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Nonpoint Source News-Notes

The Condition of the Water-Related Environment
The Control of Nonpoint Sources of Water Pollution
The Ecological Management & Restoration of Watersheds

As this issue goes to press, we have learned that Hal Wise, News-Notes' founder and driving spirit, has died peacefully after a serious illness. Hal's commitment to the environment and to News-Notes has provided a vision that will carry on through succeeding editors. We dedicate this issue to you, Hal, with gratitude for the wisdom and perspective you shared with all of us.

Commentary

More Action on the Clean Water Act — Senate Begins Reauthorization Mark-Up; Other Developments

by Hal Wise

In the last weeks of February, there were several significant developments indicating how the Clinton administration will administer the Clean Water Act. Other developments involved the process of the reauthorization of the Clean Water Act through Congress to the President's desk,

- The Senate Committee on Environment and Public Works held mark-up sessions on its version of the reauthorization bill (S. 1114) in preparation to reporting the bill out for full Senate action. (For our story on the bill and the hearings held, see *News-Notes* # 31, August 1993.)

  The *Washington Post*, in an editorial at the time of the mark-up sessions, reiterated some of its earlier comments and warnings:

  > *The Clean Water Act has accomplished a great deal in the past 20-plus years, but much of that has been the easy part. The question is where to head next. The Senate Environment and Public Works Committee is scheduled to vote on its answer this week.*

INSIDE THIS ISSUE

All issues of *News-Notes* are stored in downloadable files on the *NPS Electronic Bulletin Board System*. Additionally, the *NPS BBS* contains a searchable database that allows the user to search for and retrieve *News-Notes* articles on specific topics. To access the database from the main menu, type OPEN. See page 25 for log-on information.

More Action on the Clean Water Act — (continued)

The early years of the Clean Water Act were spent reducing pollution from particular pipes—industrial and municipal sewage treatment outlets. Those efforts were successful enough so that now the main sources of pollution are of a different kind: the generalized runoff from city streets and broad agricultural areas. This runoff is complex and costly to control. Dealing with it can involve altering habits—the way people use their land—across an entire watershed. This raises sensitive land use questions of the kind that have traditionally been left to state and local government rather than to the feds. In the cases of municipalities, it could require digging up and reconfiguring entire storm sewer systems, a prospect that affected cities regard, with some cause, as the ultimate unfunded (or at least underfunded) federal mandate.

The committee chaired by Max Baucus and ranking Republican John Chaffee has administration backing. It tries to steer a middle course on these and other major issues. For example, it would require the states to develop plans for controlling general agricultural and other rural and small town runoff. The feds, while enunciating standards, would try to stay in the background. That probably is as it should be in the early stages of such a process.

As to municipalities, the bill would stretch out a set of highly demanding runoff control requirements that Congress adopted in 1987. In effect, it would therefore actually be reducing financial pressures on local government. The authors also warn that without the stretchout, municipalities could begin to face lawsuits for failure to comply as early as this fall.

(It has been reported that the House of Representatives will hold hearings on its version of the reauthorization bill within the next few weeks. Watch your newspapers.)

- On January 31, 1994, the Clinton administration issued its *Clean Water Initiative,* together with a side-by-side analysis of S. 1114. While the administration's witnesses were generally favorable to S. 1114 during their testimony, the Initiative fills in details, and, in fact, in some cases, goes further than testimony presented to the Senate. It remains to be seen how much direct impact the Initiative will have at this time on either the Senate or House reauthorization legislation. It is a good statement, and could provide the basis for additional legislation in the next Congress. The Initiative is summarized in the following article.

- Earlier in February, the President sent Congress his 1995 budget request, which included significant overall increases for EPA. The budget included an increase in grants to states to implement their NPS management programs (from $80 million in 1994 to $100 million). Comments by EPA Administrator Carol M. Browner on the President's budget recommendations are reported in this issue.

- On February 11, 1994, President Clinton issued an Executive Order on environmental justice and fairness. This issue of *News-Notes* reports on that statement.

Notes on the National Scene

Clinton Administration's Clean Water Initiative

"The Clinton administration calls for fundamental change in the law that protects our nation's waters," EPA Administrator Carol M. Browner remarked in mid-February, as she unveiled key elements of the administration's innovative new approach. "We've done the easy part by controlling pollution at the end of the pipeline. For the first time, we are tackling the hard part — the control of polluted runoff, which is the biggest remaining barrier we face in keeping the nation's waters clean." Browner pledged to work with Congress to reauthorize the Clean Water Act this year "so we can reduce water pollution at a reduced cost to the nation."

