Assessment of Water Quantity and Quality Indicators in the 2012 TREB

Delaware Estuary Science & Environmental Summit
January 28, 2013
Cape May, NJ

John Yagecic, P.E.
Delaware River Basin Commission

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

Quantity (Ch. 2)

- David Sayers (DRBC)
- J. Kent Barr (DRBC)
- Jeff Fischer (USGS)
- Jen Shourds (USGS)

Quality (Ch. 3)

- John Yagecic, P.E. (DRBC)
- Ronald MacGillivray, Ph.D. (DRBC)
- Erik Silldorff, Ph.D. (DRBC)
- Eric Vowinkel, Ph.D. (USGS)
  - Special thanks to Jack Gibs (USGS)

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Water Quantity Primary Indicators

1 – Water Withdrawals – Tracking Supply and Demand

2 – Consumptive Use

3 – Per Capita Water Use

4 – Groundwater Availability

5 – Salt Line Location and Movement

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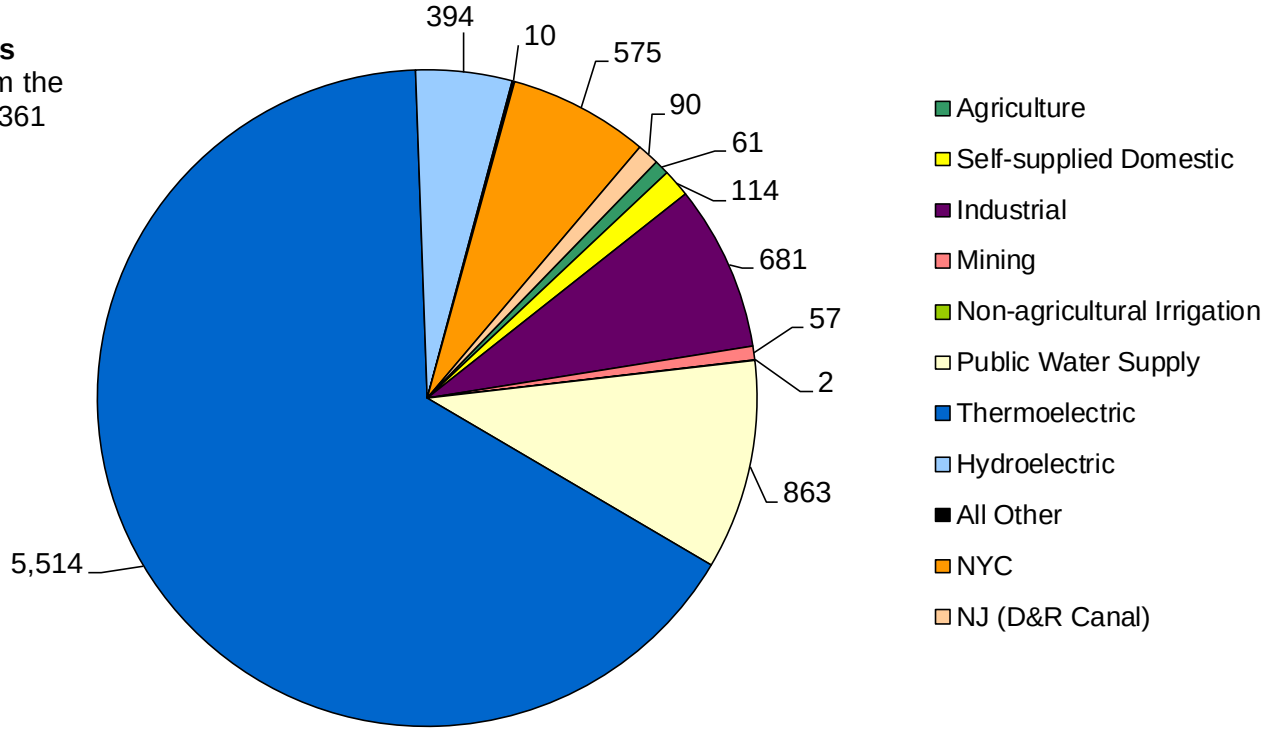
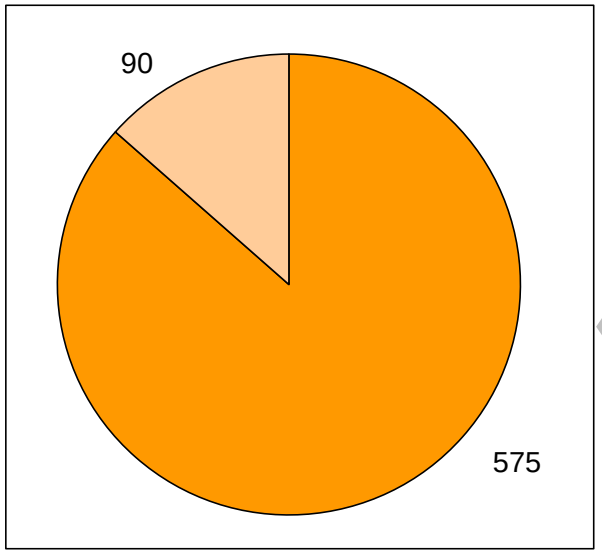
DAILY WATER WITHDRAWS, MAJOR EXPORTS AND CONSUMPTIVE USE IN THE DRB, 2007

