



# NJ Water Monitoring Council

## Measuring What Counts for Clean & Plentiful Water

September 24, 2014  
MEETING MINUTES

### Member Attendees

**NJDEP** – *WM&S*: Leslie McGeorge, Alena Baldwin-Brown, Brian Henning, Helen Pang, Vic Poretti, Bob Schuster *NJGWS* – Karl Muessig, Ray Bousenberry *OS* – Sandra Goodrow, Nick Procopio *DWQ* – Marco Alebus  
**NJDOH** – Doug Haltmeier  
**USGS** – Bob Reiser, Pam Reilly, Tom Imbrigotta  
**USGS (retired)** - Art Baehr  
**DRBC** – Tom Fikslin  
**EPA R2** –  
**IEC** – Caitlyn Nichols  
**NJ Pinelands Commission** –  
**NJ Water Supply Authority** – Heather Desko  
**Rutgers (Coop Extension Service)** –  
**Rutgers (IMCS)** –  
**Rutgers (Env. Bioengineering)** – Eric Vowinkel  
**Montclair University** – Kassandra Archer  
**Monmouth University/Urban Coast Institute** – Jim Nickels  
**Stockton College** –  
**Meadowlands Environmental Research Institute** – Christine Hobble  
**NOAA** –  
**Monmouth County Health Dept** –  
**Barnegat Bay Partnership** – Stan Hales  
**Stony Brook-Millstone Watershed Association** –  
**Musconetcong Watershed Association** – Nancy Lawler  
**NJ Harbor Dischargers** –  
**Brick Township MUA** – Rob Karl

### Guest Speakers/Discussion Leaders

David Anning – USGS NAWQA  
Kim Cenzo - NJDEP/WM&S  
Carol Collier – ANSDU  
Lou Jacoby – NJDEP/OIRM  
Charles Kovatch – EPA HQ  
Jim Kreft – USGS  
Mike Kusmiesz - NJDEP/WM&S  
Paul Morton – NJDEP/WM&S  
John Pollack - CUASHI  
John Yagecic - DRBC  
Dwane Young – EPA HQ

### Other Attendees

Kevin Berry - NJDEP/WM&S  
Greg Cavallo – DRBC

Pat Gardner - NJDEP/WM&S  
Jack Gibs – USGS retired  
Biswarup Guha – NJDEP/WM&S  
Chris Kunz – NJDEP/WM&S  
Bob Limbeck - DRBC  
Kevin Meninger – Musconetcong Watershed Assoc.  
Carol O'Donnell Kee – NJDEP/WM&S  
Jack Pflaumer - NJDEP/WM&S  
Evelyn Powers – IEC  
Jeff Reading – NJDEP/WM&S  
Steve Seeberger – NJDEP/DWQ

- **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 05/29/14 Council meeting were approved.
  - Next NJWMC meeting is scheduled for January 21 at DRBC, with a snow date of February 4 (same location)
  - Suggested Technical Themes for the January meeting are Environmental Mercury and Contaminants of Emerging Concern.
- Information Updates, Presentations and Announcements:
  1. Membership Updates – **New Members**: Tom Imbrigotta has joined the Council a USGS representative and has replaced Jack Gibs as the Water Quality Specialist at the NJWSC.
  2. Announcements – 1. Tom Fikslin announced that, effective August 1, Steve Tambini became the new Executive Director at DRBC. 2. On behalf of EPA (where he does some liaison work on behalf of Rutgers University), Eric Vowinkel announced several management changes at EPA Region 2 (as of the date of the meeting) including: Kevin Kubik is still the Acting Director for DESA and John Kushwara is still currently the Acting Deputy Director. However, Carol Lynes is now the Acting Branch Chief of the Monitoring and Assessment Branch, and Randy Braun has returned to his former position as Chief of the Monitoring and Operations section. 3. Bob Reiser announced that Tony Navoy has retired at USGS NJWSC and that Bob Nicholson has been named as the new Associate Director, replacing Tony. 4. Carol Collier updated the Council on meetings that the William Penn Foundation has been having with water resource-related groups associated with the Kirkwood-Cohansey Delaware River Watershed Initiative Project. The 1<sup>st</sup> meeting focused specifically on monitoring was held Sept 9. A second meeting was held on Nov 6. There are also plans for the release of 2 reports, as well as the addition of an interactive map of the basin to their website ([www.ansp.org/drwi](http://www.ansp.org/drwi)). Carol agreed to provide more details on this effort at a future Council meeting. 5. An announcement regarding the Passaic River Symposium, scheduled for Oct 9 & 10 at Montclair State University, was also made.
  3. National Water Monitoring Information from the NWQMC – Leslie shared pertinent information from the Summer NWQMC tele-meeting including: a. updates on the National Network of Reference Watersheds and its FY14 Work Plan progress, which includes establishing a link to the National Water Quality Portal; b. the release of NEMI (National Environmental Methods Index) 4.0, the addition of a protocol library, and linkages to the National Portal and USGS' BioData system; and c. the activities of the Outreach and Collaboration Workgroup including the Council's newsletter and its webinar series – one of which (Continuous Monitoring for Nutrients) was scheduled for this same day (9/24). The presentation from the nutrients webinar is on the national Council website. Draft minutes and most presentations from the tele-meeting are also available on the NWQMC website: [http://acwi.gov/monitoring/ppt/telecon\\_072914/index.html](http://acwi.gov/monitoring/ppt/telecon_072914/index.html). Additionally, some of the key agenda items from the national tele-meeting (e.g., National Water Quality Portal, EPA continuous monitoring strategy, etc.) were presented during this NJ Council meeting.
  4. Updating NJ's Long Term Water Monitoring & Assessment Strategy – Leslie reviewed the development and contents of the existing NJ Water Monitoring & Assessment Strategy (2005-2014) as well as examples of successes in filling key gaps identified in the Strategy. Development of such a long term strategic water management document is a requirement for DEP continued receipt of federal CWA 106 funding. Council

