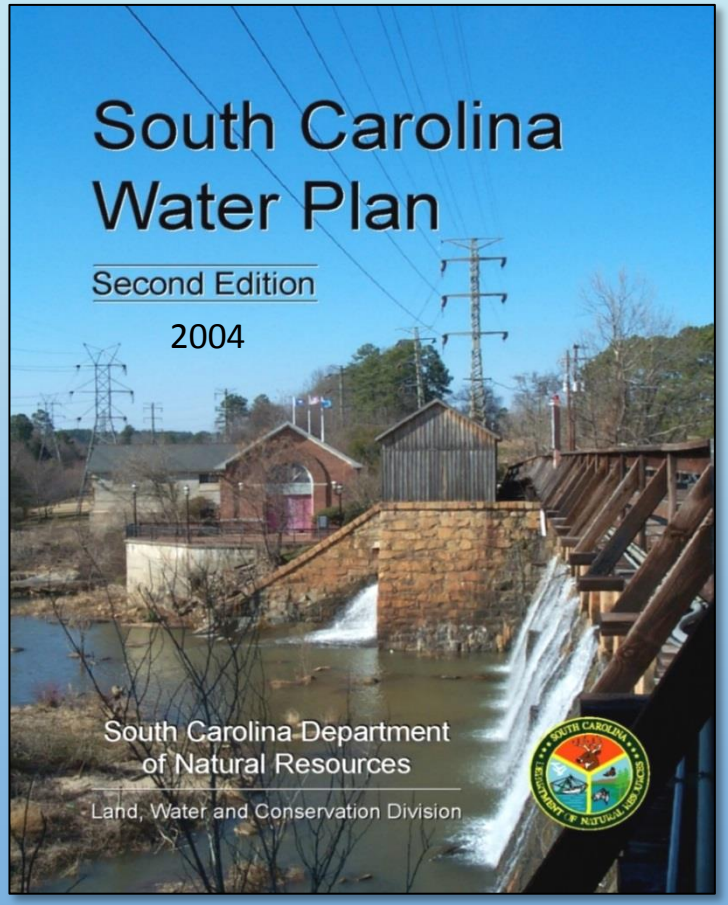
South Carolina Water Plan Update

Ken Rentiers
Deputy Director
Land, Water and Conservation Division
S.C. Department of Natural Resources

South Carolina Water Plan Symposium
Columbia, South Carolina
May 30th, 2018

A Brief History of Water Planning…



- First Edition published in 1998
- In 2004, DNR published the second edition of the South Carolina Water Plan incorporating lessons learned from the drought of 1998-2002.
- One recommendation was for the development of regional water plans for each major river basin in the State.
- 10 years later – SCDNR and SCDHEC initiated the first step towards these regional water plans.

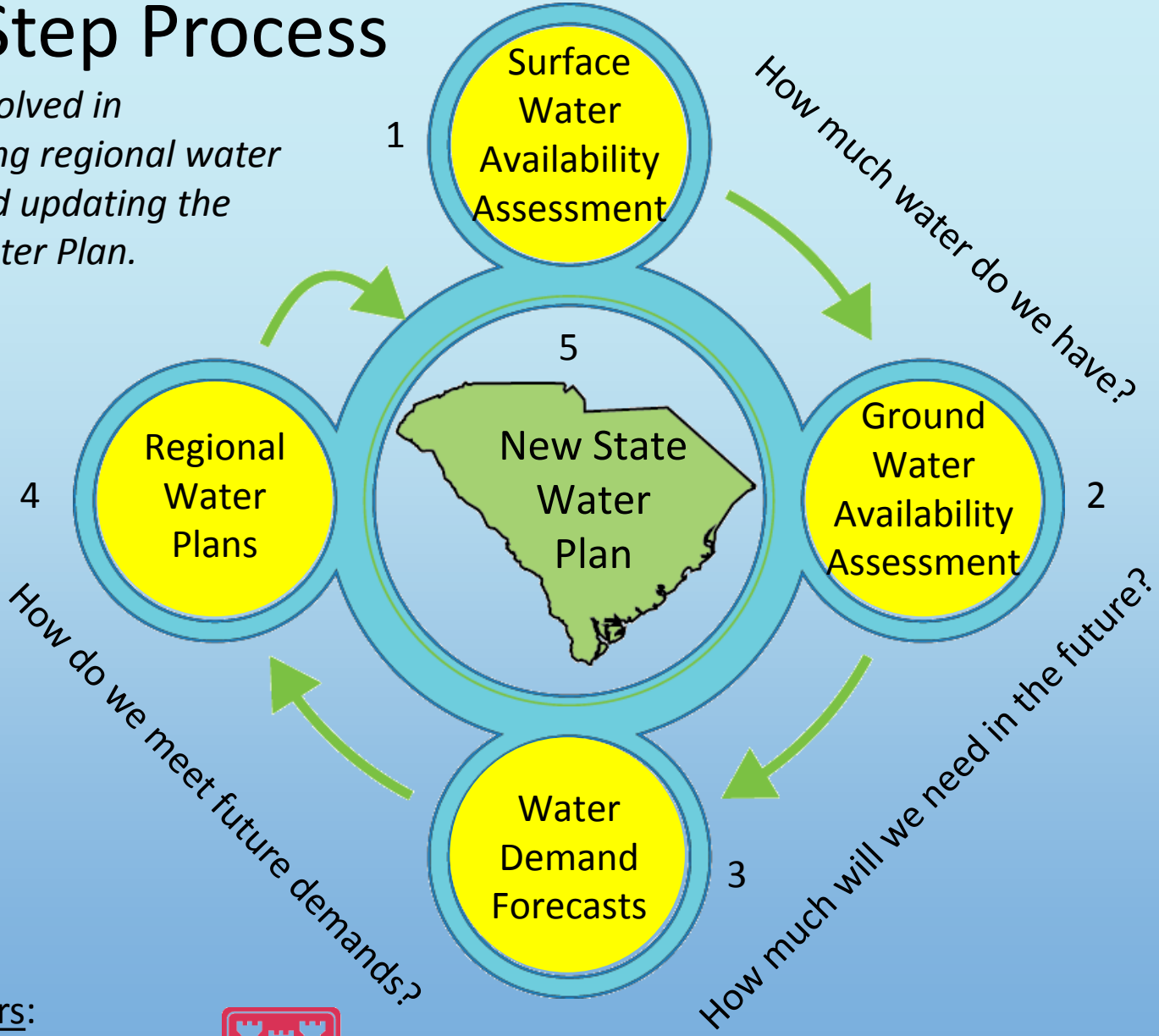
South Carolina's Major River Basins

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.

Water plans will be developed for each of these basins, the same basins used by DHEC for water-quality assessments and for managing interbasin transfers of water.

Five Step Process

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



Cooperators:

dhec Healthy People. Healthy Communities.

US Army Corps of Engineers

CDM Smith

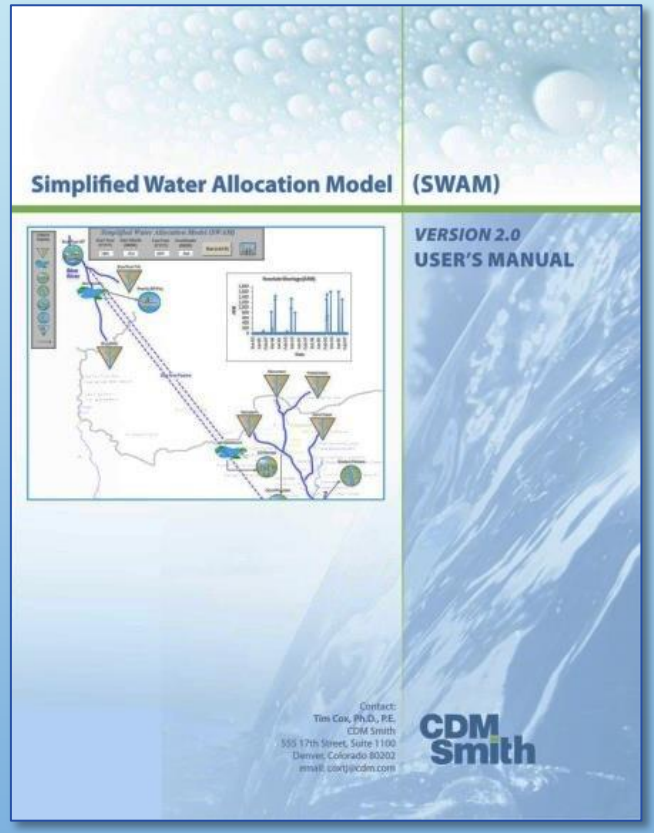
USGS science for a changing world

CLEMSON UNIVERSITY

Step 1. Surface-Water Availability Assessment

Purpose: Develop surface water quantity models for each basin.

- In August 2014, CDM Smith, Inc. was awarded a contract to develop surface-water quantity models for each basin using its *Simplified Water Allocation Model* (SWAM) modeling tool.
- Stakeholder meetings for the project were facilitated by Clemson University with support from CDM Smith, DNR, and DHEC.
- Final models submitted to SCDNR in June 2017



CDM Smith

South Carolina Department of Natural Resources

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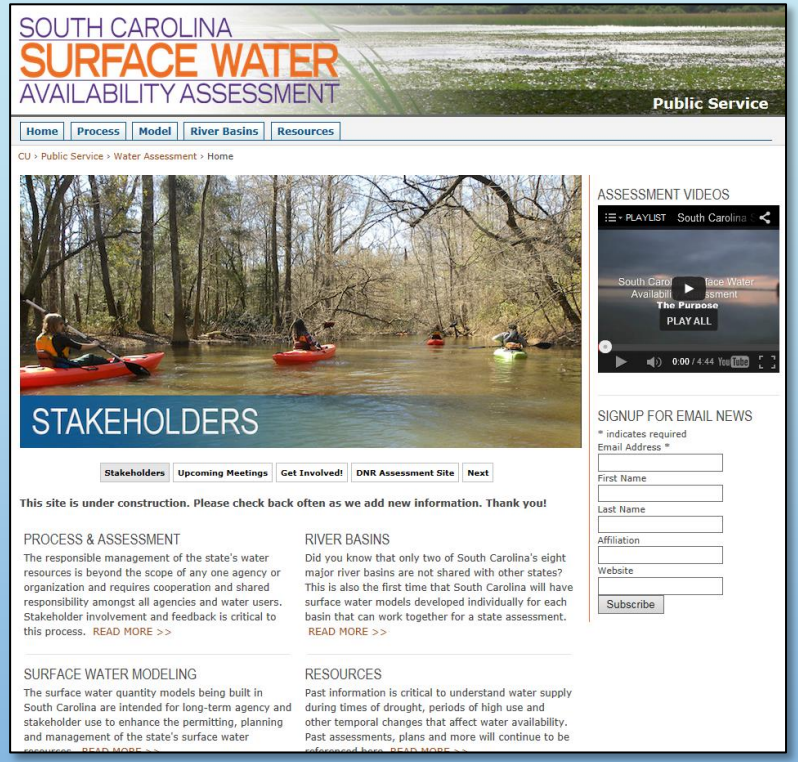
Clemson University

