u> 100% (26 wells surveyed)	<u>Target:</u> % of Requested <u>Actual:</u> 100% (7 wells surveyed)	<u>Target:</u> % of Requested <u>Actual:</u> 100% (9 wells surveyed)	<u>Target:</u> % of Requested <u>Actual:</u> 100% (26 wells surveyed)	<u>Target:</u> % of Requested
<p>Review water permits, policies, programs, plans and projects</p> <p>Additional Notes: Determined by the number of permits submitted.</p> <p>Required by: State government Best in the Country: SCDNR</p>	Output	<u>Target:</u> % of Requested <u>Actual:</u> 100% (24 reviews)	<u>Target:</u> % of Requested <u>Actual:</u> 100% (28 reviews)	<u>Target:</u> % of Requested <u>Actual:</u> 100% (38 reviews)	<u>Target:</u> % of Requested <u>Actual:</u> 100% (55 reviews)	<u>Target:</u> % of Requested
<p>Add groundwater data and wells to the DNR groundwater database</p> <p>Required by: State government Best in the Country: SCDNR</p>	Output	<u>Target:</u> % of Available <u>Actual:</u> 100% (2634 wells)	<u>Target:</u> % of Available <u>Actual:</u> 100% (3117 wells)	<u>Target:</u> % of Available <u>Actual:</u> 100% (3202 wells)	<u>Target:</u> % of Available <u>Actual:</u> 100% (2912 wells added)	<u>Target:</u> % of Available
<p>Provide water-related technical assistance and information to citizens, government entities, water managers, well drillers, engineers, and others</p> <p>Additional Notes: Determined by the number of requests.</p> <p>Required by: State government Best in the Country: SCDNR</p>	Output	<u>Target:</u> % of Requested <u>Actual:</u> 85% (198 requests)	<u>Target:</u> % of Requested <u>Actual:</u> 85% (199 requests)	<u>Target:</u> % of Requested <u>Actual:</u> 85% (227 requests)	<u>Target:</u> % of Requested <u>Actual:</u> 85% (213 requests)	<u>Target:</u> % of Requested
<p>Develop a network of 25 wells along the coast to monitor for saltwater intrusion of coastal aquifers</p> <p>Additional Notes: Determined by the number of well owners who are willing to participate and by the availability of funds needed to drill new wells.</p> <p>Required by: State government Best in the Country: SCDNR</p>	Output	<u>Target:</u> 25 <u>Actual:</u> 5	<u>Target:</u> 20 <u>Actual:</u> 3	<u>Target:</u> 17 <u>Actual:</u> 2	<u>Target:</u> 15 <u>Actual:</u> 0	<u>Target:</u> 15
<p>Prepare technical/scientific reports that document results from water-related investigations</p> <p>Additional Notes: 2017-18 target is not an optimal target and is limited because of staff shortage.</p> <p>Required by: State government Best in the Country: SCDNR</p>	Output	<u>Target:</u> 1 report <u>Actual:</u> 0 report	<u>Target:</u> 1 report <u>Actual:</u> 1 report	<u>Target:</u> 1 report <u>Actual:</u> 0 report	<u>Target:</u> 1 report <u>Actual:</u> 4 reports	<u>Target:</u> 1 report
<p>Organize eight basin advisory councils to help develop regional water plans</p> <p>Additional Notes: Pilot-project in the Savannah River basin done in cooperation with Clemson and funded by Duke Energy Mitigation Funding from FERC relicensing.</p> <p>Required by: State government Best in the Country: SCDNR</p>	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 1 council

Hydrology Section

State Water Plan Update

- Surface-water availability assessment
- Groundwater availability assessment
- Water-demand forecasts
- Regional water plans
- State Water Plan



Water Resources Monitoring and Mapping

- Groundwater monitoring network
- Saltwater monitoring network
- Water-level (potentiometric) mapping
- Aquifer delineation
- Surface water monitoring



Water Resources Data Collection

- Coring/drilling
- Geophysical logging
- Well inventory/database

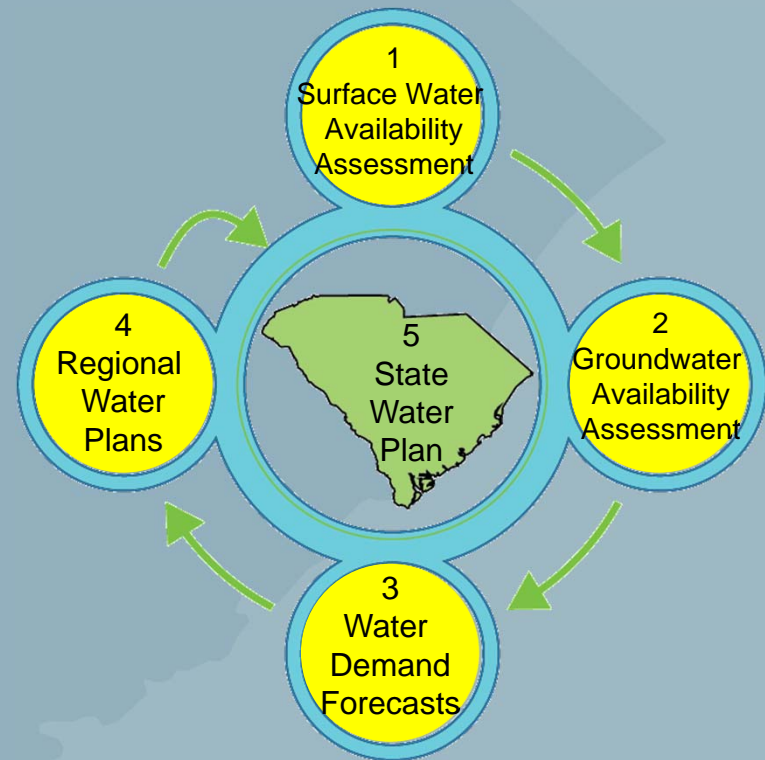


Water Resources Policy and Management Guidance

- Savannah River basin study
- FERC relicensing
- Environmental reviews and drought assessments

State Water Plan Update

The goal of water planning is to develop a water-resources management plan that ensures that an adequate and reliable supply of clean water will be available to sustain all future uses.



Steps involved in developing regional water plans and updating the State Water Plan.



US Army Corps
of Engineers



Cooperators:

Surface-Water Availability Assessment Stakeholder Meetings

Saluda	#1	Greenville	Apr. 2015
	#2	Greenville	Dec. 2015
Edisto	#1	Blackville	June 2015
	#2	Blackville	Dec. 2015
Broad	#1	Spartanburg	Aug. 2015
	#2	Spartanburg	May 2016
Pee Dee	#1	Florence	Nov. 2015
	#2	Florence	May 2016
Catawba	#1	Rock Hill	Nov. 2015
	#2	Rock Hill	Nov. 2016
Santee	#1	Moncks Corner	Mar. 2016
	#2	Moncks Corner	Dec. 2016
Salkehatchie	#1-2	Walterboro	Aug. 2016
Savannah	#1	North Augusta	Aug. 2016
	#2	North Augusta	Feb. 2017



www.scwatermodels.com



Surface-Water Availability Assessment DNR Webpage

The screenshot shows the DNR website with the following content:

- Header:** "Life's Better Outdoors" logo, "DNR South Carolina Department of Natural Resources", and a navigation bar with links: Buy, Boating, Education, Fishing, Hunting, Land, Maps, Regulations, Water, Wildlife.
- Left Sidebar:** Information, Contact Us, News, Other States, Presentations, Surface Water Modeling, Water Assessment (2009 Report), Water Plan (2004 Report), White Papers, Water Plan Home, Hydrology Section.
- Main Content:**
 - Surface Water Modeling and Assessments:** A paragraph explaining the need for accurate water resource assessment and the development of surface-water quantity models for eight major watersheds in South Carolina.
 - Project Documents:** A section with links to "Monthly Progress Reports", "Legislative Quarterly Reports", "Technical Reports", "Technical Memorandums", "Meeting Notes", "Presentations", "Videos", and "River Basins". Each link is accompanied by a right-pointing arrow icon.

[Monthly Progress Reports](#)

[Legislative Quarterly Reports](#)

[Technical Reports](#)

[Technical Memorandums](#)

[Meeting Notes](#)

[Presentations](#)

[Videos](#)

[River Basins](#)

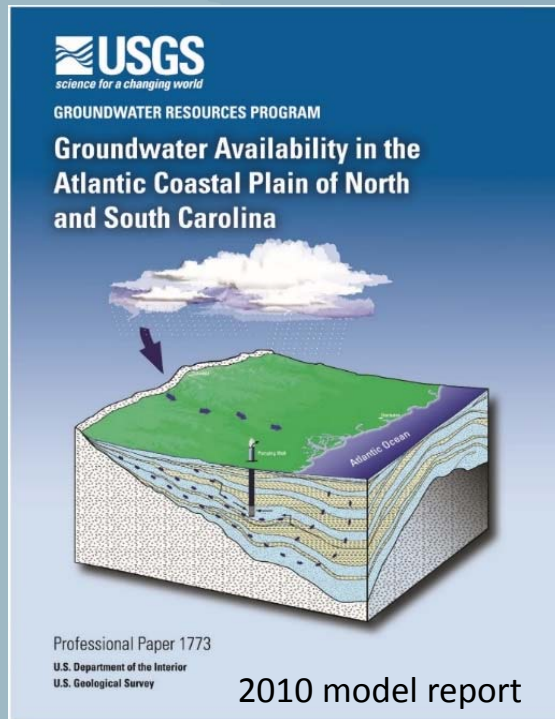
Broad	Catawba
Edisto	Pee Dee
Salkehatchie	Saluda
Santee	Savannah

<http://www.dnr.sc.gov/water/waterplan/surfacewater.html>

Groundwater Availability Assessment Groundwater Flow Model

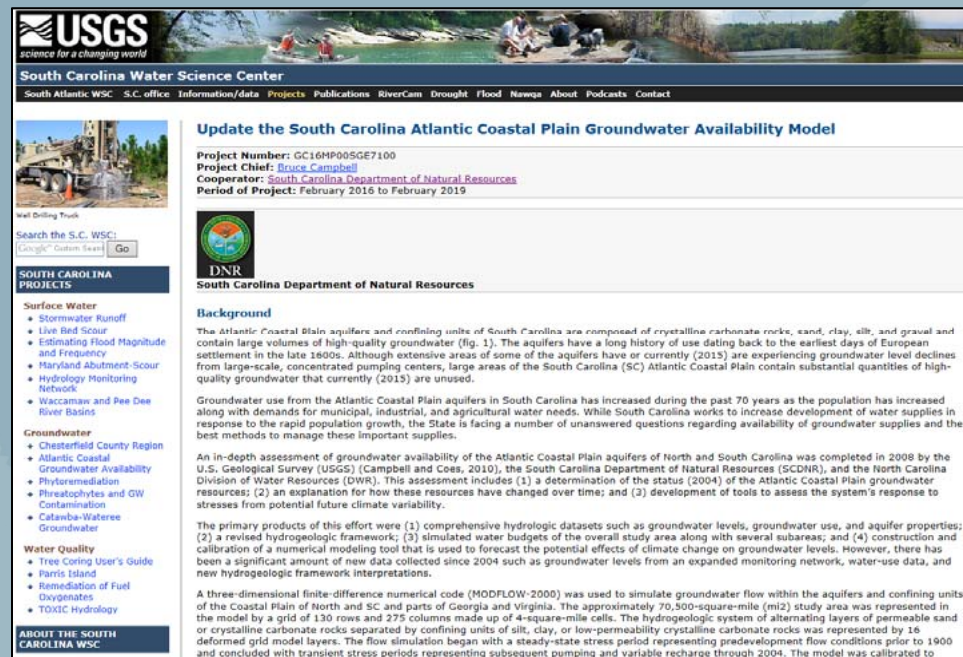
Purpose: Update the 2010 groundwater flow model of the Coastal Plain.

<http://pubs.usgs.gov/pp/1773/>



USGS webpage for the project:

https://www.usgs.gov/centers/sa-water/science/update-south-carolina-atlantic-coastal-plain-groundwater-availability-0?qt-science_center_objects=1#qt-science_center_objects



Model update is scheduled to be completed by February 2019.



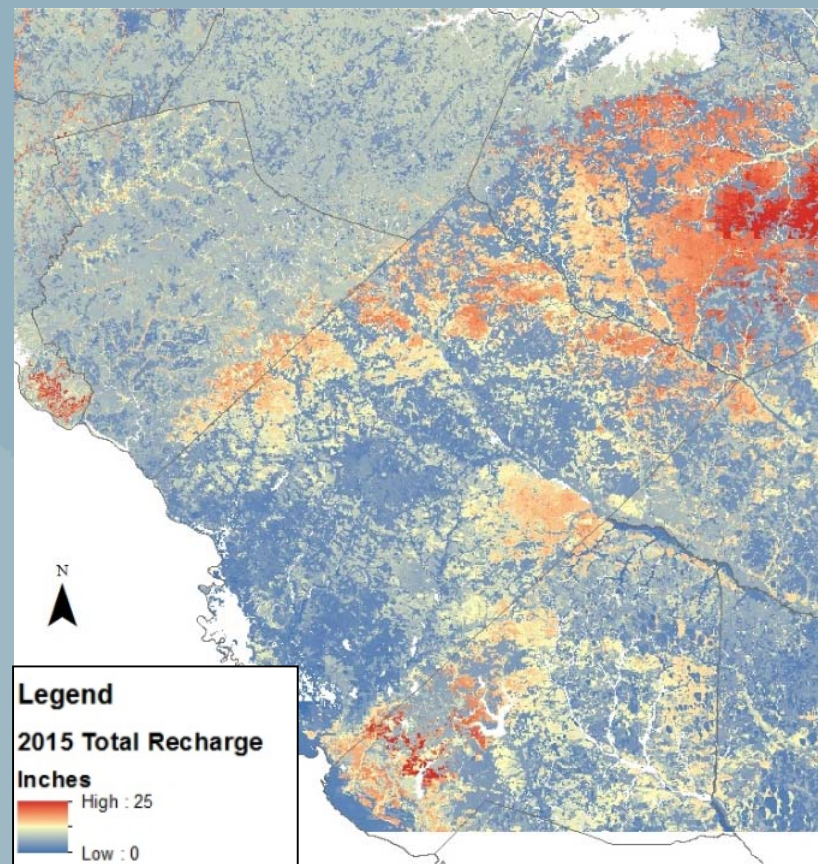
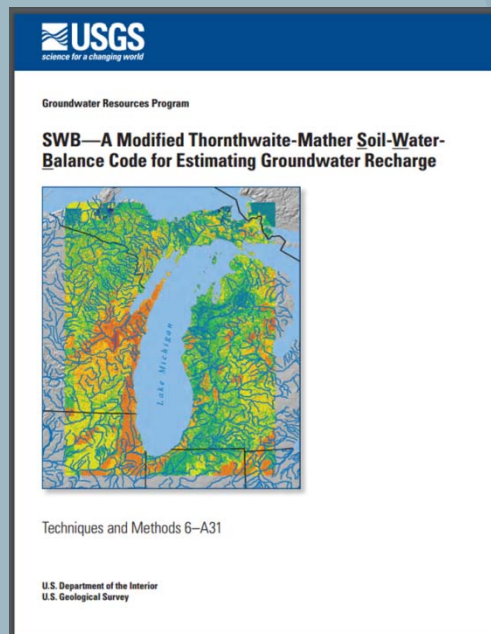
Groundwater Availability Assessment

Groundwater Recharge Model

Purpose: To develop maps showing groundwater recharge rates for the Coastal Plain. Recharge rates will be used as input for the groundwater flow models.

Includes many data sources:

- Geology
- Land Cover
- Soils
- Climate



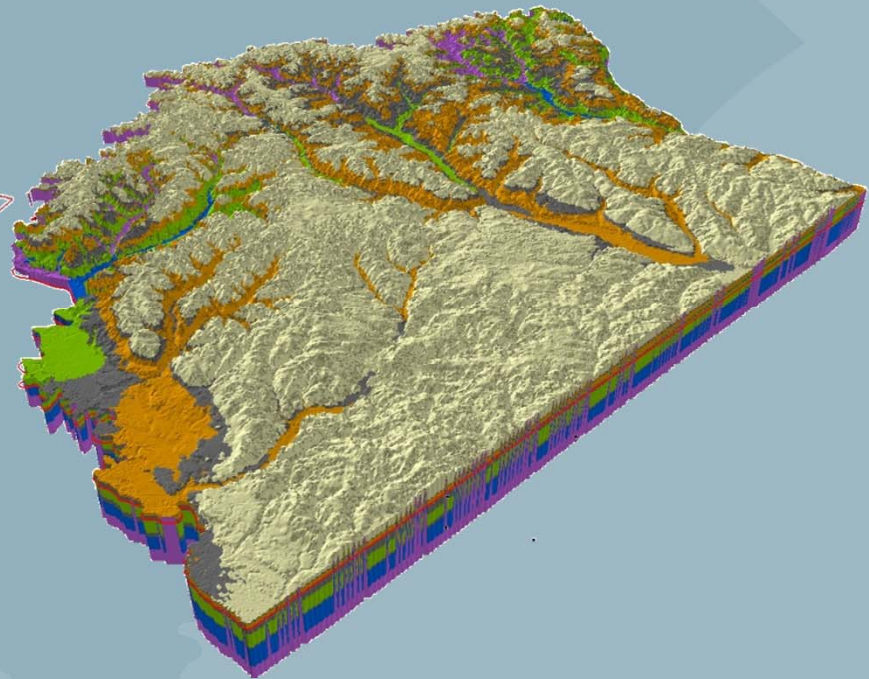
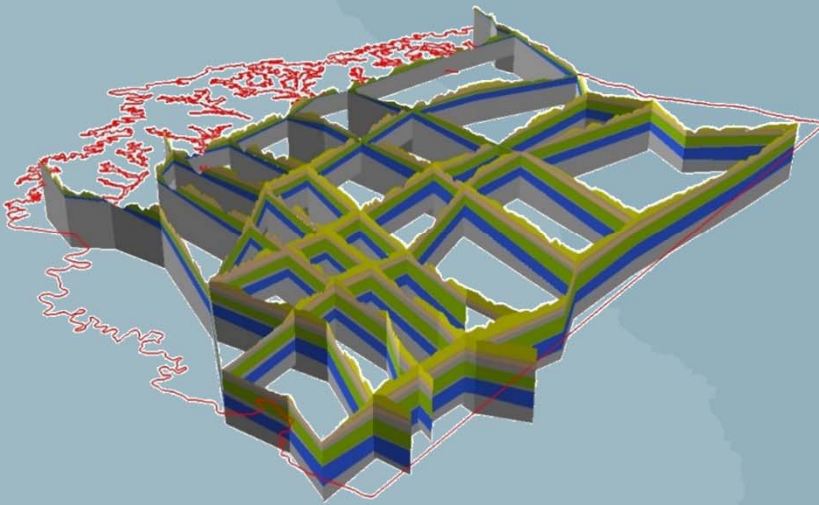
DNR



Groundwater Availability Assessment Hydrogeologic Framework

Purpose: Update the hydrogeologic framework of the Coastal Plain

A fence diagram depicting aquifers and confining units in Aiken County.



A 3-D hydrogeologic framework generated from the fence diagram using ARC-Hydro software.

Water-Demand Forecasts

Purpose: Develop water-demand forecasts for each of the 8 basins.

- SCDNR and USACE (Charleston) are currently (9/2017) developing methodologies and forecasts for the Savannah River basin.
- Methodologies will be applied to other basins.

Forecasts from 2013-2063 in 5- and 10-year intervals for:

1. Public supply
2. Domestic supply
3. Agriculture
4. Industry
5. Power
6. Golf Course



US Army Corps
of Engineers



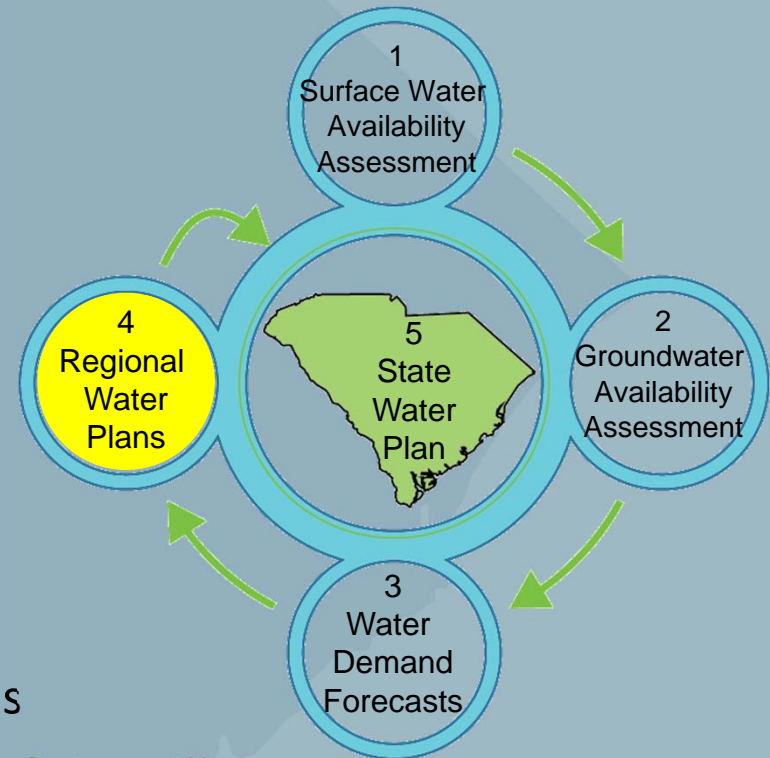
DNR

Regional Water Plans

Using the models and forecasts, and with oversight from State agencies, stakeholders will begin the process of developing regional water plans for each basin.

This step includes:

- The formation of basin advisory councils
- An analysis to determine if any water deficits will occur
- An assessment of management strategies to meet the future demands
- Water conservation and drought management recommendations

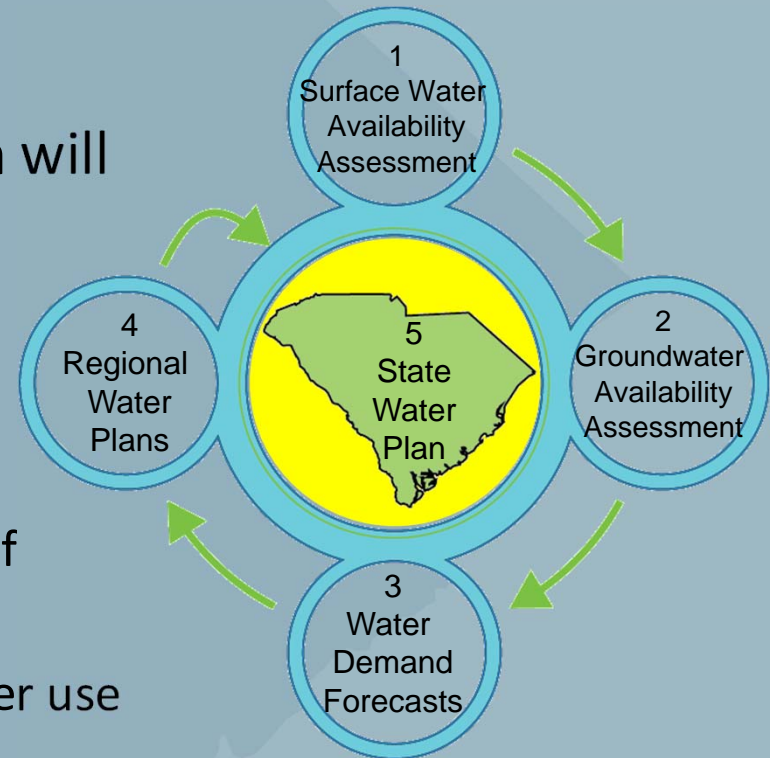


State Water Plan

Upon completion of the regional water plans, the State water plan will be updated by DNR.

