

**DELAWARE RIVER BASIN COMMISSION
FLOOD ADVISORY COMMITTEE SUMMARY**

May 3, 2006

The May 3, 2006 Flood Advisory Committee (FAC) meeting began at 10:00 AM at the Commission office (DRBC) in West Trenton, NJ. Peter Gabrielsen of the National Weather Service chaired the meeting.

A. Introductions and Review of the Draft Minutes from the February 8th Meeting.

Mr. Gabrielsen requested a change under Item D. He was quoted to say that the Weather Service will continue to operate as they have for the past ten years. He would like to change that to say the Weather Service will continue normal operations. The summary will be posted on the DRBC web site. Tapes of the meeting may be reviewed upon request.

B. Flood Advisory Committee Membership

Mr. Gabrielsen noted that many of the member organizations have appointed voting members, and some of the organizations have listed alternates as well. Mr. Fromuth mentioned that members can be designated only for particular meetings if desired. The member organizations that have not yet identified their voting member should contact Laura Tessieri as they establish who that member will be.

Resolution 2006-3 was passed at the March 1st Commission meeting which amended the membership of the Flood Advisory Committee to include a local emergency management representative from each state. These individuals have not yet been appointed, but the DRBC plans to have a letter from the Executive Director go out to the heads of the emergency management agencies in each state to ask for nominations. Based on those nominations, appointments will be made by the Executive Director.

Actions:

1. Remaining organizations that have not yet identified their voting member should do so and email that information to the DRBC.
2. DRBC will send a letter from the Executive Director to the heads of the emergency management agencies in each state asking for nominations.

C. Hydrologic Conditions Report

A presentation of the current hydrologic conditions was given by Mr. Fromuth. Conditions were very dry for the previous six weeks in the Basin. The most recent storm provided an average of two inches of rain throughout the basin. Because of that storm, the past thirty days show a very normal precipitation profile based on long-term averages.

Both Cannonsville and Pepacton Reservoirs are spilling as of May 3rd. Neversink Reservoir has about a two billion gallon void. Combined storage is normal for early May, when the reservoirs are typically full.

This year's forecast is for nine hurricanes with five storms of category 3 or more. This is above average hurricane activity. A total of 28 named storms, 15 hurricanes, and 8 category three plus storms occurred during 2005. Last year set a new record for the number of category 5 storms.

D. Opportunity for Public and Interested Party Comments

No public input or comments were received, although there was public discussion during subsequent portions of the meeting.

E. Storage Void Evaluation of NYC Reservoirs

Full Reservoir vs. No Reservoir Comparison – presentation by the National Weather Service

Mr. Ahnert presented model simulations done at the Mid-Atlantic River Forecast Center. The simulations, which were performed by Ted Rodgers, looked at the impacts of Cannonsville and Pepacton Reservoirs under two scenarios. The first scenario simulated the April 2-5, 2005 flood with the reservoirs in place and filled to capacity. The second scenario removed the reservoirs for the same April 2005 event by setting the outflow from the two reservoirs equal to the inflow.

Results compared the peak flow and crest for the two simulations at three locations: the West Branch of the Delaware River at Hale Eddy; the East Branch of the Delaware at Fishs Eddy; and the main stem of the Delaware River at Callicoon.

Mr. Ahnert explained that the hydrograph is made up of three components: base flow, local runoff which is the contribution of ungaged tributaries between the dam and the downstream gage, and the upstream routed flow, which is either the routed outflow from the reservoir, or, in the case of the second (no reservoir) scenario, the routed reservoir inflow.

The simulation results showed that flood crests at Hale Eddy, Fishs Eddy, and Callicoon increased by 2.2 feet, 1.0 ft, and 1.1 ft, respectively if the reservoirs were removed from the system. This corresponded to peak flow increases of 26 percent at Hale Eddy, 8 percent at Fishs Eddy, and 10 percent at Callicoon.

Dr. Bill Vogt asked about the margin of error. Mr. Ahnert said since this is a comparison of simulations and an effort was made to match the simulations as closely as possible, results should be within a quarter of a foot in terms of crests. Mr. Ahnert stated that he did not have any way of proving this because their models are designed for operational river forecasting; and not generally used for this type of simulation.

