



**F I N A L**

# NJ Water Monitoring Council

Measuring What Counts for Clean & Plentiful Water

**January 19, 2017**  
**MEETING MINUTES**

Member Attendees

**NJDEP** – *DWM&S*: Leslie McGeorge, Alena Baldwin-Brown, Bruce Friedman, Brian Henning, Helen Pang, Vic Poretti, Bob Schuster *DWS&G*: Jeff Hoffmann, Ray Bousenberry *DSREH*: Nick Procopio, Sandra Goodrow

**NJDOH** – Doug Haltmeier

**USGS** – Bob Reiser, Pam Reilly

**USGS (retired)** –

**DRBC** – Tom Fikslin, John Yagecic

**EPA R2** – John Kushwara

**IEC** – Jessica Haley

**NJ Pinelands Commission** – Marilyn Sobel

**NJ Water Supply Authority** – Heather Desko

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

**Rutgers (IMCS)** –

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

**Montclair University** –

**Monmouth University/Urban Coast Institute** –

**Stockton College** –

**Meadowlands Environmental Research Institute** –

**NOAA** –

**Monmouth County Health Dept.** –

**Barnegat Bay Partnership** – Jim Vasslides

**Stony Brook-Millstone Watershed Association** – Erin Stretz

**Musconetcong Watershed Association** –

**Raritan Headwaters Association** – Kristi MacDonald

**Great Swamp Watershed Association** –

**NJ Harbor Dischargers** – Gregory Alber

**Brick Township MUA** –

Guest Speakers/Discussion Leaders\*

Kevin Berry – NJDEP/DWM&S

Dean Bryson – NJDEP/DWM&S

Carol Collier – ANSDU

Scott Haag – ANSDU

Dan Kennedy – NJDEP/WRM

Stefanie Kroll – ANSDU

Bob Limbeck – DRBC

Richard Mitchell – EPA HQ

Karen Murray – USGS

Erik Pilgrim – EPA ORD

Gary Taghon – Rutgers University

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John Vile – NJDEP/DWM&S

## Other Attendees\*

Coleen Makuszewski – NJDEP/DWM&S

Jenna Krug - NJDEP/DWM&S

Anna Signor - NJDEP/DWM&S

Kevin Biallis – NJDEP/DWM&S

Rachel Posavetz - NJDEP/DWM&S

Rachel Host - NJDEP/DWM&S

Katie Ellis - NJDEP/DWM&S

Chris Kunz - NJDEP/DWM&S

Debbie Kratzer - NJDEP/DWM&S

Aynan Zaman - NJDEP/DWM&S

Jack Pflaumer – NJDEP/DWM&S

Eric Best – NJDEP/DWS&G

Teresa Guloy – NJDEP/DWQ

Steve Tuorto – Stony Brook Millstone Watershed Association

Nik Hansen - Stony Brook Millstone Watershed Association

Amy Latham – NJDEP/OWRMC

Deborah Bechtel - NJDEP/OWRMC

Dan Millemann – NJDEP/DSREH

Lori Lester - NJDEP/DSREH

- **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 09/21/16 Council meeting were approved
- The next meeting will be May 24 at USGS. Fish tissue and aquatic invasive plants were suggested as potential technical themes for May. Other ideas should be sent to Leslie, Bob or Alena.