This step includes:

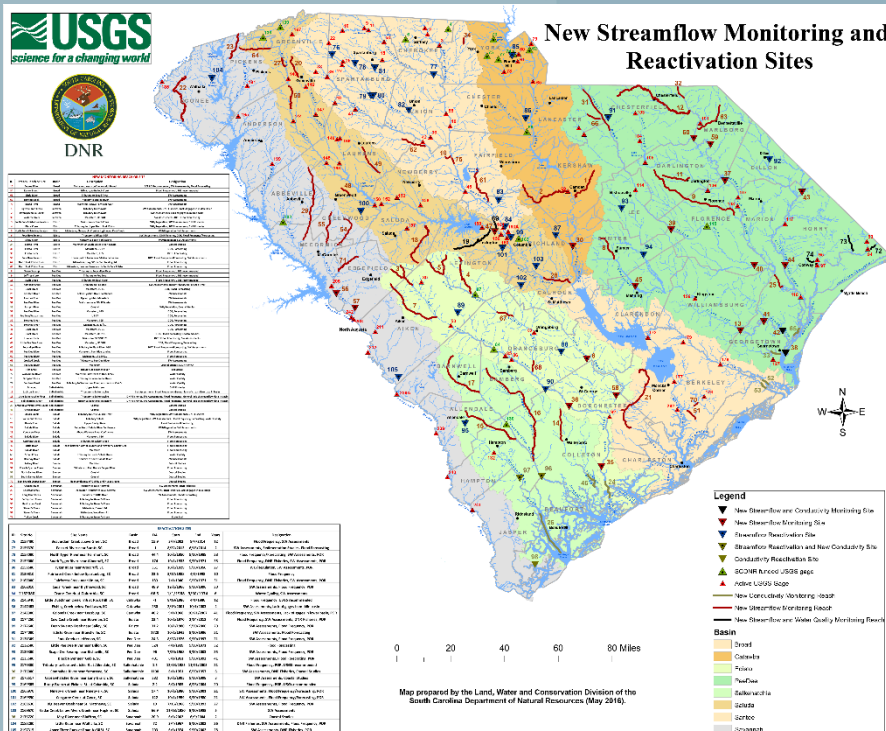
- Assessment of the overall condition of water resources in the State
- Evaluation of statewide trends in water use and availability
- Offering water-resource policy and program recommendations
- Introducing innovative practices



Surface Water Monitoring

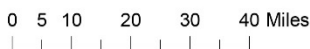
<http://www.dnr.sc.gov/water/hydro/streamflow.html>

Two streamflow monitoring workshops were held in 2016 to highlight monitoring needs in the State and to solicit additional monitoring recommendations. Workshops were attended by a variety of stakeholders including local, state and federal agencies, water suppliers, power utilities and conservation groups. A total of 105 recommendations were made, mainly for flood forecasting, water planning, water quality, and ecological monitoring. DNR currently funds 16 USGS streamflow gages.

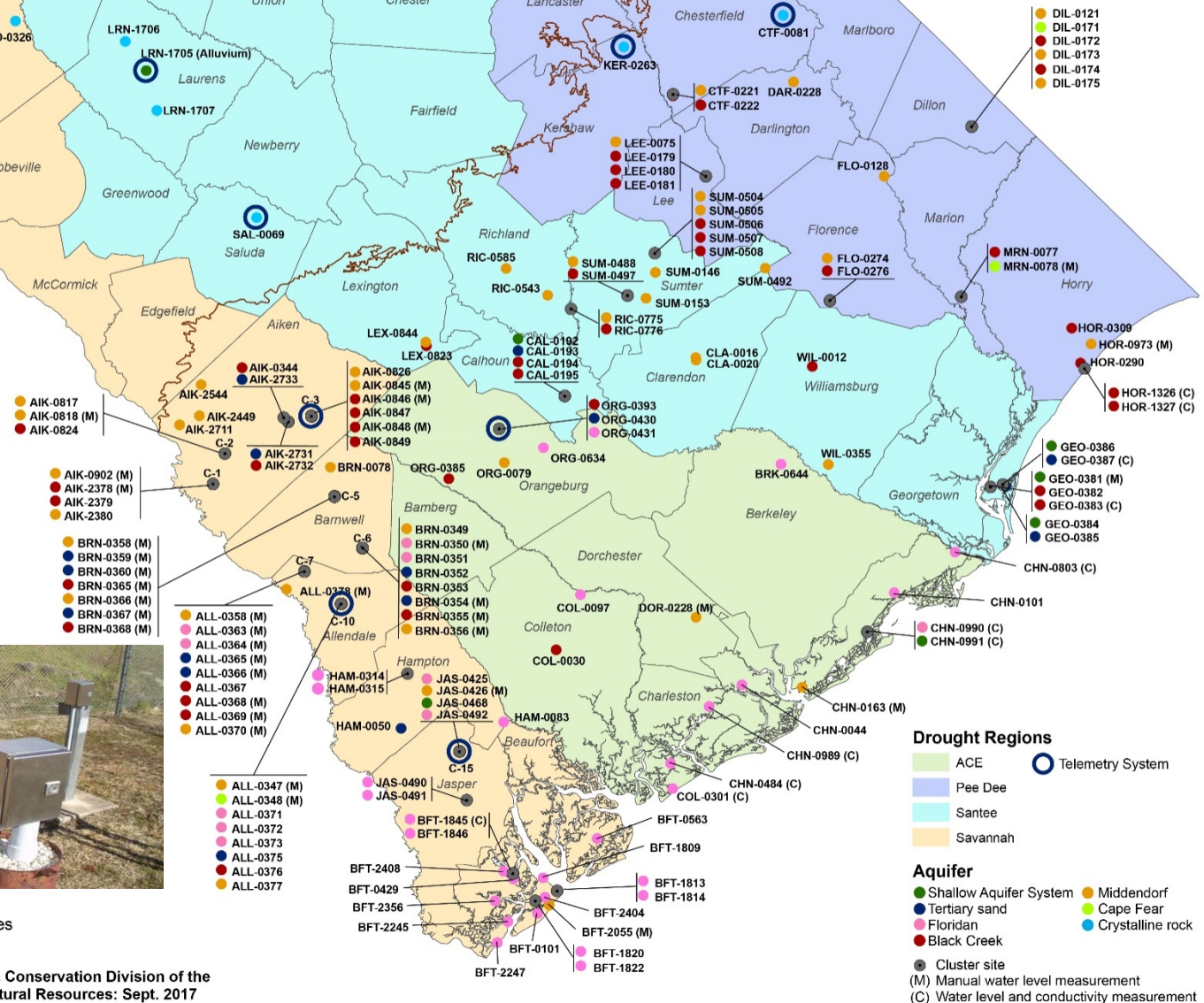


South Carolina Groundwater Monitoring Network

- 169 permanent wells in network
- 136 equipped with automatic data recorders



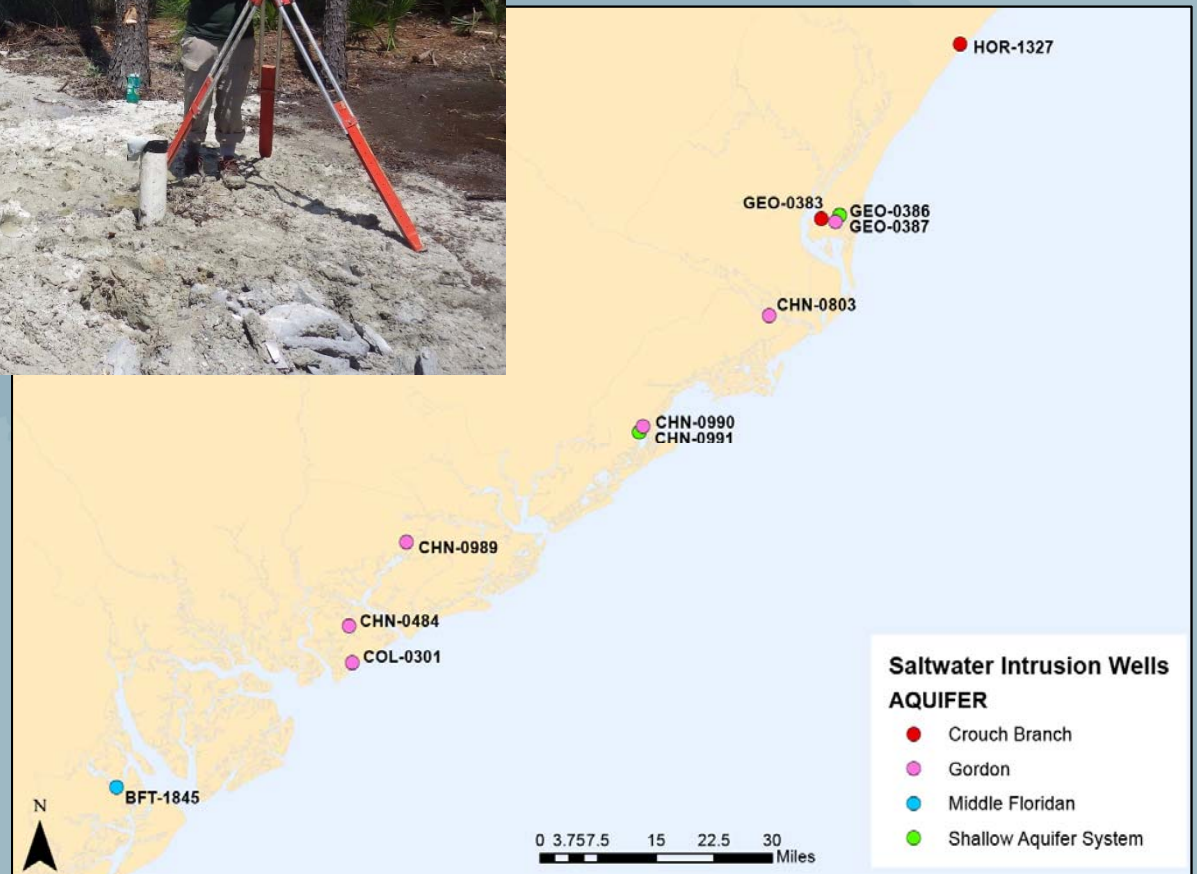
Map prepared by the Land, Water & Conservation Division of the
South Carolina Department of Natural Resources: Sept. 2017



Saltwater Monitoring Network

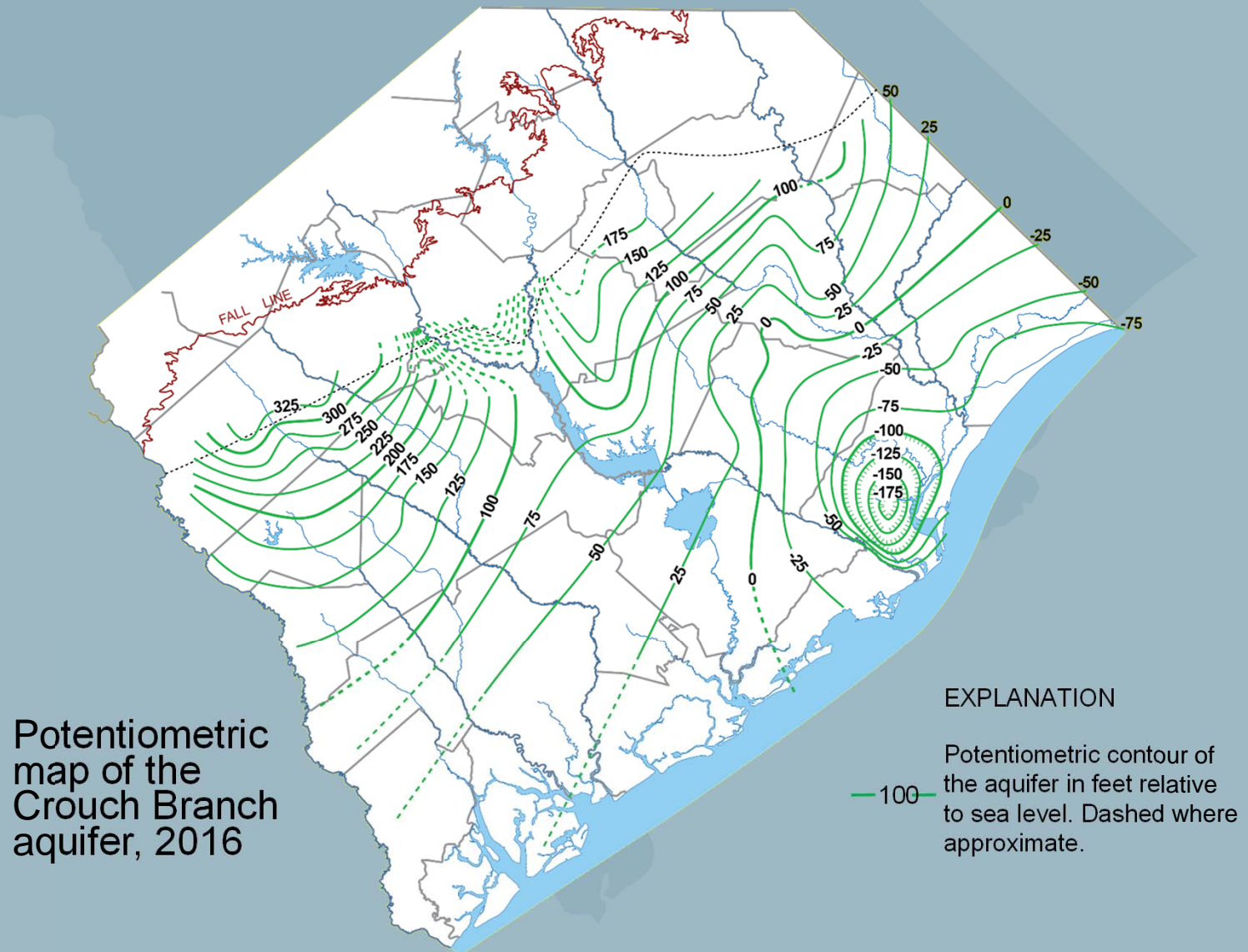


- Eleven wells are equipped with continuously logging conductivity probes to monitor for saltwater intrusion of our coastal aquifers.
- Long-term data will allow us to understand seasonal and annual trends and to evaluate the influence of pumping.



Potentiometric Mapping

Maps showing groundwater elevations of the major aquifers.



Coring and Well Drilling

Core samples,
Chesterfield County.



Well drilling, Dillon County.



Well-cluster site, Sumter County.



USGS coring rig at well site
in Calhoun County.



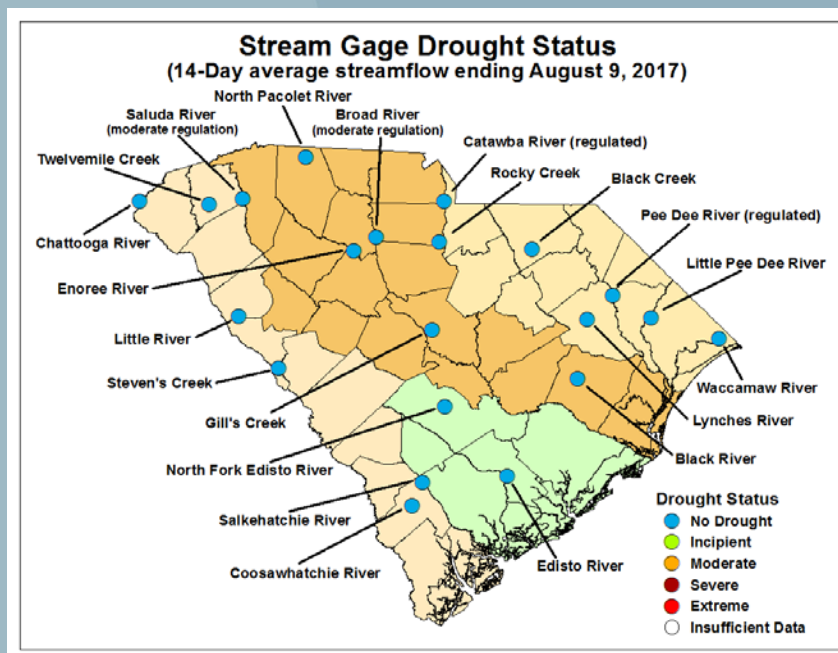
Savannah River Basin Study

- Purpose is to develop a new Drought Management Plan for Lakes Hartwell, Russell, and Thurmond that benefits the entire Savannah basin
- Multiyear project with the U.S. Army Corps of Engineers, Georgia EPD, SC DNR, and The Nature Conservancy
- Eight different potential drought management plans are being evaluated
- Analysis involves computer model simulations of how proposed reservoir operations would impact lake levels, Savannah River flows, Harbor water quality, ecosystems and water uses throughout the basin

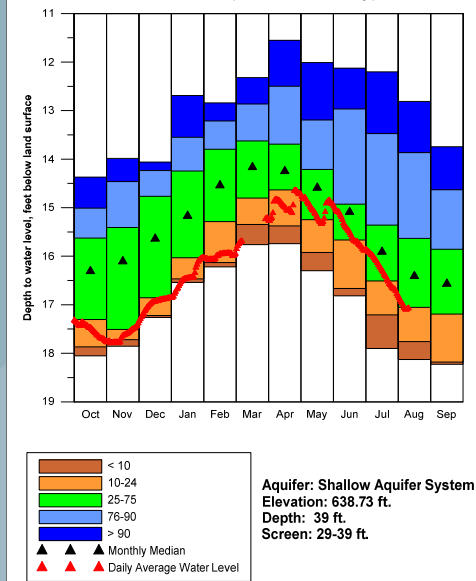


FERC Relicensing, Environmental Reviews and Drought Assessments

The Hydrology Section assists in the review of FERC relicensing agreements, environmental projects, surface-water withdrawal permits, and assists the S.C. State Climatology Office with drought assessments.



Well LRN-1705 (Laurens County)



Hydrology Section

Potential Harm

Greatest potential harms to the public if deliverables are not provided

- Comprehensive water resources policy in the State is necessary to ensure that an adequate supply of clean water is available for all future off stream and instream uses, including public health, economic development, fish and wildlife habitat, and recreational opportunities.
- Intrastate and interstate problems must be addressed to protect our water resources from exploitation and misuse.
- Water policy would lack consistency and would thereby be ineffective, resulting in degradation and exploitation of our water resources.
- Technical and scientific studies are required to adequately address water resource issues and to provide reliable information to decision makers. Without this information, sound water policy cannot be developed causing degradation of our water.
- Consultation with other government agencies ensures that water policies are being enforced and that water is being protected and conserved.
- For water policies to be effective, stakeholders and the general public must have a say in how our water is managed. Lack of acceptance can lead to misuse of our water.
- The effective management of our water resources requires cooperation and shared responsibility among Federal, State and local agencies, without which the water resources of the state would be exploited and misused.
- Reports are published to provide reliable information and policy recommendations to decision makers, without which the water resources of the state would be exploited. Spatial information will not be in an electronic format for easy dissemination and efficient use, thereby limiting the value of the information.
- Over pumping of groundwater can result in saltwater intrusion and land subsidence. Over pumping of surface water can cause degradation of water quality and be harmful to fish and wildlife habitat.

How the General Assembly can help avoid the greatest potential harm, other than money

- | | |
|--|---|
| • Support recommendations in the State Water Plan. | • Additional FTE's needed to accomplish mission. |
| • Make water resources a high-priority item. | • Support and encourage cutting-edge geospatial technology |
| • Support water-planning efforts in the State. | • Support sharing of geospatial data, maps, reports, etc. between state agencies. |
| • Support interstate committees. | • Support information technology development services |
| • Support Savannah River Advisory Council. | • Support scientific inquiries. |
| • Support Governor's Savannah River Committee. | • Support technical and scientific studies. |
| • Support Catawba Wateree Working Group. | • Continue to support legislative duty. |

Geological Survey

The Department is authorized through the Geological Survey to provide field and laboratory studies in Geology to provide advice and assistance to other state and local governmental agencies.

			CUSTOMERS			COSTS	
Item #	<u>Product/Service Components</u>	Does law require, allow, or not address it?	Does agency know the annual number of potential customers?	Does agency know the annual number of customers served?	Does the agency evaluate customer satisfaction ?	Does the agency know the cost it incurs, per unit, to provide the product or service?	Does the law allow the agency to charge for it to cover the agency's costs?
2A	Field and laboratory studies in Geology mapping and related gathering of surface and subsurface data.	Require	Yes	Yes	Yes	Yes	Yes
2B	Advice and assistance on Geology.	Require	Yes	Yes	Yes	Yes	No
2C	Encourage economic development by disseminating published geologic information as bulletins, maps, economic reports, and open-file reports.	Require	Yes	Yes	Yes	Yes	Yes
2D	Provide unsolicited advice, when appropriate, to Mining Council.	Require	No	No	Yes	No	No
2E	Operate and maintain statewide repository for rock cores, well cutting, and related subsurface samples and all associated supplemental data.	Require	Yes	No	Yes	Yes	No
2F	Provide minerals research laboratory.	Require	No	Yes	Yes	No	Yes

Geological Survey

GOAL 1 Develop and Implement programs that study, manage and conserve the State's Land and Water Resources through planning, research, technical assistance, public education and the development of a comprehensive natural resources database.

Strategy 1.1 Water Resource Management and Earth Science research, as well as review of proposed environmental impacts as published in the regulatory arena to provide reliable, science-based information to decision makers and the public.

Objective 1.1.2 Produce reliable geologic maps and information in support of economic development, environmental protection, and land-use planning.