Mr. Tudor asked if one could generally say that dams, reservoirs, lakes have a dampening, attenuating affect and therefore have an effect in terms of reducing flood peaks. Mr. Ahnert said that is typically the case. When there is a water quantity through a reservoir that impounds the water at least temporarily and, even though the reservoir spills, the water comes out over a longer period of time than it would have if the reservoir was not there. Mr. Ahnert noted that it is possible that for different precipitation scenarios, the change in timing of the peak flow caused by the reservoir could increase a downstream peak flow. However, in the case of the April storm, it did not. Mr. Gabrielsen said there are also timing issues if you are dealing with a snowmelt event depending on how your snowpack is melting, there are a number of other factors, you cannot say that the result will be the same every time because of the potential for distribution of the inflow. Mr. Ahnert said this simulation cannot be generalized. This simulation is for the April 2-4 event only and for the precipitation that was observed for that event.

Mr. Skip Danielson, the emergency management director for Sussex County, asked if the NWS was going to do a similar model for the Neversink. Mr. Ahnert said unfortunately, they do not model Neversink at this time. They are working on it; they are going to be doing it in the future because they realize it is important. Mr. Danielson said the Neversink was a major problem for them in the April 2005 flood. He also asked if the NWS was looking to model Swinging Bridge, Rio and Mongaup. Mr. Ahnert said no, not those dams. Currently, they do not model the smaller reservoirs, but they are adding Neversink. Mr. Danielson said when you drove up to the Swinging Bridge, Mongaup and Rio area around April 6 or 7, whole roads including the state highway were totally wiped out, and the damage is still significant. Mr. Ahnert said the amount of the water coming out of the larger subbasins includes that water, so it is implicit in the model, but they do not explicitly model the effect of those three dams.

Mr. Fromuth thanked Mr. Ahnert and the Weather Service for the modeling and presentation. Mr. Ahnert said that NWS is currently looking at additional runs to show hypothetically what the effects might have been if there had been different voids in the Cannonsville and Pepacton reservoirs. At the next presentation they hope to present some additional results and a written report.

Report on 2006 Void Program Implementation – presentation by New York City DEP

Tina Johnstone gave a presentation on the void program implementation during 2006. She stated that there are two void programs, one in Pepacton and the other at Neversink. On January 24, 2006 the snowpack void program came into effect for Pepacton and Neversink. The theory of the program was to keep a void in the reservoirs equal to one-half the water equivalent of the snowpack in the watersheds. Ms Johnstone showed a graph for Pepacton Reservoir showing the releases made to create the void. At the beginning of February there was some snowmelt and some rain. According to the void program agreements, releases had to be suspended for a few days so that they were not adding to any possible flooding downstream. Pepacton stopped spilling in the middle of February, and reached the target void on February 28.

The second void program went into effect on February 8th. The goal was to achieve a void equal to the amount of runoff from a one inch rain event in the respective watershed. At this time, snowpack was so light that the runoff based void defined the limit of drawdown rather than snowpack. On February 28th, the void for a one inch rainfall event was achieved, and no additional releases from that point on were required to maintain that void. Accordingly, releases were lowered to conservation rates. Due to the void program, Pepacton actually stopped spilling before it normally would have, and releases were required for fish habitat protection. These releases depleted the portion of the habitat storage bank set aside for fishery protection to the point where fishery releases had to be cut to avoid total depletion of the banks.

The target void for Neversink reservoir was reached on February 17, and no additional releases were required to maintain that void. Similarly to Pepacton Reservoir, releases above conservation were charged to the habitat bank for fisheries protection. The period of February, March and April for the Neversink watershed was the driest on record, based on 76 years of historical data. This combined with the void releases to end reservoir spills quickly and require the releases for fish habitat protection.

