New Jersey Flows

New Jersey Water Resources Research Institute

Volume III, Issue 2 **SUMMER, 2002**

Watershed Education Initiative Launched at Stony Brook-Millstone Watershed

By Jeff Hoagland, Education Director, Stony Brook-Millstone Watershed

Among the many challenges we face in our classrooms today is creating a heightened sense of environmental literacy. Students need to understand the complex relationships between human activity and the environment while embracing a sense of responsibility for our planet and our future. Through their program Building Environmental Education Solutions (BEES), the **Stony Brook-Millstone Watershed Association** (SBMWA) has launched a Watershed Education Initiative that focuses attention on the watershed as a unit for understanding and managing our environment.

The Watershed Education Initiative is aimed primarily at middle- and high-school teachers. It consists of several components and involves several partnerships. The initiative has been made possible thanks to the support of the US EPA and the Educational Foundation of America. The centerpiece of the initiative is the **Summer Watershed Education Institute**. The week-long workshop empowers teachers to explore watershed issues with their students in the formal classroom and in the field. Teachers learn how to: implement classroom activities exploring the dynamics of a watershed; conduct water quality investigations in their community; implement social and historical surveys exploring the relationship between various stakeholders and the environment; and share, compare, and contrast their findings with other schools on line. In addition to training and materials, participating teachers receive Professional Development credit, a stipend to purchase equipment and materials, and year-round support from SBMWA staff.

The SBMWA has adopted New Jersey Audubon Society's (NJAS) ***New Jersey WATERS*** as a critical resource for the Institute. Dale Rosselet, NJAS's Education Director notes "***New Jersey WATERS*** represents New Jersey Audubon Society's effort to provide teachers with solid background information about New Jersey's watersheds. It covers a wealth of information on each of New Jersey's watershed basins and also includes a rich collection of activities." ***New Jersey WATERS*** is also available to educators through NJAS.

The Watershed Education Initiative also includes a **Watershed Stewardship program** in partnership with the NJ DEP. Colleen Gould, Director of the Stewardship program, notes that it is a "unique community-based watershed education program that focuses on developing leadership skills in high school students while instilling a sense of stewardship toward the environment." The program consists of a weekend workshop for teachers and core groups of students during the school year. Teams submit proposals for projects which are then funded by mini-grants, this year provided by the NJ DEP.

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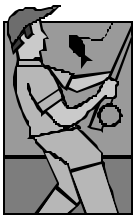
The Director's Chair

by Joan G. Ehrenfeld, Ph.D., Director, New Jersey Water Resources Research Institute
Rutgers, The State University of New Jersey

This issue of New Jersey Flows is devoted to the topic of water education. As research on water resource problems increasingly addresses non-point, diffuse, and complex issues pervading whole watersheds, it becomes clear that the daily behavior of people has a profound impact on both the genesis of these problems and their solution. Education, especially of the next generation, is thus critically important in trying to ameliorate existing problems and prevent new ones. In this issue, a variety of programs offered throughout the state to citizens and to K-12 teachers are described, in the hope that better knowledge of the resources available for water-related education will lead to better use of the state's waters. *****

NJDEP Educates Consumers and Children on Safe Fish and Crab Consumption



Harbor Watershed Education and Fishing Program for Urban Youth

New Jersey DEP staff, through partnerships with the Hackensack RiverKeeper, Bayonne Municipal Utilities Authority, and the Greater Newark Conservancy, sponsors an Urban Fishing Program to take fifth and sixth grade students from area schools for a four-day program and environmental tour of local waterways, such as the Hackensack and Passaic rivers and Arthur Kill.

The program was started in 1997 in response to community concerns that their citizens may not be adhering to consumption advisories for locally caught blue crabs, shellfish and certain species of fish. DEP staffer Kerry Kirk Pflugh, currently Bureau Chief for the Division of Watershed Management's Raritan Region, developed the award-winning community outreach program.

"The program's goal is to foster community and youth awareness of the vital links between pollution, water quality and human health. Upon completion of the program, students show understanding of the surrounding land and waters, identification of fish targeted in consumption advisories, watersheds and food chains, and ways they can help prevent pollution," Pflugh said.

