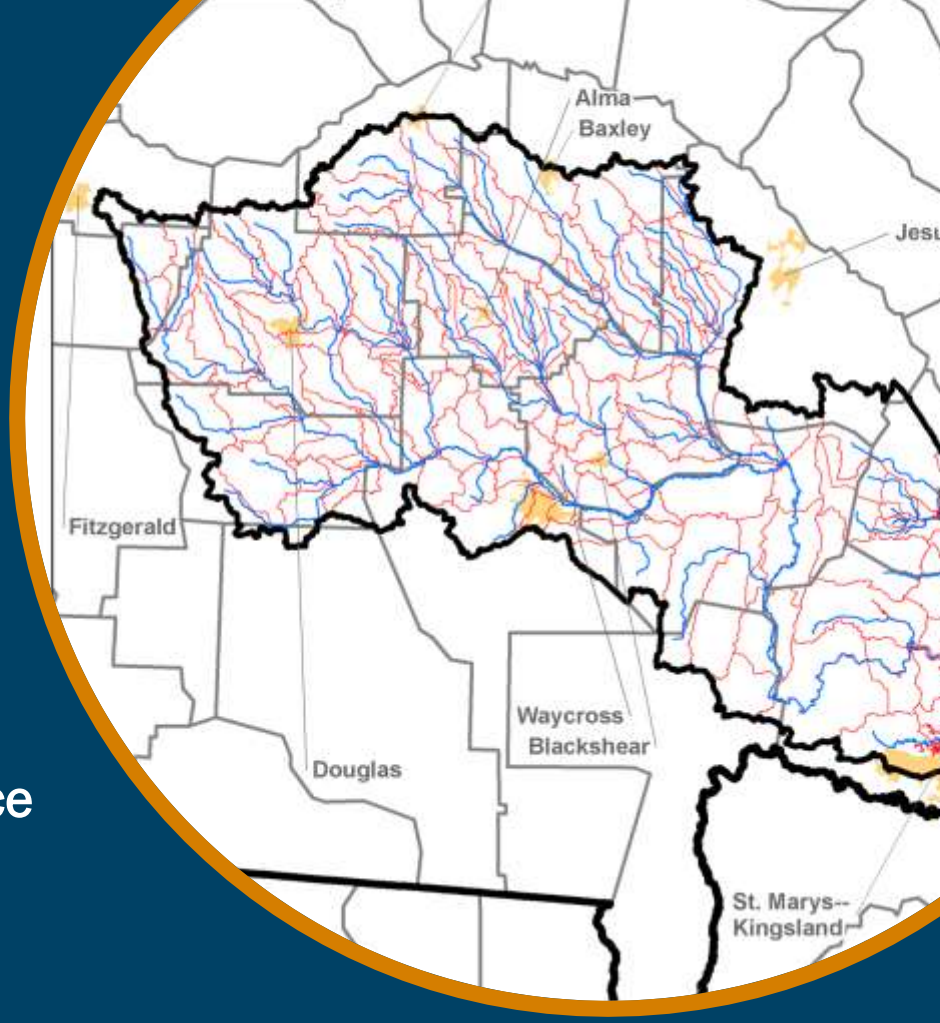
TETRA TECH

EPD

Watershed Prioritization and Evaluation



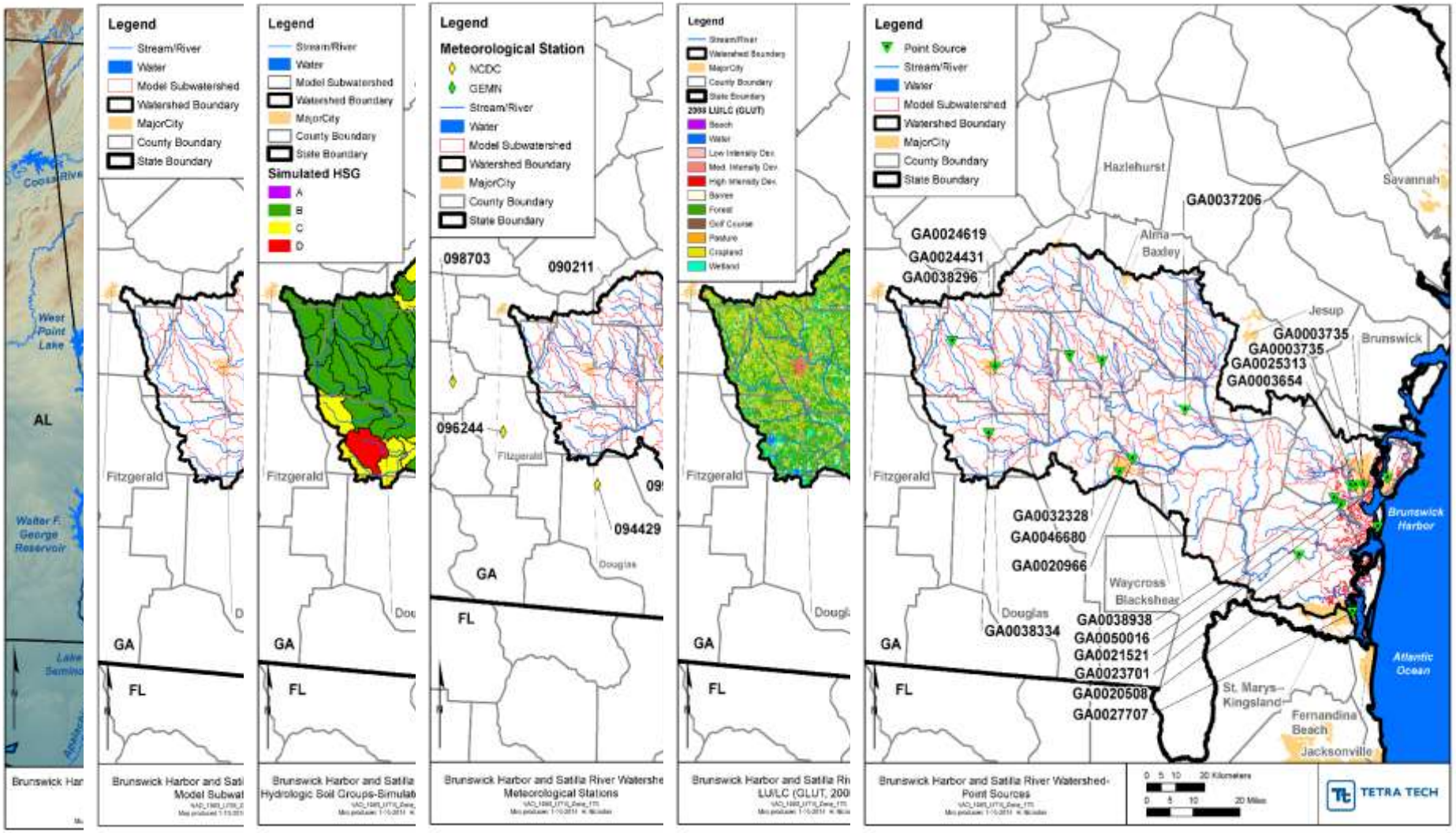
Alabama Water Resources Conference
Orange Beach, AL

Madhu Akasapu – Smith
Water Resources Engineer, Tetra Tech, Inc.
September 11, 2015

