



# NJ Water Monitoring Coordinating Council

## Measuring What Counts for Clean & Plentiful Water

September 22, 2010  
MEETING MINUTES

### Member Attendees

**NJDEP** – *WM&S*: Leslie McGeorge, Alena Baldwin-Brown, Bob Connell, Danielle Donkersloot, Debra Hammond, Al Korndoerfer *NJGS*: Ray Bousenberry *OS*: Gary Buchanan, Judy Louis

**USGS** - Eric Vowinkel, Jack Gibs

**DRBC** – Ron MacGillivray (for Tom Fikslin)

**EPA R2** - John Kushwara, Randy Braun, Paula Zevin

**IEC** - Caitlyn Nichols

**NJ Pinelands Commission** –

**NJ Water Supply Authority** – Todd Kratzer

**Rutgers (Coop Extension Service)** – Diana Morgan

**Rutgers (IMCS)** – Mike Kennish

**Passaic River Institute/Montclair U.** – Kirk Barrett

**Meadowlands Environmental Research Institute** – Ed Konsevick

**NOAA** –

**Monmouth County Health Dept** – Bill Simmons

**Stony Brook-Millstone Watershed Association** – Alyse Greenberg

**Musconetcong Watershed Association** – Nancy Lawler

### Guest Speakers/Discussion Leaders

Julia Barringer – USGS

Trish Ingelido – NJDEP/WM&S

Paul Morton – NJDEP/WM&S

Ashley Pengitore – PVSC

Zoltan Szabo – USGS

Tom Vernam – NJDEP/WM&S

Anne Witt – NJDEP/WM&S

### Guests

Mira Gorska – NJDEP/WM&S

Helen Pang – NJDEP/WM&S

Jay Springer – NJDEP/WM&S

### ➤ **Council Business**

- Minutes from the 05/19/10 Council meeting were approved.
- **Member Announcements:** *USGS Reorganization* – Eric Vowinkel provided an update on the USGS reorganization, including sharing the 10year plan that is driving the reorganization. Specific pieces of the new organization that affect New Jersey include the transfer of Toxic Substances Hydrology (Herb Buxton) under “Energy and Minerals, and Environmental Health”. Eric also shared that the

Regional Executive (REX) for the Northeast (including the NJ Water Science Center) is Dave Russ. *WATERSMART* – Eric also provided an update on the USGS WATERSMART (water census) initiative that Eric Evenson had spoken to the Council about in May 2009, including an announcement that the Delaware River Basin has been selected for a pilot area for this effort. *2010 NJ Water Monitoring and Education Summit* – Danielle Donkersloot, Alena Baldwin-Brown and Kirk Barrett provided an update on planning for this event (which is being co-sponsored by the Watershed Watch Network and the NJ Water Monitoring Council), scheduled for December 1 and 2, at Montclair University. A call for presentations has been distributed via email and listservs as well as posted on the Council and NJDEP Water Monitoring and Standards' websites. The deadline for submissions is October 18. [NOTE: the Summit was postponed until 2011]. *AmeriCorps Watershed Ambassador Program* – Leslie McGeorge, Trish Ingelido and Danielle provided a brief overview of the DEP AmeriCorps Watershed Ambassador program including a description of the types of activities Ambassadors are required to perform during their year-long involvement in the program. Several Council member organizations are “host agencies” for Ambassadors (Rutgers IMCS, NJ Water Supply Authority, Stony Brook Millstone Watershed Association, DRBC, Monmouth County Health Dept, PVSC, and Rutgers Cooperative Extension). *Monmouth County Health Department Stream Sampling Program* – Bill Simmons announced that MCHD is potentially losing funding for monitoring sites. DEP Council members articulated the value of the data supplied by MCHD for a variety of water resource management decision-making needs. Council Co-chairs offered to prepare a letter, from the Council, in support of the value of the stream monitoring data provided by MCHD. Bill agreed with Council's planned expression of support for the value of the county's monitoring information. *MACOORA Annual Meeting* – Eric announced that the MACOORA Annual Meeting is scheduled for October 28 and 29 and that he, Bob Tudor and Bob Connell anticipate attending [NOTE: Eric, Bob Tudor, Bob Connell and Bob Schuster all attended this meeting. Additionally, MACOORA is now referred to as MARACOOS.]. *Sustainability Symposium* – Kirk Barrett announced that Montclair University's Institute for Sustainability Studies is planning to hold a Sustainability Symposium on October 25-27 at Montclair University. Interested parties should contact Kirk for additional information.