On day one, the children are given a classroom lesson to familiarize them with the bay area, and to explain the fish consumption advisories. Day two consists of marking storm drains to make the community aware of nonpoint source pollution, and then a cleanup on the waterfront. On day three, the youth are taken on an "eco-cruise" where they test water quality. Day four is a day of fishing on a local waterfront , and includes a fish dissection!

Recently, New Jersey Department of Environmental Protection's Division of Science, Research and Technology performed a site specific assessment of dioxin-related health risks to recreational anglers illegally trapping blue claw crabs in the Newark Bay Complex. This area covers 32 municipalities including tidal portions of the Hackensack and Passaic Rivers, Newark Bay, Arthur Kill and Kill Van Kull.

CRAB Outreach Program

By Kerry Kirk Pflugh, NJDEP Bureau Chief, Raritan Watershed Program

Consumption advisories for this region for blue claw crabs are ***do not eat and do not catch*** for both general and high risk population, which includes women of child bearing age, fetuses and children up to the age of 15 years old. There are advisories on five other species of finfish in this region from **do not eat** to **eat only once a week or once a month**.

TCDD (Dioxin), the most biologically potent member of a large chemical family of related dioxins and furans, produces a number of effects in animal toxicity testing including suppression of the immune system, impaired reproduction, birth defects in some species, impaired neurological development, alterations in liver function, and carcinogenesis. The US EPA has classified dioxin as a probable human carcinogen.

To reach an acceptable risk level using certain conservative assumptions that are protective of public health, a person could eat only about one crab every 20 years. The magnitude of these risks was one of the highest encountered by DEP in any context. (The acceptable level of dioxin in crab tissue is 25 ppt of total dioxin. Levels found in some samples were as high as 400 ppt.)

While most of the fish advisories are unenforceable suggestions to protect public health - for crabs in the Newark Bay Complex, there is an enforceable, "no harvest, no consumption" *ban* in effect. People found catching and eating crabs **can be** subject to fines from the State of New Jersey which range from

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Conference Calls

34th MID-ATLANTIC INDUSTRIAL & HAZARDOUS WASTE CONFERENCE
COOK COLLEGE, RUTGERS UNIVERSITY NEW BRUNSWICK, NJ, SEPTEMBER 20-21, 2002

Rutgers University will host the 34th Mid-Atlantic Industrial & Hazardous Waste Conference. The program will include platform sessions on Bioremediation, Microbial Processes, Environmental Fate and Transport of Toxic Chemicals, Water and Wastewater Treatment, and Hazardous Waste Management and Site Remediation. An extensive Poster session will be part of the program. For more information visit: **http://cook-college.rutgers.edu/~biotech/MAIHWC/conference.htm**

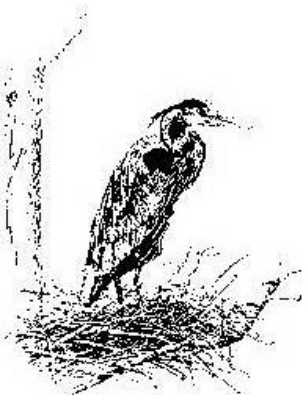
5th Wetlands Workshop, October 22 – 25, 2002 The Holiday Inn-Boardwalk, Atlantic City, New Jersey

Sponsored by Wetlands Work Group **www.wetlandsworkgroup.org** and USEPA. Past workshops have featured a unique blend of current scientific, regulatory, and management issues. Contemporary wetlands issues will continue to be the focus of this gathering. Contact Ralph Spagnolo, USEPA, Philadelphia, PA. Email: **spagnolo.ralph@epa.gov** Phone: 215.814.2718

Wetlands 2002 National Symposium: Restoring Impaired Wetlands and Other Waters, October 7-9, 2002

This national symposium, to be held at the Westin Hotel, Indianapolis, IN, will assess successes and failures of science and policy related to restoration of wetlands and related waters and point to methods for improving future success. For more information visit the Web site at: **www.core4.org/Core4/Wetlands/Wetlands2002.html**

"Down Jersey - Celebrating Our Sense of Place"



By Christine Raabe, Education Director, Citizens United to Protect the Maurice River

