Indicators in the State of the Estuary / State of the Basin Technical Reports

NJWMC

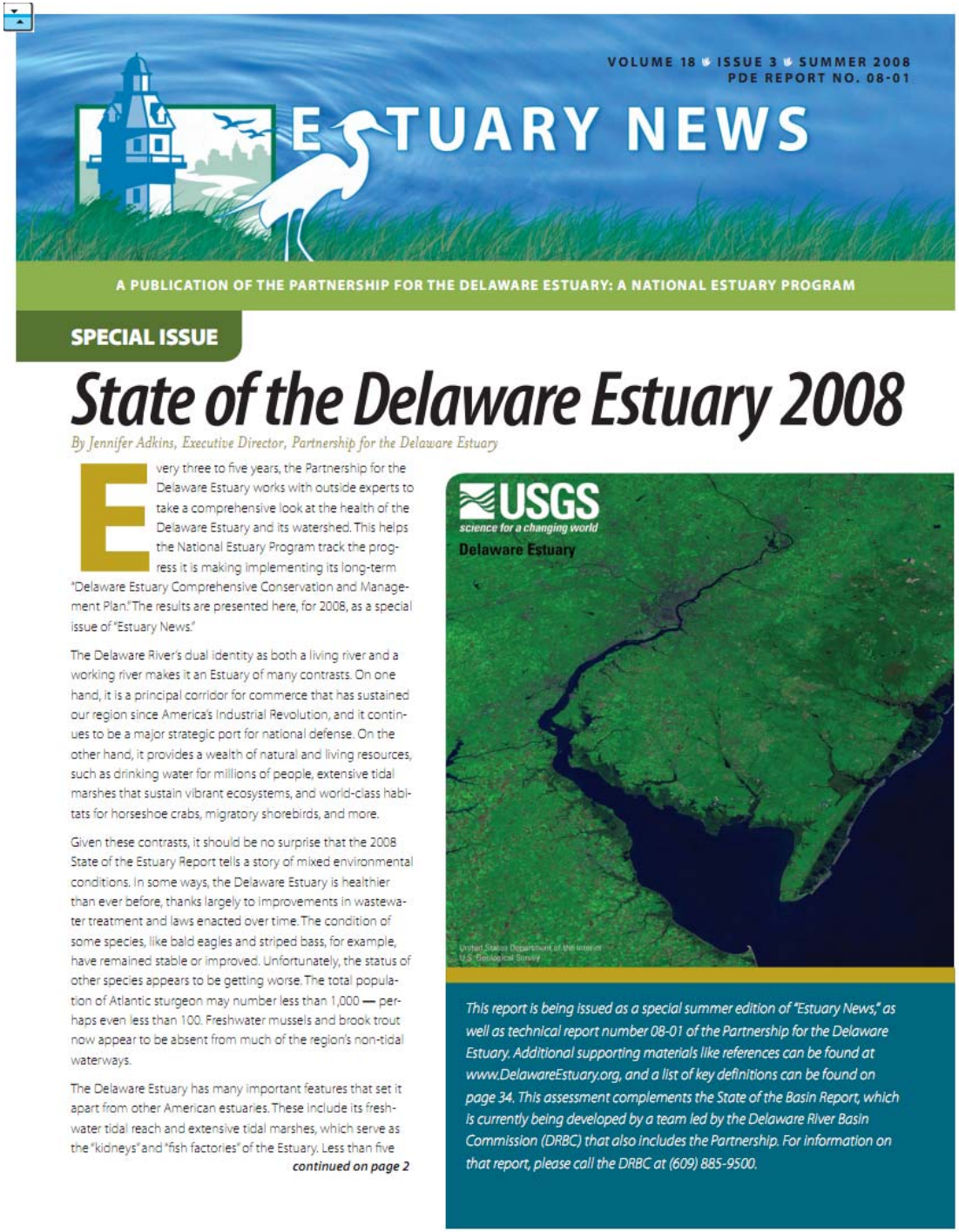
January 25, 2012

John Yagecic, P.E.

Delaware River Basin Commission

Timetable

- December 2009 – Finalize Indicators
- 2010 – 2011 – Drafting of Technical Reports
- February 2011 – Poster presentations at PDE Science Conference
- November 2011 – Draft technical reports complete
- December 31, 2011 – Final Layout complete
- January 31, 2011 – Full TREB reports complete and electronically published



VOLUME 18 • ISSUE 3 • SUMMER 2008
PDE REPORT NO. 08-01

ESTUARY NEWS

A PUBLICATION OF THE PARTNERSHIP FOR THE DELAWARE ESTUARY: A NATIONAL ESTUARY PROGRAM

SPECIAL ISSUE

State of the Delaware Estuary 2008

By Jennifer Adkins, Executive Director, Partnership for the Delaware Estuary

Every three to five years, the Partnership for the Delaware Estuary works with outside experts to take a comprehensive look at the health of the Delaware Estuary and its watershed. This helps the National Estuary Program track the progress it is making implementing its long-term "Delaware Estuary Comprehensive Conservation and Management Plan." The results are presented here, for 2008, as a special issue of "Estuary News."