F. Status of DRBC Flood Mitigation Plan Proposal

Mr. Fromuth referred to handout F1 which is a summary of a grant proposal that has been submitted to the New Jersey Office of Emergency Management (NJ OEM) for a multi-jurisdictional Flood Mitigation Plan for the non-tidal N.J. section of the Delaware River Basin. This would include portions of four counties upstream of Trenton: Sussex, Hunterdon, Warren, and Mercer. It would be a combined multi-agency and local planning effort. Ms. Tessieri, who is at a HAZUS training session this week, did a lot of work in putting together the grant application with input from Region II of FEMA and the New Jersey Office of Emergency Management. The difference with this approach to planning for the 64 communities that are in these counties is it requests a lot of assistance from the counties and the municipalities. Those steps and effort that they would need to provide are listed on the back of handout F1. The budget, which includes in-kind services from the DRBC and NJDEP is approximately \$120,000. The NJ OEM would provide organizational assistance with the project. In looking at past efforts to develop flood mitigation plans for communities in New Jersey, the average cost runs in the range of \$10,000-\$15,000 per community. This project is an attempt to spend a lot less than that on all of the communities, but to get the assistance of the communities on essentially a volunteer basis. DRBC would supply summaries of insurance claims, maps, past flood events, background information; also they expect to run the HAZUS model for the counties and communities to generate the outputs of potential flood damages. The actual planning process to spell out particular hazards and mitigation choices for the communities would be counties working with the community. If DRBC gets the grant, the work will start around the beginning of June, and work would be spread over a two-year timeframe. This is a flood mitigation assistance grant,

so it is focused on flood mitigation as opposed to all hazards mitigation. The intent is to prepare the work in such a way that it could be used as part of an all-hazards mitigation plan.

Joe Zagone asked where the 25% match is coming from for the FMA grant. Mr. Fromuth responded that it was coming from the salaries of DRBC and NJ DEP personnel. Mr. Zagone asked if there is a possibility to expand this to the Pennsylvania side. Mr. Tamm said it is a possibility. At this time it looks like most of the PA counties are involved in preparing their own plans. Mr. Zagone said there is still more federal FMA money available. Mr. Zagone said that, under the guidance of DHS they have been asked to send all of their money back by April 15. In their region, they sent back of \$760,000.

Mr. Tudor said DRBC really does not have the capacity to go beyond the proposed project area at this time, but they did want to structure the plan in a way that if it proved effective and usable to the counties and municipalities that they could expand it in the future to other locations within the basin. The mindset was to pick the top half of New Jersey that is in the basin, then do the lower half that is in the basin, and then as need be if there is more vulnerability assessment work needed to be done or more technical assistance to communities in terms of what the actual mitigation actions would be, we would do it as funds are available. They would also be interested, if there was funding available, to do the all-hazards mitigation plan on a basin scale.

Automated Snowpack Water Content Monitors

Rick Fromuth reported on the status of the grant application submitted to the NOAA flood warning system grant application process. The DRBC requested funding for two additional automated snowpack monitors to measure the water equivalent in the snowpack for the New York City reservoir watershed. New York City has already purchased and installed two monitors. The snowpack monitoring that is done now is done manually by the city and also by the National Weather Service based on remote sensing overflights. If the DRBC gets the grant for the two additional monitors, they would be turned over to the city and installed. The city would pay for the installation costs for the monitors. Mr. Fromuth stated that he does not expect to hear about the grant award until June or early July.

G. Status of NJ Governor's Task Force Report

Mr. Moyle stated that since the last meeting, the draft report has been posted on the website. Comments on the report were to be submitted by March 17. Only eight comments were received. Comments were received from the NRCS, the South Jersey RC&D Council, NJOEM, the National Weather Service, Bill Vogt, Nancy Wittenberg from New Jersey Builders Association, DRBC, and Dirk Hoffman, a consultant who used to be with NJDEP. The department is currently bringing the comments to the attention of the full task force report and will revising the report in accordance with the comments that should be incorporated into the full text.

The next meeting for the full task force is May 15th with Commissioner Jackson. After that meeting, the report will become finalized and sent to the Governor's office for approval. At the May 15th meeting, a determination will be made whether or not to have an open public meeting. John Moyle did specify, though, that both he and his administrator, Dave Rosenblatt, have gone to a few meetings with municipalities and counties that were public meetings. These have included a Lambertville Council meeting and the Warren County League of Municipalities with potential future meetings with the City of Trenton and Phillipsburg.

