



NJ Water Monitoring Council

Measuring What Counts for Clean & Plentiful Water

May 21, 2014
MEETING MINUTES

Member Attendees

NJDEP – *WM&S*: Leslie McGeorge, Alena Baldwin-Brown, Danielle Donkersloot, Brian Henning, Helen Pang, Vic Poretti *NJGWS* – Karl Muessig *OS* – Sandra Goodrow, Judy Louis, Nick Procopio *DWQ* – Marco Alebus

NJDHSS – Doug Haltmeier

USGS – Bob Reiser, Pam Reilly

DRBC – Bob Tudor, Tom Fikslin

EPA R2 –

IEC – Bill Shadel

NJ Pinelands Commission –

NJ Water Supply Authority – Heather Desko

Rutgers (Coop Extension Service) –

Rutgers (IMCS) –

Rutgers (Env. Bioengineering) – Eric Vowinkel

Montclair University –

Monmouth University/Urban Coast Institute –

Stockton College – Art Baehr

Meadowlands Environmental Research Institute –

NOAA –

Monmouth County Health Dept –

Barnegat Bay Partnership –

Stony Brook-Millstone Watershed Association – Erin Stretz

Musconetcong Watershed Association – Nancy Lawler

NJ Harbor Dischargers – Ashley Slagel

Brick Township MUA –

Guest Speakers/Discussion Leaders

Manny Charles – USGS NJWSC

Michele DePhilip – The Nature Conservancy

Steve Domber - NJDEP/NJGWS

Neil Ganju – USGS/Woods Hole Coastal & Marine Science Center

Jeff Hoffman - NJDEP/NJGWS

Steve Johnson - NJDEP/NJGWS

Bill Kibler - Raritan Headwaters Assoc.

Daryll Pope – USGS NJWSC

Erik Silldorff - DRBC

Ian Snook - NJDEP/NJGWS

Steve Spayd - NJDEP/NJGWS

Guests

Theresa Galloy – NJDEP/DWQ

Angela Gorczyca – Raritan Headwaters Assoc.

Biswarup Guha – NJDEP/WM&S

Robert Miskewitz – Rutgers
Lisa Oberreiter - PVSC
Jeff Reading – NJDEP/WM&S
Melissa Riskin - USGS NJWSC
Paul Schorr – NJDEP/NJGWS

- **Council Business** (Copies of the agenda, minutes and many of the information updates and presentations will be available on the Council’s webpage, under “Meeting Information” - <http://www.state.nj.us/dep/wms/wmccmeetinginfo.html>)
 - Minutes from the 01/29/14 Council meeting were approved.
 - Next NJWMC meeting is scheduled for September 24 at NJDEP HQ
 - Suggested Technical Themes for the September meeting are Environmental Mercury, Water Quality Data Management/Dissemination, and Citizen Science/Volunteer Monitoring.

- Information Updates, Presentations and Announcements:
 1. **Membership Updates – New Members:** Sandra Goodrow has joined the Council as part of the NJDEP Office of Science representatives and Eric Vowinkel has returned to the Council now as a representative for the Rutgers University Dept of Environmental Sciences’ Bioengineering Program. **Retirements:** Jack Gibs (USGS NJWSC) retired as of January 31, Paula Zevin (EPA Region 2) retired as of April 30, Bob Tudor (DRBC) retired as of May 31 and Judy Louis (DEP/OS) retired as of June 30. **Resignations:** Mike Kennish (Rutgers IMCS) and Jennifer Samson (NOAA) have resigned. Replacements for both are being sought.

 2. **Announcements** – 1. Leslie McGeorge announced two management changes in DEP’s Water Resource Management (WRM) area: a. Dan Kennedy is the new Assistant Commissioner for WRM, and b. Patricia Gardner is the new Director of the Division of Water Monitoring and Standards. 2. On behalf of John Kushwara, Bob Reiser announced several management changes at EPA Region 2 (as of the date of this meeting) including: Kevin Kubik is the Acting Director for DESA, John is currently the Acting Deputy Director, Randy Braun is the Acting Branch Chief of the Monitoring and Assessment Branch, and Darvene Adams is the Acting Chief of the Monitoring and Operations section. 3. Bob Tudor announced that DRBC’s 2014 Integrated Report (305(b) portion only) was submitted to EPA on April 1. DRBC is still awaiting EPA’s official response. 4. Robert Miskewitz announced the formation of the Rutgers Center for Hydrological Measurements, which is an applied center focusing primarily on water cycling and water budgets. In the future, the Center may be connected with the Rutgers Experiment Station. It expects to serve as a contract lab for unsaturated zone hydraulic characterization, tracer studies, and water budget measurements. Bob Tudor suggested Robert contact Eric Evenson (USGS NJWSC) regarding the National Water Budget Initiative. It was also suggested he talk to Bob Nicholson (USGS NJWSC) or Jeff Hoffman (NJDEP NJGWS) for potential collaboration.

