

**DELAWARE RIVER BASIN COMMISSION
FLOOD ADVISORY COMMITTEE (FAC)**

February 17, 2010

The February 17, 2010 Flood Advisory Committee (FAC) meeting began at 10:00 AM at the Commission office (DRBC) in West Trenton, NJ. Joseph Ruggeri of the New Jersey Department of Environmental Protection (NJDEP) chaired the meeting at the request of John Moyle (NJDEP, Current FAC Chair) as Mr. Moyle was unable to attend the meeting.

A. Introductions and Review of the Draft Minutes from the November 18, 2009 Meeting

Corrections to the minutes were received via email from Jeff Mahood, NRCS prior to the FAC meeting. The minutes were approved with those corrections noted. The approved minutes will be posted on the DRBC web site. Tapes of the meeting may be reviewed upon request.

B. FAC Membership Announcements

Richard Bell, Director of Delaware County Department of Emergency Services, attended his first meeting as the emergency management representative for the State of New York. He was nominated by Jim Eisel, Delaware County Chairman and the appointment has been reviewed by Carol Collier, Executive Director of DRBC. Other county/local emergency management representatives on the FAC include: Dave Burd, Lambertville Emergency Management Coordinator representing New Jersey and Bill Winslade, Yardley Borough Emergency Management Coordinator representing Pennsylvania. There is currently no emergency management representative on the FAC representing the State of Delaware.

Sean McGuinness has been named the NPS Superintendent of the Upper Delaware Scenic and Recreation River. He replaces Vidal Martinez who started a new assignment in Virginia. Sandy Schultz, Assistant Superintendent, is retiring after 37 years of service with the Upper Delaware.

Action Items:

1. Nominations for an Emergency Management Coordinator representing the State of Delaware should be sent to Laura Tessieri, DRBC.
2. Any updates on FAC membership should be forwarded to Laura Tessieri, DRBC.

C. Hydrologic Conditions Report

A presentation of the current hydrologic conditions was given by Laura Tessieri, DRBC. As of February 15th, the year-to-date precipitation for 2010 ranged from 1.35 inches below normal for the upper basin (above Montague) and 1 inch below normal mid-basin (above Trenton) to 1.67 inches above normal in the lower basin (Wilmington).

To date, for the month of February, streamflow both at Montague and Trenton gages were right at or slightly below the normal range for that time of year. But, in general, over the past several months we have been above normal.

As of February 16, 2010, the total storage for the NYC Delaware reservoirs was 244 BG. Storage is 12.4bg above the long-term median; Cannonsville was at 90.4%, Pepacton at 92.2% and Neversink at 83.3%. Cannonsville and Neversink reservoirs were releasing at L1b levels, Pepacton at L1c/c1. Additional supplementary releases have been made at Pepacton in accordance with the Temporary Supplemental Releases Program for the temporary 2009 Rondout West Branch tunnel shutdown. The USACE reservoirs in the lower basin storage (Beltzville and Blue Marsh) were at or slightly above their normal pool indicating that all of flood control storage in the two reservoirs was available.

As of February 4, 2010, the salt line (7-day average river mile location of 250 mg/l chlorides) was at river mile 62 which is eleven miles downstream of its normal position at 68 miles. The next one-three month outlooks show an equal probability of experiencing either higher or lower than normal temperatures and precipitation.

D. How the NWS Forecasts River Stages: Patti Wnek, Senior Service Coordination Hydrologist Middle Atlantic River Forecast Center (MARFC)

Patti Wnek gave a presentation on NOAA-NWS river forecasting. The Middle Atlantic River Forecast Center River (MARFC) is one of 13 River Forecast Centers in the Nation. MARFC forecasts from southern New York down to Richmond, Virginia. It issues forecasts for 7 River Basins including the Delaware, Susquehanna, Passaic, Raritan, Potomac, Rappahannock and James.

