Joint STAC-MACC Meeting

May 31, 2018

Eutrophication Model Development Monitoring 2018

Delaware River Basin Commission

West Trenton, NJ

May 31, 2018

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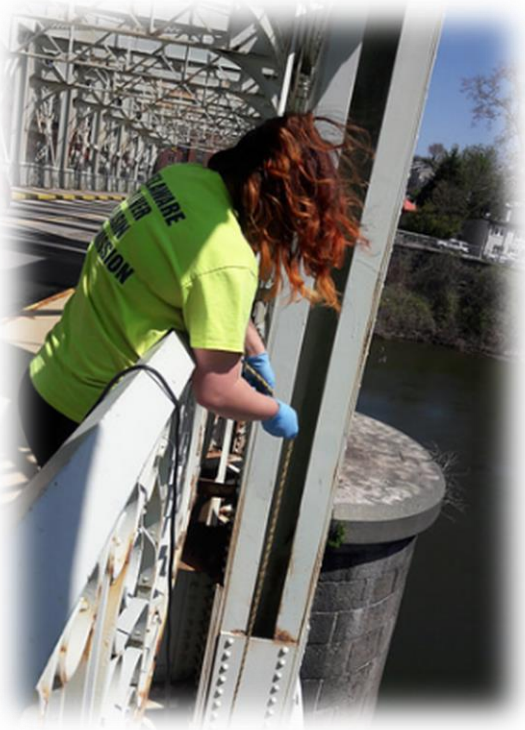

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Delaware River at Trenton & Schuylkill Monitoring

* Monitor twice per month at the Calhoun Street Bridge in Trenton, NJ and Falls Bridge in Philadelphia, PA;
* Started monitoring the Delaware at Calhoun Street Bridge twice per month in January 2017 and added the Schuylkill River for the intensive-monitoring period (2018-2019);
* Delaware at Trenton and Schuylkill River account for the largest freshwater inflows to the Delaware Estuary.

Delaware River at Trenton & Schuylkill Monitoring

* Composite samples collected and analyzed for a number of nutrient species and conventional pollutants;
* Parameter list includes:
  * COD, Chloride, Ammonia (filtered), Nitrate + Nitrite, TKN, Alkalinity, Silica, TSS, Total Solids, TVS, Sulfate, TOC, POC, DOC, CBOD20 @ 30 degrees C*, Total Phosphorus, Orthophosphate, Particulate Inorganic Phosphorus*, Chlorophyll-a
    * CBOD20 @ 30 degrees C is an amended method used as a surrogate to the ultimate BOD test (90 day test)
    * Parameter list refined with help from DRBC's Eutrophication Model Development Expert Panel

Delaware River at Trenton & Schuylkill Monitoring

* Results from 2017 monitoring at the Delaware River at Calhoun Street Bridge available in STORET;
* Results from 2018 monitoring at the Delaware River at Calhoun Street Bridge and Schuylkill River at Falls Bridge is starting to come in;
* Monitoring one of two monthly events concurrently with DRBC's intensive Tributary Nutrient Monitoring project