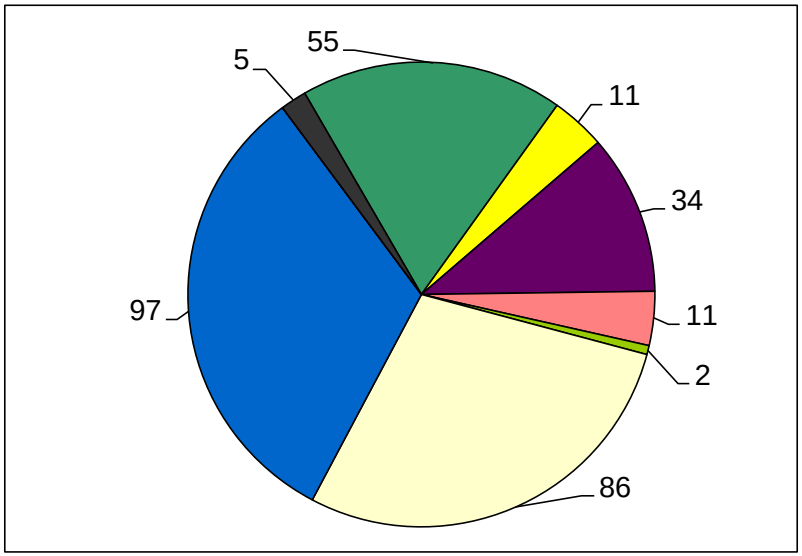
Total Water Withdrawals (ground and surface) from the Delaware River Basin: 8,361 mgd



Major **Exports** from the Delaware River Basin: 665 mgd



Consumptive Use in the Delaware River Basin: 302 mgd



Pie chart values in mgd (million gallons per day)

