



# NJ Water Monitoring Coordinating Council

## Measuring What Counts for Clean & Plentiful Water

February 6, 2013

### Joint NJWMC/Barnegat Bay Partnership Meeting MEETING MINUTES

#### Member Attendees

**NJDEP** – *WM&S*: Leslie McGeorge, Alena Baldwin-Brown, Bruce Friedman, Debra Hammond, Helen Pang, Vic Poretti, Bob Schuster *NJGWS*: Karl Muessig *OS* – Gary Buchanan, Nick Procopio *DWQ* – Marzooq Alebus

**NJDHSS** – Doug Haltmeier

**USGS** – Bob Reiser, Jack Gibs

**DRBC** – Bob Tudor, Tom Fikslin

**EPA R2** – John Kushwara, Randy Braun

**IEC** – Evelyn Powers

**NJ Pinelands Commission** – Sarah Smith

**NJ Water Supply Authority** – Heather Desko

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

**Rutgers (IMCS)** –

**Montclair University** –

**Monmouth University/Urban Coast Institute** – Jim Nickels

**Meadowlands Environmental Research Institute** –

**NOAA** – Jennifer Samson

**Monmouth County Health Dept** – Bill Simmons

**Barnegat Bay Partnership** – Stan Hales, Jim Vasslides

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

**Musconetcong Watershed Association** –

**NJ Harbor Dischargers** – Ashley Slagle

**Brick Township MUA** – Rob Karl

#### Guest Speakers/Discussion Leaders

Tom Belton – NJDEP/OS

Monica Bricelj – Rutgers University

Dean Bryson – NJDEP/WM&S

Larry Feinson - USGS NJWSC

Brian Henning – NJDEP/WM&S

Trish Ingelido - NJDEP/WM&S

Chris Kunz – NJDEP/WM&S

Jill Lipoti - NJDEP/WM&S

Bob Nicholson - USGS NJWSC

Fred Spitz - USGS NJWSC

Rob Tunstead – USDA/NRCS

Andrew Watson – USGS NJWSC

#### Other Meeting Attendees

See attached listing at end of meeting minutes

- **Council Business** (Copies of the agenda, minutes and most 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 10/03/12 Council meeting were approved.
- Remaining 2013 NJWMC meetings are scheduled for: May 22, September 25
- Information Updates, Presentations and Announcements:
  1. New/Replacement Members – The Council welcomed the following replacement members: Erin McCollum Stretz from Stony Brook Millstone Watershed Association (replacing Alyse Greenberg), Heather Desko from the NJ Water Supply Authority (replacing Todd Kratzer), Sarah Smith from the Pinelands Commission (replacing Nick Procopio) and Jennifer Samson from NOAA (replacing Jawed Hameedi).
  2. 2012 NJ Water Monitoring Summit – Alena Baldwin-Brown and Leslie McGeorge summarized the 2012 Summit, held Nov 28 and 29 at the Rutgers EcoComplex, in Columbus, NJ. The NJWMC was a co-sponsor of this event with the NJ Watershed Watch Network and DEP. The two-day Summit included 7 Plenary and 43 platform presentations. There were also 9 posters presented as well as a QAPP training session, and a data access session. Approximately 120 people participated each day. 80% of the evaluations received ranked it "Excellent" or "Very Good" overall. Topics of interest suggested for the next Summit include: Superstorm Sandy, flood monitoring, monitoring related to Green Infrastructure projects, and more trainings, among others. Presentations have been posted on the Summit website at [http://www.state.nj.us/dep/wms/2012\\_summit.htm](http://www.state.nj.us/dep/wms/2012_summit.htm). There is also a link to this information from the Council's website, under "Events". It was suggested that the next Summit be held at a coastal location. Jim Nickels and Jim Vasslides agreed to assist in finding potential locations.
  3. Inland Waters Flood Monitoring Plan Update – Dean Bryson (DEP/BFBM) provided an update on the development of an inland flood water quality monitoring plan for NJ. Council members were reminded that comments on the draft proposal are currently being sought; he indicated that he would be willing to share it with any additional NJWMC members who wished to review the document (Bob Reiser (USGS), Doug Haltmeier (DOH), John Yagecic (DRBC), Caitlyn Nichols (IEC) and Ashley Slagle (Harbor Dischargers) are currently reviewing the draft proposal). Questions and/or comments offered at the meeting included: under "implementation" make sure that key locations are flood proof (e.g., harden stream gauges), include sediment analyses, under "sources" include industrial/Superfund sites, consider adding an additional trigger for sampling when a wastewater treatment facility overflow is necessary, and include POCs (points of contact) and best information exchange mechanisms. There were also questions related to the plan's roll out and if it will be adapted to coastal waters.
