DELAWARE RIVER BASIN COMMISSION
FLOOD ADVISORY COMMITTEE MINUTES

DECEMBER 10, 2003

The Flood Advisory Committee (FAC) meeting chaired by Bob Hainly began at 10:00 AM in the Commission office (DRBC) in West Trenton, NJ.

Review of the Draft Minutes from the October 2, 2003 Meeting

There being no comments, corrections, or additions, the Minutes were accepted.

Update of Hazard Mitigation Plan Status

Bob Hainly asked Rick Fromuth if he had heard from Alan Tamm regarding any comments received on the hazard mitigation plan. Mr. Fromuth said that Mr. Tamm received comments from several people, he made some editorial comments, and he seemed satisfied. Mr. Hainly suggested that if Mr. Tamm wants to report back to the committee, we should put that on the agenda for the next meeting.

Overview of Basin Hydrologic Conditions

Mr. Fromuth showed a map that Walt Nickelsberg's office put together depicting the snow totals from the December 6, 2003 winter storm. The area around the Commission offices received approximately 10 to 12 inches. DRBC staff tries to keep track of what it would take to cause flooding by looking at the two-day forecast and at the flash flood guidance from the Weather Service combined with the snow pack water content. Ted Rodgers said that the headward guidance that MARFC puts out also takes stream levels into account. Mr. Fromuth showed a few slides of products that the DRBC has been using to keep up with the potential for the flooding which has been constant over the past several months. One statistic he noted is that discharge in the Delaware River at both Montague and Trenton for the period of September through November was the highest it has ever been in 92 years of record at Trenton and about 65 years of record at Montague (three times normal).

Overview of Pennypack Watershed Flood Mapping and Assessment Project

Mr. Fromuth reported that Jeff Featherstone, who used to be the Deputy Executive Director for the River Basin Commission, is now the director of the Center for Sustainable Communities at Temple University's Ambler Campus, and he has been involved in putting together a study to bring the flood insurance maps of the Pennypack Creek Watershed up to date. The Pennypack Watershed is located on the Bucks County-Montgomery County border. The drainage area is 56 square miles and the population is 640,000. He showed a picture of an overlay of the 100-year floodplain boundary in Hatboro, which showed some of the structures located in the floodplain, including apartment complexes and a school. This is a typical situation where you have a highly urbanized watershed with structures that were built in the floodplain long ago and which not only are subject to damage, but also cause flow constrictions. For the past 30 years, there has been damage to the

stream channel. Because of the urbanization, the floodplain maps are out of date, and there have been at least three incidents of flooding that have caused property damage or loss of life in the last few years. One issue is that no single community has the resources to deal effectively with the problem, and it is difficult to coordinate an effort to resolve the flooding problem.

The goals of this project are to reduce flooding, improve water quality, and manage development more effectively. There are twelve municipalities. There is a section of the Pennypack in the Bryn Athyn municipality that is still open space, but which represents only a small part of the watershed.

The short- and long-term study outcomes include: updated maps for the flood insurance program, identification of at-risk homes and structures, and analysis of storm water facilities. Activities and products will include water quality sampling, GIS maps, identification of open space riparian corridors, and a record of public comments to help guide any decisions that are made. This is an effort to increase public awareness and provide the maps as a basis for making decisions; that is where most of the money is going.

The project originated in response to a request from an organization of twelve municipalities in eastern Montgomery County. While the municipalities were organized to deal with emergencies, they had faced so many flooding emergencies over the past several years that they approached Mr. Featherstone to see how the center might be able to help them. He served in a coordinating role and got each municipality to participate. Initial activities got the attention of the William Penn Foundation, who contributed about $300,000, and FEMA, who contributed about $200,000 to do the aerial photography necessary for mapping at two-foot contour intervals. There were also grants from each of the twelve municipalities, and other participants included the Philadelphia Water Department and the Pennsylvania DEP. The study format will consist of:

- new GIS mapping (elevation, surface and floodplain contours);
- determination of new floodplain boundaries;
- water quality monitoring; and
- assessment of alternatives for open space and corridors to meet multiple recreation objectives.

It appears that land involved in property acquisition will be turned over to the county, similar to the case in Bucks County discussed by Jeff Mahood and Dick Manna at the last FAC meeting. Mr. Fromuth added that retention basins were being evaluated for adequacy. He noted that while Bucks County has effective stormwater management requirements for new construction, existing development still causes problems.