Stakeholder Meetings

- Two stakeholder meetings per basin
- Facilitated by Clemson University



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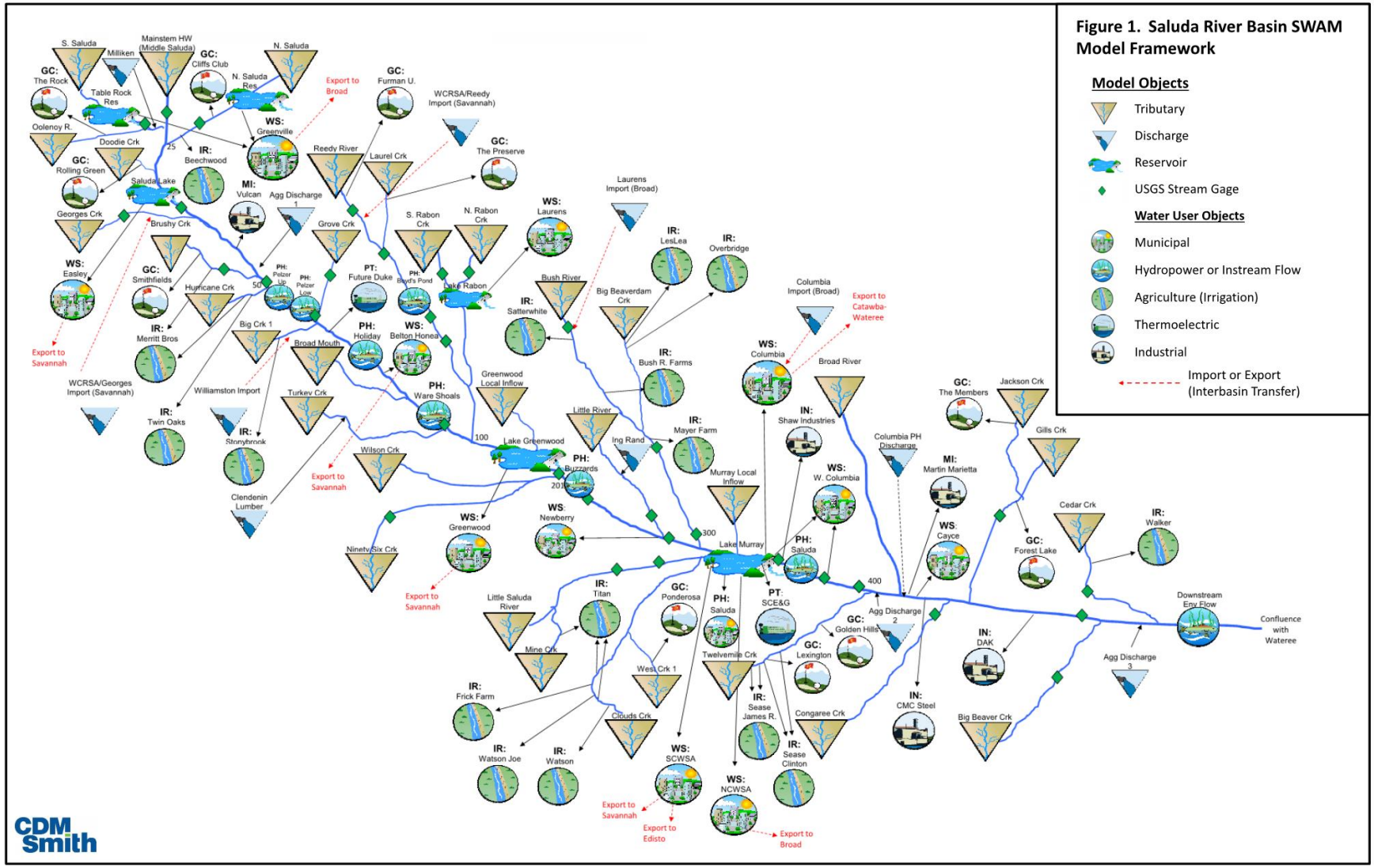
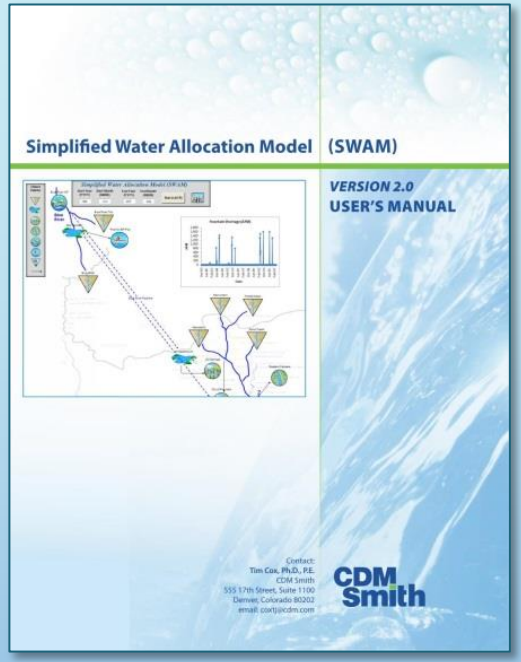
Model Schematic – Saluda Basin

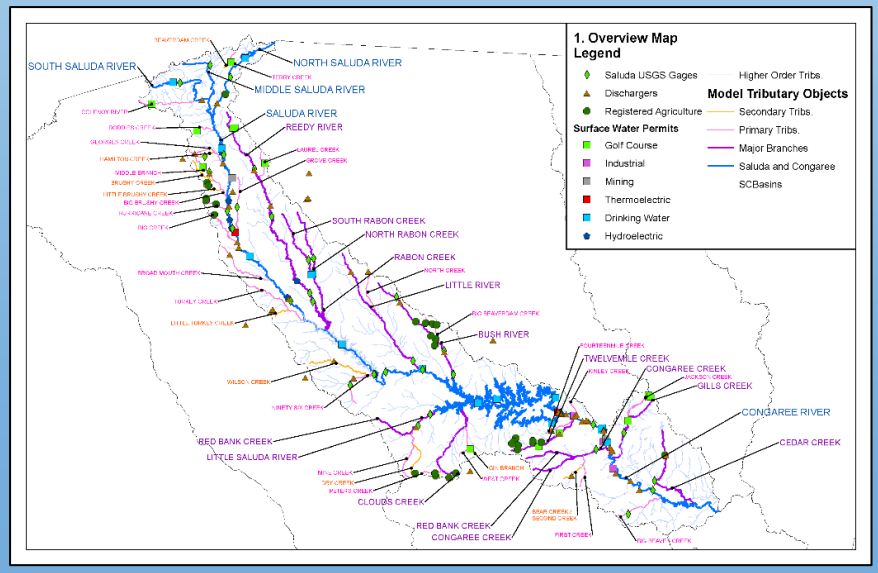


Surface Water Assessment – SWAM Model

- Models will be used to:
  - Determine surface-water availability
  - Predict where and when water shortages might occur
  - Test alternative water-management strategies
  - Help resolve water disputes
  - Evaluate IBTs and withdrawal permits (DHEC)
  - Support development of drought management plans

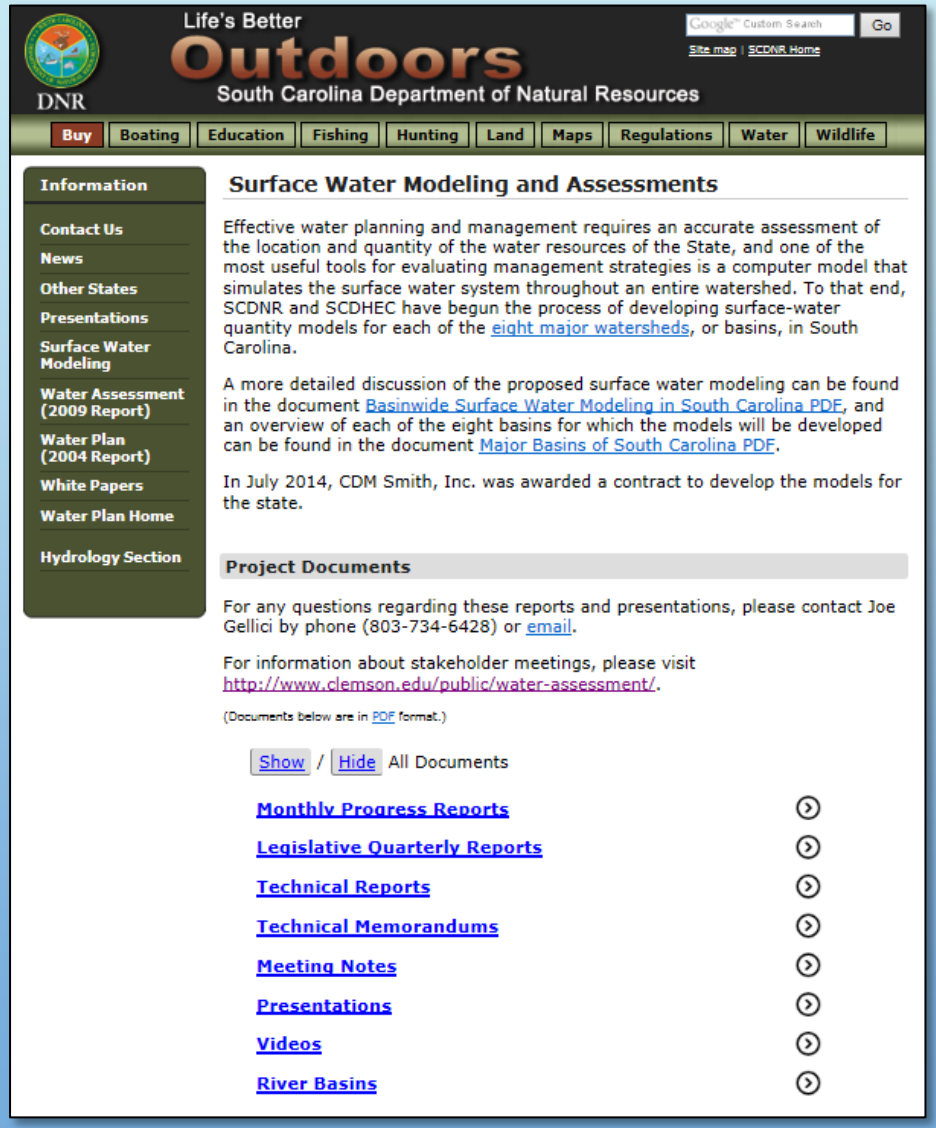


Ultimately, the models will support the development of Regional or Basin water plans



On the Web at DNR

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



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[River Basins](#)

