

**Final Report 319 NPS Project #07-09**

Niantic River Watershed Monitoring – nutrients, bacteria, and streamflow

USGS

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**Executive Summary/Abstract**

This is a multi-year project. This report presents information on data from the first year+ of data collection. The USGS installed 3 streamflow gaging stations on the 3 largest tributaries of the Niantic River Estuary. The goal of the project was to implement monitoring as part of the [Niantic River Watershed Based Plan](#).

The project objectives are to:

- ❖ Collect baseline nutrient data (whole water and filtered forms of nitrogen and phosphorous) and indicator bacteria (E-Coli) at Latimer Brook, Oil Mill Brook, and Stony Brook, all tributaries to the Niantic River
- ❖ Samples will be collected monthly from July 2008 through September 2009, with an additional 3 samples collected during high flow events during the 15-month period of the agreement.
- ❖ Install and operate a real-time, streamflow-gaging station on Latimer Brook. Install partial-record streamflow gages on Oil Mill Brook and Stony Brook for calculation of discharge.

**Introduction**

The Niantic River Estuary is listed on the Connecticut 303d as impaired for shellfishing and recreation. Of particular concern are concentrations of bacteria, and nutrients.

**The Resource, Environmental Problems:**

The Niantic River is the first estuary (moving from west to east) that contains significant eelgrass beds. The eelgrass beds are considered to be stressed by nutrients from the watershed. Data on the bacteria loading and nutrient loading are necessary to determine the baseline data and futures trends, during and following the implementation of a watershed based plan.

**The Solution:**

**Results:**

1. QAPP created and approved summer 2008
2. Stream gages were installed prior to October 2008. Rating curves are under continuous development for each site. Rating curves relate continuous river stage to streamflow. This relation changes with temporal changes in streambed geomorphology, therefore frequent manual measurements of discharge are needed. Streamflow data is not yet finalized.

Samples were collected monthly, and at several selected storm events from August 2008-September 2009.

**Future Plans:**

We will be continuing monitoring for another year (October 2009-September 2010), and have requested funding for an additional year beyond that (October 2010-September 2011) and have requested funds to write a short report on the loads of nutrients and bacteria.

**Conclusions:**

The majority of the samples had low total nitrogen concentrations. Concentrations of total nitrogen at Latimer Brook are generally higher than those from the other two stations.

e. coli concentrations were typically less than 100 colonies per 100 ml, but high concentrations were observed on several occasions. The highest concentration at Latimer Brook was >2,400 colonies, on Sept. 27, 2008, and 2,400 colonies per 100 ml, on July 2, 2009. High flows occurred on these days, and concentrations also were elevated at the other 2 stations. So far with one year of data collection, the bacteria statistics are as follows.

| Station                  | e. coli geometric mean | e. coli maximum |
|--------------------------|------------------------|-----------------|
| Latimer Brook 011277905  | >45                    | > 2,400         |
| Oil Mill Brook 011277914 | 25                     | 2,400           |
| Stony Brook 011277916    | 39                     | 1,700           |

