USE OF BIOLOGICAL CONDITION GRADIENTS TO INFORM THE ESTABLISHMENT OF REGULATORY THRESHOLDS FOR MACROINVERTEBRATE DATA

Kevin Berry
New Jersey Department of Environmental Protection
Water Monitoring and Standards
Bureau of Water Quality Standards and Assessment
401 East State St.
P.O. Box 409, 7th floor
Trenton NJ 08625

ABSTRACT

Many states use biological data to assess compliance with the goals of the Federal Clean Water Act (CWA) regarding the protection of aquatic life uses. Towards this end New Jersey's Department of Environmental Protection employed biological condition gradients (BCG) developed by USEPA for New Jersey to inform the development of regulatory thresholds applied to benthic macroinvertebrate metrics. A BCG is a conceptual framework using narrative descriptions of biological categories ranging from pristine undisturbed biological communities to those resulting from severe anthropogenic disturbance. As a consequence of this project a series of operational "rules" were developed which assign benthic communities to one of 6 possible categories or "tiers" reflecting degrees of cultural disturbance within the BCG framework. Using a published consensus that tiers 1 – 4 reflect biological communities in support of the interim goals of the CWA in regards to the support of aquatic life uses while tiers 5 and 6 reflect communities not in support these goals, the Department established thresholds for metric scores which separated scores associated with tiers 1 - 4 from scores associated with tiers 5 and 6. The Department used this information to identify waterbodies in need of regulatory action under CWA section 303(d). Options to identify and protect high-tier waterbodies (tiers 1-3) and prevent their degradation through time are also discussed.

KEYWORDS

Biological condition gradients, tiered aquatic life, 303(d), water quality, regulatory thresholds, macroinvertebrate data, clean water goals, Clean Water Act.

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