The presentation covered what goes into river forecasting, including precipitation input over the past 24 hours, precipitation forecasts over the next 48 hours, gathering of current river levels and antecedent data, the rainfall-runoff model in use by MARFC, routing of runoff and flow in the river using hydraulic modeling and finally conversion of flow to stage at flood forecast points. If you are interested in viewing the presentation, please contact Laura Tessieri at DRBC to request or Patti Wnek directly.

Currently, precipitation information is received from 12 RADARs and 1,347 precipitation gages (ranging from manual to automatic). If you or your family are interested in collecting precipitation information and reporting: Join CoCoRaHS, a Community Collaborative Rain and Hail Snow Network <http://www.cocorahs.org/>

MARFC website: <http://weather.gov/marfc> Resources include:

- ▶ Flood Outlooks
- ▶ Flood Climatology
- ▶ Water Supply
- ▶ Precipitation
- ▶ Flash Flood Guidance
- ▶ Expansion into Water Resources
- ▶ Customer Advisory Board

COMET - Website Resource: <http://www.meted.ucar.edu> The COMET (Cooperative Program for Operational Meteorology, Education and Training) Program's mission is to serve as a premier resource that supports, enhances, and stimulates the communication and application of scientific knowledge of the atmospheric and related sciences for the operational and educational communities. The MetEd website provides free access to hundreds of hours of material & free training that is available to the public.

Action/Discussion Items:

1. Greg Westfall, NRCS, will explore if there are any locations or opportunities for cross-over/data sharing of soil moisture estimates or modeling between USDA NRCS and NOAA-NWS.

E. Discussion of Flash Flood Forecasting Needs in the Delaware River Basin: Mike Schaffner, Senior Service Hydrologist, National Weather Service Forecast Office (BGM)

Mike Schaffner, NWS Binghamton Forecast Office, discussed a new technique that is being evaluated to forecast flash flooding. The approach utilizes the NWS Office of Hydrologic Development (OHD) Research Distributed Hydrologic Model (RDHM). It evaluates both localized runoff and routed components of flash flood generation. A prototype currently exists in Maryland and another in western Pennsylvania. Both are undergoing evaluation.

There is a potential for a prototype to be developed for the Upper Delaware River Basin in New York State. The current application area is undergoing discussion.

Benefits of this new technique to forecast flash flooding may include:

- WFO Binghamton to produce more accurate flash flood warnings in the Upper Delaware River Basin
- Reduce size of flash flood warnings due to better depicting the threat area
- Increase warning lead times
- Allow ability to identify thresholds for the onset of flash flooding and extreme flash flood events using multiple archived flash flood case studies.

If you are interested in viewing this presentation, please contact Laura Tessieri, DRBC, to request, or Mike Schaffner directly.

Conference announcement: Eastern Regional Flash Flood Conference, June 2-4, 2010, Wilkes-Barre, PA Attendance targeted at NWS, other federal agencies, universities, and state and local emergency managers, water resource managers, and other partners. No conference fee, but registration is required. June 2– NWS Internal Session; June 3– Technical/Science of flash flood forecasting; June 4–Delivery of flood services (focused on NY, PA, NJ and MD customers/partners). For more information, visit: <https://services.srbc.net/NWSEasternconf/>

F. Floodplain Status Update on Flood Inundation Mapping: Jason Miller, USACE

Jason Miller, USACE Philadelphia District, gave an update on the status of the development of flood inundation mapping for the main stem of the Delaware River from Trenton, NJ to Port Jervis, NY. It was explained that the mapping, once final, will be made available in two formats:

1. Stand-alone GIS Application
 - Intended users: Federal, State, County
 - Mapping will be continuous through study area (exception – Delaware Water Gap)
 - Additional information (Select structures contain demographic, elevation and economic data; plus digital photographs)
2. Available to public through NWS-AHPS
 - Nine separate reaches covering gage/forecast points

The nine reaches that will be available on AHPS include Trenton, New Hope/Lambertville, Stockton, Frenchtown, Riegelsville, Easton/Phillipsburg, Belvidere, Montague and Port Jervis. USACE has been working closely with NWS to ensure consistency and accuracy. Where available, high water marks, gage ratings, flood impact statements and other historic information is being used for checks.