## Information Updates, Presentations and Announcements:

### 1. Announcements –

- Jeff Hoffmann announced that the DRBC drought watch was lifted on January 18 and that the drought conditions for the rest of the state were slowly beginning to look up. Drought information can be found on the DEP website at: <http://www.nj.gov/dep/drought/>.
- Jeff Hoffman also announced that the National Ambient Ground Water Monitoring Network application had been submitted to USGS to replace three (3) bedrock NJ Ambient Ground Water Quality Monitoring Network monitoring wells (which are also part of the National Ambient Ground Water Monitoring Network). These three wells were prioritized for replacement as all three had been identified as no longer suitable for sampling (low flow, turbidity, etc.). [NOTE: the grant proposal has been accepted and recommended for funding pending a final resolution of the Federal Budget].
- Heather Desko provided information regarding the Raritan Basin River Friendly Program which was the 2016 Governor’s Environmental Excellence Award winner in the Water Resources category. The River Friendly Program is a cooperative effort between the NJ Water Supply Authority, the Raritan Headwaters Association and the Stony Brook Millstone Watershed Association to promote clean water and a healthy environment through voluntary actions and programs with businesses, golf courses, schools and residents. Additional information about the program can be found online at: <https://www.njriverfriendly.org/>. The Council congratulated its three member organizations for their receipt of this award.
- On behalf of Meiyin Wu, Leslie announced that Montclair University had submitted a proposal under the EPA Harmful Algal Blooms (HAB) STAR Grant opportunity for research related to treatment of

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cyanobacterial blooms. The proposal, if funded, would include cooperative DEP work with Montclair in assisting with water sample collection.

- Leslie & Bob Reiser announced that the final report for the DEP- sponsored study on Trends in the Quality of Water in New Jersey Streams (1971–2011) was expected to be released shortly. This study focused on long-term trends in total phosphorus, total nitrogen and nitrate concentrations and loads. DEP and USGS provided several presentations on this study at the September 21, 2016 Council meeting. The analysis of water quality trends at 28 stream sites found levels of total nitrogen and total phosphorus declined or stayed the same at most stream sites between the 1970s and 2011. A study of trends in chloride, total dissolved solids and specific conductance at 4 sites found increases at in all constituents at each site. [NOTE: the report was released on February 27 and is available online at: <https://pubs.er.usgs.gov/publication/sir20165176>. The USGS press release is available online at: <https://www.usgs.gov/news/40-year-trend-study-finds-signs-improved-water-quality-new-jersey-streams-0>. The NJDEP press release is available online at: [http://www.nj.gov/dep/newsrel/2017/17\\_0010.htm](http://www.nj.gov/dep/newsrel/2017/17_0010.htm)]
- Pam Reilly also announced the release of several new USGS reports related to Hurricane Sandy, ground water withdrawals in Ocean County, and land use/sample location effects on nitrate and stream flow. These publications can be found online at: <https://nj.usgs.gov/publications/index.html>. She also announced that USGS NJWSC is now on both Facebook and Twitter.

3. *National Water Quality Monitoring Council (NWQMC - <http://acwi.gov/monitoring/>)* – Leslie McGeorge provided a summary of the National Water Quality Monitoring Council’s winter meeting, as well as copies of the meeting minutes. Key topics included new features of the Water Quality Portal, nutrient data exchange (including a USGS metadata project – publication available at: <http://www.sciencedirect.com/science/article/pii/S0043135416309642> - and an EPA WQX/STORET data review), information on the CA Water Monitoring Council’s new HABs portal ([www.mywaterquality.ca.gov](http://www.mywaterquality.ca.gov)), and the Council’s key priorities for 2017. In addition, Leslie also announced that Dwane Young (EPA HQ) would be coming to NJ on February 8 to provide training on the Water Quality Portal. The training is open to interested NJWMC members – those wishing to participate should contact Alena Baldwin-Brown. [NOTE: Approximately 91 people attended the February 8 training. Representatives from 17 NJWMC organizations were among the attendees]. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]