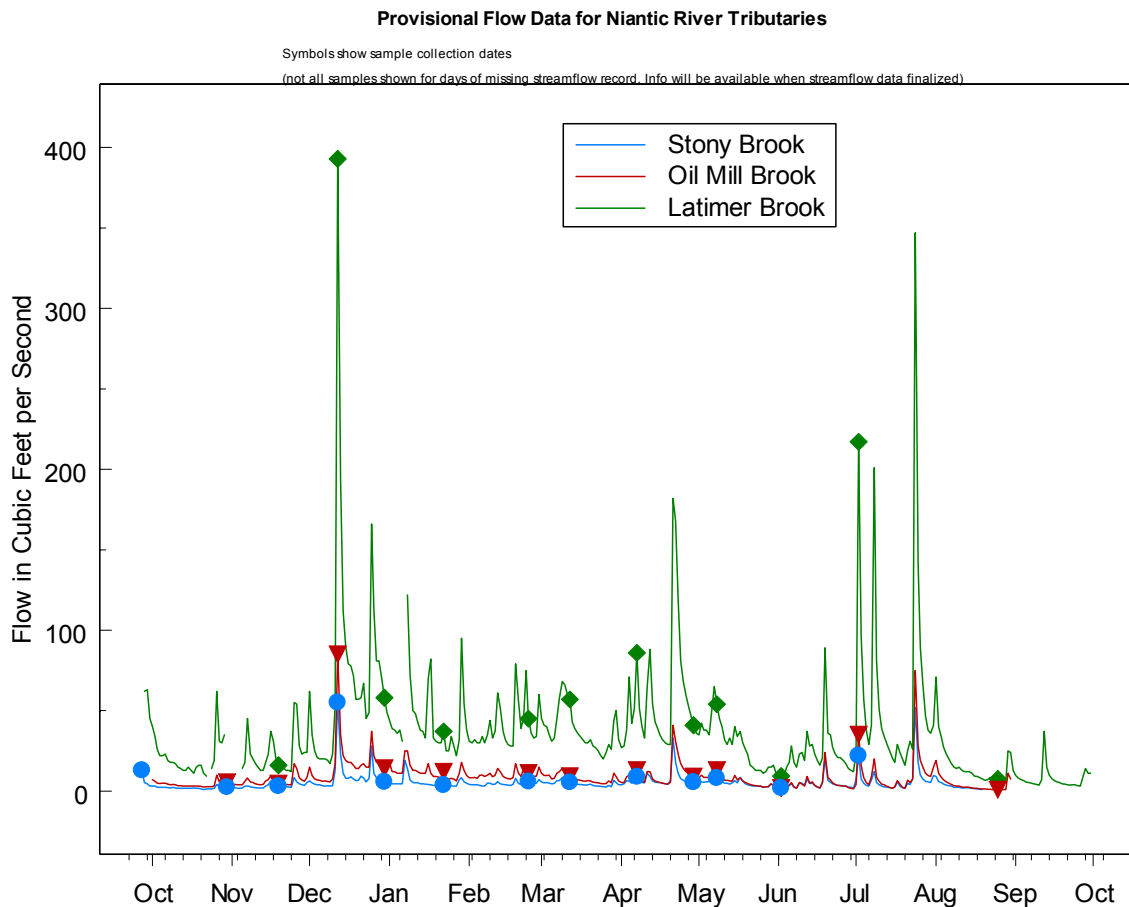


Figure 1. Dates and flows for sample collection, 2008-2009

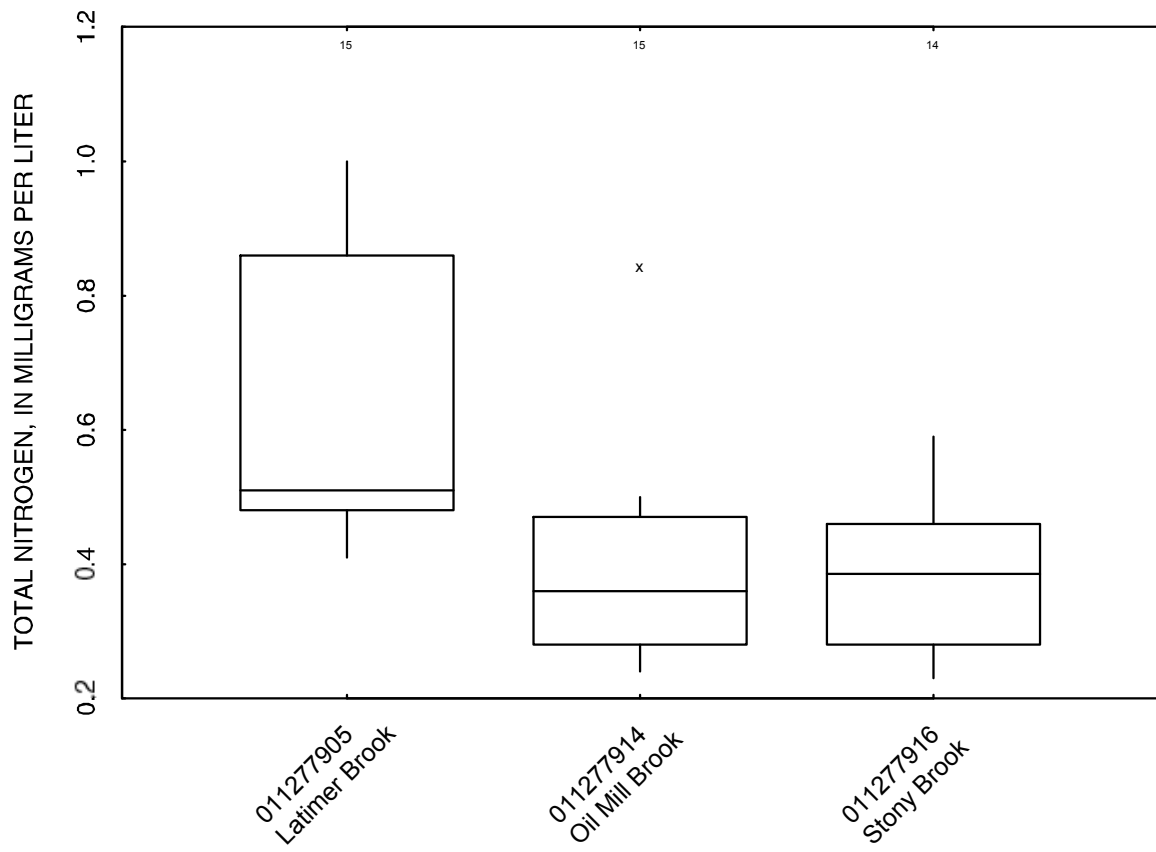


Figure 2. Boxplots showing distribution of total nitrogen concentrations, 2008-2009