- Broad
- Catawba
- Edisto
- Pee Dee
- Salkehatchie
- Saluda
- Santee
- Savannah

Status of Surface Water Assessments

- Baseline models received from CDM Smith in June, 2017
  - Final SCDNR internal review is ongoing
  - Review has led to revisions to improve reservoir operating rules and to correct the occasional data input error
- CDM Smith has recently added several SWAM enhancements to the baseline models
  - Updated baseline models were released to SCDNR and SCDHEC this spring
  - Several of the enhancements led to a recalibration exercise for the Edisto basin that is near completion
- A subset of the basin models are scheduled to be released this summer (tentatively – Edisto, Salkehatchie, Saluda, and Pee Dee)

USGS Streamflow and Lake Level Monitoring Network

USGS
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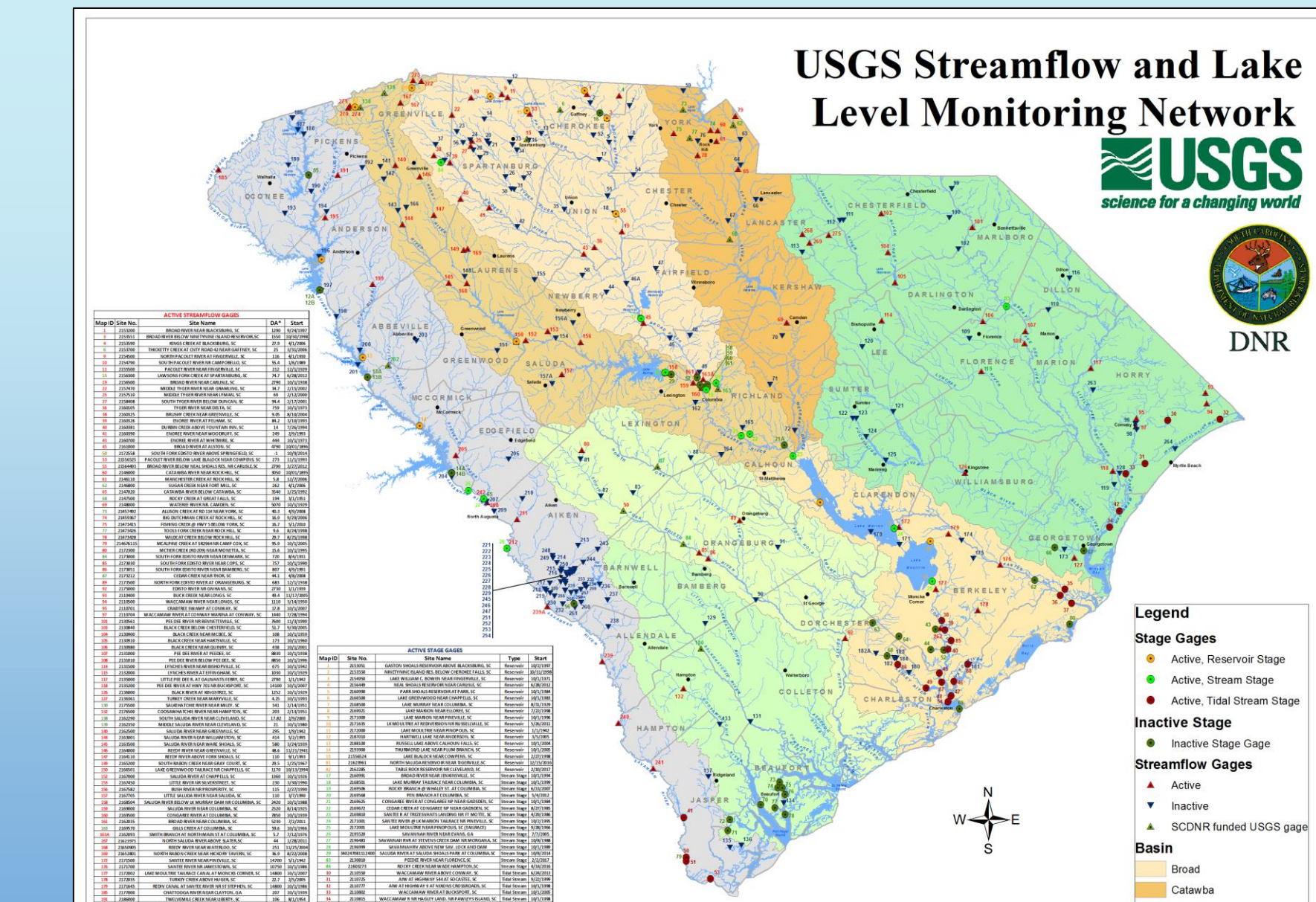
DNR



ACTIVE STREAMFLOW GAGES

Map ID	Site No.	Site Name	DA*	Start
1	2153300	BROAD RIVER NEAR BLACKSBURG, SC	1290	9/24/1997
3	2153551	BROAD RIVER BELOW NINETYNINE ISLAND RESERVOIR,SC	1500	10/30/1998
4	2155990	KINGS CREEK AT BLACKSBURG, SC	27.9	4/1/2006
5	2155709	THICKETTY CREEK AT CHTY ROAD AT NEAR GAFFNEY, SC	25	3/13/2006
9	2154500	NORTH PACOLET RIVER AT FINGERVILLE, SC	116	4/1/1950
10	2154700	SOUTH PACOLET RIVER NR CAMPOBELLO, SC	55.4	1/6/1989
11	2155500	PACOLET RIVER NEAR FINGERVILLE, SC	212	12/1/1939
15	2156500	LAWSONS FORK CREEK AT SPARTANBURG, SC	74.7	6/28/2012
19	2156505	BROAD RIVER NEAR CARLISLE, SC	2790	10/1/1938
22	2157470	MIDDLE TYGER RIVER NEAR DRAYTON, SC	34.7	2/15/2002
25	2157510	MIDDLE TYGER RIVER NEAR LYMAN, SC	60	2/12/2002
27	2158008	SOUTH TYGER RIVER BELOW DUNCAN, SC	94.4	2/17/2003
36	2160105	TYGER RIVER NEAR DELTA, SC	759	10/1/1973
38	2160525	BRUSHY CREEK NEAR GREENVILLE, SC	5.05	6/10/2004
39	2160526	ENOREE RIVER AT PELHAM, SC	84.2	3/10/1993
40	2160981	DURBIN CREEK ABOVE FOUNTAIN INN, SC	14	7/26/1996
41	2160990	ENOREE RIVER NEAR WOODRUFF, SC	249	3/5/1983
43	2160700	ENOREE RIVER AT WHITMIRE, SC	444	10/1/1973
45	2161000	BROAD RIVER AT ALSTON, SC	4790	10/01/1896
50	2172558	SOUTH FORK EDISTO RIVER ABOVE SPRINGFIELD, SC	-1	10/9/2014
53	2156525	PACOLET RIVER BELOW LAKE BLALOCK NEAR CowPENS, SC	273	11/1/1993
55	2156480	BROAD RIVER BELOW NEAL SHOALS RDS, NR CARLISLE, SC	2790	5/22/2012
60	2146000	CATAWBA RIVER NEAR ROCK HILL, SC	3050	10/01/1895
61	2146110	MANCHESTER CREEK AT ROCK HILL, SC	5.8	12/2/2006
62	2146800	SUGAR CREEK NEAR FORT MILL, SC	262	4/1/2006
65	2147020	CATAWBA RIVER BELOW CATAWBA, SC	3540	1/25/1992
68	2147500	ROCKY CREEK AT GREAT FALLS, SC	194	3/1/1951
69	2148000	WATEREE RIVER NR. CAMDEN, SC	5070	10/1/1929
73	2345702	ALLISON CREEK AT RD 134 NEAR YORK, SC	40.3	4/9/2008
74	2345936?	BIG DUTCHMAN CREEK AT ROCK HILL, SC	36.9	9/29/2006
75	2347545	FISHING CREEK @ HWY 5 BELOW YORK, SC	36.7	5/1/2010
77	2347426	TOOLS FORK CREEK NEAR ROCK HILL, SC	9.6	8/24/1998
78	2347426	MUSKAT CREEK BELOW ROCK HILL, SC	29.7	8/29/1998
79	2346765.115	MCALPINE CREEK AT SR2964 NR CAMP COX, SC	95.9	10/1/2005
80	2172000	MCTIER CREEK (RD 209) NEAR MONETTA, SC	15.6	10/1/1955
84	2173000	SOUTH FORK EDISTO RIVER NEAR DENMARK, SC	720	8/4/1931
85	2173030	SOUTH FORK EDISTO RIVER NEAR COPE, SC	757	10/1/1990
86	2173051	SOUTH FORK EDISTO RIVER NEAR BAMBERG, SC	807	4/9/1981
87	2173212	CEDAR CREEK NEAR THOR, SC	44.1	4/8/2008
89	2173500	NORTH FORK EDISTO RIVER AT ORANGEBURG, SC	683	12/1/1938
92	2173000	EDISTO RIVER NR GINYARDS, SC	2730	1/1/1939
93	2110600	BUCK CREEK NEAR LONGS, SC	49.4	11/17/2005
94	2110500	WACCAMAW RIVER NEAR LONGS, SC	1110	5/14/1950
95	2110701	CRABTREE SWAMP AT CONWAY, SC	17.8	10/1/2007
97	2110704	WACCAMAW RIVER AT CONWAY MARINA AT CONWAY, SC	1640	7/28/1994
101	2130561	PEE DEE RIVER NR BENNETTSVILLE, SC	7600	11/1/1990
103	2130840	BLACK CREEK BELOW CHESTERFIELD, SC	51.7	9/30/2005
104	2130900	BLACK CREEK NEAR MCBEE, SC	108	10/1/1950
105	2130910	BLACK CREEK NEAR HARTSVILLE, SC	173	10/1/1960
106	2130980	BLACK CREEK NEAR QUINBY, SC	438	10/1/2001
107	2131000	PEE DEE RIVER AT PEEDEE, SC	8830	10/1/1938
108	2131010	PEE DEE RIVER BELOW PEE DEE, SC	8850	10/1/1996
114	2131500	LYNCHES RIVER NEAR BISHOPVILLE, SC	675	10/1/1942
115	2132000	LYNCHES RIVER AT EFFINGHAM, SC	1030	10/1/1929
117	2159000	LITTLE PEE DEE R. AT GALIVANTS FERRY, SC	2790	1/1/1942
118	2152500	PEE DEE RIVER NR MARION, SC	14100	10/1/1942
126	2136000	BLACK RIVER AT KINGSTREE, SC	1252	10/1/1929
127	2136961	TURKEY CREEK NEAR MURPHYVILLE, SC	4.25	10/1/1993
130	2137500	SALKEHATCHIE RIVER NEAR MIXTE, SC	341	7/1/1951
132	2176500	COOSAWHATCHIE RIVER NEAR HAMPTON, SC	205	2/1/1951
138	2162290	SOUTH SALUDA RIVER NEAR CLEVELAND, SC	17.82	2/5/2009
139	2162350	MIDDLE SALUDA RIVER NEAR CLEVELAND, SC	21	10/1/1980
140	2162500	SALUDA RIVER NEAR GREENVILLE, SC	295	3/9/1942
144	2163001	SALUDA RIVER NEAR WILLIAMSTON, SC	414	5/1/1985
145	2163500	SALUDA RIVER NEAR WARE SHOALS, SC	580	3/24/1939
146	2164000	REEDY RIVER NEAR GREENVILLE, SC	48.6	11/21/1941
147	2164510	REEDY RIVER BELOW SHOALS, SC	110	9/1/1981
149	2165200	SOUTH RABON CREEK NEAR GRAY COURT, SC	29.5	1/25/1967
150	2166501	LAKE GREENWOOD TAILRACE NEAR ELLOREE, SC	1170	10/1/1994
152	2167000	SALUDA RIVER AT CHAPPELLS, SC	1360	10/1/1926
158	2167450	LITTLE RIVER NR SILVERSTREET, SC	230	3/30/1990
159	2167582	BUSH RIVER @ HWY 60 NEAR PELZER, SC	115	12/1/1998
172	2167705	LITTLE SALUDA RIVER NEAR SALUDA, SC	110	3/7/1990
174	2168504	SALUDA RIVER BELOW LK MURRAY DAM NR COLUMBIA, SC	2420	10/1/1968
177	2168900	SALUDA RIVER NEAR COLUMBIA, SC	2520	8/1/1925
180	2169500	CONGAREE RIVER AT COLUMBIA, SC	7850	10/1/1939
182	2169355	BROAD RIVER NEAR COLUMBIA, SC	5230	2/2/2001
183	2169570	GILLS CREEK AT COLUMBIA, SC	59.6	10/1/1966
183A	2162093	SMITH BRANCH AT NORTH MAIN ST AT COLUMBIA, SC	5.7	7/12/1976
187	2162375	NORTH SALUDA RIVER ABOVE SLR,SC	44	1/28/2011
188	2165695	REEDY RIVER NEAR WATERLOO, SC	251	11/25/2004
189	2165281	NORTH RABON CREEK NEAR HICKORY TAVERN, SC	36.9	8/22/2008
172	2172500	SANTEE RIVER NEAR PINEVILLE, SC	14700	5/1/1942
176	2171700	SANTEE RIVER NR JAMESTOWN, SC	10750	10/1/1986
177	2172002	LAKE MOULTRIE TAILRACE CANAL AT MONCKS CORNER, SC	14800	10/1/2002
178	2172035	TURKEY CREEK ABOVE HIGER, SC	22.7	2/5/2005
179	2172645	REDKY CANAL AT SANTEE RIVER NR ST STEPHEN, SC	14800	10/1/1986
185	2173000	CHATTOOGA RIVER NEAR CLAYTON, GA	207	10/1/1939
186	2186000	TWELVEMILE CREEK NEAR LIBERTY, SC	106	8/1/1954
195	2180702	EIGHTEENMILE CREEK BELOW PENDLETON, SC	48.6	10/10/2014
196	2172040	BACK RIVER AT DUPONT INTAKE NR WITMERSIDE, SC	-1	10/6/2014
199	2187910	ROCKY RIVER NR STARR, SC	111	5/25/1989
202	2192500	LITTLE RIVER NEAR MT. CARMEL, SC	217	1/1/1942
205	2196000	STEVENS CREEK NEAR MODOC, SC	545	11/1/1929
208	2196681	AUGUSTA CANAL NR AUGUSTA (UPPER)	-1	10/1/1996
211	2196691	HORSE CREEK AT CLEARWATER, SC	155	6/6/2005
212	2197000	SAVANNAH RIVER AT AUGUSTA, GA	7510	10/01/1883
230	2197500	SAVANNAH R AT BURTON FERRY NR NEW ELLENTON, GA	8040	10/1/1939
230A	2197360	SAVANNAH RIVER NEAR WAYNESBORO, GA	8000	1/22/2005
240	2198575	SAVANNAH RIVER NEAR ESTILL, SC	9670	7/5/2008
241	2198500	SAVANNAH RIVER NEAR CLYO, GA	9850	10/1/1939
242	2198483J	SAVANNAH RIVER ABOVE AUGUSTA CANAL NEAR BOHARI,GA	-1	1/11/2013
268	2133452	LITTLE LYNCHES RIVER ABOVE KERSHAW, SC	32.2	6/9/2015
269	2133455	LITTLE LYNCHES RIVER NEAR KERSHAW, SC	49.8	6/9/2015
270	2362385	SOUTH SALUDA RIVER NEAR ROCKY BOTTOM,SC	-1	2/8/2017
271	2362280?	SUCKING CREEK NEAR ROCKY BOTTOM,SC	-1	2/9/2017
272	2362950	NORTH SALUDA RIVER NEAR HIGHLAND,SC	-1	2/2/2017
273	2362957	BIG FALLS CREEK NEAR TIGERVILLE,SC	-1	12/16/2016
274	2162287	TABLE ROCK RESERVOIR TAILRACE NR CLEVELAND, SC	-1	5/2/2017
275	2151485	BUFFALO CREEK AT MT PISGAH, SC	10.7	6/10/2015