President Clinton's initiative includes strong actions to control polluted runoff, to eliminate highly toxic contaminants, and to assure that polluters comply with the law. It achieves these goals in new ways — by empowering communities, by encouraging pollution prevention, and by focusing resources toward the most important problems first.

Clinton Administration's Clean Water Initiative (continued)

Controlling Polluted Runoff

The administration's proposal for controlling polluted runoff provides new direction in three key areas:

State Nonpoint Source Programs

Upgrade to implement best available management measures for sources causing water quality impairments within seven and one-half years.

States should rely on a mix of voluntary and regulatory approaches. However, state programs should include enforcement authorities to be used as needed to ensure implementation of the management measures. The state authorities should be backed by federal enforcement authorities that could be exercised if state authorities should fail. Where states do not develop an approvable program, section 319 grants should be withheld from the state, and EPA should be authorized to establish minimum NPS controls.

Combined Sewer Overflows

Require permits that are developed by states and municipalities on a site-specific basis for wet weather overflows and include new enforcement actions for dry weather overflows.

Be fully eligible for funding from State Revolving Loan Funds.

Stormwater Controls

Target areas and facilities that pose the highest risk and provide states and municipalities with new flexibility to implement the program.

Encourage pollution prevention by exempting facilities and activities that are not exposed to precipitation.

Eliminating Toxic Pollutants

Despite dramatic progress in reducing toxic pollution since enactment of the Clean Water Act, the discharge of certain toxics continues to contribute to serious environmental and human health problems. Some toxics are extremely harmful in small quantities. Others build up in the food chain to produce adverse effects in fish and wildlife — and in the people who consume them. Emerging scientific evidence links certain pollutants not only to cancer but also to neurological, reproductive, developmental and immunological adverse effects. The administration's proposal includes three areas related to toxics:

Persistent Toxics

Strengthen authority to restrict or prohibit the discharge of highly toxic and bioaccumulative pollutants.

Authorize a new strategy to control the use of chlorine and chlorinated compounds to reduce risk to human health and the environment.

Pollution Prevention

Encourage pollution prevention to be considered in development of effluent guidelines and best management practices.

Multi-Media Controls

Reduce water pollution from air and land sources where this is the most efficient means to control pollution and where other environmental laws are ineffective to reduce risk.

Improving Compliance with the Law

A vigorous enforcement program is essential to encourage voluntary compliance, to deter violations, and to achieve the ambitious goals of the Clean Water Act. Compliance should begin at home: the federal government must obey the Act and assure that its activities do not contribute to water quality degradation. In relation to the point source program, citizens should be fully empowered to sue polluters, and lawbreakers should not realize any economic benefit for failing to purchase the equipment or hire the personnel necessary to comply. The administration's proposal contains the following reforms:

Clinton Administration's Clean Water Initiative (continued)

Federal Facility Compliance

Allow states and citizens to sue the federal government for penalties when a federal facility violates the Clean Water Act.

Create a new procedure which allows EPA to enforce the law against federal facilities.

Citizens Suits

Strengthen citizens' rights by allowing suits for violations that took place within the Act's five-year statute of limitations.

Profit Prevention

Require courts to assess penalties at least equal to the economic gain realized by the polluter for not complying with the law.

[The President's Clean Water Initiative is available on the NPS BBS in a downloadable file called PREZINIT.ZIP. See page 25 for BBS log-on information.]

EPA's 1995 Budget Proposed by Administration Expands NPS and Watershed Restoration Grants

In mid-February, EPA Administrator Carol Browner issued the following statement on the occasion of the President's release of his 1995 budget recommendations to Congress. Browner noted the proposed increase in funds for NPS control and watershed restoration. There is a long way to go before the money is actually appropriated by the Congress, but Browner's comments and the President's recommendations are the beginning of the process. Browner said,

> *Last week, the President announced his proposed federal budget for 1995. As you know, the nation's budget deficit requires significant reductions in federal spending, which is why I am so delighted by the large increase in EPA's budget in the President's proposal for FY95. EPA's budget request for 1995 — the agency's highest ever — is a testament to this administration's commitment to the work we do at EPA.*
>
> *The President's budget request calls for $7.2 billion for EPA in 1995. This new figure is $500 million higher than our FY94 budget, an increase of 8 percent.*

Here are some excerpts of the statement.

Operating Programs

EPA employees come to work every day to face one of the most daunting regulatory and implementation agendas anywhere in the federal government. The President, recognizing the challenges we face and the importance of the work we do, has proposed a 13 percent increase for EPA's operating programs. This increase means that we will be able to maintain or expand our core programs across the agency while branching out into emerging, high-priority areas. The expanded operating budget will also enable us to fully fund our workforce, to provide funding for employee transit subsidies and to begin the process of moving the agency into its new Washington headquarters.