  4. Announcements – 1. Bob Reiser shared information from the National Research Council's report on preparing for the 3<sup>rd</sup> decade of NAWQA, including accomplishments from Cycles 1 & 2 as well as the future design & direction for the program in Cycle 3. 2. Bob Reiser also introduced USGS' WaterNow Data Notification Service, which provides current real-time gauging station data via text message or email directly to your mobile phone or email. This system replaces the USGS StreamMail system. 3. Vic Poretti provided an update on the 2013-2014 EPA National Rivers & Streams Assessment survey, including the sampling sites that have been chosen for NJ. 4. Brian Henning (DEP/BFBM) announced that the validation of the Headwaters IBI (HIBI) will take place this summer. The HIBI was developed to evaluate high gradient streams with drainage areas <5mi<sup>2</sup> and, when validated, will complement the established Northern Fish IBI (which evaluates streams with drainages >5mi<sup>2</sup>). 5. Bob Tudor summarized the 5<sup>th</sup> Delaware Estuary Science and Environmental Summit, which was held Jan 27-30 in Cape May, including presentation & attendance stats, session types, media coverage, as well as next steps for the science-management of the Estuary.

➤ **Technical Session - Barnegat Bay**

A. *Barnegat Bay Ambient Water Monitoring Project: Partnerships and Objectives, Monitoring Locations and Implementation, Results to Date and Next Monitoring Phase* – Leslie McGeorge, Chris Kunz, Bob Schuster, Helen Pang and Trish Ingelido (NJDEP/WM&S)

Leslie McGeorge, Chris Kunz, Bob Schuster, Helen Pang and Trish Ingelido presented background, locations, results and planned next steps for NJDEP's Barnegat Bay Ambient Water Monitoring Project. Leslie provided an overview of the project, including its objectives as well as development of the partnerships that have been instrumental to performing the types and amount of monitoring necessary. Chris and Bob described the tributary and bay monitoring locations, parameters being measured in each type of water, as well as how the monitoring (frequency and parameters) in both the tribs and the bay has been refined throughout the course of the project. Helen presented key monitoring results to date, including data from the two intensive monitoring events of July and August 2012. She also shared various intended uses of the data including population/calibration/validation of the model, and the Barnegat Bay-specific assessment. Trish reviewed the 3 phases of the project (phases 1 and 2 are complete, phase 3 is currently in progress) and provided a summary of modifications that have been implemented during phase 3, which will run until June 30, 2013).

B. *Flow and Continuous Water Quality Monitoring in the Barnegat Bay Watershed* – Andrew Watson and Jack Gibs (USGS NJWSC)

Andy Watson provided a summary of the gaging stations that USGS operates and maintains in cooperation with NJDEP for the Barnegat Bay project. Water velocity and stage are recorded every 6 minutes at 3 gaging stations on Barnegat Bay and at 3 gaging stations on the inlets to the Bay. Acoustic Doppler Current Velocity meters are permanently installed at each gage to record the magnitude and direction of velocity. Bubble gages record stage. Cross sectional profiles of channel depth, velocity and discharge are collected routinely from a boat to calibrate the gages. Provisional data is available in near real time from the USGS website at [http://waterdata.usgs.gov/nj/nwis/current/?type=tide&group\\_key=NONE](http://waterdata.usgs.gov/nj/nwis/current/?type=tide&group_key=NONE). Effects of Hurricane Sandy and other events were discussed. Many stations experienced damage to shelters and equipment which has since been repaired.

