The Potomac River Basin Drinking Water Source Protection Partnership

Annual Meeting Summary held via webinar on February 2, 2022

Attendees

Water Suppliers

DC Water:
Anjuman Islam
Maureen Schmelling

Fairfax Water:
Nicki Bellezza
Jojean Bolton
Doug Grimes
John Kingsbury
Gregory Prelewicz
Niffy Saji
Joel Thompson

Loudoun Water:
Thomas Barrack
Jessica Edwards-Brandt
Pam Kenel
Mark Peterson

Town of Leesburg:
Russell Chambers

Washington Aqueduct:
Anne Spiesman

WSSC Water:
Martin Chandler
Robin Forte
Jin Shin
Priscilla To

State and Local Agencies

DC DOEE:
Joshua Rodriguez

Frederick County:
Laura Pfeiffer

MDE:
Greg Busch
Jonathan Leiman
Robert Peoples
Michael Roberts
Rebecca Warns

PA DEP:
Adrian Bouknight
David Mittner

VDEQ:
Tara Wyrick

VDH:
Raven Jarvis

WV DHHR:
Monica Whyte

Federal and Regional Agencies

EPA Region 3:
Virginia Vassalotti
Calvin Yahn

ICPRB:
Renee Bourassa
Claire Buchanan
Curtis Dalpra
Christina Davis
Rikke Jepsen
Heidi Moltz
Andrea Nagel
Michael Nardolilli
Stephanie Nummer
Gordon “Mike” Selckmann

MWCOG:
Steve Bieber

Business Meeting

Due to social distancing requirements resulting from the coronavirus pandemic, the February 2, 2022 Quarterly Meeting was held via webinar. There were 44 attendees, including the moderator and presenters.

A recording of the webinar is available on the ICPRB YouTube page.

Presentations

Potomac River 2021 in Review: Algae and Primary Production
Gordon "Mike" Selckmann, Ph.D., ICPRB (presentation)

- Background on Algae
  - Algae is a component of the greater picture of primary production in the Potomac River
  - Algae is a subset of primary production
  - General concept of biology and ecology of primary production and the key players in the Potomac
  - How algae relates to river morphology:
    - take into consideration where sediments and nutrients are falling out
    - turnover of how nutrients are making their way downstream
    - flow
    - 2021 versus historical data
  - Was 2021 a novel year or if it was part of an ongoing dynamic?

- Primary production in the Potomac
  - Primary Production incudes
    - Filamentous Green Algae
    - Blue-Green Algae/Cyanobacteria
    - Submerged Aquatic Vegetation
    - Periphyton
      - Mostly in tributaries and generally shallower systems
      - Clear flowing water
    - Planktonic Algae
      - Free-floating
      - Another primary producer that takes advantage of the more stagnant waters
      - They move vertically in the water column to access light in these larger water bodies
    - Main things to consider is all plants need three things
      - Water
        - Plenty of water since it is flowing water
      - Food

        - Nutrients are coming from terrestrial environments
        - Flowing water is carrying nutrients
    - Light
        - Limited by riparian buffers, width of the stream
  - Plants are found more in shallower parts of the river

- High Altitude of Potomac as a Whole – River Continuum Concept
    - Continuous gradient from small water bodies to larger bodies
    - Shift in primary production community along river continuum
    - Headwaters have underwater grasses and filamentous algae that are attached
        - Taking advantage of clear water
    - Downriver algae have higher residence time and nutrients feed algae
    - Potomac River – lots of publication on river morphology
    - Areas with lots of a bends – like driving a car – every time there is a bend – water has to slow going around a bend and sediment falls out
        - Lots of areas that are very sinuous and causes a lot of larger sediments to drop out
            - Acts as a depositional filter on the grand scale of the river
        - Larger straight areas are widening and becoming finer particulate trap
            - These areas need changes in flow to stir up areas that have sediments and move them down stream
    - There are a lot of spots moving from Cumberland to Washington DC that slow down the water and thus the cycling of nutrients

- Jennings Randolph Lake Reservoir and Dam
    - Jennings Randolph Lake Reservoir (JRL) is on the North Branch of the Potomac
    - Army Corps of Engineers (USACE) Operates JRL
        - Constantly manipulating flow for various things
            - Water and recreation
            - Flood control
            - Somewhat related to biological targets like fish spawning
        - Could USACE manipulation affect an area like Cumberland where there have been excess nutrients associated with CSOs?
            - Is Cumberland acting as a nutrient source?
        - JRL releases and USACE influence on North Branch has reduced the flashiness so that the high flow impulses of the North Branch are flattened, and the lowest lows are raised which reduced the flow variability.
    - ICPRB is currently investigating the idea of flushing flows at JRL
        - At this time, we don’t see sediment transport or scouring effects downstream of Cumberland