The last part of this project is a public awareness program aimed at describing project activities and their value, as well as soliciting public input. They have a website (Temple.edu/Ambler/CSC) that describes the project's background, purpose, and intended outcome.

The project provides a technical basis for assessing stream corridors properly and indicates how much money is required to do a floodplain management update. The resulting database should also help in identifying potential areas for AHPS flood forecast implementation.

Mr. Fromuth showed a presentation used by Mr. Featherstone's group in their public meetings. It demonstrated the type of education that could eventually be used in places where this process is required. With this type of work, there are some signs that things are eventually going to lead to much better flood mitigation, because there will be a better planning basis. This is already happening in Bucks County, where they are acquiring over 40 properties, and also in the Assunpink watershed. One of the things that the DRBC is going to be working on is to get some GIS component to what is being done in the system so that we can see progress in terms of property acquisition and stream corridor work. This is consistent with the direction that this group has worked on over the past couple of years with the Basin Plan.

George McKillop said that the Pennypack is a candidate for an inundation project. However, the Pennypack does not have a daily deterministic forecast. There are no implementation plans to recalibrate or apply any flood wave or simplified hydrologic routing techniques (SHRT). While it is a potential candidate, establishing the forecast is not currently a high priority. The good news is that we are getting the digital elevation data.

Member Reports on Progress Toward Implementation of Flood Warning Recommendations

Walt Nickelsburg said that New Castle County in Delaware is apparently working on procedures to give better advanced warning on floods in the White Clay and Christina Rivers. Part of that would be converting dial-up flood gages to data collection platforms (DCPs) and adding a few more rain gages. They are all part of the original recommendations for getting more real-time flood stage data (not having to rely on phone lines), plus rainfall and temperature forecasts.

Note: Subsequent to the December 10th Flood Advisory Committee Meeting, Mr. John Talley of the Delaware State Geological Survey, provided the following information correcting and supplementing the above paragraph.

The Delaware Geological Survey and the Office of the Delaware State Climatologist in cooperation with the Delaware Emergency Management Agency are working on procedures to support development of a severe weather warning system in northern New Castle County, Delaware. Through a cooperative program with the US Geological Survey (Delaware-Maryland-DC and Pennsylvania districts), four gages in the Piedmont of northern New Castle County have been upgraded with DCPs that report stages at one-hour intervals. A fifth station located in the Coastal Plain will be equipped with a DCP in the near future. Each of these stations are also equipped with phone lines and ancillary equipment that will enable the gages to call specified numbers to report when specific gage heights have been reached. The three stations in southern Chester County on the White Clay, Red Clay, and Brandywine Creeks were already equipped with DCPs. Two gages are equipped with phone and telemetry equipment to permit call outs when specified gage heights are reached; a phone line is being installed at the third station. Real-time Campbell weather stations have been installed in Newark, DE; Wilmington, DE; Longwood Gardens, PA; and the SCCRA facility north of Avondale, PA to provide real-time data for inclusion in the statewide Delaware Environmental Observation System. The work in PA is being coordinated with the Chester County Office of Emergency Services.

Mr. Hainly said that he thought they were also going to implement a network of climatological stations, and asked if that information will be available and useful to Mr. Nickelsburg. Mr. Nickelsburg responded that part of it is supposed to be available. Mr. Hainly asked if the climate network would be statewide, and he said that it would.

Mr. McKillop said that he and Peter Gabrielsen tried to reach Jim Quarier to get the status of the additional gages in the upper watershed, but he was not available.

Back in October in Dallas, Mr. Fromuth and Mr. Gabrielsen put together a presentation on this plan for the National Hydrologic Warning Council. It was met very favorably by an audience of about 200 people. He had the main floor the first day with a keynote speaker, and it got a lot of visibility.

Mr. McKillop also discussed news regarding National Weather Service funding. There are two bills, the omnibus conference mark and the senate mark. They have taken the AHPS funding line item and the Susquehanna River Basin line item, combined the two, and zeroed out the Susquehanna funding. The AHPS funding was roughly $6.4 million and the Susquehanna was about $1.3 million. The one thing positive for the Delaware is that they put the Delaware River Basin in the language with this funding. The language says that the AHPS is funding the Susquehanna and the Delaware. The Weather Service is in the planning stages right now of working on the budget with the AHPS people and the people in Washington. It looks like equal cuts will be made across the board; roughly 20 percent from AHPS funding and 20 percent from Susquehanna funding. Where the Delaware stands at this point has not been worked out. The Weather Service is scrambling to readjust the budgets. Mr. Fromuth said that what has to be done this year is getting the Susquehanna system to survive, because it was used to a funding stream for years, and the AHPS funding is needed to keep that system going.