Workyears

EPA also received a significant increase in workyears in the President's proposal. The budget proposes 900 new EPA workyears for contractor conversion. The request for new workyears responds to concerns I have heard from many of you who believe more of our work should be done by EPA employees. By hiring new staff to assume functions previously carried out by contractors, we will be able to do our jobs better, save money, and address criticism about our contracting process.

New Initiatives

The President's budget proposal focuses EPA spending on top agency priorities including our day-to-day rulemaking activities, pollution prevention, environmental justice, environmental technology, ecosystem protection, and quality science. Among the major initiatives that will receive funding increases are

- Drinking Water and Clean Water State Revolving Funds ($700 million and $1.6 billion respectively);

EPA's 1995 Budget Proposed by Administration (continued)

- Environmental Technology Initiative ($80 million);
- U.S./Mexico Border Initiative ($179 million);
- Nonpoint source/watershed restoration grants ($100 million); and,
- Climate Change Action Plan ($117 million).

President Clinton Signs Executive Order on Environmental Justice

EDITOR'S NOTE: Below is an excerpt from a press release issued by the White House, February 11, 1994, on the President's Executive Order on Environmental Justice, together with EPA Administrator Carol M. Browner's statement on the order.

Fulfilling a commitment he made on Earth Day 1993 to address the problems of environmental inequity and discrimination, President Clinton today signed the Executive Order on Environmental Justice to protect Americans — particularly those who can least afford it — from pollution and to help provide safe, clean communities.

The Executive Order will increase public participation in the environmental decision-making process.

"All Americans have a right to be protected from pollution — not just those who can afford to live in the cleanest, safest communities. Today, we direct federal agencies to make environmental justice a part of all that they do," said President Clinton.

The Executive Order is expected to have a sweeping impact on lead removal in public housing, pollution control in urban rivers, and exposure of farm workers to dangerous pesticides. The order will require environmental justice strategies from each federal agency that conducts programs substantially affecting human health and the environment.

Vice President Gore said, "Every community must be included in making decisions about their health and their environment. Under today's executive order, we will ensure that disadvantaged populations have an opportunity to participate fully in making health and environmental decisions."

EPA will lead an interagency effort to carry out the Executive Order, which requires federal agencies to:

- Develop strategies for identifying and addressing disproportionately high and adverse human health or environmental effects on low income and minority populations of their programs, policies or activities.
- Ensure that minority and low-income populations have access to public information related to human health and the environment.
- Conduct activities related to human health and the environment in a manner that does not discriminate or have the effect of discriminating against low-income and minority populations.
- Consider disproportionately high and adverse human health effects of environmental hazards on minority and low income populations in conducting research and data collection related to human health or the environment.

EPA Administrator Carol M. Browner made this statement:

> *For too long, low-income communities and minority communities have borne a disproportionate burden of modern industrial life. Today's Executive Order seeks to bring justice to these communities.*
>
> *All Americans deserve to be protected from pollution — not just those who can afford to live in the cleanest, safest communities. All Americans deserve clean air, pure water, land that is safe to live on, food that is safe to eat.*
>
> *Last April, on Earth Day, President Clinton called on federal agencies to ensure equal environmental protection to all Americans. . . .*

President Clinton Signs Executive Order (continued)

We will develop strategies to bring justice to Americans who are suffering disproportionately — farm workers who are exposed to high-risk pesticides, children who are exposed to lead paint in old buildings, people who fish in polluted waters, those who live near hazardous waste incinerators.

We will develop strategies to ensure that low-income and minority communities have access to information about their environment — and that they have an opportunity to participate in shaping government policies that affect their health and their environment.

The Clinton administration's proposal to reform our Superfund law speaks to these concerns — by increasing public participation in Superfund decision-making.

The President has asked me to convene an interagency working group to begin to implement the Executive Order. I look forward to working with my colleagues in this administration to ensure that all Americans have a safe and healthy environment.

National Research Council's Agenda for Agriculture Recommends Changes in Farming Practices to Protect Soil and Water Quality

In a report issued late last fall, a National Research Council committee concluded that new national policies and new approaches to farming are needed to address soil and water problems attributed to farming practices.

The report said that efforts to protect soil quality deserve the same attention as those for air and water. Protecting soil quality should be a fundamental environmental goal for the nation, with increased attention to the prevention of surface and groundwater pollution through more effective use of fertilizers, pesticides, and irrigation.