ACTIVE STAGE GAGES

Map ID	Site No.	Site Name	Type	Start
2	2153051	GASTON SHOALS RESERVOIR ABOVE BLACKSBURG, SC	Reservoir	10/1/1997
3	2153550	NINETYNINE ISLAND RES. BELOW CHEROKEE FALLS, SC	Reservoir	10/31/1998
6	2154950	LAKE WILLIAM C. BOWEN NEAR FINGERVILLE, SC	Reservoir	10/1/1971
7	2154490	SEAL SHOALS RESERVOIR NEAR CARLISLE, SC	Reservoir	6/28/2012
8	2160990	PARR SHOALS RESERVOIR AT PARR, SC	Reservoir	10/1/1984
9	2166500	LAKE GREENWOOD NEAR CHAPPELLS, SC	Reservoir	10/1/1981
10	2168500	LAKE MURRAY NEAR COLUMBIA, SC	Reservoir	8/31/1929
11	2169921	LAKE MARION NEAR ELLOREE, SC	Reservoir	7/22/1998
12	2171000	LAKE MARION NEAR PINEVILLE, SC	Reservoir	10/1/1996
13	2171635	LK MOULTRIE AT RESERVESION NR RUSSELLVILLE, SC	Reservoir	5/26/2011
14	2172000	LAKE MOULTRIE NEAR PINOPOLIS, SC	Reservoir	1/1/1942
15	2187010	HARTWELL LAKE NEAR ANDERSON, SC	Reservoir	5/5/2005
16	2168100	RUSSELL LAKE ABOVE CALHOUN FALLS, SC	Reservoir	10/1/2004
17	2193900	THURMOND LAKE NEAR PLUM BRANCH, SC	Reservoir	10/1/2005
18	2155852.4	LAKE BLALOCK NEAR COWPENS, SC	Reservoir	2/27/1998
83	2162386?	NORTH SALUDA RESERVOIR NEAR TIGERVILLE,SC	Reservoir	12/15/2016
82	2162285	TABLE ROCK RESERVOIR NR CLEVELAND, SC	Reservoir	2/28/2017
17	2160991	BROAD RIVER NEAR JENKINSVILLE, SC	Stream Stage	10/1/1994
18	2168501	LAKE MURRAY TAILRACE NEAR COLUMBIA, SC	Stream Stage	10/1/1990
19	2169596	ROCKY BRANCH @ WHALEY ST. AT COLUMBIA, SC	Stream Stage	6/13/2007
20	2169568	PEN BRANCH AT COLUMBIA, SC	Stream Stage	5/4/2012
21	2169625	CONGAREE RIVER AT CONGAREE NP NEAR GADSDEN, SC	Stream Stage	10/1/1984
22	2169672	CEDAR CREEK AT CONGAREE NEAR GADSDEN, SC	Stream Stage	8/27/1985
23	2169810	SANTEE R AT TREZEVANTS LANDING NR FT MOTTE, SC	Stream Stage	4/29/1986
24	2172001	SANTEE RIVER @ LK MARION TAILRACE NR PINEVILLE, SC	Stream Stage	10/2/1995
25	2172001	LAKE MOULTRIE NEAR PINOPOLIS, SC (TAILRACE)	Stream Stage	9/28/1966
26	2195530	SAVANNAH RIVER NEAR EVANS, GA	Stream Stage	7/7/2005
27	2196481	SAVANNAH RIVER AT STEVENS CREEK DAM NR MORGANA, SC	Stream Stage	10/6/1988
28	2196999	SAVANNAHRIV ABOVE NEW SAV. LOCK AND DAM	Stream Stage	10/1/1989
29	3602439811124O0	SALUDA RIVER AT SALUDA SHOALS PARK AT COLUMBIA,SC	Stream Stage	10/8/2014
83	2130810	PEEDEE RIVER NEAR FLORENCE,SC	Stream Stage	2/2/2017
84	2160327?	REDKY CREEK NEAR WADE HAMPTON,SC	Stream Stage	4/16/2016
30	2110550	WACCAMAW RIVER ABOVE CONWAY, SC	Stream Stage	6/26/2013
31	2110725	AIW AT HIGHWAY 544 AT SOCASTEE, SC	Stream Stage	9/22/1999
32	2110777	AIW AT HIGHWAY 9 AT NIXONS CROSSROADS, SC	Total Stream	10/1/1998
33	2110802	WACCAMAW RIVER AT BUCKSPORT, SC	Total Stream	10/1/2005
34	2110815	WACCAMAW R NR HAGLEY LAND. NR PAWLEYS ISLAND, SC	Total Stream	10/1/1998
35	2171800	NORTH SANTEE RIVER NR NORTH SANTEE, SC	Total Stream	4/26/1979
36	2171850	SOUTH SANTEE RIVER NR MECLELLANVILLE, SC	Total Stream	10/13/1993
37	2171985	S. SANTEE R @ STATE PIER NR MCCLELLANVILLE, SC	Total Stream	8/2/2001
38	2172030	W BRANCH COOPER R @ PINELIO NR MONCKS CORNER, SC	Total Stream	10/2/1986
39	2172090	COOPER R NR GOOSE CREEK, SC	Total Stream	10/2/1986
40	2172050	COOPER R AT MOBAY NR N CHARLESTON, SC	Total Stream	10/1/1998
41	2198790	SAVANNAH RIVER ABOVE HARDEEVILLE, SC	Total Stream	10/1/1987
42	2110825	WACCAMAW RIVER NEAR PAWLEYS ISLAND, SC	Total Stream	11/30/2001
45	2172077	COOPER RIVER @ FILBIN CREEK @ NORTH CHARLESTON, SC	Total Stream	4/6/1987
46	2172078	WANDO RIVER ABOVE MT.PLEASANT, SC	Total Stream	7/30/1992
47	2172079	COOPER RIVER AT U.S. HWY 17 AT CHARLESTON, SC	Total Stream	4/21/1997
48	2172711	COOPER RIVER AT CUSTOMS HOUSE AT CHARLESTON, SC	Total Stream	8/7/1984
49	2172869	ASHLEY RIVER NEAR NORTH CHARLESTON, SC	Total Stream	7/30/1992
50	2198784	L BACK RIVER ABOVE LUCKNOW CANAL, NR LIMEHOUSE, SC	Total Stream	10/1/2000
51	2198791	LITTLE BACK RIVER AT HWY DOCK, NEAR LIMEHOUSE, SC	Total Stream	8/30/2013
53	2198787?	SAVANNAH RIVER AT EBBA ISLAND, NEAR SAVANNAH, GA	Total stream	8/27/2013
54	2172710	COOPER RIVER AT CUSTOMS HOUSE AT CHARLESTON, SC	Total Stream	1/25/1982
85	2172908	COOPER RIVER ABOVE GOOSE CREEK,SC	Total Stream	6/4/2016
86	2172825	ASHLEY RIVER BELOW SUMMERVILLE, SC	Total Stream	1/26/2017
87	2172909?	COOPER RIVER @ PORTS AUTHORITY PIER K, CHARLESTON SC	Total Stream	7/1/2016
88	2172909.2	WANDO RIVER AT CAINHOY BELOW WANDO,SC	Total Stream	5/25/2016