The Delaware River's dual identity as both a living river and a working river makes it an Estuary of many contrasts. On one hand, it is a principal corridor for commerce that has sustained our region since America's Industrial Revolution, and it continues to be a major strategic port for national defense. On the other hand, it provides a wealth of natural and living resources, such as drinking water for millions of people, extensive tidal marshes that sustain vibrant ecosystems, and world-class habitats for horseshoe crabs, migratory shorebirds, and more.

Given these contrasts, it should be no surprise that the 2008 State of the Estuary Report tells a story of mixed environmental conditions. In some ways, the Delaware Estuary is healthier than ever before, thanks largely to improvements in wastewater treatment and laws enacted over time. The condition of some species, like bald eagles and striped bass, for example, have remained stable or improved. Unfortunately, the status of other species appears to be getting worse. The total population of Atlantic sturgeon may number less than 1,000 — perhaps even less than 100. Freshwater mussels and brook trout now appear to be absent from much of the region's non-tidal waterways.

The Delaware Estuary has many important features that set it apart from other American estuaries. These include its freshwater tidal reach and extensive tidal marshes, which serve as the "kidneys" and "fish factories" of the Estuary. Less than five

continued on page 2

USGS
science for a changing world
Delaware Estuary

United States Department of the Interior
U.S. Geological Survey

This report is being issued as a special summer edition of "Estuary News," as well as technical report number 08-01 of the Partnership for the Delaware Estuary. Additional supporting materials like references can be found at www.DelawareEstuary.org, and a list of key definitions can be found on page 34. This assessment complements the State of the Basin Report, which is currently being developed by a team led by the Delaware River Basin Commission (DRBC) that also includes the Partnership. For information on that report, please call the DRBC at (609) 885-9500.

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Technical Reports for State of the Estuary / State of the Basin (TREBs)

Chapter	Author(s)
1. Watersheds & Landscapes	**Jessica Rittler Sanchez** – Delaware River Basin Commission **Gerald J. Kauffman** – University of Delaware **Andrew Homsey** – University of Delaware
2. Water Quantity	**David A. Sayers** – Delaware River Basin Commission
3. Water Quality	**John Yagecic, P.E.** – Delaware River Basin Commission **Ronald MacGillivray, Ph.D.** – Delaware River Basin Commission **Erik Silldorff, Ph.D.** – Delaware River Basin Commission **Eric Vowinkel, Ph.D.** – U.S. Geological Survey
4. Sediments	**Jeffrey A. Gebert** – U.S. Army Corps of Engineers **Rene Searfoss** – U.S. Environmental Protection Agency (R3)
5. Aquatic Habitats • **Subtidal** • **Intertidal** • **Non-tidal**	**Douglas MIller** – University of Delaware **Angela Padaletti** – Partnership for the Delaware Estuary **Danielle Kreeger** – Partnership for the Delaware Estuary **Andrew Homsey** – University of Delaware **Robert Tudor** – Delaware River Basin Commission **Ellen Creveling** – The Nature Conservancy, New Jersey **Michele M. DePhillip** – The Nature Conservancy, Pennsylvania
6. Living Resources	**Greg Breese** – US Fish & Wildlife Service **Gerald Bright** – Philadelphia Water Department **David Burke** – PA Department of Environmental Protection **Desmond Kahn** – Delaware Division of Fish & Wildlife (DNREC) **Danielle Kreeger** – Partnership for the Delaware Estuary **John Kraeuter** – Rutgers Haskin Shellfish Research Laboratory **Jerre Mohler** – US Fish & Wildlife Service **Rich Wong** – Delaware Division of Fish & Wildlife (DNREC)
7. Climate Change	**Raymond Najjar** – The Pennsylvania State University **Andrew Ross** – The Pennsylvania State University **Danielle Kreeger** – Partnership for the Delaware Estuary **Susan Kilham** – Drexel University
8. Restoration	**Laura Whalen** – Partnership for the Delaware Estuary **Simeon Hahn** – National Oceanic & Atmospheric Administration

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Water Quality Primary Indicators