Committee Chair Sandra S. Batie, the Elton R. Smith Professor of Food and Agricultural Policy at Michigan State University, said

> *Soil and water quality problems are as important as other environmental problems we face. The nation should look to new agricultural practices that will both protect the environment and help farm productivity.*

The committee recommended that the USDA, EPA, and Congress undertake a coordinated effort to identify the highest priority regions for federal, state, and local programs to improve soil and water quality. Technical assistance, educational programs, financial resources, and government regulations should be directed at regions where degraded soils and polluted water are most severe, and at farms that cause a disproportionate amount of environmental problems.

According to the report, targeting measures to prevent soil degradation and water pollution now may allow U.S. agricultural producers to avoid high-cost solutions in the future. But time for low-cost solutions could be running out. "In some regions, soil degradation and water pollution may already be serious enough that solutions will entail economic losses to the agricultural sector," the committee cautioned. "Concerted action now is needed to prevent the list of such regions from getting longer."

Problem-Solving Strategies

The committee defined four interrelated strategies for national policy that hold the most promise of preventing soil and water problems while sustaining farm profits.

1. *Broadening the approach to protecting soil quality.* "National policies to protect soil resources are too narrowly focused on controlling erosion and conserving soil productivity," the committee said. Other important and often irreversible threats to soil include salinization, compaction, acidification, and loss of biological activity. Soil is a living, dynamic substance that acts as the interface between agriculture and the environment. High-quality soils, for example, prevent water pollution by absorbing and partitioning rainfall and by breaking down agricultural chemicals, wastes, and other potential pollutants.

2. *Increasing efficiency in the use of fertilizers, pesticides, and irrigation methods.* Improving the way fertilizers, pesticides, and irrigation water are used can prevent pollution at

its source. New programs are needed that reduce the amount of those potential pollutants produced as a by-product of farming. Many technologies and management methods are already available for more efficient use of fertilizers, pesticides, and irrigation water, but they need to be more widely implemented, the committee said.

3. *Reducing farm erosion and runoff.* Many different conservation systems such as reduced tillage, crop rotation, and use of cover crops have proven potential to reduce erosion and runoff. But today, only 30 percent of U.S. croplands are farmed using reduced tillage methods. In many regions, increased use of these techniques on lands that are most vulnerable to degradation of soil quality or that most contribute to water pollution could result in dramatic decreases in erosion and runoff.

4. *Creating and protecting "buffer zones."* In many watersheds, "field-by-field" efforts to conserve soil quality, increase efficiency, and reduce erosion and runoff will not be enough to protect the environment. Buffer zones, such as vegetation along streams; strategically planted grass strips; and sophisticated, artificially constructed wetlands can help intercept or immobilize pollutants and reduce runoff, the committee said. These zones can augment, though not replace, efforts to improve farm management. "Managing the landscape by creating or restoring buffer zones is a promising way to increase the effectiveness and lower the cost of programs to protect soil and water quality," the committee said.

Emphasis on one strategy to the exclusion of others could exacerbate one environmental problem while attempting to solve another, the report warned.

New Policies Needed

The committee concluded that traditional, voluntary approaches to improve soil and water quality need to incorporate modern market-based incentives, and enlist support from the private sector — including seed, chemical, and equipment manufacturers — to improve farming practices. The committee noted that regulatory approaches might be needed in areas where environmental problems are severe and where farm owners and managers are "unacceptably slow" in implementing improved farming techniques.

Best management practices recommended to farmers by public agencies need to be integrated into comprehensive farming plans. Implementation of such plans, rather than adoption of single practices, should be the basis on which farmers receive technical or financial assistance or are judged to meet the requirements of regulatory programs.

The federal government should invest in research and development of new agricultural production technologies and management methods, the committee said. "Much greater progress could be made if producers had better tools and information to refine the management of their farming systems."

State and federal laws should clarify the legal responsibilities of landowners and land users to manage land in ways that protect soil and water quality, the committee recommended. Permanent, publicly funded soil and water quality gains are impeded by inconsistencies in the legal definition of the rights and responsibilities of landowners and users.

Some croplands cannot be profitably farmed without causing soil degradation or water pollution. Other lands could help improve soil and water quality if maintained as buffer zones or wetlands. A program to purchase use rights from landowners through long-term easements should be developed to protect these environmentally sensitive lands, the committee said.

The National Research Council is the principal operating agency of the National Academy of Sciences and the National Academy of Engineering. It is a private, nonprofit institution that provides science and technology advice under a congressional charter.