Down Jersey - Celebrating Our Sense of Place is a teachers' curriculum and resource kit designed to help teachers and students learn more about the region they call home. Unlike many other areas, New Jersey's Delaware Bayshore retains the character of an earlier time, and people continue to rely extensively on livelihoods related to local natural resources. This curriculum complements the New Jersey Network film "Down Jersey" and the National Park Service's publication "Historic Themes and Resources within the New Jersey Coastal Heritage Trail Route: Southern New Jersey & the Delaware Bay". Citizens United to Protect the Maurice River and Its Tributaries, Inc., the National Park Service's New Jersey Coastal Heritage Trail Route, and PSE&G developed this curriculum with the hope that it will build local pride and continued enthusiasm in teachers and students as they become aware of their unique place in this region. It is with education that environmental stewardship can become entwined in our lives. The curriculum was developed using the combined expertise of numerous individuals and groups, and the end result is truly a unique collection of activities and lessons to celebrate Down Jersey. Partial funding for the project came from The NJDEP - Watershed Management Public Education and Outreach Grants.

The packets include a series of more than 40 lesson plans each of which focuses on one of the four main themes of the film and the National Park Service's study of the region: agriculture, architecture, natural resources, and maritime history. Each activity is correlated to the New Jersey Core Curriculum Content Standards for ease in school use. The kit includes the activity guide, a video copy of the film "Down Jersey," the National Park Service's publication Historic Themes and Resources book as a reference text, plus numerous supplementary teacher resources to accompany the curriculum.

Down Jersey - Celebrating Our Sense of Place was recognized by the EPA and received the Environmental Quality award for 2000, and most recently was awarded First Place by the New Jersey DEP's Division of Watershed Management. The entire curriculum is available on-line at Citizens United's website: **cumauriceriver.org**. Workshops can be arranged by Contacting Chistine Raabe, Education Director, at **craabeatay@aol.com**. *****

Undergraduate Research Opportunities

By Dr. Kauser Jahan, Professor, Department of Civil and Environmental Engineering, Rowan University

Research experiences in water pollution control is an attractive area for undergraduates. Water quality is an area that is important for all engineering students. Research experiences expose students to the creativity of the research process and enable them to apply their acquired knowledge from required coursework. The undergraduate civil and environmental engineering program at Rowan University has a strong funding record on water quality research. Research topics include non-point source pollution in local streams and lakes, organic pollutants in local rivers and wastewater treatment plants and alternative innovative technology for pollution prevention. The CEE program has obtained funding from the NJWRRI, NSF, NJDEP and WERF (Water Environment Research Foundation) to promote undergraduate research with successful outcomes. The undergraduate students involved in research experiences have participated in state and national conferences and competitions winning numerous awards. This allows students to enhance their careers and network with practicing professionals. Some students have pursued graduate studies at institutions like Cornell University or pursued jobs at the American Water Works Company. Overall the research experiences in water quality and pollution prevention have been instrumental at promoting social awareness and environmental consciousness. Students also benefit from better understanding of coursework, understanding of the research process as would be expected in graduate school, and a better self-esteem and confidence. *****

L. to r. - Marcus Roorda, Margaret Jacques, and Shira Perlis at the 6th International In Situ and In-Site Bioremediation Conference held at San Diego, California

Corporate Education Magnifies Benefits of Watershed Management Technique at BMS Hopewell Campus

By Greg J Braun, Bristol-Myers Squibb

Bristol-Myers Squibb Company (BMS) has adopted a watershed management approach to ensure natural resource sustainability and environmental stewardship at its Hopewell Campus, a 433-acre mosaic of agricultural, forest, open field, wetland, stream, pond, and developed habitats. Education and community outreach activities communicating the importance of ecosystem health and natural resource stewardship are recognized as essential to the success of the Hopewell Campus and Bristol-Myers Squibb.

BMS has trained leaders from all departments on the BMS 2010 Sustainability Goals. Watershed management training has also been given to leaders of facilities management to ensure that design and construction activities are compatible with nature and to communicate a message that natural systems are superior to engineered systems for managing water quality and quantity. BMS also presents papers to members of the scientific and engineering profession at international conferences to educate and promote the success of the watershed approach.