Tidal (3A) and Non-Tidal (3B) Indicators

1 – Dissolved Oxygen

2 – Nutrients

3 – Contaminants

4 – Fish Contaminant Levels

5 – Salinity

6 – pH

7 – Temperature

8 – Emerging Contaminants

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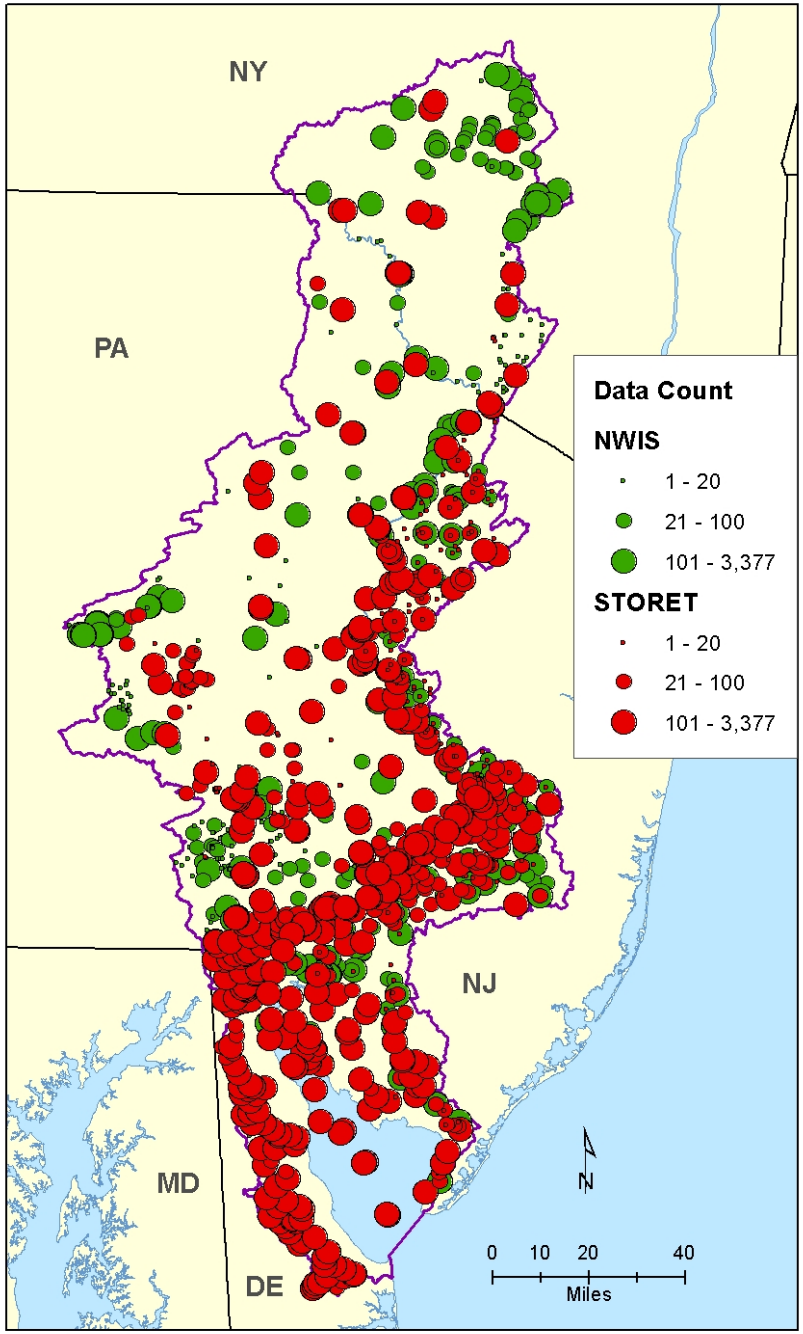

Data Sources

- 2000—2010 Data window for current conditions
- Primarily STORET and NWIS (discrete observations)
- Over 400,000 discrete observations
- *Not including continuous real time data – retrieved separately*

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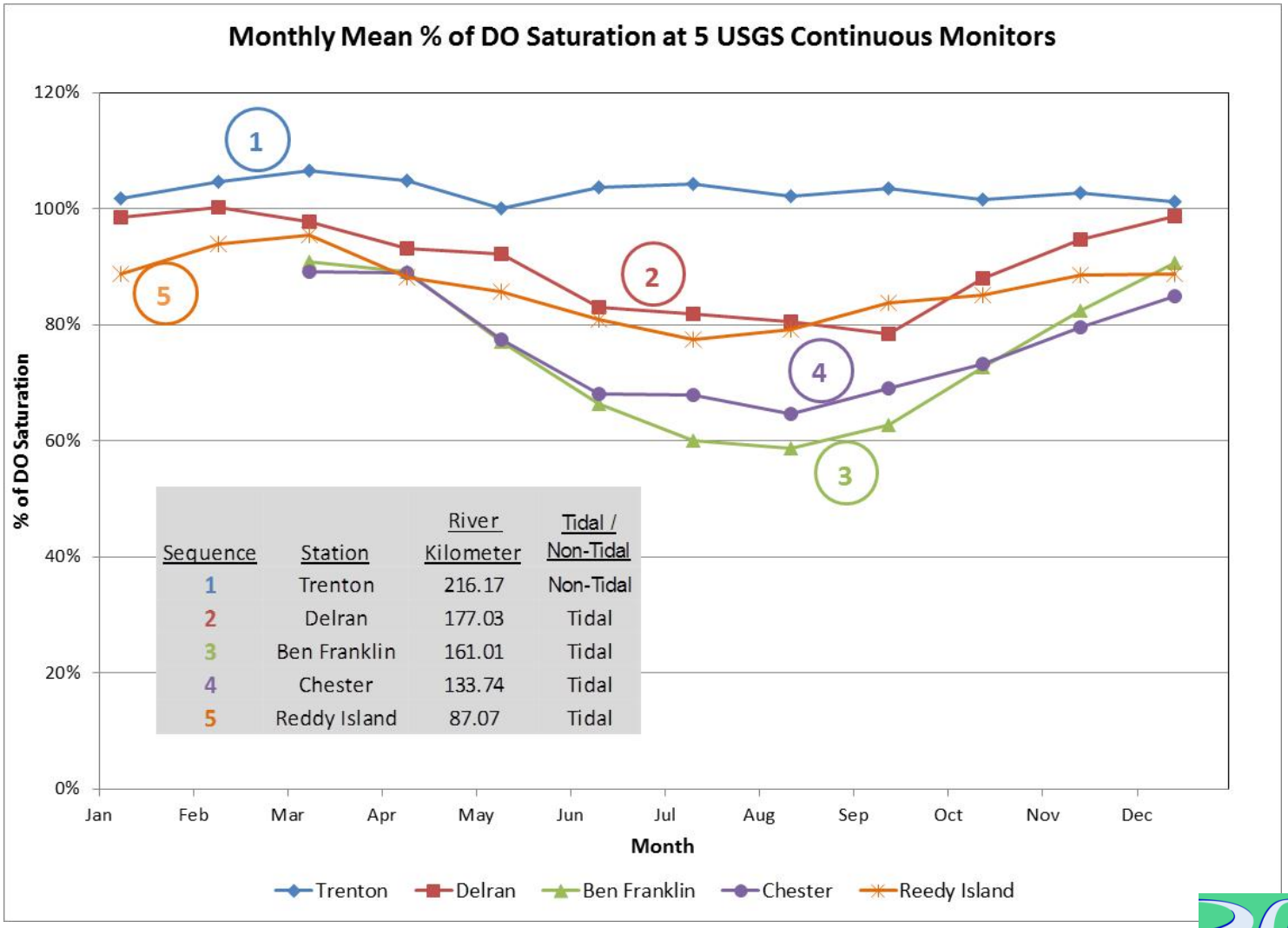
DO Saturation



