

Tulane Institute

on Water Resources Law & Policy

Comments of the Tulane Institute on Water Resources Law & Policy Regarding the U.S. EPA's Draft Ambient Water Quality Criteria Recommendations for Lakes and Reservoirs of the Conterminous United States: Information Supporting the Development of Numeric Nutrient Criteria

Docket ID: EPA-HQ-OW-2019-0675

August 20, 2020

David P. Ross
Assistant Administrator, Office of Water
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Dear Mr. Ross,

On May 22, 2020, the United States Environmental Protection Agency (“EPA”) requested public comment on the Draft Ambient Water Quality Criteria Recommendations for Lakes and Reservoirs of the Conterminous United States: Information Supporting the Development of numeric Nutrient Criteria (“Draft Recommendations”), EPA Document Number: 820P20001.¹ The Tulane Institute on Water Resources Law and Policy (“the Institute”) welcomes the chance for public comment and has the following comments.

I. INTRODUCTION

The Institute is an organization whose mission is to foster understanding of the complex relationship between people and water, through the lens of law, policy, science, engineering, and resource management practices. Accordingly, the Institute is particularly interested in these Draft Recommendations and the EPA’s work to decrease nutrient pollution in lakes and reservoirs

¹ Draft Ambient Water Quality Criteria Recommendations for Lakes and Reservoirs of the Conterminous United States: Information Supporting the Development of Numeric Nutrient Criteria, 85 Fed. Reg. 31,184 (proposed May 22, 2020); Environmental Protection Agency, *Draft Ambient Water Quality Criteria Recommendations for Lakes and Reservoirs of the Conterminous United States: Information Supporting the Development of Numeric Nutrient Criteria* (May 22, 2020), <https://www.epa.gov/sites/production/files/2020-05/documents/draft-ambient-wqc-recommendations-lakes-2020.pdf>. [For clarification, the second source is EPA Document Number 820P20001 and has the same title as the Proposed Rule, but is the EPA’s supporting document which contains how the EPA developed the Proposed Rule, as well as the actual recommendations for the Proposed Rule – this is the document referred to throughout as “Draft Recommendations.”]

Tulane Institute

on Water Resources Law & Policy

throughout the United States. Eutrophication, which causes hypoxia, is a major problem in lakes and reservoirs that contributes to issues such as harm to fish and wildlife, public health concerns, destruction of habitat, loss of recreational areas, economic hardships, unsafe drinking water, and more. As climate patterns change and temperatures rise, the issue has become significantly more important. Therefore, the fact that the EPA is taking necessary steps in order to curtail hypoxia is a positive and welcome occurrence. However, overly broad and unenforceable limits and purely narrative criteria are ineffective and do little to actually limit hypoxia, as well as its negative effects in and on waterbodies. The Institute has the following comments on how the EPA can better manage nutrients and thus better control hypoxia in lakes and reservoirs throughout the United States. Further, while the Institute welcomes the 30-day comment period extension, a longer extension of 90 days would be more appropriate due to the size of the Draft Recommendations and the supporting documents produced by the EPA. The Institute's substantive comments are presented below.

II. COMMENTS

A. The EPA should add enforceability measures and clarify implementation procedures in the Draft Recommendations to better combat nutrient pollution in lakes and reservoirs.

While recommendation criteria such as these are helpful for states to determine their specific needs for their own waterbodies, a system of enforceability is crucial to fixing the hypoxia problem. The Draft Recommendations clarify that they are non-regulatory guidelines and are not legally binding. This is problematic if the goal is to actually reduce nutrients in waterbodies and to create healthier lakes and reservoirs that meet the attainment goals described. As evidenced by the continued problems in the Mississippi River Watershed and Gulf of Mexico Dead Zone, nutrient guidance and strategies without enforceability likely will result in very little, if any, meaningful change or successes.² The Institute understands that states should have their own tailored nutrient criteria; however, the EPA must have some way to hold them accountable when they fail to create such criteria or fail to meet enforceable limits. Further, the Draft Recommendation's language raises concerns specifically about implementation. If states do not implement nutrient criteria for lakes and reservoirs, they must submit an explanation to the EPA, but there appear to be no ramifications for failure to comply, or even examples of what appropriate rationales could be for not implementing criteria. States may be able to simply choose not to implement any nutrient criteria, submit an explanation, and not be required to implement any criteria in the future. The Draft Recommendations could be a positive start; but, if the EPA wants to take hypoxia seriously, the agency must add enforceability and more concrete

² See *Larger-than-average 'dead zone' expected for Gulf of Mexico*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., (June 3, 2020), <https://www.noaa.gov/media-release/larger-than-average-dead-zone-expected-for-gulf-of-mexico>.

implementation measures. Without any legal requirements, states are unlikely to implement and uphold meaningful nutrient criteria of their own accord.