Mr. McKillop said that he understands the gaging network is the lifeblood of the system, and they are not looking to cut that. One of the big impacts in the AHPS program is that the implementation stage is going to get cut back. The original number of forecast points to be calibrated and implemented this year is going to be reduced.

Mr. Fromuth said that when we have spoken with people about the flood warning program, we have said that it builds around the AHPS program. If that were taken the wrong way, someone might believe that putting money into AHPS equates to funding gaging and everything else. That perception was never intended, but it is a potential problem. In the future, we are going to have to be very careful to separate that. Mr. Hainly said that the Susquehanna Basin is going to approach the Commissioners to develop a resolution that will clarify the difference between AHPS and the Susquehanna flood forecasting program, making sure that the legislators understand that they are two different programs.

Mr. Rodgers reported that since the last FAC meeting, they have added 25 probabilistic forecasts to the Delaware Basin, including the Lehigh and the Schuylkill. There will be more additions, but perhaps not as many as quickly. Mr. McKillop said that a key part of the AHPS plan is the outreach effort and to recognize a need to explain these probabilistic products. Some of the

funding directed toward outreach efforts is going to get cut, but not completely. They hope to minimize the impact of this cut and continue efforts to provide this outreach.

With regard to the USGS, Mr. Hainly reported on the National Stream Flow Information Program (NSFIP). They have not come out with their allocations yet, but they are expecting a slight decrease in that program. They have received line item funding the last few years, but it has been flat or slightly lower. They have been discussing a way to dovetail AHPS and the NSFIP program with their headquarters office and the people who run it. The Weather Service has found that the data provided are integral to the performance of AHPS. The NSFIP program is to increase USGS funding to the network to help reach some stability. Their first effort is to direct money toward flood forecasting, either by providing real-time data or by flood hardening some gage locations (e.g., elevating a gage or using structural means to make it more resistant to flooding). They have been talking over the last year or so about a way to balance it so that the AHPS program doesn't have to support the stream gaging program directly. The stream gaging network is a cooperative network. Many agencies are in favor of operating gages, but if they reduce their contribution to the network, their reduction could impact a site that is very important to the Weather Service. Without the Weather Service providing any funding, the USGS would have no choice but to discontinue that site, so the stability of the network would come from funding for AHPS or from USGS.

Mr. Hainly said that it might be possible to use this to get USGS and Weather Service headquarters together to talk about how they are going back together. We have to make it a request to the President to include that in his original budget, and maybe this situation will help support that.

The goal of the NSFIP is to get more federal funding into the stream gaging network. A lot of the funding is cooperative funding, matching local or state funding up to 50 percent. That works well except that if the local sponsor pulls their funding, then USGS has to pull their funding. If it were direct federal funding it would be independent of any local share.

Mr. Hainly asked Rob Reiser if anything was going on in New Jersey regarding stream gages. Mr. Reiser said that they have some additional gages going in as part of the drought monitoring network, which is a cooperative project with DEP. Over the last year, they have installed seven new gages and put DCPs in at twelve gages that were already in place, but which previously lacked real-time capabilities. They are also upgrading several gages in the Passaic Basin with DCPs. They have backwater conditions at these locations, and the DCP is an instrument that will help compute more accurate flows with monitored velocity and stage. There are several proposals for new gages; one is on Teaneck Creek in the Meadowlands area. The Wetlands Mitigation Council wants USGS to work with them to install several gages, probably a year off.

Mr. Fromuth said that at the last meeting, we handed out a map and a table that had the most recent inventory of gages in the Basin. He was wondering if we should send it out again to each of the districts to make sure it is up to date. If it is sent electronically, Mr. Reiser could check it and get back to us with any changes. Mr. Reiser said that there are a couple new gages this year in the Delaware Basin: one in Papakating Creek, a small tributary in Sussex County, and one on

the Cohansey River in Seeley. Mr. Reiser said that Mr. Fromuth could send the updated inventory to him.

