

Water Quality TREB Update

STAC-MACC Meeting

April 25, 2017

John Yagecic, P.E.



Delaware River Basin Commission

DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA



Indicators

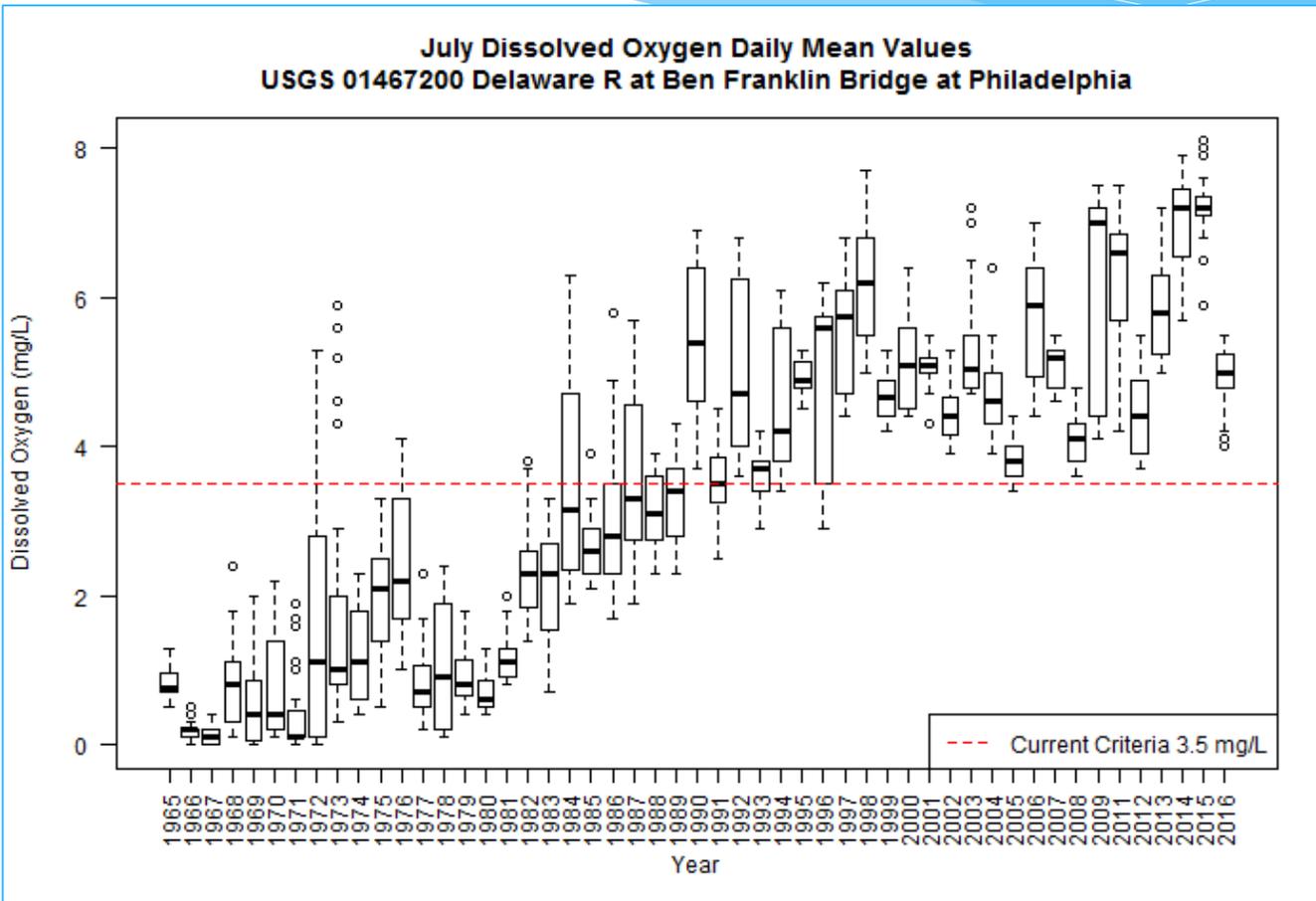
* 3A – Tidal

- * Dissolved Oxygen
- * Nutrients
- * Contaminants
- * Fish Contaminant Levels
- * Salinity
- * pH
- * Temperature
- * Emerging Contaminants

* 3B – Non-Tidal

- * Dissolved Oxygen
- * Nutrients
- * Contaminants
- * Fish Contaminant Levels
- * pH
- * Temperature