Escherichia coli, Defined Substrate Technology, water, most probable number per 100 milliliters

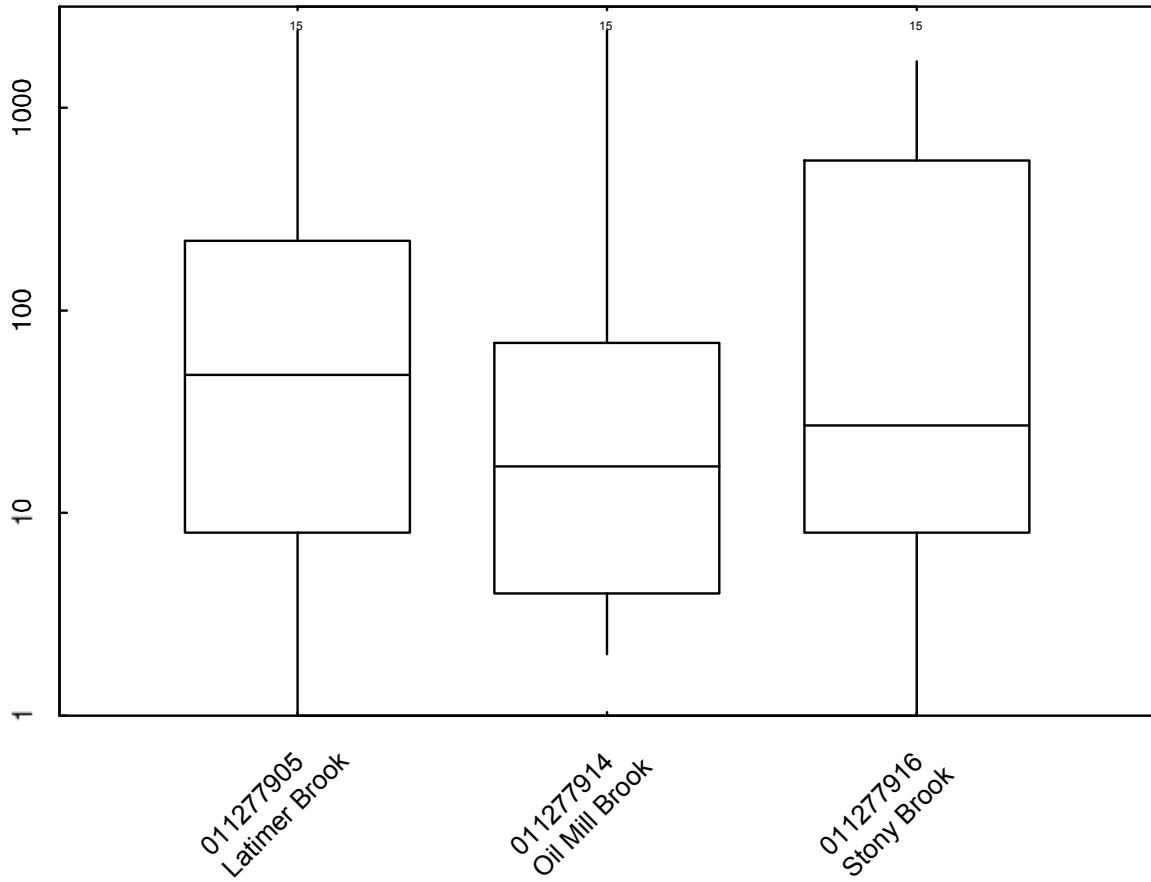


Figure 3. Boxplots showing distribution of e. coli in samples, 2008-2009