Suggestions for Addition of Flood Stage Forecast Mapping to AHPS

Mr. McKillop gave a presentation about inundation mapping and talked about flood forecast mapping in AHPS. Definitions of AHPS basic service and full service have been discussed previously. The third AHPS service, flood inundation mapping study, has not been implemented as quickly as the others.

The purpose of flood inundation mapping is to provide water elevation forecasts referenced against well understood markings. This will be done at multiple locations along the River and will require water surface profiles. Mr. Rodgers and his group at MARFC are going to be doing profile work, and this is the calibration step using the SHRT. There is not a lot of dynamics in the Basin tributaries, so we can get away with this basic routing technique. The second requirement is the digital elevation data. Third are the processing tools (both static and dynamic) to set up the water surface grids, the ground grids, and the dynamic processing, which will require deterministic and probabilistic forecasts. Finally, methods must be selected for presenting the study results. The calibration work has been done on the Delaware and all the watersheds at this point. Verification of the deterministic forecast is being done, and eventually verification of the probabilistic forecasting will also be performed. Line data are being gathered, including orthophotos, USGS quad sheets, utility plans, roads, phone lines, gas lines, etc. Presentation will be via the Internet using an ArcView-based utility called Flood View.

There is currently a test location in the Juniata Basin between Lewistown and Newport for which a prototype has been developed. Ground and surface water grids have been processed and the results, along with line data, overlaid on an orthophoto. The map is delivered using an Internet map server and the user can turn data layers on and off or zoom in and out as needed, as well as view simulated data from historical floods.

The next steps will be to inventory line, elevation, and orthophoto data with respect to what is needed and what is available, and to determine cross section requirements for water profiles. These steps are anticipated to involve both the DRBC and the Weather Service. It will also be necessary to determine in which areas efforts should be focused and to identify further user needs. Selection of areas may be driven in part by known availability of data. This will be a slow process involving large quantities of data and significant effort, but the Juniata River prototype has been a good test and it is felt that the project is worthwhile.

Mr. McKillop said that if he is not mistaken, some of this floodway routing has already been done in the Delaware. Mr.Fromuth said that he knows the Delaware was restudied by the Corps with the states about five years ago. All of the elevations were updated, so he thinks all water service profiles are available in a GIS type of format. Clark Gilman said that the cross sections go back thirty years and they let the computer generate the cross sections. Mr. Fromuth said that flood stage forecast mapping started quite a few years ago in the Susquehanna Basin, and the data that they have from the flood insurance studies in New Jersey have been plugged into it as well. He is not sure if the Delaware data that are there now for the flood insurance restudy are

good enough, but it is worth looking into because it has been updated. The area of the Schuylkill River around Reading was done years ago by the Corps, and they should have good mapping there. Mr. McKillop and Mr. Gilman briefly discussed similar work that had been done on the Assunpink by NRCS. Mr. Gilman noted that the major damage center is the City of Trenton, and most of the homes have been bought out.

Mr. Hainly asked about how other members of the FAC or colleagues at their respective agencies who might have useful information should go about making it available. Mr. McKillop said that he believes efforts are under way to catalog the availability and quality of existing data from various sources. Mr. Hainly noted that with all the GIS activities going on, it would be useful to get the principal GIS users in the basin together, either in person or through an e-mail list. Mr. Hainly noted that one of the first necessary steps will be to get clarification on the specifications for useable data, after which staff members familiar with various data sources could help. Input should also be sought from individuals with the Corps, NRCS, USGS, and the states. Mr. Fromuth noted that getting data of suitable quality could be difficult; for example, Jeff Featherstone had difficulty even using LIDAR for acquiring elevation data and instead had to have an aerial survey.

Mr. Gilman said that FEMA is working to redo flood insurance studies in most of Camden County, which may also provide digitized mapping. Mr. Fromuth said he thinks the whole state of Delaware has two-foot contour mapping as well. He suggested talking to the water resources agency since they have a GIS system.

Mr. McKillop also discussed snow survey work being done by Tom Carroll's group at the National Operational Hydrologic Remote Sensing Center (NOHRSC). They are working with the River Forecast Centers (RFC) to accurately determine snow pack and snow water equivalent, and incorporate the data into the RFC flow forecast models. It is hoped that eventually the RFCs will be able to use the data directly. George emphasized that the NOHRSC web site has valuable information worth investigating. He and Mr. Fromuth both noted that Mr. Carroll's group is actively seeking suggestions for additions or improvements that would make the site as useful as possible. In response to a question from Mr. Fromuth, Mr. McKillop said that funding for the work is secure.