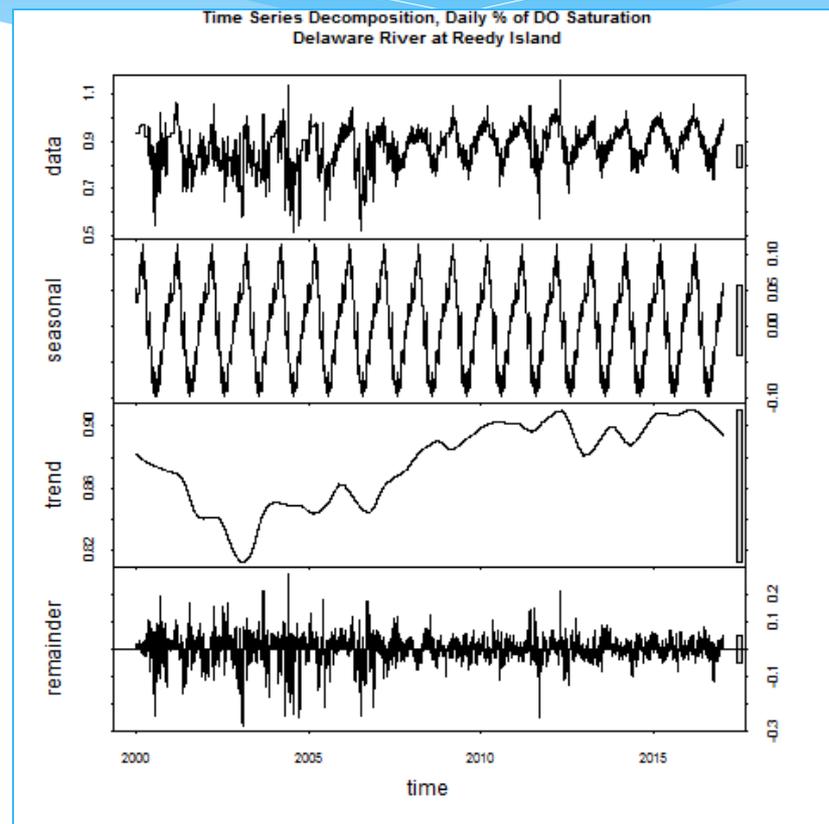
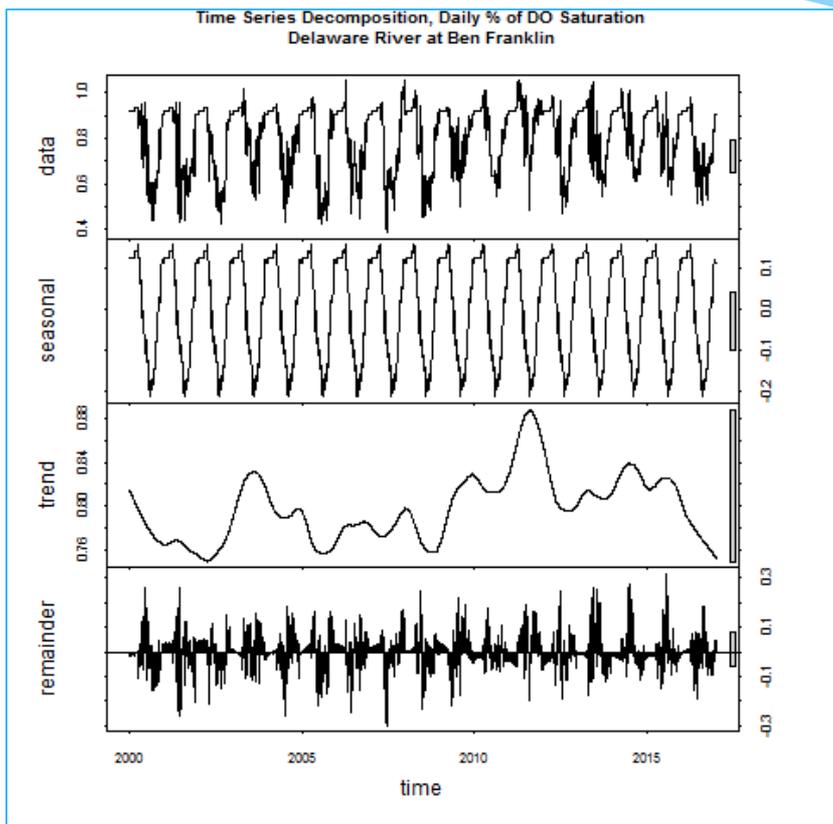
Estuary DO - Trends



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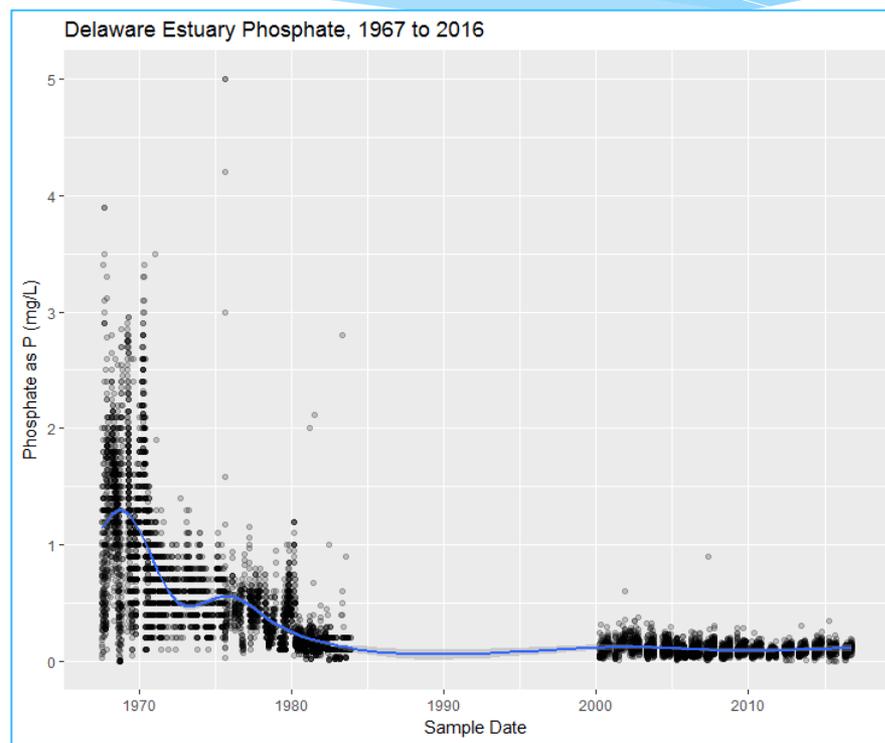
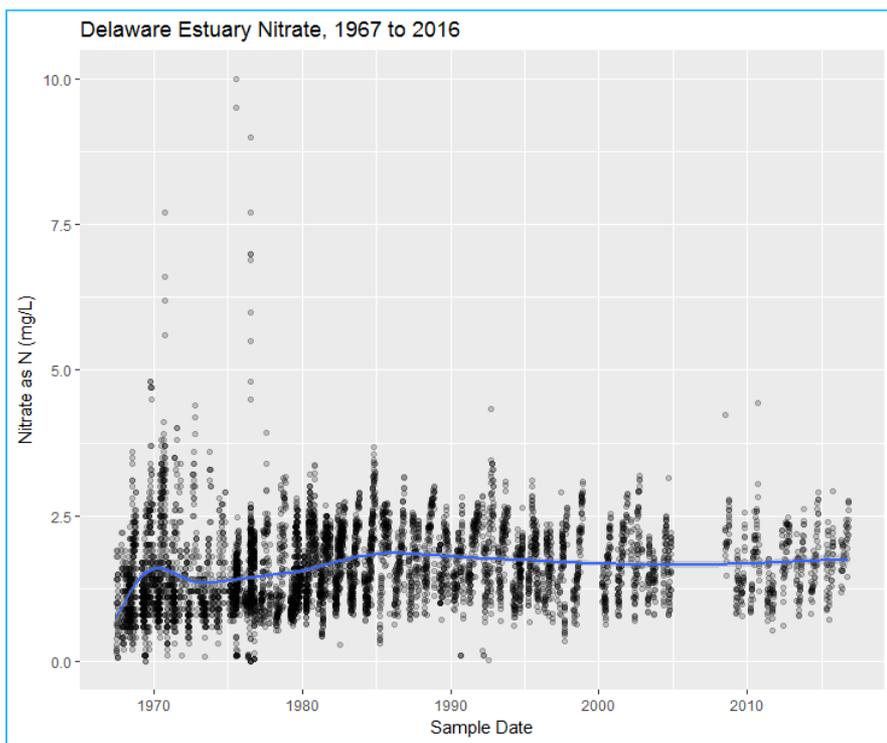
Estuary

