



**FINAL**

# NJ Water Monitoring Council

Measuring What Counts for Clean & Plentiful Water

**September 26, 2018**  
**MEETING MINUTES**

Member Attendees

**NJDEP** – *DWM&S*: Leslie McGeorge, Alena Baldwin-Brown, Bruce Friedman, Brian Henning, Helen Pang, Vic Poretti *DWS&G*: Ray Bousenberry *DSR*: Nick Procopio *DWQ*: Teresa Guloy

**NJDOH** –

**NJDMAVA** –

**USGS** – Bob Reiser, Heather Heckathorn

**DRBC** – Namsoo Suk

**EPA R2** – Philip Cocuzza

**IEC** –

**NJ Pinelands Commission** – Marilyn Sobel

**NJ Water Supply Authority** – Angela Gorczyca

**Rutgers (Coop Extension Service)** – Lisa Galloway Evrard

**Rutgers (IMCS)** –

**Rutgers (Env. Bioengineering)** – Eric Vowinkel

**Montclair University** –

**Monmouth University/Urban Coast Institute** –

**Stockton University** –

**NJ Sea Grant Consortium** – Pete Rowe

**Meadowlands Environmental Research Institute** – Cheryl Yao

**NOAA** –

**Monmouth County Health Dept.** – Dave Sorensen

**Barnegat Bay Partnership** – Stan Hales

**The Watershed Institute** – Nik Hansen

**Musconetcong Watershed Association** –

**Raritan Headwaters Association** – Kristi MacDonald

**Great Swamp Watershed Association** –

**American Littoral Society** -

**NJ Harbor Dischargers** –

**Brick Township MUA** – William Ruocco, Rob Karl

Guest Speakers/Discussion Leaders

Jake Bransky - DRBC

Susan Cormier – EPA/ORD

Will Isenberg – VA DWQ

Deborah Kratzer – NJDEP/DWM&S

Chris Kunz – NJDEP/DWM&S

Stephen McCracken – Dupage River Salt Creek Workgroup

Kelly Smalling - USGS

Ted Stets – USGS

Tim Wuestneck - BTMUA

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## Other Attendees

Maria Berezin – Raritan Headwaters Association  
Muhammad Bilal Manj – EPA R2  
Lisa Carper – USGS  
Ron MacGillivray – DRBC  
Elaine Panuccio – DRBC  
Sheri Preisig – NJDEP/DWQ  
Brian Salvo – NJDEP/DWQ  
Mara Tippett – Raritan Headwaters Association

- **Council Business** (Copies of the agenda, minutes and many of the information updates and presentations are available on the Council's webpage, under "Meeting Information" - <http://www.state.nj.us/dep/wms/wmccmeetinginfo.html>)
- Minutes from the 05/23/18 Council meeting were approved
- The next meeting will be January 23, 2019 at NJDEP HQ [NOTE: meeting rescheduled for February 6, same location]. Remaining 2019 meetings will be May 22 at USGS and September 18 at DRBC. Continuation of the Freshwater Salinization Monitoring topic was approved by the Council for the January meeting. USGS, DEP/NJGWS, and the Musconetcong Watershed Association expect they will have material that they would like to present. In addition, Council members suggested PFAS compounds in fish tissue and water as another potential topic. The Council Steering Committee will develop the meeting agenda using the suggestions above.
- The Council welcomed new/returning members Kristi MacDonald (Raritan Headwaters) and Angela Gorczyca (now with The NJ Water Supply Authority)

## Information Updates, Presentations and Announcements:

### 1. Announcements –

- Nick Procopio announced that the DEP Division of Science, Research & Environmental Health has been renamed to the Division of Science and Research.
- Leslie McGeorge reminded the Council about the upcoming National Water Monitoring Conference, March 25-29, 2019 in Denver, CO. Abstracts for presentations, posters and/or extended sessions were due September 14. DEP/DWM&S, USGS and Raritan Headwaters Association indicated that they had submitted abstracts for consideration.
- Vic Poretti summarized the reported HAB occurrences to date for 2018 which are 28 reports, 16 of which were confirmed as HABs. Of the reports, 4 resulted in bathing beach closures and 2 were potential drinking water supplies. Vic also shared several updates that have been made to the CyanoHAB website (<https://www.state.nj.us/dep/wms/bfbm/CyanoHABHome.html>), including additional outreach materials.
- Bob Reiser announced several new USGS publications summarized in a handout. These include a study of pesticides and amphibian pathogens in the Pinelands, as well as a study to reconstruct historical daily streamflows in northern NJ and southeastern NY for modeling purposes. Bob also provided fact sheets on several other USGS projects: Delaware River Basin pilot for the Next Generation Water Observing System; Bioremediation of chlorinated ethene compounds at the Naval Air Warfare Center site in W. Trenton; and a summary of US estimated water use in 2015.

