

# Nutrient Criteria

## STATE OF MICHIGAN, DEPARTMENT OF ENVIRONMENTAL QUALITY

### *Nutrient Framework to Reduce Phosphorus and Nitrogen Pollution*

Nutrient criteria are a component of Michigan's Water Quality Standards (WQS) and are used to determine the amount of nutrients that can enter Michigan's lakes and streams before negatively impacting uses of the waterbodies.

The state of Michigan has had narrative nutrient criteria since 1968 and a total phosphorus 1 mg/L effluent standard for point source discharges since 1986. The current narrative criteria for nutrients also allows for lower nutrient limits in point source discharge permits when needed to protect inland lakes and rivers.

Michigan began developing numeric nutrient criteria in 2001 pursuant to a nationwide Environmental Protection Agency (EPA) mandate, and has an EPA approved plan for criteria development. Michigan's plan proposes to use a model to predict the expected, or natural, level of total phosphorus in a waterbody, which can then be used to establish site-specific nutrient criteria. The proposed methods are based on cause and effect relationships between nutrients and biological responses (see figure below) and a narrative standard with a translator mechanism. Numeric nutrient criteria would be used to determine when there are excessive levels of nutrients based on water concentrations in a water body, instead of only relying on the presence of nuisance plants or algae, which can vary greatly both spatially and temporally.

As of December 31, 2006, the Michigan Legislature withdrew the DEQ's authority to update the WQS. No timeline has been established as to when the DEQ may regain its rule-making authority and continue efforts to develop numeric nutrient criteria. If the DEQ does update the WQS, a stakeholders committee will be established to assist in developing the rules, including guidance for their implementation.

In 2012, the DEQ awarded a grant to Michigan State University to update the methods used to develop expected nutrient concentrations for inland lakes. Recent data and research on nutrients and their effects on aquatic systems are being used to improve a model that will allow for a better site-specific prediction of phosphorus in inland lakes. This update will put the DEQ in a position to consider the development of numeric criteria in the future.



Upper Picture: Goose Lake in Marquette County, Michigan. (Bing.com) Lower Picture: Lake Michigan shoreline in 2012.

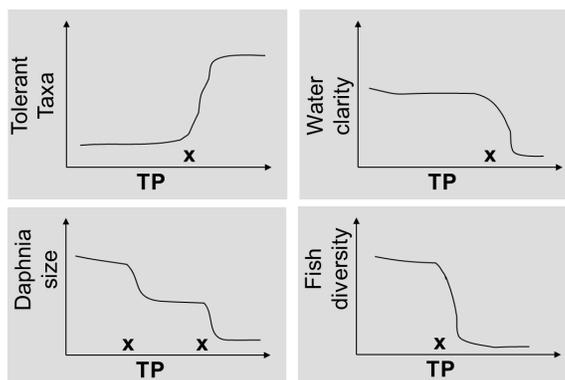


Figure: Examples of potential relationships between nutrients (TP: Total Phosphorus) and biological responses where the 'x' indicates a phosphorus concentration where a significant biological response occurs.