The goal is for inundation areas to be posted to AHPS by Spring 2010. The GIS application is expected to be disseminated through state and counties. A DVD with all the information packaged on it and a users manual will be provided.

It was discussed that USACE will include structural survey information for 6 municipalities (3 in NJ and 3 in PA). This information was collected under a separate initiative that captured structural information in the floodplain of identified damage centers. That information will be included in the GIS application. It is possible that additional information on structures could be added to the GIS application after it is passed onto the user. All communities participating in the NFIP are required to have first floor elevations for structures in the floodplain. These are recorded on Elevation Certificates and are maintained at the local level.

It was asked if the inundation mapping would be available via Google Earth. While the whole length of the mapping may not be, the nine sites available through the NWS AHPS page will have a download option both to shapefiles and kmz files.

G. Status Update on Flood Analysis Model: Bill Muszynski, DRBC

Development of the flood analysis computer model was among the 45 recommendations identified by the Delaware River Basin Interstate Flood Mitigation Task Force in its July 2007 action agenda. Bill Muszynski, DRBC, reported that the Interstate Flood Mitigation Task Force convened on December 15, 2009 to hear implementation progress on several Task Force recommendations. Presentations at this meeting were focused on flood warning improvement recommendations, flood analysis model results, and floodplain management recommendations.

The interagency team that developed the flood analysis model included staff from the USACE Hydrologic Engineering Center, NWS and U.S. Geological Survey (USGS). The Flood Analysis Model was developed using two software programs: a reservoir and flow routing model called HEC-ResSim (developed by USACE) and a rainfall-runoff model called PRMS or Precipitation Runoff Modeling System (developed by USGS).

The HEC-ResSim model portion of the Delaware River Basin Flood Analysis Model has been available online since December 2009. In February 2010, the documentation for both the HEC-ResSim and PRMS portions of the Delaware River Basin Flood Analysis Model were posted. The HEC-ResSim model can be used to assess the impact of pre-event reservoir voids on flood crests. The PRMS rainfall-runoff model can be used to generate inflows to the HEC-ResSim model to evaluate the effects of development on flooding. Both models and documentation can be downloaded from the DRBC website at: http://www.nj.gov/drbc/Flood_Website/FloodAnalysisModel/index.htm

The flood analysis model was used by DRBC staff to predict river stages for six hypothetical pre-event reservoir conditions for each of the three storms (September 2004, April 2005, and June 2006). In each scenario, river stages were simulated at nine NWS Advanced Hydrologic Prediction Service (AHPS) flood forecast points.

Of the 13 reservoirs simulated in the model upstream of Trenton, N.J., five did not spill during any of the three storm events and thus can provide no further flood mitigation with additional pre-event void space. For the eight reservoirs that did spill, the model results indicate that larger pre-event voids could have reduced flood crests, but much of the main stem would still have remained in the National Weather Service (NWS) designated moderate or major flood stage. The amount of reduction in the flood crest that could potentially be achieved with pre-event voids was found to depend upon the characteristics of the storm event (path, precipitation intensity, duration, timing, and antecedent soil saturation) as well as on proximity to the reservoir, stream channel characteristics, and local topography.