DO – Trends (continued)



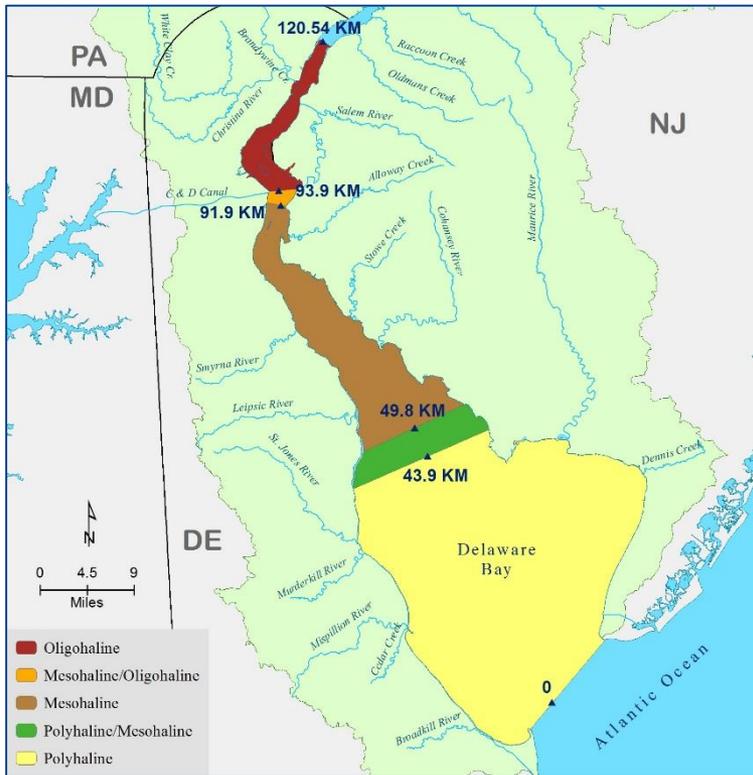
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Estuary Nutrient Trends



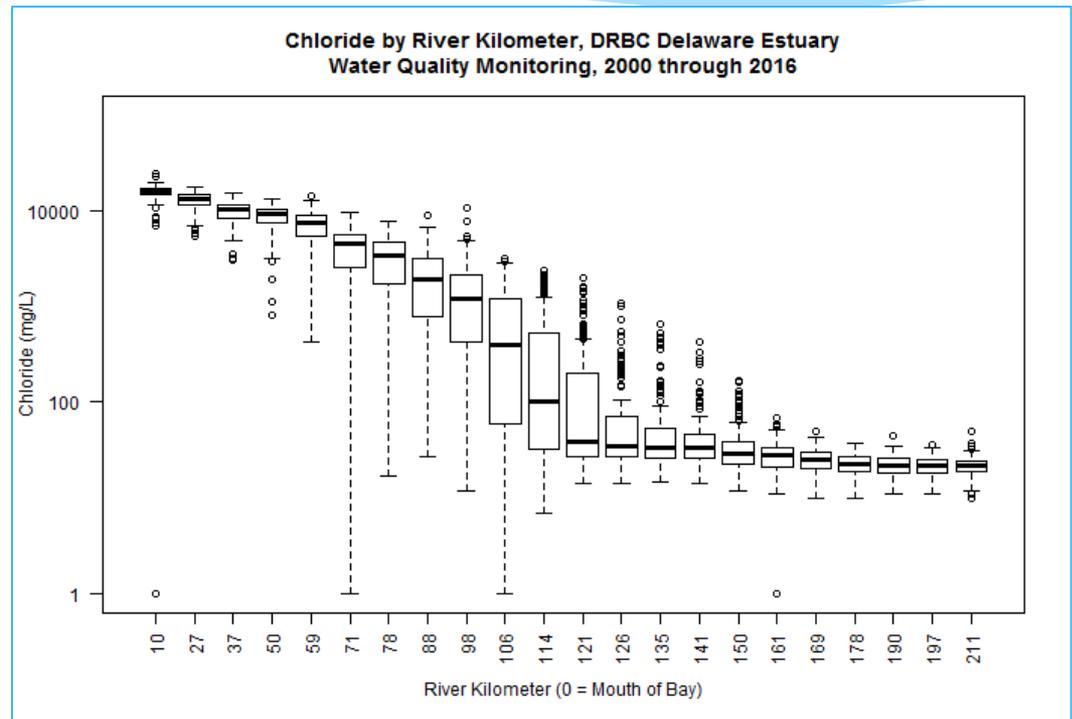
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Estuary Salinity – Current Status