	<u>FTE equivalents utilized</u>		<u>Total spent / budgeted</u>
2016-17	5.85 FTE	1.00 TG	\$1,343,219 (1.82%)
2017-18	5.85 FTE	1.00 TG	\$1,053,565 (1.49%)

Geological Survey

Performance Measures	Type of Measure	2013-14	2014-15	2015-16	2016-17	2017-18
Promote the extraction and conservation of South Carolina's earth raw materials and their manufacture to the economic improvement of the State by disseminating published geologic information to appropriate governmental agencies and private industry <u>Additional Note:</u> Reliable geologic information of the 566 quadrangles covering the State in digital format <u>Required by:</u> State government <u>Best in the Country:</u> SCDNR	Outcome	<u>Target:</u> 410 quadrangles <u>Actual:</u> 156 quadrangles	<u>Target:</u> 403 quadrangles <u>Actual:</u> 163 quadrangles	<u>Target:</u> 397 quadrangles <u>Actual:</u> 169 quadrangles	<u>Target:</u> 391 quadrangles <u>Actual:</u> 175 quadrangles	<u>Target:</u> 386
Map 1:24,000-scale quadrangles in the Coastal Plain region and make information available digitally to public in open-file report form <u>Required by:</u> Federal government <u>Best in the Country:</u> Delaware Geological Survey	Output	<u>Target:</u> 4 maps <u>Actual:</u> 7 maps	<u>Target:</u> 4 maps <u>Actual:</u> 6 maps	<u>Target:</u> 4 maps <u>Actual:</u> 6 maps	<u>Target:</u> 5 maps <u>Actual:</u> 5 maps	<u>Target:</u> 4 maps
Field check 1:24,000-scale quadrangles in Inner Piedmont (Spartanburg County) to verify mapped relations <u>Additional Note:</u> 2017-18 target is not an optimal target and is limited because of staff shortage. <u>Required by:</u> State government <u>Best in the Country:</u> USGS	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 2 quadrangles <u>Actual:</u> 2 quadrangles	<u>Target:</u> 2 quadrangles <u>Actual:</u> 1 quadrangles	<u>Target:</u> 1 quadrangles
Complete 10 per cent of regional compilation of Carolina terrane and field check relations to verify map reliability <u>Required by:</u> State government <u>Best in the Country:</u> USGS	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 10% digitized <u>Actual:</u> 75% digitized	<u>Target:</u> 25% digitized
Compile available information to produce offshore map of South Carolina waters of Long Bay area (North Island to Little River) <u>Required by:</u> State government <u>Best in the Country:</u> Coastal Carolina University	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> Compile map <u>Actual:</u> Map compiled	<u>Target:</u> No longer tracked
Finish digitization of 6 sets of coastal aerial photographs from Capers Island to Murrells Inlet and start AMBUR (Analyzing Moving Boundaries Using R) analysis of physical change <u>Required by:</u> Agency selected <u>Best in the Country:</u> Georgia Southern	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 6 sets digitized <u>Actual:</u> 3 sets digitized	<u>Target:</u> 3 sets digitized <u>Actual:</u> 1 set digitized	<u>Target:</u> 2 sets digitized
Finish digitization of pilot project in ACE (Ashepoo-Combahee-Edisto) Basin and do AMBUR program analysis of physical change <u>Required by:</u> Agency selected <u>Best in the Country:</u> Georgia Southern	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 5 shorelines <u>Actual:</u> 5 shorelines	<u>Target:</u> 100% analysis <u>Actual:</u> 100% analysis	<u>Target:</u> No longer tracked
Measure Surface Elevation Table network along Coast quarterly to determine occurrence of positive or negative vertical crustal movements <u>Required by:</u> Agency selected <u>Best in the Country:</u> USGS	Output	<u>Target:</u> 4 times <u>Actual:</u> 4 times	<u>Target:</u> 4 times <u>Actual:</u> 4 times	<u>Target:</u> 4 times <u>Actual:</u> 4 times	<u>Target:</u> 4 times <u>Actual:</u> 3 times	<u>Target:</u> 4 times
Conduct multi-year BOEM project to evaluate offshore sand resources <u>Additional Note:</u> This is a two-year project which will be completed this year. <u>Required by:</u> Agency selected <u>Best in the Country:</u> SCDNR	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 30% <u>Actual:</u> 30%	<u>Target:</u> 70%
Maintain Core Repository by obtaining core samples from private companies and institutions <u>Additional Note:</u> Target level beyond agency control. Depends on acquiring donations. <u>Required by:</u> State government <u>Best in the Country:</u> Texas Geological Survey	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> % of Amount donated accepted <u>Actual:</u> 100% (1616 Feet)	<u>Target:</u> % of Amount donated accepted



Geological Survey

GEOLOGIC DATA COLLECTION

-Mapping (the cornerstone)

Piedmont

Coastal Plain

Shoreline Change

SET

Offshore Mapping

-Offshore Sand Studies

-Hazard Studies

-Broad River Project

-Digital Information



STATEMAP



Association of
American State Geologists



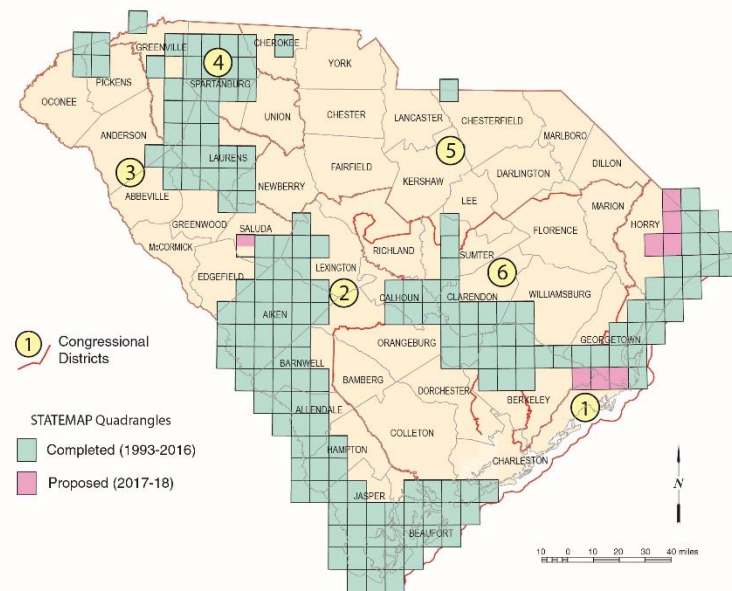
United States
Geological Survey

National Cooperative Geologic Mapping Program

STATEMAP Component:

States compete for federal matching funds for geologic mapping

SOUTH CAROLINA



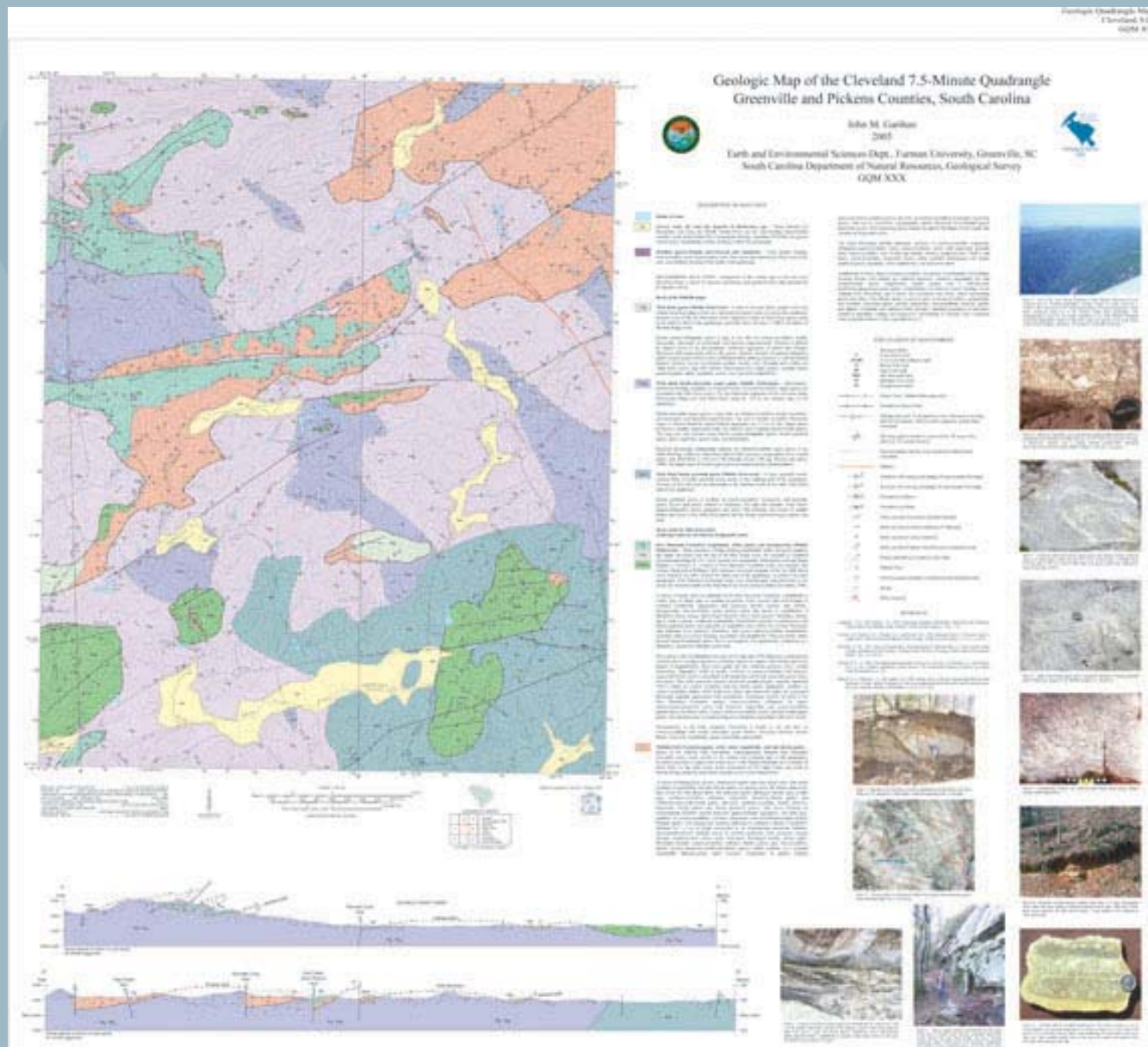
Contact Information:

South Carolina Department of Natural Resources
Geological Survey
Chief Geologist:
Scott Howard 803.896.7712
HowardS@dnr.sc.gov
www.dnr.sc.gov/geology

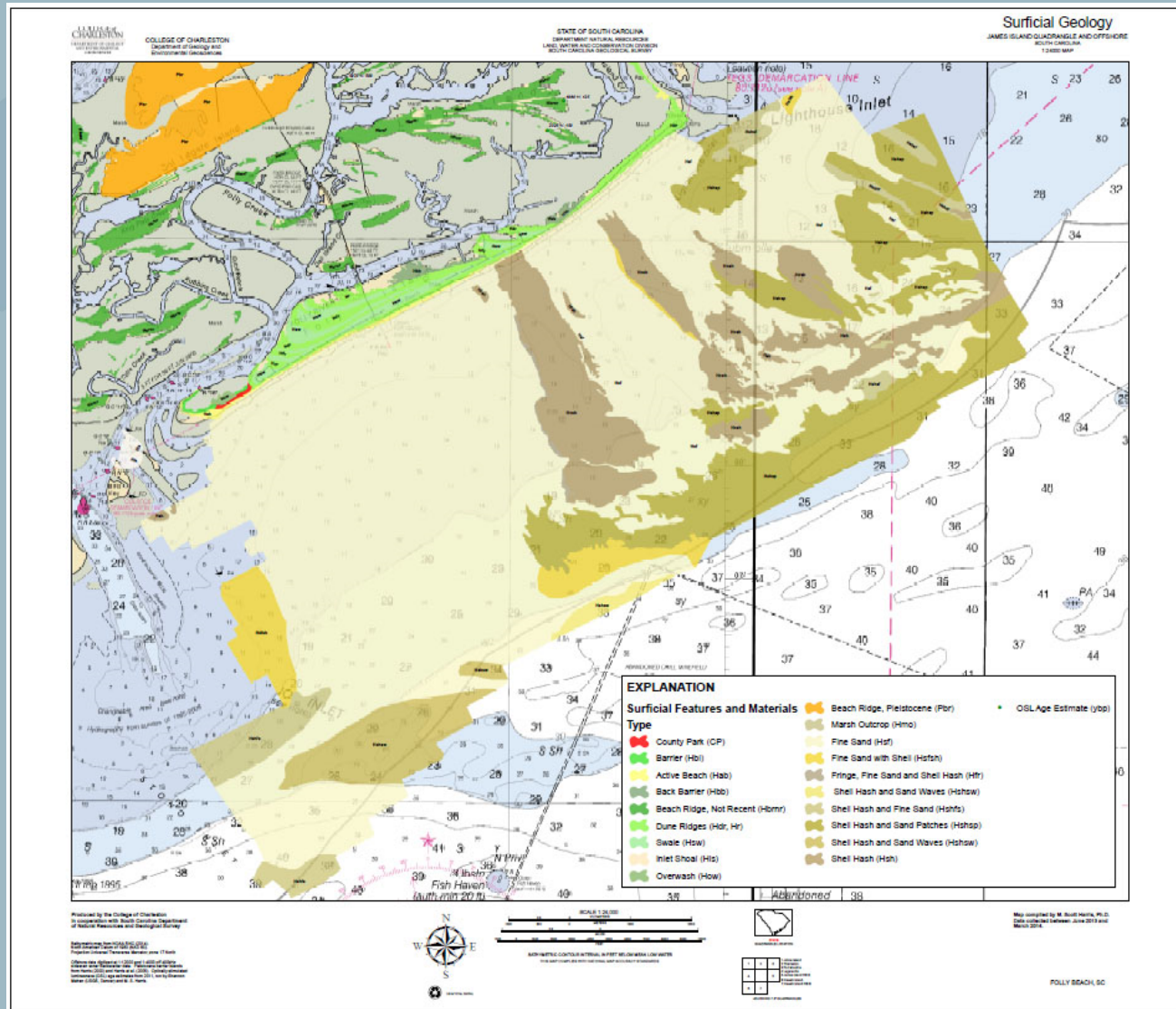


U.S.G.S. Geologic Mapping Program Office
Associate Program Coordinator:
Douglas A. Howard 703.648.6978
<http://ncgmp.usgs.gov/>



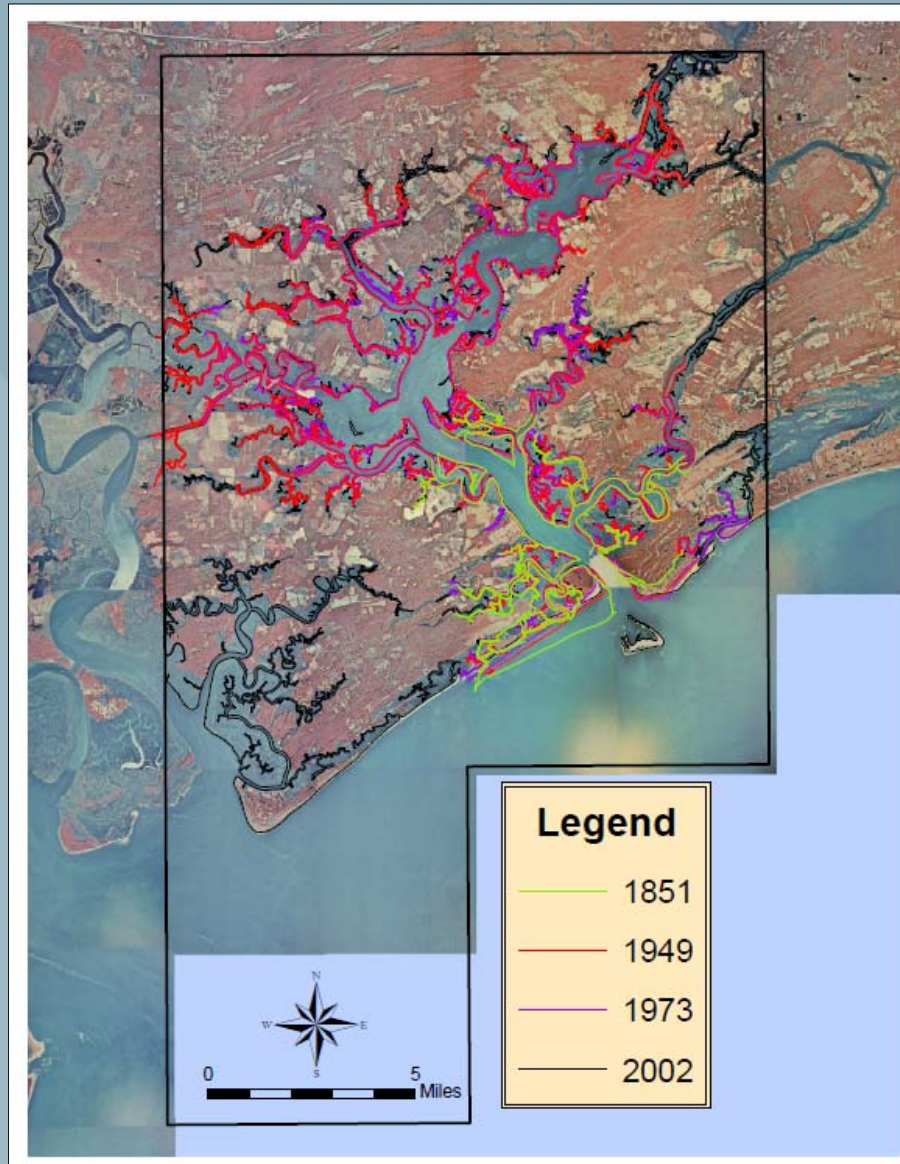


Digital Map Product



Offshore Mapping

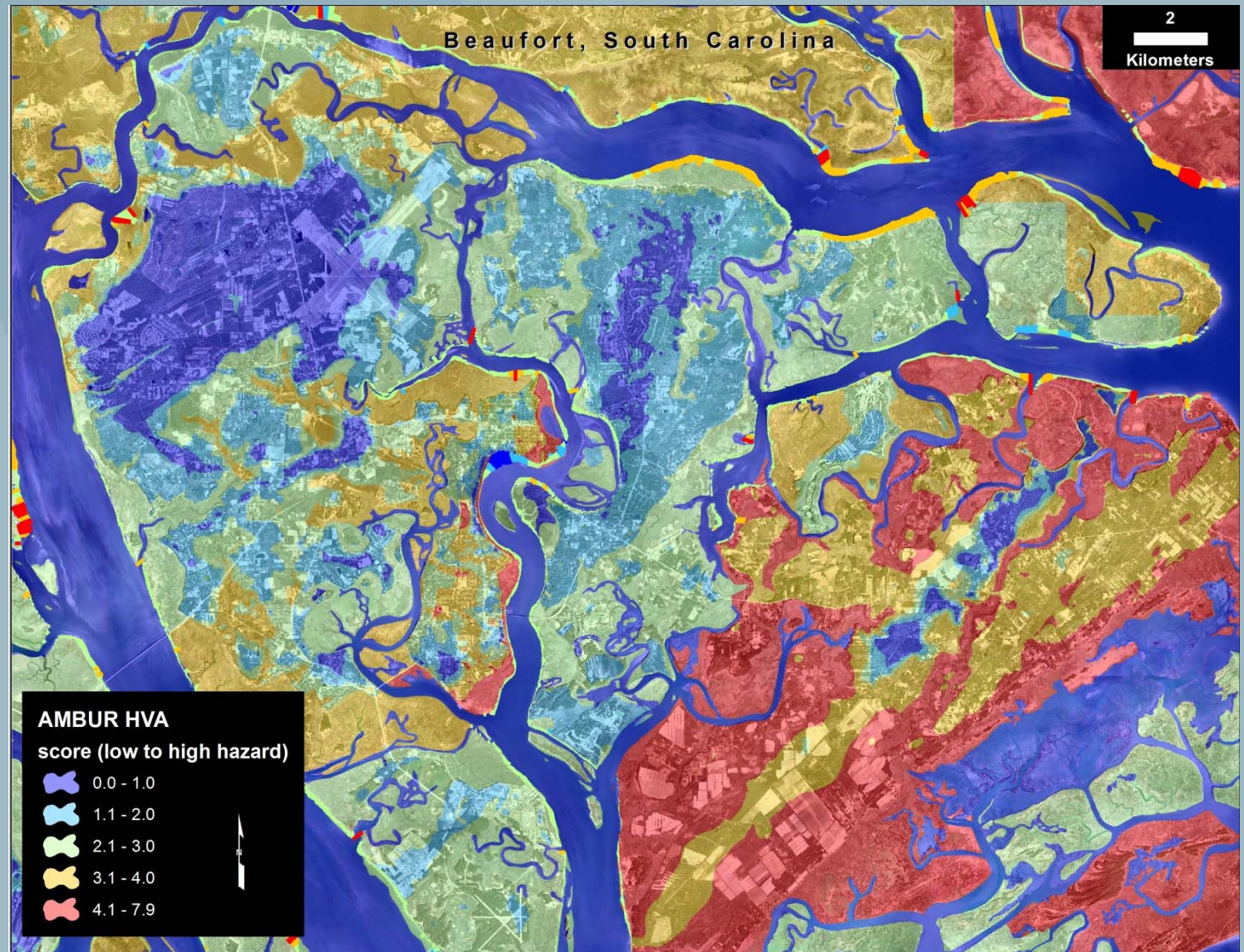
Developing Shoreline Data Sets

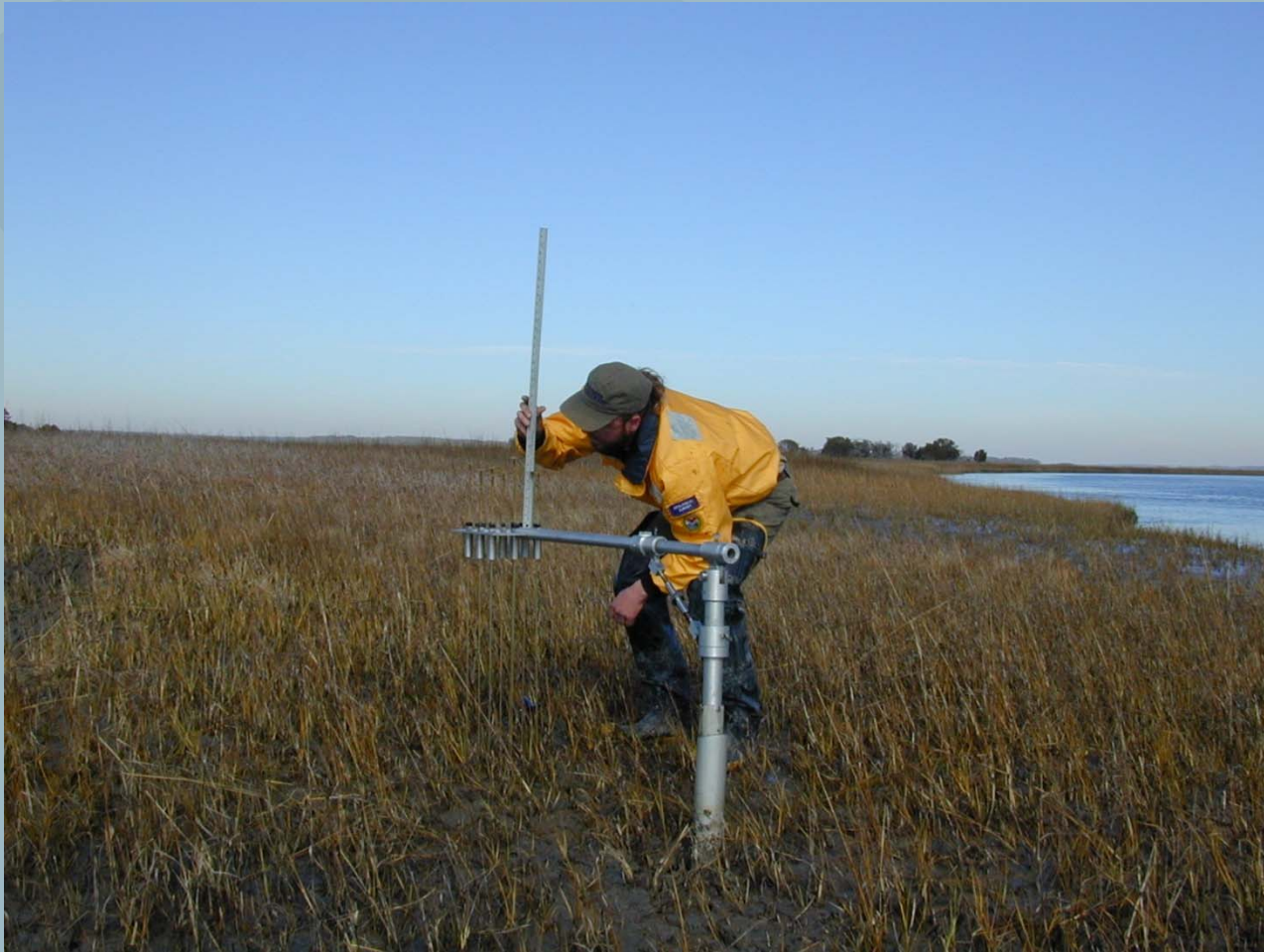


AMBUR-HVA Modeling potential hazard from physical change

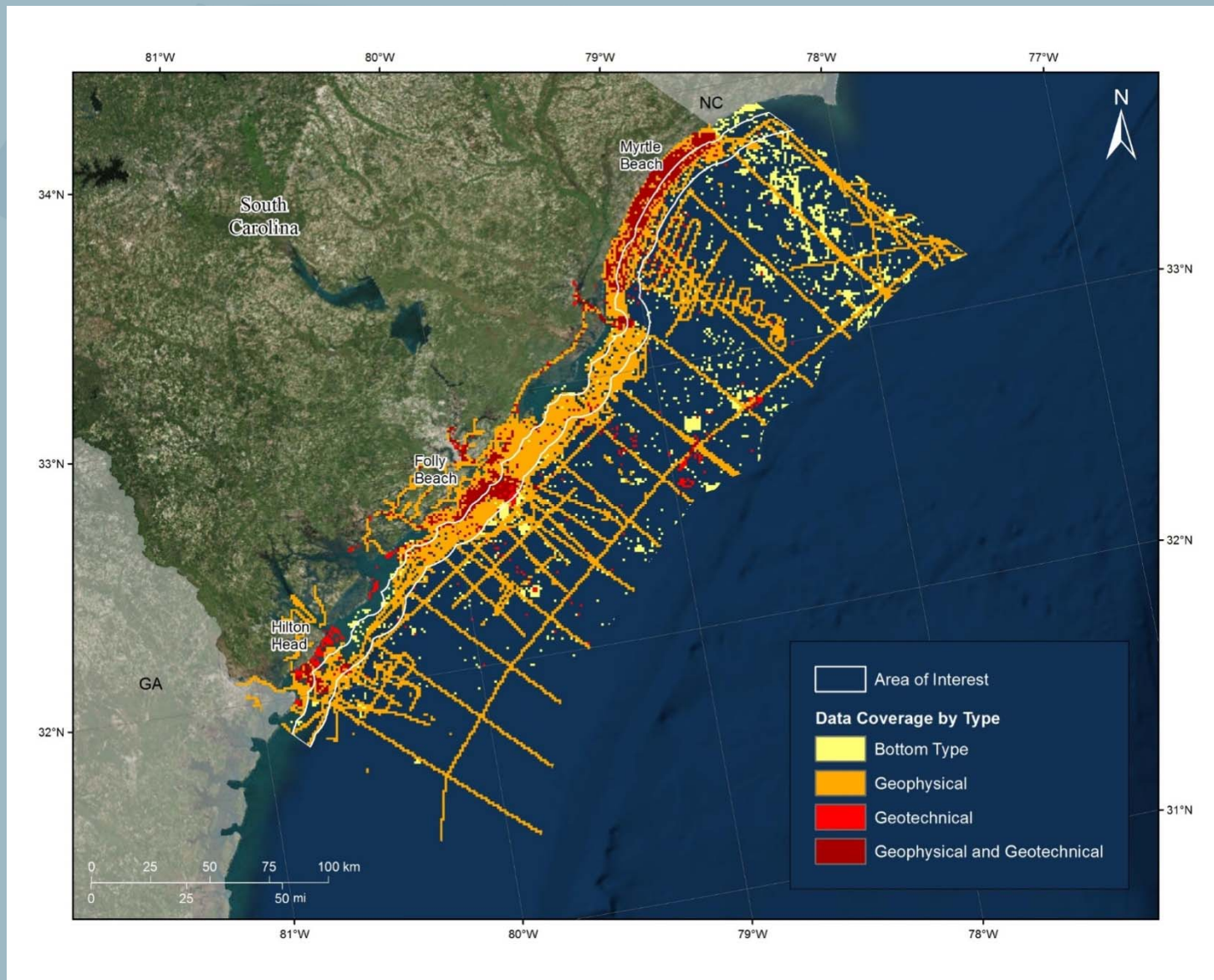
Model Inputs

- Tide range and sea level rise projection
- Shoreline change rates (AMBUR)
- Social vulnerability index (USC)
- High-resolution elevation
- Mean wave height
- SLOSH model
- Areas prone to hurricane winds
- Coastal slope
- Geomorphology





Surface Elevation Table
Measurement for Physical Change



BOEM -Data Coverage in Offshore
Sand Resource Database

GEOLOGIC HAZARDS of the South Carolina Coastal Plain 2012

SC Department of Natural Resources, Geological Survey
and
SC Emergency Management Division, Office of the Adjutant General



MAP GUIDE

High Potential for Liquefaction	Low Potential for Liquefaction
Potential for Collapse	Potential for Sinkholes
Potential for Landslide	Low geologic hazard potential
Fall Line	

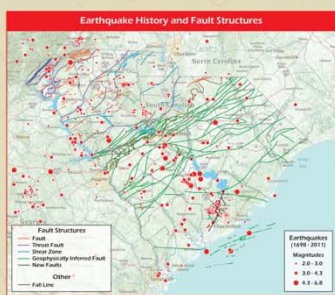
- Liquefaction Features caused by 1886 Charleston Earthquake
 - Prehistoric Liquefaction features
 - Known Sinkhole Occurrences
 - Limestone Cave
 - Landslide Occurrence
- Lakes and Rivers
 - Municipalities
 - County Boundary
 - Interstate
 - US Highway
 - Railroad
 - Power Line
 - Gas Pipeline
 - Airport - Runway 3000-5000 ft
 - Airport - Runway 1500-3000 ft
 - Bridge - Interstate
 - Bridge - Major Road
 - Hospital
 - Nuclear Reactor
 - High Hazard Dam
 - Significant Hazard Dam

MAP DISCLAIMER

This map and accompanying data have been prepared by the South Carolina Department of Natural Resources - Geological Survey. The information presented includes subjective interpretation developed on the basis of available geologic evidence. This map has been designed as a general guide to regional geologic hazards. The map may be used to provide information to regulatory agencies as a tool in the response and recovery from a hazardous geologic event. The map may be used to provide information to regulatory agencies as a tool in the response and recovery from a hazardous geologic event. The map may be used to provide information to regulatory agencies as a tool in the response and recovery from a hazardous geologic event.