 3. **National Water Monitoring Conference** – Leslie McGeorge, as well as other NJWMC presenters/attendees, provided information from the National Water Monitoring Conference, held April 28-May 2 in Cincinnati. Approximately 650 people attended the conference - other NJWMC attendees included Danielle Donkersloot, Brian Henning, Helen Pang, Stan Hales, Nancy Lawler, John Yagecic, Erin Stretz and Jim Kurtenbach. The conference consisted of platform and poster presentations, panels, demonstrations and trainings. Areas of increased emphasis included sensors/continuous monitoring, water quality assessment, emerging contaminants, data management tools/portals, and data and information dissemination (e.g., water quality indices, report cards, etc.). Presentations and posters are expected to be available on the National Council’s webpage in the near future. As part of an invited panel on Extreme Weather, Leslie presented NJ’s water monitoring approaches with Hurricane Irene/Tropical Storm Lee/Superstorm Sandy, including the development of the NJ in-land flood monitoring plan. There was also an R-based Statistics training held (Brian Henning, Helen Pang & John Yagecic attended) from which a listserv is being developed, hosted by DRBC, for which 144 people are currently registered. John Yagecic will send information about the ListServ to Alena for distribution to the full Council. Other items of importance from NJ Council attendees included: use of probabilistic surveys, image-recognition technology, microbial source tracking, smartphone apps, real time monitoring, use of report cards,

use of continuous monitoring data for assessment purposes, citizen science vs. volunteer monitoring and the possible establishment of a National Volunteer Monitoring Council.

3. *Water Level Response in Barnegat Bay Following Hurricane Sandy* – Neil Ganju (USGS Wood Hole). Neil Ganju summarized a study comparing water level response before and after Hurricane Sandy. Approximately 30% of the highest daily maximum water levels ever seen in Great South Bay and Barnegat Bay, between 2007 and 2013, came in the 5 months following Hurricane Sandy. Thus the intent of this study was to see if these types of extreme events alter systems that are protected by barrier islands, leaving the mainland more vulnerable to flooding. The study showed, however, that comparisons between water levels before and after Hurricane Sandy at stations in both bays as well as offshore showed no significant differences in transfer of sea level fluctuations from offshore to either bay following Hurricane Sandy. The study found that the high water levels appeared to be due to winter storms. The paper containing the results from the study is available, online, at: <http://onlinelibrary.wiley.com/doi/10.1002/2014GL059957/abstract>.

4. *The Nature Conservancy's EcoFlow Goals Project* – Erik Silldorff (DRBC) and Michele DePhilip (TNC). Erik Silldorff and Michele DePhilip gave an overview of The Nature Conservancy's EcoFlow Goals Project in the Delaware River Basin – a major sponsor of which is DRBC. The objective of the project was to develop science-based flow recommendations, based on existing information, that could be used to inform policy making in the Delaware Basin. The project encompassed all tributary rivers and streams in the Appalachian Plateau, Ridge and Valley, New England and Piedmont physiographic provinces as well as the nontidal mainstem Delaware River down to Trenton. It also included assessments of which species – fish, mussels, reptiles & amphibians, aquatic insects & crayfish, birds & mammals, and floodplain & aquatic vegetation – are sensitive to changes in streamflow. Results show that there are many flow needs that are common across many species, which are important for maintaining aquatic life. Recommendations from the project include seasonal recommendations and recommendations for four habitat types (i.e., size of drainage area). The project report is available online at: http://www.state.nj.us/drbc/library/documents/TNC_DRBFlowRpt_dec2013.pdf.

➤ **Session – Ground Water Monitoring**

A. *Intro to Ground Water Quality & Quantity Basics in NJ* – Jeff Hoffman (DEP/NJGWS)

Jeff Hoffman provided a basic overview of ground water quality and quantity in NJ including the ground water cycle, soil porosity vs. permeability, types of aquifers in NJ and the differences between them including recharge time, as well as how streamflow can be highly influenced by aquifers in the watershed (e.g., watersheds on rock aquifers tend to be flashier with lower base flows while watersheds on sand aquifers tend to be less flashy and have higher base flows). He also explained how land use and travel time governs ground water/recharge quality – younger ground water (shorter travel time, shallower wells, rock aquifers, etc.) is more highly influenced by recent land use practices while older ground water (longer travel time, deeper wells, sand aquifers, etc.) is more influenced by historic land use practices. Some of the most important contaminants affecting ground water include anthropogenic nitrates and natural arsenic and radium. Salt water intrusion is not generally a problem away from the coastal water table aquifers and some confined coastal plain aquifers.

