New Jersey Flows

New Jersey Water Resources Research Institute

Volume III, Issue 4 **WINTER, 2002**

AWRA National Water Resources Policy Dialogue

By Jeannine Der Bedrosian, NJWRRI

"By the end of the 21st century, fresh water may well be the most imperiled natural resource in the world." On this premise, the National Water Resources Policy Dialogue was convened on September 17 – 18, 2002 in Washington D.C. by American Water Resources Association (AWRA). Characterized by a diversity of opinions and representation, this by-invitation-only participatory meeting of concerned water stewards from federal, state, and local governments, academia, NGO's, elected officials, industrial representatives, and private citizens met to discuss six key water resource policy issues in panels and working groups.

Sponsorship by ten federal water resources agencies included FEMA, NOAA-National Ocean Service, NOAA-National Weather Service, U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, USDA-NRCS, USEPA, U.S. Fish and Wildlife Service, U.S. Forest Service, and U.S. Geological Survey. Twenty four Non-Governmental Organizations (NGOs) co-sponsored the event including the National Institutes for Water Research, of which New Jersey Water Resources Research Institute is a member organization.

The program stated, "Present and future stresses on the fresh water resources require careful husbanding of available water in the United States and worldwide. In order to accomplish this nationally, the United States must have balanced water resources policies in place at all levels of government that consider the needs of all stakeholders … and the environment, including the needs of all species of plants and animals. It is absolutely imperative that advocates for each group have equal voices in collaborative efforts to reach consensus on water policies."

State and local perspectives on water policy issues were offered by keynote speaker The Honorable Parris N. Glendening, Governor of Maryland. The Honorable Harry Reid, U.S. Senator from Nevada and then-Assistant Majority Leader, offered a congressional perspective and The Honorable James L. Connaughton, Chair of the Council on Environmental Quality, Washington, DC, proffered the administration perspective on water resources policy issues.

In addition to keynote speakers, panels were convened on the six key water resource policy issues of the dialogue which included (with the "charge" from AWRA for that issue):

- **Restoring and Protecting the Environment -** How can we best manage and meet current and future water needs while still restoring and protecting the environment?
- **Water Resources Infrastructure -** With a generally aging water infrastructure in the United States, the rehabilitation, replacement, and upgrading of this vital water resource's infrastructure must be considered. What are the alternatives, how are they accomplished, and who pays?
- **Safety and Security of Water Resources -** Terrorism and natural disasters threaten the safety and security of the nation's water supplies and water storage facilities. How can water resource policies best address these issues?
- **Managing Watersheds Holistically -** Watersheds provide water for terrestrial and aquatic species and their habitat and meet human needs for municipal, industrial, agricultural, recreational and other water uses. How can a holistic approach help resolve these conflicts?
- **Sustainable Water Use and Drought Management -** How can future policy decisions manage water use for the long run to sustain all needs including instream, offstream, habitat?
- **Flood Plain and Coastal Zone Management -** How can future

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The Director's Chair

by Joan G. Ehrenfeld, Ph.D., Director, New Jersey Water Resources Research Institute
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In this issue, we highlight two recent contributions to the improvement of water resources. First, we report on an important national conference held in September that brought together water resource managers and scientists from around the country to call for a unified national approach to water management. Second, we reprint abstracts (indicated with an asterisk after the title) from the American Water Resources Association Annual Meeting held in Philadelphia in November which describe some of the ongoing important research on water in New Jersey. [ed. note: permission to reprint abstracts from **AWRA 2002 Annual Water Resources Conference Abstract Proceedings** has been kindly granted by American Water Resources Association and the authors] *****

Development Of The Multiple Model Broker - A Model Integration System *

By Andrew T. Rowan, The GIS Center at Stony Brook;
Christopher G. Uchrin, Hong Cheon Ahn, and Yu-ri Mun,
Dept. of Environmental Sciences, Rutgers, The State University

ABSTRACT: A software system was created for integrating separate models and allowing them to interact with each other as they run. The current version of the system incorporates the Stormwater Management Model (SWMM) and the MODFLOW groundwater model. The models run simultaneously, passing data back and forth as they work through a simulation period. The modular design of the system facilitates the incorporation of other models. Modifications made to each model are geared toward allowing it to exchange data with the central Broker program. Since the models communicate only through the Broker and not directly with each other, new models could be incorporated without substantial further modifications of the existing models.