FUNDING INFORMATION

Funding for this publication was available through a sub award between the SC Emergency Management Division and Department of Natural Resources under the cooperative agreement with the US Department of Homeland Security, Federal Emergency Management Agency, Grant Agreement GSA-01-03-0015, USPA Number 17-064, Earthquake Commission and State Assistance.



An example of a sand blow, generally referred to as a 'sand volcano', associated with the 1886 Charleston earthquake.



Sinkhole in the corner of East Bay and Lombard Streets in downtown Charleston, Georgia, south of the 1886 earthquake.



Sinkhole in the corner of East Bay and Lombard Streets in downtown Charleston, Georgia, south of the 1886 earthquake.

MAP DISCUSSION

Introduction

This map has been designed as a planning tool for use by emergency managers for the response to and recovery from a hazardous geologic event, such as a large magnitude earthquake or a smaller occurrence such as a sinkhole formation. It also may be useful to land-use planners and regulators as a general guide to regional hazard mitigation actions. This deterministic map assumes that the occurrence of geologic hazards in the Coastal Plain region of South Carolina is related to the underlying geologic conditions.

The South Carolina Geological Survey (SCGS) used several data sets to construct this map including known and geographically inferred faults, epicenters and magnitudes of earthquakes, areas susceptible to liquefaction including sites of known liquefaction, a GIS analysis of landsliding potential, and areas of sinkhole and karst occurrence. All data sets have been assembled using GIS technology and are available digitally. The primary data sources used to compile this map include 7.5-minute topographic maps of the Coastal Plain, existing geologic maps at various scales, United States Geological Survey (USGS) earthquake database, field records and maps showing locations of potential liquefaction features, a map of the liquefaction features created by the 1886 Charleston earthquake, and various published reports on geologic hazards in the Coastal Plain. The quality and accuracy of the data varied according to the type of data, date of development, and original map scale. Therefore, for best results, this map should be used at the scale of construction, 1:600,000.

Another area of potential collapse occurs east of Lake Marion along the Santee River, and recent sinkhole activity in Georgetown is shown. There is field evidence for significantly more karstic features in the lower Coastal Plain, but because of map scale sinkhole potential is generalized.

Landslide Potential

Areas of potential landsliding have been delineated using GIS analysis. A slope-stability model was developed to identify hill slopes sensitive to potential landslide hazard. Modeling was done in ArcGIS 9.3 and resulted in areas with a slope surface equal to or greater than 10 percent. These areas were generalized for this map. Additional information on this process is available from the South Carolina Geological Survey.

Areas with landslide potential consist of steep slopes and thick, cohesionless materials. The cohesionless materials include thick and thin units that mainly consist of sand with some clay loess. Areas with landslide potential were recognized using a known landslide occurrence in Lexington County as the type example (Howard, 2010). The landslide occurred on a 12 percent slope surface. Using this information, it was determined that a slope surface of 10 percent or greater was appropriate for representing areas sensitive to potential landslide hazard. Two major areas of landslide potential are recognized. First are oversteepened banks of major rivers, such as the Santee, the Congaree, and Wateree Rivers, and some of their minor stream tributaries. These areas are adjacent to large stream alluvial valleys. The second area consists of areas adjacent to fall zone, which is that area of the Coastal Plain immediately southeast of the Piedmont and exhibits high relief particularly in incised stream valleys.

Known Faults

The Earthquake History and Fault Structures map (HFS) is a derivative of the Structural Features Map of South Carolina (Meyhan, 1998), and includes new faults that are interpreted to be responsible for the 1886 Charleston earthquake (cf. Dura-Gomez and Talwan, 2009). The interpreted faults from the Charleston earthquake map (HFS) for the 1886 Charleston earthquake was developed by Boltzinger (1977), and it shows the extent of shaking intensity associated with this event relative to today's infrastructure.

Because faults are buried structures with no surficial expression, their presence is inferred from secondary lines of evidence. They are inferred from geophysical data. There are two designations of faults on the structural features map. The first set of faults consists of features inferred from aeromagnetic anomaly data. The interpretation source for these structures is the Structural Features of South Carolina (Meyhan, 1998). The second set of faults called 'new' is inferred from seismicity and first-motion studies of earthquakes in the vicinity of the 1886 Charleston epicenter. These faults were interpreted by Dura-Gomez and Talwan (2009) to be the causal faults of the 1886 Charleston earthquake.

Recent Seismicity

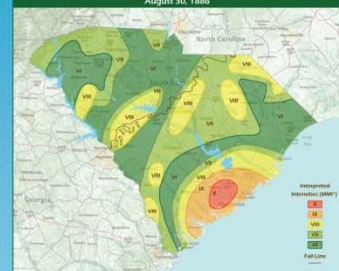
The Earthquake History and Fault Structures map (HFS) also shows epicenters of 500 earthquakes in and closely adjacent to South Carolina. The earthquakes are separated into three categories by their magnitude. Major cluster sites are the Summerville area, site of the 1886 earthquake; Lakes Monticello and Jocassee, sites of reservoir induced seismicity; and the Eastern Piedmont fault system, the northeastern trending faulted area between Savannah River and the North Carolina border with Columbia along its axis. Several counties have no record of any significant seismic events including Horry, Marion, Dillon, Williamsburg, Jasper, and Hampton Counties.

Acknowledgments

Pradeep Talwan, University of South Carolina, assisted in the preparation of this map, and the staff at the SC Emergency Management Division (SCEMD), Office of the Adjutant General, supported this project. For more information about SCEMD please visit www.scedmd.org. Photo Source: The 1886 Charleston earthquake photos are from SCGS Bulletin 41. Sinkhole photos were provided by Brenda Hockenmeyer, SCDM - Hydrology Section. For data and list of references visit www.dnr.sc.gov/geology/ggms/.

* Modified Mercalli Intensity Scale (MMI), for scale description please visit <http://earthquake.usgs.gov/earthquakes/shake/summary.php>

Interpreted Isoseismals from the Charleston Earthquake August 30, 1886



Collapse Potential

Two different areas of collapse potential are shown on the map. The first and larger area is taken from a USGS report on potentially karstic rocks in southeastern United States (Woray, 2008). This map area indicates where near-surface sediments are either carbonate rich or contain carbonate sediments. The area lies inland of the zone of liquefaction and consists almost entirely of the middle Coastal Plain. Additionally, a few areas with known sinkhole potential are delineated in the potential-liquefaction zones. They are mapped on the basis of karstic features (e.g. sinkholes, caves, and losing streams). Two areas north of Myrtle Beach are delineated from sinkhole studies by Hockenmeyer and Pelletier (1987). A large area is found around the town of Beaufort. The data for this area comes from geologic mapping by Durr (2003).

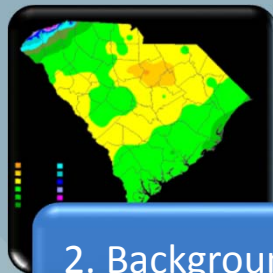
Hazard Studies

Broad River Sediment Study

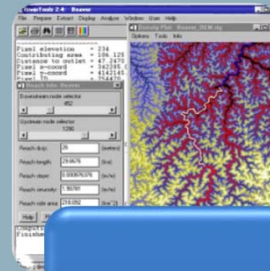
Objective: Quantitatively define the major paths of sediment transport; identify the physical conditions responsible for eroding, mobilizing and depositing sediment; and evaluate methods to reduce sediment input.



1. Define the problem



2. Background Information
(climate, geology, etc)



3. Subdivide Watersheds



4. Interpret historic aerial/LiDAR

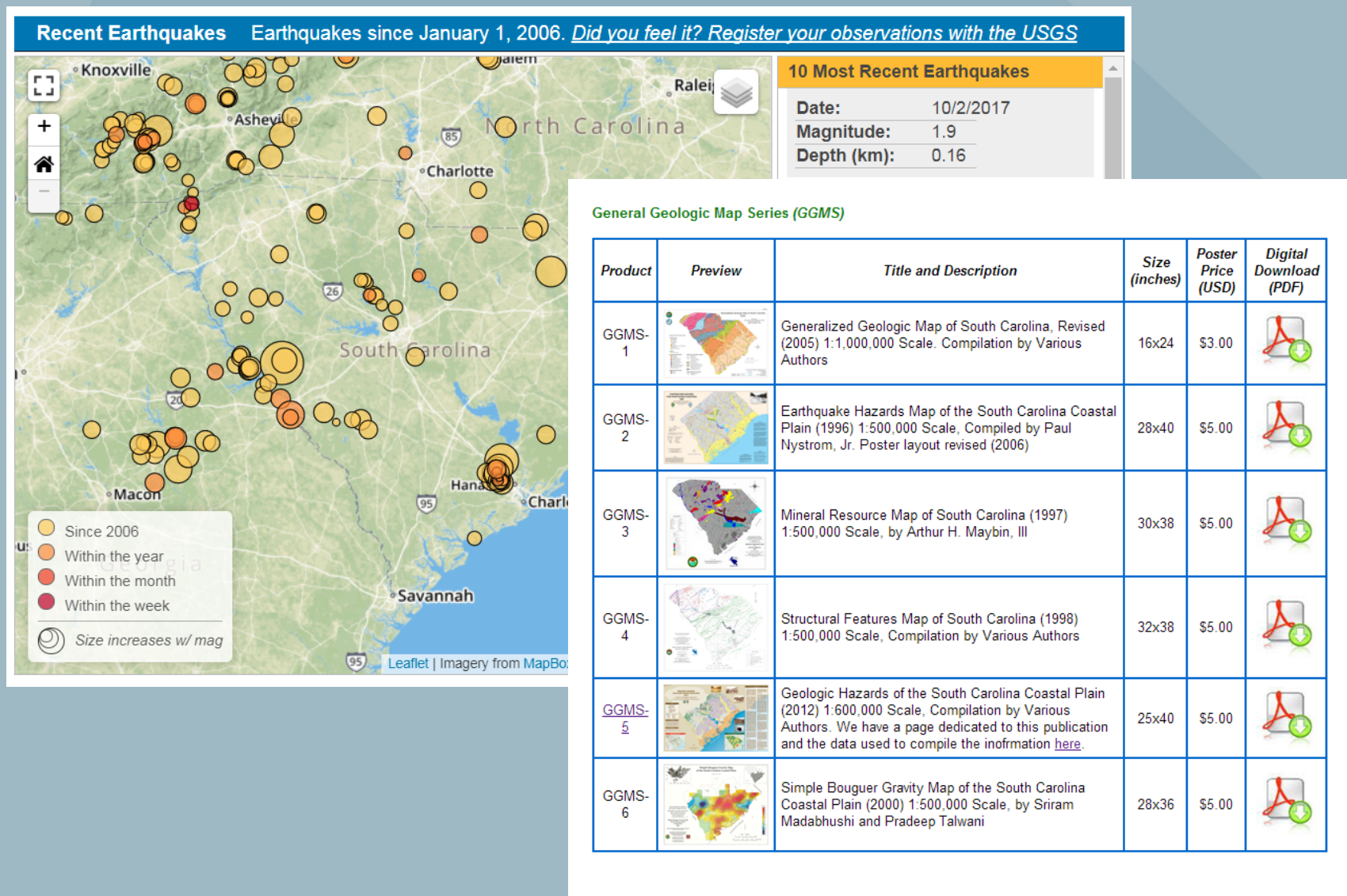


5. Conduct fieldwork



6. Analyze Data

Disseminating Geologic Information



Geological Survey

Potential Harm

Greatest potential harms to the public if deliverables are not provided

- Lack of information available to provide assistance to other state agencies, private companies, and general public.
- Accurate and reliable geologic information not available to the public.
- Lack of geologic support for economic development. Spatial information will not be in an electronic format for easy dissemination and efficient use, thereby limiting the value of the information.
- Lack of reliable and accurate information to the Mining Council.
- Exploration companies are aware of the Core Repository and use it on a frequent basis.
- Limited services to the general public will be reduced even more.

How the General Assembly can help avoid the greatest potential harm, other than money

- Add FTE's needed to accomplish mission.
- Expand collaboration with other state agencies to disseminate geologic information, e.g. Dept Commerce, SCDOT.
- Support and encourage cutting-edge geospatial technology
- Continue legislated mission of the Geological Survey.
- Support information technology development services
- Support sharing of geospatial data, maps, reports and publications between state agencies.
- Cost of drilling new rock cores greatly exceeds cost to maintain Core Repository.
- Continue legislative duty.

GIS

Publish reports, including the results of studies, inquiries, surveys, and analyses. Encourage economic development by disseminating published geologic information as bulletins, maps, economic reports, and open-file reports.

GOAL 1 Develop and Implement programs that study, manage and conserve the State's Land and Water Resources through planning, research, technical assistance, public education and the development of a comprehensive natural resources database.

Strategy 1.1 Water Resource Management and Earth Science research, as well as review of proposed environmental impacts as published in the regulatory arena to provide reliable, science-based information to decision makers and the public.

Objective 1.1.3 Expand digital capabilities and uses for the dissemination of information.

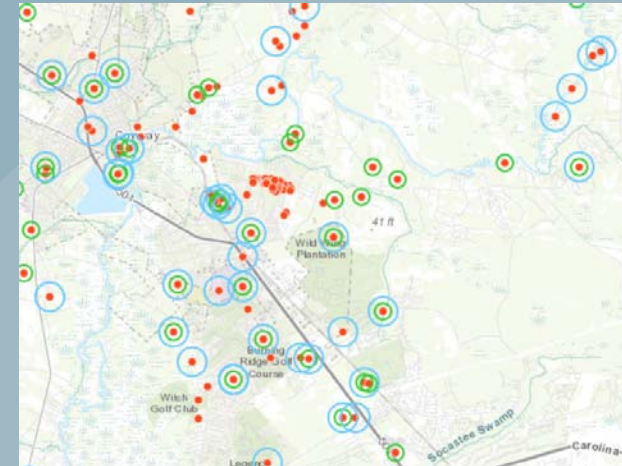
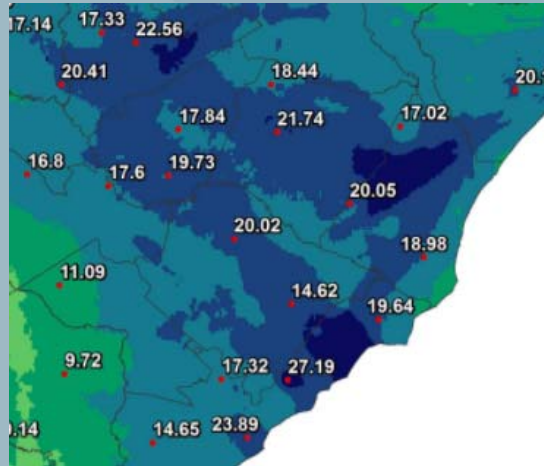
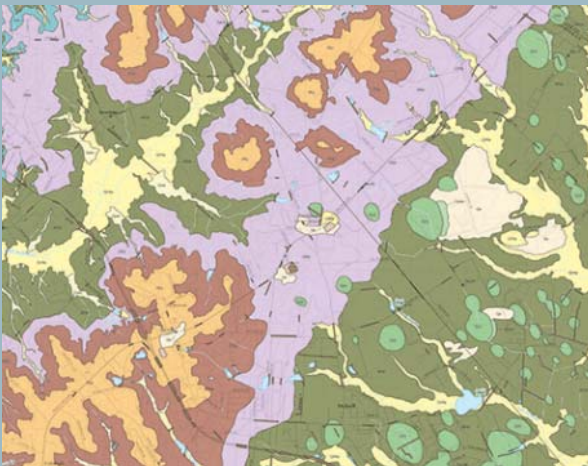
	<u>FTE equivalents utilized</u>	<u>Total spent / budgeted</u>
2016-17	1.25 FTE	\$109,911 (0.15%)
2017-18	1.25 FTE	\$105,154 (0.15%)

GIS

Performance Measures	Type of Measure	2013-14	2014-15	2015-16	2016-17	2017-18
Expand use of digital-mapping in field work done by LWC Division <u>Required by:</u> Agency selected <u>Best in the Country:</u> Kentucky Geological Survey	Efficiency	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 1 in use <u>Actual:</u> 1 in use	<u>Target:</u> 2 in use <u>Actual:</u> 2 in use	<u>Target:</u> 3 in use
Improve the preservation and accessibility of spatial data from and for LWC programs with new and existing GIS databases <u>Required by:</u> Agency selected <u>Best in the Country:</u> Florida Geological Survey	Efficiency	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> Improve existing or develop a new database for LWC program that benefits program operations. <u>Actual:</u> Database of river access, data used for new GoPaddleSC.com website.	<u>Target:</u> Improve SC Geological Survey databases of geologic map information.
Expand information available from LWC Division webpages with use of story maps to disseminate natural resource information <u>Required by:</u> Agency selected <u>Best in the Country:</u> Delaware Geological Survey	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 1 page <u>Actual:</u> 2 page	<u>Target:</u> 1 page
Increase use of digitally interactive maps to provide additional information to support aspects of natural resource information <u>Required by:</u> Agency selected <u>Best in the Country:</u> Texas Parks and Wildlife	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 1 map <u>Actual:</u> 1 map	<u>Target:</u> 1 map
Evaluate uses of drones to digitally collect natural resource information <u>Required by:</u> Agency selected <u>Best in the Country:</u> College of Charleston	Input/Activity	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 25% evaluated <u>Actual:</u> 25% evaluated	<u>Target:</u> 25% evaluated
Begin to integrate available onshore maps with offshore information of Long Bay area to produce composite working map <u>Required by:</u> Agency selected <u>Best in the Country:</u> New Jersey Geological Survey	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 20% integration <u>Actual:</u> 15% integration	<u>Target:</u> 20% integration

GIS

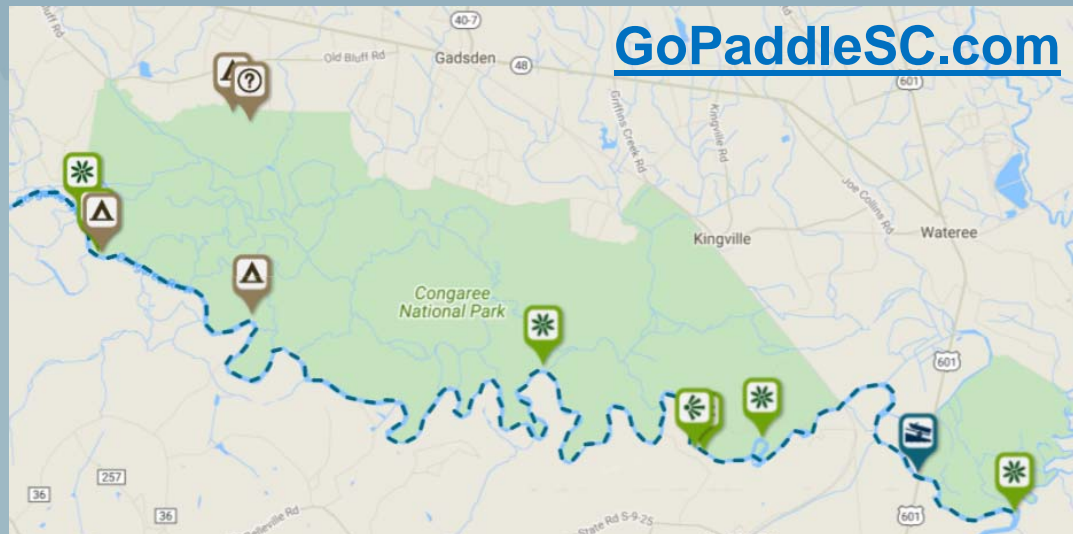
- GIS Support for All LWC Sections
- GIS Databases and Data Collection
- Analysis
- Cartography
- Dissemination of Information



GIS

Database Development

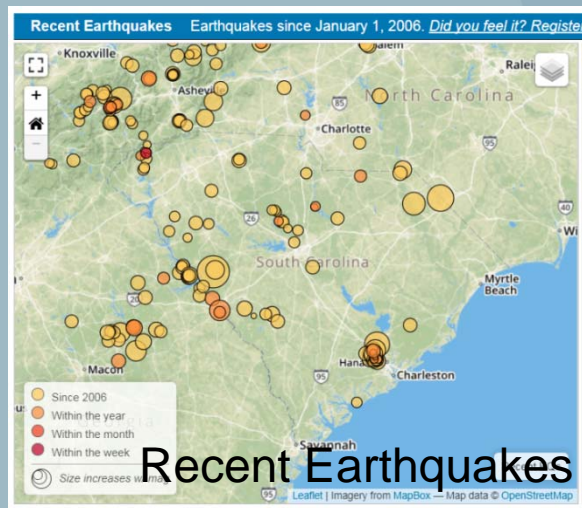
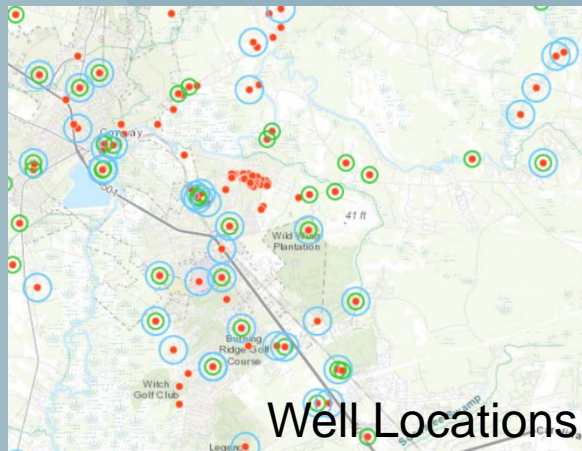
- River Access Database – statewide



- Geologic Map Schema (GeMS) – implement national standard database for geologic maps

GIS

- Disseminate LWC information on the web



South Carolina Flooding 2015

The historic heavy rainfall event of October 1-5, 2015 produced record rainfall rates and rainfall totals in South Carolina. The rainfall amounts and distributions across the State were similar in pattern to those normally produced by hurricanes making landfall; however, although the moisture drawn over the State was from deep in the tropics, the synoptic features, or mechanism, that produced the heavy rainfall was of a mid-latitude nature rather than that of a tropical cyclone. Mid-latitude features include surface and upper level high and low pressure features, warm fronts and cold fronts, as well as ridges and troughs that exist due to differences in temperature and moisture content.