The study was sponsored by the U.S. Department of Agriculture and the Environmental Protection Agency.

[The committee's report, Soil and Water Quality: An Agenda for Agriculture, is available from the National Academy Press, 2101 Constitution Ave. N.W., Washington D.C. 20418. Phone: (202) or 1-800-624-6242. The cost of the report is $54.95. Shipping costs are $4.00 for the first copy and $.50 for each additional copy.]

Iowa Farmer Named Chief of Soil Conservation Service

EDITOR'S NOTE: The Soil Conservation Service is an important partner in nonpoint source pollution control, implementing soil conservation techniques, and working with state and local groups toward environmental quality.

The new Chief of the Soil Conservation Service is Paul W. Johnson, an Iowa farmer and state legislator well known for his conservation leadership.

In naming Johnson to the post, Secretary of Agriculture Mike Espy said, "This department has a mission to strengthen natural resource protection. Paul Johnson understands these issues and he understands our customers' concerns. He'll bring broad experience and visionary leadership to our team."

Johnson has been actively involved in conservation issues since he started farming in 1974. His dairy, sheep, grain, and Christmas tree farm is in Decorah, Iowa, where he has served as assistant commissioner for the conservation district.

As a representative in the Iowa General Assembly from 1984 to 1990, Johnson wrote several major pieces of environmental legislation. He was a major architect of Iowa's Groundwater Protection Act, a model used nationwide for its emphasis on research, education, and voluntary approaches to water quality.

Other significant legislation by Johnson includes the Iowa Resource Enhancement and Protection program (REAP), the Iowa Energy Efficiency Act, and the Iowa Integrated Farm Management Program.

"The Soil Conservation Service will be moving ahead using an ecosystem approach to protecting and enhancing our natural resources," said James R. Lyons, Assistant Secretary for Natural Resources and Environment. "Paul's expertise is what we need, especially as we look ahead to the 1995 Farm Bill and the reauthorization of the nation's Clean Water Act. He'll bring a balanced perspective to the debate."

The new SCS chief, who has a Master's degree in forestry from the University of Michigan, serves on the Board of Agriculture of the National Academy of Sciences and has been involved in major studies in agriculture, forestry, and conservation. Johnson also taught forestry in Ghana for two years and has been visiting professor of environmental policy at Luther College.

"One of the most important challenges of our time is to learn to live in harmony with the land. No group has been more involved with making this happen over the years than the Soil Conservation Service. I look forward to being part of that proud tradition," the 52-year old Johnson said.

Notes on Rivers and Riparian Areas

Protecting the Mighty Mississippi at Its Source

More than 29 mostly local agencies and organizations have formed a partnership to control nonpoint source pollution in north-central Minnesota's Lake Bemidji watershed, which includes the headwaters of the Mississippi River. Coordinated by the Beltrami Soil and Water Conservation District, the Lake Bemidji Watershed Management Project has created a steering committee made up of local lay people who help tailor the project to fit the resources and needs of the community.

The 400,000-acre watershed's many lakes are important to the lifestyle of the region's people, many of whom enjoy lake-front property. In addition, the quality of the lakes is vital to the area's economy. The project references economic studies that indicate that at least 535,000 annual visitor-days in the Bemidji area are related to water recreation. Based on socioeconomic studies, project personnel calculate that a 9.5 percent reduction in water-related tourism because of water quality degradation would cost the Bemidji area up to $3,400,000 annually.

The project began with an assessment of Lakes Bemidji and Irving in 1989. The diagnostic study showed that Lake Bemidji was at a critical stage, with phosphorus just below the threshold that results in nuisance algae blooms and a rapid decrease in water quality evident to lake users. Lake Irving had already gone beyond that point.

Protecting the Mighty Mississippi at Its Source (continued)

The study concluded that the key to improving water quality in the lakes lies in reducing the phosphorus coming into the system from the Mississippi River. Based on results of the diagnostic study, the implementation plan includes installation of BMPs for urban, agricultural, and forestry sites along the river. Monitoring of the Mississippi and Schoolcraft rivers and their tributaries continues, as well as information and educational activities geared toward increasing the public's knowledge of the causes of lake and groundwater degradation.

In addition to traditional information sources such as newsletters, news articles, and presentations, project staff have developed two videos: *Stream Monitoring In the Lake Bemidji Watershed* for groups interested in the installation of a computerized stream monitoring network within the watershed, and *The Lake Bemidji Watershed: A Clean Water Partnership*, about watershed management and the steps that have been taken to reduce urban, agricultural and forestry source of pollution.