#### 4. *Presentations:*

- ***Draft CyanoHABs Strategy & Advisory Committee*** – Leslie & Vic Poretti (NJDEP/DWM&S) updated the Council on DWM&S/Bureau of Freshwater & Biological Monitoring’s development of the draft NJ Cyanobacterial Harmful Algal Blooms (HABs) Freshwater Recreational Response Strategy and Guidance which is being put together by an Interagency Workgroup (NJDEP and NJDOH). Comments on the draft Strategy document from EPA Headquarters and Workgroup members have been incorporated and the draft is currently undergoing NJDEP management review. In addition, several accompanying resources are also in final development – a new HAB website (freshwater and marine), an online CyanoHAB reporting form, and a technical cyanobacterial fact sheet – are also in final development. The Strategy and website are expected to be finalized in the spring. It is anticipated that an Advisory Committee, consisting of internal and external partners will be added to the Workgroup. The Advisory Committee will discuss ongoing HAB matters such as new analysis methods, communication, and research.
- ***Delaware River Watershed Initiative Update*** – Carol Collier, Stefanie Kroll and Scott Haag (ANSDU) gave an update on components of the ongoing Delaware River Watershed Initiative (DRWI). Carol provided a summary of the overall 3 year project, the goal of which is to ensure clean water through healthy watersheds in the Delaware River Basin. More than 50 nonprofit organizations are participating; eight “clusters” within the basin have been targeted and the focus is on reducing ag runoff and stormwater as well as protecting areas where water quality is currently good. Carol reviewed the planning that occurred during Phase 1 and provided an overview of Phase 2 of the project. Stefanie shared information on development of multiple indicators and metrics, including diatoms, macroinvertebrates, fish, habitat and chemistry, to provide an overall picture of baseline data being collected to potentially show stream

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response to restoration measures at the 300 sites that are part of the study. The data will become publicly available starting in 2018 but can be requested directly in the meantime. Scott summarized the various information systems that have been built to support the DRWI including both a Stream Reach Assessment Tool – which will assist in accurately assessing pollutant loads in streams and evaluate the quality of natural resources that are supporting clean water - as well as use of tools built by other organizations including the Stroud Water Research Center, the Univ of Vermont, USGS Shippensburg, and CUHASI, among others. Scott indicated he would be willing to speak more with NJDEP regarding data comparability and the various tools, if desired. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentations]

## **Session – Biological Monitoring**

- A. ***EPA Biological Monitoring: NARS (inc NLA) and eDNA – A Research Tool with Practical Monitoring Applications*** – Richard Mitchell (EPA HQ) and Erik Pilgrim (EPA ORD) shared information regarding some of the biological monitoring activities and tools that are ongoing at EPA. Richard provided a brief summary of the 4 different National Aquatic Resource Surveys – Rivers and Streams, Lakes, Coastal Condition and Wetlands – and focused on showcasing the biological results from the 2012 National Lakes Assessment (<https://www.epa.gov/national-aquatic-resource-surveys/national-lakes-assessment-2012-results>). Erik shared how environmental DNA (eDNA) can be used for both gaining a broad community perspective as well as looking at specific species of interest (e.g., invasives, threatened or endangered). Erik explained the benefits of using eDNA vs traditional morphological samples – cost, processing time, applicability to many groups simultaneously - as well as its potential use in both the 2017 National Lakes Assessment and the 2018-2019 National Rivers and Streams Surveys. Limitations of eDNA include issues with DNA sequence databases covering potential groups of interest, differences in eDNA residence time related to environmental factors, and eDNA signals from dead individuals (zombie DNA) being interpreted as the presence of live populations. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentations]
- B. ***NJ Biomonitoring and Freshwater Macroinvertebrate Monitoring***– Dean Bryson (DEP/WM&S) provided an overview of DEP’s statewide freshwater and marine biomonitoring programs, including macroinvertebrates, fish and algae (currently in development), and highlighted gaps in routine biomonitoring such as lakes and coastal waters. Dean focused on NJ’s long-standing, stream benthic macroinvertebrates monitoring, and the three regional indices used to assess the NJ macroinvertebrate data – HGMI, PMI and CPMI. Dean also covered the newer probabilistic monitoring, a bionutrient correlation project, an ongoing analysis of index and metric variability, and existing gaps and needed refinements. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]
- C. ***Fish & Headwaters Indices of Biotic Integrity & Development of New Indices for High-Gradient Streams*** – John Vile and Brian Henning (DEP/WM&S) summarized the development of both the fish and headwaters indices of biotic integrity (IBI). John presented information on both the northern and southern Fish IBIs, including the development of new metrics and index for the northern IBI which are more sensitive and responsive to anthropogenic stressors. Brian detailed the development of the new Headwaters IBI including why it was needed and the various ways it differs from the northern and southern Fish IBIs. Unlike the Fish IBIs, this index is used for smaller order streams and uses indicators such as crayfish, fish, frogs and salamanders. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]
- D. ***DRBC Biological Monitoring Program Update*** – Bob Limbeck (DRBC) provided an update on the biological monitoring program at DRBC. Bob indicated that, with the departure of Erik Silldorff, the program is currently undergoing review. At this time, DRBC is performing benthic invertebrate monitoring, benthic diatoms and soft algae, and aquatic plant monitoring. There is also planning for phytoplankton monitoring in the Delaware Estuary/Bay as well as ichthyoplankton monitoring. Bob also indicated that the DRBC Biological Advisory Committee is to be reconvened. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]
- E. ***NAWQA Regional Stream Quality Assessments of Ecological Conditions & Multiple Stressors*** – Karen Murray (USGS NYWSC) presented an overview of the USGS’ Regional Stream Quality Assessment (RSQA) program, with a specific emphasis on the Northeast Stream Quality Assessment (which includes 2 sites in NJ – Saddle River and HoHoKus River). The goal of RSQA is to understand how various physical, chemical, and biological stressors affect stream condition. Biology monitored included fish,