... Exploring the Story Map ...

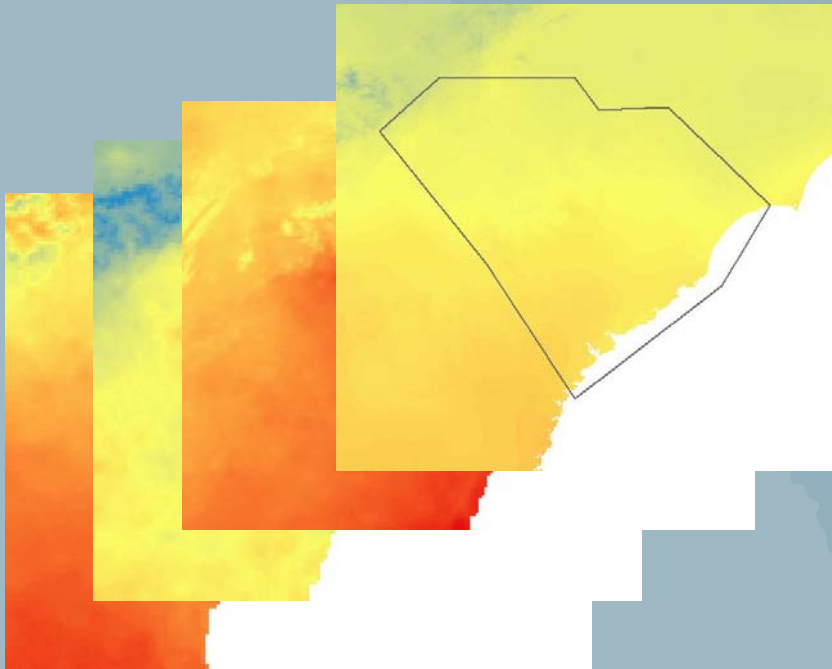
2015 Flood Story Map
dnr.sc.gov/flood2015



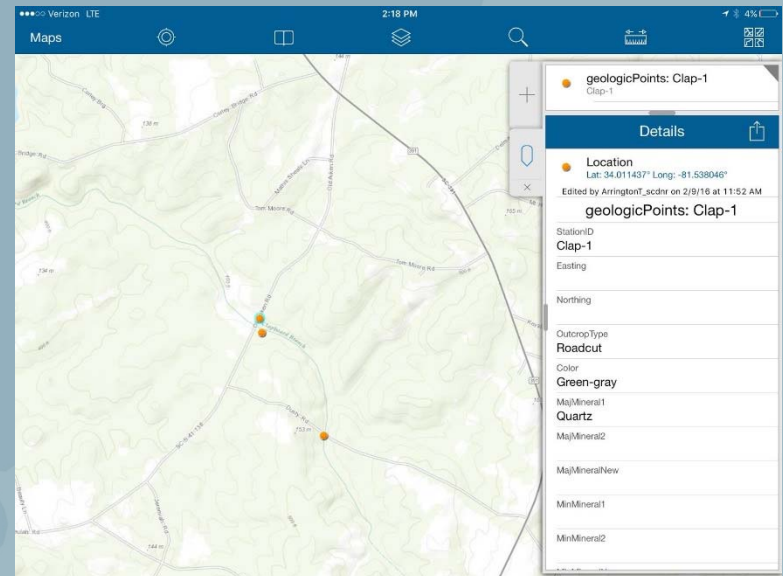
GIS

- Increase efficiency
 - GIS tools for analysis and data collection

Process climate data for recharge model



Geologic mapping with iPad



Climatology

The Department must monitor for drought, create a drought plan and inform the public and require compliance with the law. Also, the Department must archive and disseminate climate information.

			CUSTOMERS			COSTS	
Item #	<u>Product/Service Components</u>	Does law require, allow, or not address it?	Does agency know the annual number of potential customers?	Does agency know the annual number of customers served?	Does the agency evaluate customer satisfaction ?	Does the agency know the cost it incurs, per unit, to provide the product or service?	Does the law allow the agency to charge for it to cover the agency's costs?
3	Department must monitor for drought, create a drought plan and inform the public and require compliance with the law.	Require	No	No	Yes	Yes	Yes
4A	Evaluate the significance of natural, manmade, deliberate and inadvertent changes in the climate and weather affecting the state.	Require	Yes	Yes	Yes	Yes	Yes
4B	State Climatologist may certify copies as being authentic reproductions of weather records held in the state.	Require	Yes	Yes	Yes	Yes	Yes

Climatology

GOAL 1 Develop and Implement programs that study, manage and conserve the State's Land and Water Resources through planning, research, technical assistance, public education and the development of a comprehensive natural resources database.

Strategy 1.2 State Climate Office/Flood Mitigation activities provide reliable information for the protection of lives and property.

Objective 1.2.1 Monitor, conduct and report on studies of climate and weather events of environmental and economic importance to the State.

	<u>FTE equivalents utilized</u>	<u>Total spent / budgeted</u>
2016-17	3.05 FTE	\$305,498 (0.41%)
2017-18	3.05 FTE	\$292,258 (0.40%)

Climatology

Performance Measures	Type of Measure	2013-14	2014-15	2015-16	2016-17	2017-18
Continue soliciting CoCoRaHS volunteer observers: Recruit 3 observers in counties with minimal participation <u>Required by:</u> State government <u>Best in the Country:</u> North Carolina	Outcome	<u>Target:</u> 92 <u>Actual:</u> 71	<u>Target:</u> 92 <u>Actual:</u> 98	<u>Target:</u> 92 <u>Actual:</u> 48	<u>Target:</u> 92 <u>Actual:</u> 55	<u>Target:</u> 92
Retain CoCoRaHS observers <u>Required by:</u> State government <u>Best in the Country:</u> Kansas and Nebraska	Outcome	<u>Target:</u> 20% <u>Actual:</u> 32%	<u>Target:</u> 20% <u>Actual:</u> 40%	<u>Target:</u> 20% <u>Actual:</u> 48%	<u>Target:</u> 20% <u>Actual:</u> 53%	<u>Target:</u> 20%
Conduct drought and water shortage table-top exercise <u>Required by:</u> Agency selected <u>Best in the Country:</u> Washington Metropolitan Drought Exercises organized and conducted by the Interstate Commission on the Potomac River Basin	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 1 table top exercise (scheduled September 2017)
Give presentations on climate <u>Required by:</u> Agency selected <u>Best in the Country:</u> SCDNR	Output	<u>Target:</u> DNE <u>Actual:</u> 40	<u>Target:</u> DNE <u>Actual:</u> 40	<u>Target:</u> DNE <u>Actual:</u> 45	<u>Target:</u> As requested <u>Actual:</u> 37	<u>Target:</u> As requested
Conduct pre-season and in-season Tropical, Severe, and Winter Weather Briefings to state and county officials <u>Required by:</u> State government <u>Best in the Country:</u> SCDNR	Output	<u>Target:</u> Weather Dependent <u>Actual:</u> DNE	<u>Target:</u> Weather Dependent <u>Actual:</u> 42 conference calls, 8-12 pre-season exercises	<u>Target:</u> Weather Dependent <u>Actual:</u> 34 conference calls, 8-12 pre-season exercises	<u>Target:</u> Weather Dependent <u>Actual:</u> 18 conference calls, 8-12 pre-season exercises	<u>Target:</u> Weather Dependent
Expand the Severe Weather Alert Listserve <u>Required by:</u> State government <u>Best in the Country:</u> SCDNR	Output	<u>Target:</u> 1,675 <u>Actual:</u> 1,903	<u>Target:</u> 2,200 <u>Actual:</u> 2,092	<u>Target:</u> 2,400 <u>Actual:</u> 2,374	<u>Target:</u> 2,600 <u>Actual:</u> 2,937	<u>Target:</u> 3,137
Complete weekly and Annual Report on Climatological data <u>Required by:</u> State government <u>Best in the Country:</u> SCDNR	Output	<u>Target:</u> 53 <u>Actual:</u> 53	<u>Target:</u> 53 <u>Actual:</u> 53	<u>Target:</u> 53 <u>Actual:</u> 53	<u>Target:</u> 53 <u>Actual:</u> 53	<u>Target:</u> 53
Complete Special Weather Summaries about significant weather events <u>Required by:</u> State government <u>Best in the Country:</u> SCDNR	Output	<u>Target:</u> 20-25 <u>Actual:</u> 22	<u>Target:</u> 20-25 <u>Actual:</u> 19	<u>Target:</u> 20-25 <u>Actual:</u> 17	<u>Target:</u> 20-25 <u>Actual:</u> 17	<u>Target:</u> 20-25
Staff assists SCDNR Law Enforcement, SC Highway Patrol, and County Solicitor's Offices with weather and climate information pertaining to watercraft, vehicle and criminal investigations <u>Required by:</u> State government <u>Best in the Country:</u> SCDNR	Output	<u>Target:</u> As requested <u>Actual:</u> Approximately 40 requests	<u>Target:</u> As requested <u>Actual:</u> Approximately 30 requests	<u>Target:</u> As requested <u>Actual:</u> Approximately 40 requests	<u>Target:</u> As requested <u>Actual:</u> Approximately 45 requests	<u>Target:</u> As requested
Conduct applied climatological research and produce decision-support products and tools important to the state <u>Required by:</u> State government <u>Best in the Country:</u> Unknown	Output	<u>Target:</u> 2-3 reports and products <u>Actual:</u> 3 reports and products	<u>Target:</u> 2-3 reports and products <u>Actual:</u> 3 reports and products	<u>Target:</u> 2-3 reports and products <u>Actual:</u> 4 reports and products	<u>Target:</u> 2-3 reports and products <u>Actual:</u> 2 reports and products	<u>Target:</u> 2-3 reports and products
Provides weather and climate information as requested <u>Additional Notes:</u> Staff also participates in approximately 5-6 depositions a year, and provides certified weather data. <u>Required by:</u> State government <u>Best in the Country:</u> SCDNR	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> Not agency dependent, depends on number of requests. <u>Actual:</u> Approximately 360 requests	<u>Target:</u> Not agency dependent, depends on number of requests.

South Carolina State Climatology Office

The South Carolina State Climatology Program serves as the State's focal point for weather and climate information.

- Archive, process, and disseminate South Carolina weather and climate data
- Educate the people of South Carolina on current and emerging weather and climate issues
- Assist in forecast interpretation before, during, and after periods of severe weather and maintain an active research program.



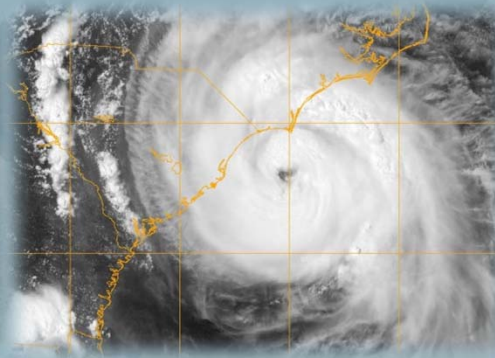
Gather and archive data on climate conditions in South Carolina

- Collect climate observations from government and private observing stations. The office serves as **State Coordinator for the Community Collaborative, Rain, Hail and Snow Network (CoCoRaHS)**.
- Archive and distribute recent and historic climate data and information that date back to the late 1800s. Under SC State Law the Office has the authority to certify weather observations for official use.
- Cooperate with climate observers, National Climatic Data Center, National Weather Service and CoCoRaHS to assure that station continuity, station coverage and data accuracy are maintained throughout SC.



Inform and educate the citizens of South Carolina on matters related to weather and climate

- Assist in data acquisition and forecast interpretation before, during, and after periods of severe weather.
- Promote weather and climate awareness by educating the public through email list serves, publications, personal contact, attendance at conferences, lectures and media interviews.
- Administer the *South Carolina Drought Response Act*, which requires the office to execute a comprehensive state drought response program.



Weather Alerts

Hazardous Weather Updates from SCO Severe Weather

Tropical Update-96L - Message (HTML)

Message Developer Adobe PDF

Reply Reply to All Forward Delete Move to Folder Create Rule Other Actions Block Sender Safe Lists Categorize Follow Up Mark as Unread Find Related Select Find

You forwarded this message on 8/21/2014 8:24 AM.

From: Mark Malsick
To: WEATHERALERT
Cc:
Subject: Tropical Update-96L

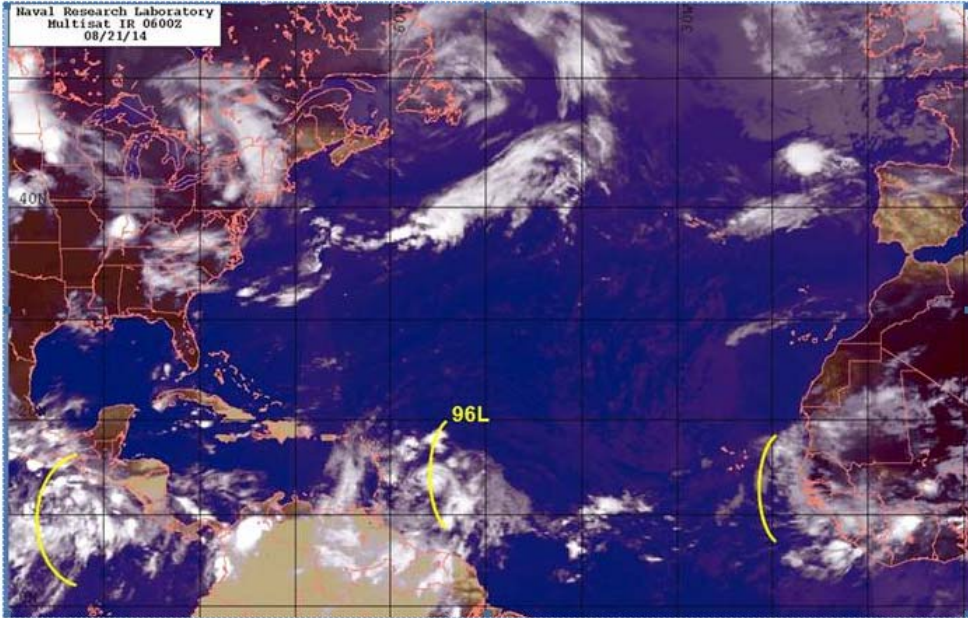
Sent: Thu 8/21/2014 8:20 AM

Good Morning,

A large, sprawling gaggleplex of convection... I'm sorry: an easterly tropical wave near 15N, 055W (1978 miles southwest of Charleston) is showing signs of slow intensification as it tracks west-northwest at 10-15 mph. Your mileage may vary. This feature, now designated 96L, will tangle with the cooler waters of the eastern Caribbean and the topography of the Lesser and Greater Antilles over the weekend; yet, with lessening shear over the eastern Caribbean, 96L does have the potential to strengthen into at least a tropical depression or weak tropical storm in the next 24-48 hours.

The track forecast is still a bag O'Badgers due to the sprawling convection that is 96L this morning. Models have changed dramatically overnight taking 96L from a GoMex storm to a solution that takes 96L on a recurving track off the US southeast coast, hanging a Ralph over the Bahamas along 070W. There is decent model consensus, this morning at least, putting 96L more than 500 miles southeast of the State Monday afternoon. 96L is still far away facing many environmental challenges alone and unafraid as the Prudent Mariner abides with a salty eye on the weather glass,

Naval Research Laboratory
Multisat IR 0600Z
08/21/14



Climatology

Potential Harm

Greatest potential harms to the public if deliverables are not provided

- Water shortages, economic loss, detrimental environmental impacts.
- Increased vulnerability to weather and climate disasters.
- There is no other state agency that has the authority to certify weather records for the state or citizens of SC. Customers would have to order certifications from the federal agency, National Centers for Environmental Information. Their minimum charge is \$124 up to \$588. <https://www.ncdc.noaa.gov/customer-support/certification-data>. The SC State Climate Office does not charge to certify data for SC State Agencies. The charge to certify for other customers, especially those related to legal cases, ranges from \$20 to \$100.

How the General Assembly can help avoid the greatest potential harm, other than money

- Strengthen the Drought Response Act.
- Make water resources a high-priority item.
- Support water-planning efforts in the State.
- Continue legislated mission of SC State Climate Office

Flood Mitigation

The Department is the designated state coordinating agency for the National Flood Insurance Program.

Item #	<u>Product/Service Components</u>	Does law require, allow, or not address it?	<u>CUSTOMERS</u>			<u>COSTS</u>	
			Does agency know the annual number of potential customers?	Does agency know the annual number of customers served?	Does the agency evaluate customer satisfaction?	Does the agency know the cost it incurs, per unit, to provide the product or service?	Does the law allow the agency to charge for it to cover the agency's costs?
5A	Enact, whenever necessary, legislation enabling counties and municipalities to regulate development within flood-prone areas.	Allow	Yes	Yes	No	No	No
5B	Encourage and assist communities in qualifying for participation in the Program.	Allow	Yes	Yes	No	No	No
5C	Guide and assist county and municipal public bodies and agencies in developing, implementing, and maintaining local flood plain management regulations.	Allow	Yes	Yes	No	No	No
5D	Provide local governments and the general public with Program information on the coordination of local activities with Federal and State requirements for managing flood-prone areas.	Allow	Yes	Yes	No	No	No
5E	Assist communities in disseminating information on minimum elevation requirements for development within flood-prone areas.	Allow	Yes	Yes	No	No	No
5F	Assist in the delineation of riverine and coastal flood-prone areas, whenever possible, and provide all relevant technical information to the Federal Insurance Administrator.	Allow	Yes	Yes	No	No	No

Flood Mitigation

Product/Service Components continued

5G	Recommend priorities for Federal flood plain management activities in relation to the needs of county and municipal localities within the State.	Allow	Yes	Yes	No	No	No
5H	Provide notification to the Federal Insurance Administrator in the event of apparent irreconcilable differences between a community's local flood plain management program and the minimum requirements of the Program.	Allow	Yes	Yes	No	No	No
5I	Establish minimum State flood plain management regulatory standards consistent with those established in this part and in conformance with other Federal and State environmental and water pollution standards for the prevention of pollution during periods of flooding.	Allow	Yes	Yes	No	No	No
5J	Assure coordination and consistency of flood plain management activities with other State, area wide, and local planning and enforcement agencies.	Allow	Yes	Yes	No	No	No
5K	Assist in the identification and implementation of flood hazard mitigation recommendations which are consistent with the minimum flood plain management criteria for the Program.	Allow	Yes	Yes	No	No	No
5L	Participate in flood plain management training opportunities and other flood hazard preparedness programs whenever practicable.	Allow	Yes	Yes	No	No	No
5M	Other duties and responsibilities, which may be deemed appropriate by the State and which are to be officially designated as being conducted in the capacity of the State Coordinating Agency for the Program, may be carried out with prior notification of the Federal Insurance Administrator.	Allow	Yes	Yes	No	No	No

Flood Mitigation

GOAL 1 Develop and Implement programs that study, manage and conserve the State's Land and Water Resources through planning, research, technical assistance, public education and the development of a comprehensive natural resources database.

Strategy 1.2 State Climate Office/Flood Mitigation activities provide reliable information for the protection of lives and property.

Objective 1.2.2 Administer the Federal Emergency Management Agency, Flood Mitigation Assistance, Cooperating Technical Partners, Community Assistance-State Support Services Element Programs.

	<u>FTE equivalents utilized</u>		<u>Total spent / budgeted</u>	
2016-17	1.55 FTE	3 .00 TG	\$1,747,965	(2.36%)
2017-18	1.55 FTE	3 .00 TG	\$2,012,975	(2.72%)

Flood Mitigation

Performance Measures	Type of Measure	2013-14	2014-15	2015-16	2016-17	2017-18
Continue to assist communities with Substantial Damage post-disaster for the next 6 months <u>Required by:</u> Federal government <u>Best in the Country:</u> Federal government	Outcome	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> Continue to assist communities with Substantial Damage post-disaster for the next 6 months. <u>Actual:</u> Assisting communities with Substantial Damage post-disaster for the next 6 months.	<u>Target:</u> Continue to assist communities with Substantial Damage post-disaster. <u>Actual:</u> Assisting communities with Substantial Damage post-disaster for the next 6 months.	<u>Target:</u> Continue to assist communities with Substantial Damage post-disaster for the next 6 months.
Outreach to 235 communities with selection of projects and preparing Flood Mitigation Assistance (FMA) applications <u>Required by:</u> Federal government (quarterly and annually) <u>Best in the Country:</u> Federal government	Outcome	<u>Target:</u> Outreach to 231 communities <u>Actual:</u> Outreach to 231 communities	<u>Target:</u> Outreach to 231 communities <u>Actual:</u> Outreach to 231 communities	<u>Target:</u> Outreach to 231 communities with selection of projects and preparing Flood Mitigation Assistance (FMA) applications <u>Actual:</u> Provided outreach to 231 communities with selection of projects and preparing Flood Mitigation Assistance (FMA) applications	<u>Target:</u> Outreach to 233 communities with selection of projects and preparing Flood Mitigation Assistance (FMA) applications <u>Actual:</u> Provided outreach to 235 communities with selection of projects and preparing Flood Mitigation Assistance (FMA) applications	<u>Target:</u> Provide outreach to 235 communities with selection of projects and preparing Flood Mitigation Assistance (FMA) applications
Conduct 20 Community Assistance Visits and Community Assistance Contacts <u>Required by:</u> Federal government <u>Best in the Country:</u> Federal government	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> Conduct 20 Community Assistance Visits and Community Assistance Contacts <u>Actual:</u> Renegotiated grant because of the flood event. Only 9 CAVs have to be conducted.	<u>Target:</u> 9 CAVs to be conducted <u>Actual:</u> Renegotiated grant because of the flood event. 9 CAVs have been conducted.	<u>Target:</u> 9 CAVs to be conducted.
Conduct 5 workshops and field deploy 1 L273 Course (Managing Floodplain Development Through the National Flood Insurance Program) <u>Required by:</u> Federal government <u>Best in the Country:</u> Federal government	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> Conduct 5 workshops and field deploy 1 L273 Course (Managing Floodplain Development Through the National Flood Insurance Program) <u>Actual:</u> Renegotiated grant and conducted 10 workshops	<u>Target:</u> Conduct 5 workshops and field deploy 1 L273 Course (Managing Floodplain Development Through the National Flood Insurance Program) <u>Actual:</u> Conducted 14 workshops and field deploy 1 L273 Course (Managing Floodplain Development Through the National Flood Insurance Program)	<u>Target:</u> Conduct 5 workshops and field deploy 1 L273 Course (Managing Floodplain Development Through the National Flood Insurance Program)
Provide ordinance assistance to communities in 7 watersheds and 5 counties where preliminary Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps are released <u>Required by:</u> Federal government <u>Best in the Country:</u> Federal government	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> Provide ordinance assistance to communities in 7 watersheds and 5 counties where preliminary Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps are released <u>Actual:</u> Provided ordinance assistance to communities in 7 watersheds and 5 counties where preliminary Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps are released	<u>Target:</u> Provide ordinance assistance to communities in 4 watersheds and 3 counties where preliminary Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps are released <u>Actual:</u> Provide ordinance assistance to communities in 5 watersheds and 6 counties where preliminary Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps are released	<u>Target:</u> Provide ordinance assistance to communities in 3 watersheds and 5 counties where preliminary Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps are released
Conduct 2 Discovery Meetings for new Flood Insurance Rate Map mapping projects <u>Required by:</u> Federal government <u>Best in the Country:</u> Federal government	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> Conduct 2 Discovery Meetings for new Flood Insurance Rate Map mapping projects <u>Actual:</u> Conducted 1 Discovery meeting for the Tyger Watershed. Postponed the Black Watershed to evaluate impacts of the flood event.	<u>Target:</u> Conduct 3 Discovery Meetings for new Flood Insurance Rate Map mapping projects <u>Actual:</u> Conducted 2 Discovery meeting for new Flood Insurance Rate Map mapping projects. Delay in funding from FEMA delayed other Discovery Meetings.	<u>Target:</u> Conduct 2 Discovery Meetings for new Flood Insurance Rate Map mapping projects
Release preliminary Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps <u>Required by:</u> Federal government <u>Best in the Country:</u> Federal government	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> Release 5 preliminary Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps <u>Actual:</u> Released 5 preliminary Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps	<u>Target:</u> Release 3 preliminary Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps <u>Actual:</u> Released 3 preliminary Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps	<u>Target:</u> Release 1 preliminary Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps
Conduct 2 Preliminary Digital Flood Insurance Rate Map (DFIRM) Community Coordination meetings, 4 open house meetings and 5 Resilience meetings <u>Required by:</u> Federal government <u>Best in the Country:</u> Federal government	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> Conduct 8 Preliminary Digital Flood Insurance Rate Map (DFIRM) Community Coordination meetings and 11 open house meetings. <u>Actual:</u> Conduct 8 Preliminary Digital Flood Insurance Rate Map (DFIRM) Community Coordination meetings and 11 open house meetings.	<u>Target:</u> Conduct 6 Preliminary Digital Flood Insurance Rate Map (DFIRM) Community Coordination meetings and 11 open house meetings. <u>Actual:</u> Conduct 5 Preliminary Digital Flood Insurance Rate Map (DFIRM) Community Coordination meetings and 7 open house meetings.	<u>Target:</u> Conduct 2 Preliminary Digital Flood Insurance Rate Map (DFIRM) Community Coordination meetings, 4 open house meetings and 5 Resilience meetings.