B. The EPA should consider using a higher mean minimum dissolved oxygen (DO) concentration that is more protective of aquatic life when developing numeric nutrient criteria.

In developing the Draft Recommendations, the EPA used a DO threshold of 5 mg/L.³ However, this criterion is not protective enough for all aquatic life. The DO concentration required for aquatic life varies based on the size and complexity of the organism. For example, salmonids, a cold-water fish, need a DO concentration of at least 8 – 8.5 mg/L in order to grow; a DO concentration of at least 8 – 9 mg/L in order to maximize their swimming fitness; and a DO concentration of at least 9.75 mg/L for protection of larvae and mature eggs.⁴ Striped bass need a dissolved oxygen concentration of at least 6 mg/L in order to survive.⁵ Therefore, while a DO threshold of 5 mg/L will protect some aquatic organisms, others will be unable to survive.

Several states have recognized that a DO concentration of 5 mg/L is too low and have implemented a higher DO concentration threshold. For example, in Colorado, waters that are classified as “Class 1 Cold Water Biota” must have a DO concentration of at least 6 mg/L and at least 7 mg/L during spawning, and waters classified as “Class 1 Warm Water Biota” must have a DO concentration of at least 5 mg/L.⁶ Furthermore, because the numeric nutrient criteria recommendations made by the EPA were based on a DO concentration that is not sufficient to sustain *all* aquatic life, it should therefore be adjusted to a higher concentration.

Additionally, a fish assessment should be used as a measure of aquatic life. The Draft Recommendations emphasize cool-water and cold-water fish but do not go into sufficient detail on the conditions of fish in lakes and reservoirs. Fish assessments can be beneficial as an assessment of aquatic life attainment in waterbodies. The more information on this that the EPA includes in the Draft Recommendations, the better the guidance for states when implementing

³ EPA, *Draft Ambient Water Quality Criteria Recommendations for Lakes and Reservoirs of the Conterminous United States: Information Supporting the Development of Numeric Nutrient Criteria* (May 22, 2020) at 36, <https://www.epa.gov/sites/production/files/2020-05/documents/draft-ambient-wqc-recommendations-lakes-2020.pdf>.

⁴ Katharine Carter, *The Effects of Dissolved Oxygen on Steelhead Trout, Coho Salmon, and Chinook Salmon Biology and Function by Life Stage*, CAL. REG’L WATER QUALITY CONTROL BD. (August 2005), https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/shasta_river/060707/29appendixbetheeffeetsofdissolvedoxygenonsteelheadtroutcohosalmonandchinooksalmonbiologyandfunction.pdf.

⁵ *Dissolved Oxygen*, CHESAPEAKE BAY PROGRAM, https://www.chesapeakebay.net/discover/ecosystem/dissolved_oxygen.

⁶ *Aquatic Life Use Attainment: Methodology to Determine Use Attainment for Rivers and Streams*, COLORADO DEP’T OF PUB. HEALTH & ENV’T (August 7, 2017), https://www.colorado.gov/pacific/sites/default/files/Policy%2010-1_Appendices.pdf.

their own numeric nutrient criteria. Therefore, a fish assessment should be required to better understand the ideal concentration of DO to sustain all aquatic life in lakes and reservoirs would be.

C. The EPA should develop numeric nutrient criteria recommendations for ecoregions within each individual state.

Currently, the EPA has only published numeric nutrient criteria recommendations for lakes and reservoirs in 12 out of 14 ecoregions of the conterminous U.S.⁷ Numeric nutrient criteria were developed based on ecoregion to account for differences in geology, landforms, soils, vegetation, climate, land use, wildlife, and hydrology.⁸ However, accounting for only 12 ecoregions is insufficient to ensure that wildlife in lakes and reservoirs are adequately being protected because there is too much ecological variability within the different ecoregions. The Draft Recommendations, as written, are too broad to be applied generally across the United States. More ecoregion-specific and site-specific assessments should be given to best guide states on implementing numeric nutrient criteria.

Furthermore, the EPA created different hierarchical levels of ecoregions, ranging from broad to more specific areas. Currently, there are four levels in the continental U.S.: Level I (12 ecoregions), Level II (25 ecoregions), Level III (105 ecoregions), and Level IV (967 ecoregions).⁹ Given that the EPA itself has recognized the high degree of ecological diversity present throughout the conterminous U.S., steps should be taken to protect more than just 12 ecoregions. Therefore, the Institute recommends that numeric nutrient criteria be developed for the different ecoregions within each state.