- July 2010 National Water Quality Monitoring Council Meeting – Leslie provided a summary as well as draft minutes from the July NWQMC meeting. Among items that were discussed is the development of a national Rivers and Streams Reference Site Network. Bill Wilber (USGS) is heading this effort – any organizations with reference sites should contact him (Stony Brook Millstone Watershed Assoc., Musconetcong Watershed Assoc., and EPA Region 2 indicated they planned to do so). Leslie also announced that CUAHSI (Consortium of Universities for the Advancement of Hydraulic Science, Inc.) is now a member of the NWQMC. CUASHI has a HIS (Hydraulic Information System - an internet-based system for sharing water information) and EPA's WQX is among the 47 services on the HIS. Rick Hooper (CUAHSI) should be contacted for additional information. Additionally, Leslie shared that the next National Water Monitoring Conference is tentatively scheduled for May 2012 in Portland, OR. Additional information from the Council meeting (including minutes, presentations and the forthcoming Fall newsletter) are available on the Council's website: <http://acwi.gov/monitoring/>.
- Water Quality Data Exchange System - Paul Morton provided an update on use of the NJ Water Quality Data Exchange System as well as the ongoing evolution of the EN Brower as a tool for retrieving water quality data and information from the system. Paul reported that the EN Brower is about to go “public” and, as such, Council members are needed to test the new version. Interested Council members should email either Paul or Alena (**NOTE:** Nancy Lawler subsequently volunteered to test). Additionally, Paul requested feedback from Council members on Data Miner reports as well as reminded members to please register their water monitoring projects in WQDE (for Inventory purposes). Paul's presentation is available on the Council's website.
- **Technical Presentations** (Copies of many of the following presentations have been posted to the Council's webpage - <http://www.state.nj.us/dep/wms/wmccpresentations.html>)

*Assessment of Nutrient Loading and Eutrophication in Barnegat Bay-Little Egg Harbor* – Mike Kennish provided an overview of the nutrient loading and eutrophication project he is currently conducting with other Rutgers and USGS investigators in Barnegat Bay-Little Egg Harbor. There is a variety of contributing factors to the Bay's current condition - however, Mike reported that the project is keying in on nitrogen as the primary eutrophication agent. Coastal lagoons, such as Barnegat Bay-Little Egg Harbor, are very responsive to nutrients and other human stressors. Land use/land cover changes and resulting surface water runoff can have a significant impact on coastal lagoon ecology. Additionally, nutrient inputs have resulted in nuisance and toxic phytoplankton blooms in the estuary, which have reduced the amount of light reaching the bottom of the lagoon. This attenuation of light appears to have significantly reduced the biomass of seagrass in the estuary. In addition, the high algal production in the estuary may have resulted in low DO levels in some areas during the past decade. These low DO levels should be a concern because they have the potential to seriously affect abundances of fish and shellfish populations if they worsen. As part of the project, Barnegat Bay-Little Egg Harbor has been subdivided into three broad segments where seagrass, macroalgae, epiphytes, shellfish, and an array of physicochemical parameters were measured from spring to fall from 2004 to 2010. There will be sampling throughout the estuary in 2011 including targeted widgeon grass beds in northern Barnegat Bay. Mike also shared information on the range of current research being conducted in Barnegat Bay and Little Egg Harbor with the other state and federal agency collaborators (DEP, USGS, EPA, NEIWPCC), as well as the indicators which are being used in the assessment of the estuary for development of key biotic indicators to determine estuarine and eutrophic condition.

