

A PREDICTIVE MODEL FOR ANTI-DEGRADATION MONITORING OF THE DELAWARE RIVER

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ABSTRACT

The non-tidal portion of the Delaware River consists of many large sections designated as Wild and Scenic Rivers and passes through two national parks. Although there is increasing pressure on the watershed, large sections of the mainstem of the river can be considered to be in minimally disturbed condition. Thus, the primary goal of this research was to develop a monitoring tool to be used by the Delaware River Basin Commission (DRBC) to monitor for changes in the macroinvertebrate assemblage that may be a result of human development in the basin. Using the conditions in the river in 2006 as a baseline, we developed a RIVPACS-type predictive model that can be used to assess the similarity of any given site to the minimally disturbed condition as predicted by the model. We first verified the sections of river that are considered representative of minimal disturbance by the DRBC and national park personnel. We identified 5 groups of sites using flexible beta clustering based on benthic macroinvertebrate data from riffles, glide/runs, and pools. We then developed a discriminant model based on maximum velocity, mean water depth, latitude, and a regional indicator variable. The final predictive model and this approach in general, provide DRBC and the National Park Service with a tool that can be used for early detection of changes to the river and may be useful in diagnosing causes of such changes. Although this work was reviewed by EPA and approved for publication, it may not necessarily reflect official Agency policy.

KEYWORDS

RIVPACS, predictive model, nonwadeable rivers, benthic macroinvertebrates, random sampling

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