Mr. Tudor asked the committee to consider at its next meeting what role they might play in terms of advancing some of the progressive actions contained in the report on a multi-state scale as opposed to just New Jersey. Mr. Moyle said that in the report there is an implementation aspect that lists who is responsible, and he thinks there are a couple of recommendations that identify DRBC as the lead agency.

Mr. Moyle said there are a lot of the comments that deal with regulatory reform, and right now the department is in the process of making amendments to the New Jersey Flood Hazard Area Control Act regulations. The Commissioner has asked NJDEP staff to talk to the engineering community and some of the people who are going to be impacted by these rules, and then hopefully there is going to be a proposal some time late spring with respect to some of those regulatory form questions.

H. Map Modernization and Interstate Coordination

PA MAGIC/DCED Map Mod Conference

A recent workshop that focused on enhancing Pennsylvania's role in FEMA's Map Modernization program was held on March 14-15 by PAMAGIC/DCED (Pennsylvania Mapping and Geographic Information Consortium/ Department of Community and Economic Development). Three people from the flood committee attended: Laura Tessieri from DRBC, Bob Hainly of the USGS, and Jason Miller of the USCOE. There were some discussions at the last flood meeting about mapping consistency, the age of the maps, increased need for state input and communication under FEMA's map modernization plan. Ms. Tessieri, based on the last committee meeting, expressed interest at the workshop about the committee's interest in coordination of flood mapping on both sides of the Delaware. This would include flood discharges, flood rate standards, and the application of flood regulations.

One of the goals of the workshop is the potential for a flood mapping conference for Pennsylvania, and the integration and map modernization program FEMA has with the state water plan, and also with flood warning since when the mapping gets redone, they plan to use it as flood stage forecast mapping and put it on line associated with the flood warning system up there with the Weather Service. There is a full report on the workshop and it is available from Doreen Henry. She is with the Pennsylvania Association of Township Supervisors and her e-mail is dhenry@dsats.org.

NJDEP Coordination Activity

Mr. Moyle mentioned that the department has identified a funding mechanism in place to upgrade some of the maps in New Jersey, since they date back to the late 1970s. They have had two meetings with FEMA and they are trying to leverage the map modernization program with these new funds. FEMA has indicated the first thing they need to do is enter into a cooperative technical partnership (CTP) agreement and then incorporate a scope of work to identify what they want to see accomplished with the updated maps. NJDEP and FEMA have had two meetings so far, but have not yet signed the CTP. Prior to formalizing the scope, FEMA has asked for a joint technical meeting with representatives from the Corps, USGS, FEMA Region II, as well as a representative from the state of Pennsylvania. This meeting is scheduled for May 16th. Originally, they thought they could just enter into this agreement with FEMA and then have the technical meeting, but they decided that it would be best if they have the technical meeting and identify where they are going to go with the scope and what information is available based upon all the different agencies before they formally enter into this agreement with FEMA.

New Jersey is prepared to sign a feasibility agreement with the Philadelphia District of the Army Corps of Engineers to look at the NJ recommendations from the 1984 Corps report which focused on the Delaware River mainstem from Trenton to Port Jervis. A draft agreement has been prepared, and they are waiting for the Philadelphia District to send it up. Jason Miller said there has not been a sponsor yet for the Pennsylvania side. They are still hoping to move forward, but as of now NJDEP is the only local sponsor. Mr. Moyle said they are planning to look at what they can do to mitigate some of the flood damages on the New Jersey side. He does not feel at this point that there is going to be any major flood control project coming out of this. It is going to be one of those opportunities for additional buyouts, or mitigation of some homes, or an increase in the ability to get the word out into flooding and flood mapping associated with the AHPS system where they could be incorporated. Something that the Corps

talked about is what they had in the Susquehanna Basin. Mr. Miller said these studies draw the wide net to look at all different kinds of options – structural and non-structural. You never know what is going to come out of it. The anticipation is that it is supposed to be non-structural at this point, but there is no way to know until everything is looked at and all options are exhausted. The feasibility study is very broad in nature in terms of options that it looks at.

