United States Environmental Protection Agency

Office of Water
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Fact Sheet: Ambient Water Quality Criteria to Address Nutrient Pollution in Lakes and Reservoirs

Summary

EPA has published final recommended ambient water quality criteria to address nutrient pollution in lakes and reservoirs under Section 304(a) of the Clean Water Act (CWA). These criteria serve as an important resource in EPA's ongoing efforts to support states and authorized tribes in developing and adopting numeric nutrient criteria into their water quality standards to protect public health and aquatic life from the adverse effects of nutrient pollution in surface waters, including harmful algal blooms.

States and authorized tribes can adopt these criteria into their water quality standards or can adopt other scientifically defensible nutrient criteria. These final criteria are not a regulation, nor do they impose a legally binding requirement. These criteria provide information to develop science-based standards that are protective of drinking water, recreational, and aquatic life designated uses of lakes and reservoirs against the adverse effects of nutrient pollution.

Background

Numeric nutrient criteria provide important tools for states and authorized tribes to use when managing the effects of nutrient pollution by providing clear targets that support the protection and maintenance of the designated uses of their waters.

In 2000 and 2001, EPA published recommended numeric nutrient criteria for most lakes and reservoirs. Since then, scientific understanding of the relationships between nutrient concentrations and harmful effects in lakes and reservoirs has increased, and new data collected from lakes and reservoirs across the United States have become available. These new recommended criteria replace the recommended criteria published in 2000 and 2001 and reflect the latest scientific knowledge, in accordance with the provisions of CWA Section 304(a).

What is nutrient pollution?

Nutrient pollution is a widespread and costly environmental and public health challenge. Excess nitrogen and phosphorus in our waterways degrade water quality, feed harmful algal blooms, affect drinking water sources, increase public health risks, and contribute to costly impacts on drinking water treatment, recreation, tourism, and fisheries. The frequency of harmful algal blooms appears to be increasing, possibly due to interactions between climate change and nutrient pollution.

What are EPA's recommended nutrient criteria?

EPA's recommended ambient water quality criteria for lakes and reservoirs consist of linked models that states and authorized tribes may use to identify protective candidate numeric criteria for total nitrogen and total phosphorus to protect three designated uses (aquatic life, recreation, and drinking water supply). These candidate criteria (consisting of magnitudes generated by the models and associated duration and frequency components) can be adopted into state or authorized tribal water quality standards regulations. For water bodies with multiple use designations, states and authorized tribes need to identify candidate criteria to protect each applicable designated use and then adopt the candidate criteria that protect the most sensitive use.

How were these criteria developed?

The ecological and health protective responses on which the criterion models are based were selected by applying a risk assessment approach to explicitly link nutrient concentrations to the protection of aquatic life, recreation, and drinking water source protection designated uses. Statistical stressor-response models were then used to relate the ecological and health protective responses to concentrations of nitrogen and phosphorus. The models are based on previously published EPA technical guidance, as well as scientific peer-reviewed statistical and modeling techniques.

These criteria provide a flexible approach

States and authorized tribes can use the provided criterion models that are based on national data or can incorporate local data into the national models to help develop numeric nutrient criteria that are protective of designated uses and consistent with national relationships, while accounting for unique local conditions.

Modeling expertise is not needed to use the models

Because EPA has already developed the criterion models and provided interactive software applications to apply the models, states and authorized tribes do not need to develop their own models. However, states and authorized tribes that use these models to derive criteria should understand the science underlying the models. This will help them correctly specify the parameters needed to run the models and communicate the choices they made to derive protective criteria to stakeholders and EPA.

If states or authorized tribes have local or state level data and want to use them to derive criteria reflective of those conditions, some additional knowledge of stressor-response analyses will be needed.

How do these criteria affect existing state nutrient criteria?

The publication of this guidance does not invalidate criteria previously approved by EPA as effective for CWA purposes, nor does it compel a state or authorized tribe to revise current EPA approved and adopted criteria, Total Maximum Daily Load nutrient load targets, or nitrogen or phosphorus numeric values established by other scientifically defensible methods. EPA encourages states and authorized tribes to take the opportunity to consider this new information and determine if revisions are warranted as part of the state or authorized tribe's triennial review of water quality standards. States and authorized tribes could consider using the recommendations as an alternative to, or as a supplement for, other scientifically defensible approaches.

Help is available

EPA stands ready to assist states and authorized tribes to add their data into the models through the Nutrient Scientific Technical Exchange Partnership & Support (N-STEPS) program. For more information, please see the N-STEPS website at https://www.epa.gov/nutrient-policy-data/n-steps-program.

Where can I find more information?

To view the final recommended criteria and for more information, please visit EPA's website at https://www.epa.gov/nutrient-policy-data/technical-support-numeric-nutrient-water-quality-criteria-development or email Lester Yuan at yuan.lester@epa.gov.