### 2. Presentations:

- ***Estrogenic Endocrine Disrupting Chemicals in NJ Surface Water and the Biological Effects in Smallmouth Bass*** – Nick Procopio (NJDEP/DSR) and Kelly Smalling (USGS) shared the impetus for the research investigation, as well as the results from a study looking at the potential biological effects of endocrine disrupting chemicals on smallmouth bass in NJ's surface waters. The study was a cooperative effort between NJDEP Divisions of Science and Research and Water Monitoring & Standards and the USGS New Jersey Water Science Center. It focused on estrogenicity (measured using a yeast bioassay) at

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101 surface water sites throughout the state (16 reservoirs and 85 river sites) and fish histopathology at nine of those sites. Results from the bioassay showed that estrogenic compounds were potentially present in surface waters across the state and high levels of intersex were prevalent in smallmouth bass at each site. Additionally, while associations between land use, estrogenicity, and intersex were identified, at present, there is no evidence of specific land uses or contaminants that may be associated with these observations. Additional work is necessary to identify the drivers of estrogenicity and intersex in these waters. Kelly indicated that a manuscript related to these results is in preparation; publication is expected in about 6 months. She also agreed to return to a future Council meeting and provide information from the additional work. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]

## **Session – Freshwater Salinization Monitoring**

- a) ***Increasing Conductivity in US Rivers & the Potential Links to Lead Contamination in Drinking Water*** – Ted Stets (USGS CO) presented an overview of monitoring associated with salinity, as well as the relationship between salinity, total dissolved solids and specific conductance primarily as it relates to chloride levels in freshwaters. In addition, he provided a summary of a USGS study looking at salinity increases in surface waters across the US and its relationship to potential corrosivity in drinking water facilities. The study covered the period 1992-2012 and examined hundreds of locations around the Nation as a result of increasing salinity or chloride levels that had been found in recent regional and/or national studies. Increases in chloride concentrations in New Jersey streams were particularly strong, as were other surface waters in the Northeastern US. Rising salinity and potential corrosivity in surface waters can increase the risk of lead contamination in tap water. Urban areas showed particularly strong increases in both salinity and indicators of potential corrosivity – chloride concentration and the chloride-to-sulfate mass ratio. Statistical relationships between these indicators and instances of elevated lead concentration in tap water were found. The results suggest that monitoring of elements critical to understanding potential corrosion, such as chloride and sulfate, should be implemented to optimize corrosion control. The original study was published in the journal Science of the Total Environment in 2018 (see <https://www.sciencedirect.com/science/article/pii/S0048969717318223?via%3Dihub>).
- B. ***Modeling Conductivity and Biological Extirpation*** – Susan Cormier (EPA ORD) shared information from research that was undertaken as a result of conductivity being ranked as the #1 priority for national aquatic life criteria by state water quality managers and EPA regions. The research was designed to: 1. estimate natural background conductivity based on geology, climate, landcover and other natural drivers; 2. Develop a field-based method for determining effects to stream life relative to increases in dissolved minerals; and 3. Create a story map of background, biological effect levels, and measured conductivity for streams across the US. The resulting application, Freshwater Explorer, was built using information from >2000 sites nationwide. Susan used Loantaka Brook, NJ to show how the application can be used to model potential biological effects from increased conductivity. Currently, the model has only been validated for mixtures for which at least half of the anions are bicarbonate and sulfate. The model has not yet been validated for sodium chloride. Freshwater Explorer is expected to be available ~Spring 2019.
- C. ***Monitoring Water Quality in Relation to Road Salt Application in NJ's Rivers & Streams*** – Chris Kunz (NJDEP/Bureau of Freshwater and Biological Monitoring - BFBM) provided an overview of salinity-related parameters in DEP's statewide Rivers and Streams Monitoring Network, including sites, data availability and how data loggers have been incorporated into the network and targeted specifically toward road salt monitoring. He also presented BFBM's Road Salt Project, including pairing continuous conductivity data to weather data to see if spikes in conductivity correlate with recorded precipitation. Chris also spoke about developing relationships between specific conductance, chloride and TDS (on a site or watershed/region-specific basis) and how they can be used to extrapolate chloride and TDS values from continuous specific conductance data. This information can then be used to fill in gaps such as estimation of days/hours chloride or TDS exceed surface water quality standards. In addition, Chris articulated that several gaps in this area exist: better communication/awareness regarding the human health effects of increased conductivity is needed, best management practices guidelines could be helpful for road salt application, as well as a possible survey of municipalities associated with compliance with the road salt requirements in their MS4 permits. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]

