

Setting the Stage: Key Classification Concepts

Implementation-based vs. Ecologically-based Classifications Schemes

- Ecologically-based classifications schemes improve the precision of assessments & interpretation of water quality data, whereas Implementation-based schemes are intended to improve the application of water quality programs.
- Generalizations intrinsic within classification are not as accurate as site-specific studies, yet they are important because they make it possible to manage statewide resources
- Ecological and Implementation-based classifications need to be considered in the context of nutrient-criteria and associated management programs.

Ecologically-Based Classifications

- They are intended to account for *natural* environmental variation
 - e.g., a [P] of 0.05 ppm has different effects in different places
 - There is no reason to consider an ecological classification scheme if it doesn't reduce natural variation of water quality stressors or responses
 - Human-caused differences among waters are important (especially irreversible changes), but this speaks to management objectives and water quality goals, not what is needed to ensure the protection of uses
 - With increasing classifications the pool of available data shrinks sometimes making it more difficult to discern between natural variation and human alterations.
- They are derived from empirical & scientific observations
 - One must evaluate and document these relationships
- They are used to set different nutrient criteria in different places or to change the interpretation of assessment data
 - What [P] or [N] is too high?

Examples of Ecological Classification Schemes *Nutrient Criteria Context*

Waterbody Types: Lakes, Wetlands, Streams

typically used as the "first cut", often subcategorized

Ecoregions: Most Commonly Conglomerates

- Fairly coarse, but can be easily mapped

Key Physical Attributes: Slopes, Size, Temperature

- Best account for natural gradients, but definitions require field data
- Useful in setting criteria or creating assessment methods

- What responses to nutrients are considered too great?
- How green is too green? Should we expect water clarity to be the same in a naturally warm vs. naturally cold-water lakes or streams?
- Ecologically-based classifications are reviewed by EPA and based upon their scientific merits
 - Numeric criteria associated with classes must be derived with accepted analytical methods
- Ecological classifications are used to define specific water quality goals, but this is done by defining aquatic life uses, which is a separate albeit related process

Implementation-based Classifications

- Describe management processes and decisions for different types of waters and different types of uses.
- Can consider both natural and human-caused gradients
- Useful for taking into account social and economic constraints
- Much flexibility in terms of how the classes are created—decisions simply need to be logical, fair, and transparent
- Can be used, in conjunction with variances and technology-based processes, to phase in requirements
- Higher, less-populated water bodies are less controversial, but this is not where nutrient-related problems exist
- **Others?**

Examples of Management Classification Schemes
Nutrient Criteria Context

Antidegradation Protection Classes

- Class 1: USFS land, Class 2: Special Designation, Class 3: Most

Aquatic Life Designated Uses

- Used to set water quality goals
- Difficult to change

Assessment Methods

- Distinguish: lakes, wetlands, and streams

Assessment Results

- Category 5: Impaired, TMDL Required
- Category 4: TMDL Complete