Jack Gibs shared information about the continuous-record water quality monitors installed at 2 gaging stations in cooperation with NJDEP for the Barnegat Bay project. The monitor at the Toms River at Toms River streamgaging station collects data every 30 minutes. Parameters collected are temperature, pH, DO, SC, DOC and nitrate. Jack discussed matrix interferences from DOC on nitrate readings. A flow-through-cell with a shorter path length and an air compressor to keep the water moving are methods that have been used to decrease the effects. Samples of DOC and nitrate are collected routinely to calibrate the sensors. The monitor at Barnegat Bay at Mantoloking collects data every 30 minutes. Parameters collected are temperature, pH, SC, DO, total chlorophyll and 4 species of algae. Chlorophyll samples are analyzed routinely to maintain the instrument calibration. Jack discussed some results observed since the installation in September 2011.

C. *What Can Continuous Water Quality Monitoring Tell Us About Hurricanes Irene & Sandy in Barnegat Bay* – Jim Nickels (Monmouth University)

Jim Nickels described the layout of the existing Monmouth University continuous water quality dataloggers deployed in the Barnegat Bay, and how this type of array is useful to have in place prior to storms and other unplanned events to monitor changes to water quality as compared to "baseline" conditions. He provided information on the meteorological differences between the two storms (Irene and Sandy), and described how those differences were reflected in the water quality conditions. For example, the diurnal signal typically seen with salinity data was not evident once Sandy made landfall, and the loss of the diurnal pattern carried over for several days after the storm, whereas in Irene the signal was dampened but was still present at most of the loggers. He also discussed issues in providing quality control of the data in extreme events, and trying to tease out what is true data versus malfunctioning equipment when conditions are far outside the normal experience.

*D. Continuous Real-time Water Quality Data Collected in Barnegat Bay at Mantoloking During Hurricane Sandy – Larry Feinson (USGS NJWSC)*

Larry Feinson summarized the continuous real time water quality data that was able to be collected at Mantoloking during Hurricane Sandy. The water quality monitor remained operational through the hurricane. All parameters, including temperature, pH, SC, DO, total chlorophyll and 4 species of algae, were measured. Dramatic changes were observed in some characteristics during and after the storm. Rapid increases were observed in turbidity and SC. Decreases were observed in total chlorophyll-a, green and diatomic algal communities while increases were evident in blue-green and cryptophytic algae. The monitor is located close to the breach in the barrier island at Mantoloking.

*E. Bottom Characterization, Hydrodynamics, Loadings and Water Quality Modeling in Barnegat Bay-Little Egg Harbor Watershed – Bob Nicholson and Fred Spitz (USGS NJWSC)*

Bob Nicholson presented information about seafloor mapping, load estimates, circulation and sediment transport modeling. He summarized nutrient loadings to the Bay from 2003 to present. Total nitrogen loads are 650,000 kg/year. Streamflows account for 62% of nitrogen loads, atmospheric deposition 22%, ground water 12%, and direct storm runoff 4% of the total load. Nitrogen loads have significantly increased during the period 1988 – 2011. Geophysical surveys are being done. Bathymetry is used to survey the elevation of the bottom of the Bay. High resolution seismic reflection evaluates sediment below the bay. Side scan sonar shows historical channels. Eacrl B Lidar is used for bottom elevations in shallow areas where a boat cannot be used. Lidar data from 6 plane flights covered the majority of the Bay, except for the western shore, before Sandy in October. The entire bay has been flown from 8 plane flights, post-Sandy, in Nov – Dec. 2012. Difference maps will be produced showing scour and deposition. Hydrodynamic modeling (ROMS) will be linked to the EPA-supported WASP model. Initial results were shown to be good in some areas. Warmer temperatures and lower salinity is shown in the northern part of Bay. However, calibration is needed at Mantoloking because it's shallow. The Model will be used to track residence time – particle tracking.

