Chapel Branch Creek TMDL Development: Integrating TMDL Development with Implementation.

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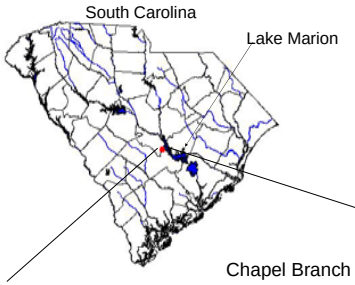
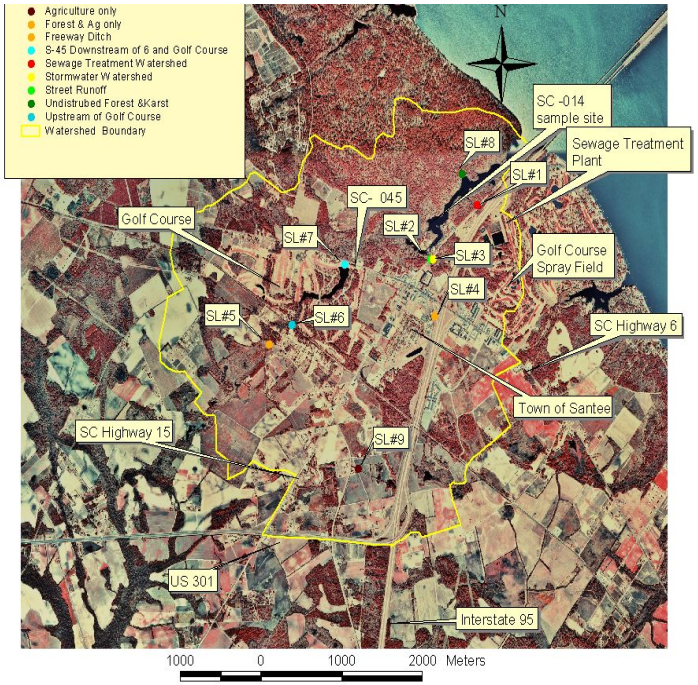


Chapel Branch Creek Watershed



SL #1 - Stream draining the area with sewage treatment plant and irrigated golf course. SL# 2 - End of road ditch along SC-15 Hwy with storm drainage from Town of Santee. SL #3 - Combined outflow of sample locations 2 and 4 that includes entire southern portion of Chapel Branch Creek watershed. SL #4 - Lower end of ditch along I-95 that includes all of I-95 runoff and associated agricultural fields. SL #5 - Headwater of CBC (primarily agriculture and forestry). SL #6 - Upstream of golf course that includes water from location 5 and small low income residential development. SL #7 - On CBC downstream of golf course and upstream of cavern. SL #8 - Outlet of small watershed that drains only Santee State Park land without any development (zone of limestone bedrock with a potential impact on stream pH). SL # 9 - At the headwaters of ditch of sample location 4 (only agriculture and forestry). SC-014 DHEC sample site where impairment was determined

Cooperators

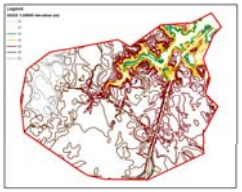
1. USDA Forest Service, Center for Forested Wetlands
2. Clemson University, Baruch Institute of Coastal Ecology and Forest Science
3. Clemson University, Cooperative Extension Service
4. College of Charleston, Department of Geology and Environmental Geosciences
5. South Carolina Public Service Authority – Santee Cooper
6. Town of Santee
7. SC Department of Parks, Recreation & Tourism, Santee State Park 8. Natural
8. Natural Resources Conservation Service - Orangeburg District
9. Orangeburg Soil and Water Conservation District

Sponsor EPA 319 through SC Department of Health and Environmental Control

THE PROBLEM: Chapel Branch Creek is a rather small creek that drains into Lake Marion near the town of Santee SC. The creek is on the USEPA list of impaired waters for excess nitrogen, phosphorus, chlorophyll a, and pH. This pollution threatens one of the most important recreational resources of coastal South Carolina.

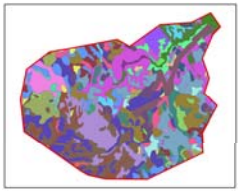
The watershed has an unusually large number of potential non- point sources of N and P; sewage effluent spraying, golf course development, highway runoff, residential runoff, and agriculture. The value of the resource and the large number of potential sources has developed a large, diverse, and concerned group of stakeholders, each willing to participate in a program to address the real water quality problems, yet skeptical that they are a major contributor.

GIS DATA SETS: A number of GIS data sets have been developed for the project the GIS is being used to better understand the land uses in the watershed and their interactions with the hydrology of the watershed. It is the interactions of the land uses and the hydrology that leads to the impairment of the creek. Using the GIS we will be able to model changes in the land uses and how the impact the hydrology leading to the most effective or Best Management Practices (BMP) for the watershed.

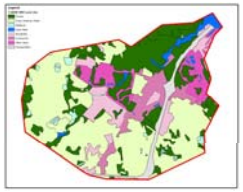


Chapel Branch Creek watershed is characterized by gently rolling topography moving into a well constrained incised stream Empting into Lake Marion

The watershed has several larger ponds and man-made reservoirs that serve as storage and flood water retention. There are isolated and riparian wetland across the watershed

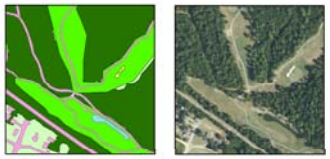


Chapel Branch Creek watershed is composed of thirty-three soils at the series level. Soils range from well drained sandy soils to Poorly drained hydric soils.

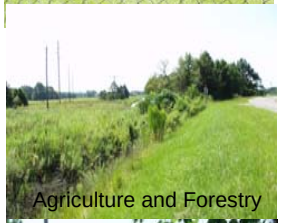


The 1:24000 scale land use tends to over estimate the effects of the built-up areeas on the watershed. The management practices in the agricultural regions can not be identified.

The 1:6000 scale land use allows for the separation of management practices with in the agricultural regions. True estimates of impermeable ground can be developed to better understand run off relationships.



The 1:6000 scale land Was developed using the national Agriculture inventory program (NAIP) 2005 aerial photography.



(SWAT, Soil Water Assessment Tool) will be used to estimate the current and maximum daily loading of N and P . We will be using a sampling of sub-watersheds in Chapel Branch Creek to examine impact of each of the potential sources of non-point pollution. This data will be used to both calibrate the SWAT model and prioritize application of Best management Practices in the TMDL implementations.

Difficulties:

1.Stakeholders require verification provided by sub-watershed sampling.
2. Sampling adds time and expense to TMDL development.
3. Sampling also requires EPA approved Quality Assurance Project Plan. This procedure will delay TMDL development and BMP implementation for over a year.

Advantages:

1.SWAT can be calibrated with site specific information.
2. Stakeholder "buy in" comes by involvement with the data collection and analysis.
3. BMP implementation can be prioritized and may reduce overall project cost.