B. *Summary of NJ's Ground Water Monitoring Networks and the National Ground Water Monitoring Network* – Daryll Pope (USGS NJWSC)

Daryll Pope summarized NJ's ambient ground water monitoring networks – water level, and water quality data - which are maintained by both USGS NJWSC and NJDEP (DWM&S & NJGWS). Data from these networks are an important source of information for addressing concerns such as declining water levels, well interference, drought, saltwater intrusion, anthropogenic impacts on groundwater, and streamflow depletion. He also provided an update on the National Ground Water Monitoring Network, which was created in 2009 and is mostly water quantity and availability-based, but does have some water quality information. A pilot study for this network was conducted in NJ in 2010. At that time, insufficient sampling frequency was the biggest gap identified in the NJ ground water-quality monitoring network. However, working through the NJWMC, a mechanism to address this gap has been developed. An information portal for the NGWMN was released in 2011. Updates to the portal include a new look & feel, fine-tuned control of site selection, enhanced map controls (zooming, panning, selecting), enhanced filter/map interaction, better help & explanations, new filters (data availability, state/ county, filter refresh), and new download options. During FY14, maintenance on the

portal will continue and water quality pilots in additional states – MA & UT - will begin (EPA Regional Labs are providing analytical services at no cost). For FY15 and beyond, additional activities will depend on the level of federal funding that is available.

C. Web-based Water Table Maps for NJ – Manny Charles (USGS NJWSC)

Manny Charles shared a new web-based tool, being developed in cooperation with NJDEP, which presents water table maps of the Coastal Plain. The tool represents nine published water table studies in the Coastal Plain, has search capability (place, name or street address), contains pop up information for the study areas, ground water points and surface water points, links to downloadable data files (ArcGIS) for all data layers, and links to recent depth-to-water data points from NWIS. Additional areas in the Coastal Plain that still lack water-table studies are in the areas of Monmouth County, Camden County, southern Atlantic County, and the Tuckahoe River basin. Additional work is proposed for developing and serving a depth-to-water mapping tool that is specific to at-risk coastal areas.

D. Drought Indicators Information – Ian Snook (DEP/NJGWS)

Ian Snook briefed the Council on the statewide drought indicators that are produced by DEP's NJ Geologic and Water Survey. For this endeavor, NJ is divided into six drought regions. The indicators, themselves, primarily focus on reservoirs and shallow ground water systems; much of the data used is provided by USGS. The indicator reports are generated – under normal conditions – bi-weekly. Under dry conditions, they are produced weekly. Conditions evaluated (as appropriate) for each of the six regions include: precipitation, stream flows at unregulated gauges, groundwater wells, and reservoir levels. The indicators are used to both give an overview of the general status of the resource and as a tool to determine an appropriate drought condition for a particular region (note: there are 4 levels of drought declarations – normal, watch, warning & emergency. The DEP Commissioner can declare a watch and warning but only the Governor can declare or lift an emergency). Additional information about the indicators can be found online at: www.njdrought.org.

E. Update on Available NJ Water Use Information – Steve Domber (DEP/NJGWS)

Steve Domber provided an overview as well as the status of the NJ Water Transfer Data System (NJWaTr), which is an in-house water transfer database that can be used as a water resource management tool. NJWaTr can tell a user where water comes from, where it goes, what it is used for, by whom, how much is used, and how these facts can change over time. It is currently in an Access database that links back to NJEMS and all water allocation activities are included. USGS provides match money for this effort. NJWaTr currently contains sites, conveyances and transfer volumes. 2010-2011 data are expected to be available during Summer 2014 (often takes 1-2 years for data to be reviewed, QA'd and then entered into the database). NJWaTr publications can be found online at <http://www.nj.gov/dep/njgs/geodata/dgs10-3.htm>.

F. Chloride Data Analysis for Water Supply in Cape May – Steve Johnson (DEP/NJGWS)

Steve Johnson summarized ongoing activities in Cape May related to public water supply well monitoring. These activities include installation of sentinel observation wells in key locations in salt-water affected aquifers, monitoring salt water intrusion, and management of the ground water supply via ground water diversion permitting program. Chloride levels have been increasing in some wells in Wildwood's Rio Grande Well Field, Villas, and Fishing Creek Areas in Lower and Middle Townships. Cape May City responded to salt-water intrusion in its shallow wells by using less water from the affected aquifer and by using water from the deeper 800-foot sand aquifer with reverse osmosis treatment to "remove" the natural salts. In Cape May County, the two aquifers chiefly affected are the Estuarine Sand and Cohansey. Water supply pumping has influenced the freshwater/salt water interface in these aquifers. Monitoring of the aquifers/ water resources is being handled by water users as mandated in the diversion permit. Looking forward, the salt-water intrusion problems may necessitate changes in water supply well placement for wells using the Estuarine Sand or Cohansey aquifer. USGS studies have shown that maximal usage of water supply wells in these areas can be achieved by relocating the wells along Cape May's spine, thus spreading out the pumpage to minimize salt water intrusion effects, and by going to less limited aquifers such as the deeper Rio Grande Water Bearing Zone and 800-foot sand in the Kirkwood Formation.