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macroinvertebrates and algae. Parameters sampling included nutrients, pesticides, pharmaceuticals, emerging contaminants, mercury (in water, sediment, and fish), metals, flow, and temperature, among others. She also shared some of the RSQA results related to stressor-ecology relations from other regions in the country. Karen offered to speak to the NJWMC again when more data are available to share.

[see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for study fact sheet]

- F. Pinelands Commission Biological Research & Monitoring** – Marilyn Sobel (Pinelands Commission) summarized the biological research and monitoring activities of the Pinelands Commission - past, present and future. The previous focus had been on watershed assessments; specifically, looking at relationships among land use, water quality degradation, and altered aquatic communities for on-stream habitats. Currently, the focus has expanded to off-stream habitats and includes assessments of pond vulnerability and the functional equivalency of created wetlands. In the future, Commission and USGS scientists plan to explore point and nonpoint sources of endocrine-disrupting compounds and their possible effects on fish and frogs. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]
- G. Watershed Association Biological Monitoring:**
- **Stony Brook - Millstone** Watershed Association (SBMWA) – Erin Stretz shared information regarding the types of biological monitoring that are performed by the SBMWA. Erin detailed SBMWA’s Stream Watch program where biological monitoring occurs. Stream Watch has approx. 99 volunteers that monitor at 46 sites in the watershed. Erin also described collection protocols, sorting & identifications (at the family level) and its quality assurance practices (SBMWA has a DEP approved QAPP and their data are used to inform assessments for DEP’s Integrated Report). SBMWA is currently updating their collection methods and will soon also switch one of their family-level identifications to genus-level (to be done by a certified lab). SBMWA is also beginning to do trends analyses on their biological data.
  - **Raritan Headwaters** Association (RHA) - Kristi MacDonald provided a summary of the biological monitoring taking place at RHA which involves ~100 volunteers conducting stream monitoring at over 65 sites. RHA identifies benthic macroinvertebrates to the genus level and is now using NJDEP’s High Gradient Macroinvertebrate Index (HGMI) for assessing water quality. In addition to biological water quality measurements, RHA also performs chemical analyses and visual habitat assessments. RHA is expanding its science programs to include regular monitoring of bacteria in streams, a study of atrazine and arsenic in surface water, an assessment of microplastics downstream of wastewater treatment plants, surveys of aquatic dependent wildlife and habitat connectivity, vernal pool certification and they continue to monitor groundwater quality via their longstanding well test program. They recently completed a trend analysis on 3 decades of groundwater data and are currently working on a trend analysis of their stream monitoring data. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentations]
- H. Update on Ocean Benthic Index & Oxygen Conditions** – Bob Schuster (DEP/WM&S) provided an update on ocean benthic monitoring related to water quality impairment. NJ’s ocean waters are listed as impaired on the Impaired Waterbodies List (303(d) list) for Dissolved Oxygen (DO). Because little data has been available in the past on ocean benthics, DO is used as a surrogate for biological conditions. To further evaluate the low DO values which have caused the impaired status, NJ has employed a slocum glider, since 2011, to conduct continuous, three-dimensional monitoring for DO along the coast. These continuous data from the glider sampling runs may be used in the future to revise the assessment status of the ocean waters. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]