The system runs under Microsoft Windows and utilizes an interprocess communication service known as anonymous pipes that enables the programs to communicate using system memory rather than reading from disk files, providing a significant performance boost. Each model was modified as little as possible, and modifications were implemented in such a way that each model can be run alone and revert to its standard mode of operation, producing results identical to the unmodified model.

The models are launched simultaneously by the Broker system and alternate in running through time steps one at a time. At the end of each time step, values of infiltration calculated by the Runoff Block of SWMM are passed to MODFLOW as recharge and water table elevations calculated by MODFLOW are passed back to SWMM. To account for different spatial discretization schemes, the system utilizes embedded GIS functions to calculate conversions between the surface subcatchments and groundwater cells. The models also have different temporal scales, with MODFLOW stress periods generally being longer than SWMM time steps. To allow for this, data from multiple SWMM time steps are accumulated and transferred to MODFLOW once per stress period.

A pilot study was conducted on the watershed of Cranberry Lake, a small impoundment in Warren County in northern New Jersey. SWMM was used to process precipitation data and calculate runoff and infiltration, and MODFLOW was used to represent the groundwater system. Results from both models were used as input to a receiving water model used to represent processes occurring within the lake.

Results of the pilot study highlight the fact that SWMM subcatchments must be drawn with different characteristics than would be chosen for running SWMM alone. In particular, because the SWMM model only uses a single value each for groundwater elevation and surface elevation in each subcatchment, the subcatchments must be drawn so that the variation in depth to groundwater within each one is minimized. *****

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International Year of Freshwater 2003

The UN General Assembly resolution proclaiming the "International Year of Freshwater 2003" was sponsored by the Government of Tajikistan and approved by 148 additional countries. Inaugurated at the United Nations in New York City on December 12, 2002, the intent is to raise world awareness of the critical need to protect and manage fresh water.

UNESCO Director-General Koïchiro Matsuura, a speaker at the ceremony, said that "water can be an agent of peace, rather than conflicts, and UNESCO is looking at ways that will allow this century to be one of 'water peace' rather than 'water wars'. By developing principles and methods to manage this resource efficiently and ethically, while respecting related ecosystems, we move a step closer to the goal of sustainable development." [see *www.wateryear2003.org*]

A feature of the International Year of Freshwater (IYFW) will be the 3rd World Water Forum, scheduled for Kyoto (Japan), March 16-23. The Forum was scheduled to coincide with **World Water Day,** held annually on **March 22.** The World Water Assessment Programme (WWAP), a cooperative effort between 23 UN agencies involved in freshwater and hosted by UNESCO, will present its World Water Development Report at the meeting. [*see www.unesco.org/water/wwap*]. The report initiates a series on the state of ***water stress*** in the world, to be published every three years, and targets crucial issues using case studies of selected river basins. [s*ee www.unesco.org/water/wwap/case_studies/index.shtml*]

One goal of the IYFW is to focus attention on the UN's Millennium Declaration Goal on Water, which pledged "to halve, by the year 2015, the proportion of the world's people unable to reach, or to afford, safe drinking water" and "to stop the unsustainable exploitation of water resources."

The World Summit on Sustainable Development held in Johannesburg (South Africa) in August 2002 voted to endorse this worthy goal, which also set a new target of halving the proportion of people who do not have access to basic sanitation by 2015. It also acknowledged the critical role of water in health, biodiversity, agriculture, ecosystems, and energy, in addition to combating poverty.