### Mercury

#### *A. Overview: Mercury in NJ* – Gary Buchanan (NJDEP/OS)

Gary Buchanan provided an overview of mercury in general (properties – persistent, bioaccumulative, toxic, etc), fish/wildlife and human health concerns, fish consumption advisories as well as efforts to control/reduce it. Additionally, he shared information regarding sources of mercury, bioaccumulation factors, biomagnification and uptake in fish and wildlife (including average concentrations of mercury found), as well as human effects of exposure. He also provided general information on mercury-related research and monitoring that has or is occurring in NJ.

#### *B. Mobilization of Mercury to a 1<sup>st</sup> Order Coastal Plain Stream* – Julia Barringer (USGS – NJ Water Science Center)

Julia Barringer summarized a cooperative USGS/NJDEP project she managed which related to mobilization of mercury in a tributary (Squankum Brook) to the Great Egg Harbor River. Most of the water in the Great Egg Harbor River (and its tributaries) comes from groundwater discharge. Mercury levels in Squankum Brook were found to range from 50-250 ng/L. The project objectives were to: discover the high sources of mercury in Squankum Brook, investigate groundwater inputs, evaluate possible inputs from a sewage treatment plant, assess land use-related inputs of mercury to soils, and develop a conceptual model of mercury inputs to a 1<sup>st</sup> order Coastal Plain urban stream. Results revealed that mercury mobilization likely occurs in other urban/suburban areas in southern NJ, mercury from soils can be mobilized to shallow groundwater and discharged to streams, and such mobilization of mercury can occur in other regions where unsewered residential development on acidic, highly permeable soils/geologic materials is present.

#### *C. Mercury in Groundwater* – Zoltan Szabo (USGS – NJ Water Science Center)

Zoltan Szabo provided a summary of another cooperative project between USGS and NJDEP – this one investigating the variability of mercury concentrations in domestic well water in the NJ Coastal Plain. The study focused on the Kirkwood-Cohansey aquifer system where mercury concentrations in some wells were found to vary considerably. Differences in sampling protocol (such as duration of well flushing) were suspected as being a cause. As such, serial sampling during well purging was undertaken. At about a dozen sites, samples were taken every ten minutes for 50 minutes of well purging. At 3 sites samples were also taken every 2 hours from morning to mid-afternoon. Finally

historical sampling records over the last 10 years were compared at about 20 sites. Results show that: mercury contamination is verifiable and reproducible; unfiltered samples tend to have slightly greater variability than filtered samples; surges in particulates do produce slightly higher mercury results for ~10 mins after pumping begins; large changes in filtered mercury concentrations are possible over time & are likely driven by changes in geochemistry & flow patterns in the aquifer; and local mercury “plumelets” are spread across the NJ Coastal Plain with mobility poised to change with minor geochemical variations.

*D. Mercury in NJ's Ambient Groundwater Monitoring Network – Ray Bousenberry (NJDEP/NJGS)*  
Ray Bousenberry provided an update on sampling in NJ's Ambient Groundwater Monitoring Network, with an emphasis on the mercury-related results. In both cycle 1 and cycle 2 of network sampling in southern NJ, mercury has been detected in the agricultural and urban wells. In Southern NJ cycle 1, the frequency of detection was similar (5.26% (2 wells) - ag, 7.41% (2 wells) - urban); in cycle 2, not only was a marked increase in overall detections observed but there was also a bigger difference between urban and agriculture wells (26.32% (10 wells) - ag, 18.51% (5 wells) - urban). In northern NJ, mercury was only found in urban wells in cycle 1 (3.13% (1 well)), but in cycle 2 it was found in urban (12.12% (4 wells)), agriculture (9.52% (2 wells)) and undeveloped wells (1% (1 well)). Possible sources include either natural or anthropogenic; possible modes of mobilization are pH change, septic effluent, fertilizers and road salt. However, no correlation between mercury, DO, pH and other nutrients, major ions and trace metals were observed in this network. Therefore, the conclusion is that the few detections of mercury are from anthropogenic sources, were below the drinking water and ground water quality standards of 2 ug/L, and the exact source and/or mobilization at the ground water table is still unknown.

