

INTRODUCTION TO CRITERIA DEVELOPMENT

Tribal Water Quality Standards Academy



WATER QUALITY CRITERIA DEFINITION

- **Concentration, Level or Statement in Water Quality Standards**
- **Intended to Protect and Support a Designated Use**

“CRITERIA”

1 WORD - 2 MEANINGS

- 1. Scientifically defensible guidance developed and published by EPA per CWA Section 304(a)**
 - Basis for Federal promulgation when necessary**
- 2. Adopted part of State/tribal water quality standards**
 - Section 303(c)**

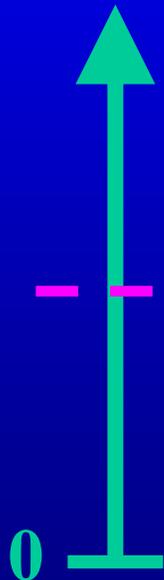
INCLUSION OF POLLUTANTS

- States Must Adopt Criteria That Protect the Designated Use
 - Must Be Based on Sound Scientific Rationale
 - Must Contain Sufficient Parameters or Constituents to Protect Designated Use
 - Must Support the Most Sensitive Use

See 40 CFR 131.11

RELATIONSHIP OF CRITERIA TO RISK

Water Quality
Parameter



Designated Use Threatened

Human Health and/or
Aquatic Life May be at Risk

CRITERION LEVEL

Designated Use Protected

No Significant Risk Posed

FORM OF CRITERIA

- States Should Adopt (1) Numerical Criteria Based on:
 - 304(a) Guidance, or
 - 304(a) Guidance Modified to Reflect Site-Specific Conditions, or
 - Other Scientifically Defensible Methods
- And (2) Narrative Criteria or Criteria Based on Biological Monitoring and Assessment Methods to Supplement Numerical Criteria

NUMERIC CRITERION EXAMPLE

For the protection of Human Health from the Toxic Effects of Copper, the Concentration of Copper in Water Should not Exceed the Recommended Criterion Level of 1300 $\mu\text{g}/\text{L}$.



NARRATIVE CRITERION EXAMPLE

- Surface Waters Shall be Virtually Free from Floating Non-Petroleum Oils of Vegetable or Animal Origin, as Well as Petroleum-Derived Oils.



SPECIAL REQUIREMENTS FOR PRIORITY POLLUTANTS

- **CWA Section 303(c)(2)(b) Requires States to Adopt Criteria for Priority Pollutants (those listed in Section 307(a)) Where EPA Has Published 304(a) Guidance**
- **States Must Identify How They Intend to Regulate Point Sources of Priority Pollutants if They Use Narrative Criteria**

TYPES OF WATER QUALITY CRITERIA

- **Human Health Criteria**
- **Bacteriological Criteria**
- **Aquatic Life Criteria**
- **Biological Criteria**
- **Nutrient Criteria**

HUMAN HEALTH CRITERIA

- **Expressed as a Pollutant Concentration Based on:**
 - **Toxicological Assessment**
 - **Exposure Scenario**
- **Calculated for Ingestion of Aquatic Organisms Only and for Ingestion of Water and Organisms**

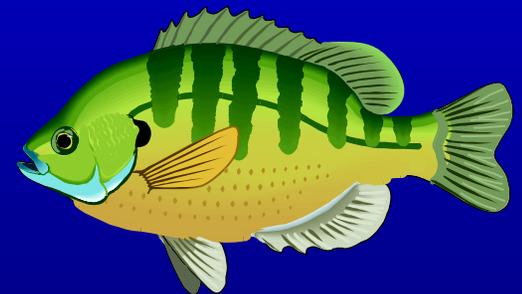
BACTERIOLOGICAL CRITERIA

- **Expressed as a Bacterial Indicator Concentration Based on:**
 - **Epidemiological Studies**
 - **Selected Unacceptable Illness Rate**
- **Intended to Protect Recreational Uses from Unacceptable Rate of Gastrointestinal Illness During Swimming**

AQUATIC LIFE CRITERIA

Contain:

- **A Concentration of Exposure**
 - (how much - magnitude)
- **A Time Period of Exposure**
 - (how long - duration)
- **A Frequency of Exposure**
 - (how often - frequency)



FOUR TYPES OF AQUATIC LIFE CRITERIA

**Saltwater:
Chronic
(4-Day Average)**

**Freshwater:
Chronic
(4-Day Average)**

**Saltwater:
Acute
(1-Hour Average)**

**Freshwater:
Acute
(1-Hour Average)**

BIOLOGICAL CRITERIA

- **Biological Criteria Describe the Desired Biological Condition of Surface Waters for a Specific Aquatic Life Designated Use**
- **Developed Based on an Appropriate Reference Condition**
- **Expressed as Narrative or Numeric**

EXAMPLES OF BIOCRITERIA

- **Narrative:**
 - **“Waters Shall Be Free From Substances in Concentrations or Combinations That Would Adversely Alter the Structure and Function of Aquatic Communities, as Defined by the Reference Condition”**
- **Numeric:**
 - **Class I Cool Water Aquatic Life**
 - **Taxa Richness: 5**
 - **EPT Index: 3**

NUTRIENT CRITERIA

- **Expressions of Allowable Levels of Nutrients Related Biological and Chemical Response Variables to Protect Aquatic Life and Recreational Uses**
- **Developed for Specific Ecoregions and Waterbody Types Based on a Reference Condition or Other Scientifically Defensible Approach**