involvement in the original strategy included review of the document and various annual progress reports, assistance in filling existing state monitoring gaps, as well as identifying new strategic needs. Leslie also presented an overview of the DEP's Division of Water Monitoring and Standards' initial plans for development of the new strategy, including (once again) proposed Council involvement, which will occur in 2015.

5. 2014 Assessment Methods for the NJ Integrated Report and 303(d) Visioning Options – Kim Cenno (DEP/WM&S) provided an overview of the process for preparing NJ's biennial Integrated Water Quality Monitoring and Assessment Report, including preparation of the supporting Methods Document. For 2014, she reviewed the changes and/or additions to the Methods Document which are: the addition of 3 new subcategories (5A – arsenic, 5L – legacy, 5R – restoration) to Sublist 5 - the List of Water Quality Limited Waters; the use of a rotating basin technique as part of a regional comprehensive assessment approach; the new requirement for 20 data points specifically for conventional parameters; the fact that there are now 960 overall assessment units as a result of the new delineations in Barnegat Bay; and the EPA 303(d) 10 year vision and how it's being incorporated in NJ.

➤ **Session – Decision Support Tools: Water Quality Data Access and Dissemination**

A. *National Water Quality Portal* – Jim Kreft (USGS)

Jim Kreft showcased uses of and anticipated enhancements to the National Water Quality Portal. This water quality data retrieval tool is a product of EPA, USGS and the National Water Quality Monitoring Council. The portal serves out data collected by over 400 state, federal, tribal and local agencies that have been entered into either EPA's STORET or USGS' NWIS. The data can be downloaded in a variety of formats (e.g., Excel, CSV, TSV and KML) and the Portal is set up to work on any type of a browser as well as with iPads, cell phones, etc. Users can access water quality by state, county or HUC8. Currently, the portal only offers chemical/physical data but initial biodata and habitat metrics and indices are expected to be added shortly. In addition, the NWQMC is hoping to add new data sources and an interactive mapper in the future. The NWQMC is also developing a Portal Vision for the next 5-10 years. The Portal can be accessed at: <http://www.waterqualitydata.us/>.

B. *EPA's STORET Update and Assessment Framework* – Dwane Young and Charles Kovatch (EPA HQ)

Dwane Young and Charles Kovatch provided a summary of both the EPA Water Quality Framework as well as planned updates to STORET and ATTAINS. The Water Quality Framework is an approach to integrate existing data and information systems within EPA to work together. The Framework's 4 pieces: monitoring (STORET/WQX), assessment/restoration (ATTAINS), actions (GRTS), and geospatial info (NHDPplus). The majority of data currently in STORET is chemical/physical; however, EPA is putting increased emphasis on adding biological and habitat data (NJ's bio and habitat data comprise a large portion of information currently stored). For bio data, WQX currently supports almost any biological family that can be added, as well as habitat, indices and metrics. EPA is currently evaluating additional data elements and needed changes for an updated WQX schema release. Sensors and continuous monitoring data are also on EPA's radar. WQX is not the platform on which to share this data. However, data standards do exist for sensors (Sensor Observation Standards – SOS, and Water Markup Language 2 – WaterML2), so these may be the route to pursue for sharing this information. There's also a possible future National Water Data Sharing Network (currently conceptual) that would allow a user to publish data in whatever phase they wish (preliminary, final, etc.) and would allow for cloud compilation and reporting. There are also plans to revise/enhance ATTAINS so that the system will be able to track and report changes, strategic measures, have a GIS interface, support both Exchange as well as Non-Exchange Network submittals, better facilitate communication between the Regions and States, and approvals of 303(d) lists and TMDLs.

