WQS
Water Quality Standards

Module 7
Introduction to Criteria

- What exactly is meant by the term "Criteria"?

- What do the WQS regulations require for state adopted criteria?

- For what types of criteria has EPA developed recommendations?

Water Quality Criteria (40 CFR 131.3)

- Discussed in Sections 304(a) and 303(c) of the Act
- A concentration, level or narrative statement
- Represent a level of water quality that supports a particular use
- When criteria are met, water quality will protect the designated use

Water Quality Criteria
1 Word – 2 Meanings

- Scientifically defensible guidance developed and published by EPA per
  CWA § 304(a)
  - Basis for Federal promulgation when necessary

- Adopted part of State/Tribal WQS
  - Section 303(c)

Water Quality Criteria Requirements (40 CFR 131.11)

- States/Tribes Must adopt criteria that protect the designated use
  - Based on a sound, scientific rationale
  - Sufficient parameters to protect the designated use
  - Must support the most sensitive use (for waters with multiple use designations)

Water Quality Criteria: Forms
(40 CFR 131.11b)

- States and Tribes should adopt numeric criteria based on:
  - 304(a) guidance
  - 304(a) guidance modified to reflect site specific conditions
  - Other scientifically defensible methods
- States/Tribes should adopt narrative criteria:
  - Where numeric criteria cannot be established
  - Or to supplement numeric criteria

Special Criteria Requirements for CWA 307(a) "Priority Pollutants"

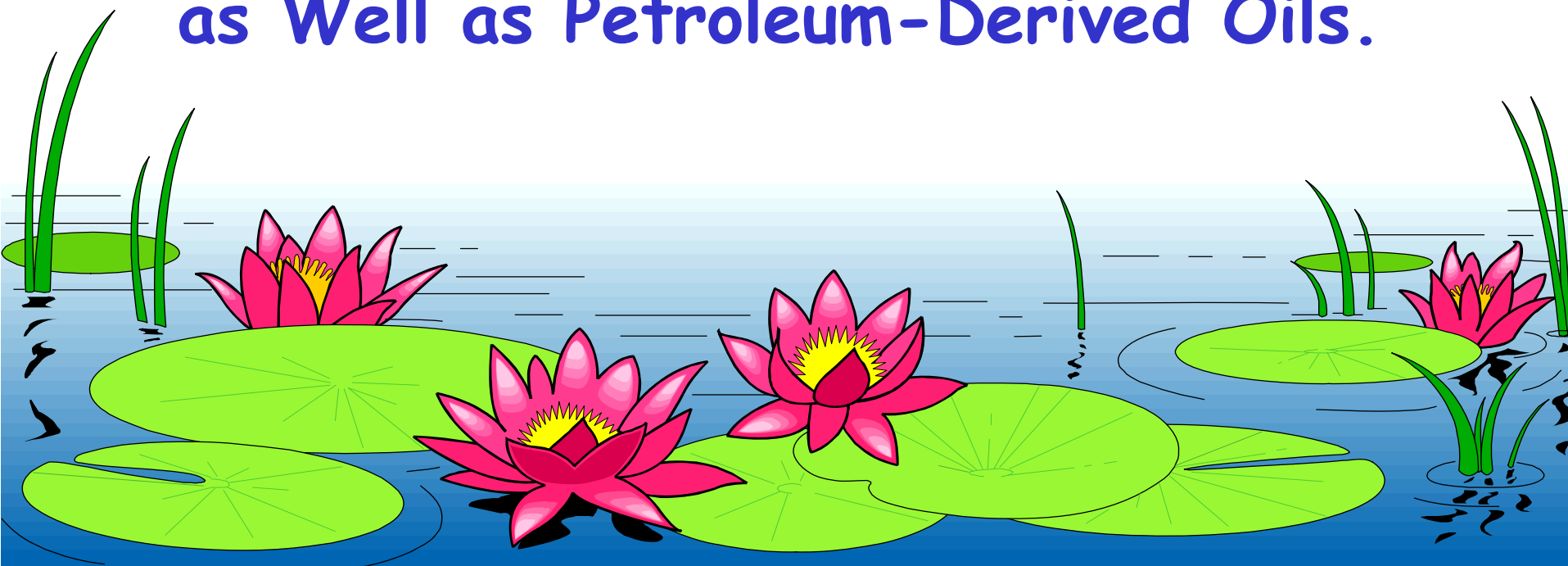
- 1987 CWA Amendment - CWA Section 303(c)(2)(B)
- For 307(a) Pollutants Where EPA Has Published 304(a) Guidance – States Shall Adopt Numeric Criteria Where Discharge/Presence Can Reasonably be Expected to Interfere with Designated Uses
- States Must Identify How They Intend to Regulate Point Sources of Priority Pollutants if They Use Narrative Criteria
- EPA Promulgation

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 µg/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.



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TYPES OF WATER QUALITY CRITERIA

- Human Health Criteria
- Bacteriological Criteria
- Aquatic Life Criteria
- Sediment Quality Assessments
- Biological Criteria
- Nitrogen and Phosphorus Criteria
- Others

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HUMAN HEALTH CRITERIA

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

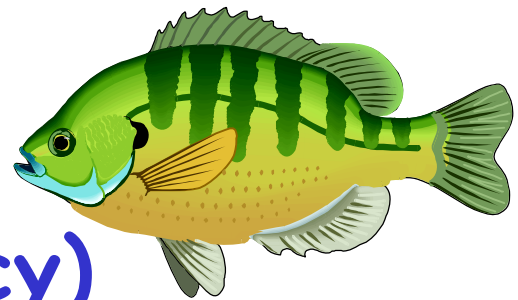
BACTERIOLOGICAL CRITERIA

- 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

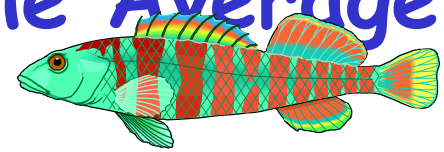
Contain:

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



AQUATIC LIFE CRITERION EXAMPLE

Freshwater Aquatic Organisms and their Uses Shall not be Affected Unacceptably if the *4-Day Average* Concentration of Chemical X does not Exceed *2.0 µg/L* more than *Once Every 3 Years* on the Average, and if the *1-hour Average* Concentration does not Exceed *4.3 µg/L more than once every three years* on the Average.



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)

SEDIMENT QUALITY ASSESSMENTS

Types of Assessments include:

- Sediment chemistry
- Sediment toxicity
- Benthic community
- Bioaccumulation

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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

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EXAMPLES OF BIOCRITERIA

- Narrative:
  - "…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:
  - Index of Biotic Integrity (IBI)
  - Observed / Expected
  - Biomass

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 /Waterbody Types Based on a Reference Condition or Other Scientifically Defensible Approach
  - e.g., Stressor - Response