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- D. ***Status of Trends in Salinity Indicators in NJ Streams*** – Bob Reiser (USGS/NJWSC) summarized work that has been done by USGS to study trends in salinity indicators in NJ's streams. Five of the studies were in cooperation with NJDEP and/or NJDEP and DRBC (1976-1986, 1986-1995, 1998-2007, 1998-2009 and 1971-2011) and included specific conductance, sodium, TDS and chloride among them. All of them showed some increasing salinity trends. The most recent 3 studies showed no sites with significant decreasing trends in salinity indicators. Increasing trends in the first 2 studies were at least 80 percent of significant results, no more than 20 percent of significant results were decreasing. Bob also shared an additional USGS-only study (see <https://pubs.er.usgs.gov/publication/sir20165176>) that looked at chloride levels in streams, groundwater and aquifers across the northern US; nine of the stream sites were in NJ. The results of the study showed that salinity indicators had more significant increasing trends than any other water quality data studied. This study also included trend information related to land use as well as potential variables – such as highway density, major upstream point source discharges and urban minus agricultural land uses - that may explain the variable chloride yields. The relation of chloride to chloride:bromide mass ratio has been found to be related to different chloride sources. The need for a brief summary for managers and the public of all of these trends studies was discussed. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]
- E. ***Trends and Impacts of Road Salt within the Metedeconk River Watershed*** – Will Ruocco and Tim Wuestneck (BTMUA) provided a summary of conductivity-related monitoring that BTMUA has undertaken in the Metedeconk River Watershed. BTMUA provides drinking water from three sources within the watershed: the Metedeconk River, the Brick reservoir and wells that are screened into three aquifers. The population in the watershed continues to grow and, with more development and more roads, more road salt is being used during the winter, and there is the potential for higher conductivity levels in these drinking water sources. Based on the actual increasing average annual conductivity levels seen, BTMUA has started to work with towns/municipalities to develop Best Management Practices for road salt application. In addition, BTMUA has worked with Virginia Tech University on a corrosion issue, experienced in 2014, during a Lead & Copper Rule excursion (as a result of the high chloride/conductivity levels) which has since been resolved. This interaction analyzed the effect of increased corrosivity on lead corrosion and various treatment options that BTMUA can employ to avoid future corrosion issues. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]
- F. ***Near Real-Time Sodium & Chloride Assessment in the Delaware River*** – Jake Bransky (DRBC) shared information regarding DRBC's near real-time assessments of sodium, chloride and TDS levels in Zones 2 (upper most tidal portion) and 3 (urban stretch around Philadelphia) of the Delaware River. These zones have drinking water intakes. Using data from DRBC's estuary water quality monitoring along with specific conductance data from USGS real-time meters, DRBC has developed scripted programs that allow for estimation of sodium, chloride and TDS values. Having this information in near real-time allows DRBC early awareness when a potential problem exists, perform additional monitoring (if needed), notify users if/when there are problems and make future operational adjustments. In addition, as a result of this work, year-round conductivity is being added to the USGS monitor at the Ben Franklin Bridge. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]
- G. ***Trend Analysis of Water Quality in the Pinelands*** – Marilyn Sobel (PC) presented work that has been done by the Pinelands Commission to analyze water quality trends (including conductivity) in the Pinelands. In addition to providing background on land use and general water quality in the Pinelands, Marilyn summarized several studies looking at reference conditions and the impact of water quality degradation on aquatic communities, as well as both long-term monitoring of pH and specific conductance and their relationship with land use. Results showed that there is a strong relationship between altered land use and pH and specific conductance, with both parameters increasing as there is greater land disturbance. Similarly, as the percent of altered land increased, so did the probability of encountering non-native fish species, frogs and toads. She also discussed how the long-term data are being used to study specific conductance and pH trends and what factors may be affecting these trends, including road density, types of land use, percentage of altered land and road salting. Also discussed were the ecological impacts of these trends. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]
- H. ***Assessing Seasonal Water Quality Total Dissolved Impairments in NJ*** – Deborah Kratzer (DEP/DWM&S) shared how work that's being done in DWM&S' Bureau of Environmental Analysis,

