RIDEM's Use of Performance-Based Limits for Nutrients in RIPDES Permits

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Why Limit Nutrients?

(Aesthetic/Habitat Impacts)

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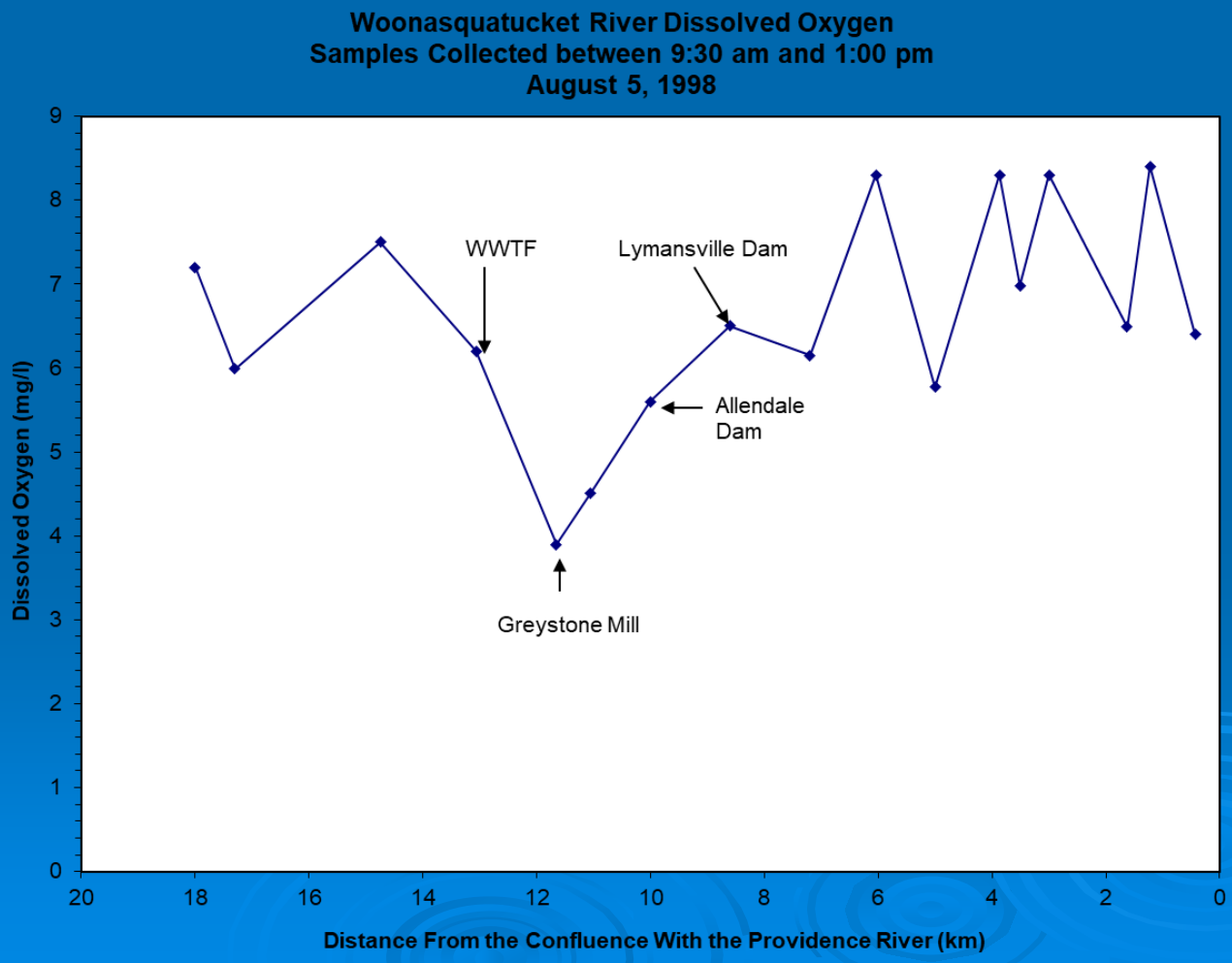
(DO Impacts)



Freshwater Nutrient WQ Criteria

(Numeric/Narrative)

- **Average Total Phosphorus shall not exceed 0.025 mg/l in any lake, pond, kettlehole or reservoir,** and average Total P in tributaries at the point where they enter such bodies of water shall not cause exceedance of this phosphorus criteria, except as naturally occurs, unless the Director determines, on a site-specific basis, that a different value for phosphorus is necessary to prevent cultural eutrophication.
- **None in such concentration that would impair any usages specifically assigned to said Class**, or cause undesirable or nuisance aquatic species associated with cultural eutrophication, nor cause exceedance of the criterion above in a downstream lake, pond, or reservoir. New discharges of wastes containing phosphates will not be permitted into or immediately upstream of lakes or ponds. **Phosphates shall be removed from existing discharges to the extent that such removal is or may become technically and reasonably feasible**.
- Shall not exceed the following limitations and/or more stringent site-specific limits necessary to prevent or minimize accelerated or cultural eutrophication.

Saltwater Nutrient WQ Criteria
(Numeric/Narrative)

- **None in such concentration that would impair any usages specifically assigned to said Class**, or cause undesirable or nuisance aquatic species associated with cultural eutrophication. Shall not exceed site-specific limits if deemed necessary by the Director to prevent or minimize accelerated or cultural eutrophication. **Total phosphorus, nitrates and ammonia may be assigned site-specific permit limits based on reasonable Best Available Technologies.** Where waters have low tidal flushing rates, applicable treatment to prevent or minimize accelerated or cultural eutrophication may be required for regulated nonpoint source activities.
- Shall not exceed the following limitations and/or more stringen site-specific limits necessary to prevent or minimize accelerated or cultural eutrophication.