C. *Publication of Time Series Data Using CUAHSI HIS* – Jon Pollak (Consortium of Universities for the Advancement of Hydrologic Science - CUAHSI)

Jon Pollak introduced the Council to CUAHSI which was established in 2001 and is a primarily academic consortium of more than 100 U.S. university members as well as international water science-related organizations. Its primary mission is to develop infrastructure and services for the advancement of water science in the U.S. and its primary funding comes from the National Science Foundation. The HIS (Hydrologic Information System) consists of a services-oriented architecture for publishing, discovering and managing

time-series data collected at fixed points (stream discharges or chemistry at gauges). The system uses WaterML as its standard data transmission language and allows users to both publish their water-related data as well as search for/access data from diverse sources, using cloud technology. It uses open source software and has open data access. In NJ, both Princeton and Rutgers Universities are members of CUAHSI. CUAHSI can be accessed at: [www.cuahsi.org](http://www.cuahsi.org).

*D. USGS SPARROW Decision Support System for Dissolved Solids – David Anning (USGS NAWQA)*  
David Anning shared the results of work that NAWQA has been doing related to the study of stream salinity and how this information can assist managers in prioritizing actions for reducing it. Elevated salinity in streams - which can result from irrigation, road deicing, detergents, fertilizers and/or weathered geologic formations - has been shown to result in altered biological communities. The SPARROW model seeks to integrate monitoring data with both information on watershed characteristics as well as sources of dissolved solids. It then allows the model to be run, using the land use type(s) of various catchments, to give managers potential management actions based on various scenarios including a better understanding of the dissolved solids sources, potential/prioritized areas for dissolved solids reductions as well as test the long-term benefits of these reductions. Road salt application estimates used in the SPARROW model were determined on the basis of USGS Minerals Yearbook estimates of the amount of rock salt used in each state, and the portion of that used for de-icing purposes. These estimates for each state were then apportioned to individual catchments based on the length of major highways and roads within the catchment, and on the number of days each year with snowfall greater than 1 inch. A report related to this work, as well as access to the decision support tool, can be found online at: [http://water.usgs.gov/nawqa/home\\_maps/dissolved\\_solids.html](http://water.usgs.gov/nawqa/home_maps/dissolved_solids.html).

*E. USGS Sediment Portal – Bob Reiser (USGS NJWSC)*  
Bob Reiser provided an overview of a new web-enabled database, created by the USGS NAWQA program, for analysis of suspended sediment data across the nation. All of the data in the database has been taken from NWIS and is available at the HUC 8 level and uses the 2006 Land Use coverage. The purposes of this portal are to: 1. Support local and national-level decision making, project planning and data mining activities, 2. Provide tools to allow users to identify, access, interpret quality-controlled suspended sediment data (as well as other ancillary data – water quality, stream flow & station attributes), and 3. Improve the utility and accessibility of USGS suspended sediment data to water managers, researchers and the public. The Portal can be accessed at: <http://cida.usgs.gov/sediment/>. The report describing the portal can be found online at <http://pubs.usgs.gov/ds/776>.

*F. New Tools for Accessing, Assessing and Sharing Water Quality Data for the Tidal Delaware Mainstem – John Yagecic (DRBC)*

John Yagecic shared several new tools that DRBC has used or put in place to allow better/easier access to, assessment of and sharing of its water quality data for the tidal Delaware River mainstem. The first is an Application Programming Interface (API) for accessing data, which allows for automated data pulling without using the interactive graphical user interface - this works very well using the R-statistics software but is not so easy when using Excel. Advantages of using API include 1 single step for pulling data into your preferred platform, data can be pulled from multiple stations, for multiple parameters and multiple time periods, it can knit together volumes of data that would exceed the limit of other queries, its fast, and allows for automation. Another way of accessing data is to have an event history (where the data manipulation and assessment steps would be saved) but would start with a new pull of the data each time the data are accessed. This approach makes it easier to fix processing mistakes, prevents these mistakes from being passed along, allows others to see exactly what was done (as well as the user at a later date), allows others to tweak your manipulations, and the raw data remains pristine. For assessing data, automated assessment is in the works based on scripting of data retrieval, manipulation and processing. New ideas for sharing data include boat run explorer and interactive maps as users have indicated that they want brief interpretations of data as well as interactivity in how the results are presented. Boat run explorer can be found at: <https://johnyagecis.shinyapps.io/BoatRunExplorer/>. An interactive map is available at: [www.nj.gov/drbc/basin/map/interactive-map.html](http://www.nj.gov/drbc/basin/map/interactive-map.html).