D. The EPA should conduct a more up-to-date National Lakes Assessment (NLA).

To assess the current conditions of lakes throughout the United States, the EPA conducts an NLA every five years. Currently, only data from 2007 and 2012 have been released. The sample data from the 2017 assessment are still being processed.¹⁰ In order to develop draft numeric nutrient criteria, the EPA used NLA data from 2012 that linked designated uses (aquatic life, recreation, and drinking water) to Chlorophyll *a* (Chl *a*), total nitrogen (TN), and total

⁷ *Ecoregional Nutrient Criteria for Lakes and Reservoirs*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/nutrient-policy-data/ecoregional-nutrient-criteria-lakes-and-reservoirs>.

⁸ *Ecoregions*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/eco-research/ecoregions>.

⁹ *Id.*

¹⁰ Amina I. Pollard et al., *The Promise and Potential of Continental-Scale Limnology Using the U.S. Environmental Protection Agency's National Lakes Assessment*, LIMNOLOGY AND OCEANOGRAPHY BULLETIN (2018), <https://doi.org/10.1002/lob.10238>.

phosphorus (TP).¹¹ However, this data is not current enough to develop accurate numeric nutrient criteria. The conditions of lakes in the United States have undoubtedly changed since 2012, and any strategy to reduce the amount of nutrient pollution within them should be based on up-to-date data.

Moreover, the EPA itself has admitted that “the number of samples is limited within the national data set that is available to estimate relationships within any single state, and uncertainty in estimating relationships specific to a single state is higher than that associated with the national models.”¹² Therefore, the Institute recommends that the NLA incorporate more samples in order to better understand the specific conditions in individual states. As previously stated, it is important that the EPA develops numeric nutrient criteria for ecoregions within each state. However, without accurate and sufficient data from the NLA, this goal cannot be accomplished.

E. The EPA should consider cellular respiration in the Draft Recommendations.

Cellular respiration is the opposite of photosynthesis in nature; photosynthesis creates energy, while cellular respiration breaks down energy. The conceptual graphs in the Draft Recommendations indicate only photosynthesis by showing the arrows always moving in one direction. That is not always true in nature; rather, organic matter is cyclical in nature. Further, organic matter has other sources besides phytoplankton and macrophytes, which are the only sources that are described in the Draft Recommendations. Therefore, because the Draft Recommendations’ graphs do not consider cellular respiration or any sources of organic matter besides phytoplankton and macrophytes, they are not fully informative or informed for creating such guidance. The EPA should consider all of these aspects to develop a better understanding of how hypoxia affects lakes and reservoirs, and thus how it can be best limited throughout the United States.

F. The EPA should study other types of cyanotoxins in the Draft Recommendations.

In the Draft Recommendations, the primary cyanotoxin group referenced is microcystin. However, there are other cyanotoxins worth studying and mentioning when developing guidance nutrient criteria for waterbodies. The EPA’s own cyanotoxin health effects website describes cylindrospermopsin and anatoxin-a. These are other groups of cyanotoxins that cause similar, and in some cases worse, public health issues.¹³ While microcystin is one of the most common

¹¹ Draft Ambient Water Quality Criteria Recommendations for Lakes and Reservoirs of the Conterminous United States: Information Supporting the Development of Numeric Nutrient Criteria, 85 Fed. Reg. 31,184 (proposed May 22, 2020); EPA, *Draft Ambient Water Quality Criteria Recommendations for Lakes and Reservoirs of the Conterminous United States: Information Supporting the Development of Numeric Nutrient Criteria* (May 22, 2020), <https://www.epa.gov/sites/production/files/2020-05/documents/draft-ambient-wqc-recommendations-lakes-2020.pdf>.

¹² *Id.* at 62.

Tulane Institute

on Water Resources Law & Policy

cyanotoxins, other recognized cyanotoxin groups, such as cylindrospermopsin and anatoxin-a, that have negative health effects, should also be considered in the Draft Recommendations when determining nutrient criteria for lakes and reservoirs.

G. CONCLUSION

These comments, along with the others submitted by water resource organizations and state agencies, scientific groups, and interested individuals will create a better nation-wide nutrient strategy for lakes and reservoirs to curb hypoxia and its harmful effects nationwide. The inclusion of enforcement procedures is crucial to creating meaningful successes based on the Draft Recommendations' guidance. The Institute hopes that the EPA will consider all of the comments and make the necessary changes to better protect public health and the environment.

Sincerely,

Mark S. Davis
Eugenie Schwartz Professor of River and Coastal Studies
Director, Tulane Institute on Water Resources Law and Policy
Director, Tulane ByWater Institute
Director, Tulane Center for Environmental Law
6325 Freret Street
New Orleans, LA 70118
504-865-5982

¹³ *Health Effects from Cyanotoxins*, U.S. ENVTL. PROT. AGENCY, , <https://www.epa.gov/cyanohabs/health-effects-cyanotoxins>.