        - We do see some scouring effects proximal to JRL, but that seems the flow velocity and its impacts on the environment is reduced by the time it gets to Cumberland
        - Cumberland, with wastewater discharge and overflow issues in the area, is a nutrient source
            - The water released from JRL and the nutrients from Cumberland go through Paw Paw bends and the depositional zones
        - From Hancock down to the confluence of the Shenandoah and Potomac have a well-documented Planktothrix bloom for the past 35 years (recent publication by MD DNR)
    - This works in a cyclical fashion where the primary producers take up the nutrients and hold on to them until the fall senescence, when the nutrients are released back into the water column
        - Thus, it is unlikely to see a change in primary production near DC four days after a spill in Cumberland with a release from JRL.
        - Abiotic factors can resuspend nutrients from sediments and then move those nutrients downstream.
            - The degree to which this occurs is going to change from year to year

- Significance of Flow – Cacapon River
    - There is a 5-mile stretch that has an annual nuisance-level filamentous green algae bloom/abundance of primary production that is problematic
        - A dissolved oxygen (DO) sensor was placed at one of these sites as a surrogate of the primary production in the area
            - This showed very high-highs and low-lows occurring within a 12 to 24-hour period. This is a similar pattern over 12 to 24-hours to what would be expected based on photosynthesis and respiration
        - This puts significant stress on the biological community
        - This pattern in DO has been observed whether the primary production in this 5-mile stretch was predominantly algae or submerged aquatic vegetation
        - The cyclical pattern in DO and pH (which is affected by the DO) can still be observed, to a lesser magnitude, at the USGS gage on the Cacapon 30 miles downstream of the problematic 5-mile stretch
            - This shows that the Cacapon River is productive
        - Flow likely influences the dominant primary producer in this 5-mile stretch
            - High velocity years seem to be linked with submerged aquatic vegetation (SAV)
                - SAV can withstand higher flows
            - Low velocity years appear to be linked with filamentous algae as the dominant primary producer

- 1000 cubic feet per section (cfs) seems to be the threshold
    - The frequency of 1000 and higher cfs events tend to influence the type of primary producers in the area

- North Fork Shenandoah
    - Both the North and South Fork Shenandoah have had algae blooms for a long time
    - In 2021, Virginia flagged 56 miles of the North Fork Shenandoah for having a Harmful Algal Bloom (HAB)
        - Elevated chance of human contact issues with toxigenic algae, which is an issue because it is a recreational destination
        - ICPRB was brought in to quantify the toxigenic algae
            - Hurricane Ida came through the area and scoured the river which diluted the HAB to non-detectable levels

- Potomac River below Harpers Ferry
    - The Potomac River below Harpers Ferry is characterized by very old bedrock, a lot of channelization, and significant mechanical turnover
        - The older bedrock leads to more cobble/boulder riverbeds
        - There are pools and fine sediment traps interspersed throughout this length of the river
            - An example is Seneca pool
            - These are areas where the small particles and fine sediments fall out of the water column
                - Depending on flow and water depth, there are some years where these areas act more like a river while other years they may act like a reservoir or lake
    - After the nutrient sink at Seneca Pool, water enters a rapid transport area through Great Falls and Little Falls
    - In 2021, this region experienced an algal bloom after low flows and high temperatures
    - Using pH and DO as a surrogate for primary production at places like Point of Rocks and Little Falls, the river is very productive

- The Long-Term Perspective
    - Excess production has been recorded in the Potomac and its tributaries for at least the last 35 years
    - Annual, seasonal, and spatial variability play a critical role in explaining the distribution and abundance of algae
        - There is no single indicator that predicts the type of primary producer for the entire length of the river
    - Not all algae are toxic, but algal blooms can be harmful
        - Bioindicators
        - Production as a symptom of a watershed issue
    - The Potomac is a nutrient enriched system

- Summary for 2021
    - The Potomac was hot and had low flows in July and August which created the ideal conditions for algal blooms. Long residence time allows for cells to accumulate.
    - Recurring algal blooms in the Potomac and Shenandoah will likely continue
    - High productivity in the Potomac below Harpers Ferry may continue to cause trouble for Washington area water suppliers in hot, dry summers if nutrient levels don't diminish

Workgroup Updates

Agricultural Issues
Pam Kenel, Loudoun Water
Recently the Agricultural Issues workgroup has:

- Focused on NRCS National Water Quality Initiative funding:
    - Carroll and Frederick Counties, MD
        - Project is on the Upper, Middle, and Lower Little Pipe Creek watersheds, which is part of the Monocacy River watershed
        - Located in Frederick and Carroll Counties
        - This is in the Planning/Readiness phase with NWQI funding with ICPRB as the contractor
        - Scheduled to occur from August 2021 – September 2022
        - Goal is to apply for the Implementation Phase funding around Summer 2022
    - Cacapon River; several counties in West Virginia
        - Proposal submitted for 29 or more HUC12 watersheds
        - Accepted for Readiness Phase to identify practices for agricultural producers to implement and NWQI funding
        - EPA is leading the plan to engage stakeholders and is keeping DWSPP informed as the project proceeds
        - The proposal for the actual work is still in the process of being refined
- Worked in Virginia on forming local and state connections with Loudoun County, Clarke County, and VA-NRCS. Recent conversations have also occurred with Goose Creek Association (Fauquier and Loudoun Counties).
- Ongoing outreach occurring including discussions with land trusts and NGOs to advance use of the Land Prioritization Tool

Contaminants of Emerging Concern (CEC)
Anne Spiesman, WSSC Water
The Contaminants of Emerging Concern update was used to share a related topic. EPA Region 3 recently provided DWSPP with funding that was available for FY21 for a novel topic. With the CEC's recent work on microplastics, it was suggested that the funding be used to further our knowledge of this topic. With EPA's approval, the funding is being used to develop a literature

review on microplastics through their contractor Cadmus. The draft literature review was recently provided to DWSPP.