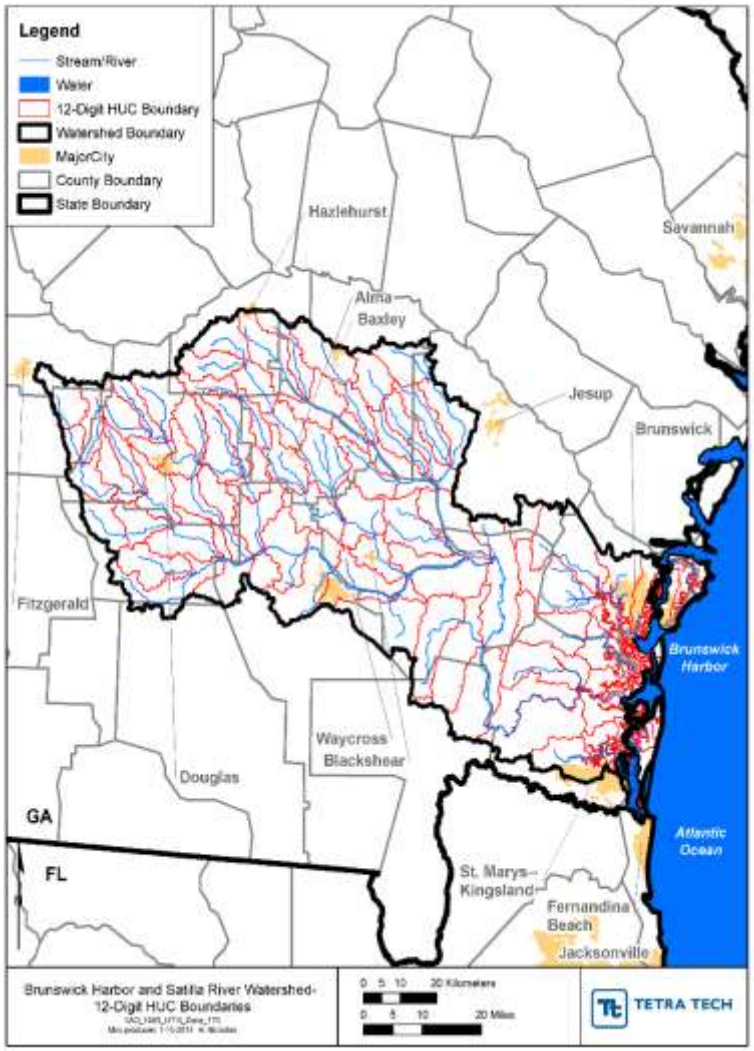
Overview

- Help watershed planners identify critical watersheds using existing watershed models for potential non-point source BMPs
- Developed a procedure to prioritize and evaluate watersheds for non-point source management planning efforts based on
  - Biochemical Oxygen Demand (BOD)
  - Total Nitrogen (TN)
  - Total Phosphorus (TP)
  - Total Suspended Solids (TSS)
- Used a Rainfall-Runoff model developed for Satilla River Watershed as a case study for the procedure

Satilla River Watershed



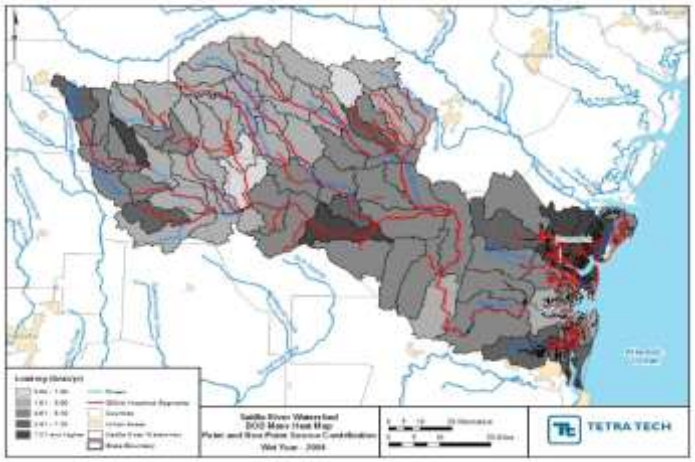
Watershed Prioritization: Initial Set-up



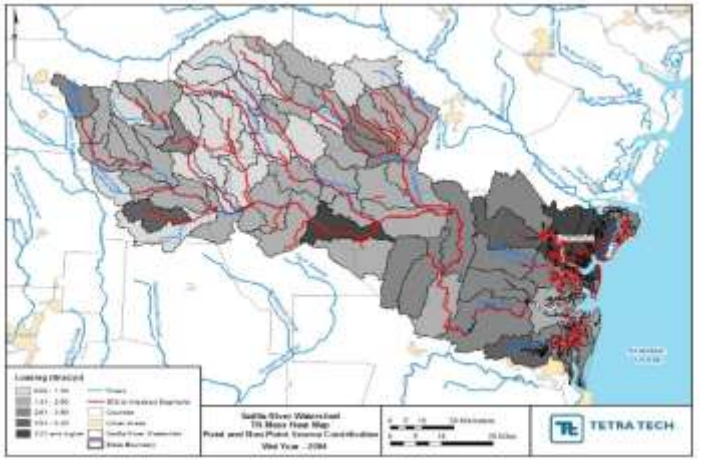
- Identified 75 12 digit Hydrologic Unit Code (HUC-12) watersheds in the Satilla River Watershed
- Grouped the subwatersheds from the Satilla River Watershed into the identified HUC-12 watersheds
- Used precipitation data from the watershed model to represent dry, wet, and normal years for the watershed
  - 2004: Wet Year
  - 2012: Dry Year
  - 2007: Normal Year