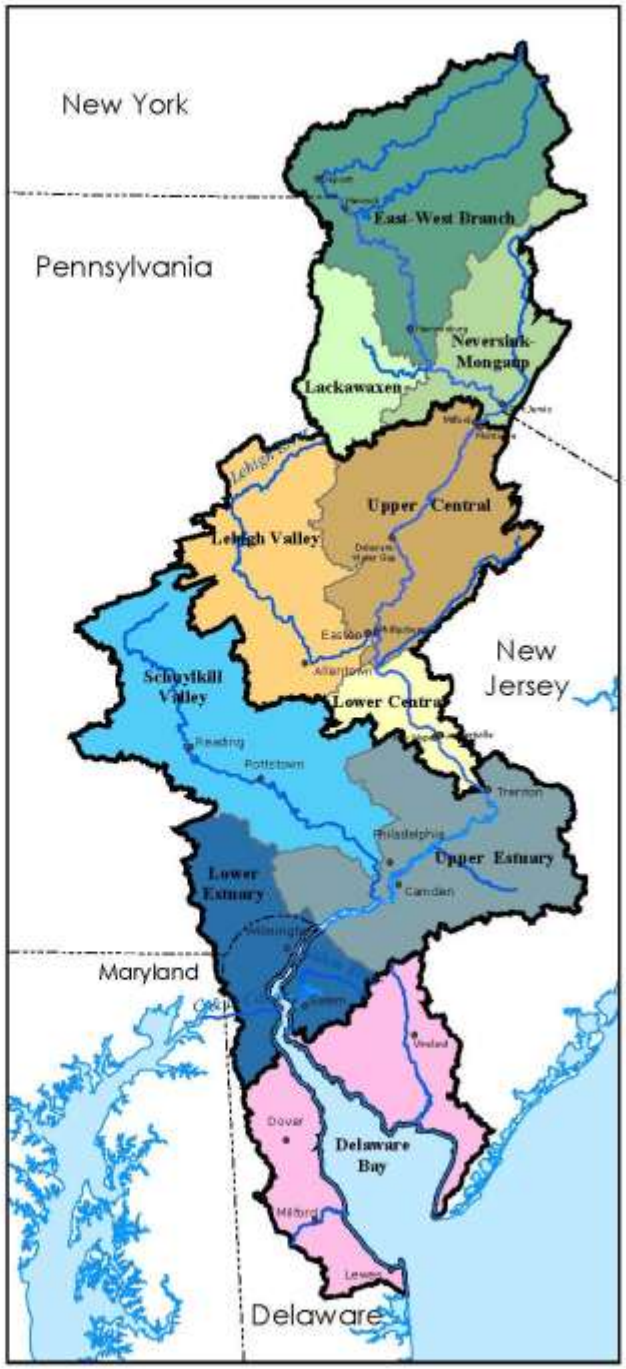
Sub-basins of the Delaware River

UPPER REGION
- East-West Branch
- Neversink-Mongaup
- Lackawaxen

CENTRAL REGION
- Upper Central
- Lower Central
- Lehigh Valley

LOWER REGION
- Upper Estuary
- Lower Estuary
- Schuylkill Valley

BAY REGION
- Delaware Bay

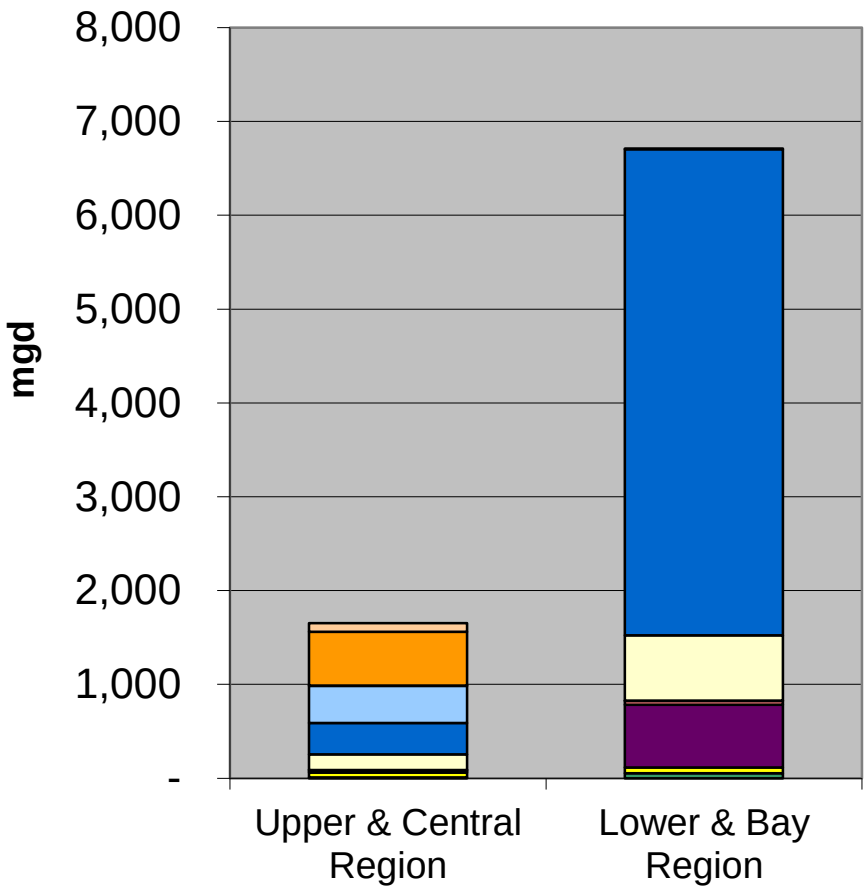


N

0 10 20
Miles

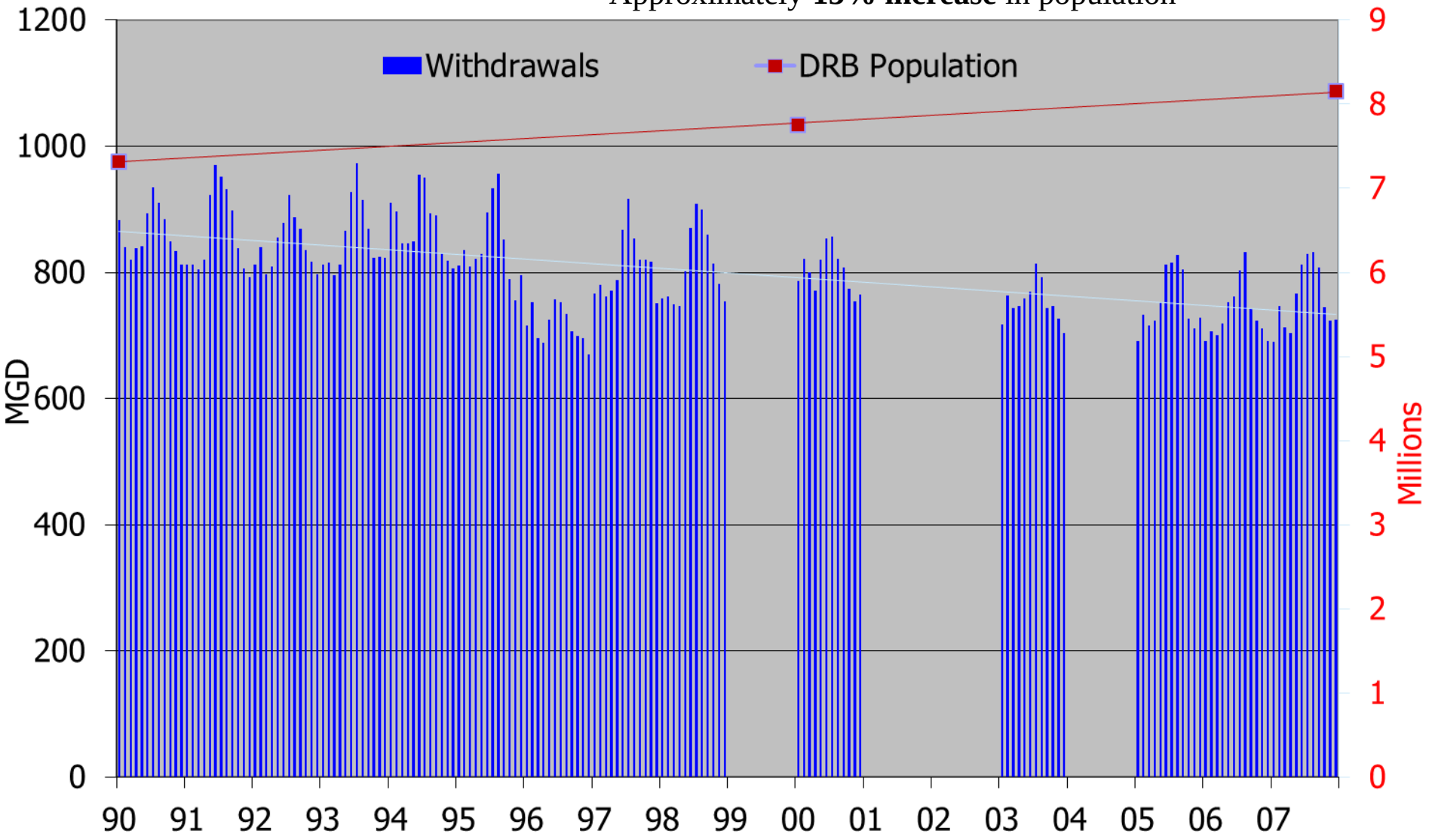
Water Use By Region

- NJ (D&R Canal)