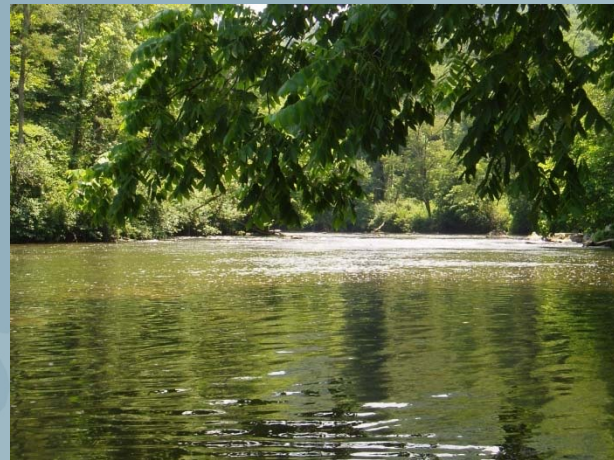
Flood Mitigation Program

Protecting Lives, Protecting Property

Floodplain Management, Mapping, and Mitigation

The Flood Mitigation Program manages three programs pertaining to the National Flood Insurance Program.

- Community Assistance Program
- Cooperating Technical Partners program
- Flood Mitigation Assistance program.



State Coordinators Office

- Provides technical assistance to local floodplain managers regarding the NFIP
- Assist communities in the adoption and enforcement of their floodplain management ordinances
- Assist communities in joining the NFIP
- Audit communities to ensure compliance
- Outreach regarding the recent law changes to the NFIP
- Provide training for local floodplain managers



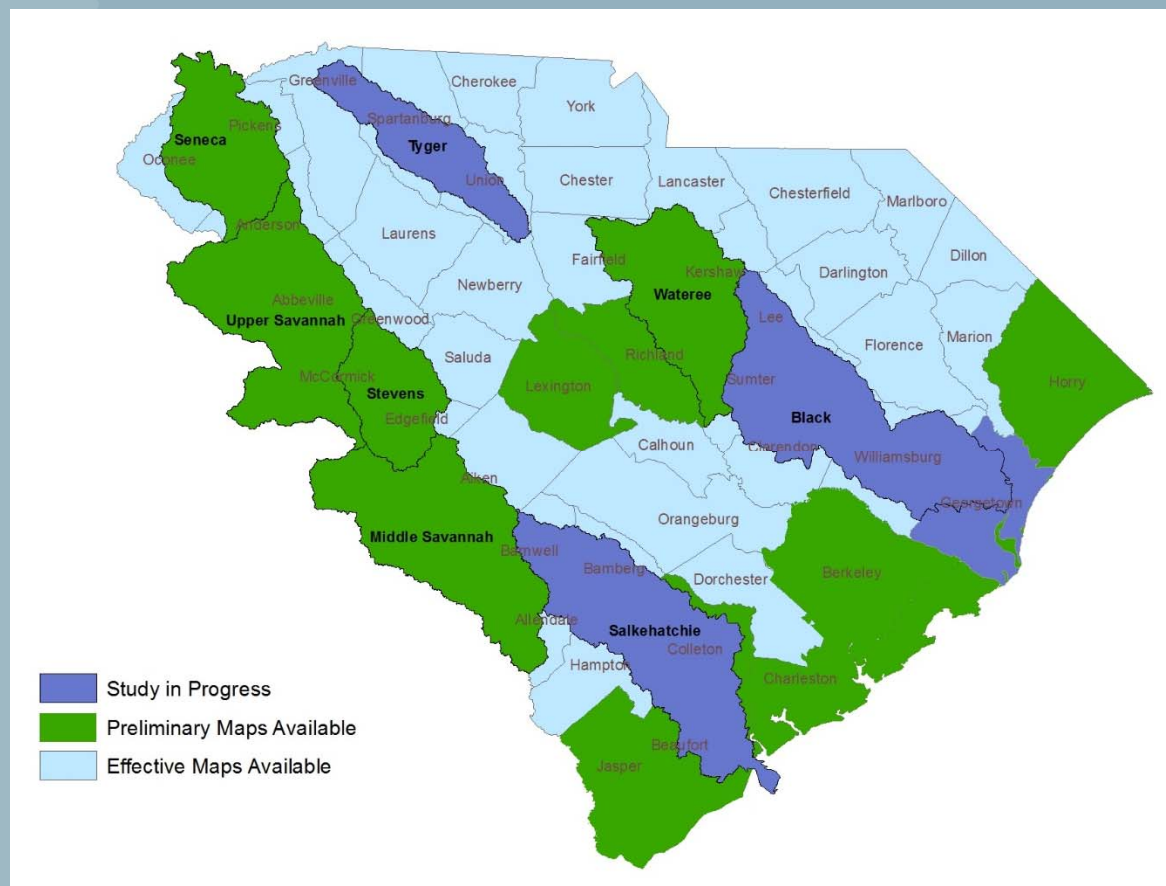
Flood Mitigation Assistance

- Provides local governments grants to elevate, relocate, demolish or acquire insured properties in the floodplain
- Provide assistance to identify mitigation opportunities
- Oversees the grants awarded to communities



Floodplain Mapping

In the past, FEMA Flood Insurance Studies were conducted on a county basis. Now studies are conducted on a **watershed basis**. The map below indicates the maps that are effective, currently preliminary and the studies that are underway, both at the county and watershed level.



Flood Mitigation

Potential Harm

Greatest potential harms to the public if deliverables are not provided

- The NFIP participating communities would not be provided technical assistance in regards to protecting life and property from flooding.
- Communities wishing to join the NFIP would not be provided technical assistance in regards to joining the program.
- The state would not be able to provide valuable knowledge in regards to known flooding. Flood prone areas and deficiencies in floodplain mapping resulting in citizens being at higher risk for flooding.
- SC would not be providing priorities that benefit the communities within the state.
- The state would not be able to provide information to FEMA in regards to compliance issues with communities.
- The state would not be receiving guidance pertaining to the federal regulations.
- State Agencies would not be provided technical assistance in regards to protecting life and property from flooding.
- Expertise that is provided to the NFIP participating communities would not be able to be obtained.
- State set priorities and duties for floodplain management would not be able to be conducted.

How the General Assembly can help avoid the greatest potential harm, other than money

- Allocate the \$1 per flood insurance policy fee to the SCDNR-Flood Mitigation Program
- Pass higher standards legislation regarding floodplain management.

Aquatic Nuisance Species

Department must administer the Aquatic Plant Management program.

			CUSTOMERS			COSTS	
Item #	<u>Product/Service Components</u>	Does law require, allow, or not address it?	Does agency know the annual number of potential customers?	Does agency know the annual number of customers served?	Does the agency evaluate customer satisfaction ?	Does the agency know the cost it incurs, per unit, to provide the product or service?	Does the law allow the agency to charge for it to cover the agency's costs?
6	Identify, prioritize, and treat problem aquatic vegetation in SC public waters. *Note: Cost share is provided to municipal, state, and federal stakeholders.	Require	No	No	No	Yes	Yes*

Aquatic Nuisance Species

GOAL 1 Develop and Implement programs that study, manage and conserve the State's Land and Water Resources through planning, research, technical assistance, public education and the development of a comprehensive natural resources database.

Strategy 1.3 Aquatic Nuisance Species Control activities support healthy habitat for recreation, fish, wildlife and citizens.

Objective 1.3.1 Reduce the footprint of invasive species to provide high quality habitat for hunting, fishing, and recreational activities by utilizing prevention, new and existing technologies, biocontrol, and selective herbicides to improve habitat, provide navigability, and keep water supply sources accessible.

	<u>FTE equivalents utilized</u>	<u>Total spent / budgeted</u>
2016-17	3.25 FTE	\$700,284 (0.95%)
2017-18	3.25 FTE	\$698,380 (0.94%)

Aquatic Nuisance Species

Performance Measures	Type of Measure	2013-14	2014-15	2015-16	2016-17	2017-18
Create and submit to SCDHEC for approval a plan for nuisance species control on water supply lakes to limit herbicide use and budget by utilizing biocontrol and herbicides approved for use in drinking water supply waters <u>Required by:</u> Required by State: SC Department of Health and Environmental Control requires prior written documentation of herbicides utilized in drinking water supply lakes <u>Best in the Country:</u> SCNDR	Outcome	<u>Target:</u> 1 per year <u>Actual:</u> 1 per year	<u>Target:</u> 1 per year <u>Actual:</u> 1 per year	<u>Target:</u> 1 per year <u>Actual:</u> 1 per year	<u>Target:</u> 1 per year <u>Actual:</u> 1 per year	<u>Target:</u> 1 per year
Control > 80% of nuisance, invasive species that impact public waters across the state <u>Required by:</u> State government <u>Best in the Country:</u> SCNDR	Outcome	<u>Target:</u> 80% <u>Actual:</u> 1,387 acres treated (90 % efficacy)	<u>Target:</u> 2,000 acres (80% efficacy) <u>Actual:</u> 2,764 acres (>95% efficacy)	<u>Target:</u> 2,000 acres (80% efficacy) <u>Actual:</u> 2,769 acres	<u>Target:</u> 2000 acres (80% efficacy) <u>Actual:</u> 3,656 acres (>90% efficacy)	<u>Target:</u> 2000 acres (80% efficacy)
Web site info is routinely updated with current educational information <u>Required by:</u> Agency selected <u>Best in the Country:</u> USF&WS	Outcome	<u>Target:</u> 100% compliance <u>Actual:</u> 100% compliance	<u>Target:</u> 100% compliance <u>Actual:</u> 100% compliance	<u>Target:</u> 100% compliance <u>Actual:</u> 100% compliance	<u>Target:</u> 100% compliance <u>Actual:</u> 100% compliance	<u>Target:</u> 100% compliance
Attend and distribute educational materials at the 2 largest wildlife oriented events in the state (Palmetto Sportsman's Classic and Southeastern Wildlife Expo) <u>Required by:</u> Agency selected <u>Best in the Country:</u> SCNDR	Outcome	<u>Target:</u> 100% compliance <u>Actual:</u> 100% compliance	<u>Target:</u> 100% compliance <u>Actual:</u> 100% compliance	<u>Target:</u> 100% compliance <u>Actual:</u> 100% compliance	<u>Target:</u> 100% compliance <u>Actual:</u> 100% compliance	<u>Target:</u> 2
Attend Gulf & South Atlantic Regional Panel Meetings on Invasive Species and maintain open lines of communication with border states and Santee Cooper staff <u>Required by:</u> Agency selected <u>Best in the Country:</u> SCNDR	Outcome	<u>Target:</u> 3 meetings/year <u>Actual:</u> 3 meetings/year	<u>Target:</u> 3 meetings/year <u>Actual:</u> 3 meetings/year	<u>Target:</u> 3 meetings/year <u>Actual:</u> 3 meetings/year	<u>Target:</u> 3 meetings/year <u>Actual:</u> 3 meetings/year	<u>Target:</u> 3 meetings/year
Create annual South Carolina Aquatic Plant Management Plan <u>Required by:</u> State government <u>Best in the Country:</u> SCNDR	Outcome	<u>Target:</u> 1 per year <u>Actual:</u> 1 per year	<u>Target:</u> 1 per year <u>Actual:</u> 1 per year	<u>Target:</u> 1 per year <u>Actual:</u> 1 per year	<u>Target:</u> 1 per year <u>Actual:</u> 1 per year	<u>Target:</u> 1 per year
Maintain 100% accuracy of record system for scheduled treatments and surveys utilizing GIS technology <u>Required by:</u> State government <u>Best in the Country:</u> SCNDR	Outcome	<u>Target:</u> 100% <u>Actual:</u> 100%	<u>Target:</u> 100% <u>Actual:</u> 100%	<u>Target:</u> 100% <u>Actual:</u> 100%	<u>Target:</u> 100% <u>Actual:</u> 100%	<u>Target:</u> 100%

Aquatic Nuisance Species Program

PURPOSE

- Prevent and control the introduction, spread and impact of aquatic invasive species in South Carolina's public waters
- Improve habitat and minimize the problematic impacts to water use caused by invasive species through management and prevention efforts
- Develop SC Aquatic Plant Management Plan annually



What We Do!

Prevention

Literature/plans



Boat ramp signs



Inspections



Billboards

WARNING! You may be moving more than your gear!

STOP

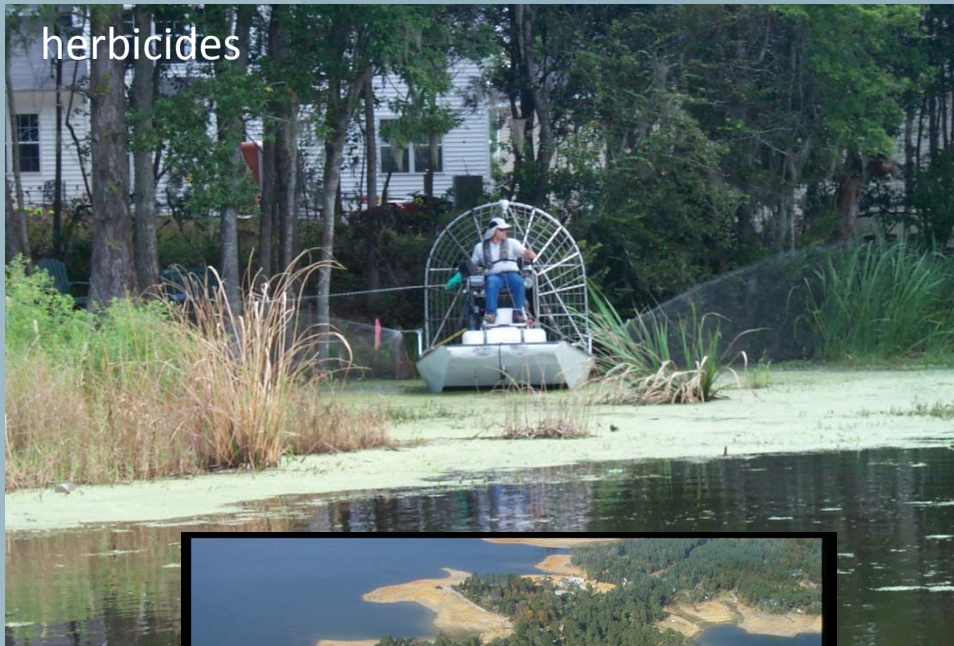
Aquatic Hitchhikers

 **Paid for by US Fish & Wildlife Service - Invasive Species Task Force** 



What We Do!

Management





Before



After



Before



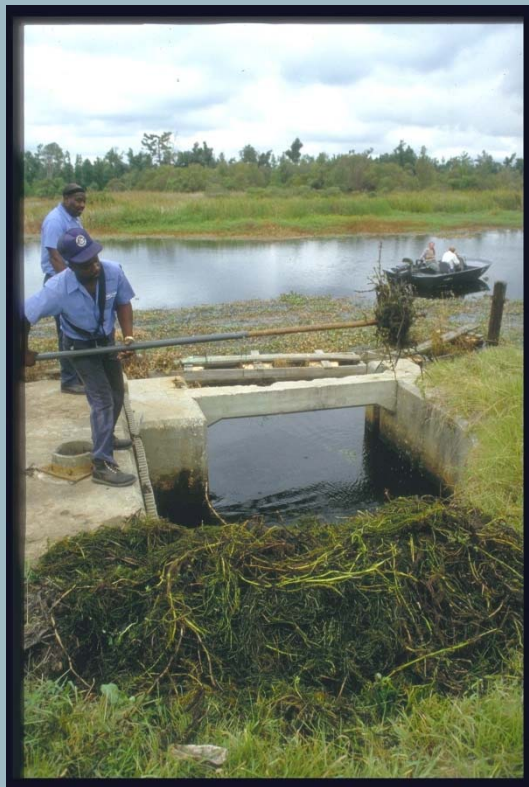
After



Before



After



Aquatic Nuisance Species

Potential Harm

Greatest potential harms to the public if deliverables are not provided

- Economic and ecological repercussions include blocked water flow for municipal, industrial, agricultural and power-generation purposes; degraded water quality; boat damage; flooding because of restricted water flow; fish population declines; reduced waterfront property values; expanded mosquito breeding grounds; and impaired recreational outlets for swimming, hunting, fishing and boating.

How the General Assembly can help avoid the harm, other than money

- Strengthen laws for possession and spreading invasive or noxious species in SC waters.
- Coordinate legislation with neighboring states.

Heritage Trust:

Cultural Preserves and Endangered Species

- The Department shall manage Heritage Trust properties and the Heritage Trust Fund in accordance with the statute. Also, the Department shall conduct biological inventories of outstanding or unique natural areas, flora, and fauna.

			CUSTOMERS			COSTS	
Item #	<u>Product/Service Components</u>	Does law require, allow, or not address it?	Does agency know the annual number of potential customers?	Does agency know the annual number of customers served?	Does the agency evaluate customer satisfaction ?	Does the agency know the cost it incurs, per unit, to provide the product or service?	Does the law allow the agency to charge for it to cover the agency's costs?
8B	Shall inventory, conduct research and asses properties for cultural resources.	Require	No	No	No	No	No
8C	Shall manage cultural heritage trust properties.	Require	No	No	No	No	No
8A	Conducts biological inventories of outstanding or unique natural areas, flora, and fauna. Deputy Director receives ecological and habitat information concerning public and private parcels of property and recommends to the SC Heritage Trust Advisory Board conservation measures agreeable to all parties. *Note: Data is made available without charge under the SC Freedom of Information Act.	Require	No	No	No	No	No*

Heritage Trust: Cultural Program

GOAL 1 Develop and Implement programs that study, manage and conserve the State's Land and Water Resources through planning, research, technical assistance, public education and the development of a comprehensive natural resources database.

Strategy 1.4 Heritage Trust Cultural Resources/Habitat Protection monitors and protects cultural and other resources throughout the state on Heritage Trust properties, and provides culturally related recreational/educational opportunities.

Objective 1.4.1 Survey, research, outreach, education, and management activities for Cultural Heritage Trust Preserves and Programs as well as meeting with the Heritage Trust Advisory Board for board action as required by statute.

	<u>FTE equivalents utilized</u>	<u>Total spent / budgeted</u>
2016-17	8.30 FTE	\$799,733 (1.08%)
2017-18	8.30 FTE	\$798,626 (1.08%)

Performance Measures	Type of Measure	2013-14	2014-15	2015-16	2016-17	2017-18
<p>Conduct archaeological investigation on Heritage Trust Preserves (HTP) and Wild Life Management Areas (WMA). Investigation may be implemented for management purposes (MP), compliance with state or federal regulations (CO) (quantity varies depending on submissions), scientific research (SR) and or public outreach (PO)</p> <p><u>Additional Notes:</u> Measured by acreage, projects and/or by number of properties. <u>Required by:</u> Federal government, state government, and agency selected <u>Best in the Country:</u> SCDNR and private</p>	Outcome	<p><u>Target:</u> 1 HTP, 100% Cultural Resource Management (CRM), 1 SR/PO <u>Actual:</u> 1HTP (Bear Branch HP), 100% CO (<u>Actual</u> number DNE), 1 SR/PO (Johannes Kolb Archaeology and Public Education Project).</p>	<p><u>Target:</u> Same as previous year <u>Actual:</u> 1HTP (Fort Frederick HP), 100% CO (Boating Infrastructure Grants, 1 boat landing), 1 SR/PO (Johannes Kolb Archaeology and Public Education Project).</p>	<p><u>Target:</u> Same as previous year <u>Actual:</u> 0 HTP (Oct 2015 flood), 100% CO (Boating Infrastructure Grants), 1 SR/PO (Johannes Kolb Archaeology and Public Education Project).</p>	<p><u>Target:</u> Same as previous year <u>Actual:</u> 0 HTP, 100% CO (Boating Infrastructure Grant, 2 individual projects & 50 acres of Hail Gold Mine mitigation Tract Wateree River HP/WMA), 0 SR/PO (Acquisition of Archaeological Research Facility consumed year).</p>	<p><u>Target:</u> Same as previous year <u>Actual:</u> 1HTP (planned Fort Lamar HP Dec 2017/Jan 2018), 100% CO (Continuing Hail Gold Mine mitigation Tract Wateree River HP/WMA), 1 SR/PO (Pockoy Island Shell Ring Investigation July 2017).</p>
<p>Conduct Public Outreach Archaeology Program</p> <p><u>Additional Notes:</u> Measured by programs and presentations given and attendance to public archaeological investigations. <u>Required by:</u> Agency selected <u>Best in the Country:</u> SCDNR</p>	Outcome	<p><u>Target:</u> 1 Program (Johannes Kolb Archaeology and Public Education Project). <u>Actual:</u> 1 Program (Johannes Kolb Archaeology and Public Education Project), public attendance approximately 300.</p>	<p><u>Target:</u> 2 Programs (Johannes Kolb Archaeology and Public Education Project and Fort Frederick Archaeology Program). <u>Actual:</u> 2 Programs (Johannes Kolb Archaeology and Public Education Project and Fort Frederick Archaeology Program), attendance approximately 300 per program.</p>	<p><u>Target:</u> 1 Program (Johannes Kolb Archaeology and Public Education Project). <u>Actual:</u> 1 Program (Johannes Kolb Archaeology and Public Education Project), public attendance approximately 300.</p>	<p><u>Target:</u> 0, Planning for new projects <u>Actual:</u> 0</p>	<p><u>Target:</u> Develop new programs with Education interns, Boy Scouts Archaeology Merit Badge, Project Archaeology Teacher Recertification Program. Conduct public archaeological investigation.</p>