Sequence	Station	River Kilometer	Tidal / Non-Tidal
1	Trenton	216.17	Non-Tidal
2	Delran	177.03	Tidal
3	Ben Franklin	161.01	Tidal
4	Chester	133.74	Tidal
5	Reddy Island	87.07	Tidal

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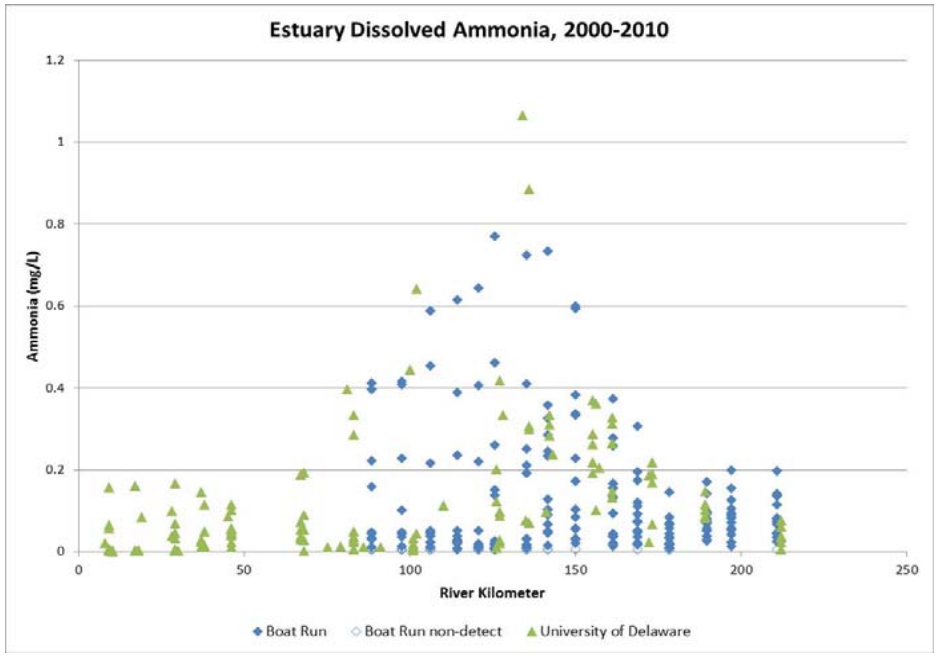
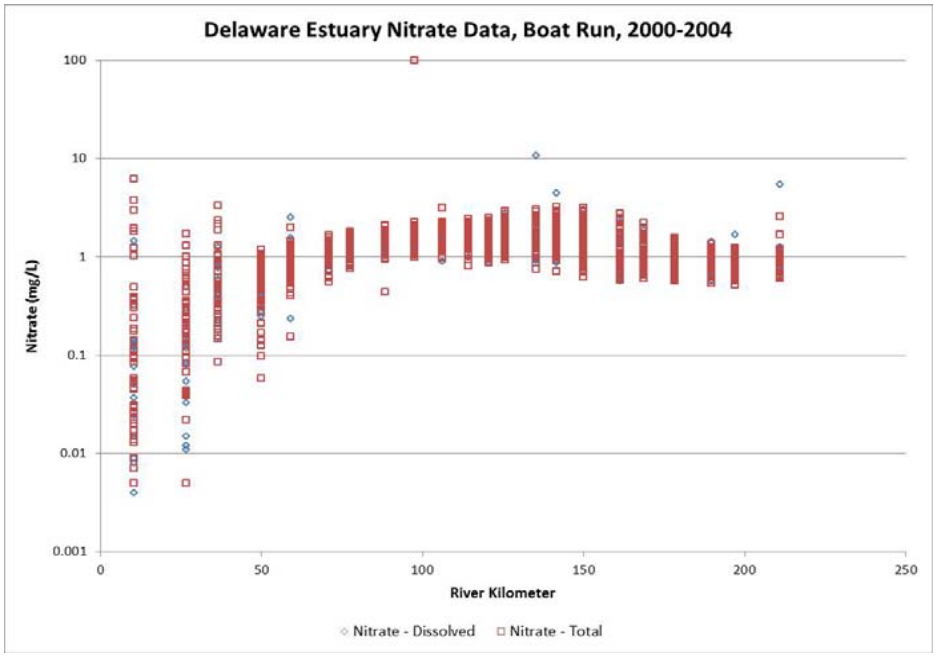
Nutrients: Ammonia and Nitrate