- NYC
- All Other
- Hydroelectric
- Thermoelectric
- Public Water Supply
- Non-agricultural Irrigation
- Mining
- Industrial
- Self-supplied Domestic
- Agriculture

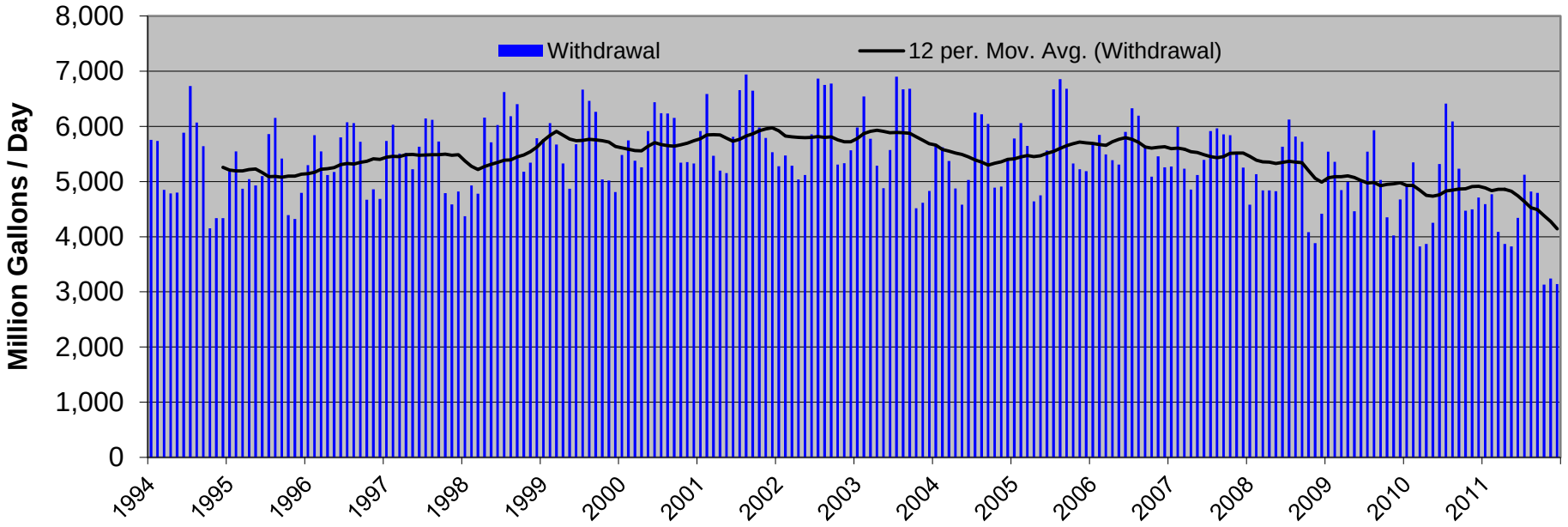


Aggregated Withdrawals of 40 Public Water Supply Systems in the DRB (MGD)

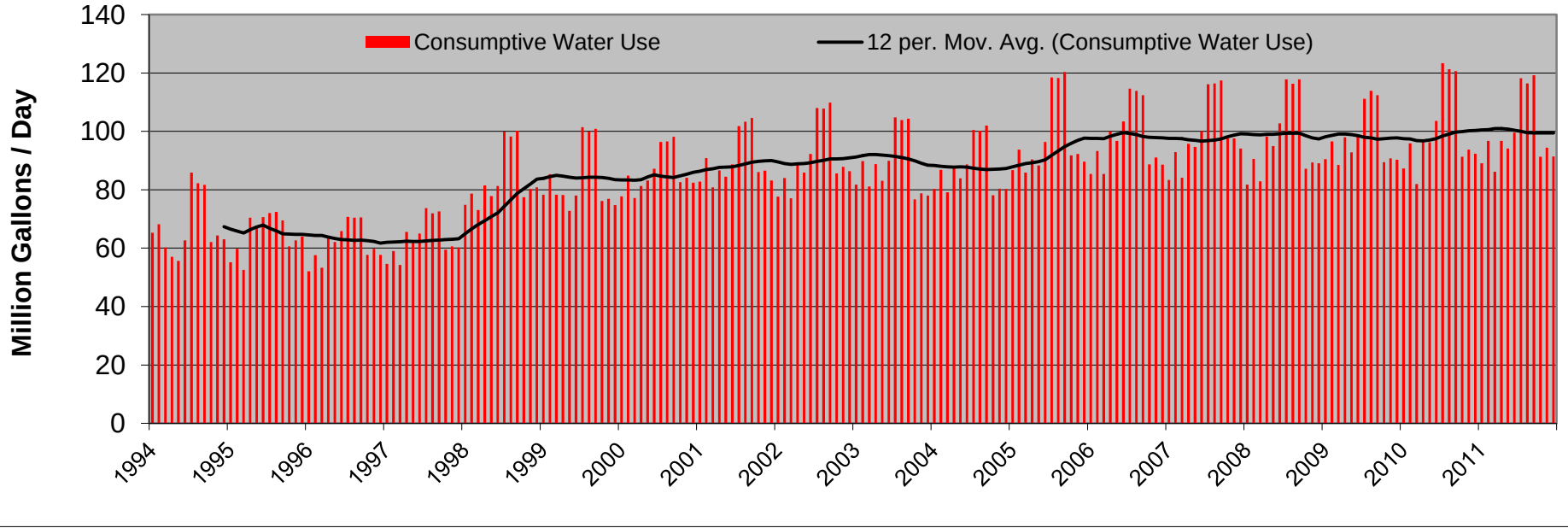
Trendlines 1990 - 2007: Approximately **15% decline** in withdrawals
Approximately **13% increase** in population