The NJDEP is working on an agreement with USGS to upgrade stream gages in the Delaware Basin portion of the state.

I. Status of Flood Warning Recommendations Update

Mr. Fromuth reported that the USGS and the Weather Service have worked with Ms. Tessieri to supply stream gage information for all of the states in the basin, plus all of the updated flood forecast points. She is preparing new maps with the information to put into the updated report. It was requested that if there are specific recommendations for gages, flood forecast points, precipitation gages that anyone has that need to go into this report be sent to Laura Tessieri within the next month.

Mr. Gabrielsen said the recommendations developed in the 2002 report were helpful in working with the New York City DEP to establish additional monitoring on the upper Delaware Basin. Having that information makes it much easier for an agency such as the Weather Service to develop and implement its hydrologic forecasting. Updating the gaging infrastructure is one part of the recommendations and modernizing the forecast point delivery is another. In addition, the weather service also updated the AHPS program which gives them a lot of momentum to make changes to their flood forecasting and warning program and make it more viable. Also, due to the events of April 2005, they have discussed some of the smaller reservoir inflows such as Swinging Bridge and the need to model such systems. It is important and very valuable to take a few minutes to review the recommendations and provide input at where you would need gages, periods of record and the feasibility for delivery of their services. It is a key component to keep NWS forecasting services relevant in the watershed.

Action:

1. Any specific recommendations for gages, flood forecast points, precipitation gages, etc. should be sent to Laura Tessieri within the next month.

Open Business:

Mr. Tudor mentioned that there is an effort to reinvigorate the Delaware River Congressional Caucus. In Pennsylvania, Congressmen Fitzpatrick and Gerlach have taken the lead to try to make that happen. Congressman Castle in Delaware, Holt in New Jersey, and Hinchey in New York are also involved. Mr. Tudor emphasized Mr. Gabrielsen's point that it is very helpful to have a product that is endorsed by a committee that consists of all of the Flood Advisory Committee organizations.

Mr. Fromuth reported that the National Weather Service received the Government Award this year from the Water Resources Association of the Delaware River Basin. The award recognized the forecasting services and technical support of the Weather Service both during and after the flooding from Tropical Storm Ivan in 2004 and April of 2005. Mr. Fromuth noted that National Weather Service warning information is linked to the stream flow information gathered by the USGS.

An open invitation was extended for FAC members to attend the New Jersey Association of Floodplain Managers board meeting following the FAC meeting at 1:30pm. A light lunch was provided by NJAFM for those that wish to stay.

Skip Danielson, and the Mayor of Byram Township asked if anyone else attended the emergency dam break exercise that Mirant Technology put on back in March. Mr. Tudor stated that the DRBC

participated by phone. At the exercise, concern was raised regarding Mashipcong Island. Mashipcong Island is a 150-acre piece of farming land in the middle of the Delaware River. The island is accessible by a corduroy road at best that becomes inundated very easily. There are several houses on the island, and the average population of the island is approximately a dozen people. People can make it in and out by boat to an extent, but once the river begins to really rise and the flow rate gets up to a point, those people need to be evacuated. They have had to evacuate them twice by helicopter; once during the aftermath of Tropical Storm Ivan in late 2004 and again last year during the April flood. Mirant, the company that owns the Mongaup hydroelectric reservoirs (including Swinging Bridge Reservoir) has indicated that if they have a dam failure or other problem up in their area; Sussex County is going to be notified. Their modeling indicates an 18-foot wall of water hitting the Sussex County area should the combination of the Swinging Bridge, the Mongaup, and the Rio dams fail. Mr. Danielson requested that any early warning system to alert in the event of a dam break provide quick notification to the Mashipcong Island area residents. He needs a system of getting information to his office as quickly as possible when they do have an Upper Delaware River elevated condition.

