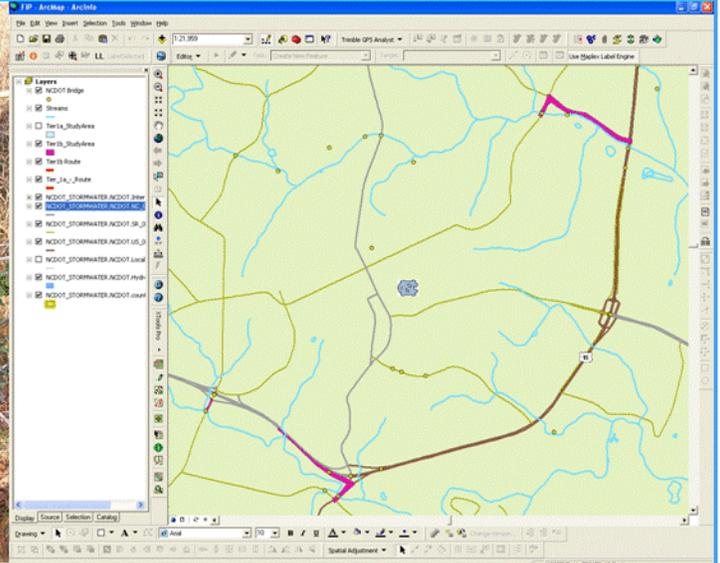


Stormwater System Inventory

DOT's NPDES Permit at Part II.B.1



Typical environment trekked during the Field Inventory Program (left); Screenshot of ESM showing implicit outfall locations as yellow dots (right)

Program Objectives

Objectives established by DOT's Permit at Part II.B.1

- Continue to build the statewide DOT stormwater system inventory for the purpose of supporting the Retrofit Program, Post-Construction Program, and Illicit Discharge Detection and Elimination Program.
- Maintain a stormwater system GIS map and prioritize sensitive water crossings.
- Develop a field inventory procedure to be used for DOT/DWQ-identified priority areas.

Outfall Inventory Updated in Year 3

DOT continues to maintain and update its GIS-based stormwater outfall inventory as required by the NPDES permit at Part II.B.1. Approximately 20% of the expected state-wide implicit outfalls from primary and secondary roadways which cross or parallel sensitive streams have been generated and added to DOT's Environmental Sensitivity Map (ESM), a GIS- and web-based repository of geographical information used for permitting and design (Management Measure a). The ESM was also updated with the most recent roadways layer to locate outfalls from new construction (Management Measure b).

Outfalls from industrial activities were inspected and assessed as part of DOT's Stormwater Pollution Prevention Plan (SWPPP) requirements. New outfalls identified were also added to the ESM in Year 3 (Management Measure c).

Hardware and Software Used to Develop the FIP

- **ESRI ArcGIS**—Desktop GIS software to edit field data.
- **ESRI ArcPad**—Mobile GPS software to collect data.
- **ESRI ArcSDE**—Spatial Database Engine software to store data.
- **Trimble Geo XH**—Sub-foot accuracy GPS unit to collect the data in the field.



DOT Expands Pilot Studies for Field Inventory Program (FIP)

DOT's Hydraulics Unit conducted an FIP Pilot Study in Year 3 which encompassed stormwater inventories in four (4) predetermined work areas. Each field study was based on the tiered inventory system developed and documented in the FIP Needs Assessment Report completed in Year 2. Each tier represents a hierarchical level of information to be collected depending on the data requirements identified once a priority area is identified and the work area is predetermined. The tiers are described below:

- **TIER IA** identifies true outfalls to waters of the state at or within the ROW boundary (known as DOT outfalls per the NPDES Permit);
- **TIER IB** identifies points where concentrated stormwater exits the ROW (known as ROW discharge points), as well as Tier I A DOT outfalls;
- **TIER IC** includes the collection of Tier I A and B data plus the locations of non-DOT outfalls to Waters of the State outside of the ROW extending from ROW discharge points;
- **TIER II** identifies the stormwater drainage system within the boundaries of the ROW; and
- **TIER III** identifies the complete DOT and non-DOT owned stormwater drainage system.

The pilot studies completed in Year 3 were held to validate the geodatabase design and business processes necessary to implement the FIP successfully.



ROW Discharge Point from Concrete Pipe —Near James Taylor Bridge/Chapel Hill

GIS-Based Coastal Prioritization Method Established

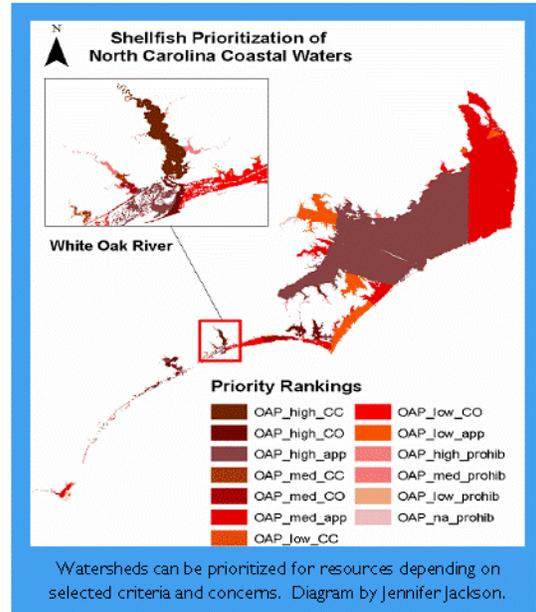
Since 2004, DOT has been working closely with DENR's Shellfish Sanitation and Recreational Water Quality Section and the NC Coastal Federation (NCCF) to develop methods for enhancing the identification and distribution of information related to stormwater problem areas potentially affecting shellfish harvesting waters.

As an extension of this effort, the first phase of the DOT's prioritization system to direct FIP activities focused on the coastal region. DOT sponsored research to develop a GIS-based prioritization method using integrated data from several resource agencies and DOT's implicit outfall locations to identify sites where resources should be applied for optimum results in reducing DOT's impacts to water quality. The results can also be used to assess watershed needs and more accurately identify areas needing an in-field inventory assessment such as the FIP.

The algorithms behind the prioritization method are divided into three water quality management issue areas reflecting concepts in DWQ's use support rating system, including shellfish harvesting, primary and secondary recreation, and aquatic life support. For each issue area the prioritization method assigns groupings of attribute data to geographic areas coincident with DWQ's coastal assessment unit polygons based on the 1:24,000 scale hydrology GIS dataset. Additionally prioritization attribute data are assigned to NCDOT implicit outfall point locations.

Depending on the issue of concern, water quality managers can use the attribute data to prioritize geographic areas and management actions. Hence, the prioritization method is very flexible and

broadly applicable to a variety of needs. Detailed documentation of the prioritization method is provided in the report entitled "A coordinated Prioritization of North Carolina Coastal Waters and Stormwater Outfalls as Part of NCDOT's Stormwater Inventory and Prioritization Program" prepared by Jennifer Jackson as partial fulfillment of the requirements for the Master of Environmental Management degree in the Nicholas School of the Environmental and Earth Sciences of Duke University.



Watersheds can be prioritized for resources depending on selected criteria and concerns. Diagram by Jennifer Jackson.

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