In response to a question from Mariana Mossler about how real-time the data are, Mr. McKillop said that much of it, such as satellite data, is updated continually. There are many aircraft flight lines already established and they are shown on the website. NOHRSC is always seeking to add flight lines, and requests for particular watersheds can be channeled through the FAC to Mr. Carroll to be added. In response to a question from John Kane regarding the determination of ground conditions, Mr. McKillop noted that snow water equivalents determined from the airborne surveys have been higher than those from ground conditions because the airborne surveys can detect not just snow on the surface, but also moisture in approximately the top seven inches of soil.

DRBC Staff Support of Flood Hazard Assessment

Mr. Fromuth noted that the FAC has been meeting for about three years and that its work has been helpful in bringing together many people with a great deal of expertise and giving the DRBC direction with regard to flood warning and flood mitigation activities and needs. While the DRBC's resources for flood loss reduction are limited to about one-half the time of a single staff member, direction provided by the FAC has allowed the DRBC to use that time more efficiently in pulling together information that should be useful to the committee. The 2002 report on recommendations to address flood-warning deficiencies has been useful in providing justification that our directors need when seeking additional funding from Congress for flood warning and AHPS. We are trying to apply a similar principle to mitigation - gathering, assimilating, and coordinating information on the status of various activities in the basin.

A number of GIS maps have recently been put together using data from FEMA and several other sources; these maps are included in Attachment E1 of the meeting information packet.

- The first map is simply a topographic relief map with the basin boundary overlaid. Worth noting are the rugged terrain in the Catskills, where flash flooding has killed a number of people over the years, and the Pocono plateau, where the worst flood-related loss of life in the history of the basin occurred in the 1955 flood.
- The second map shows National Flood Insurance Program participation by municipality in the basin as of a given date, acknowledging that participation data are updated regularly. Most of the basin participates, either at the municipal level or at the county level (most of Delaware). Those areas that are not participating are also classified as to whether or not they have an identified flood hazard.
- The third map shows the availability of Q3 flood data by county in the basin. The Q3 data for a given area can be overlaid on a base map at the FEMA web site. FEMA's emphasis is shifting to DFIRM data, however; it is currently available only for very limited areas, and DRBC staff will investigate the status of future availability within the basin. DFIRM data should be compatible with much of what the NWS wants to do in terms of flood stage forecast mapping.
- The next four maps represent FEMA claims data from 1974 to 2003 by watershed. They show i) number of claims, ii) dollar value of claims, iii) number of claims per square mile, and iv) dollar value of claims per square mile. The Schuylkill watershed stands out on these maps as a problem area.
- The final four maps show a similar analysis (number of claims and dollar value of claims, both in absolute terms and normalized by area), based on repeat claims. The Schuylkill watershed again is a problem area in terms of total claims and total dollars, as are the Neshaminy, the Assunpink, and the Perkiomen watersheds. The latter two maps show that there are high densities of problems in the Pennypack and Sandy Run watersheds.

Two bar charts that appeared in the 2002 report on recommendations to address flood-warning deficiencies were also updated to reflect these recent FEMA data on claims and repeat claims, and are included in the attachment.

It is worth noting that while flood insurance claims are useful and useable because the database exists, they do not tell the whole story. For example, the main stem Delaware River has not had serious flooding in many years, and so claims are low. However, there would be a great deal of damage if it floods in the future, so it still warrants serious attention. Other useful information that should be made available would include a list of existing studies, such as the Delaware Basin Study, which provided some damage estimates. Also, some of the regional offices may have more extensive claims data than those used here, but data provided in the past have sometimes been difficult to use because they were not geo-referenced.

In addition to flood- and mitigation-related maps such as these, it will also be important to compile maps related to flood warning. The DRBC will be putting together a similar inventory of discharge gages and flood forecast points and could help look into the availability of topographic information for use in flood mapping. The hope would be to make these inventories available on a flood assessment web site and maintain them to provide up-to-date information on the status of the basin. We could also include links to other available information, such as FEMA's site for mapping Q3 flood data.

Kathy Lear said that NJ-OEM has done some elevation and acquisition projects in and around the basin recently and she could provide information on these projects. Mr. Fromuth said that attribute information would probably not be necessary initially, but location information, such as longitude and latitude coordinates, would be useful.