Watershed Prioritization : Heat Maps

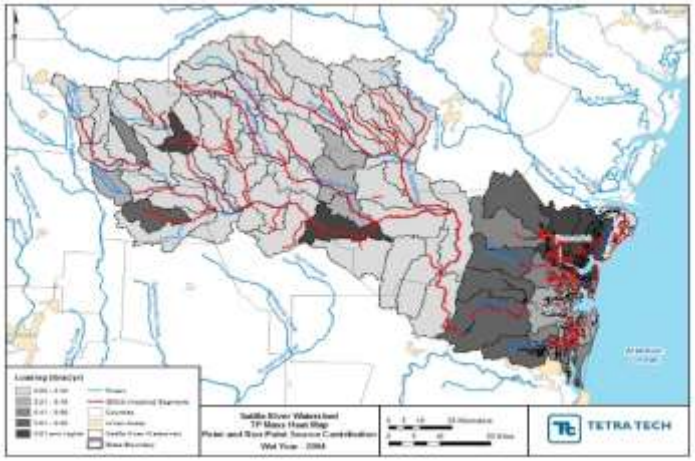
Biochemical Oxygen Demand



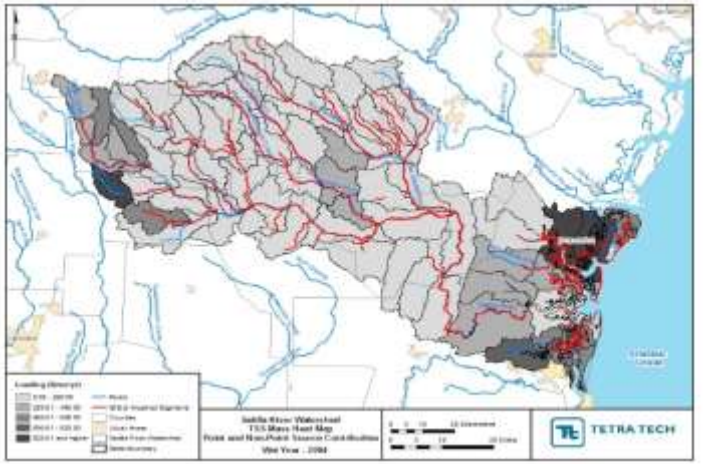
Total Nitrogen



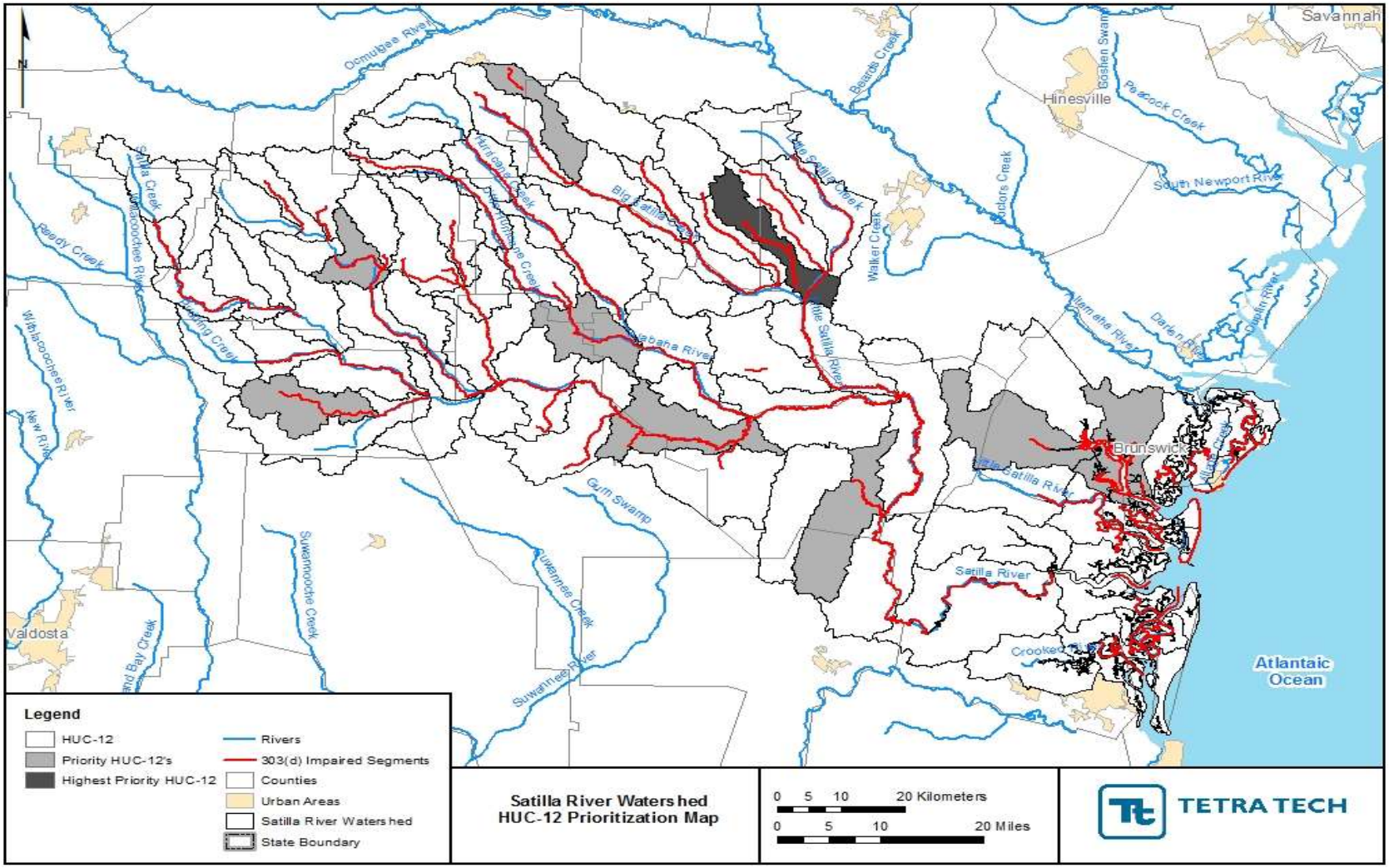
Total Phosphorus



Total Suspended Solids



Watershed Prioritization: Priority Watersheds



Watershed Prioritization: Procedure

- Step 1: Precipitation Pattern Ranks
  - Computed loads, concentrations, and flows, for wet, dry, and normal years
  - Sorted from highest to lowest and ranked from 1 to 75

- Step 2: Analysis Ranks
  - Precipitation Pattern Ranks summed for each HUC-12 watershed by the analysis type (loading, concentration, and flow) for each constituent
  - Sorted from lowest to highest and ranked from 1 to 75

Watershed Prioritization: Procedure (contd.)

- Step 3: Constituent Ranks