Total Withdrawals for Thermoelectric Facilities in the DRB



Total Consumptive Use for Thermoelectric Facilities in the DRB



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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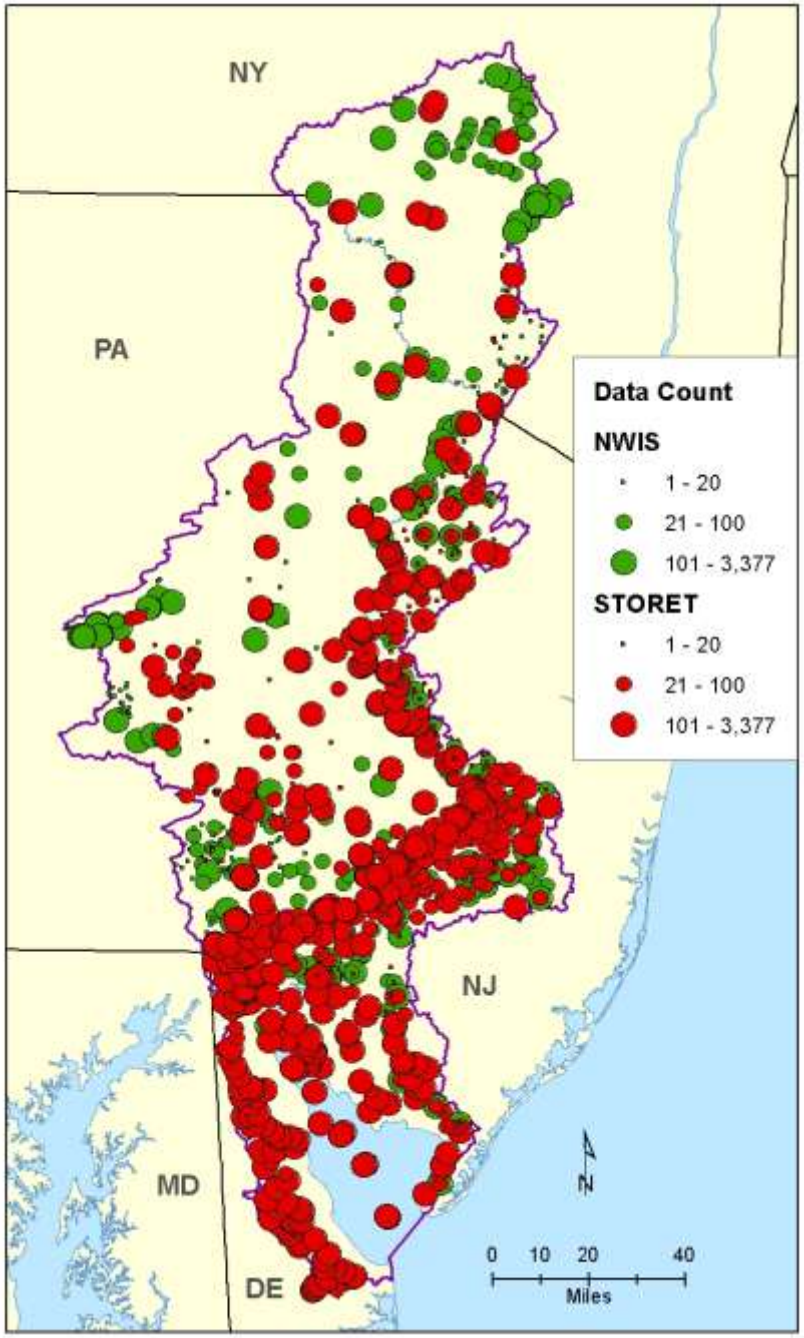

Data Sources

- 2000—2010 Data window for current conditions
- Primarily STORET and NWIS (discrete observations)
- Over 400,000 discrete observations
- *Also pulled full period of record for continous monitors*