"The Year [of Freshwater 2003] offers a wonderful opportunity to raise awareness about water issues and to motivate people of all ages to get involved. Schools, the private sector, youth and community associations – each has something to contribute," says Alberto Tejada-Guibert, the UNESCO Coordinator for IYFW. [*see also www.un.org/events/water/*]

According to a UNESCO press release, "projections show

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Wetlands Research In An Urbanizing Watershed *

By Robert K. Tucker, Ph.D.
Stony Brook-Millstone Watershed Association

Our research, funded by the USEPA through a STAR (Science to Achieve Results) grant, combines metal uptake in wetland plants, education of citizens and public officials in wetland values and function, with measurement of the education's effectiveness. The research has begun to provide information of substantial value in protecting wetlands in central New Jersey. That part of the research carried out by Dr. Jaffé and his students at Princeton aims at understanding the dynamics of trace metals in wetland sediments. Mobility of trace metals in wetland sediment is controlled by the vertical redox profile that develops in these sediments. This profiles determined by the transport of different electron acceptors into the sediments via diffusion and advection; for oxygen, the transport through the roots of wetland plants is also important. Chris Altomari and Julie Hajdusek have especially contributed to our overall goal of using the scientific information from our research to increase public understanding and support for the vital role wetlands play in the integrity of watersheds, and to use scientific insights from the modeling and research in education of local officials whose decisions impact protection of wetlands. Characterization of Beden Brook and Rocky Brook subwatersheds, by our Watershed Management Group under Noelle MacKay's leadership, has provided valuable information to citizen groups in efforts to oppose wetlands loss from development. For example, citizens in Montgomery Township were able to persuade their Planning Commission to require a reevaluation of a major roadway extension through wetlands of exceptional quality. The Stony Brook-Millstone Watershed Association has been instrumental in the formation of two organizations that are additional vehicles for dissemination of information from our research. One, the Natural Lands Network includes municipal officials, citizens' groups and non-profit representatives from our region, and the other, The Watershed Institute, community-based watershed associations throughout the State, many who have been recently organized and thus can profit from the experience and resources of our Association. Evidence of increased environmental consciousness of citizens and public officials in our area include the results of our social science surveys, conducted as part of the research by Kerry Kirk Pflugh and Dr. Branden Johnson from the New Jersey Dept. of Environmental Protection, which show an overwhelming support for wetlands protection. *****

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Monitoring The Effects Of Drought On The Concentration Of Heavy Metals In The Hackensack River, New Jersey *

By Edward Konsevick, Kirk R. Barrett and Christine Hobble,
Meadowlands Environmental Research Institute

Located within densely populated and heavily industrialized northeastern New Jersey, the tidal Hackensack River has been monitored by the Meadowlands Environmental Research Institute of the New Jersey Meadowlands Commission since 1993. Data collected seasonally from 5 sites within the estuary allow us to ascertain spatial and temporal trends in water quality. Surface water samples are analyzed for conventional field parameters (dissolved oxygen, pH, temperature, salinity), heavy metals (cadmium, chromium, copper, iron, lead, nickel, zinc), nutrients, solids and bacteria. One effect of drought, including that of 2001-2002, was found to be increased metal concentrations. Two mechanisms for this effect are posited: tidal influence is extended upriver during drought, bringing a greater amount of pollutants from beyond the mouth and/or increasing salinity releasing otherwise immobilized heavy metals from sediments.

Using the Palmer Drought Severity Index for Division 1 of New Jersey, a drought occurred from October of 2001 through at least Spring 2002. Since 1993, 2 additional periods of drought lasting greater than 12 months occurred, October 1994 to August 1995, and July 1998 to August 1999. A total of 15 sampling events (5 samples per event) took place during drought, and 21 events during non-drought.