Salinity

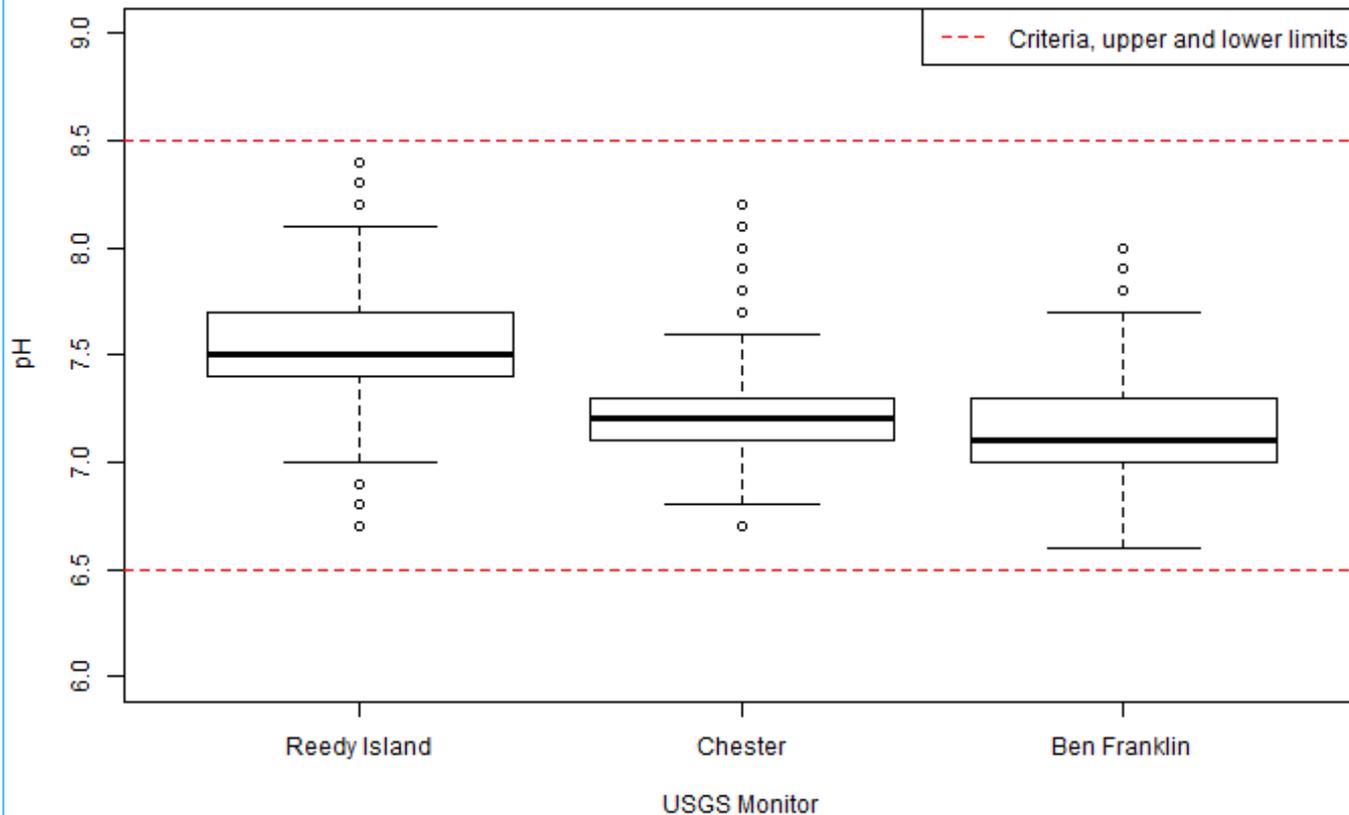
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Chloride

Estuary pH – Current Status

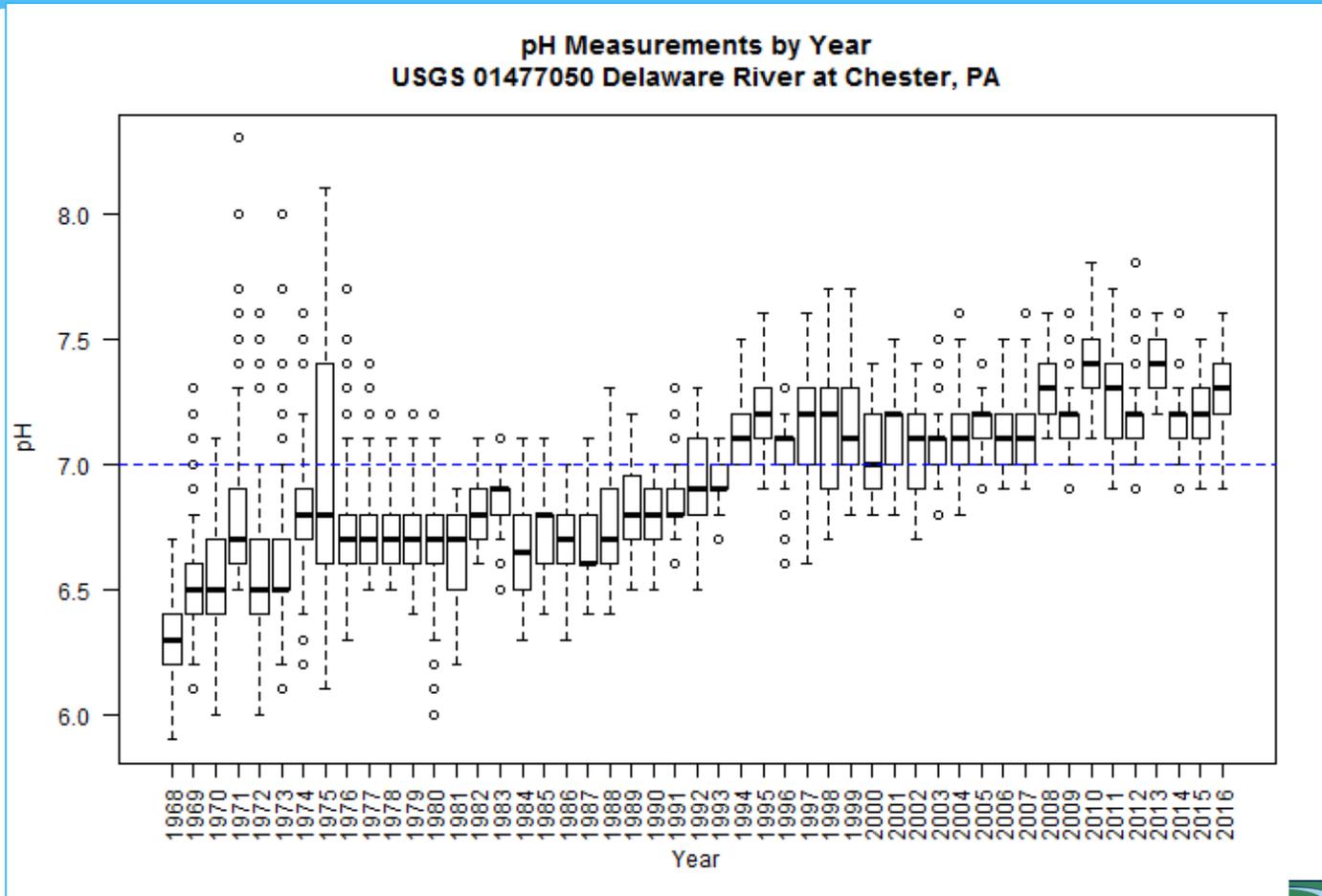
pH Measurements at 3 USGS Delaware Estuary Monitors
2011 through 2016