Legend

Stage Gages
- Active, Reservoir Stage
- Active, Stream Stage
- Active, Tidal Stream Stage

Inactive Stage
- Inactive Stage Gage

Streamflow Gages
- Active
- Inactive
- SCDNR funded USGS gage

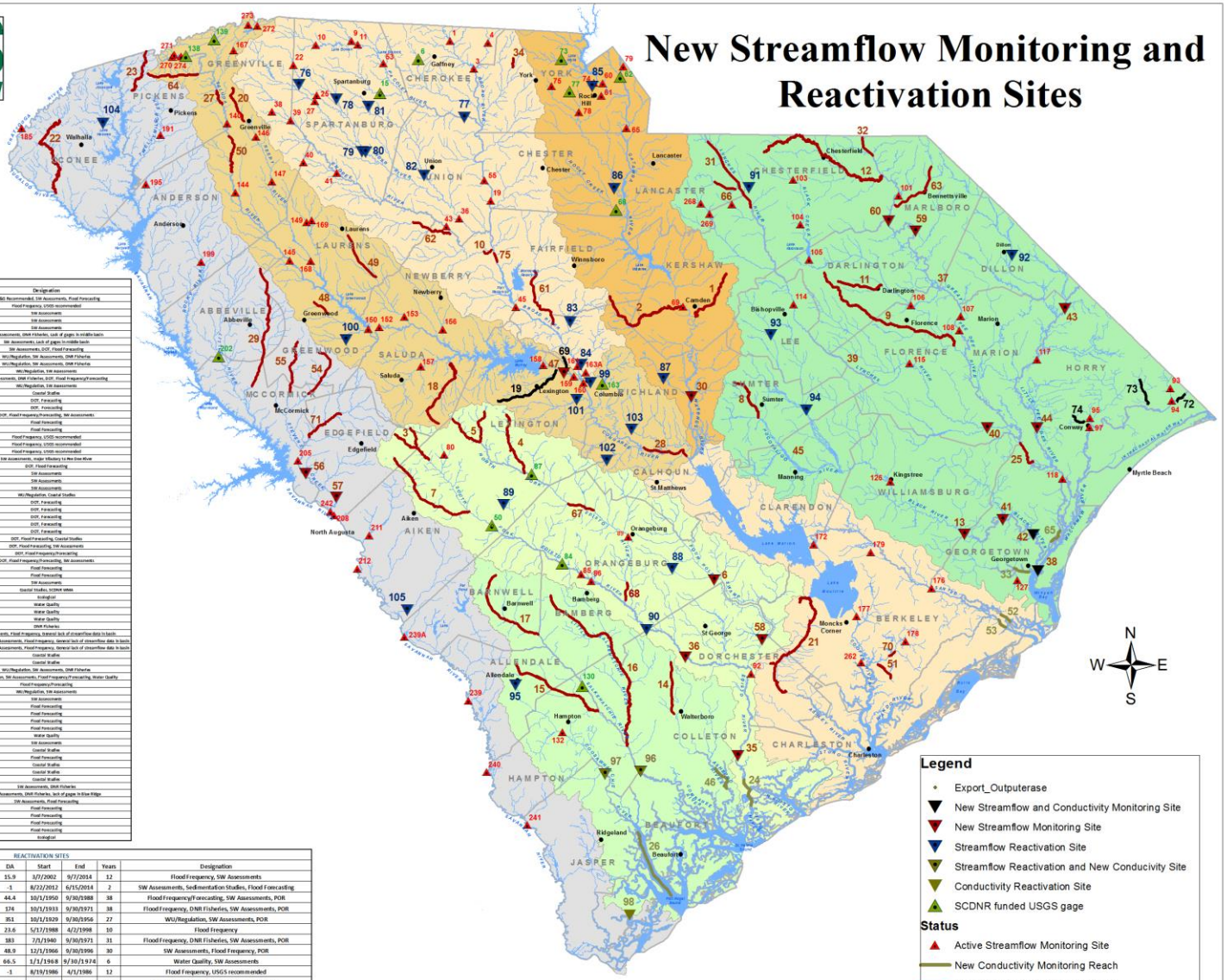
Basin
- Broad
- Catawba
- Edisto
- PeeDee
- Salkehatchie
- Saluda
- Santee
- Savannah

Map prepared by the Land, Water and Conservation Division of the South Carolina Department of Natural Resources (May 2017).

New Streamflow Monitoring and Reactivation Sites

USGS science for a changing world

DNR



NEW MONITORING REACH OR SITE

ID	Stream Reach or Site	Basin	Description	Designation
12	Enoree River	Broad	Mahstein, near confluence with Broad	SCR&I Recommended, SW Assessments, Flood Forecasting
34	Rocky Branch	Broad	Tributary to Duncan Creek	Flood Frequency, USGS recommended
43	Little River	Broad	Tributary to Broad River	SW Assessments
44	Duncan Creek	Broad	Tributary to Enoree River	SW Assessments
75	Broad River	Broad	Mahstein, above Parr Reservoir	SW Assessments
1	Big Wise Tree Creek	Catawba	Tributary to Catawba	SW Assessments, DNR Fisheries, Lack of gages in middle basin
2	Twenty/Fiorville Creek	Catawba	Tributary to Catawba	SW Assessments, Lack of gages in middle basin
50	Waterex River	Catawba	Mahstein, US 378	SW Assessments, DOT, Flood Forecasting
5	South Fork Edisto Headwaters	Edisto	Mahstein or Beech Creek	WU/Regulation, SW Assessments, DNR Fisheries
4	Black Creek	Edisto	Tributary to Upper North Fork Edisto	WU/Regulation, SW Assessments, DNR Fisheries
6	North Fork Edisto Headwaters	Edisto	Mahstein, Chinquapin Creek or Lightwood Knot Creek	WU/Regulation, SW Assessments
8	Four Hole Swamp	Edisto	Tributary to Edisto, I-95	SW Assessments, DNR Fisheries, DOT, Flood Frequency/Forecasting
7	Shaw Creek	Edisto	Tributary to South Fork Edisto	WU/Regulation, SW Assessments
14	Edisto River	Edisto	Mahstein or South Edisto River, Coastal	Coastal Studies
10	Edisto River	Edisto	Mahstein, US 17	DOT, Forecasting
9	Edisto River	Edisto	Mahstein, I-95	DOT, Forecasting
11	Four Hole Swamp	Edisto	Lower part of South near Edisto confluence	DOT, Flood Frequency/Forecasting, SW Assessments
47	North Fork Edisto River	Edisto	Mahstein, Hwy 321 or Slab Landing Rd	Flood Forecasting
48	North Fork Edisto River	Edisto	Mahstein, near confluence with South Fork Edisto	Flood Forecasting
0	Green Swamp	Pee Dee	Tributary to Piscotaligo River	Flood Frequency, USGS recommended
0	Jeffrey Creek	Pee Dee	Tributary to Pee Dee	Flood Frequency, USGS recommended
51	Swift Creek	Pee Dee	Tributary to Black Creek	Flood Frequency, USGS recommended
12	Thompson Creek	Pee Dee	Tributary to Pee Dee	SW assessments, major Tributary to Pee Dee River
13	Black River	Pee Dee	Mahstein, SC 41	DOT, Flood Forecasting
20	Pee Dee River	Pee Dee	Below Lynches River Confluence	SW Assessments
21	Lynches River	Pee Dee	Upper Lynches Mahstem	SW Assessments
22	Pee Dee River	Pee Dee	Mahstem near FR SC Border	SW Assessments
23	Sumpit River	Pee Dee	Coastal	WU/Regulation, Coastal Studies
17	Pee Dee River	Pee Dee	Mahstem, I-95	DOT, Forecasting
18	Pee Dee/Wacamaw	Pee Dee	US 17	DOT, Forecasting
19	Lynches River	Pee Dee	Mahstem, I-95	DOT, Forecasting
40	Lynches River	Pee Dee	Mahstem, SC 41/51	DOT, Forecasting
41	Black River	Pee Dee	Mahstem, SC 51	DOT, Forecasting
42	Black River	Pee Dee	Mahstem, US 701	DOT, Flood Forecasting, Coastal Studies
45	Lumber River	Pee Dee	Mahstem, SC 9/US 76	DOT, Flood Forecasting, SW Assessments
46	Little Pee Dee River	Pee Dee	Mahstem, US 378	DOT, Flood Frequency/Forecasting
0	Piscotaligo River	Pee Dee	Tributary to Black River, I-95	DOT, Flood Frequency/Forecasting, SW Assessments
16	Pee Dee River	Pee Dee	Mahstem, Tom Blue Landing	Flood Forecasting
50	Pee Dee River	Pee Dee	Mahstem, US 15/401	Flood Forecasting
53	Crooked Creek	Pee Dee	Tributary to Pee Dee River	SW Assessments
59	Pee Dee River	Pee Dee	Mahstem	Coastal Studies, SCDNR WMA
66	Flat Creek	Pee Dee	Tributary to Lynches River	Ecological
72	Waccamaw River	Pee Dee	Mahstem, upstream of Bush Creek	Water Quality
73	Simpson Creek	Pee Dee	Tributary to Waccamaw River	Water Quality
74	Crabtree Canal	Pee Dee	Tributary to Waccamaw River, upstream of Oak St.	Water Quality
24	Ashepoo	Salkehatchie	Upper Mahstem	DNR Fisheries
25	Jackson Branch	Salkehatchie	Tributary to Salkehatchie	SW Assessments, Flood Frequency, General lack of streamflow data in basin
26	Little Salkehatchie River	Salkehatchie	Tributary to Salkehatchie	DNR Fisheries, SW Assessments, Flood Frequency, General lack of streamflow data in basin
27	Salkehatchie River	Salkehatchie	Upper Salkehatchie Mahstem	DNR Fisheries, SW Assessments, Flood Frequency, General lack of streamflow data in basin
28	Broad River/Port Royal Sound	Salkehatchie	Coastal	Coastal Studies
29	Ashepoo River	Salkehatchie	Coastal	Coastal Studies
0	Coosh Creek	Saluda	Tributary to Little Saluda River	WU/Regulation, SW Assessments, DNR Fisheries
0	Twelvemile Creek	Saluda	Tributary Saluda	WU/Regulation, SW Assessments, Flood Frequency/Forecasting, Water Quality
0	Reedy River	Saluda	Upper Reedy River	Flood Frequency/Forecasting
37	Saluda River	Saluda	Below North Saluda River Confluence	WU/Regulation, SW Assessments
38	Gregorie River	Saluda	Above Wateree River Confluence	SW Assessments
67	Saluda River	Saluda	Mahstem, I-26	Flood Forecasting
68	Cormoca Creek	Saluda	Tributary to Wilson Creek	Flood Forecasting
69	Little River	Saluda	Each between City of Laurens and Newberry County Lit	Flood Forecasting
70	Saluda River	Saluda	Mahstem	Flood Forecasting
69	Stoop Creek	Saluda	Tributary to Lower Saluda River	Water Quality
69	Delaney River	Saluda	Tributary to South Saluda River	SW Assessments
31	Ashley River	Santee	Mahstem	Coastal Studies
31	French Quarter Creek	Santee	Tributary to East Branch Cooper River	Coastal Studies
32	North Santee River	Santee	Coastal	Coastal Studies
33	South Santee River	Santee	Coastal	Coastal Studies
35	East Branch Cooper River	Santee	Near confluence of Quinby and Huger Creeks	Coastal Studies
22	Savage River	Savannah	Tributary to Lake Hartwell	SW Assessments, DNR Fisheries
23	Coldstone Creek	Savannah	Headwater Tributary to Lake Keowee	SW Assessments, DNR Fisheries, lack of gages in Blue Ridge
29	Long Cane Creek	Savannah	Tributary to Little River	SW Assessments, Flood Forecasting
54	Cuffytown Creek	Savannah	Tributary to Stevens Creek	Flood Forecasting
55	Hard Labor Creek	Savannah	Tributary to Stevens Creek	Flood Forecasting
56	Stevens Creek	Savannah	Mahstem, Garrett Rd	Flood Forecasting
57	Stevens Creek	Savannah	Mahstem, Woodlawn Rd	Flood Forecasting
71	Turkey Creek	Savannah	Tributary to Stevens Creek	Ecological