Many other educational and outreach programs have been initiated on the Hopewell Campus, including:

- Brochures were created and interpretive signs installed that provide information about watershed and wildlife habitats, their connection to the surrounding ecosystem, and ongoing habitat enhancement and protection projects (see brochures at **http://www.bms.com/ static/ehs/facili/data/hopewe.html**);
- Annual Earth Day celebrations are filled with useful information and hands on education including poster contests, environmental health walk and wildlife inventory, Earth Friendly Vendor Fair, and household hazardous waste collections. These celebrations are highly anticipated and have resulted in formation of a Stream Team to replace invasive plant species with native shrubs and herbaceous plants and establishment of "No-Mow Zones" along stream corridors;
- "Lunch and Learn" programs are attended by employees, which provide practical information about watershed topics;
- Cooperation with the Stony Brook-Millstone Watershed Association and the Audubon Society to teach stream restoration and corporate wildlife enhancement seminars; and
- Certification by the Wildlife Habitat Council in November 2001, which included formation of a team of volunteers to construct, install, and monitor over 70 bird boxes, assist with stream restoration projects, and perform wildlife inventories. *****

NJDEP Educates Consumers and Chil-

(Continued from page 2)

$100 to $3,000 for the first offense. However, the NJDEP feels the heavy handed approach it is not effective in changing behavior, educating people about health risks and establishing trust.

To achieve the goal of no crab consumption, the department is taking a two tiered approach to its outreach and education - a traditional program using the media and other customary outreach tools such as signs and brochures, and a community based approach which will employ the use of local partners.

NJDEP has conducted an extensive phone calling campaign to the 32 municipalities and the health departments alerting them to the problem and enlisting their support for our outreach efforts. NJDEP will distribute "Danger, Do Not Eat" Warning signs in English, Spanish and Portuguese to these municipalities to be posted along the waterfront at fishing and crabbing locations. Marinas are also being contacted.

The issue has also been covered in local newspapers and on local and regional television, including PSAs being created for local TV and cable stations to emphasize the dangers of eating crabs. Special outreach will be made to minority markets such as the Spanish and Portuguese media.. Earlier research identified these communities as being least likely to be aware of the crab ban. These communities may have different outlets for information gathering, cultural traditions that include consumption of recreationally caught fish and crabs, or disbelief in health consequences from eating contaminated crabs.

Efforts will be supplemented by brochures and lesson plans developed in an innovative manner, in English and Spanish, which especially target women who use the Women, Infant and Children (WIC) programs throughout the region, some of whom participated in development and field testing of materials.

The second tier of this innovative outreach establishes local liaison grants ($5,000 to $10,000) to community organizations in the Newark Bay Complex to enlist their support in educating their constituents.

The Department's goal is to create an informed public who knows what species are safe to eat and what species can negatively impact their health. *****

Spotlight on New Jersey Watersheds

The Mullica Watershed Planning Project

By Chris Krupka, Watershed Coordinator, New Jersey Pinelands Commission

BACKGROUND

Since passage of the federal Clean Water Act in the 1970s, New Jersey has made great progress in addressing water pollution from point sources (e.g., industrial and municipal dischargers). Within the last decade, the state Department of Environmental Protection (NJDEP) put a new emphasis on reducing NPS through a watershed management approach, dividing the state into 20 Watershed Management Areas (WMAs) and organizing the Division of Watershed Management. In each WMA, a lead agency has been contracted by NJDEP to coordinate the development of a management plan to protect water quality, water supply and natural resources.

In September 2000, the NJ Pinelands Commission entered into a contract with NJDEP to work with a variety of organizations and individuals to develop a management plan for the Mullica River Watershed (WMA #14), most of which lies within the state-designated Pinelands Area and is protected by the Pinelands Comprehensive Management Plan (CMP). The Mullica Watershed encompasses part or all of 24 municipalities in 4 counties (Atlantic, Burlington, Camden, and Ocean), stretching from the headwaters of the Mullica and Wading Rivers in the northernmost part of the watershed southeast to the Great Bay where the Mullica River meets the Atlantic Ocean. Land uses include a mix of residential and commercial development, agriculture, forestry, recreational activities and a substantial acreage of protected parks and forests.