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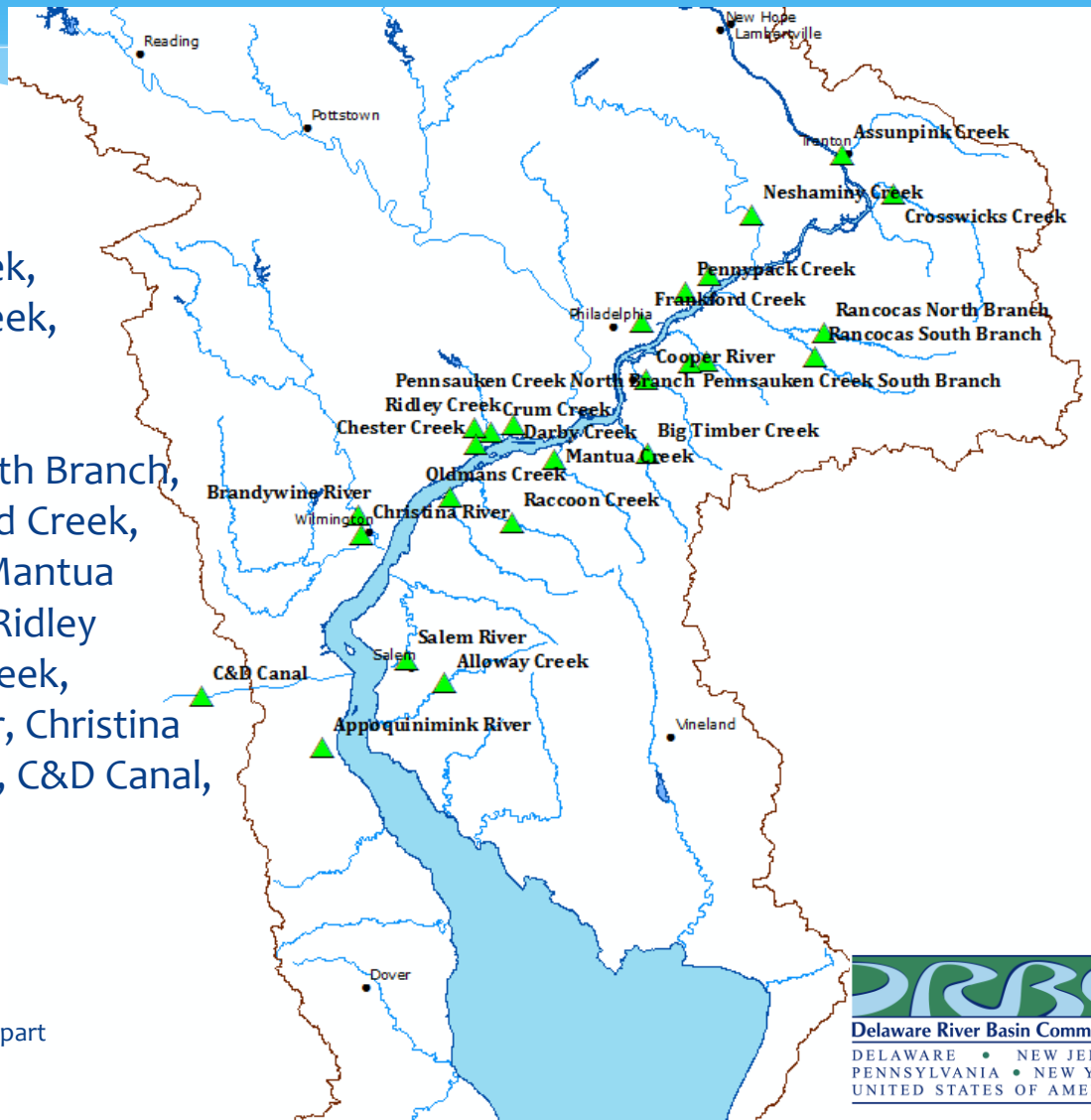
Tributary Nutrient Monitoring

* Monitor once per month for 8 months (starting April and through November) at 25 sites;
* Preliminarily monitored 10 tributary sites 4 times in both 2016 and 2017 (8 monitoring events total);
  * Tributaries in Zone 6 were monitored during this time period;
* Same parameter list as the Delaware River at Trenton and Schuylkill Monitoring project aside from silica and sulfate.

Tributary Nutrient Monitoring

* 2018 site list:
  * Assunpink Creek, Neshaminy Creek, Crosswicks Creek, Poquessing Creek, Pennypack Creek, North Branch Pennsauken Creek, South Branch Pennsauken Creek, Rancocas North Branch, Rancocas South Branch, Frankford Creek, Cooper River, Big Timber Creek, Mantua Creek, Crum Creek, Darby Creek, Ridley Creek, Chester Creek, Raccoon Creek, Oldmans Creek, Brandywine River, Christina River, Salem River, Alloway Creek, C&D Canal, and Appoquinimink River



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Tributary Nutrient Monitoring

* DRBC selected ten tributaries with the greatest drainage areas upstream of the monitoring points to monitor for CBOD-20 @ 30 degrees C and Particulate Inorganic Phosphorus (PIP);
  * Due to budget restraints, the top ten were selected opposed to omission of these analytes from monitoring plan;
  * The top 10 tributaries selected based on size of drainage area and coverage of Zones 2-5 (excluding the Delaware River at Trenton and Schuylkill):
    * Brandywine River, Christina River, Neshaminy Creek, Rancocas Creek South Branch, Rancocas Creek North Branch, Crosswicks Creek, Darby Creek, Chester Creek, Pennypack Creek, Mantua Creek, and Raccoon Creek.