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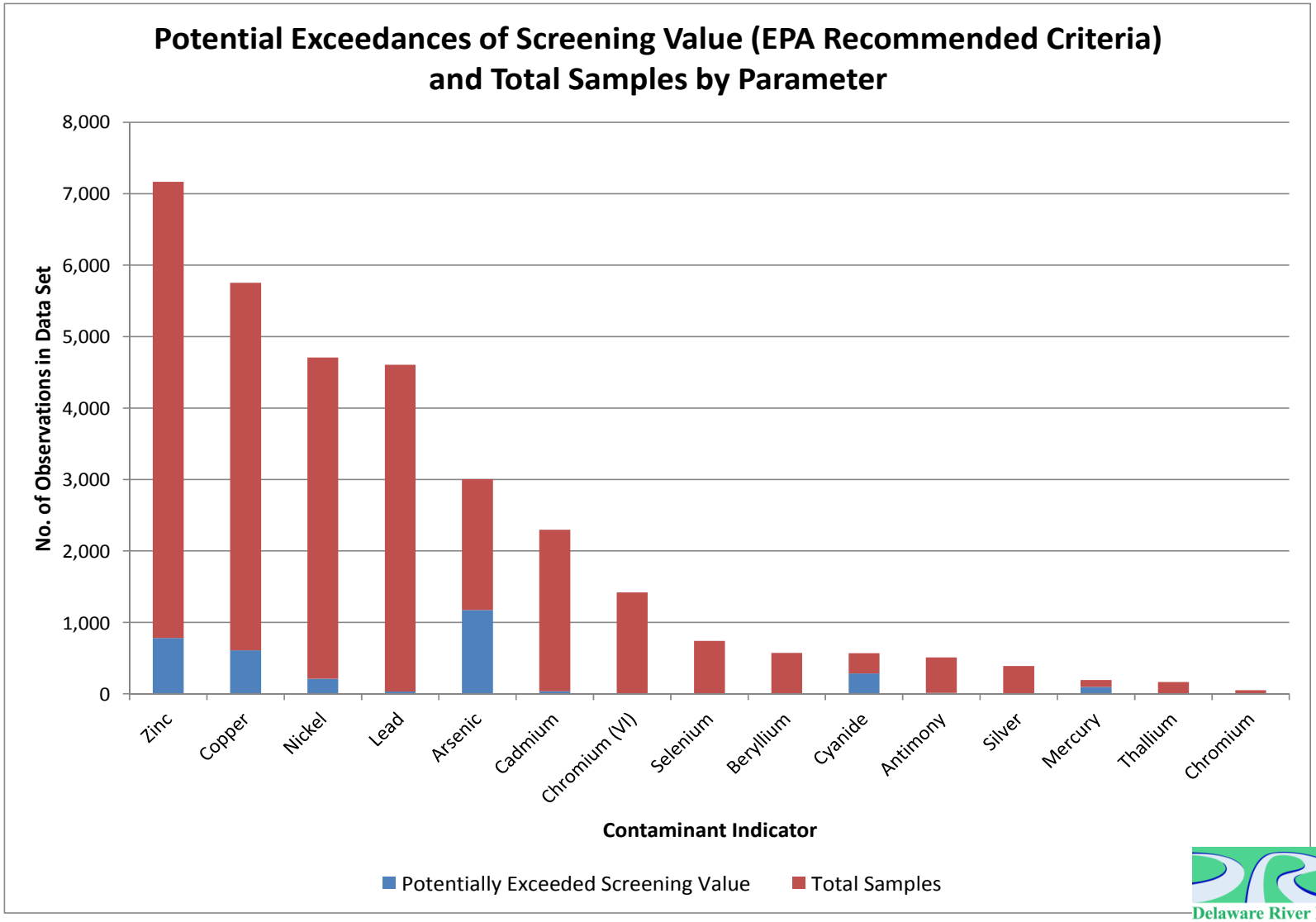
Contaminants



