

Development of Numeric Nutrient Criteria for Waters of the State of Delaware and Delaware Bay/Estuary Nutrient DO Concerns

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Nutrient Criteria Development Project Status

- State wide TMDLs for nutrients in almost every watershed
- DNREC is pursuing cause/effect numeric criteria with a weight of the evidence approach. Do not think purely statistical approach is appropriate.

Project Status, cont.

- Two researchers have assisted DNREC in establishing cause/response relationships for nutrients:
 - Dr. Kent Price (University of Delaware) has studied estuarine systems
 - Dr. John Davis (Widener University) is currently studying ponds and Piedmont stream systems
- DNREC will use the results of the above studies as part of the weight of evidence to propose numeric nutrient criteria and work with stakeholders

Project Status, cont.

- For fresh waters cause/effects Dr Davis' results so far indicate :
- Biomass to Nutrients – weak
- Macroinvert vs nutrients – potential
- Periphyton-nutrients – potential
- Gross Primary Productivity – nutrients P~
0.10 mg/L

Adoption of Nutrient Criteria

- Going to focus on free flowing fresh waters first
- Possible proposed criteria for upcoming Triennial Review

Delaware Bay/Estuary Concerns

- 2006: Listed Zone 5c for DO in accordance with DRBC 305(b)
 - 13% of Daily averages (continuous monitoring data) at Reedy Island below the criteria for 2002-2004
- Have been prior indications of DO below criteria in the Estuary/Bay
 - just under 10% of Jersey Shellfish data below minimum DO (2000-2002)
 - Low DO at Delaware Trib mouths attributed to near shore effects from tribs

Delaware Bay/Estuary Concerns

- May need to update DO Criteria
 - Could be higher or lower
- Certainly need to do more widespread DO monitoring
- May end up with de-facto nutrient criteria or controls as a result of TMDL studies and/or TMDL
- Current Bay nutrient levels will impact Delaware Tributaries as Tribs come into compliance with TMDLs