*E. NJ's Mercury TMDL – Anne Witt (NJDEP/WM&S)*

Anne Witt summarized the development of NJ's mercury TMDL, including use of fish tissue concentration and air deposition information. NJ's statewide TMDL was modeled on the Northeast Regional Mercury TMDL (approved by EPA in 2007) and was developed in a way that would complement the regional efforts in the northeast. The approach used was based on the linear relationships between air deposition, ambient concentrations in water, sediments and fish tissue mercury levels with the hypothesis that if mercury emissions are reduced, a proportional decrease in mercury fish tissue concentrations will be effectuated. TMDL targets are based on fish consumption advisories as well as meeting the surface water quality standard for mercury. Mercury load reductions, needed to meet the TMDL targets, would have to come from within as well as outside of NJ. As a result of a June 2010 meeting of 18 states to discuss the reduction of air deposition of mercury, draft national recommendations include: EPA should set mercury Maximum Achievable Control Technology (MACT) standards at a level to facilitate compliance with surface water quality standards, should adopt national standards for mercury for both consumer and industrial products and should continue its efforts to seek an international agreement for global mercury use and release reduction; and mercury research should be broadened.

*F. Mercury in Fish Tissue in the Mainstem Delaware River – Ron MacGillivray (DRBC)*

Ron MacGillivray provided an overview of DRBC's monitoring for mercury in fish tissue in the mainstem Delaware River. Fish samples are collected from 9 locations in both tidal & non-tidal portions of the river. Two species are collected representing resident benthic and pelagic trophic levels. Of the species caught from 2004-2007, mercury concentrations were higher in pelagic species compared to benthic species in non-tidal waters, but not in estuary waters. Mercury concentrations did not exceed the EPA mercury criterion (0.3ppm) except in the Upper Delaware River. Samples collected between Trenton and the Delaware Water Gap had concentrations above 0.18ppm. Samples collected between Trenton and the Salem River did not have concentrations above 0.18ppm. Smaller bluefish caught in Delaware Bay had mercury concentrations of <0.2ppm. Larger striped bass from the tidal river had concentrations >0.3ppm while smaller striped bass from the same area were generally <0.2ppm.

*G. Low Level Mercury in Freshwaters – Tom Vernam (NJDEP/WM&S)*

Tom Vernam presented the results of a joint project between NJDEP and USGS designed to more accurately measure ambient dissolved mercury levels in NJ's streams using EPA method 1631 (reporting limit of 0.04ppt). Representative stations around the state were selected (background, urban, suburban and Pinelands) and sampled using "Clean Hands/Dirty Hands" method for low level mercury. Results showed that stream concentrations of mercury were well below the lowest surface water criteria; all data were within the range found at reference stations; station type and location were not a good predictor of dissolved mercury concentrations; data suggests that air deposition is the dominant factor related to mercury concentrations in surface water; and the only correlation appeared to be between dissolved mercury concentrations and stream flow (↑stream flow, ↑dissolved mercury concentrations).

*H. Mercury Information from NJ's Participation in the National Coastal Assessment – Bob Connell (NJDEP/WM&S)*

Bob Connell reviewed the estuarine sediment mercury levels that had been found in NJ waters from 1990-2006. Data presented were from NJ's participation in the EPA National Coastal Assessment as well as from EPA's Environmental Monitoring and Assessment Program (EMAP), NOAA's Mussel Watch Program and the NOAA/EPA Mid-Atlantic Integrated Assessment (MAIA) program. As the data show, the majority of effects range median (ERM) exceedances of mercury occurred in sediment from the Raritan/Sandy Hook Bay area. Sediment mercury levels from estuarine waters in the rest of the state were either above or below the mercury effects range low (ERL).

- **Technical Topics (and additional presentations) for Next Meeting**  
Science and Use of Sensors (inc. Quality Assurance), Brick Twp MUA Monitoring Program
- **Next Meeting**  
January 26, 2011 (snow date – February 9) at USGS NJ Water Science Center