  - Summed Analysis Ranks for loading, concentration, and flows for each constituent and applied a 303 (d) weighting factor
  - Sorted from lowest to highest and ranked from 1 to 75

Constituent Rank = {Loading Analysis Rank + Concentration Analysis Rank + Flow Analysis Rank} 303 (d) weighting factor*

Watershed Prioritization: Procedure (contd.)

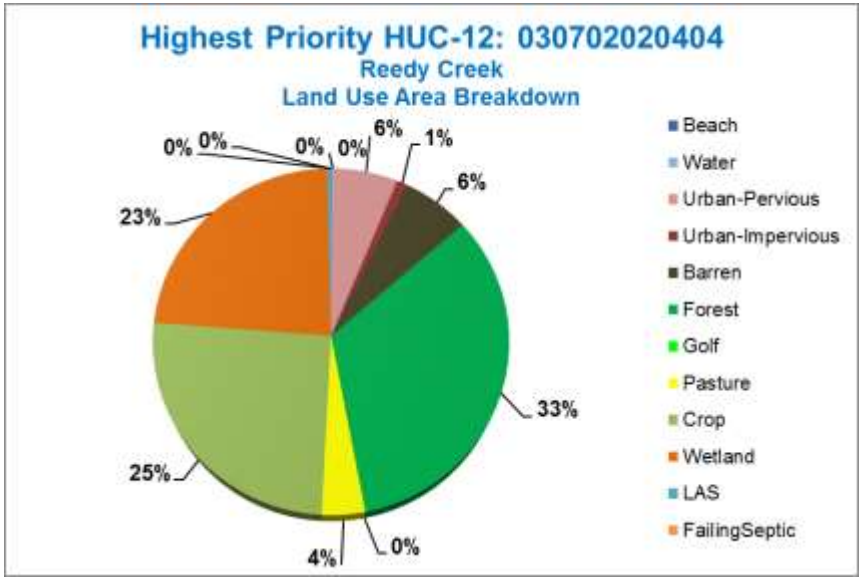
- Step 4: Overall Priority Ranks
  - Averaged all four Constituent Ranks
  - Sorted from lowest to highest and ranked from 1 to 75
- HUC-12 watershed with the lowest Overall Priority Rank had the highest loading, concentration, and flow with a lowest 303(d) weighting factor
- Prioritization based on Constituent Ranks, Analysis Ranks, or type of impairment Provides flexibility to the watershed planners