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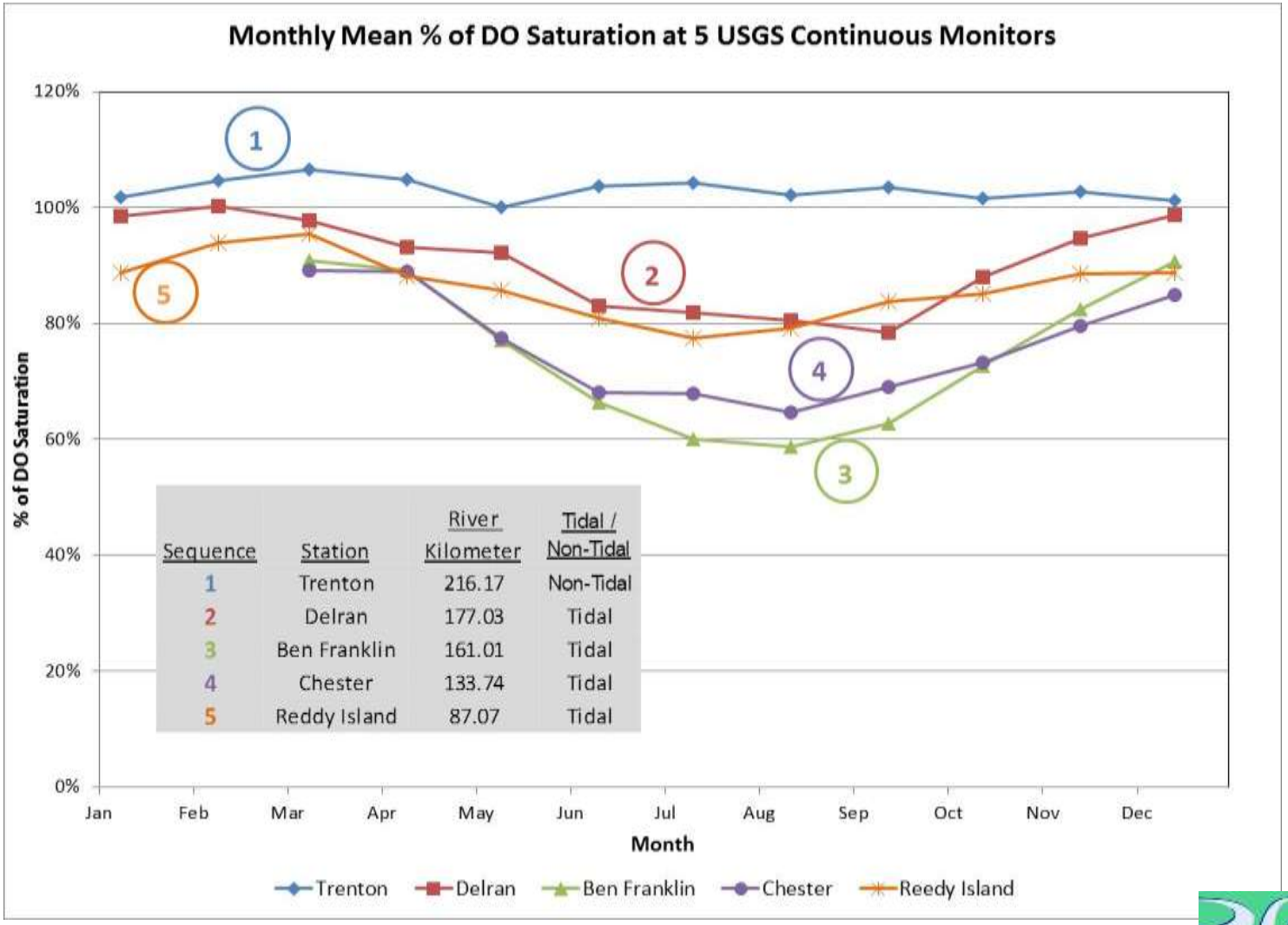
DO Saturation (2000-2010)



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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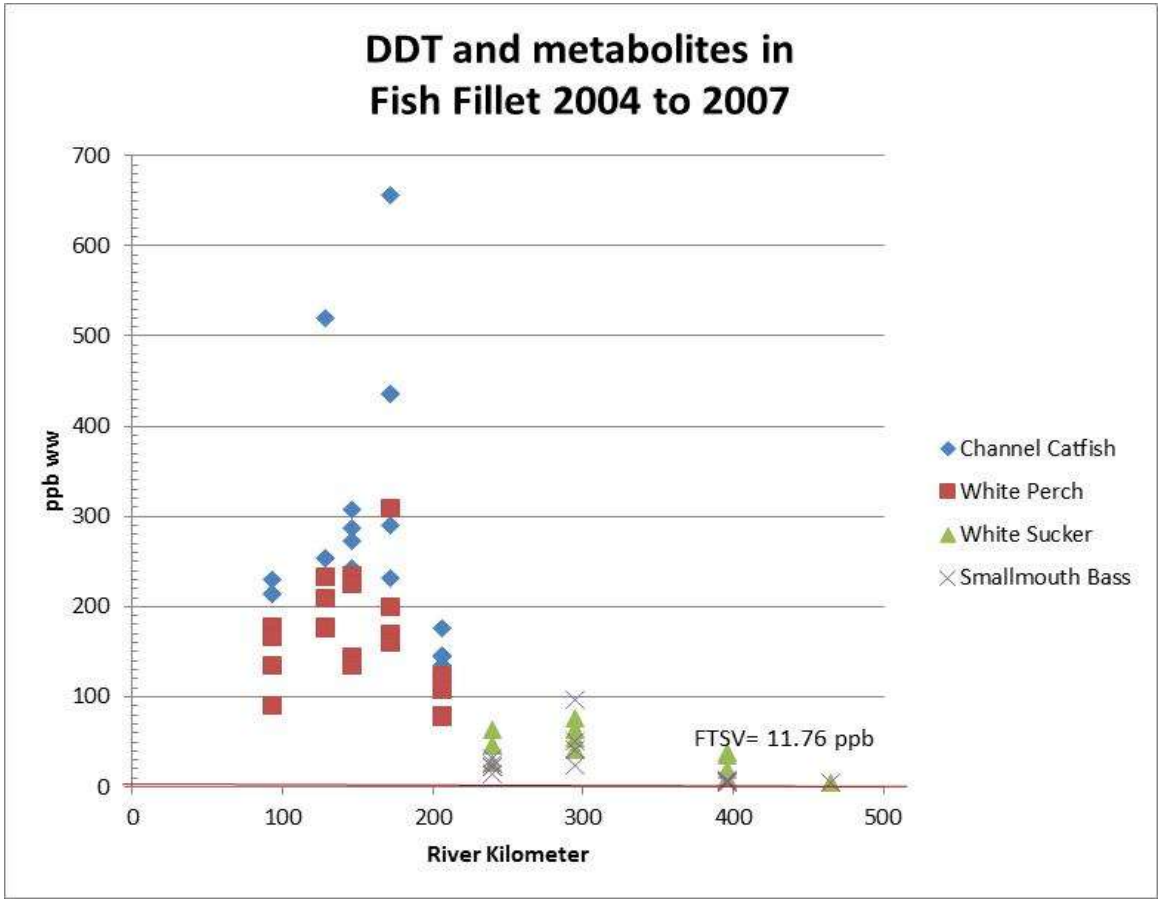
Developed Fish Tissue Screening Values based on WQ Criteria