REACTIVATION SITES

ID	Site No.	Site Name	Basin	DA	Start	End	Years	Designation
76	2157490	Beaverdam Creek above Greer, SC	Broad	15.9	3/7/2002	9/7/2014	12	Flood Frequency, SW Assessments
77	2156370	Pacolet River near Sarratt, SC	Broad	1	8/22/2012	6/15/2014	2	SW Assessments, Sedimentation Studies, Flood Forecasting
78	2157000	North Tyger River near Fairmont, SC	Broad	44.4	10/1/1950	9/30/1988	38	Flood Frequency/Forecasting, SW Assessments, POR
79	2159000	South Tyger River near Woodruff, SC	Broad	174	10/1/1933	9/30/1971	38	Flood Frequency, DNR Fisheries, SW Assessments, POR
80	2159500	Tyger River near Woodruff, SC	Broad	351	10/1/1929	9/30/1956	27	WU/Regulation, SW Assessments, POR
81	2159810	Fairforest Creek below Spartanburg, SC	Broad	23.6	5/17/1988	4/2/1998	10	Flood Frequency
82	2160000	Fairforest Creek near Union, SC	Broad	183	7/1/1940	9/30/1971	31	Flood Frequency, DNR Fisheries, SW Assessments, POR
83	2162010	Cedar Creek near Blythewood, SC	Broad	48.9	12/1/1966	9/30/1996	30	SW Assessments, Flood Frequency, POR
84	216 2080	Crane Creek at Columbia, SC	Broad	66.5	1/1/1968	9/30/1974	6	Water Quality, SW Assessments
85	2165040	Little Dutchman Creek Trib at Rock Hill, SC	Catawba	~1	8/19/1986	4/1/1986	12	Flood Frequency, USGS recommended
86	2147403	Fishing Creek below Fort Lawn, SC	Catawba	280	2/15/2001	10/1/2003	2	SW Assessments, Lack of gages in middle basin
87	2148300	Colonels Creek near Leesburg, SC	Catawba	40.2	9/1/1966	10/21/2007	41	Flood Frequency, SW Assessments, Lack of gages in lower basin, POR
88	2174250	Cow Castle Creek near Bowman, SC	Edisto	23.4	10/1/1970	2/24/2013	43	Flood Frequency, SW Assessments, DNR Fisheries, POR
89	2172640	Dean Swamp Creek near Salley, SC	Edisto	31.2	10/1/1980	9/30/2000	20	SW Assessments, Flood Frequency, POR
90	2174000	Edisto River near Branchville, SC	Edisto	1720	10/1/1945	9/30/1996	51	SW Assessments, Flood Forecasting
91	2131309	Fork Creek at Jefferson, SC	Pee Dee	24.3	8/27/1976	9/30/1997	21	SW Assessments, Flood Frequency, POR
92	2132500	Little Pee Dee River near Dillon, SC	Pee Dee	524	4/1/1939	9/30/1971	32	Flood Forecasting
93	2135300	Scape Ore Swamp near Bishopville, SC	Pee Dee	96	7/26/1968	9/30/2003	35	SW Assessments, Flood Frequency, POR
94	2135500	Black River near Gable, SC	Pee Dee	401	6/1/1951	9/30/1992	41	SW Assessments, Flood Forecasting, POR
95	2176380	Tributary to Coosawhatchie R at Allendale, SC	Salkehatchie	1.5	12/13/1985	11/21/2005	21	Flood Frequency, POR, USGS recommended
96	2176000	Combahee River near Yemassee, SC	Salkehatchie	1100	6/1/1951	6/30/1957	6	SW Assessments, DNR Fisheries, Coastal Studies
97	2176517	Coosawhatchie River near Early Branch, SC	Salkehatchie	382	10/1/1995	9/30/1998	3	SW Assessments, Coastal Studies
99	2169505	Rocky Branch at Pickens St. at Columbia, SC	Saluda	2.2	6/7/1985	6/28/2004	20	Flood Frequency, POR, USGs recommended
100	2166970	Ninety-six Creek near Ninety-six, SC	Saluda	17.4	10/1/1980	9/30/2001	21	SW Assessments, Flood Frequency/Forecasting, POR
101	2169550	Congaree Creek at Cayce, SC	Saluda	122	10/1/1959	9/30/1980	21	SW Assessments, Flood Frequency/Forecasting, POR
102	2169630	Big Beaver Creek near St. Matthews, SC	Saluda	10	7/16/1966	9/30/1993	27	SW Assessments, Flood Frequency, POR
103	2169670	Cedar Creek below Myers Creek near Hopkins, SC	Saluda	66.9	11/13/1980	9/30/1985	5	SW Assessments
98	2176720	May River near Bluffton, SC	Savannah	20.9	6/6/2002	6/9/2004	2	Coastal Studies
104	2185200	Little River near Walhalla, SC	Savannah	72	3/4/1967	9/30/2003	36	DNR Fisheries, SW Assessments, Flood Frequency, POR
105	2197315	Upper Three Runs at Road A (SRS), SC	Savannah	203	6/6/1974	9/30/2002	28	SW Assessments, DNR Fisheries, POR

0 20 40 60 80 Miles

Map prepared by the Land, Water and Conservation Division of the South Carolina Department of Natural Resources (May 2017).

Legend

- Export_Outputerase
- New Streamflow and Conductivity Monitoring Site
- New Streamflow Monitoring Site
- Streamflow Reactivation Site
- Streamflow Reactivation and New Conducivity Site
- Conductivity Reactivation Site
- SCDNR funded USGS gage

Status

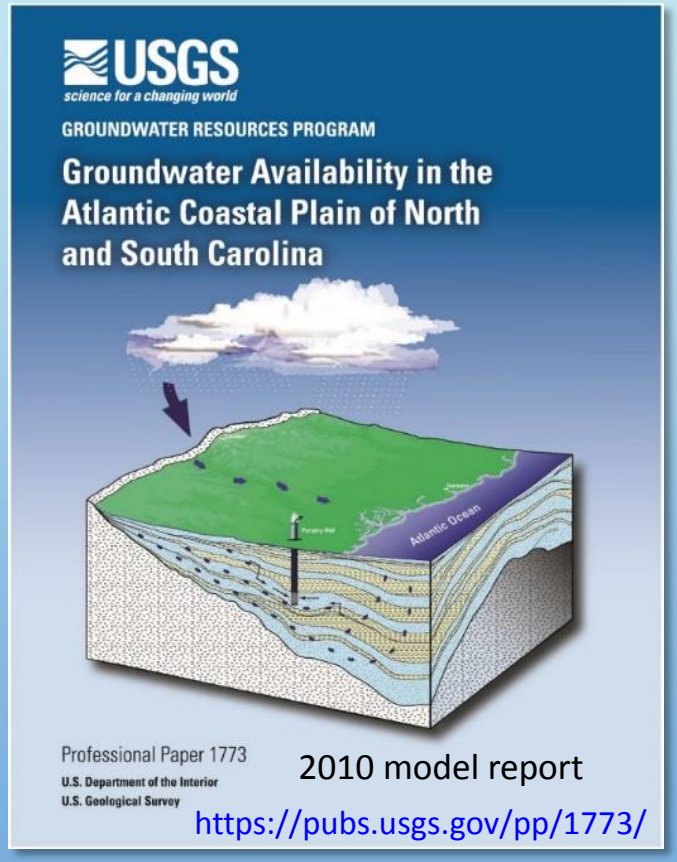
- Active Streamflow Monitoring Site
- New Conductivity Monitoring Reach
- New Streamflow Monitoring Reach
- New Streamflow and Water Quality Monitoring Reach

Basin

- Broad
- Catawba
- Edisto
- PeeDee
- Salkehatchie
- Saluda
- Santee
- Savannah

Step 2. Groundwater Availability Assessment

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



2010 model report

https://pubs.usgs.gov/pp/1773/

Model update is scheduled to be completed by June 2019.

The model will be used to:

- Determine groundwater availability.
- Evaluate the impacts that pumping has on groundwater and surface water resources and on other groundwater users.
- Evaluate future withdrawal scenarios to maximize groundwater use and minimize undesirable effects of pumping.

USGS science for a changing world

DNR

dhec Healthy People. Healthy Communities.

US Army Corps of Engineers

Groundwater Stakeholder Meetings

- Two stakeholder meetings were held:
  - North Charleston (November 28, 2017)
  - West Columbia (December 14, 2017)

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www.scwatermodels.com

- Two additional stakeholder meetings are planned for the future (TBD).
- Meetings are being facilitated by Clemson University.

