



Ambient Water Quality Criteria Recommendations

**Information Supporting the Development
of State and Tribal Nutrient Criteria**

Rivers and Streams in Nutrient Ecoregion II



AMBIENT WATER QUALITY CRITERIA RECOMMENDATIONS

**INFORMATION SUPPORTING THE DEVELOPMENT OF STATE AND TRIBAL
NUTRIENT CRITERIA**

FOR

RIVERS AND STREAMS IN NUTRIENT ECOREGION II

Western Forested Mountains

*including all or parts of the States of
Washington, Oregon, California, Idaho, Montana, Wyoming, Utah, Colorado, South Dakota,
New Mexico, Arizona*

and the authorized Tribes within the Ecoregion

U.S. ENVIRONMENTAL PROTECTION AGENCY

**OFFICE OF WATER
OFFICE OF SCIENCE AND TECHNOLOGY
HEALTH AND ECOLOGICAL CRITERIA DIVISION
WASHINGTON, D.C.**

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EXECUTIVE SUMMARY

Nutrient Program Goals

EPA developed the National Strategy for the Development of Regional Nutrient Criteria (National Strategy) in June 1998. The strategy presents EPA's intentions to develop technical guidance manuals for four types of waters (lakes and reservoirs, rivers and streams, estuaries and coastal waters, and wetlands) and produce section 304(a) criteria for specific nutrient ecoregions by the end of 2000. In addition, the Agency formed Regional Technical Assistance Groups (RTAGs) which include State and Tribal representatives working to develop more refined and more localized nutrient criteria based on approaches described in the waterbody guidance manuals. This document presents EPA's current recommended criteria for total phosphorus, total nitrogen, chlorophyll *a*, and turbidity for rivers and streams in Nutrient Ecoregion II (Western Forested Mountains) which were derived using the procedures described in the Rivers and Streams Nutrient Criteria Technical Guidance Manual (U.S. EPA, 2000b).

EPA's ecoregional nutrient criteria are intended to address cultural eutrophication-- the adverse effects of excess nutrient inputs. The criteria are empirically derived to represent conditions of surface waters that are minimally impacted by human activities and protective of aquatic life and recreational uses. The information contained in this document represent starting points for States and Tribes to develop (with assistance from EPA) more refined nutrient criteria.

In developing these criteria recommendations, EPA followed a process which included, to the extent they were readily available, the following elements critical to criterion derivation:

! Historical and recent nutrient data in Nutrient Ecoregion II.

Data sets from Legacy Storet, NASQAN, NAWQA and EPA Region10 were used to assess nutrient conditions from 1990 to 1998.

! Reference sites/reference conditions in Nutrient Ecoregion II. Reference sites/reference conditions in Nutrient Ecoregion II were based on the rivers and streams population distribution approach using a representative sample of all rivers and streams within the Ecoregion (see Nutrient Criteria Technical Guidance Manual-Rivers and Streams July 2000, EPA-822-B00-002. Most of the rivers in this ecoregion show relatively low concentrations of TN and TP and low turbidity. This probably results from the relatively extensive mountain ranges included in the stream sampling. States and Tribes are urged to determine their own reference sites for rivers and streams within the ecoregion at different geographic scales and to compare them to EPA's reference conditions.

! Models employed for prediction or validation.

EPA did not identify any specific models used in the ecoregion to develop nutrient criteria. States and Tribes are encouraged to identify and apply appropriate models to support nutrient criteria development.

! RTAG expert review and consensus.

EPA recommends that when States and Tribes prepare their nutrient criteria, they obtain the expert review and consent of the RTAG.

! Downstream effects of criteria.

EPA encourages the RTAG to assess the potential effects of the proposed criteria on downstream water quality and uses.

In addition, the following **QA/QC procedures** were followed during data collection and analysis: all data were reviewed for duplications. All data are from ambient waters that were not located directly outside a permitted discharger. The following States indicated that their data were sampled and analyzed using either Standard methods or EPA approved methods: Idaho, Washington, and Oregon.

The following tables contain a summary of Aggregate and level III ecoregion values for TN, TP, water column chl a, and turbidity:

BASED ON 25th PERCENTILES ONLY

| Nutrient Parameters | Aggregate Nutrient Ecoregion II Reference Conditions |
|---|---|
| Total phosphorus (µg/L) | 10.0 µg/L |
| Total nitrogen (mg/L) | 0.12 mg/L |
| Chlorophyll <i>a</i> (µg/L) (Fluorometric method) | 1.08 µg/L |
| Turbidity (FTU) | 1.3 NTU |

For subcoregions 1, 2, 4, 5, 8, 9, 11, 15, 16, 17, 19, 21, 23, 41, 77, and 78 the ranges of nutrient parameter reference conditions are:

BASED ON 25th PERCENTILE ONLY

| Nutrient Parameters | Range of Level III Subcoregions Reference Conditions |
|---|---|
| Total phosphorus (µg/L) | 3.0-32.5 µg/L |
| Total nitrogen (mg/L) | 0.0-0.53 mg/L |
| Chlorophyll <i>a</i> (µg/L) (Fluorometric method) | 0.7-2.95 µg/L |
| Turbidity (NTU) | 0.25-5.5 NTU |