*G. NJDEP's GeoWeb Water Profiles – Lou Jacoby (DEP/OIRM)*

Lou Jacoby shared information about NJ-GeoWeb, which is NJDEP's flagship online interactive mapping application available to both DEP employees and the public, emphasizing the water profiles that are available in the system. Lou then provided several demonstrations of how to use the application to access various types of water quality data. Specific emphasis was placed on the Ambient Water Monitoring profile where users can find access to chemical/physical water data stored in STORET, WQDE or NWIS, benthic macroinvertebrate data, fish IBI data, shellfish waters classifications, as well as volunteer monitoring data. While accessing water quality data, there are also additional reference map layers available to users including counties, roads, industrial sites, satellite imagery, and land use, among others. Lou also demonstrated the various ways in which users can search for water quality data, depending on how much initial information they have (e.g., address, municipality, county, watershed management area as well as particular stations of interest) as well as the different types of online reports that can be called automatically from NJDEP's Data Miner. NJ-GeoWeb can be accessed at: [www.nj.gov/dep/gis/geoweb splash.htm](http://www.nj.gov/dep/gis/geoweb splash.htm) [NOTE: the enhanced version of NJ-GeoWeb that Lou mentioned during his presentation was released in December 2014]

#### *H. GeoWeb Uses and Direct Access for Ground Water Data/Information – Karl Muessig and Ray Bousenberry (DEP/NJGWS)*

Karl Muessig and Ray Bousenberry followed Lou Jacoby's presentation/demonstration with a demonstration of using GeoWeb to specifically access ground monitoring data and information as well as other ways in which to gain direct access to NJ Ambient Ground Water Monitoring Network (AGWQN) data. Karl and Ray explained that all of the AGWQN data are also available on the NJGWS website in excel and then demonstrated how to find the data on the webpage. They also shared that 145 of the 150 wells in the AGWQN are now part of the National Ground Water Monitoring Network and that the data portal for that network allows users to pull both NJ as well as national data (including Kirkwood-Cohansey data from DE, NJ and PA). Online access to data and reports from the AGWQN can be found at the following locations: NJGWS DGS05-2 (<http://www.state.nj.us/dep/njgs/geodata/dgs05-2.htm>), NJGWS Informational Circular (<http://www.state.nj.us/dep/njgs/enviroed/infocirc/NJAGWQMN.pdf>), ACWI-Subcommittee on Ground Water Data Portal (<http://cida.usgs.gov/ngwmn/>), as well as NJ GeoWeb and USGS' NWIS.

#### *I. NJ Water Data System Update: WQDE – Paul Morton (DEP/WM&S)*

Paul Morton provided an update regarding population, use of and enhancements to NJ's Water Quality Data Exchange system (WQDE). This system was developed with extensive input and testing from the NJWMC and is currently used by multiple NJWMC member organizations, including DEP, DRBC, Harbor Dischargers Group and Brick Township MUA. WQDE currently has >1.4 million monitoring results/data points – results are sent to EPA's CDX/STORET. Data from WQDE can be accessed multiple ways including NJ GeoWeb, the National Water Quality Portal, NJDEP's Data Miner ([http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/categories?category=Ambient+Water+Quality](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/categories?category=Ambient+Water+Quality)), STORET (<http://www.epa.gov/storet/dbtop.htmlExchange Network Browser>), and the Exchange Network Browser (<http://www.enbrowser.net/enbrowser/>). Data from WQDE have been and continue to be used for NJ's Integrated Water Quality Monitoring & Assessment Report, TMDL development, identifying data gaps related to monitoring network designs/redesigns, special requests related to NJPDES permit issues, and for special studies (e.g., Barnegat Bay, diatoms) among others. Enhancements to WQDE, including a new version that should be speedier and more stable, are expected soon. Paul also offered some tips for users related to entering data, information, and agreed to explore whether or not training could be provided for new or current users.