Heritage Trust: Cultural Program

Cultural Program Performance Measures continued

<p>Manage Historic Structures and Ruins e.g. Poinsett Bridge (circa 1820), Fort Frederick (circa 1734)</p> <p><u>Additional Notes:</u> Measured by individual projects and request from other management staff with management responsibilities to other historic structures.</p> <p><u>Required by:</u> State government</p> <p><u>Best in the Country:</u> SCDNR</p>	Outcome	<p><u>Target:</u> 2 Structures</p> <p><u>Actual:</u> 2 Structures (Poinsett Bridge and Fort Frederick)</p>	<p><u>Target:</u> 2 Structures</p> <p><u>Actual:</u> 2 Structures (Poinsett Bridge and Fort Frederick)</p>	<p><u>Target:</u> 2 Structures</p> <p><u>Actual:</u> 2 Structures (Poinsett Bridge and Fort Frederick Tabby Preservation Project Completed, Poinsett Bridge Structural Analysis Report Updated)</p>	<p><u>Target:</u> 2 Structures</p> <p><u>Actual:</u> 3 Structures (Poinsett Bridge and Fort Frederick visually inspected for damage, Botany Bay Tabby Preservation Project completed)</p>	<p><u>Target:</u> 2 (Develop Poinsett Bridge Preservation Plan and inspect Fort Frederick)</p>
<p>Annually monitor 24 properties listed on the National Register of Historic Places and report to SC Department of Archives and History per the programmatic agreement between the SCDNR and the SC Department of Archives and History regarding the management of state owned or leased national register listed properties</p> <p><u>Required by:</u> State government</p> <p><u>Best in the Country:</u> SCDNR</p>	Outcome	<p><u>Target:</u> 24 Properties</p> <p><u>Actual:</u> 24 Properties</p>	<p><u>Target:</u> 24 Properties</p> <p><u>Actual:</u> 24 Properties</p>	<p><u>Target:</u> 24 Properties</p> <p><u>Actual:</u> 24 Properties</p>	<p><u>Target:</u> 24 Properties</p> <p><u>Actual:</u> 24 Properties</p>	<p><u>Target:</u> 24 Properties</p>
<p>Maintain and inspect walking trails, parking lots and, property lines and grassed acres on 17 Cultural Heritage Preserves</p> <p><u>Required by:</u> State government</p> <p><u>Best in the Country:</u> SCDNR</p>	Outcome	<p><u>Target:</u> 10 miles walking trails, 11 parking lots, 30 miles property lines, 20 acres grass</p> <p><u>Actual:</u> Same as Target</p>	<p><u>Target:</u> Same as previous year</p> <p><u>Actual:</u> Same as previous year</p>	<p><u>Target:</u> Same as previous year</p> <p><u>Actual:</u> Same as previous year</p>	<p><u>Target:</u> Same as previous year</p> <p><u>Actual:</u> Same as previous year</p>	<p><u>Target:</u> Same as previous year</p>
<p>Manage forest resources on 17 Cultural Heritage Preserves to improve wildlife habitat</p> <p><u>Additional Notes:</u> Dependent upon completion of archaeological inventory of property, future desired condition and cruise and sale of timber</p> <p><u>Required by:</u> State government</p> <p><u>Best in the Country:</u> SCDNR</p>	Outcome	<p><u>Target:</u> DNE</p> <p><u>Actual:</u> DNE</p>	<p><u>Target:</u> DNE</p> <p><u>Actual:</u> DNE</p>	<p><u>Target:</u> DNE</p> <p><u>Actual:</u> DNE</p>	<p><u>Target:</u> Harvest 40 acres at Bear Branch HP</p> <p><u>Actual:</u> 40 acres harvested</p>	<p><u>Target:</u> Cruise Congaree Creek HP Timber, burn or spray 40 acre harvest at Bear Branch HP, install fire breaks at Bear Branch HP. Eradicate 10 acres of kudzu at Poinsett Bridge HP. Eradicate 5 acres of privet at Fort Lamar HP.</p>
<p>Develop new features on 17 Cultural Heritage Preserves (e.g. trails, interpretive panels, guard rails, etc.)</p> <p><u>Required by:</u> State government</p> <p><u>Best in the Country:</u> SCDNR</p>	Outcome	<p><u>Target:</u> DNE</p> <p><u>Actual:</u> DNE</p>	<p><u>Target:</u> DNE</p> <p><u>Actual:</u> DNE</p>	<p><u>Target:</u> DNE</p> <p><u>Actual:</u> DNE</p>	<p><u>Target:</u> Develop interpretive materials for panels at Fort Frederick and Poinsett Bridge HPs. Design new trail markers for Congaree Creek HP <u>Actual:</u> materials 75% developed, Trail markers design and procured for Congaree Creek HP.</p>	<p><u>Target:</u> Complete approval process for Fort Frederick HP Boat Landing. Install interpretive panels at Fort Frederick & Poinsett Bridge HPs, Construct new trail at Poinsett Bridge HP. Install new trail markers at Congaree Creek HP. Install guard rail on dock at Childsbury Towne HP. Install guardrail at Altamaha Towne HP. Install flag pole and split rail fence at Fort Lamar HP.</p>

Heritage Trust: Endangered Species

GOAL 1 Develop and Implement programs that study, manage and conserve the State's Land and Water Resources through planning, research, technical assistance, public education and the development of a comprehensive natural resources database.

Strategy 1.4 Heritage Trust Cultural Resources/Habitat Protection monitors and protects cultural and other resources throughout the state on Heritage Trust properties, and provides culturally related recreational/educational opportunities.

Objective 1.4.2 Update inventory of Rare, Threatened and Endangered Species in SC.

	<u>FTE equivalents utilized</u>	<u>Total spent / budgeted</u>
2016-17	4.30 FTE	\$331,426 (0.45%)
2017-18	4.30 FTE	\$330,318 (0.45%)

Performance Measures	<u>Type of Measure</u>	<u>2013-14</u>	<u>2014-15</u>	<u>2015-16</u>	<u>2016-17</u>	<u>2017-18</u>
<p>Inventory significant tracts of SCDNR properties. In addition, inform public agencies, private land trusts, and the general public of the significance of their properties as areas of high or unique biodiversity or special habitats</p> <p><u>Required by:</u> Federal: USFWS tracks plants and animal species data collected by or managed by SCDNR, particularly on state and federal properties.</p> <p><u>Best in the Country:</u> Virginia Natural Heritage Program</p>	Outcome	<p><u>Target:</u> Rare plant and animal records entered into database</p> <p><u>Actual:</u> 17 plants, 1 animal entered into Heritage Database. Data reviews totaled 166 requests filled. Online herbarium voucher specimen queries totaled 917.</p>	<p><u>Target:</u> Plant records were compiled for data entry that are housed at USC and Clemson</p> <p><u>Actual:</u> 3 plants, 6 animals, 2 natural communities entered into Heritage Database. Data reviews totaled 225 data requests filled. Online herbarium specimen queries totaled 1045.</p>	<p><u>Target:</u> Evaluate Peach Tree Rock, Wateree River, and Woodbury Heritage preserves for rare plant species. Enter into database rarest tracked species housed at academic institutions (USC and Clemson)</p> <p><u>Actual:</u> 307 species occurrences for 27 different plant species considered most in need of conservation.</p>	<p><u>Target:</u> Continue evaluation of Heritage Trust Preserves and future acquisitions. Collected 90% of voucher specimen information at Furman University and USC UpState</p> <p><u>Actual:</u> 109 species added to the tracked list; 283 new/updated observations added to the occurrence database; 301 information requests answered.</p>	<p><u>Target:</u> Continue evaluation of Heritage Trust Preserves and future acquisitions. Complete collection of voucher specimen information from Furman University and USC UpState. Begin collection of voucher specimen information from Francis Marion University, Newberry College, USC Salkahatchie, Winthrop University.</p>

South Carolina Heritage Trust



The South Carolina Department of Natural Resources' Heritage Trust Program was created in 1976, the first such program in the nation, to help stem the tide of habitat loss by protecting critical natural habitats and significant cultural sites. Enabling legislation directed the South Carolina Department of Natural Resources (SCDNR), in concert with other state agencies, to set aside a portion of the state's rich natural and cultural heritage in a system of heritage preserves to be protected for the benefit of present and future generations.



Poinsett Bridge circa 1820
Surrounding Oak-Hickory Woodlands



Forty Acre Rock
Ephemeral Pools



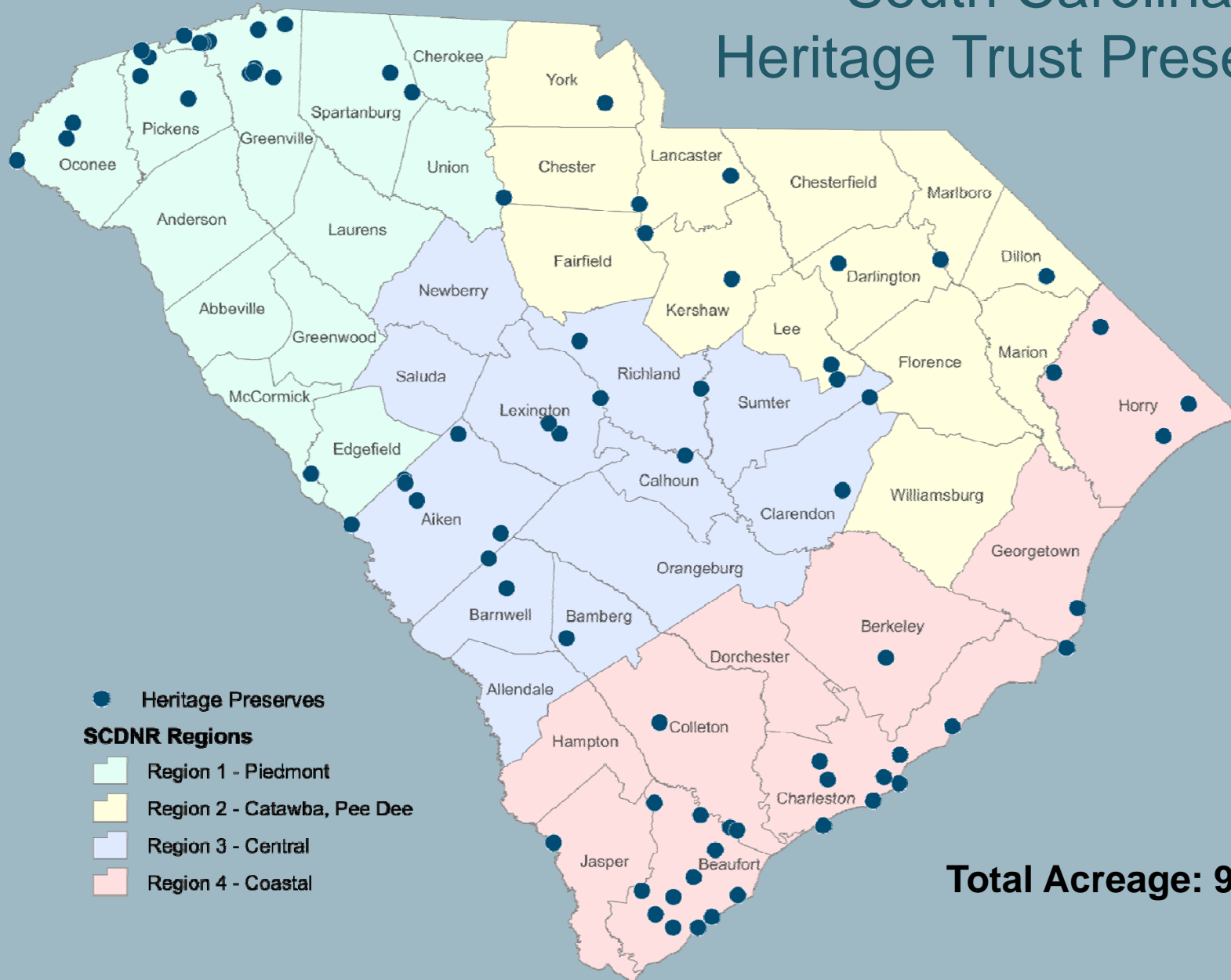
Tillman Sand Ridge

Longleaf Pine Savanna



Capers Island Maritime Forest

South Carolina Heritage Trust Preserves



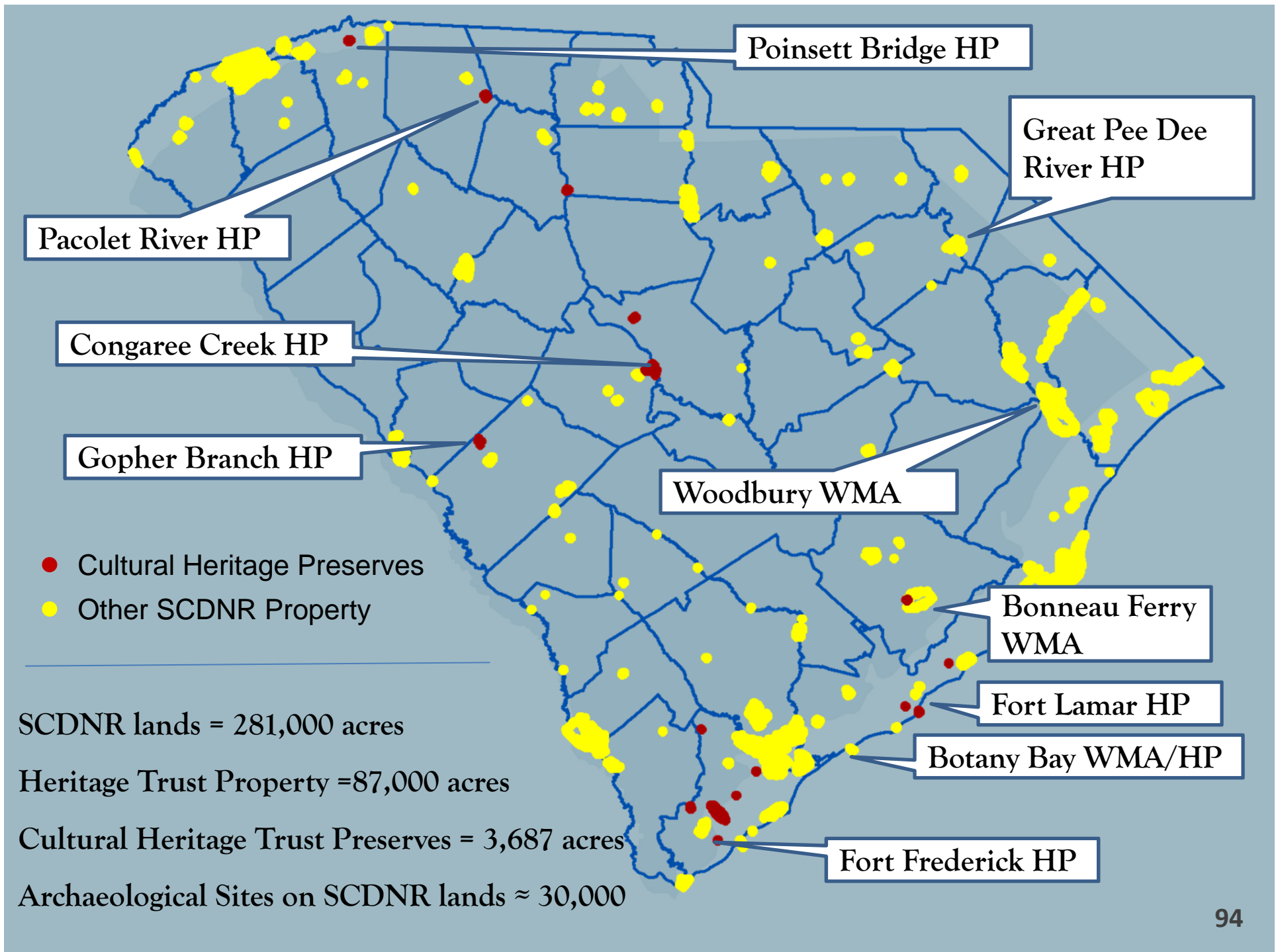
Total Acreage: 98,203

Heritage Trust Cultural Program

Heritage Trust Cultural Program manages and protects cultural resources throughout the state on SCDNR & Heritage Trust properties.

The Program:

- provides the public with archaeological educational & recreational opportunities
- conducts & supports scientific investigation of archaeological sites on SCDNR properties and beyond
- manages cultural and natural resources on 17 Cultural Heritage Preserves state wide
- insures compliance with the **National Historic Preservation Act of 1966** on federal funded and/or permitted projects and on federal land transfers
- insures compliance with the **Protection of State Owned or Leased Historic Properties Act**

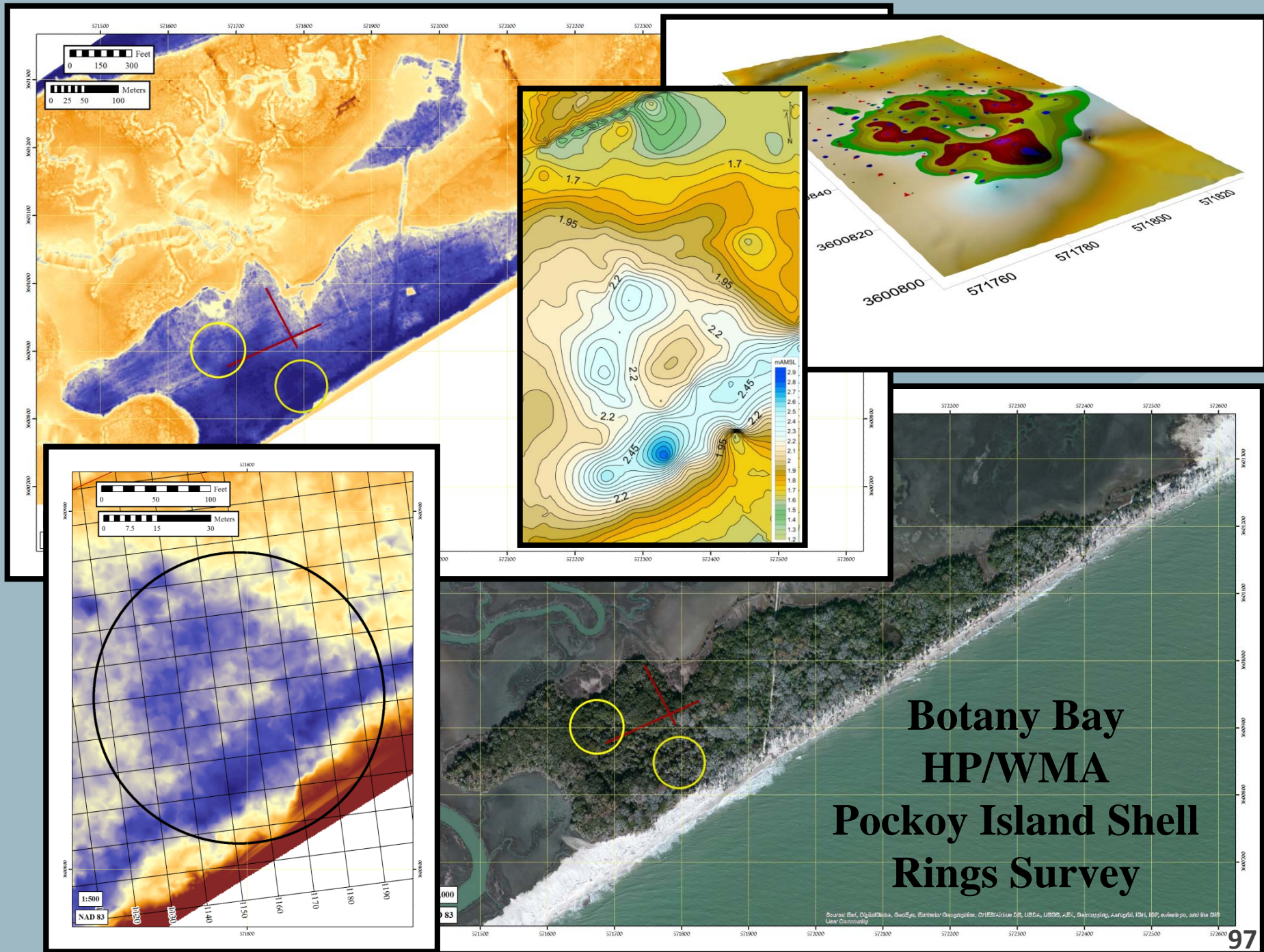


Great Pee Dee River HP
Johannes Kolb Public Education &
Archaeology Project - 1996-2016



Fort Frederick HP Archaeological Investigation, Public Education & Tabby Restoration





Botany Bay HP/WMA Pockoy Island Shell Rings Survey

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, SRT, and the GIS User Community

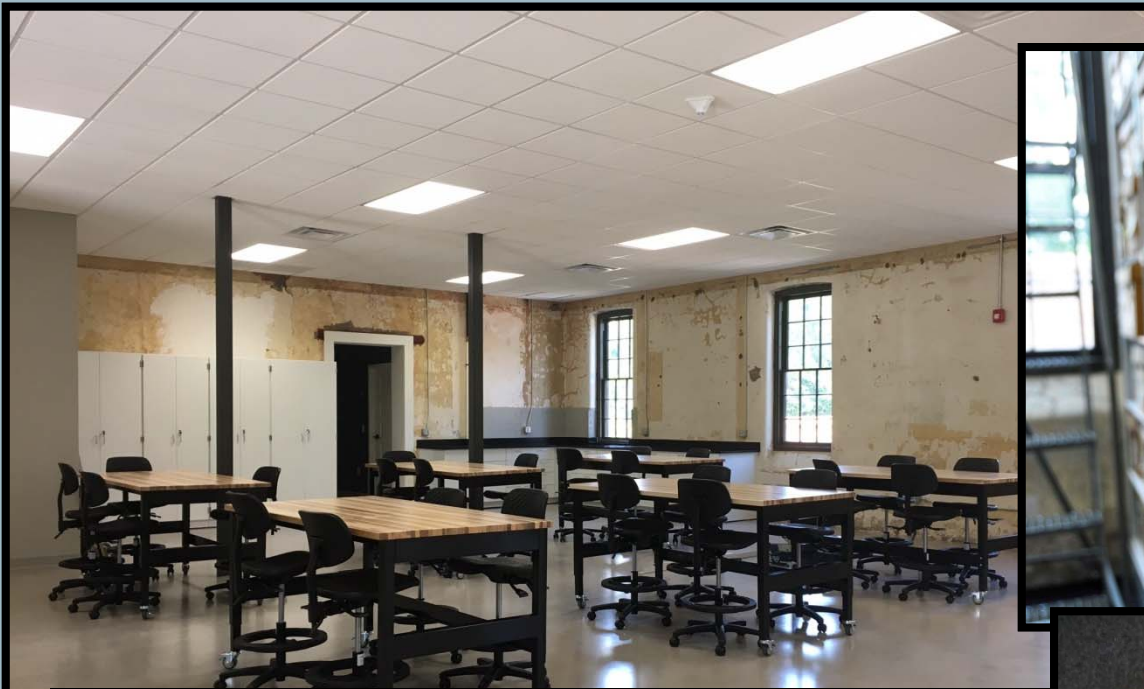
Internal Change #3: Facility to house a Cultural Resource Center which will include an Archaeology Laboratory and staff offices

To provide a facility to house a Cultural Resource Center which will include an Archaeology Laboratory and staff offices. This facility will allow for the collection, cataloging, preservation, storage and display of artifacts from the Heritage Trust properties and other SCDNR properties. The facility will also be a center for educational outreach on these important Heritage Trust artifacts.

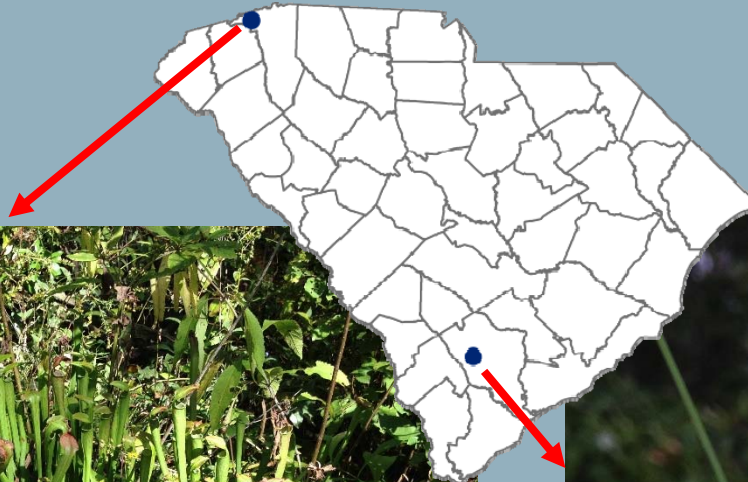
- a. Stage of analysis: Analysis complete.
- b. Presented to and approved by Board/Commission: Yes, both HTAB and SCDNR Board.
- c. Performance measures impacted and predicted impact: Predicted impact is improved care of important artifacts and greatly increased ability to educate the public and school groups on the archeological and historical resources of the State.
- d. Cost of Objective(s) that will be impacted and the anticipated impact: Non-recurring expenditures for office furniture, laboratory equipment, artifact and curation storage units, classroom and conference room furniture and equipment, Total \$196,000; Recurring costs: Building rent, security system, water, utilities, janitorial and maintenance, Internet/phones, Insurance, Total \$216,000 annually.
- e. Anticipated implementation date: This has already been implemented and the facility is in use, and is almost complete.