During the first part of the implementation phase, the project concentrated on the city of Bemidji. In 1993, the city installed a two-cell stormwater treatment system on a stormwater line that drains about 140 acres of residential area. They also installed an in-line sediment trap on a storm sewer line that drains the downtown area.

"The city of Bemidji deserves a lot of credit for participating in this project. There are only about 11,000 people in the town, and stormwater treatment is generally not a high priority with cities of this size," commented Project Manager Jeff Hrubes.

Activities farther up in the watershed have primarily been educational so far, but there are several erosion control projects planned for 1994. In addition, the USDA has allocated funds for a Water Quality Incentive Project, which provides incentives for landowners to change management systems to reduce nonpoint source pollution rather than to install structures. Thus far, about 2,000 acres have been enrolled in this program.

According to Hrubes, the stream monitoring system is providing some of the first long-term continuous monitoring of streamflows and pollution concentrations in the upper Mississippi. In addition to monitoring done by conservation district staff, the Mississippi Headwaters Board has developed a volunteer monitoring network using high school students.

[For more information, contact Jeff Hrubes, Project Manager, Lake Bemidji Watershed Management Project, 3217 Bemidji Avenue North, Bemidji, MN 56601-4328. Phone: (218) 751-3036.]

McKnight Foundation Grants Help to Preserve, Restore, and Study the Mississippi

The McKnight Foundation is funding a variety of projects all along the Mississippi's long, troubled length. Several projects are related to last summer's flooding disaster on the north central section of the Mississippi River.

American Rivers, Inc., received two grants totaling $60,000 to advocate for improved protection of environmental resources following flooding of the Mississippi River, and to promote public policies that encourage the use of nonstructural measures to reduce future flood damage along the Mississippi. The goals are to develop land management practices that will depend on restored wetlands for flood control rather than rebuild dams and levees and to educate people to think of long-term solutions.

Part of the plan will direct new development away from floodplains and find funds to assist individuals and towns that want to relocate out of the floodplain. Some farmers also need financial assistance to take certain farmlands in the floodplain out of cultivation and restore wetlands.

[Contact: Scott Faber, American Rivers, 801 Pennsylvania Ave, SE, Suite 400, Washington, DC 20003. Phone: (202) 547-6900.]

Wetlands Research, Inc., received a $9,000 grant to investigate federal, state, and local flood control policies on the Mississippi River floodplains and wetlands as part of the postflood recovery.

[Contact: Donald Hey, Wetlands Research, Inc., 53 West Jackson Blvd, Chicago, IL 60604. Phone: (312) 922-0777.]

McKnight Foundation Grants Help To Preserve, Restore, and Study the Mississippi (continued)

The Association of State Wetland Managers, Inc., received a grant of $14,000 to conduct a conference on strategies to restore Mississippi River floodplains and wetlands as part of the postflood recovery.

Two workshops were jointly conducted by the Association of Floodplain Managers and the Association of State Wetland Managers, with a broad range of cooperating organizations in St. Louis, Missouri, August 30-31, and September 27-29, 1993. These workshops involved over 300 participants from the states, local governments, universities, federal agencies, and interest groups. The workshops focused on postflood response; restoration of floodplain, wetland, and riparian areas; and mitigation of future losses.

The goals of the workshops were to assist postflood responses taking place at all levels of government, to determine barriers to effective response, and to recommend actions to the White House, federal agencies, Congress, state and local governments, interest groups, and other parties for future actions for overcoming those barriers.

Among the workshops' preliminary recommendations:

- Provide a wide range of alternatives available to floodplain occupants and local governments for using disaster assistance funds to include relocation "buy outs," structural flood-proofing, creation of greenways, wetland restoration and other remedies.
- Treat flooding in the upper Mississippi basin as a prototype "case study" to suggest possible future directions for multi-objective floodplain and watershed management and the restoration of aquatic ecosystems in other areas of the nation.
- Designate the upper Mississippi and its subbasins as a special, multipurpose watershed planning, management, and restoration area with the goal of rebuilding communities (both human and natural).

[Contact: Jon Kusler, Executive Director, Association of State Wetland Managers, PO Box 2463, Berne, NY 12023-9746. Phone: (518) 872-1804.]

Iowa Natural Heritage Foundation received a grant of $725,000 over three years directed at stewardship of the blufflands on the upper Mississippi in the states of Iowa, Wisconsin and Minnesota. The Iowa Natural Heritage Foundation, the Wisconsin Farmland Conservancy, Minnesota Land Trust, and other public and private agencies in the region have formed the Upper Mississippi River Blufflands Alliance. This alliance works with landowners and local officials to conserve the special character of the blufflands.