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pH – Long Term Trends

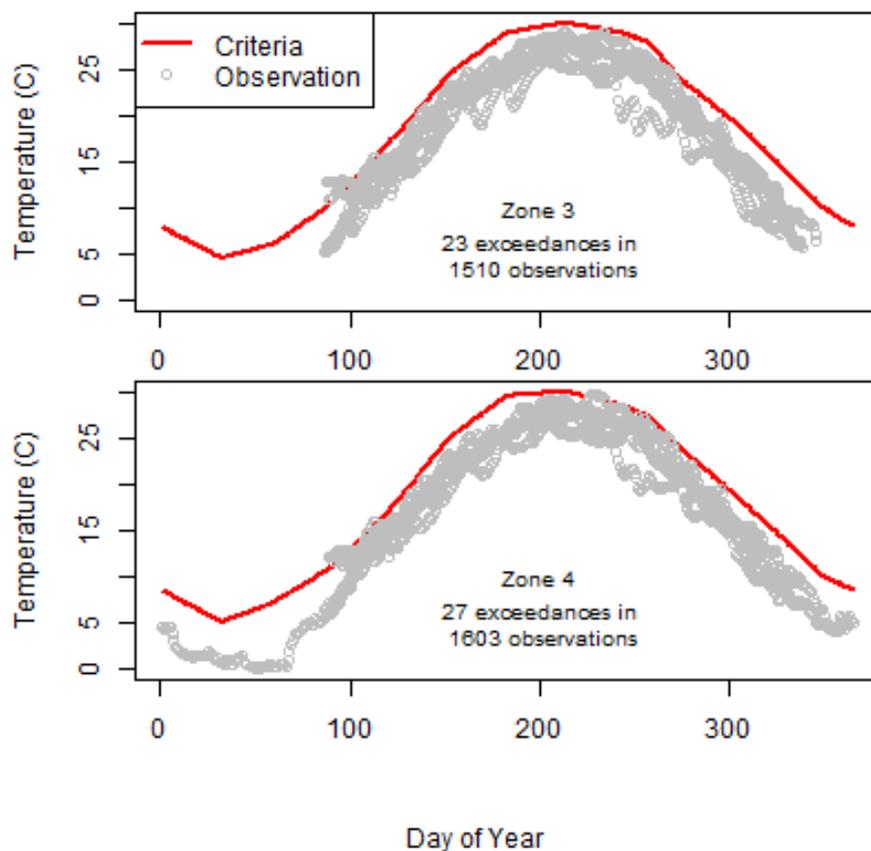


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Temperature – Current Status

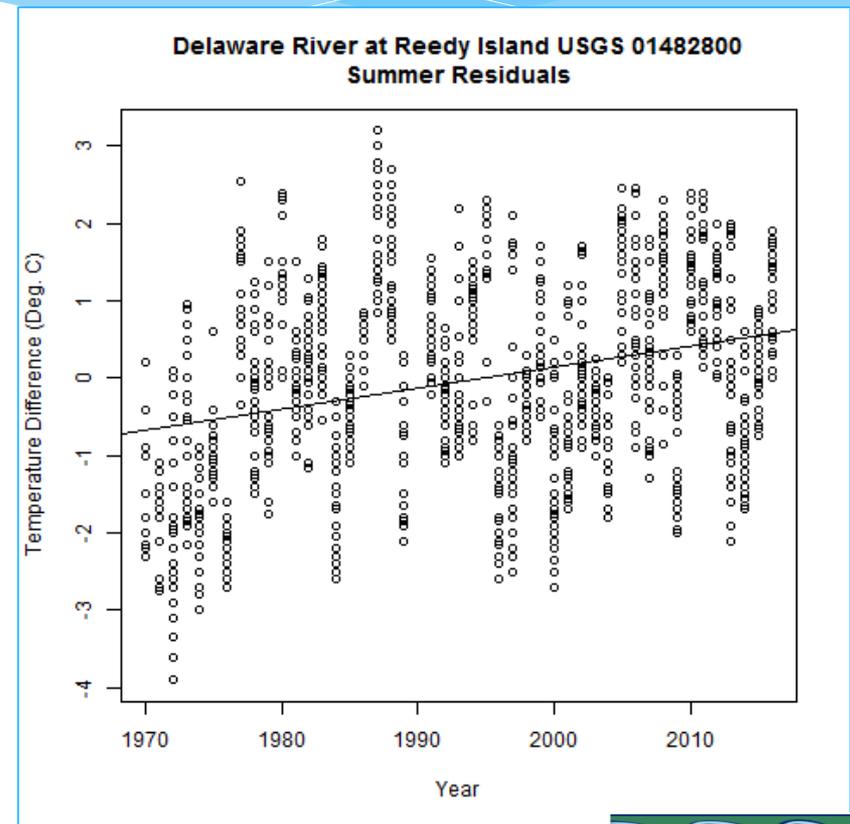
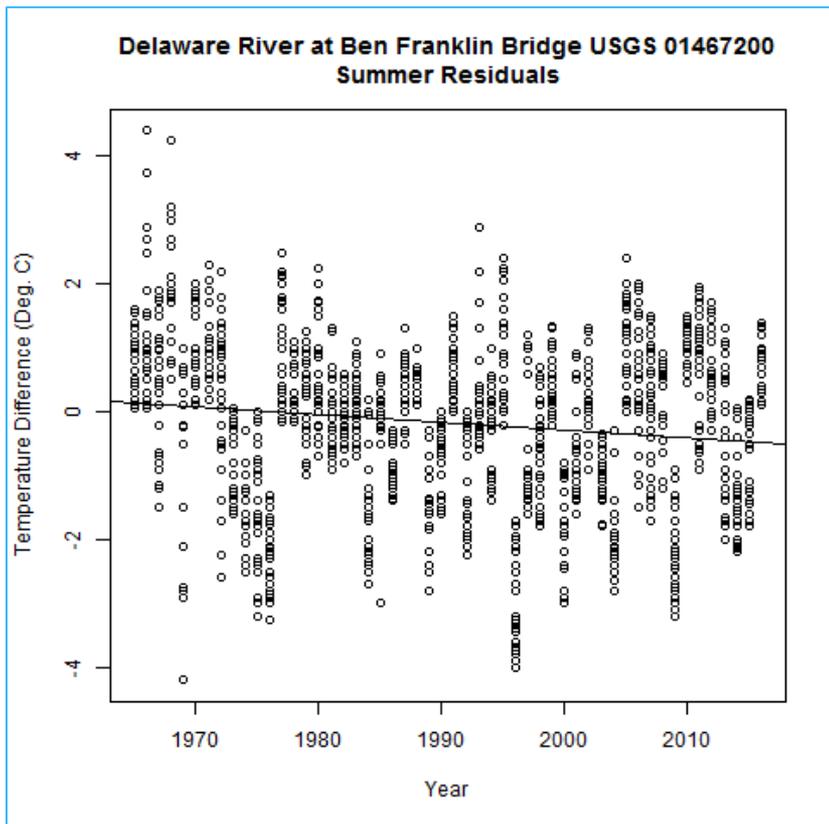
**Comparison of Daily Mean Water Temperatures to Criteria
Delaware Estuary Zones 3 and 4, 2011 through 2016**