One-way ANOVA of data during drought periods vs. non-drought periods (all five monitoring sites aggregated) showed significant increases ($p < .05$) for cadmium, chromium, copper, and lead. Increases (drought vs. non-drought) in average salinity (36%), chloride concentration (39%) and sulfate concentration (34%) were observed as well.

Moreover, the concentrations of all metals, except iron, show a positive correlation ($p < .05$) with salinity, chloride and sulfate. A strong spatial trend apparent in the estuary reinforces these findings. Heavy metal concentrations decrease with increasing distance from the mouth of the river, coincident with decreasing in salinity. Cadmium, chromium, copper, lead, and nickel (but not iron and zinc) all show negative correlation ($p < .05$) with distance from the River mouth.

It is possible to infer that increased metals concentrations result from larger chloride and sulfate concentrations associated with seawater, whose effect is most pronounced in the lowest reaches of the river and during drought. When the tidal wedge penetrates further upstream during drought, we can expect increased concentration of certain metals. This is true whether the source is the sediment reservoir within the River itself or waters beyond the mouth of the river. *****

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Occurence Of Pharmaceuticals and Other Organic Wastewater Compounds In New Jersey Streams *

By Paul E. Stackelberg, U.S. Geological Survey and
Dr. R. Lee Lippincott, N.J. Dept. of Environmental Protection

During the 1990s, pharmaceutically active compounds such as lipid-regulating drugs, analgesics, antibiotics, antiseptics, hormones, and chemotherapy and beta-blocking heart drugs were detected in wastewaters, streams, and groundwater resources across Europe. Although pharmaceutically active compounds had been detected previously in effluent from sewage-treatment plants (STPs) and landfills, these more recent investigations indicated that some pharmaceutically active compounds are nearly ubiquitous in the environment at low-level concentrations. More recently, the U.S. Geological Survey (USGS) expanded the scope of these studies by conducting a reconnaissance of pharmaceuticals and other wastewater-related contaminants in susceptible waters across the United States. The USGS study documented that a wide variety of organic wastewater-related contaminants such as antibiotics, other prescription drugs, nonprescription drugs, animal and plant steroids, reproductive hormones, personal care products, detergent etabolites, flame retardants, products of oil use and combustion, and other extensively used chemicals, collectively referred to as organic wastewater contaminants (OWCs), are frequently detected in streams that receive effluent from agricultural, domestic, and (or) industrial wastewaters. New Jersey has a large number of STPs that are permitted to discharge effluent to streams; thus, it is likely that OWCs are present in the State's water supplies. However, because these compounds have not been routinely analyzed for, their occurrence, distribution, and concentration in the State's water supplies are poorly understood.

To evaluate the occurrence of OWCs in New Jersey's water supplies, the USGS, in cooperation with the N.J. Department of Environmental Protection (NJDEP), collected water samples at 30 sites on 23 streams, many of which are used for public supply or are tributaries to streams used for public supply. Each sample was analyzed for 110 OWCs. Ninety-three percent of the samples contained detectable concentrations of one or more of the target compounds. The number of compounds detected per sample ranged from 0 to 32, with a median of 11. The total concentration of these compounds per sample ranged from non-detectable to 81 ug/L, with a median of 1.7 ug/L. Compounds detected in more than 40 percent of all samples include the pharmaceuticals carbamazepine, cotinine, and caffeine, the flame retardants and plasticizers tri(dichloroisopropyl) phosphate and tri(2-chloroethyl) phosphate, the fragrance compound acetyl-hexamethyl-tetrahydro-napthalene (AHTN), the plant and animal steroids cholesterol and 3-b-coprostanol, and the pesticides prometon, diazinon, and metlachlor. The total number and concentration of target compounds detected per sample correlated significantly with the percentage of streamflow contributed by STPs, indicating, as expected, that the likely primary source for many of these compounds is effluent from the wastewater treatment process. The USGS and NJDEP are continuing to investigate this emerging water-quality issue and are currently focusing their investigations on (1) seasonal and diurnal variations in occurrence and concentration, (2) the fate and transport of OWCs in streams, and (3) the fate of OWCs through conventional and advanced drinking-water-treatment facilities. *

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Note: *Also see AWRA Philadelphia February meeting announcement in* ***"Conference Calls,"*** *with featured speaker Paul Stackelberg*

International Year of Fresh Water (cont.)