#### *J. NJ's Bathing Beach Data Management Portal – Mike Kusmiesz (DEP/WM&S)*

Mike Kusmiesz provided a live demonstration of the new NJ bathing beach data management portal which is the behind-the-scenes functions of the bathing beach webpage ([www.njbeaches.org](http://www.njbeaches.org)). Mike explained the enhancements that had been made to the existing njbeaches.org webpage so that the site can now serve as both an information/notification system for the public as well as a data management/retrieval portal. In addition to daily activity reports regarding beach conditions (closed, open, advisories) during beach season, the site also provides information regarding coastal flights, test methods used to determine coastal water quality, annual water quality summary reports, fact sheets, items found on the beach, as well as an interactive map showing the status of all of the coastal bathing beaches. Mike also demonstrated how the water quality data are entered and approved – both by the counties (who take the water samples) as well as by the DEP program managers.

➤ **Action Items**

- Investigate opportunities for WQDE training for new &/or current users, including Council members -  
*Paul Morton*

➤ **Technical Topics for Next Meeting**

Environmental Mercury/Air Deposition

➤ **Next Meeting**

January 21 at DRBC (snow data – February 4)

### **Identified Gaps in Water Quality Data Assessment/Data Dissemination**

- Need for the USGS/EPA/NWQMC to develop a National Water Quality Data Portal “dictionary”
- Suggest that the NWQMC develop a webpage with a listing of the existing water quality data portals, including live links
- Request that EPA/USGS and the NWQMC provide firmer dates and dedicate resources to making bio, metric/index data available through the WQ Portal. Clarify plans for continuous data handling/dissemination at national level.
- Suggest that the NWQMC reach out to NOAA re: adding a link to NOAA data from the WQ Portal
- Need enhanced communications with non-profit agencies regarding data availability, as well as links from their websites
- Need to know who (which organizations) is supporting what type(s) of information access
- Need to continue efforts for “1 stop shop” mechanisms for water quality data
- Address reasons that USGS continuous monitoring cooperator data is not always available in the same manner as other data (i.e., provisional data flows through NWIS for a specific time period and then is no longer available if it is either erroneous or does not conform to USGS standards)<sup>1</sup>
- Need for automation of continuous monitoring data management to assist in water quality assessments
- Need for raw water reservoir data access/availability from purveyors
- Suggest use of standard spreadsheets to assist getting data from organizations/entities with limited staff and/or data entry capabilities. (similar to the Barnegat Bay researchers effort)
- Suggest use of a standard format for reporting continuous data (CUASHI WaterML2?)
- Suggest that DEP include data collected by NJPDES permittees for permit modifications and/or nutrient related exit ramp studies be entered into WQDE
- Suggest that DEP or NJWMC investigate where academic monitoring data currently reside and – if appropriate – seek ways in which to capture it in the WQ Portal or other appropriate national database
- Need mechanism to provide good, quick summary stats for chemical data (useful for water quality indices), as well as other ways to integrate and present chemical data to public and water resource managers
- Need to know who are the communities of data users and what information do they want to see and/or have
- Need to know what GIS data other groups have
- Scaling of information issues in data management mentioned
- Real time data handling issues discussed

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<sup>1</sup> Water quality data collected from water quality monitors by the USGS New Jersey Water Science Center is put onto NWIS Web in near real-time. Every hour the latest data is added for public access. The data is flagged as being provisional and subject to revision until it has been approved for publication. The data is analyzed, checked, and reviewed before it is approved several times each year. The approved data that is collected through agreements with cooperators is stored permanently in the NWIS database. On occasion there could be periods of record that are removed from the database during the quality assurance process if the data is found to be erroneous and outside the range of tolerance for adjustments to be applied. If it is an obvious error, the data could be removed soon after it is collected or it could be months later. There are a few water quality monitors that operate seasonally, either at the request of the cooperator or because the station is not designed to collect the data during cold weather because of ice conditions. There are some stream gaging stations that collect water temperature data as a secondary parameter for the purpose of computing discharge. Temperature is recorded by the equipment used to measure velocity or stage sensor for calibration of the equipment. The water temperature data is not analyzed, checked, and reviewed at these stations as it is at the water quality monitor sites. The USGS makes this temporary provisional data available on NWISWeb for 120 days. Because this data is not analyzed, after 120 days it is no longer available for public access. The temporary classification means that documented routine inspections and other quality assurance measures are not performed that would make the data acceptable for archival, retrieval, or future use in general scientific or interpretive studies. USGS provides this data as a service to the public but no funding is received to collect, and analyze the data according to USGS protocols. The USGS Pennsylvania Water Science Center displays the water quality data collected on streams in Philadelphia for the Philadelphia Water Department. Calibration of water-quality instrumentation at those sites is conducted exclusively by Philadelphia Water Department personnel with USGS oversight. Erroneous or missing data, resulting from instrument malfunction, are not the responsibility of USGS. The data does not conform to USGS standards, therefore it is removed from NWISWeb after 120 days. ( information from R. Reiser, USGS)