An overview of water quality modeling in Barnegat Bay was given by Fred Spitz. He discussed model development, calibration and validation, and application. Constituents simulated by the WASP water quality model include nitrogen and phosphorus species, dissolved oxygen and oxygen demands, and algae. Flow inputs to the WASP model are provided by the ROMS hydrodynamic model via a linkage file being developed as part of the study. The WASP model grid is generally coarser than the ROMS model grid. WASP model boundary conditions include inlet concentrations and atmospheric, watershed, groundwater, and salt marsh loads. The simulation period is spring and summer of 2012. After the WASP model is fully developed and calibrated, it will be used to test water quality management options for the Bay.

*F. 2013 Barnegat Bay Assessment Process – Debra Hammond (NJDEP/WM&S)*

Debra Hammond provided an overview of both the overall water quality assessment process that NJDEP utilizes in preparing its biennial Integrated Report as well as the 2013 Barnegat Bay-specific assessment process. After reviewing the redesigned assessment process that was put in place in 2012, she detailed how this process combined with the lessons learned from the Barnegat Bay Ambient Monitoring Project will assist in shaping the Barnegat Bay-specific assessment for 2013. This included a summary of existing data sources, assessment units, parameters and associated criteria, the process for narrative nutrient criteria assessment, as well as the anticipated schedule for preparing the overall assessment. She also requested ideas for other things to include in the assessment beyond short & long term status & trends of multiple environmental indicators, shellfish stock assessments, wetlands conditions, municipal stormwater management, boating impacts, and effects of the fertilizer ordinance.

*G. DEP-Sponsored Barnegat Bay Research Projects – Tom Belton (NJDEP/OS)*

Tom Belton presented an overview of Action Item 9 of the Governor's 10 point plan for Barnegat Bay ("More Comprehensive Research"), including how the information gathered will support other

areas of the Action Plan such as supporting water quality improvements, establishing baseline conditions for the Bay, filling critical data gaps, as well as advancing habitat restoration on the Bay. Tom also summarized each of the 10 DEP-sponsored research projects being funded under this Action Item, providing objectives, sampling information, methodology and results (where available).

#### *H. Barnegat Bay Subaqueous Soil Survey Early Findings and Implications – Rob Tunstead (USDA/NRCS)*

Rob Tunstead initially summarized the short history of subaqueous soil surveys and how they relate to the more traditional soil survey, before explaining the numerous uses of a subaqueous soil survey, including restoration planning for submerged aquatic vegetation and shellfish, evaluation of sediment as contributors to eutrophication, evaluating barrier beach dynamics, and assessing the potential of sediment for carbon sequestration, to name a few. He then described the processes associated with creating a subaqueous soil survey, including the identification of major landform types through bathymetry, sampling and identifying the unique soil series within each landform, collecting the necessary data to document the findings, and collating the information into a GIS based map. Lastly, he described some of the landforms and soil series found in the northern portion of Barnegat Bay and described the upcoming year's workplan.

#### *I. Barnegat Bay Hard Clam Populations and Water Quality – Monica Bricelj (Rutgers University)*

Monica Bricelj discussed results of a white paper prepared for the Barnegat Bay Partnership on understanding hard clam population changes in the bay and the interplay between hard clams and water quality. She emphasized key water quality components that influence the successful growth and survival of various life history stages of hard clams. Salinity in the bay is a major driver of hard clam distribution, with clams exhibiting poor tolerance for low salinities below ~15. There is also a synergistic effect between salinity and temperature on clam larval survival, but poor understanding of the effects of high and low salinities on the physiology of postset and adults. Dr. Bricelj stressed that the relationship between clam growth and survival and eutrophication is not cut and dry, as hard clams are well adapted to eutrophic estuarine conditions, as measured by total microalgal biomass (chlorophyll *a*). They can, however, be negatively affected by changes in nutrient speciation (e.g. different forms of nitrogen) that control the composition of their phytoplankton food supply, as not all phytoplankters are equally nutritious. Therefore, sole reliance on the measurement of chlorophyll *a* as an indicator of habitat suitability for shellfish is misleading. The role of the toxic alga that causes brown tide was also touched upon, as were the effects of other environmental variables such as macroalgal blooms that can affect near-bottom dissolved oxygen, turbidity, and pH in sediments. She concluded by discussing the ability of hard clams to positively alter certain aspects of water quality, including light penetration via their high filtration capacity, nutrient recycling via biodeposition, and even ability to crop low levels of brown tide.