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that the combined effects of population increase, global warming, and mismanagement of existing water resources are likely to increase the number of countries experiencing severe water stress during the next decades. To help offset conflict between nations over shared water resources and to promote peaceful negotiation, UNESCO's International Hydrological Programme (IHP) has started a new project called From Potential Conflict to Cooperation Potential. Another program, also led by IHP and entitled Hydrology for the Environment, Life and Policy (HELP), is creating a new approach for the integrated management of catchments." *

[*See also Water Water, A Celebration: www.waterwater.org/*]

Water Information Day, Third World Water Forum
Kyoto, Japan, March 16-23, 2003
See: www.awra.org/meetings/Kyoto2003/index.html

NRC Convenes Panel on Water Resources Research

A committee has been convened by the National Research Council (the research arm of the National Academy of Sciences) which is charged with the task of evaluating the scope and extent of water resources research in the country. The panel, which includes New Jersey Water Resources Research Institute Director **Joan Ehrenfeld**, is examining not only what kinds of research are carried out by the many agencies and departments in the government, but whether this effort is capable of solving the water-related problems that are increasingly affecting all components of society. The panel will make recommendations to Congress about the organization, scope, and funding of water resources research at the national level. *

Bacterial Source Tracking of Fecal Pollution

By Michael A. Palladino, Biology Dept.,and John A. Tiedemann, Technology & Engineering Dept., Monmouth University

Fecal contamination in some New Jersey coastal watersheds results in harvest restrictions or closure of hard clam (*Mercenaria mercenaria*) beds. This is particularly true in Monmouth and northern Ocean Counties, where sanitary quality necessitates classification of most areas as *Prohibited* or *Special Restricted*. A preliminary step toward remedying the shellfish harvest restrictions in these waters would be to determine specific sources of fecal contamination to these areas and implement corrective strategies to control these inputs.

Fecal contaminants can potentially enter the Manasquan River Estuary from a variety of sources, including runoff, stormwater discharges, septic systems, sewer lines, pets, wildlife, and boat waste. The primary goal of this project is to identify and differentiate human and nonhuman isolates of *Escherichia coli* (*E. coli*) as the indicator organism of fecal contamination in the Manasquan River Estuary through bacterial source tracking (BST) techniques of multiple antibiotic resistance (MAR) testing and DNA fingerprinting analysis. Although either MAR testing and DNA fingerprinting can be used as a sole technique for analyzing pollution sources, results from either method alone can lead to inconclusive or overlapping results which can make a definitive determination of a fecal source difficult. Because of this, we have chosen to use both MAR testing and ribotype DNA fingerprinting simultaneously to discriminate sources of pollution. By creating a searchable database of MAR patterns and cognate DNA fingerprints for different strains of *E. coli* from human and nonhuman feces, the combined application of this database will provide a more effective and highly discriminating analysis of *E. coli* as an indicator organism of fecal contamination than traditional coliform tests. This approach will allow us to examine species-specific sources of *E. coli* contamination.

To date, over 4,100 *E. coli* isolates from 17 different species have been analyzed by MAR testing to build a database of antibiotic resistance patterns. When completed, this database will contain MAR patterns for over 5000 fecal *E. coli* isolates from 22 species. Water and sediment samples are being collected during a range of weather, tidal, and seasonal conditions at a network of sampling sites that has been established throughout the Manasquan River Estuary. *E. coli* in water samples is being isolated by culturing on differential and selective media and *E. coli* isolates subjected to MAR testing and ribotype DNA fingerprint analysis. Fingerprints from water samples can then be compared to known fingerprints and MAR patterns in the database to identify their source. Ancillary field data recorded includes water temperature, salinity, dissolved oxygen, pH and water transparency.