Additional Point-Discharge Monitoring

* Round 1 of Point-Discharge Monitoring started in 2011-2015 in order to later categorize dischargers into tiers (71 facilities):
  * Tier 1 dischargers:
    * Contribute top 95% of total load for Ammonia-N, TKN, or BOD5
    * 12 facilities identified (one sample per week)
  * Tier 2 dischargers:
    * Contribute top 95% of total load for TP, SRP, Nitrate-N, or TN
    * 20 facilities identified (one sample per month)
  * Tier 3 dischargers:
    * Remaining 39 facilities
    * No additional monitoring required (will use existing dataset)
* Goal is to estimate loadings of nutrients from individual facilities during model calibration period of 2018-2019;

Additional Point-Discharge Monitoring

* Tier 1 Facilities (weekly monitoring starting March 2018):
  * Philadelphia Water Department Southwest
  * Philadelphia Water Department Northeast
  * Philadelphia Water Department Southeast
  * Lower Bucks County Joint Municipal Authority
  * DELCORA
  * Morrisville Borough Municipal Authority
  * Camden County Municipal Utilities Authority
  * Gloucester County Utilities Authority
  * Hamilton Township – Wastewater Utility
  * Trenton Sewer Utility
  * Willingboro Municipal Utilities Authority
  * City of Wilmington, Department of Public Works

Additional Point-Discharge Monitoring

* Tier 2 Facilities (monthly monitoring starting April 2018):
  * Bristol Borough Water & Sewer Authority
  * GROWS Landfill, Waste Management
  * Mt. Holly Municipal Utilities Authority
  * Paulsboro Refining Company
  * Delran Sewerage Authority
  * Valtris Specialty Chemicals
  * City of Millville Sewage Treatment Authority
  * Cumberland County Utilities Authority
  * Bordentown Sewerage Authority
  * Moorestown Township WWTP
  * Burlington City STP
  * Florence Township STP
  * Riverside Water Reclamation Authority
  * Chemours Chambers Works
  * Mt. Laurel Municipal Utilities Authority
  * Pennsville Sewerage Authority
  * Cinnaminson Sewerage Authority
  * Delaware City Refining
  * Kent County Dept. of Public Works

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Additional Point-Discharge Monitoring

Analytical Parameter	Units	Filtered, Unfiltered, or Both	Sample Type
Total Phosphorus (TP)	mg/L as P	Unfiltered	24-hour composite
Total Kjeldahl Nitrogen (TKN)	mg/L as N	Unfiltered	24-hour composite
Nitrate Nitrogen (NO_3-N)	mg/L as N	Unfiltered	24-hour composite
Nitrite (NO_2-N)	mg/L as N	Unfiltered	24-hour composite
20-day BOD (BOD_{20})	mg/L	Unfiltered	24-hour composite
20-day Carbonaceous BOD ($CBOD_{20}$) standard method	mg/L	Unfiltered	24-hour composite
20-day Carbonaceous BOD ($CBOD_{20}$) *amended method**	mg/L	Unfiltered	24-hour composite
Chemical Oxygen Demand (COD)	mg/L	Unfiltered	24-hour composite
Total Organic Carbon (TOC)	mg/L	Unfiltered	24-hour composite
Total Suspended Solid (TSS)	mg/L	Unfiltered	24-hour composite
Soluble Reactive Phosphorus (SRP)	mg/L as P	0.45 µm membrane filter	24-hour composite
Soluble Kjeldahl Nitrogen (SKN)	mg/L as N	0.45 µm membrane filter	24-hour composite
Ammonia Nitrogen (NH_3-N)	mg/L as N	Both: 0.45 µm membrane filter & Unfiltered	24-hour composite
Discharge Flow*	MGD	N/A	24-hour mean or higher frequency
Water Temperature	°C	N/A	24-hour mean
Dissolved Oxygen	mg/L	N/A	24-hour mean
pH	1-14	N/A	24-hour mean
Specific Conductance or TDS	µS/cm or mg/L	N/A	24-hour mean

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Additional Point-Discharge Monitoring

* DRBC sent FAQ sheet and Electronic Data Deliverable (EDD) template to the Tier 1 & Tier 2 facilities early 2018;
  * Laboratory reports and EDDs required for all facilities;
  * Submitted monitoring data is reviewed by DRBC;
  * Facilities are starting to submit data;
    * Issues within the submissions are handled early-on

Eutrophication Model Development Monitoring 2018

* Discussion & Questions?

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