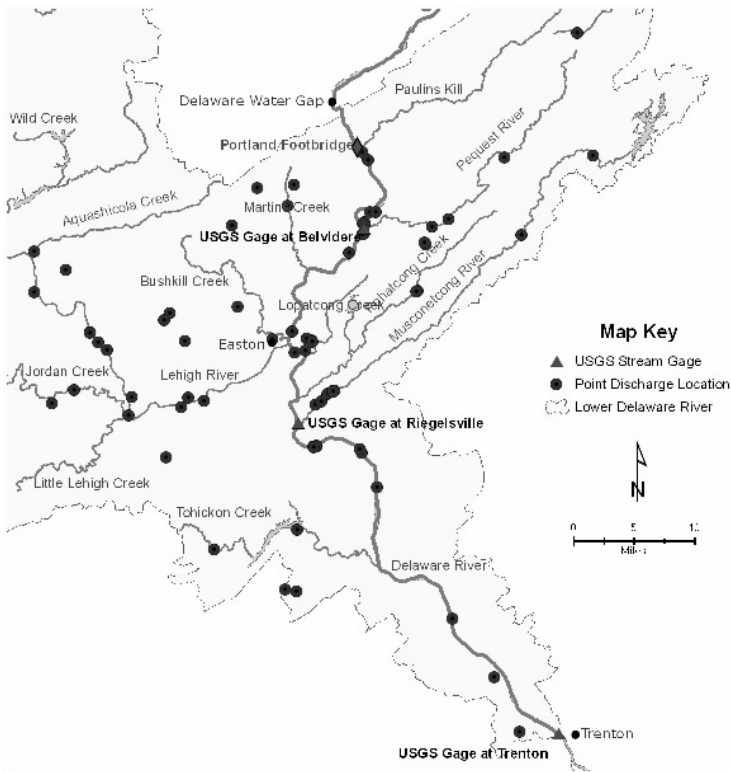


# Proposal to Enhance an Existing Water Quality Model of the Lower Delaware River from the Delaware Water Gap to Trenton, NJ

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## Lower Delaware River Special Protection Waters

### Background

In December 2007, the Delaware River Basin Commission (DRBC) completed the development of a preliminary water quality model of the non-tidal Lower Delaware River from the Delaware Water Gap to Trenton, NJ using the QUAL2K model platform. This model was developed using funds from the USEPA Section 106 Grant. The model is a critical component for implementing DRBC's Special Protection Waters Regulations in the Lower Delaware and determining change to existing water quality parameters, particularly nutrients such as nitrogen and phosphorus. This model simulates the transport and fate of nutrients and dissolved oxygen in the Lower Delaware and predicts water column nutrient and dissolved oxygen concentrations.

At the time the model was developed, DRBC highlighted the lack of necessary point discharger water quality data as the final major hurdle in completing model calibration. According to DRBC records, there are approximately 90 point sources discharging to mainstem or segmented tributaries in the model domain. Of these, only 41 are listed in EPA's Permit Compliance System (PCS), and only 16 include either measured or permitted flow data. State NPDES permitting authorities in the basin do not require monitoring for the specific nutrient parameters needed by the model. Previous coordination on the Brodhead water quality model suggests that acquisition of appropriate point discharge data is a step unlikely to be taken without external funding.

### Project Objective

DRBC is seeking external funding to perform sampling and analysis of the point dischargers in the model domain, allowing for better estimates of point discharge loadings and calibration of the Lower Delaware River water quality model.

# Proposal to Supplement an Existing Water Quality Model of the Lower Delaware River from the Delaware Water Gap to Trenton, NJ

## Work Plan

DRBC proposes to collect 2 samples from each of the 90 point dischargers in the model domain using in-house staff interns. Samples will be analyzed by the Academy of Natural Sciences in Philadelphia for the analytical parameters required by the model, including:

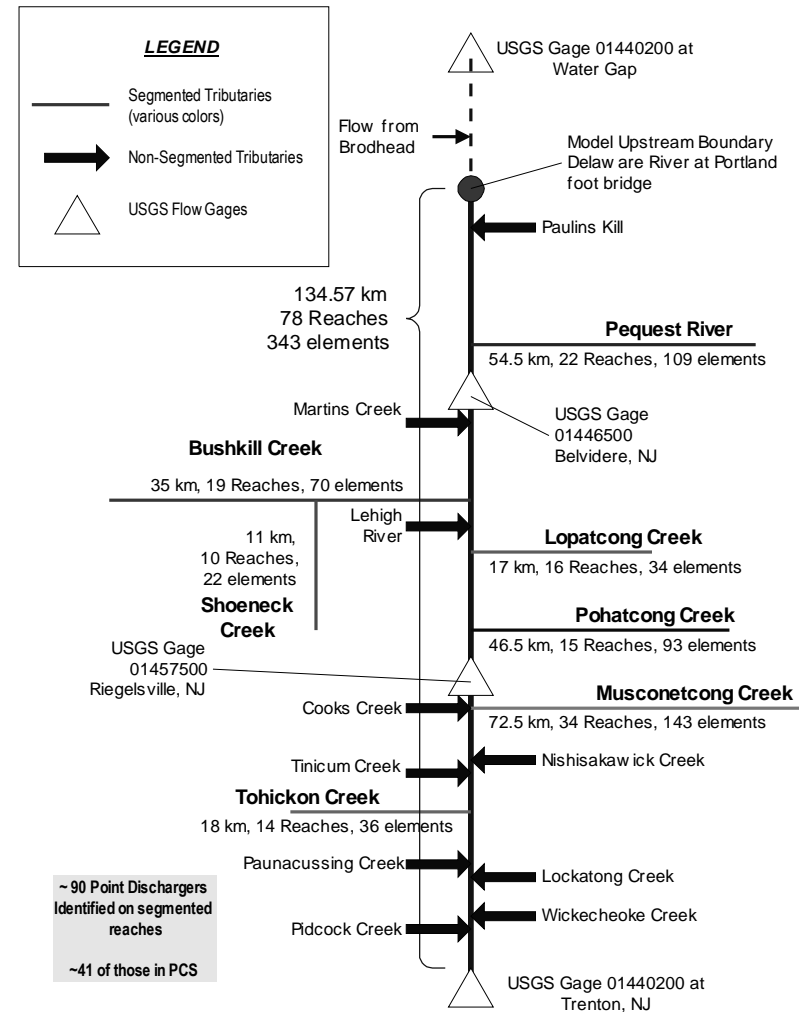
- Phosphorus total (mg/L)
- Phosphorus ortho (mg/L)
- Hydrolyzable Phosphorus
- Ammonia (mg/L)
- Nitrate + Nitrite (mg/L)
- TKN (mg/L)
- Total Hardness (mg/L as CaCO<sub>3</sub>)
- TSS
- Chlorophyll a (corrected)

## Cost Estimate

Based on our existing contract for nutrient analysis, DRBC estimates that for \$53,000, we could perform necessary sampling and analysis of each of the 90 point dischargers in the model domain. This information would provide the critical point source loading information necessary to complete calibration of the model.

## Deliverable

Upon completion of this work, DRBC will possess the point discharge data required to calibrate the Lower Delaware water quality model for nutrients. DRBC will subsequently calibrate the model using existing in-house resources, and apply the model toward implementing the Special Protection Waters Regulations.



**Lower Delaware River Model Segmentation**