#### *J. Shellfish Closures in Response to Hurricane Sandy – Bob Schuster (NJDEP/WM&S)*

Bob Schuster summarized the steps taken by the Bureau of Marine Water Monitoring in preparing for Hurricane Sandy. In addition to implementing a statewide closure of all shellfish harvesting waters as a precautionary measure, these included development of a sampling plan to guide reopening of the waters as well as maps by which the data could be reported on the web. Bob described the sampling and reopening process that was utilized. Based on water quality results, waters in the southern portion of the state were reopened within 2 weeks of the Hurricane while waters in the northern portion were opened after 6 weeks. However, some areas of the Barnegat Bay Estuary are still closed due to viral contamination of the shellfish. Reasons for this include the fact that areas of Barnegat Bay were close to the center of the storm - the area from Little Egg Harbor north to Mantoloking was hit very hard with surge, wind and rain, the entire area was affected by multiple cycles of elevated tides, and the cooler water temperatures have not allowed the shellfish to purge their contaminants.

## ➤ **Action Items**

- Add comments/suggestions to draft flood monitoring plan. Continue to seek comments from Bob Reiser (USGS), Doug Haltmeier (DOH), John Yagecic (DRBC), Caitlyn Nichols (IEC) and Ashley Slagle (Harbor Dischargers) – *Dean Bryson*
- Pursue possible coastal locations for next Summit with Jim Nickels and Jim Vasslides – *Alena and Leslie*

➤ **Technical Topic for Next Meeting**  
Biological Monitoring

➤ **Next Meeting**  
May 22, 2013 at USGS NJ Water Science Center

### **Additional Attendees at Joint NJWMC/BBP Meeting – February 6, 2013**

Christine Bell (Ocean County Planning Dept), Jenny Buck (Mantoloking Env. Comm), Bill Crouch (USFWS), Amy Drohan (NOAA), Mihaela Enache (NJDEP/OS), Lila Forsberg (SBB), Dorina Frizzera (NJDEP/OS), Brent Gaylord (EPA R2), Helen Henderson (Littoral Society), Peter Hibbard (OCCCW), Susan Hibbard (OCCCW), Lois Jacobson (SBB-PTCAC), Donna Johnson (NOAA), Lynette Lurig (NJDEP/WM&S), Maureen McCarthy (Clam Farmer), Peter McCarthy (Clam Farmer), David McKeon (Ocean County C Planning Dept), Sheila McVeigh (LWVOC), Bob Mancini (Little Egg Harbor), Steve Mars (USFWS), Paul Morton (NJDEP/WM&S), Harold Nebling (NJDEP), Dale Parsons (Parsons Seafood), Victor Pecchili (Ocean County Planning Dept), Kerry Pflugh (NJDEP), Jeff Reading (NJDEP/WM&S), Jaclyn Rhoads (Pinelands Preservation Alliance), Janice Rollwagen (EPA R2), Heather Saffert (COA), Greg Sakowicz (Jacques Cousteau-NERR), Richard Shaw (USDA-NRCS), Barbara Spinweber (EPA R2), Andy Thuman (HDR/Hydroqual), Karen Walzer (BBP), Britta Wenzel (SBB), Louise Woolton, Elizabeth Zimmerman (Richard Stockton College), Cindy Zipf (COA)