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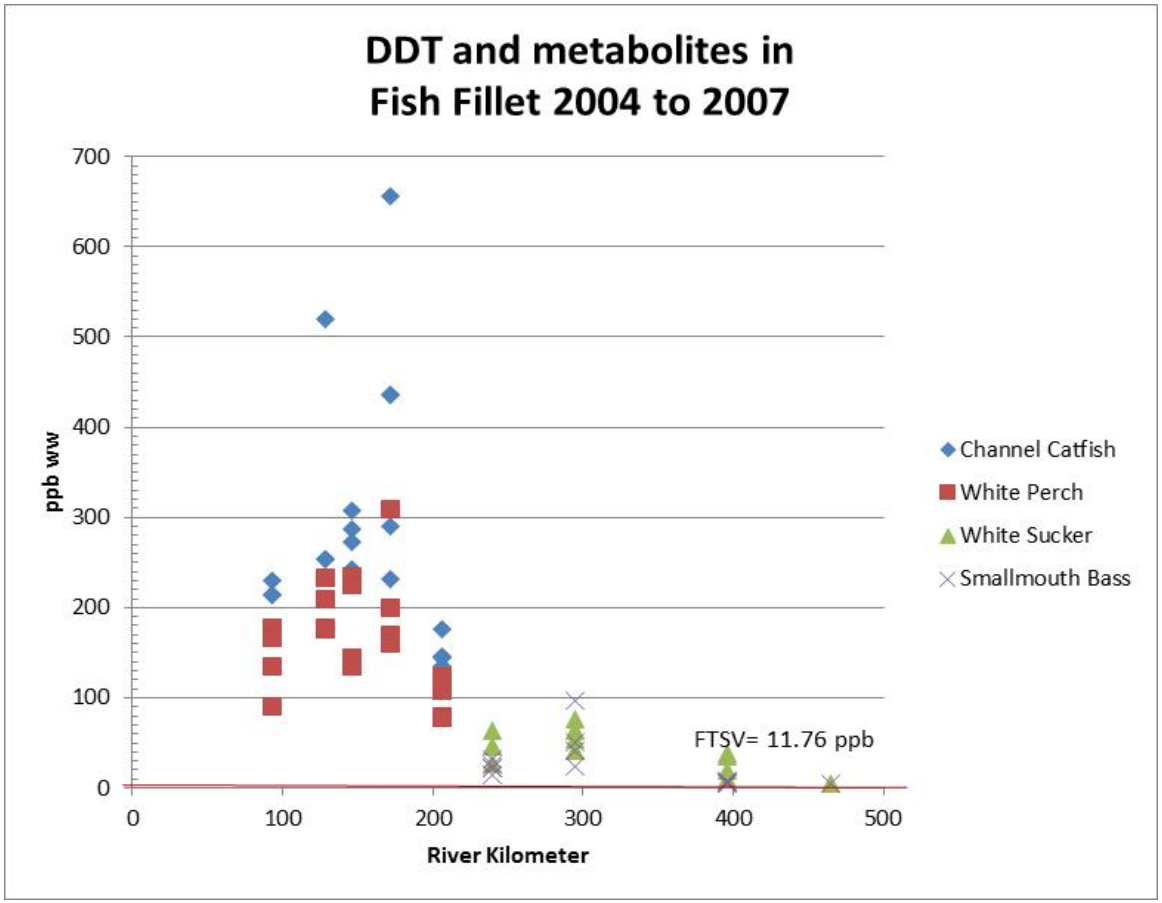
Developed Fish Tissue Screening Values based on WQ Criteria

- Compared fish tissue concentrations to the FTSVs
- Exceeded FTVS for DDT and metabolites
- Linkage between fish tissue and water column suggests that WQ criteria could be exceeded



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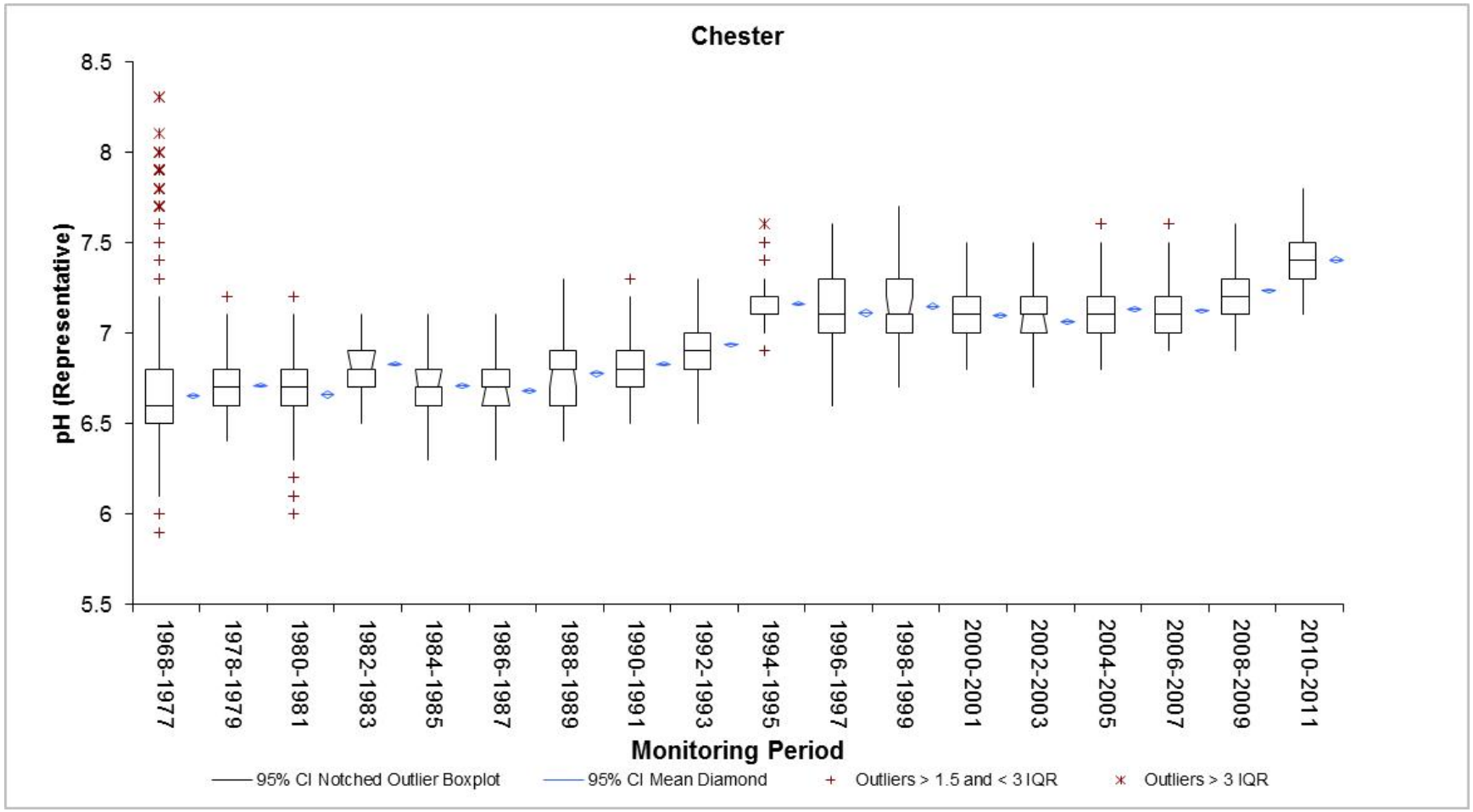
Apparent Increase in pH over Period of Record