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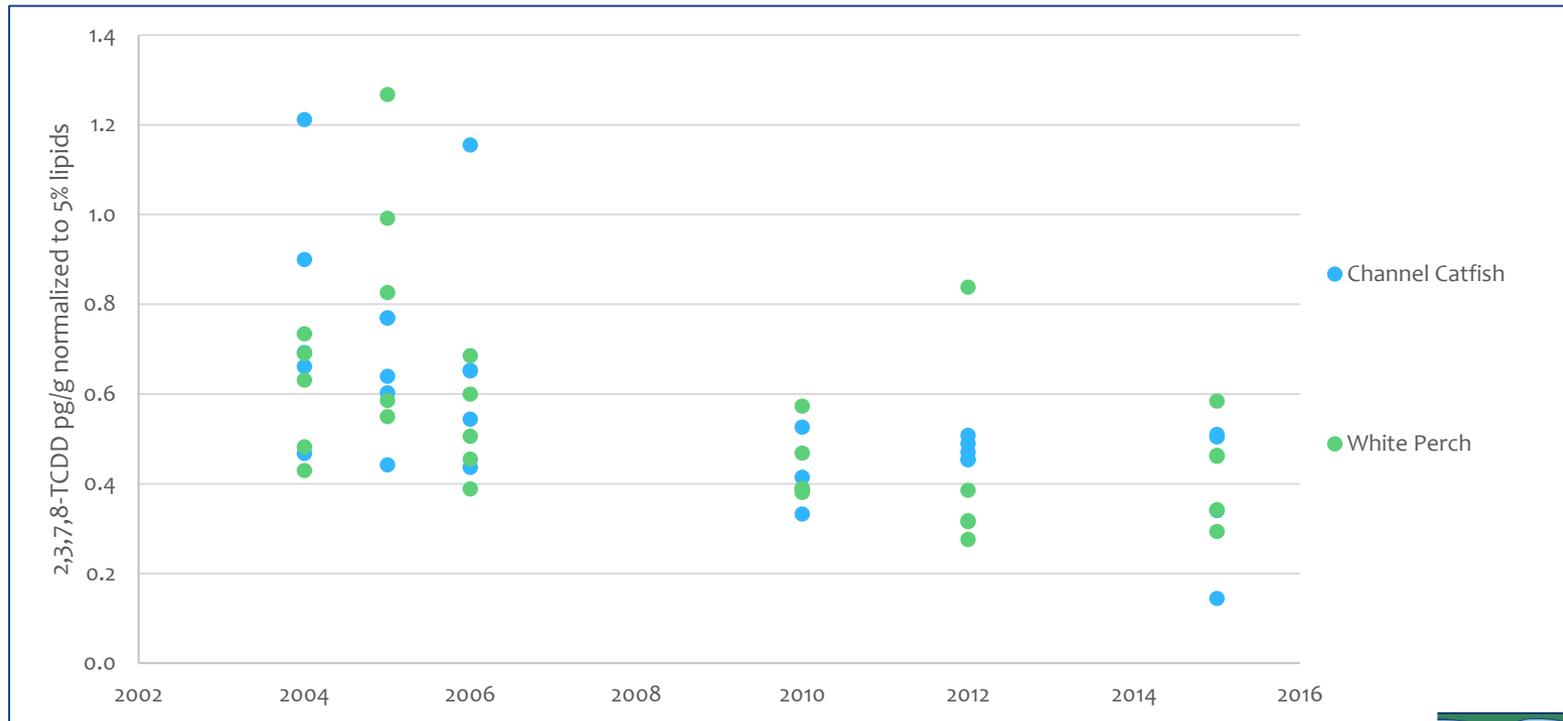
Estuary