A variety of tools are being used in this effort, including input from the public and from technical and scientific experts, the CMP, the Coastal Zone Management rules, and extensive land use and scientific data. Much of this data was collected as part of the Pinelands Commission's recently completed 5-year ecological monitoring study of the Mullica Watershed, which found a significant correlation between land-use patterns and surface water quality indicators (including fish, frog and plant communities).

THINGS ARE HAPPENING!

The "kickoff" meeting for the project was held in April 2001, followed by the first Steering Committee meeting a few months later. The Steering Committee has developed a "Top Ten" list of Action Now Projects—aimed at making immediate improvements in water quality and advancing overall watershed goals—which are currently being developed by Pinelands Commission staff and other watershed partners. Two project proposals—implementing a "backyard habitat" program in Galloway Township, and stabilizing several damaged streambanks in Wharton State Forest—have already been submitted to NJDEP for funding.

The first Technical Focus Groups began meeting this spring and will work closely with the Steering Committee to provide technical expertise on a variety of issues. The initial TFGs include Permanent Land Protection; Recreation; Agriculture; Sustainable Development; and Wastewater Management Systems. (Other groups may be formed as the project evolves.)

Other major project activities to date include the creation of a brochure, website and project newsletter ("Mullica Watershed Watch"). Working with the Mullica Forum, we hosted two workshops to teach watershed residents how to landscape for water protection and conservation. The Commission has also initiated an on-site wastewater management program through the Action Now program.

WHAT DOES THE FUTURE HOLD?

Project partners will continue to work with NJDEP to develop Action Now project proposals to address immediate needs in the watershed. Steering Committee and general public meetings will be held on a quarterly basis, with the intention of exchanging information and ideas freely between the two groups. The TFGs will continue to meet and provide recommendations to project participants.

Public participation and education is critical to the success of the management plan. Upcoming educational programs include a Project WET (Water Education for Teachers) Workshop on Saturday, October 26 in Browns Mills, NJ and a presentation at the 26th Annual New Jersey Science Convention on Tuesday, Oct. 15 in Somerset, NJ. *For more information, contact Chris Krupka, Watershed Coordinator, at 609-894-7300 or* **mullica@njpines.state.nj.us**. *Please visit our website at* **www.nj.gov/pinelands/mullica**. *****

Partners for Water Quality

Steering Committee members represent a wide variety of interests in the Mullica Watershed.

- Atlantic County Dept. of Regional Planning & Development
- American Littoral Society
- Builder's League of South Jersey
- Burlington County Office of Land Use
- Camden County Division of Environmental Affairs
- Chamber of Commerce of Southern NJ *(invited)*
- Jacques Cousteau National Estuarine Research Reserve
- NJDEP – Division of Watershed Management
- NJDEP – Natural and Historic Resources
- NJ Federation of Sportsmen's Clubs
- NJ Forestry Association
- NJ Pinelands Commission Science Advisory Committee
- NJ Water Association
- Ocean County *(invited)*
- Pine Barrens Canoe Rental
- Pinelands Agricultural Advisory Committee
- Pinelands Municipal Council
- Pinelands Preservation Alliance

Educational Opportunities at The Wetlands Institute

By Charlotte McDevitt, Education/Special Events, The Wetlands Institute

Education at the Wetlands Institute in Stone Harbor, New Jersey, is accomplished in a setting of salt marsh and sandy beach, nurtured by twice-daily tides. Here in the natural world of grasses, herons, egrets, and fiddler crabs, children and adults are awakened to the role which coastal ecosystems play in the survival of life on this planet.

Established thirty years ago by the late Herbert Mills, the Wetlands Institute continues its education efforts throughout all seasons of the year. **Distance learning** links the Institute with schools across the nation in the winter with electronic field trips which bring the salt marsh to students, allowing them to speak to Institute staff about such topics as conservation, the diamondback terrapin, and marsh ecology.

In early spring, even before the grasses green in the marsh, school groups begin to arrive daily. Students from Pre-K through high school experience classes on such topics as Marsh Critters, Turtle Talk, Cycles of Life, Barrier Beach Ecology, and Wetlands Ecology. After viewing a shore video and program, students trek to the marsh or beach to explore the actual habitats.