[Contact: Gerald F. Schnepf, President INHF, or Mark Ackelson, Project Supervisor, 505 5th Avenue, Suite 444, Des Moines, Iowa 50309. Phone: (515) 288-1846.]

To the Mouth in the South: Grants Awarded in Lousiana

The McKnight Foundation also made a series of grants focusing on pollution problems along the Mississippi River in Louisiana. It is a coordinated initiative designed to help businesses, scientists, agencies, and citizen groups reduce discharges of toxic chemicals. According to Michael O'Keefe, executive vice president, these grants are part of a five-year, $9 million program to maintain and restore a healthy and sustainable environment in the Mississippi River basin.

In September, the Foundation made a grant of $188,000 to the **Center for Energy and Environmental Studies** at Southern University in Baton Rouge for a two-year project that will assess the environmental health of the lower Mississippi corridor.

It also gave $112,000 to the **Coalition to Restore Coastal Louisiana** to study environmentally sustainable economic development, use and land practices and policies in the lower Mississippi corridor.

Three more grants totaling $230,000 were approved December 14, 1993, when the McKnight directors met in Minneapolis:

The **Louisiana Environmental Action Network (LEAN),** a statewide coalition of 65 citizens groups, was awarded a two-year, $93,000 grant for its project to strengthen citizen groups working to reduce pollution and improve protection of the Mississippi River. The grant will expand these groups' access to technical information on sources of pollution and processes that can prevent and control pollution.

McKnight Foundation Grants Help To Preserve, Restore, and Study the Mississippi (continued)

The **Louisiana Nature and Science Center, Inc.,** will use an $85,000 McKnight grant for a two-year project to improve environmental education in public high schools in parishes along the river. The project will give special attention to programs tailored to the needs of low-income communities.

Inform, Inc., based in New York City, was awarded $60,000 over two years to help citizen groups in Louisiana's Mississippi River corridor advocate pollution prevention as a way to reduce emissions from "chemical alley" industries. Inform will conduct workshops to help local citizens identify any threats that the chemical plants pose to their communities and the pollution prevention steps that both citizens and the plants can take.

Another award in Louisiana by the McKnight Foundation is $2.5 million to the **Lower Mississippi River Demonstration Project,** which seeks to help citizens groups, industry, public agencies and scientists work together to reduce the discharge of toxic chemicals in the river corridor between Baton Rouge and New Orleans. The Foundation is especially interested in supporting projects that assist people adversely affected by the degradation of the river but whose situation is often ignored because of prejudice, poverty, lack of access, or organization.

The McKnight Foundation is a private charitable foundation with primary interests in assisting people who are poor or disadvantaged by enhancing their capacity for productive living and encouraging preservation of the natural environment.

[For more information, call or write Dan Ray, Program Officer for the Environment, The McKnight Foundation, Suite 600, 121 South Eighth Street, Minneapolis, MN 55402. Phone: (612) 333-4220.]

Total Environmental Management for Water Quality on the Androscoggin River Watershed in Maine

EDITOR'S NOTE: The following story has been adapted from one written by Donald J. Albert, P.E., that appeared in the winter 1993-1994 issue of the state of Maine's newsletter, the *Nonpoint Source Times*. It's a good article. Thanks, Don, for your help.

When the Clean Water Act was enacted in 1972, the Androscoggin was the same as almost every other major New England river — historically abused and heavily used for food, transportation, power generation, and industrial development.

For the next 20 years, the Maine Department of Environmental Protection (MeDEP) practiced water quality management as called for by the Clean Water Act. Permits were written based on technology limitations (i.e., best practicable and best available treatment) or waste-load limitations. Expansive concrete and steel municipal waste treatment facilities were constructed using federal construction grant monies for municipal treatment works to meet limits established by the permits. MeDEP developed and applied an inspection program to ensure compliance with the permit conditions and, for those facilities with significant violations, enforcement actions (with penalties) normally required additional or improved end-of-the-pipe treatment.

By 1992, the state of Maine was not satisfied that it was really going in the right direction. Something else was needed. New directions had to be found. The water quality management program needed revitalization. Maine's water quality managers took a page from the 1990 Congressionally enacted Pollution Prevention Act and began thinking of Total Quality Environmental Management as an added and necessary approach to water quality management and pollution prevention.

The Current Situation

Maine's water quality standards provide for the lower portion of the Androscoggin to be used for wildlife habitat, fishing, swimming, and other recreational uses. These uses also permit the water to be used for industrial cooling processes, drinking, and power generation as long as the basic recreational and wildlife uses are protected.