John Yagecic mentioned that they have an automated program that captures the AHPS forecasts everyday and compares those to flood action stages. If there is a predicted exceedance of the flood action stage, it sends a message to an e-mail list server and anybody who subscribes to that list server gets the message. The area covers the Upper Delaware but would not cover the scenario of dam failures. Mr. Danielson responded that the email notification would provide a good redundancy, which is not a bad thing when lives are in peril.

Mr. Fromuth said that the DRBC has a set of emergency action plans associated with a potential dam failure for anyone that wants to review them. Mr. Danielson said that behind Swinging Bridge dam, the impoundment is a 9-mile reservoir and the impoundment height is ~80 to 100 feet and once that goes, the other two reservoirs below it, the Rio and the Mongaup, are sticks that are going to fall in the wind. He mentioned that during one potential failure situation last June, they heard about the potential situation via fire radio traffic, not through an alert. He mentioned that there is now a tri-state emergency management group that is working particularly on the situation with regard to the confluence of the Neversink and the Delaware. The group includes Orange and Sullivan Counties in New York, Pike in Pennsylvania, and Sussex in New Jersey. They meet on roughly a quarterly basis or more to discuss their mutual concerns.

Mike Reuber of the NPS asked Skip Danielson was comfortable with the communications flowchart that Mirant put together. Mr. Danielson stated that they tested it, it worked, and it seemed to be good. They also attended the Park Service exercise about a month or so ago and that was good. Mr. Fromuth said the gaging station on the Mongaup River below Rio dam was taken out in the late 1990s. If it were re-installed, it could provide the basis for a reverse 911 calling system or Community Alert Network. He suggested this be included in the updated recommendations report.

Mr. Danielson said the Northwest Region of the New Jersey Office of Emergency Management is purchasing three interoperability communications trailers; one for each of three counties; Hunterdon, Warren and Sussex. They will be putting in what they call a command radio interface system in each of the trailers. They will be able to pull one of these trailers up to a site, hopefully on high ground, and have the ability to have all of the incident commanders that are involved up and down the river in an emergency speaking on one communications line no matter what network or what band they are on. That is an intricate part of their preparedness with regard to emergency response along the river. One of the problems they had last April was the fact that they could not communicate adequately up and down the river.

Mr. Danielson mentioned that Paul Miller of NJOEM brought the concept of the Flood Mitigation Plan to the four specific counties after the last county coordinators meeting. He is also the president of the New

Jersey county coordinators group. In Sussex County, they are trying to do what they can to reach out to municipalities impacted or affected by flooding. In fact, a lot of Sussex County is in the Delaware basin. He noted that they are interested in this mitigation initiative.

J. Next Meeting

The next meeting was scheduled for Wednesday, August 9, 2006 at 10:00 am.

**FLOOD ADVISORY COMMITTEE
ATTENDANCE**

May 3, 2006

| NAME | AGENCY |
|---------------------|--|
| AHNERT, Peter | National Weather Service (NWS) |
| DANIELSON, Eskil S. | Sussex County Office of Emergency Management (OEM) |
| FROMUTH, Rick | Delaware River Basin Commission (DRBC) |
| GABRIELSEN, Peter | NWS – Eastern Region Headquarters |
| HAINLY, Bob | United States Geological Survey – PA |
| JOHNSTONE, Tina | New York City Department of Environmental Protection |
| LECKNER, Mariana | New Jersey – OEM |
| MANSKI, James | Cumberland County OEM |
| MILLER, Jason | United States Army Corps of Engineers |
| MOYLE, John | New Jersey Department of Environmental Protection (NJ DEP) |
| NICKELSBURG, Walt | NWS |
| REUBER, Michael | National Park Service – Upper Delaware Scenic and Recreational River |
| RUPERT, Clarke | DRBC |
| SCHOPP, Bob | United States Geological Survey (USGS) |
| SCORDATO, John | NJ DEP |
| TAMM, Alan | Pennsylvania Emergency Management Agency |
| TUDOR, Bob | DRBC |
| VOGT, Bill | Delaware Riverside Conservancy |
| WESTFALL, Greg | USGS – Natural Resources Conservation Service |
| YAGECIC, John | DRBC |
| ZAGONE, Joseph N. | Department of Homeland Security – FEMA Reg. III |