Technical Advisory Committee

Dr. Adem Ali
Associate Professor of Geology, College of Charleston

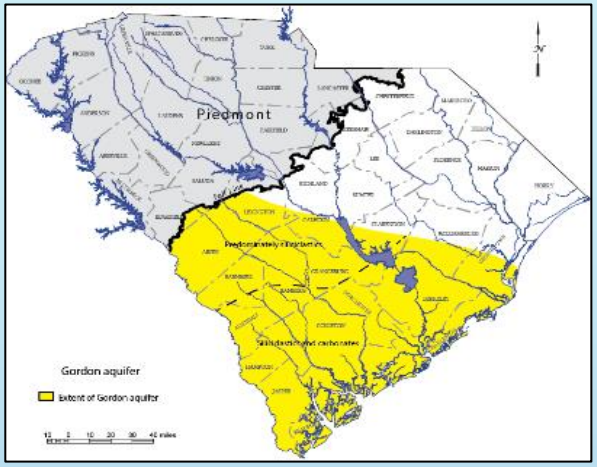
Mr. Clay Duffie
General Manager, Mount Pleasant Waterworks

Ms. Kelley Ferda
General Manager, South Island Public Service District

Mr. Raymond E. Gagnon, PE
Executive Director/CEO, Georgetown County Water and Sewer District

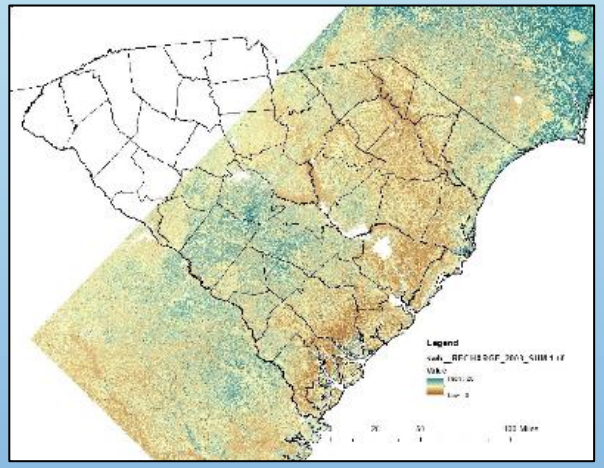
Mr. Lance Tully
Natural Resources Manager, Nestle Waters

Dr. Alicia Wilson
Associate Director, USC School of Earth, Ocean and Environment



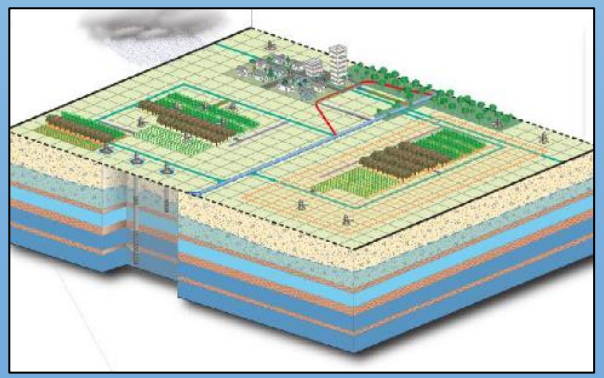
1. Hydrogeologic Framework
Developing maps of the aquifers and confining units.

Joe Gellici DNR



2. Groundwater Recharge Model
Developing a model to estimate groundwater recharge.

Alex Butler dhec Healthy People. Healthy Communities.

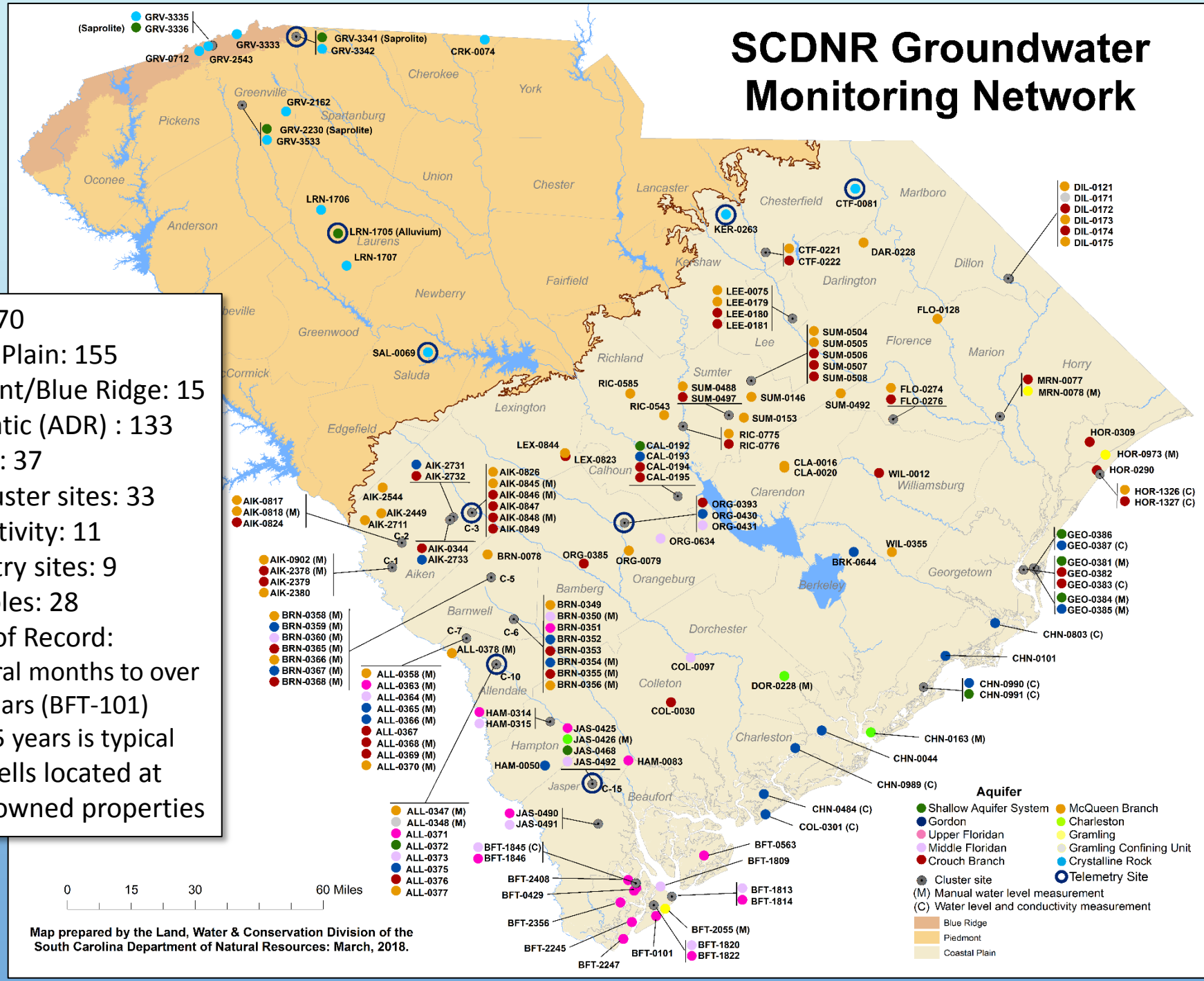


3. Groundwater Flow Model
Developing a model to simulate groundwater flow.

Bruce Campbell USGS science for a changing world

Status of Groundwater Assessment

- Hydrogeologic framework
  - Eight aquifers and seven confining units have been delineated and mapped.
  - Framework report scheduled to be completed by June 2019.
- Groundwater recharge model
  - Annual recharge maps for years 1979-2015 have been completed.
  - Recharge data have been input into the groundwater model.
  - Work on future projections of groundwater recharge are underway (will include models of future changing land use and land cover).
- Groundwater flow model
  - Aquifer picks for calibration wells have been adjusted per DNR reviews.
  - Review of aquifer assignments for water-use and pumping test wells underway.
  - Model calibration will continue based on these new inputs.
  - Model scheduled to be completed by June 2019.


SCDNR Groundwater Monitoring Network
Total: 170
Coastal Plain: 155
Piedmont/Blue Ridge: 15
Automatic (ADR) : 133
Manual: 37
Well-cluster sites: 33
Conductivity: 11
Telemetry sites: 9
Core holes: 28
Period of Record:
• Several months to over 50 years (BFT-101)
• 10-15 years is typical
Most wells located at state-owned properties
0 15 30 60 Miles
Map prepared by the Land, Water & Conservation Division of the South Carolina Department of Natural Resources: March, 2018.
Aquifer
Shallow Aquifer System
Gordon
Upper Floridan
Middle Floridan
Crouch Branch
McQueen Branch
Charleston
Gramling
Gramling Confining Unit
Crystalline Rock
Cluster site
Telemetry Site
(M) Manual water level measurement
(C) Water level and conductivity measurement
Blue Ridge
Piedmont
Coastal Plain
GRV-3335
(Saprolite) GRV-3336
GRV-0712
GRV-2543
GRV-3333
GRV-3341 (Saprolite)
GRV-3342
CRK-0074
GRV-2162
GRV-2230 (Saprolite)
GRV-3533
LRN-1706
LRN-1705 (Alluvium)
LRN-1707
SAL-0069
KER-0263
CTF-0081
CTF-0221
CTF-0222
DAR-0228
LEE-0075
LEE-0179
LEE-0180
LEE-0181
SUM-0504
SUM-0505
SUM-0506
SUM-0507
SUM-0508
SUM-0488
SUM-0497
SUM-0146
SUM-0492
SUM-0153
RIC-0585
RIC-0543
RIC-0775
RIC-0776
FLO-0128
FLO-0274
FLO-0276
DIL-0121
DIL-0171
DIL-0172
DIL-0173
DIL-0174
DIL-0175
MRN-0077
MRN-0078 (M)
HOR-0309
HOR-0973 (M)
HOR-0290
HOR-1326 (C)
HOR-1327 (C)
LEX-0844
LEX-0823
CAL-0192
CAL-0193
CAL-0194
CAL-0195
CLA-0016
CLA-0020
WIL-0012
ORG-0393
ORG-0430
ORG-0431
ORG-0634
ORG-0385
ORG-0079
BRK-0644
WIL-0355
GEO-0386
GEO-0387 (C)
GEO-0381 (M)
GEO-0382
GEO-0383 (C)
GEO-0384 (M)
GEO-0385 (M)
AIK-2731
AIK-2732
AIK-0826
AIK-0845 (M)
AIK-0846 (M)
AIK-0847
AIK-0848 (M)
AIK-0849
AIK-2544
AIK-2449
AIK-2711
C-3
C-2
AIK-0817
AIK-0818 (M)
AIK-0824
AIK-0344
AIK-2733
BRN-0078
C-1
AIK-0902 (M)
AIK-2378 (M)
AIK-2379
AIK-2380
C-5
BRN-0358 (M)
BRN-0359 (M)
BRN-0360 (M)
BRN-0365 (M)
BRN-0366 (M)
BRN-0367 (M)
BRN-0368 (M)
C-7
C-6
ALL-0378 (M)
C-10
ALL-0358 (M)
ALL-0363 (M)
ALL-0364 (M)
ALL-0365 (M)
ALL-0366 (M)
ALL-0367
ALL-0368 (M)
ALL-0369 (M)
ALL-0370 (M)
BRN-0349
BRN-0350 (M)
BRN-0351
BRN-0352
BRN-0353
BRN-0354 (M)
BRN-0355 (M)
BRN-0356 (M)
HAM-0314
HAM-0315
HAM-0050
JAS-0425
JAS-0426 (M)
JAS-0468
JAS-0492
HAM-0083
C-15
ALL-0347 (M)
ALL-0348 (M)
ALL-0371
ALL-0372
ALL-0373
ALL-0375
ALL-0376
ALL-0377
JAS-0490
JAS-0491
BFT-1845 (C)
BFT-1846
BFT-2408
BFT-0429
BFT-2356
BFT-2245
BFT-2247
BFT-0101
BFT-2055 (M)
BFT-1820
BFT-1822
BFT-0563
BFT-1809
BFT-1813
BFT-1814
COL-0097
COL-0030
DOR-0228 (M)
CHN-0803 (C)
CHN-0101
CHN-0990 (C)
CHN-0991 (C)
CHN-0163 (M)
CHN-0044
CHN-0989 (C)
CHN-0484 (C)
COL-0301 (C)
Greenville
Pickens
Oconee
Anderson
Spartanburg
Cherokee
York
Union
Chester
Lancaster
Laurens
Newberry
Fairfield
Chesterfield
Marlboro
Kershaw
Darlington
Dillon
Lee
Florence
Marion
Horry
Richland
Sumter
Saluda
Lexington
Edgefield
Calhoun
Clarendon
Williamsburg
Georgetown
Berkeley
Orangeburg
Aiken
Barnwell
Bamberg
Dorchester
Colleton
Allendale
Hampton
Jasper
Beaufort
Charleston
Greenwood
Cormick
beville