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Restoration and Standards is attempting to address seasonal total dissolved solids (TDS) water quality impairments. TDS impairments are often the result of road salt (sodium chloride) use. Deborah explained that there has been an increasing trend in the nationwide use of road salt - in 2017, 22 million metric tons of salt were used for de-icing (which is a 275% increase since 1975) and such use is impacting water quality from both the human health (drinking water issues) and the ecological (aquatic life) perspectives. In NJ's 2014 Integrated Water Quality Assessment Report, 20 HUC14s (subwatersheds) were listed as impaired for TDS. Based on seasonal monitoring data, TDS exceedances are seen most often in the colder months. There is a strong correlation between specific conductance and TDS and chloride, therefore, it can be used as a surrogate. NJ is now reviewing existing regulations as well as other states' TMDL approaches and Best Management Practices that can potentially be used to address these impairments. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]

- I. **Chloride Management and Implementation of Chloride TMDLs in NE Illinois** – Stephen McCracken (DuPage River Salt Creek Workgroup) provided a summary of chloride management activities covering monitoring and the implementation of chloride TMDLs in NE Illinois, where the DuPage River Salt Creek Workgroup is based. The Workgroup consists of members from cities, villages and Sanitary Districts in DuPage and Cook Counties. Stephen shared information regarding the nature of impairments and approved TMDLs for chloride, the monitoring done for developing the TMDLs, load reductions recommended in the TMDLs, as well as various ways in which recommended salt reduction could be achieved, including de-icing workshops, road salt applicator trainings and development of Best Management Practices handbooks. Several agencies in the program, including local and county DOTs and Highway Departments, as well as the Illinois Tollway, have successfully made substantial cuts in their total salt application. He also described a road salt study (MI DOT Bounce and Scatter Study) investigating the speed of the application vehicle vs. salt staying in target area/landing in the gutter. In addition, a comparison of dry vs. treated salt was done. Results showed that lower speed and treated salt provided the best coverage with the least scatter. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]
- J. **Accotink Creek, VA Chloride TMDLs and the Salt Management Strategy (SaMS)** - Will Isenberg (VA DEQ) presented information on the Accotink Creek Chloride TMDL, including characteristics of the Accotink Creek Watershed, why chloride was a problem, as well as the steps taken in the TMDL development. In addition, he described progress on development of a Salt Management Strategy for northern VA which is focused on reducing negative impacts of de-icing salts and public safety maintenance, using improved awareness and implementation of Best Management Practices. Strategy development is heavily stakeholder driven, which is intended to increase public awareness, elicit positive behavioral changes and establish long-term support for continued improvement in de-icing practices and activities. Development of the strategy is intended to be a two-year process with the anticipated completion date of Dec. 2019; implementation to follow. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]

➤ **Action Items**

- Hold initial meeting of the Decontamination Protocols Workgroup [Note: meetings held 11/28/18 and 1/3/19]

➤ **Topics for Next Meeting**

Continuation of Freshwater Salinization Monitoring, and PFAS Compounds in Water, Sediment and Fish Tissue

➤ **Next Meeting**

February 6, 2019 at DEP HQ (rescheduled from January 23)

# **F I N A L**

## **Gaps/Needs Related to Freshwater Salinization Monitoring**

- Need synthesis of information from the USGS/DEP long- term trends studies
- Need for better training/understanding of road salt application issues
- Need further investigation of whether TDS, chloride or other related TMDLs may be needed
- Consider developing statewide road salt application strategies/options
- Need to further investigate why some undeveloped watersheds are seeing a conductivity increase
- Consider investigating the relationship between climate change and road salt application
- Need to look at septic tank density in the Pinelands region
- Recommend that DEP look at specific conductance and salinity sampling data in the Barnegat Bay ambient long-term monitoring network
- Need comprehensive information on how much road salt is applied annually (federal, state, local, county and private highways and roads)