Temperature – Long Term Trends



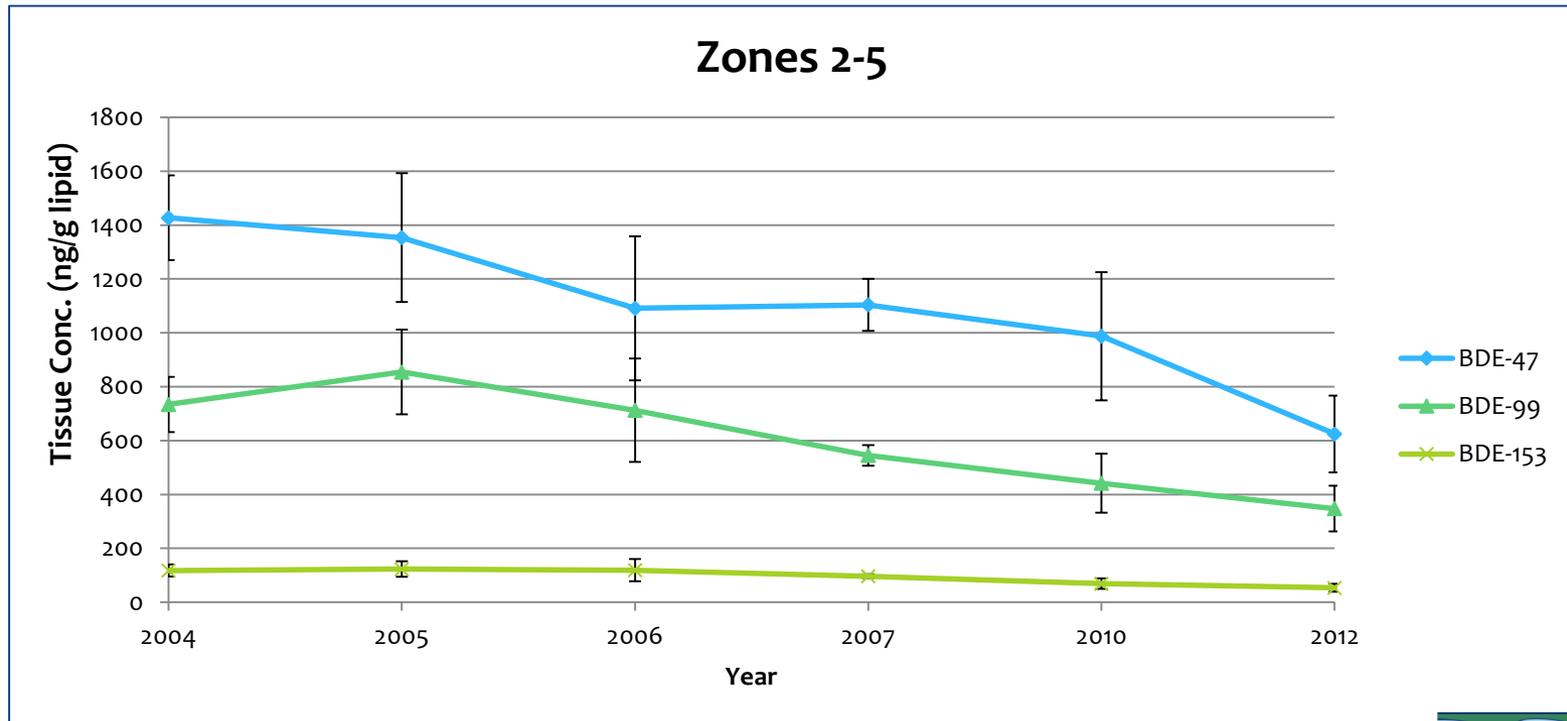
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Estuary Fish Contaminant Levels



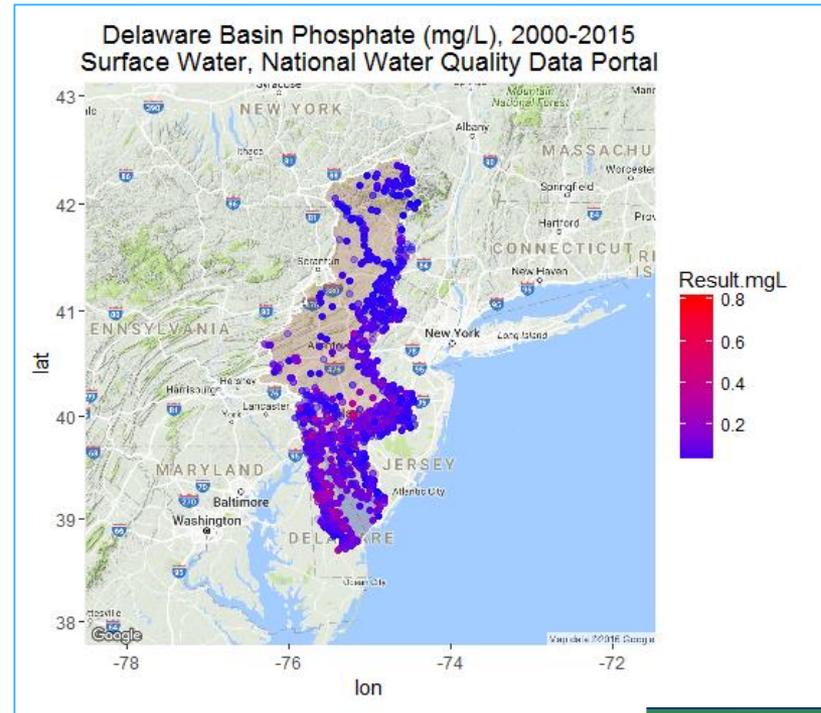
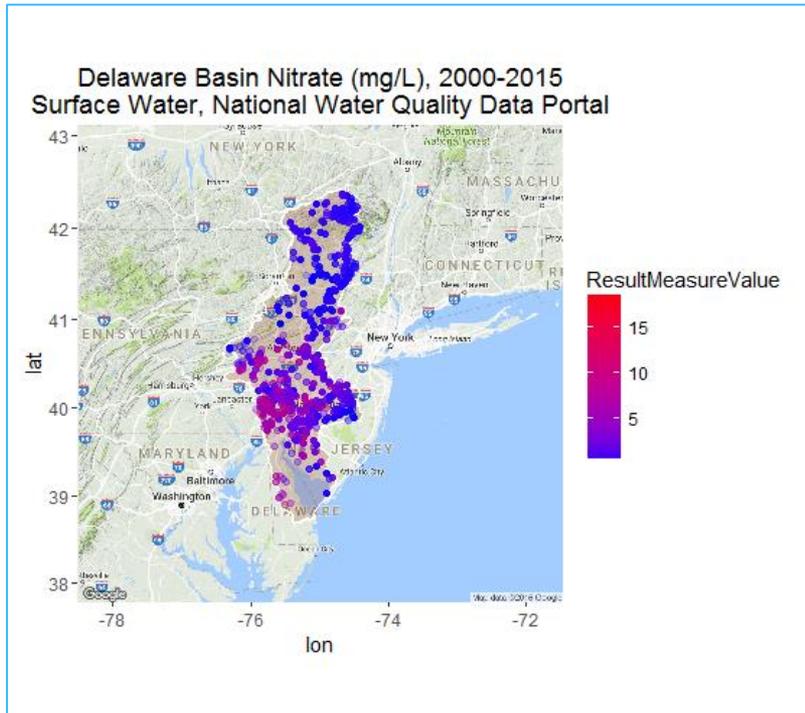
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Estuary Emerging Contaminants