Parker Annex Archaeology Center





Endangered Species



Canby's Dropwort
Crosby Oxypolis HP



Mountain Pitcher Plants
Ashmore-Chandler HP



Heritage Trust

Potential Harm

Greatest potential harms to the public if deliverables are not provided

- Heritage Trust Properties are acquired to protect significant resources for public benefit. Public knowledge of the significant resource can only be generated through inventory, research and assessments. Not conducting such activities denies the public knowledge of the resources that are acquired for their benefit.
- Once acquired land and resources must be managed in order to provide public access. Without access the public cannot gain knowledge or enjoyment of the property or its resources. The properties also protect important natural communities that require management to properly function.
- Biologically sensitive resources such as marshes, lakes, ponds, Carolina bays and other unique geological formations, indigenous fauna, and flora that are enjoyed by the public as outdoor recreational activities or as studied by scientific community could be lost. Important areas for eco-tourism and outdoor recreation, recharge of groundwater aquifers or surface water resources could diminished.

How the General Assembly can help avoid the greatest potential harm, other than money

- Continue legislated mission of the Heritage Trust Program.
- Consult with Heritage Trust program managers, the academic community, and the general public about unknown or under-appreciated unique or outstanding examples of biological and landscape resources.
- Promote appreciation of South Carolina's longtime historical and current involvement in natural history studies for both the lay public and those with specialized scientific training.
- Encourage both institutions of higher learning and primary to secondary to use Heritage Trust lands as areas of educational and research value.

Soil and Water Conservation Districts

Department must assist Soil and Water Conservation Districts.

			CUSTOMERS			COSTS	
Item #	Product/Service Components	Does law require, allow, or not address it?	Does agency know the annual number of potential customers?	Does agency know the annual number of customers served?	Does the agency evaluate customer satisfaction?	Does the agency know the cost it incurs, per unit, to provide the product or service?	Does the law allow the agency to charge for it to cover the agency's costs?
7A	Offer such assistance as may be appropriate to the commissioners of soil and water conservation districts in the carrying out of any of their powers and programs and to coordinate the programs of districts organized under this chapter so far as this may be done by advice and consultation.	Require	Yes	Yes	Yes	No	No
7B	Keep the commissioners of each of the several districts organized under the provisions of this chapter informed of the activities and experience of all other districts; facilitate an interchange of advice and experience between such districts and cooperation between them; and disseminate information throughout the State concerning the activities and programs of districts.	Require	Yes	Yes	Yes	No	No
7C	Receive gifts, appropriations, materials, equipment, lands and facilities and manage, operate and disburse them for the benefit of the soil and water conservation districts; secure the cooperation and assistance of the United States and any of its agencies and of agencies and counties of this State, in the work of such districts.	Require	Yes	Yes	Yes	No	No
7D	Assist commissioners of conservation districts and directors of watershed districts with the organization and function of watershed conservation districts.	Require	Yes	Yes	No	Yes	No

Conservation Districts

GOAL 1 Develop and Implement programs that study, manage and conserve the State's Land and Water Resources through planning, research, technical assistance, public education and the development of a comprehensive natural resources database.

Strategy 1.5 Conservation Districts Program assists farmers, ranchers and landowners with Conservation planning and facilitates access to Farm Bill programs through a partnership with the United State Department of Agriculture (USDA).

Objective 1.5.1 Provide increased technical assistance and administrative support to Conservation District Commissioners, District staff and partner agencies.

	<u>FTE equivalents utilized</u>		<u>Total spent / budgeted</u>
2016-17	4.30 FTE	4 .00 TG	\$1,481,250 (2.00%)
2017-18	4.30 FTE	4 .00 TG	\$1,566,392 (2.12%)

Conservation Districts

Performance Measures	Type of Measure	2013-14	2014-15	2015-16	2016-17	2017-18
Hire 3 new state-funded staff positions to assist conservation districts and watershed district boards <u>Required by:</u> State <u>Best in the Country:</u> Missouri DNR - Soil and Water Program	Outcome	<u>Target:</u> Create 1 new state-funded staff position to assist conservation districts and watershed boards <u>Actual:</u> Funds appropriated by Legislature; vetoed by the governor.	<u>Target:</u> Same as previous year <u>Actual:</u> Funds appropriated by Legislature, hired in August 2014.	<u>Target:</u> Create 3 new state-funded staff positions to assist conservation districts and watershed boards <u>Actual:</u> No funds appropriated for these positions	<u>Target:</u> Same as previous year <u>Actual:</u> No funds appropriated for these positions	<u>Target:</u> Same as previous year
Seek additional \$150,000 of federal grant funds to hire 2 new grant-funded positions to provide increased technical assistance <u>Required by:</u> State <u>Best in the Country:</u> Missouri DNR - Soil and Water Program	Outcome	<u>Target:</u> Obtain \$150,000 in federal grant agreements <u>Actual:</u> Received \$215,000	<u>Target:</u> Obtain \$150,000 in federal grant agreements <u>Actual:</u> Received \$173,540	<u>Target:</u> Obtain \$150,000 in federal grant agreements <u>Actual:</u> Received \$223,540	<u>Target:</u> \$200,000 <u>Actual:</u> Received \$276,082	<u>Target:</u> \$200,000
Seek increase in state funding for Aid to Conservation Districts to \$1 million <u>Required by:</u> State <u>Best in the Country:</u> Missouri DNR - Soil and Water Program <u>Additional Notes:</u> Currently, Aid to Districts is funded at \$690,000 with each of the 46 Districts receiving \$15,000. With the increase requested, each District would receive \$21,739.13 annually, which is for operating costs of the district offices.	Outcome	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> \$1,000,000 <u>Actual:</u> No increase	<u>Target:</u> \$1,000,000 <u>Actual:</u> No increase	<u>Target:</u> \$1,000,000
Increase participation by 20% by promoting Envirothon at schools and at statewide educational events <u>Required by:</u> Agency selected <u>Best in the Country:</u> Pennsylvania Envirothon.org	Outcome	<u>Target:</u> 144 <u>Actual:</u> 144 in attendance	<u>Target:</u> 160 in attendance <u>Actual:</u> 156 in attendance	<u>Target:</u> 192 in attendance <u>Actual:</u> 126 in attendance	<u>Target:</u> 144 in attendance <u>Actual:</u> 126 in attendance	<u>Target:</u> 144 in attendance
Increase Conservation plans serviced by 50 <u>Required by:</u> State <u>Best in the Country:</u> Missouri DNR - Soil and Water Program	Output	<u>Target:</u> 300 <u>Actual:</u> 400 plans	<u>Target:</u> 450 <u>Actual:</u> 600	<u>Target:</u> 600 <u>Actual:</u> 600	<u>Target:</u> 600 <u>Actual:</u> 876	<u>Target:</u> 850
Conduct 5 demonstration workshops using the rainfall simulator <u>Required by:</u> State <u>Best in the Country:</u> Iowa Learning Farms - Iowa State University <u>Additional Notes:</u> The grant that supports this program will expire in December 2017.	Output	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> DNE <u>Actual:</u> DNE	<u>Target:</u> 5 demonstration workshops <u>Actual:</u> 14 demonstration workshops	<u>Target:</u> 10 demonstration workshops <u>Actual:</u> 14 demonstration workshops	<u>Target:</u> 8 demonstration workshops

Conservation Districts

Man Working in Harmony with Nature



Conservation Districts

- Soil and Water Conservation Districts Law § 48-9-10, et. Seq.
- 46 Conservation Districts in SC
- Subdivisions of state government
- 230 Commissioners: 138 Elected in General Election and 92 appointed by the DNR Board



Functions of Conservation Districts

Coordinate technical, financial and educational resources to meet the needs of the public for conservation of soil, water and related resources.

Conservation Districts provide both urban and rural assistance, by providing conservation plans so that landowners can implement Best Management practices.

8.8 million acres under a conservation plan in SC



Promote Federal Cost Share Programs

- Farm conservation plans
- Cost share assistance
- Urban and rural flood information
- Soils information
- Water quality programs
- Wildlife and forestry planning



Provide Educational Programs

- SC Envirothon (high school teams)
- Land and Water Management Workshops
- Soil and Water Stewardship Programs
- Natural resource education workshops
- Outdoor education centers and nature trails
- Conservation contests and scholarships



Conservation Districts

Potential Harm

Greatest potential harms to the public if deliverables are not provided

- If this assistance is not provided, there will be no state agency coordination, support and guidance to the commissioners of the conservation districts, resulting in diminished, and in some cases terminated service in the local district office. Through the conservation districts, landowners and managers receive the technical and financial assistance needed to help apply complex conservation treatments to control erosion and improve the quality of our soil resources, improve water quality, enhance fish and wildlife habitat, and manage woodlands and pasturelands.
- If this deliverable is not provided, the 46 Conservation Districts will be without a coordinating state agency. Conservation Districts are subdivisions of State Government and are responsible for directing millions of federal cost-share dollars in conservation efforts for specific programs and projects within their boundaries. The 230 Conservation District Commissioners are public officials, who serve without pay, and are charged by State law to appraise conservation needs, develop plans and implement programs to solve environmental problems.
- If the State appropriations to conservation districts for operating costs of the 46 district offices are not provided, the conservation districts ability to meet their obligations to the public and landowners/managers would be greatly diminished in many counties and quite possibly terminated in others. The same is true if there is not cooperation and assistance from the USDA Natural Resources Conservation Service, which annually provides over \$25 million of assistance which goes directly to landowners who install conservation practices. A Districts' inability to meet their obligations increases the risks to the public in regard to soil erosion, water quality and habitat destruction.
- By not providing this assistance, the public could be impacted by flooding hazards in the watershed area, due to the inactivity of the watershed district directors.

How the General Assembly can help avoid the greatest potential harm, other than money

- Continue to support the Conservation Program budget line item in the DNR-Land, Water and Conservation Division.

Scenic Rivers / Federal Energy Regulatory Commission (FERC) License

The Department must designate and administer the Scenic Rivers Program

			<u>CUSTOMERS</u>			<u>COSTS</u>	
Item #	<u>Product/Service Components</u>	Does law require, allow, or not address it?	Does agency know the annual number of potential customers?	Does agency know the annual number of customers served?	Does the agency evaluate customer satisfaction ?	Does the agency know the cost it incurs, per unit, to provide the product or service?	Does the law allow the agency to charge for it to cover the agency's costs?
9	Inventory rivers and administer the program. * <u>Note</u> : No charge for services and thus no customers.	Require	No*	No*	No	No	No

Scenic Rivers / FERC

GOAL 1 Develop and Implement programs that study, manage and conserve the State's Land and Water Resources through planning, research, technical assistance, public education and the development of a comprehensive natural resources database.

Strategy 1.6 Conservation of SC's river heritage and protection of the unique or outstanding scenic, recreational, geologic, botanical, fish, wildlife, historic and cultural values of selected rivers and river segments of the state.

Objective 1.6.1 Conservation of SC's river heritage and protection of the unique or outstanding scenic, recreational, geologic, botanical, fish, wildlife, historic and cultural values of selected rivers and river segments of the state.

	<u>FTE equivalents utilized</u>	<u>Total spent / budgeted</u>
2016-17	1.25 FTE	\$64,498 (0.09%)
2017-18	1.25 FTE	\$56,132 (0.08%)

Performance Measures	<u>Type of Measure</u>	<u>2013-14</u>	<u>2014-15</u>	<u>2015-16</u>	<u>2016-17</u>	<u>2017-18</u>
Manage the State Scenic Rivers Program, and provide related technical assistance and support to project partners and the public statewide. <u>Required by:</u> Agency selected <u>Best in the Country:</u> Virginia Scenic Rivers Program	Outcome	<u>Target:</u> Provide 3 active river projects, 1 information product, 100 consultations, and 3,000 Beach Sweep River Sweep (BSRS) participants per year. Note, this is not an optimal Target and is limited because of staff shortage. <u>Actual:</u> 3 active projects; 5,253 participants in Beach Sweep River Sweep statewide.	<u>Target:</u> Same as previous year <u>Actual:</u> 3 active projects; 3,910 participants in Beech Sweep River Sweep statewide.	<u>Target:</u> Same as previous year <u>Actual:</u> 3 active projects; 4,500 participants in Beach Sweep River Sweep statewide.	<u>Target:</u> Same as previous year <u>Actual:</u> 3 active projects; 4,750 participants in Beach Sweep River Sweep statewide.	<u>Target:</u> Same as previous year. **Note, this is not an optimal Target and is limited because of staff shortage.

River Conservation Program

Enabled by the S.C. Scenic Rivers Act

Purpose:

Protect rivers with unique, outstanding resource values ... scenic, recreational, geologic, botanical, fish, wildlife, historic, or cultural values.

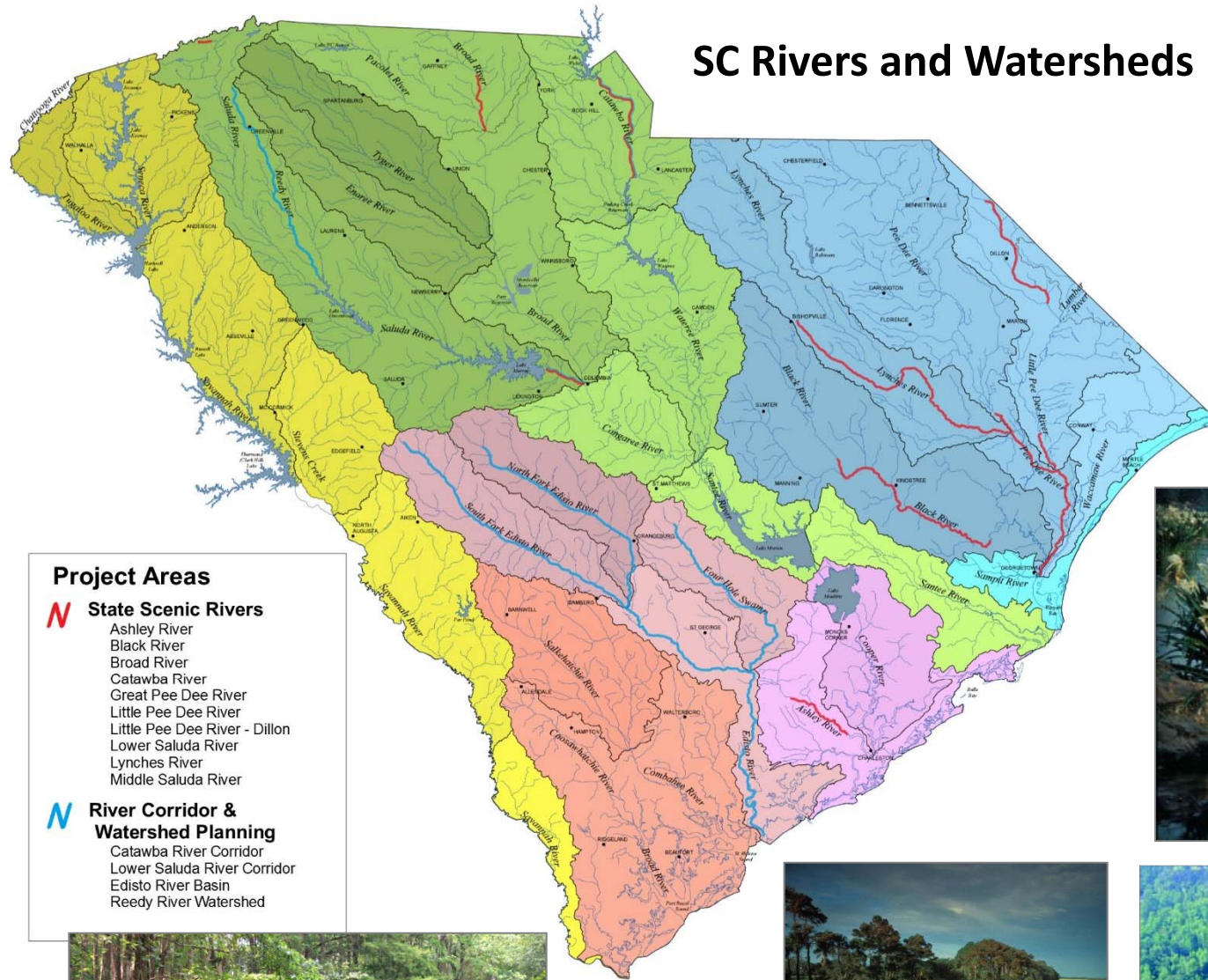
Approach:

Non-regulatory. We target river conservation goals in partnership with local stakeholders.

Project areas...

- Designated State Scenic Rivers
- River Corridor & Watershed Planning areas

SC Rivers and Watersheds



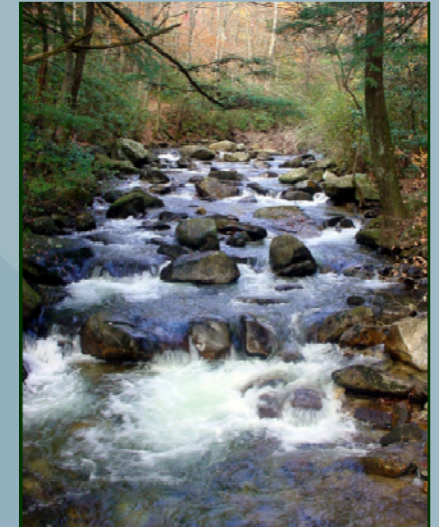
Project Areas

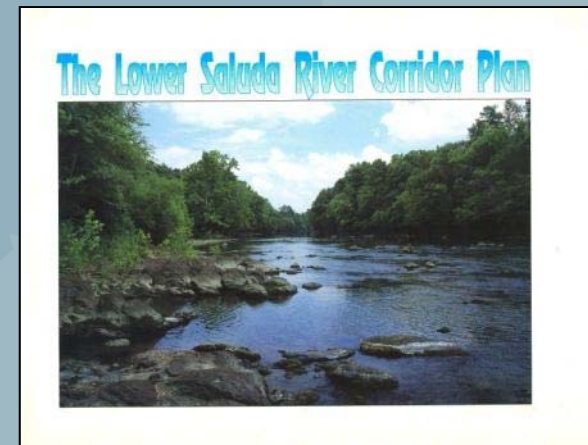
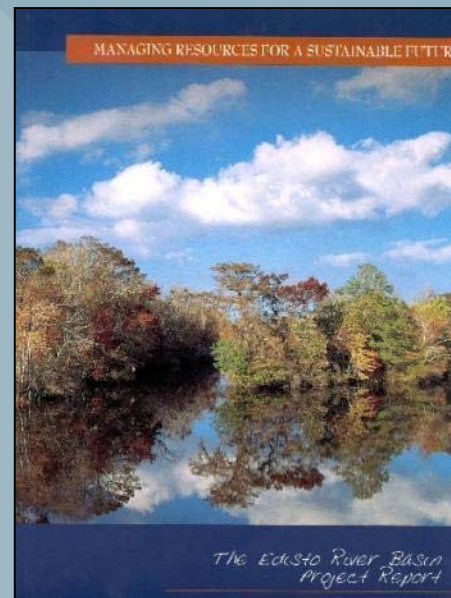
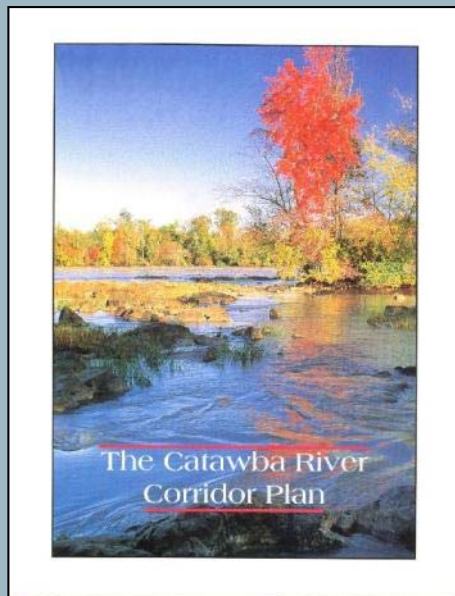
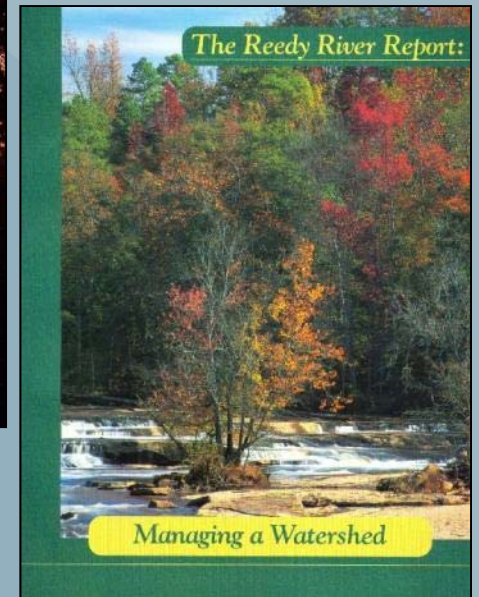
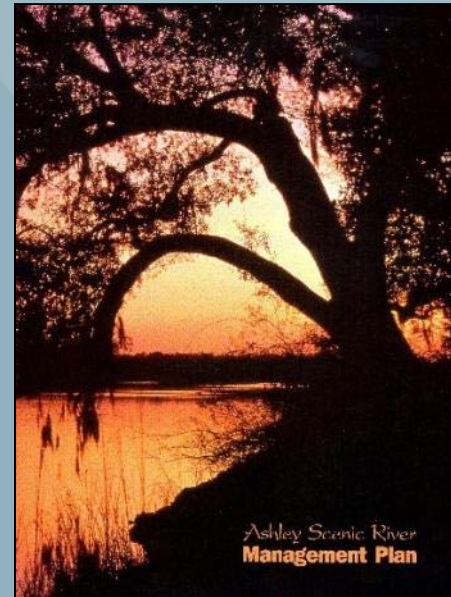
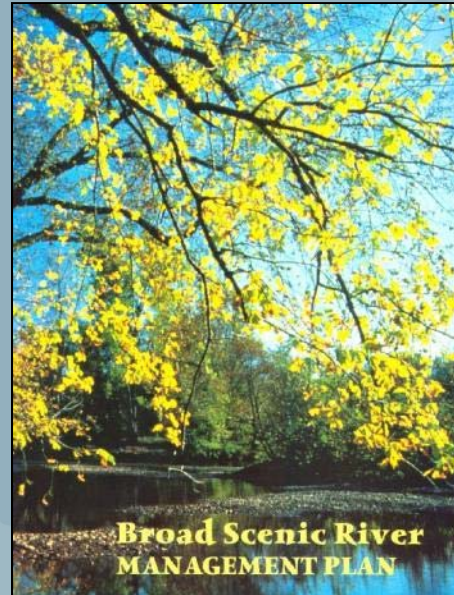
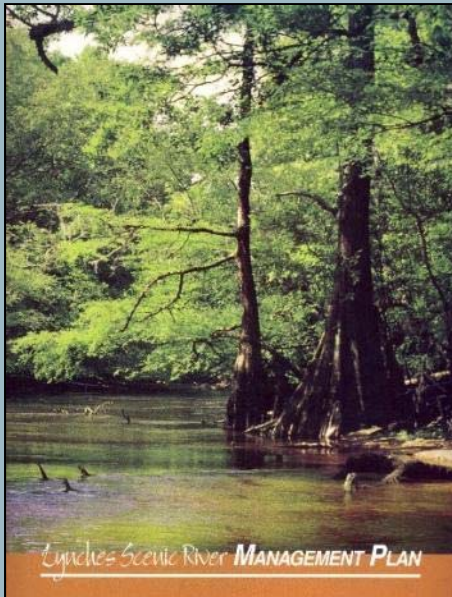
State Scenic Rivers

- Ashley River
- Black River
- Broad River
- Catawba River
- Great Pee Dee River
- Little Pee Dee River
- Little Pee Dee River - Dillon
- Lower Saluda River
- Lynches River
- Middle Saluda River

River Corridor & Watershed Planning

- Catawba River Corridor
- Lower Saluda River Corridor
- Edisto River Basin
- Reedy River Watershed





Scenic Rivers / FERC

Potential Harm

Greatest potential harms to the public if deliverables are not provided

- Loss of unique or outstanding river resources of the State to development projects or resource extraction.

How the General Assembly can help avoid the greatest potential harm, other than money

- Provide greater incentives for landowners to put conservation easements on river-bordering lands
- Strengthen water-use laws to be more protective of instream flows needed to sustain fish and wildlife resources
- Strengthen pollution-control laws to be more protective of rivers and aquatic wildlife resources.

