ENVIRONMENTAL AND COASTAL RESOURCES MANAGEMENT

WATER RESOURCE ANALYSIS, MODELING, AND MANAGEMENT

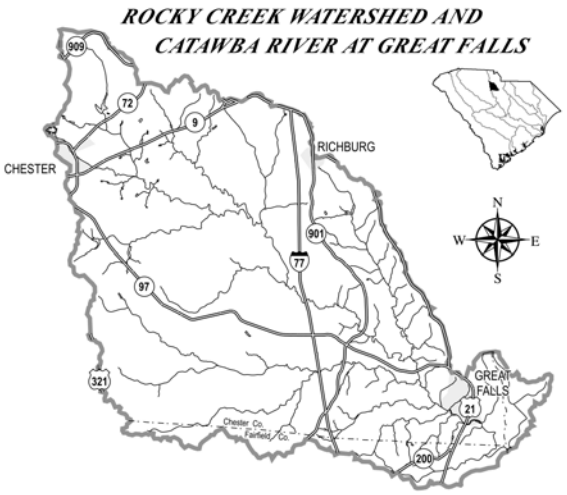
Installation of Best Management Practices for Watershed Management Identification and Mitigation of Nonpoint Source (NPS) Fecal Coliform Pollution Implementation of a Total Maximum Daily Load (TMDL)

Since 2000, RPI has been under contract (to date under six separate contracts, dollar value at $2,142,000) to the South Carolina Department of Health and Environmental Control (SC DHEC) through federally funded cost-sharing programs to address issues in water quality in several local watersheds. Funded through the U.S. Environmental Protection Agency (EPA) and the South Carolina Department of Health and Environmental Control (SCDHEC) through the Nonpoint Source Management Program (Section 319 of the Clean Water Act) these projects set to address Nonpoint Source (NPS) fecal coliform pollution. Project goals include identification of sources of NPS fecal coliform pollution, design and implementation of Best Management Practices (BMPs), and implementation of a Total Maximum Daily Load (TMDL). A very direct measure of success, which is parallel and in conjunction with the reduction of fecal coliforms in the watershed, is the increased participation rates in NPS control measures by landowners in the watershed.

The goal of the projects is to reduce fecal coliform bacteria loading into streams and creeks of these watersheds, including: Rocky Creek, Little Saluda River, Fishing Creek, Big Wateree Creek, Allison Creek, Beaverdam Creek, Calabash Branch, and Brown Creek watersheds in South Carolina. These watersheds were among those that were identified as "impaired and in violation of fecal coliform water quality standards". Sources of the fecal coliform bacteria in the watershed include agricultural/livestock operations, failing septic systems, and urban stormwater runoff.

During 2000-2004 the projects focused on reducing loadings from livestock operations and included the following principal components:

- Collecting and analyzing available spatial data (i.e. land use, soil, elevation, hydrology, etc.) to pinpoint areas of concern that may be contributing to fecal coliform loadings to the watershed, and to assess what Best Management Practices (BMPs) might be most suitable for these areas.



- Working with local agricultural agencies to identify privately owned agricultural livestock operations that may be interested in participating in the cost-sharing program.
- Meeting with interested landowners to assess what BMPs may be implemented on their properties to reduce fecal coliform bacteria loading. Consideration is taken to insure that the landowners' financial and ecological goals are also met through the BMP implementation process whenever possible. Most improvements serve multiple purposes that may include reduction of other nonpoint source pollutants (i.e. nutrients, chemicals), and are beneficial to the health of the animals, local wildlife, and the profitability of the business.
- BMPs that have been successfully implemented through cost-sharing with local landowners include:
  - Installation of livestock management practices (e.g., fencing cattle out of streams and provision of alternative watering sources using wells and watering troughs);
  - Restoration of riparian buffers between fields/pastures and waterbodies; Streambank and pasture stabilization, including re-grading and vegetating;

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Close-up of stream crossing before BMP implementation.

Stream after BMP implementation showing establishment of riparian buffer.

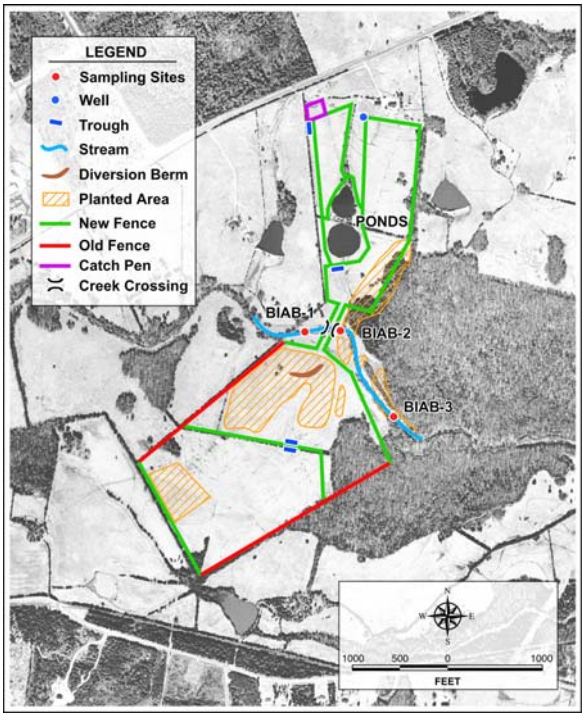
- Construction of ponds for treatment of pasture runoff;
- Establishment of ground cover on disturbed lands to increase infiltration and slow runoff;
- Construction of composting sheds to hold animal waste;
- Rental of equipment for grading of land, aerating, and spreading of animal waste;
- Installation of stream crossings and culverts.

- Before, during, and after BMPs are implemented, RPI conducts monthly water sampling, typically during storm/run-off events, to monitor fecal coliform loadings in streams located on participating landowner properties.
- Public outreach: RPI staff has presented programs at elementary schools, livestock associations, and at other local meetings in the state to educate the community on nonpoint source pollution issues. Large group tours of farms where BMPs have been implemented have been very successful in generating interest and participation in the watersheds.

Through the end of 2004, one or more of these BMP practices had been successfully implemented on more than a dozen sites.

In the selection of the BMPs for this project, the goals set forth considered the following key factors:

- A significant improvement in water quality in terms of the number of fecal coliform measured in post-project water samples;
- Increased participation rates in NPS control measures by landowners in the watershed;
- Specifics applicable to the individual farm location and its layout; and
- Cost effectiveness.



Layout of participating farm illustrating locations of BMPs implemented and water-quality monitoring stations.

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