Building and applying a comprehensive database of ribotype DNA fingerprints, in addition to MAR pattern database, for fecal *E. coli* from humans, pets, wild animals, and farm animals from the Manasquan River Watershed is an important step towards species-specific identification of fecal pollution sources in coastal watersheds and implementing correcting strategies. The applicability of this approach to coastal watersheds in New Jersey, the Mid-Atlantic Region, and nationally presents tremendous potential for the definitive identification of sources of fecal *E. coli* contamination. *****

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AWRA Water Policy Dialogue (cont.)

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policy decisions mitigate potential losses of life and property?

Despite the size of the gathering, the Dialogue included over four hours of facilitated discussion, in which all 267 attendees participated in small working groups, taking advantage of the opportunity to express personal opinions or those of the agency, group, or branch they represented.

Three rapporteur/provacateurs representing the environmental community, a state agency, and the business community offered their individual perspectives and feedback at the conclusion of the program of keynote addresses, panels and small-group discussions: Mark Van Patten, President of the National Wildlife Federation, MD, Brian Griffin, Secretary of Environment, State of Oklahoma, and G. Edward Dickey, Dawson and Associates, Baltimore, a water resources group.

After each two key issue panels, small-group facilitated discussions resulted in identification of significant subissues which were posted and voted on during the conference. The results identified three concensus issues which wove through key discussions and signified a need for further action:

1. Development of a ***National Water Vision*** is essential given the current framework of competing water resources objectives. With a unified Vision, issues could be addressed collectively, rather than piecemeal by a variety of agencies and groups. Broad topics such as drought or infrastructure would benefit from a shared approach among agencies and concerns.

2. Formulation of a ***National Water Policy*** is essential to delineate the shared responsibilities and establish guiding principals for an integrated approach to water resource issues among local, state, and national levels.

3. ***Greater coordination and collaboration*** among all water related groups and organizations on all levels is essential in order to build on successful programs including those which offer incentives for cooperation, such as water trading.

Participants identified a strong need for the Dialogue to continue over time, charging the Steering Committee to identify and facilitate future activities based on the input from the many stakeholders. *****

Hands-On Undergraduate Water Resources Research Projects *

By Dr. Joseph Orlins, P.E, Assistant Professor, Civil and Environmental Engineering, Rowan University

Student teams from Rowan University have worked on several successful water resources projects recently. Located in Glassboro, NJ, Rowan University is a regional public university committed to teaching and public service. Involving undergraduate students in "real-world" engineering projects provides a "hands-on, minds-on" approach to learning outside of traditional classes, and can provide a valuable service to the local community. In one project, students have participated in planning, design, and monitoring of streambank restoration along the stream that bisects the university campus. In a second project, students have conducted hydrologic and hydraulic analyses of several small, privately owned dams near the university campus.

The streambank stabilization project focused on the Chestnut Branch of Mantua Creek. Decades of development of the campus and surrounding community have resulted in higher peak runoff rates, leading to stream bank erosion and reductions in water quality downstream. A bank stabilization effort was undertaken in 1993, to reduce the sediment load to a lake downstream from the University Campus. Nine years later, the results of this initial bank stabilization effort have been mixed. To address the shortcomings of the initial stabilization project and address erosion problems at other locations on the campus, students have participated in all phases of planning, design, and monitoring of additional streambank restoration measures. 15 students have participated in the project over the last two years, including two visiting undergraduates participating in an NSF-funded program in Research Experiences for Undergraduates in Pollution Prevention and one supported with an NJWRRI Undergraduate Research grant.

The dam safety project focused on analyses of three privately owned dams in southern New Jersey. The dams were analyzed to assess the impact of dam failure on lands downstream of the structures. Field investigations and computer models were used to simulate stream flows for a number of storm events. Each storm event was run with and with out dam failure conditions, in order to determine downstream inundation effects. From the results of these analyses, students developed conceptual alternatives for dam rehabilitation. Ten students have participated in the project over the last two years, including one supported with an NJWRRI Undergraduate Research grant.