Early Warning & Emergency Response (EWER)
Joel Thompson & Doug Grimes, Fairfax Water
The Early Warning and Emergency Response workgroup has recently worked on:

- Online monitoring and alarming of those parameters
    - For example, Fairfax Water continues to work on alarming the toxicity monitor
        - It is working, but is sending a fair amount of nuisance alarms
- Updating the spreadsheet with online parameters and any time the alarm is triggered.
- Joel Thompson has retired from Fairfax Water and Doug Grimes has taken over as chair of the workgroup

Reaching Out
Virginia Vassalotti, MWCOG
Recently the Reaching Out workgroup has worked to:

- Publish the 2021 DWSPP Annual Report
    - It can be found at: bit.ly/dwspp2021
- Continue the monthly Member News Drop newsletter to DWSPP members
- Participate in the first national Source Water Protection Week sponsored by AWWA
- Helped to create promotional material for the Microplastics Webinar

Urban and Industrial Issues
Greg Prelewicz, Fairfax Water
The Urban and Industrial Issues workgroup has recently:

- Continued work on tracking NPDES permit renewals and applications in the Potomac
    - The workgroup maintains the list of all NPDES permits
    - EPA Region 3 did provide an updated NPDES permit list, so the work group is working through those updates right now for potential industrial sites of interest
    - One site on the anticipated tracking list for 2022 is the Invista clothing manufacturing facility in Waynesboro, VA
    - Updated this quarter is Merck, Sharp, and Dohme in Elton, VA in the Shenandoah Basin and it is available on the Samepage site
- Discussed the need for PFAS sampling with major NPDES permits
- Provided information on a couple hazardous waste sites in the basin
    - One site of interest this quarter was the VERSO Luke facility located along the North Branch Potomac River
        - WV DEP publicly advertised a notice of voluntary remediation application
        - Site is believed to contain the holding pond that is potentially associated with the black liquor that made the press a few years ago
        - ICPRB staff is working with WV DEP to obtain the information associated with the voluntary remediation application
    - A second site of interest is the Hidden Lane Landfill in Loudoun County, VA

        - This former unpermitted landfill was incorporated into the EPA Superfund program in 2008
        - Site assessment is complete, and a remediation plan is in place
        - The contaminant of issues is TCE, which impacted local private wells
            - Impacted wells/homes are being provided with public water
            - TCE is mainly a groundwater issue and is not a contaminant of interest in the Potomac
- Discussed updates to WaterSuite, the GIS-based source water tracking tool
    - New data layers are available
        - Including pipelines, hazardous materials, safety administration, pipeline incidents, and a new database of facilities that may be handling PFAS
    - Updates on significant national response center spills
    - 172 PFAS chemicals that are reported under TRI have been added
- A goal of the workgroup in 2022 is to research, monitor, and promote best management practices to reverse the long-term salinization of drinking water supplies

Water Quality (WQ)
Niffy Saji, Fairfax Water
Recently the Water Quality workgroup has worked on:

- Collecting monitoring data, including:
    - Creating a map of monitoring locations for salt (sodium, chloride, or surrogates) in the Potomac Watershed
    - Updating the existing map on HAB monitoring locations in the Potomac watershed
    - PFAS monitoring in the Potomac
    - Looking into SAV monitoring in the Potomac River

Ad Hoc Land Prioritization Implementation
Michael Nardolilli, ICPRB
The Ad Hoc Land Prioritization Implementation workgroup is working to promote the tool through:

- Submitting a proposal to present the project, Land Prioritization Mapping Project to Protect the Drinking Water to Maryland Forever and the Virginia Land Conservation and Greenways Conference
    - Was not accepted for the Virginia Land Conservation and Greenways Conference
        - Planning to have a handout regarding the Land Prioritization tool to hopefully engage land trusts in the basin
    - Tentatively accepted for the Maryland Forever conference
- Efforts to try to change the scoring formula for the Virginia Land Conservation Foundation to consider/award points for projects to protect properties that have been identified as important for source water protection

Administration Updates

Christy Davis, ICPRB

Administrative updates for the February 2nd, 2022, meeting include:

- The 2022 DWSPP membership invoice distribution is in progress
- We will be using the Webex Platform for future virtual meetings
- Future meeting dates include:
    - Wednesday, May 4th, 2022
    - Wednesday, August 3rd, 2022
    - Wednesday, November 2nd, 2022