Summer education programs expand to include both the visiting public, as well as students who enroll in weeklong classes. Daily programs for visitors include a salt-marsh safari, as well as a featured animal of the day, and many visitors walk the trail for a personal experience with marsh inhabitants. **Summer Nature Classes** are offered for children from Pre-K to Grade 6. Weekly themes focus on such topics as birds, fish, marine mammals, predator-prey relationships, or bio-diversity. These topics have their foundation in the study of the animals and plants of the coastal ecosystems and their interrelationship with one another.

The Jr. Naturalist Program continues this exploration in depth for student's grades seven through nine. Field trips provide opportunities to compare varying habitats and to speak with professionals in the field. High school students are invited to participate through the **Intern-for-a-Week** program. During this experience, student's from grades ten, eleven, and twelve are able to companion with college interns engaged in research. Interns customarily conduct studies in fish populations, bird populations, beach ecology, the life cycle of the diamondback terrapin, and plant biology. Young students experience field work while being mentored by motivated college students and scientists.

The Summer Docent program, operating for over ten years, provides an ideal opportunity for teacher (or other interested individuals) development in environmental education and habitat stewardship. Docents undergo a four day training course on the many facets of the salt march. This enables them to spend three hours a week leading interpretive events with visiting public during the course of the entire summer.

As migrating birds come south to rest in the marsh on their long trek from the Arctic, autumn comes to the marsh. As the *Spartina* flowers and monarchs migrate along the coast, visiting school groups again crowd the Institute during the lovely days of fall.

The Wetlands Institute is also the coordinator of **Project WET** in New Jersey. Project WET provides professional development for teachers and offers workshops to equip them with the knowledge needed to bring the study of wetlands into the classroom curriculum.

As education continues year round, the Wetlands Institute seeks to cultivate an understanding of the natural world that will nurture within each person a reverence of the earth and a dedication to preserve its abundant diversity of life. For more information, contact the Wetlands Institute, 1075 Stone Harbor Boulevard., Stone Harbor, NJ, visit the web site at **www.wetlandsinstitute.org** or call 609-368-1211. *****

Book Review: Life's Matrix: A Biography of Water, by Philip Ball

Philip Ball is a brilliant freelance science writer and former editor of the British science journal Nature. The author of several scientific books for the lay person, he wrote **Life's Matrix: A Biography of Water** as an exploration of the role that this molecule, one of the four elements of antiquity, has played throughout a multitude of disciplines: physics, chemistry, cell biology, planetary science, ecology, sociology and myth. He reveals fascinating information such as the fourteen different types of ice, why it is possible to ski on ice but not on most other surfaces, and details irrigation schemes gone tragically awry. He delves into water as a political issue in the Middle East, and finishes with an epilogue entitled "Blue Gold: Water as a Resource," an expression of concern for the future. A Must-Read for anyone involved with water issues.

Conference Calls

2002 AWRA Annual Conference, Philadelphia, PA, November 3-7, 2002, Wyndham Franklin Plaza Hotel. Daily forums will focus attention on: Protecting Our Drinking Waters, Sustaining Community-Based Stewardship, and Urbanization and Riparian/Aquatic Ecosystems. For more information contact:540 687 8395 or see **www.awra.org/meetings/Philadelphia2002/**

Groundwater Foundation Annual Conference "The Forgotten Element of Watershed Protection," November 18 – 20, 2002, Valley River Inn, Eugene, OR. Tel.: 402.434.2742 or see website at **www.groundwater.org/ProgEvent/conference.htm**

Watershed Education Initiative

(Continued from page 1)

Each team then completes a project designed to improve the environmental quality in some location in their watershed.

A newly developed **Watershed Education on the River program** helps classroom teachers and non-formal educators to implement interdisciplinary activities while exploring a river by canoe. Piloted at Princeton Day School in partnership with Project USE, the program utilizes GIS technology and field observations on the Millstone River to illustrate the human impact on our watersheds in unforgettable fashion.

During the spring of 2003, the Stony Brook-Millstone Watershed Association will launch as part of the Watershed Education Initiative, its first **Student Watershed Colloquium**. At this forum, students will share through various media, results of their watershed studies and projects. Date and location of this event will be announced shortly.