Watershed Evaluation

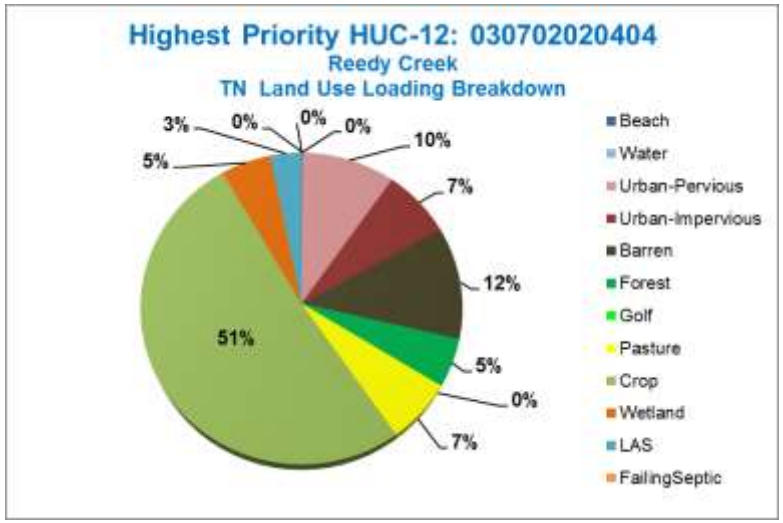
- Evaluation of any specific information on the various sources contributing to non-point source pollution to potentially help the planners in selecting BMPs
- Evaluation of Point Sources if any present in the highest priority watershed

Landuse Loading Breakdown

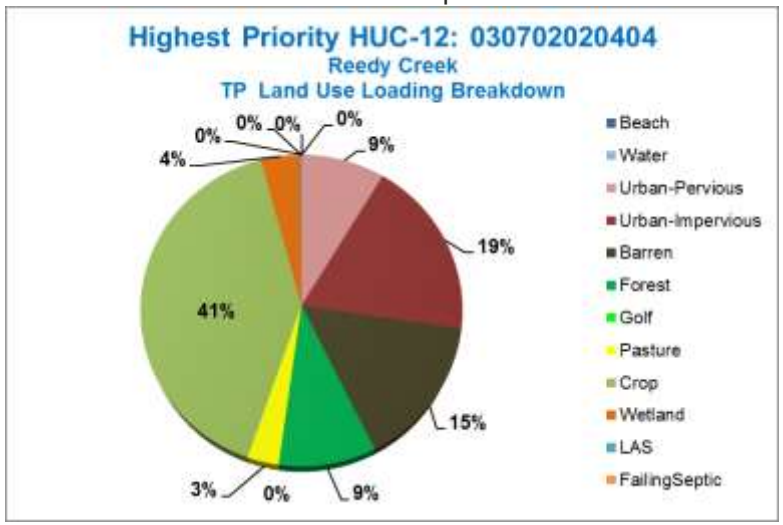
Area Breakdown



Total Nitrogen



Total Phosphorus



Questions?

Project Contributors

Georgia EPD

Glen Behrend, Mary Gazaway, and Jeffrey Linzer

Tetra Tech

Brian Watson and Jeremy Wyss

THANK YOU

Email : madhu.akasapusmith@tetratech.com