The powerpoint given on December 15, 2009 contains further analysis and results. It can be viewed at: http://www.nj.gov/drbc/Flood_Website/taskforce/Meeting121509/ModelPresentation.pdf

H. Opportunity for Public and Interested Party Comments

1. Joe Ruggeri, NJDEP, mentioned that there were two open houses coming up for Warren and Sussex County in New Jersey to present and discuss the new DFIRMs. This is the first time FEMA is incorporating the NJ flood hazard area (100 year plus 25% discharge) and the 0.2' floodway into the DFIRMs on the Delaware River.
 - Warren County Public Open House- February 18, 2010
 - Sussex County Public Open House-February 25, 2010
2. Video conferencing was requested by FAC members. With current travel restrictions, a comment was made that video conferencing may allow more members to be involved in the FAC meetings. NYDEC has requested this service in the past. Currently, PEMA and Rich Bell, Delaware County, NY are interested. DRBC does have videoconferencing capabilities, but with an IP address not an ISDN address.

3. Committee Resolutions, 2000-8 (Creates Committee) and 2006-3 (Amends Resolution 2000-8 by modifying membership) can both be viewed online, along with all meeting summaries at <http://www.nj.gov/drbc/advisory.htm#flood>
4. Jason Miller, USACE, mentioned a possible future presentation idea. The USACE is developing storm surge modeling for the Delaware Bay. This is supporting a FEMA Region III project that is re-studying the Chesapeake and Delaware Bays to re-establish storm surge levels and new floodplain mapping for all of Region III.
5. Joe Ruggeri, NJDEP mentioned that FEMA Region II has hired a contractor to do new modeling for the Atlantic Coast.
6. The DRBC, along with the NWS and other partners, prepared a proposal to develop and demonstrate an operational prototype next-generation, ensemble-based, end-to-end, storm-surge inundation and flooding forecast system for the Delaware Bay and tidal Delaware River. If awarded, this initiative could be funded through the use of FY-11 funds for the Delaware River Enhanced Flood Warning System.

The Delaware Inundation Forecast System (DIFS) would produce visualized forecast products showing city-block-scale land inundation in formats readily usable by the National Weather Service Forecast Office, emergency managers, and other public and private sector users of storm-surge inundation and flooding forecast information. This model would be extended from the existing Chesapeake Inundation Prediction System.

Action Items:

1. Video conferencing capabilities will be explored for the next FAC meeting.
2. Jason Miller recommended a future presentation on the FEMA RIII Storm Surge Modeling Project in the Delaware Bay.

I. Next Meeting

The next meeting of the Flood Advisory Committee (FAC) is scheduled for May 26, 2010 at 10:00am in the DRBC Goddard Conference Room.

**FLOOD ADVISORY COMMITTEE
ATTENDANCE**

February 17, 2010

NAME	AGENCY
BELL, Richard	Delaware County, NY Department of Emergency Services
BURD, Dave	Lambertville, NJ Office of Emergency Management
DEANGELO, Jim	Michael Baker Corporation
GOULD, A. Chris	New Jersey Department of Environmental Protection (NJDEP)
GRUBER, Hank	U.S. Army Corps of Engineers (USACE), Philadelphia District
FRAZIER, Dean	Delaware County, NY
KRUDZLO, Ray	National Weather Service (NWS)
MATTE, Al	National Weather Service (NWS)
MILLER, Audrey	New Jersey Office of Homeland Security & Preparedness (NJOHSP)
MILLER, Jason	U.S. Army Corps of Engineers (USACE), Philadelphia District
RIMAWI, Hani	Medina Consultants
RUGGERI, Joseph	New Jersey Department of Environmental Protection (NJDEP)
SCHAFFNER, Mike	National Weather Service (NWS)
SCORDATO, John	New Jersey Department of Environmental Protection (NJDEP)
SURO, Thomas	United States Geological Service (USGS) - NY
TESSIERI, Laura	Delaware River Basin Commission (DRBC)
TUDOR, Bob	Delaware River Basin Commission (DRBC)
WESTFALL, Greg	Natural Resources Conservation Service (NRCS)
WILLIAMS, David	Pennsylvania Emergency Management Agency (PEMA) Eastern Area
WINSLADE, Bill	Yardley Borough Manager & Emergency Management Coordinator
WNEK, Patti	National Weather Service (NWS)