G. Update on Trends in Ambient Ground Water Network and Natural Ground Water Quality Problem Areas – Steve Spayd (DEP/NJGWS)

Steve Spayd provided an update on the natural ground water quality problem areas that have been and continue to be identified via private well testing. Steve shared that it is very rare for people with private wells to test their water unless they are selling their home. Programs have been put in place to encourage and enable more homeowners to test their wells in areas with problems. For example, Hunterdon County shows numerous exceedances of the arsenic maximum contaminant level (MCL is 5ppb). New naturally occurring contaminants of concern, such as boron, lithium and sodium, have also been under investigation and also showed up at very high levels in the same well that had the highest arsenic reading. Of all of the tested private wells in NJ that have MCL exceedances, the majority are related to naturally occurring arsenic and radionuclides (gross alpha) while the remaining exceedances are the result of human activities (nitrate, fecal coliform/e.coli, VOCs and mercury). The need to expand testing for naturally occurring radiological contaminants in northern counties was also highlighted. The data can be found online at <http://www.nj.gov/dep/njgs/geodata/dgs05-2.htm>.

H. Community Well Test Program – Bill Kibler (Raritan Headwaters Association)

Bill Kibler spoke to the Council about the Raritan Headwaters Association's Community Well Test Program. This program is very important in this area as 80% of the residents in the watershed have wells and 60% are on septic systems. In addition, most of the residents rely on ground water for their drinking water. The program was established in 1974 and is available in 16 municipalities throughout the watershed. The program provides "self service" well test kits and all testing is performed by a NJDEP Certified laboratory. Contaminants of concern in the watershed include coliform bacteria/pathogens, nitrates, iron, manganese, lead, arsenic, pesticides/herbicides, VOCs, radon & gross alpha. RHA has built a well testing database that currently contains 4 years of data; they are working on digitizing older records for entry into the database. They are also, in 2014, attempting to produce a State of the Groundwater Report for the watershed. Bill indicated that RHA could use assistance with data analyses and that their Monitoring Advisory Committee is seeking members. If there is interest in assisting RHA, members should contact Bill at bkibler@raritanheadwaters.org.

➤ **Action Items**

- Send information regarding R-statistics ListServ for distribution to full Council - *John Yagecic and Alena*
- Provide January 29, 2014 Meeting agenda (at which the William Penn Foundation presented) to Carol Collier (at ANSDU) with a request that the William Penn Foundation stay engaged with the NJWMC – *Bob Tudor*
- Explore having Contaminants of Emerging Concern as a technical topic for a future meeting – *Steering Committee*

➤ **Technical Topics for Next Meeting**

Water Quality Data Management/Dissemination/Portals

➤ **Next Meeting**

September 24 at NJDEP HQ

Identified Gaps in Ground Water Monitoring

- Replacements for aging monitoring infrastructure (e.g., wells)
- Resources to implement the National Ground Water Monitoring Network (if funding becomes available will be used to fill identified gaps and complement the National Water Monitoring Network)
- Integration of community well test information with the Private Well Testing Act program (including technical assistance, if possible)
- Addition of contaminants (e.g., uranium, gross alpha, arsenic), as part of the PWTA program (local Watershed Associations' support?)
- How to best serve out the ground water data – nationally or locally? (if using a national tool, how can the data be tailored for local access/use?)
- Water use – agriculture community's water withdrawals are not currently metered (only estimated)
- Develop prediction tools for reservoir status impacted by drought conditions
- Need to fill in “gaps” in the Coastal Plain water table coverage. The 4 areas in the coastal plain that lack water table studies are Monmouth County, Camden County, southern Atlantic County, and the Tuckahoe River basin
- Extend water table coverages to the Newark basin
- Additional monitoring of salt water intrusion needed in Cape May to surround and protect resource
- What information sharing tools should be used for what ground water data sets?
- Additional training needed on DEP's NJGeoweb (how to input & overlay sites and water table maps)
- Explore permittee consortia for conducting/supporting monitoring
- Need for entry of legacy data into databases