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



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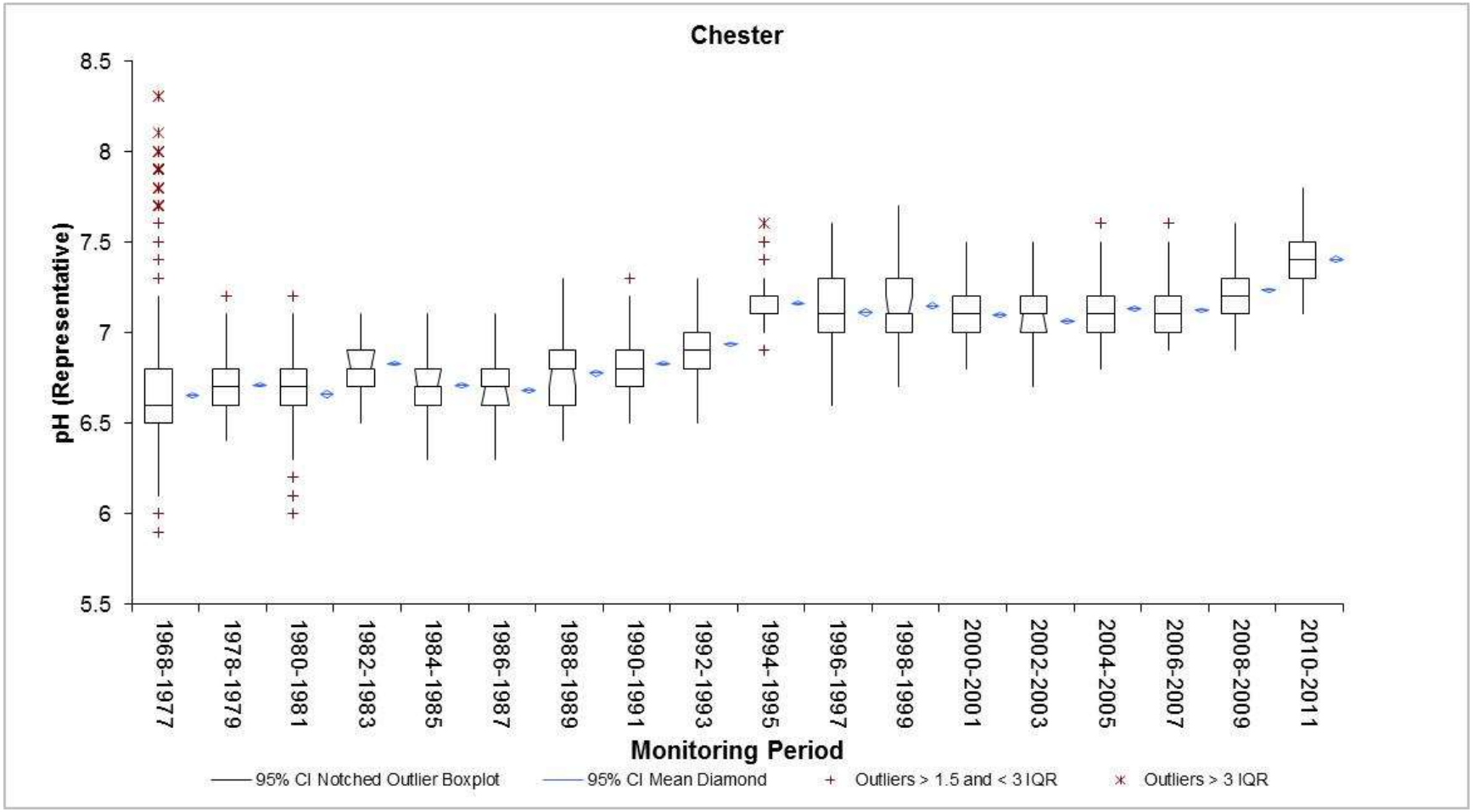
Apparent Increase in pH over Period of Record