The Watershed Education Initiative is just one of the model programs being developed by the Building Environmental Education Solutions (BEES) program at the Stony Brook-Millstone Watershed Association. The Initiative empowers teachers to fortify their curriculum with exciting and effective materials and new perspectives on watersheds. The program fosters a sense of community and environmental stewardship for teachers and students alike. Prospective participants can inquire further by contacting Jeff Hoagland or Judy Gerardi at (609) 818-9277. *****

PROJECT WET® Water Education for Teachers

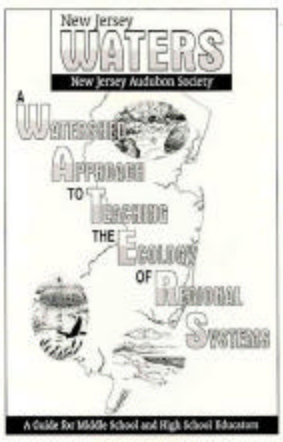
Water is the most important and essential element for life on Earth. Every species needs clean water to live. Today, more than ever, it is important to educate our future leaders and water users about the importance and value of water in our everyday life. Water is too often taken for granted. The New Jersey Project WET (Water Education for Teachers) Program provides several unique opportunities for educators to integrate water topics across their curriculum in all the disciplines.

The Project WET Curriculum and Activity Guide is a collection of over 90 innovative, interdisciplinary activities that are hands-on, easy to use and fun. It is only available to educators by attending a one-day, professional development workshop. A list of workshops in your area is posted on **www.dep.state.nj.us/watershedmgt**.

New Jersey is the proud home of three national estuaries - the Delaware Bay Estuary, the NY/NJ Harbor Estuary and the Barnegat Bay Estuary. The NJ Project WET Program offers the Wonders of Wetlands! (WOW!) Curriculum and Activity Guide, a resource guide with chapters of background information on wetlands and more than 40 multidisciplinary lessons, to highlight the importance of these estuaries. The guide is available by attending a workshop or on sale for only $20.

In an effort to promote a greater awareness and appreciation for our water resources among our future leaders, the NJ Project WET Program provides grants to schools to sponsor a one-day Water Festival. A festival typically consists of structured learning stations and exhibits that engage students in hands-on water lessons and investigations. Grants are available every September for National Water Education Day or in May to celebrate New Jersey's Watershed Awareness Month. For details, visit **www.dep.state.nj.us/watershedmgt/**.

For more information or details about the NJ Project WET Program, please contact Colleen Gould, NJ WET Coordinator, 2528 Algonkin Trail, Manasquan, NJ 08736; Phone (732) 292-4672; **cgould@superlink.net**. *****



"New Jersey Waters" Educational Guide

Watershed education touches all aspects our lives; therefore, it touches all aspects of a school's curriculum. The chemistry teacher may have students analyze the chemical make-up of a local waterway while the biology teacher has the students study the indicator species for environmental quality. A geography teacher may have students map the watershed while the history teacher has students interview local senior citizens about "the way it used to be." The list goes on and on, involving each content area in the curriculum.

The activities in New Jersey Audubon Society's ***New Jersey WATERS*** guide challenge middle and high school students to be involved in their own learning. These activities engage the students in critical thinking while involving them in real issues and solving real problems in their communities.

Taken in sequence, the lessons in each chapter create a well-rounded, interdisciplinary unit which takes the learner from awareness (content and knowledge) to action (how is this information relevant to my life and what can I do about it). Although each lesson stands on its own as a complete lesson, the chapters build upon each other taking the learner from a relationship with a "place" in the watershed to becoming a regional thinker in determining his or her quality of life.

To learn more about ***New Jersey WATERS***, or to schedule a workshop, contact Ms. Dale Rosselet, Vice President for Education, (609)-861-0700 x14 or email her at **dale@njaudubon.org**. *****

Features

New Jersey Flows

New Jersey Water Resources Research Institute

Dr. Joan G. Ehrenfeld
Director
(732) 932-1081
ehrenfel@rci.rutgers.edu

Jeannine Der Bedrosian
Editor
(732) 932-9632
NJWRRI@aesop.rutgers.edu

Institute of Marine and Coastal Sciences

NJAES NEW JERSEY AGRICULTURAL EXPERIMENT STATION

NJ Water Resources Research Institute

Ecology, Evolution, and Natural Resources
Rutgers, The State University of New Jersey
Cook College
14 College Farm Road