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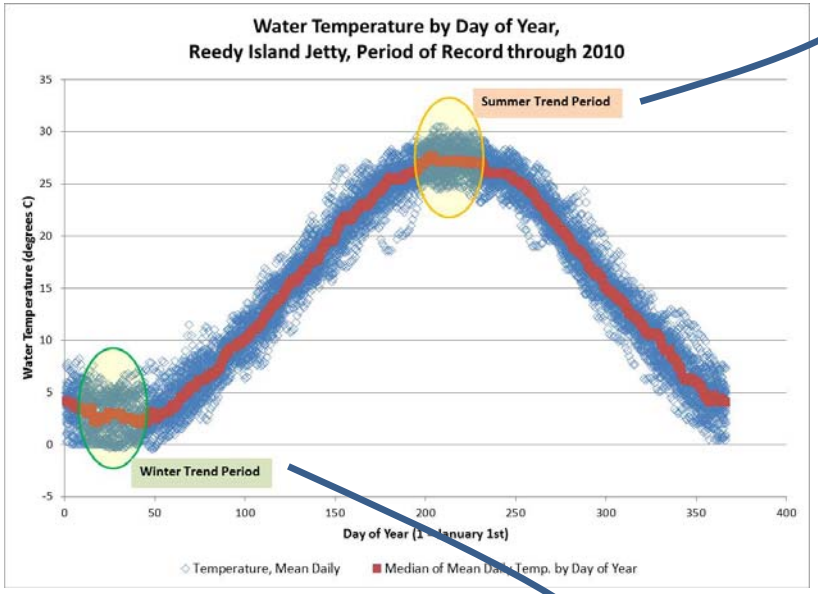
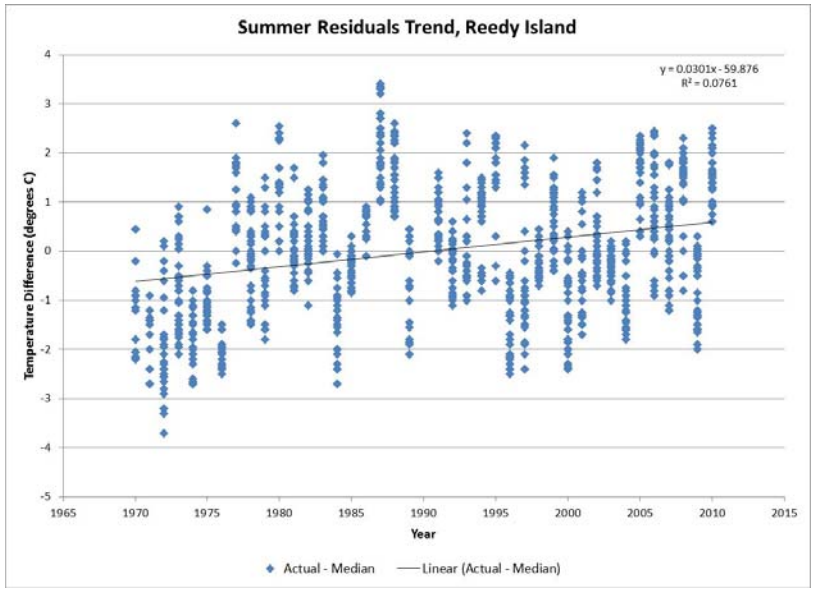
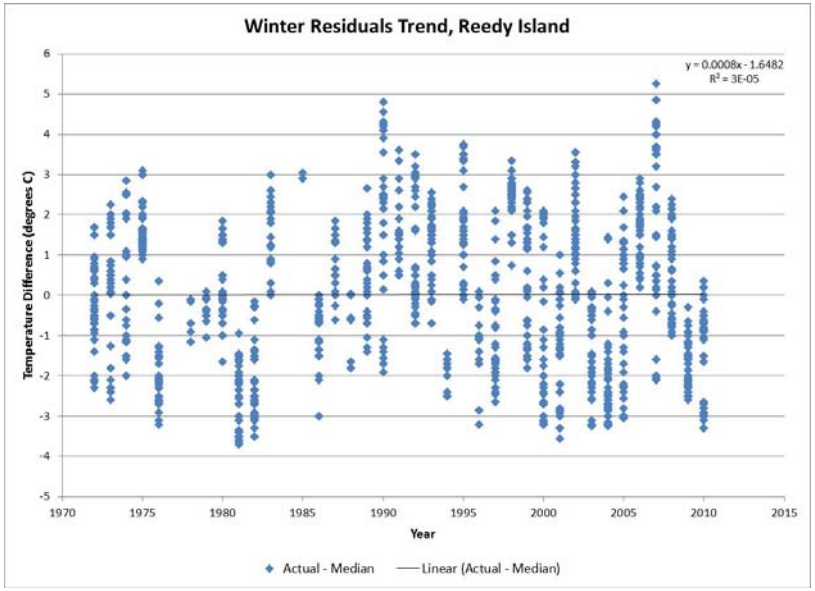
Trends in Summer versus Winter Water Temperature?