- I. Community Monitoring in Barnegat Bay & Indicator Development** – Gary Taghon (Rutgers University) summarized the work that has been done regarding benthic community monitoring in Barnegat Bay. This research is instrumental for both nutrient biocriteria and water quality model development, as well as answering questions related to the shutdown of the Oyster Creek Nuclear Power Plant. Gary explained the hypotheses behind the work, the use benthics as an indicator of water quality as well as the fact that species differ in their sensitivity/tolerance to stress (e.g., nutrient enrichment). He also detailed the problems/stressors currently facing the Bay, the sampling conducted, the community-related results and data analyses (past vs present), as well as conclusions and suggestions for further work. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]
- J. Use of Biological Data for Water Quality Assessment** - Kevin Berry (DEP/WM&S) provided an overview of how biological monitoring data are used for statewide water quality assessment – specifically for the aquatic life designated use assessments. Kevin explained the various metrics that are used, the minimum

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suite of parameters that are necessary, as well as the overall assessment process, including how determinations of impaired vs non-impaired status are made. He also shared additional uses of biological data by the NJDEP, including stream classifications, Category One antidegradation designations and nutrient criteria development. [see [www.state.nj.us/dep/wms/wmccmeetinginfo.html](http://www.state.nj.us/dep/wms/wmccmeetinginfo.html) for presentation]

➤ **Technical Topics for Next Meeting**

Follow-up Biological Monitoring Presentations and Aquatic Invasive Plant Monitoring

➤ **Next Meeting**

May 24, 2017 at the USGS NJ Water Science Center

\*Speaker/Attendee Organization Acronyms (other than NJWMC member organizations):

ANSDU – Academy of Natural Sciences Drexel University

EPA HQ – EPA Headquarters

EPA ORD – EPA Office of Research & Development

DEP/WRM – NJDEP Water Resource Management

DEP/OWRMC – NJDEP Office of Water Resources Management Coordination

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## **Gaps/Needs Related to Biological Monitoring**

- Need for potential Coastal Plain Macroinvertebrate Index (CPMI) Recalibration – are current metrics effective in detecting biological impairments in non-Pinelands, coastal plain streams? Could CPMI also be recalibrated to the family level?
- Where should Pinelands Macroinvertebrate Index vs CPMI be applied around the Pinelands/Non-Pinelands boundary?
- Are current head-of-tide determinations for tidal freshwater rivers and streams, based on surveys done in late 1970s/early 1980's, still applicable?
- Need to know how close to head-of-tide can freshwater biological monitoring sites be located – esp. near freshwater/brackish interface
- Need for better understanding of aquatic-terrestrial linkages (e.g., woody debris)
- Need for better understanding of the effects of land disturbance on mortality
- Need for routine biomonitoring in lakes and non-wadable rivers
- Need for routine biomonitoring in coastal waters
- Need to finalize marine macroinvertebrate index