Step 3. Water-Demand Forecasts

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

SCDNR is working with the USACE (Charleston) and Clemson to develop water-demand forecasts for each basin.

Forecasts from 2015-2065 in 5- and 10-year intervals for:

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

Have recently met with these groups:

- Water Works Association, SC Utility Council
- SC Chamber of Commerce, Environmental Committee
- SC Farm Bureau, Water Committee
- SC Water Quality Association

US Army Corps of Engineers

DNR

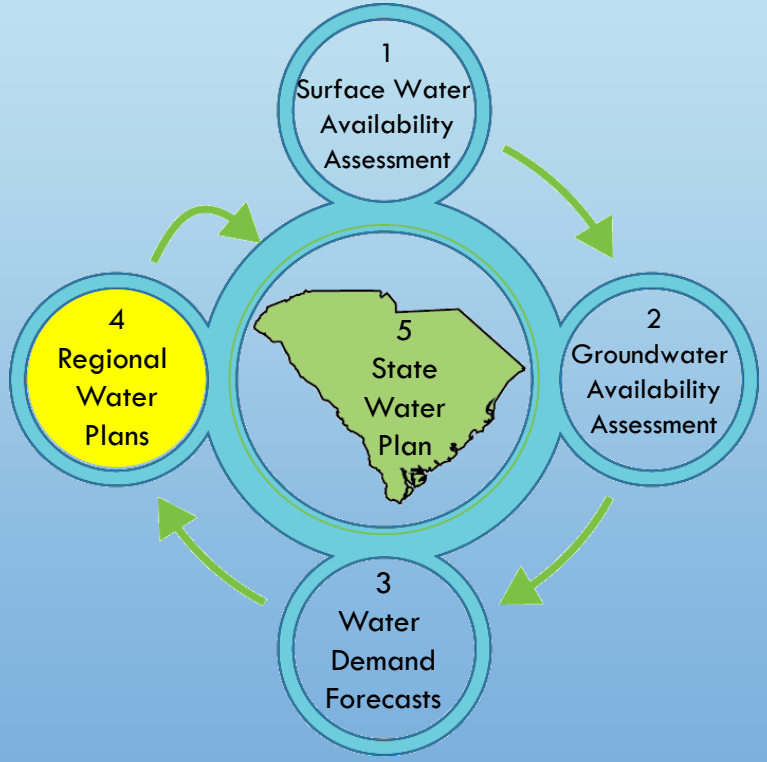
CLEMSON UNIVERSITY

Step 4. Regional (Basinwide) Water Plans

Using the assessments 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 evaluation of future water availability:
  - A gap-analysis to determine where and when shortages will occur
  - Reservoir safe yield studies
- An assessment of management strategies to meet the future demands or to plan for potential changes in water availability:
  - Demand side (Water conservation measures, drought management plans)
  - Supply side (new water sources)



Planning Process Advisory Committee (PPAC)

Develop a guidance document for the regional water plans. Some of the subject matters addressed in the document will include:

- Vision and goals
- Process of designating members to the Basin Advisory Councils
- Roles and responsibilities of the Basin Advisory Councils
- Roles and responsibilities of the State agencies
- Council bylaws/operating charter for Basin Advisory Councils
- Regional water plan format and contents
- Public and stakeholder participation
- Financing of regional water plans
- Implementation of regional water plans
- Outline how the regional water plans fit into the State Water Plan
- Administrative rules

First 2 meetings held on March 29th and May 24th, 2018

Next meeting scheduled for June 28th, 2018

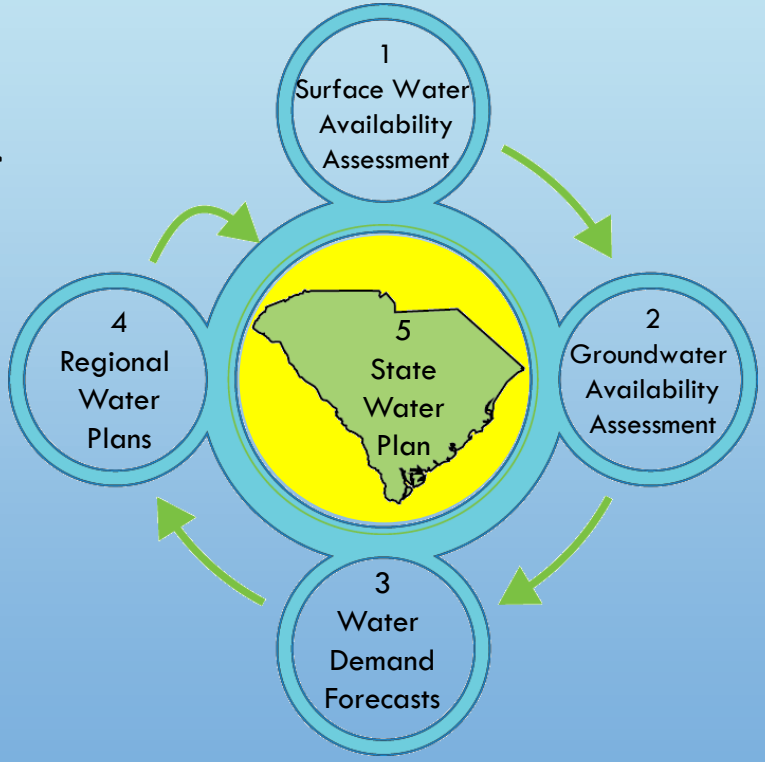
PPAC Committee Members

Jeffery Allen - Clemson University, South Carolina Water Resources Center
David Baize - WEASC/SCAWWA
John Baker - International Paper
David Bereskin - Greenville Water
Jesse Cannon - Santee Cooper
Fred Castles, III - Catawba-Wateree Management Group
Clay Duffie - Mount Pleasant Waterworks
J.J. Jowers, Jr - Edisto Engineers and Surveyors, Inc.
Eric Krueger - The Nature Conservancy
Jeff Lineberger - Duke Energy
Jill Miller - South Carolina Rural Water Association
Dean Moss, Jr – Citizen, Formerly of Beaufort-Jasper Water and Sewer Authority
Heather Nix - Upstate Forever
Myra Reece - South Carolina Department of Health and Environmental Control (SCDHEC)
Ken Rentiers - South Carolina Department of Natural Resources (SCDNR)
Bill Stangler - Congaree Riverkeeper
Scott Willett - Anderson Regional Joint Water System
Charles Wingard - Walter P. Rawl & Sons, Inc.

Step 5. Update the State Water Plan

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

- Assess the overall condition of water resources in the State
- Evaluate statewide trends in water use and availability
- Offer water-resource policy and program recommendations
- Introduce innovative practices



SC Drought Tabletop Exercise

WHAT

80 participants met to review the plans and procedures that govern state-, basin-, and local-level responses to drought and water shortages.

WHY

1) Identify and understand the strengths and breaking points in the SC Drought Response Act, SC Drought Regulations, SC Emergency Response Plan Drought Annex, and local drought plans and procedures

2) Improve awareness of local, state, and federal players in South Carolina's drought response

3) Identify key mission areas for each State Emergency Support Function

4) Collect ideas and strategies for future exercises

WHEN

September 27, 2017

WHERE

South Carolina Emergency Operations Center
West Columbia, SC

ORGANIZERS

SCEMD

CISA

Additional information and

South Carolina Drought & Water Shortage Tabletop Exercise

About South Carolina Drought Response

Drought is a complex natural hazard that can cover large territories and last for months or years. Drought can have severe effects on water resources and water-dependent sectors. The South Carolina State Climatology Office, Department of Natural Resources, and Drought Response Committee routinely monitor conditions, evaluate impacts, and provide information to the public so that water managers and users can respond effectively.

The SC Drought Response Act and Regulations guide state actions during different stages of drought. The Drought Annex of the State's Emergency Operations Plan can be activated when drought threatens public health, safety, or welfare. The tabletop exercise allowed different agencies and water managers to walk through and discuss the effectiveness of drought response plans and procedures.

Key Needs & Action Items Identified at the Exercise

1) Plans and Procedures

Identified Need: Better coordinated and timely drought response

Proposed Action Items:

- Fill Drought Response Committee vacancies
- Review and update state and local plans and ordinances, including the Drought Response Act, Drought Regulations, and Drought Annex of the Emergency Operations Plan

2) Communications

Identified Need: Improved information sharing across agencies and with the public

Proposed Action Items:

- Formalize processes to promote information sharing, enhance awareness of regional and local issues, and facilitate better working relationships across different agencies
- Develop clear, consistent water conservation messaging for different stages of drought

3) Education & Awareness

Identified Need: Greater agency familiarity with the Drought Response Program and their role in drought response and mitigation

Proposed Action Items:

- Develop education and training modules for Emergency Managers and others to learn more about drought
- Conduct future exercises at the regional and watershed level

4) Data & Information

Identified Need: More information to build common understanding of drought risks

Proposed Action Items:

- Identify and develop information that could enhance drought response and planning, such as - rainfall, weather and climate monitoring tools; water system intakes and interconnections; sector-specific impacts; resources for response and mitigation

http://www.cisa.sc.edu/PDFs/2017 SC Drought Tabletop Exercise/Drought Tabletop 2 Pager.pdf