

Recommended Nutrient Criteria for Lakes and Reservoirs

Submitted to:

Division of Water and Waste Management
West Virginia Department of Environmental Protection

Submitted by:

West Virginia Division of Forestry

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Introduction

The West Virginia Division of Forestry (DOF) appreciates the opportunity to serve on the Nutrient Criteria Committee (NCC). The hard work of all NCC committee members is evident and the DOF applauds their efforts to develop nutrient criteria recommendations for the state's waters. However, consensus for lakes and reservoirs was not reached during the April 7, 2006 conference call. Therefore the DOF is submitting this position paper to the West Virginia Division of Environmental Protection (DEP).

Background

West Virginia is approximately 80% forested. West Virginia's forests provide clean water, recreational opportunities, wildlife habitat, and wood products. The forest industry of West Virginia generates \$4.0 billion dollars annually to the state's economy. The industry provides more than 30,000 jobs and each county has a segment of the wood industry as an employer. Moreover, the forest products sector is the largest employer in many of these counties.

Approximately 1.8 million West Virginians rely on clean water for drinking, cooking, bathing, swimming, and fishing. To help insure that water quality in West Virginia is safe, the Legislature passed the Logging Sediment Control Act (LSCA) in 1992. The LSCA requires that logging operations be registered and supervised by individuals who have completed the DOF certification program. In addition, the loggers are required to use best management practices to prevent erosion and sedimentation problems in streams, rivers, lakes, reservoirs, and other bodies of water. DOF Foresters perform inspections of logging operations to insure LSCA compliance

Discussion on Methods for Developing Criteria:

The January 12, 2006 Nutrient Criteria Development Plan for West Virginia indicated that the NCC would consider the following methods for developing Nutrient Criteria:

1. " Empirical and / or cause and effect analyses based on West Virginia Data.
2. Empirical and / or cause and effect analyses based on other data.
3. Alternatives to the first two approaches are to define when and under what circumstances referenced-based or other methods might be appropriate."

The EPA eco-regional dataset was not adopted by the NCC for use with a referenced-based approach because it is not representative of West Virginia. The NCC and the West Virginia Coal Association each conducted cause and effect analyses using regression techniques. Each analyses contained large amounts of variability that could not be explained. The data set appeared to be too small and did not seem to have good enough quality for linear and multiple regression techniques to produce reliable numbers for recommended criteria.

DEP used the Trophic State Index (TSI) method in the Clean Lakes Program. However, according to the Virginia Academic Advisory Committee Report TSI is not suitable for use in constructed impoundments because sediment enters after precipitation events and interferes with accurate assessment of the relationship between TSI components (VAAC 2005a).

Because reference-based, cause and effect, and TSI methods have not been able to be successfully used, a literature based approach appears to be the only remaining alternative. The Virginia Academic Advisory Committee's report and addendum appear to be the best literature sources available for recommending nutrient criteria for WV lakes and reservoirs.

Criteria Recommendation

Warmwater Fishery

Based on review of Virginia literature, the recommended criteria are not less than 50 ug/l for average total phosphorous and 35-60 ug/l 90th percentile for Chlorophyll A (VAAC 2005a, 2005b). These criteria apply to Categories B and C. They are for chronic conditions as nutrient effects do not seem to be acute.

Coolwater Fishery

More information and research are needed before criteria can be recommended. Managing for coolwater fisheries may have negative impacts on warmwater fisheries.

Definition

The lakes subject to his criteria include "natural and artificial impoundments with a surface area greater than 10 acres and a mean water residence time of 14 or more days (EPA 2000)". Secchi depth and nitrogen are not recommended to be included in the criteria for lakes and reservoirs.

Water Quality Sampling

A minimum of four samples are needed. Samples are to be taken near the dam of each impoundment, in the area that is most like a lake. Samples are to be taken in the hypolimnion (< 1 meter below the surface). When multiple samples are taken on the same day, they are to be averaged and treated as one reading.

Literature Cited

USEPA. 2000. Nutrient Criteria Technical Guidance Manual: Lakes and Reservoirs, United States Environmental Protection Agency, Washington, DC EPA-822-B00-001.

VAAC. 2005a. January 2005 Report of the Academic Advisory Committee to the Virginia Department of Environmental Quality: Freshwater Nutrient Criteria. January 2005.

VAAC. 2005b. Report of the Academic advisory Committee to the Virginia Department of Environmental quality: Freshwater Nutrient Criteria, Addendum to January 2005 Report. May 2005.