Current students participating in these projects recently presented their work at the American Water Resources Association annual conference. The use of these real world applied projects has enabled students to gain a much deeper understanding of issues (both technical and social) in a way that is not possible in a regular classroom setting, such as the ecological benefits (and detriments) of engineering solutions. In addition, students are exposed to the socio-economic and political realities that engineers must contend with in professional practice. *****

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Conference Calls

- **2003 National Source Water Protection Conference; "Prevention: The First Step Toward Clean & Safe Water";** June 2 - 4, 2003; Washington, DC; see: *www.epa.gov/safewater/protect/swpconf.html*
- **International Congress: Watershed Management for Water Supply Systems,** June 29th-July 3rd, 2003; Millennium Hotel New York Broadway, 145 West 44th Street, NYC, NY 10036 USA; see: *www.awra.org/meetings/NewYork2003/index.html*
- **Saving Our Coastal Heritage: Restore America's Estuaries; Inaugural National Conference on Coastal and Estuarine Habitat Restoration;** April 13-16 2003; Baltimore Maryland; see: *www.estuaries.org/nationalconference.php*
- **AWRA, Philadelphia Metropolitan Area Section February Meeting;** Thursday February 20, 2003, 11:30AM - 1:30PM; 1515 Arch Street; 18th Floor, Philadelphia, PA; see: *www.awra.org/state/philadelphia/index.htm;* Featured Speaker: **Paul Stackelberg, USGS; "Occurrence of Pharmaceuticals and other Organic Wastewater Contaminants in New Jersey Streams and their Persistence through a Water-Treatment Plant"**
- **Sixth Annual Mitigation Banking Conference: Practice and Policy;** April 23 - 25, 2003; San Diego, CA; see: *www.mitigationbankingconference.com*
- **The Fourth National Workshop on Constructed Wetlands/BMPs for Nutrient Reduction and Coastal Water Protection;** June 23 - 25, 2003; Wilmington, NC; see: *www.cals.ncsu.edu/waste_mgt/workshop.htm*
- **AWWA/WEF Joint Conference;** February 9 – 12. 2003; Dallas, Texas; "**Facing the Future: Strategies for Change";** see: *www.awwa.org/Conferences/jmc/index.cfm*
- **Water Conservation Workshop;** Sponsored by the American Water Works Association AWWA; Feb 20-22, 2003; Fort Lauderdale, Florida; see: *http://www.awwa.org/conferences/conservation/*
- **AWWA Water Security Congress: "Implementing the Commitment to Security";** Mar 23-26, 2003; Los Angeles, California; by American Water Works Association; see: *www.awwa.org/education/congress/*
- **TMDL 2003;** November 16-18, 2003; Westin Michigan Avenue Chicago, Illinois; Water Envrionment Federation (WEF); Call for Abstracts - DEADLINE: MARCH 28, 2003; see: *www.wef.org/conferences/*

Spotlight on New Jersey Watersheds

Building Consensus in a Watershed - The Story of Mountain Lake

By Frank Joseph, President, Mountain Lake Community Association and Watershed Advisory Group

The 3600-acre Mountain Lake watershed is unique. It lies entirely within one municipality, Liberty Township, New Jersey. It is part of WMA #1, the Upper Delaware, and the Pequest Watershed. Mountain Lake itself is Warren County's largest, natural glacial lake with almost 3 miles of shoreline and a maximum depth of 38 feet. Of course, it experiences most of the problems faced by New Jersey's other lakes.

The Mountain Lake Community Association (MLCA), a nonprofit volunteer group, was formed back in 1966 and incorporated in 1968. Initially, the founding members had the association thriving. Working with professional consultants and state legislators, they secured a long-term grant to chemically treat nuisance aquatic weeds and hosted numerous recreational and social activities. But, like most organizations, interest began to wane, people moved, and the membership dwindled to a mere 52 by 1994.