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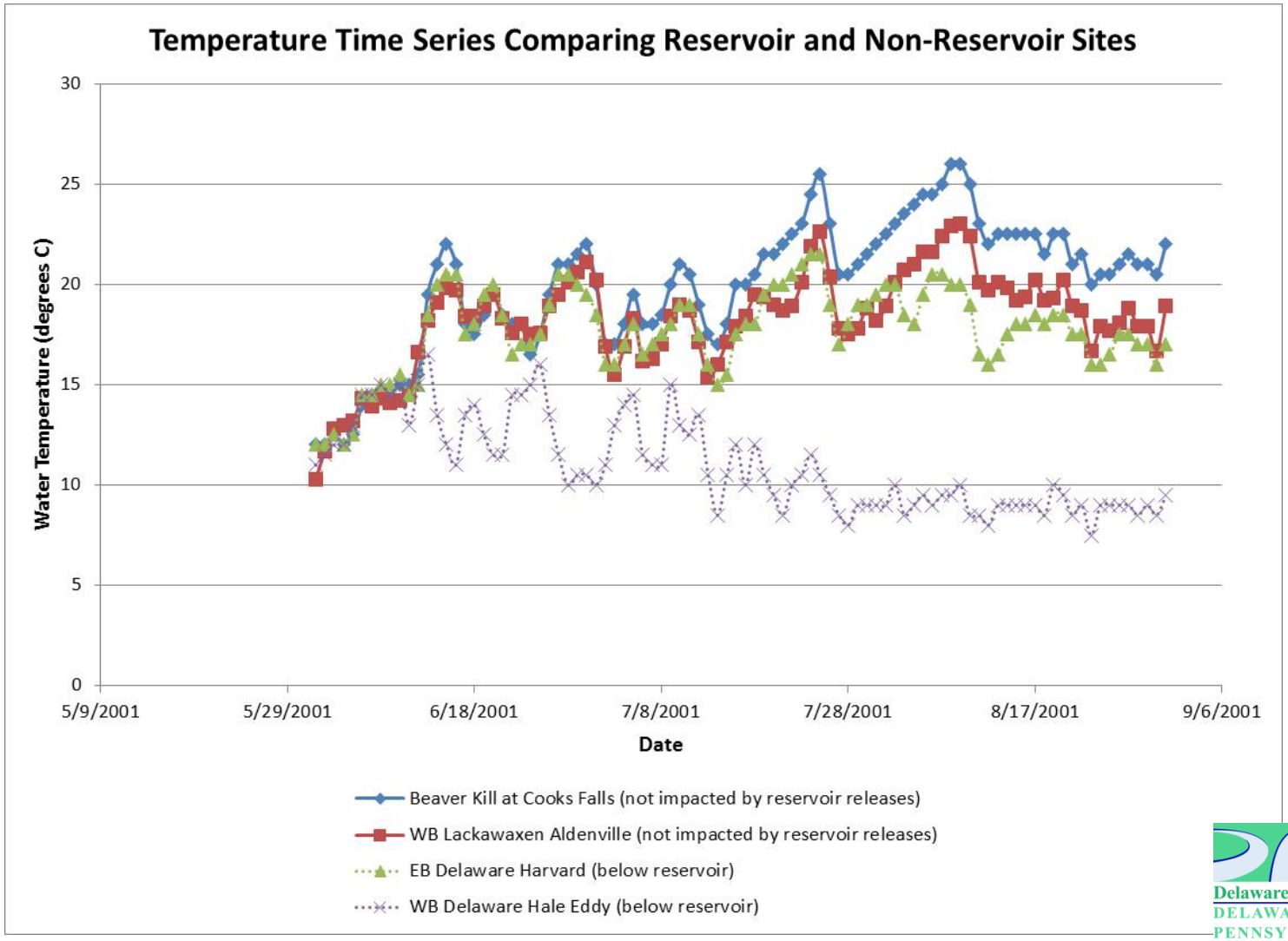
Water Temperatures Upstream and Downstream of Reservoirs



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Questions?

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