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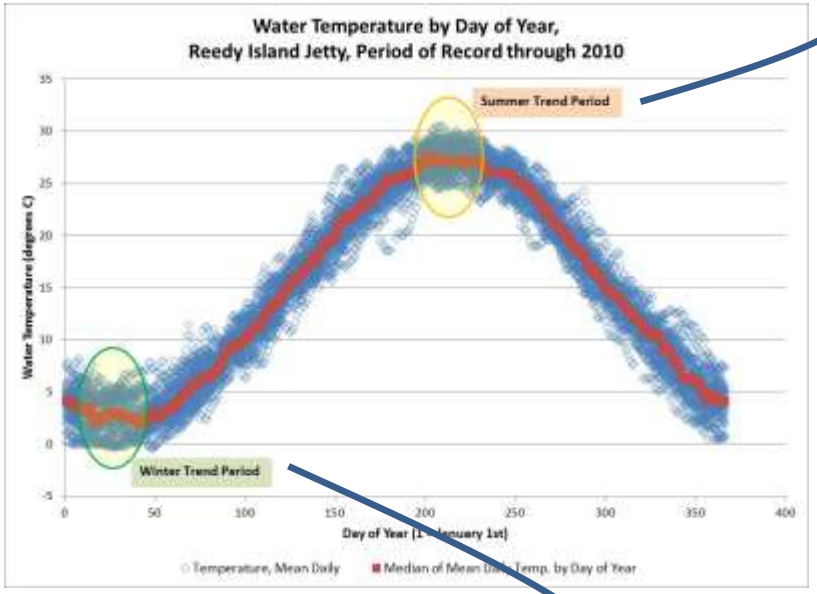
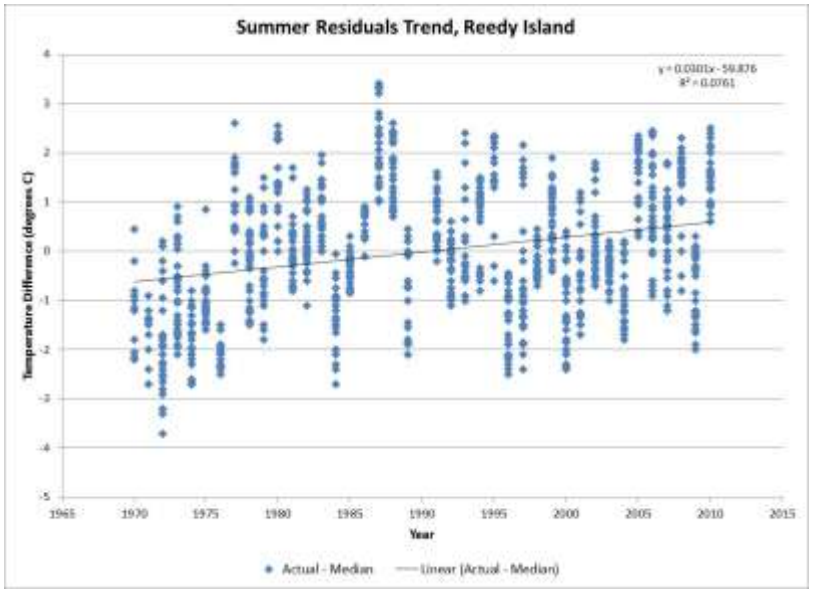
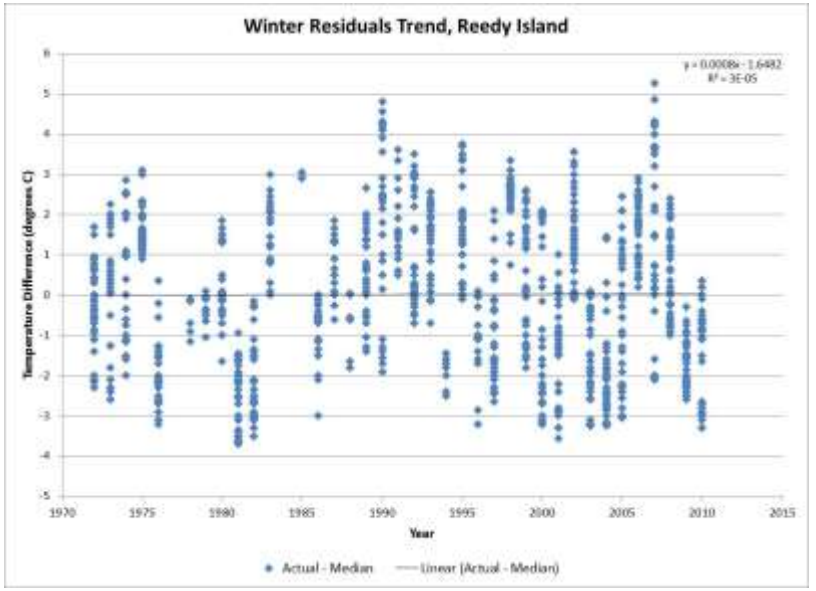
Trends in Summer versus Winter Water Temperature?







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Questions?

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