Fortunately, the MLCA and the Liberty Township Environmental Commission (LTEC) under Eileen Greason, gradually began to form a partnership. Under the direction of President Rob Bechok, the Association had done a lake survey in 1989 to assess water quality and, with the help of Duane Copley of the Warren County Soil Conservation Service in 1994, delineated the watershed boundaries. Also that year a septic leachate study was completed and the Bureau of Water Monitoring gathered data on benthic macroinvertebrates that confirmed the deteriorating health of the lake.

By 1994, lake residents Frank and Marge Joseph decided to become more active with the goal of educating those living in the watershed about lake ecology and their role as stewards of the environment. They began working with Larry Kovar of Aquatic Analysts, to better understand looming issues facing the lake. Under their leadership, and with the help of the Liberty Township Committee (LTC), the LTEC, and the NJDEP, the association was able to further study the lake and began to formulate the rudiments of a lake management plan that promoted a watershed-wide perspective. In 1995, NJDEP examined lake mercury levels; a water quality study was undertaken in 1998 using a matching grant from NJDEP ESP; similar funding enabled the development of a bathymetric map (1997) and the establishment of a water monitoring station (1998). Simultaneously, the Association, under Bob Bohm, instituted its own weekly volunteer water monitoring program and began participating in the Clean Communities program by regularly pickig up roadside litter.

Starting in 1999, the Association began publishing a quarterly newsletter to inform watershed residents of the aggressive campaign being waged to preserve and restore the local environment. They erected two community bulletin boards to share information and developed a website link thanks to the efforts of committeeman & member Joe Thomas. More and more stakeholders were being "brought into the loop" to share in the responsibility of protecting the watershed. Neighbor Jenny Jump State Forest became involved, as did the Warren County Environmental Commission. By devoting between 10-20 hours/week to Association business, the executive board (Brian Welsh, Frank Joseph, Stephanie Magennis and Alice Bechok) was attending local & regional meetings of governing and advisory bodies trying to forge a consensus and develop a clear vision of the future. They attended numerous workshops (NJCOLA, NALMS, ANJEC, etc.) to educate themselves and then, via the mailings, website, and bulletin boards, transmitted their learning to the general public.

After a storm water runoff study was completed in 2000 and a second septic leachate study finished in 2001, they applied for and received a 319h grant to upgrade storm drains around the lake. They anticipate this work being accomplished in 2003 and have reapplied to extend the scope of this work throughout the watershed. Adam Stern of Applied Water Management has provided technical support and assistance for this important project.

This year, the LTC with the urging of the LTEC & MLCA, adopted ordinances limiting the application of phosphorus based fertilizers on residential lawns; made it illegal to feed waterfowl; and made it illegal not to clean up pet waste on public thoroughfares. These laws represent the beginning of the development of environmentally based rules and procedures to improve water quality.

The Mountain Lake Community Association (MLCA) rewrote their bylaws this year to clearly outline their mission and beliefs, and to revise their name to include, "Watershed Advisory Group" (MLCA & WAG). They publish yearly goals and hold an annual general membership meeting each August supplemented by joint meetings with the LTEC that feature keynote speakers. Through ongoing publicity, they were able to attract Lehigh University to conduct a study of the lake sediment as well.

As a result of all this volunteer effort and commitment, membership has skyrocketed to 191 in 2002. The MLCA & WAG has become the largest environmental organization in Warren County. Their work is far from finished. The passion and enthusiasm that this group uses to effect environmental change is contagious and successful. Members are convinced that they're headed in the right direction and ultimately, the people of this little corner of northwest New Jersey will be the big winners! *****

For more information, contact the Association through their website link at *www.libertytownship .org*. or the author at *fjoseph@hackettstown.org*

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Features

New Jersey Flows

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