But What's a "lake, pond, kettlehole or reservoir"

- Riverine impoundments with retention times greater than 14 days.
- RI used 7Q10 flow to calculate retention time
- If greater than 14 days, calculate limits to be protective of the 0.025 mg/L criteria.

What if it's not a "Lake"?

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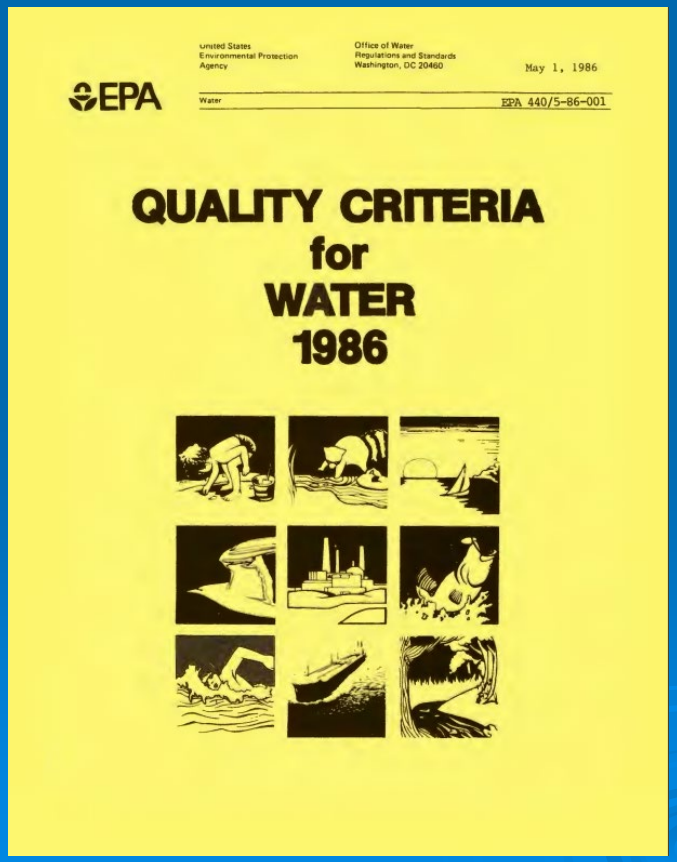
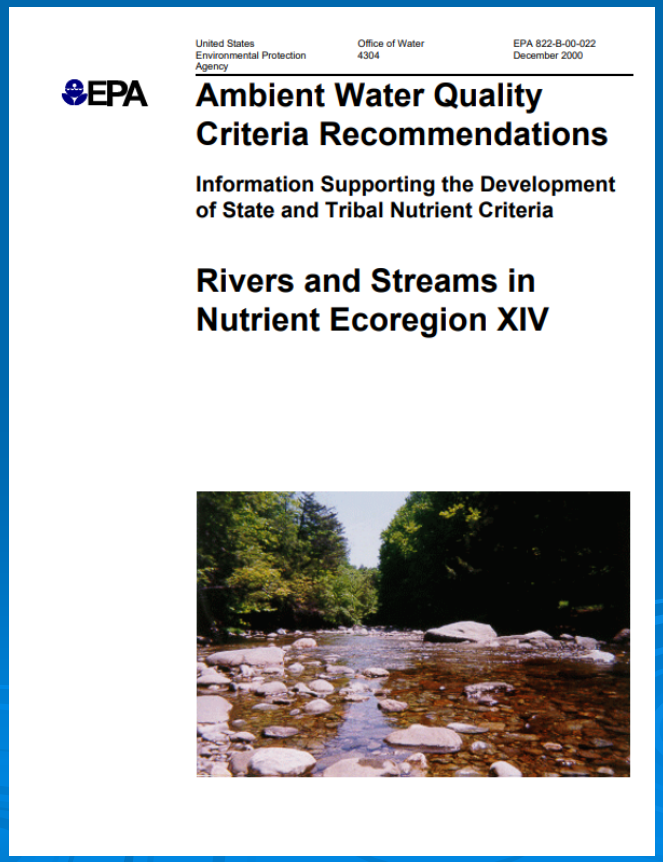
- RI's Criteria is narrative
  - "None in such concentration that would impair any usages specifically assigned to said Class…"
- However, EPA has published numeric criteria





RI's Process

(No Downstream "Lakes")

1. Determine the in-stream concentration that would result using:
    A. Design Flow (Max Monthly Average)
    B. 7Q10 Receiving Water Flow
    C. Various TP Technology concentrations (1.0, 0.2, and 0.1 mg/L)
    D. 80% allocation w/o background data and 90% allocation w/ background data
2. Compare to the Gold Book and Ecoregion Criteria (i.e., 100 and 23.75 ug/L for flowing streams)
3. Select the appropriate Technology-Based limit that results in an:
    Gold Book Criteria < IWC < Ecoregion

RI's Process
(Downstream "Lakes")

1. Calculate Water Quality-Based limit that is protective of the downstream impoundment (e.g., 25 ug/L criteria)
2. Determine the in-stream concentration that would result using: Design Flow, 7Q10 Flow, and Limit from Step 1
3. Compare the IWC to the Gold Book and Ecoregion Criteria
   A. If Gold Book < IWC < Ecoregion then assign limit from Step 1.
   B. If not go to Step 4
4. Calculate IWC at various TP Technology concentrations (1.0, 0.2, and 0.1 mg/L)
5. Select the appropriate Technology-Based limit that results in:
   A. An Gold Book Criteria < IWC < Ecoregion AND
   B. Concentration in the downstream impoundment < 25 ug/L

Questions?

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