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Non-Tidal Nutrients



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Non-Tidal Nutrients

440 Within-Site Comparisons at a Glance

Good News:
88% of water quality tests showed no degradation

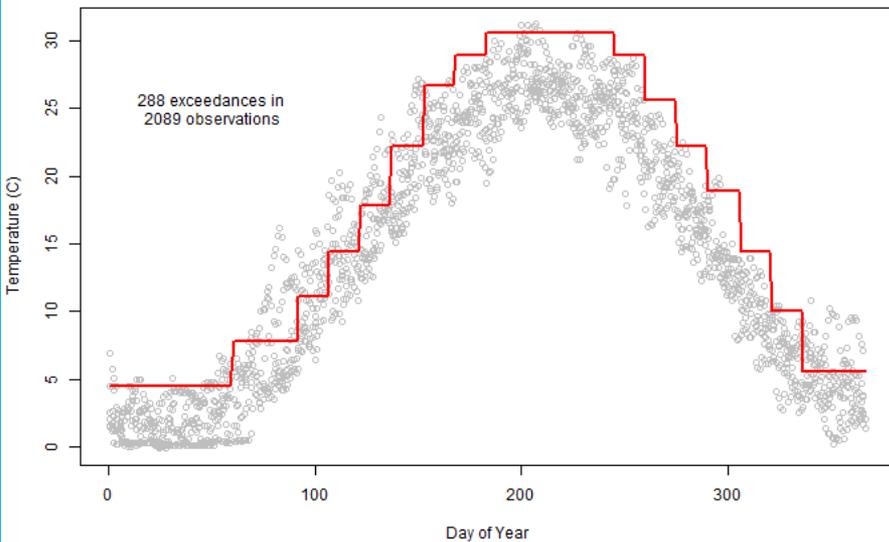
Site Color Key		Dark Blue = Interstate Control Point (ICP)										Dark Red = Pennsylvania Tributary Boundary Control Point (BCP)					Dark Green = New Jersey Tributary Boundary Control Point (BCP)								
Parameter	Site-->	Del. River at Trenton	Del. River at Washngth Crossing	Pidcock Creek, PA	Delaware River at Lambrtville	Wicke-cheokee Creek, NJ	Lockatong Creek, NJ	Delaware River at Bulls Island	Pauna-cussing Creek, PA	Tohickon Creek, PA	Tinicum Creek, PA	Nishi-sakawick Creek, NJ	Del. River at Milford	Cooks Creek, PA	Musco-netcong River, NJ	Del. River at Rieglsvll	Pohat-cong Creek, NJ	Lehigh River, PA	Del. River at Easton	Bushkill Creek, PA	Marlins Creek, PA	Pequest River, NJ	Del. River at Belvidere	Paulins Kill River, NJ	Del. River at Portland
	Site Number-->	1343 ICP	1418 ICP	1463 BCP	1487 ICP	1525 BCP	1540 BCP	1554 ICP	1556 BCP	1570 BCP	1616 BCP	1641 BCP	1677 ICP	1737 BCP	1746 BCP	1748 ICP	1774 BCP	1837 BCP	1838 ICP	1841 BCP	1907 BCP	1978 BCP	1978 ICP	2070 BCP	2074 ICP
Field	Dissolved Oxygen (DO) mg/l											~													
	Dissolved Oxygen Saturation %											~													
	pH, units																								
	Water Temperature, degrees C																								
Nutrients	Ammonia Nitrogen as N, Total mg/l																								
	Nitrate + Nitrite as N, Total mg/l																**								
	Nitrogen as N, Total (TN) mg/l																**								
	Nitrogen, Kjeldahl, Total (TKN) mg/l																								
	Orthophosphate as P, Total mg/l																								
	Phosphorus as P, Total (TP) mg/l																								
Bacteria	Enterococcus colonies/100 ml	~			~																				
	Escherichia coli colonies/100 ml	**	**	**	**	**	**			**	**	**													
	Fecal coliform colonies/100 ml																								
Conventionals	Alkalinity as CaCO3, Total mg/l																								
	Hardness as CaCO3, Total mg/l											~													
	Chloride, Total mg/l			**		**	**	**	**	**		**	**	**	**	**	**	**	**	~	**	**	**	**	**
	Specific Conductance µmho/cm			**		**	**	~	**	**	**	**	**	**	**	~	**	**	~	~	~	**	~		
	Total Dissolved Solids (TDS) mg/l																								
	Total Suspended Solids (TSS) mg/l																								
Turbidity NTU																									
KEY		= No indication of measurable change to EWQ										** = Indication of measurable water quality change toward more degraded status					~ = Weak indication of measurable water quality change toward more degraded status								

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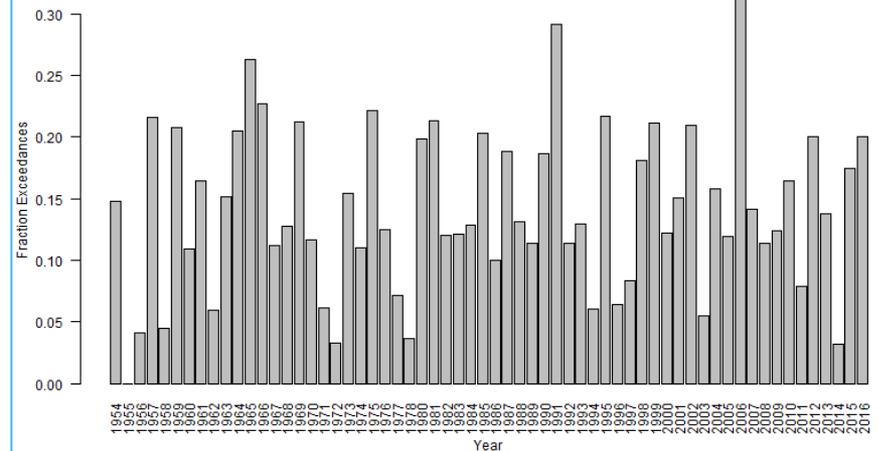


Non-Tidal Temperature – Status & Trends

Comparison of Delaware River at Trenton USGS 01463500 Daily Max Temperature to PA WWF Criteria, 2011 through 2016



Delaware River at Trenton USGS 01463500
Fraction of PA WWF Exceedances by Year



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Questions & Discussion?



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