If anyone else had comments, questions, or requests, they could send Mr. Fromuth or Rob Klosowski an email. Mr. Hainly also pointed out that the meeting information packet included a list of remote sensing centers and a description of the information available from them.

With regard to the hydrograph on the last page of the attachment, Mr. Fromuth explained that it was prepared in response to complaints that have come in from residents along the East Branch of the Delaware below Pepacton Reservoir. They have had flooding due to a series of rainstorms through October that caused so much spillage at Pepacton Reservoir that it caused flooding downstream. Mr. Klosowski took the flow rates recorded at Margaretville (upstream of the dam) and Harvard (downstream), adjusted each on a cfs-per-square-mile basis (160 square miles drainage are to Margaretville, 450 square miles to Harvard), and plotted them. You can see the smoothing effect that the reservoir has on the shape of the hydrograph. Although the actual flow at Harvard was more than at Margaretville, the flow per square mile was much less. We have tried to use this as an example when people have asked about the effect of the reservoirs when they are full. If you extrapolate and say that the same discharge per unit area would occur at Harvard that occurred at Margaretville for a fairly generalized rainstorm, the flow at Harvard would have been about 7,000 cfs higher if you follow the same shape as the Margaretville hydrograph. That translates to probably a couple of feet of elevation downstream, so this makes the point that even when reservoirs are full, they provide some flood reduction.

However, the effect is certainly not the same as if there is a void in the reservoir, and that is the issue related to the water rights of the parties to the Supreme Court decree in the case of the New York City reservoirs. New York City has volunteered to lower the level of Pepacton by 5 billion gallons. They have drafted a proposal to do so, but it has not been accepted yet by the other Parties to the Decree. If it is accepted, they will proceed to make bigger releases and lower the

elevation of the reservoir. John Kane said that they do not intend to do anything that endangers the Decree or creates a problem for downstream members of the Decree.

Mr. Fromuth asked Ms. Mossler if she has seen the 2002 report on recommendations to address flood warning deficiencies, and if there is anything that needs to be added about New Jersey. Mr. Fromuth will get her a copy. Ms. Mossler said she has heard that it looks at the state putting together a five-year plan of how to proceed when funds become available.

Election of New Officers

Mr. Fromuth said that the way that the procedures for the committee work is that the vice chair for the previous year will serve as the chair for the coming year. Alan Tamm of Pennsylvania Emergency Management, who was vice chair this past year, has agreed to serve as chair for the coming year. Peter Gabrielsen of the Weather Service is interested in serving as vice chair for the next year. Another potential plan for committee leadership would be to have a local or state representative and a federal representative serving as chair and vice chair, so there would be an opportunity to address local and regional issues. Mr. Hainly requested of the floor if there were any other nominations. No one else was nominated, and the floor approved the nominations of Alan Tamm and Peter Gabrielsen as chair and vice chair, respectively.

Next Meeting

The next meeting of the Flood Advisory Committee was scheduled for Wednesday, March 3, 2004 at 10:00 a.m. However, due to a scheduling conflict at the DRBC, the date of the next meeting was later moved to Wednesday, March 10, 2004 at 10:00 a.m.

FLOOD ADVISORY COMMITTEE
ATTENDANCE

December 10, 2003

NAME	AGENCY
DOUGLASS, William	Upper Delaware Council
FROMUTH, Rick	DRBC
GILMAN, Clark	New Jersey Department of Environmental Protection (DEP)
HAINLY, Bob	U.S. Geological Survey (USGS)– Pennsylvania
KANE, John F.	New York City DEP
KLOSOWSKI, Robert	DRBC
LEAR, Kathy	New Jersey Office of Emergency Management (OEM)
MATTE, Albert	National Weather Service (NWS)
McKILLOP, George	NWS/Eastern Region Headquarters
MOSSLER, Mariana	New Jersey OEM
NICKELSBERG, Walt	NWS
REISER, Robert	USGS
REUBER, Michael	National Park Service – Upper Delaware
ROBERTS, Chris	DRBC
RODGERS, Ted	NWS – Middle Atlantic River Forecast Center
STEIGERWALD, Scott	Pennsylvania DEP
WESTFALL, Greg	U.S. Department of Agriculture - Natural Resources Conservation Service