Treated wastewater is discharged from 12 publicly owned municipal treatment works along the river. Treated pulp and paper mill wastewater is discharged from a James River mill in adjacent New Hampshire, and from mills owned by Boise Cascade and International Paper in Maine. The river is also impacted by nonpoint source pollution from agricultural and silvicultural activities.

Total Environmental Management for Androscoggin River Watershed (continued)

The Central Maine Power Company has a permit to operate an impoundment at Gulf Island Pond. The pond segment is not meeting the minimum dissolved oxygen (DO) standard of 5 mg/L because of upstream discharges of biological oxygen demand (BOD) and oxygen demand from sediments that exist at the impoundment. Water quality models predict that only the combination of direct river oxygenation and the reduction of oxygen demanding pollutants will enable Gulf Island Pond to meet Maine's water quality criteria.

Currently, the 12 larger communities on the Androscoggin river treat their waste using secondary treatment systems. The smaller communities generally have on-site treatment for individuals or small clusters of homes.

The Turn to Total Quality Environmental Management

In 1990, Congress passed the Pollution Prevention Act to promote the prevention and reduction of pollution at its source instead of at the end of the pipe. The Act suggested that pollution prevention should be viewed as a risk reduction and environmental hierarchy. That is, pollution should be prevented or reduced at its source whenever feasible; pollution that cannot be reduced should be recycled; and pollution that cannot be recycled should be treated. Disposal should be a last resort. Pollution prevention is grounded in two principles:

1. a multimedia view of the environment as a unified whole (to avoid transferring pollutants from one medium to another), and
2. a comprehensive evaluation of the environmental impact of products and activities over their entire life cycles.

Total Quality Management is a new way of thinking, a new paradigm, about management, quality, and customers. Total Quality Management is grounded in the principles of

1. focusing on the customer, improving continuously, empowering people at all levels;
2. thinking in terms of process and systems;
3. using teams to achieve these goals.

Most people agree that pollution prevention is the appropriate control strategy for the 1990s and beyond. Reducing waste before it is generated is generally more cost effective and certainly more environmentally sound than cleaning it up later. The challenge for regulators, municipalities and industry has been to develop a framework that promotes pollution prevention.

In 1991, International Paper and MeDEP agreed to work together to address the issue of water quality problems in Gulf Island Pond. That partnership brought the concepts of pollution prevention and Total Quality Management together, and a framework for implementing pollution prevention was developed.

International Paper and MeDEP formed a team of people from all levels and a systematic approach to reduce the quantity of BOD discharged. The joint effort paid off for the Androscoggin River. Prior to the joint project, International Paper was discharging in excess of 10,000 pounds of BOD per day. After implementing the solutions identified by the joint team, the BOD discharged has averaged less than 4,000 pounds per day. The changes included modifications at the treatment plant and reductions in the waste generated. These efforts have expanded to a multimedia team whose mission is to provide ongoing improvement to the environment. This is accomplished by identifying pollution prevention opportunities through a working relationship that encourages an open exchange of ideas and information. Quality action teams were formed to identify ways to reduce the ammonia, phosphorus, and chloroform emissions at the International Paper mill.

In the summer of 1992, the Total Quality Environmental Management and pollution prevention project at International Paper was expanded to test the new approach to improve the water quality in the entire Androscoggin River basin. A multimedia pollution prevention total quality team was formed at the pulp and paper mill owned by Boise Cascade in Rumford, Maine. The team is currently working on projects to reduce the discharge of ash dust from the mill's cogeneration facility and to improve the effluent quality of the mill's waste water treatment process. For the municipalities along the river, teams including town managers, treatment plant operators, public works managers, MeDEP staff members, and others will handle the water resource issues at the local level.

Total Environmental Management for Androscoggin River Watershed (continued)

The teams will use Total Quality Management principles to identify local issues, determine the root causes of problems, and work to implement feasible solutions. To support the local teams a watershed management team will work to establish a common vision for the Androscoggin River and provide a communication network between and among the local teams.

The Total Quality Environmental Management paradigm is represented by these statements.

- Quality is not defined by the technical experts; quality is defined by the users.
- Focus on the results, or permit compliance, leads to mediocrity.
- Focus on the process leads to continuous improvement.
- People working as a team and given the power will make a difference.

The MeDEP will monitor and evaluate this pilot project closely. If it is successful, other watersheds in Maine will be managed using this new approach.

[For more information, contact Don Albert, Maine DEP, State House Station 17, Augusta ME 04333. Phone: (207) 287-7800.]

Notes on Watershed Management

Chesapeake Bay Restoration Progress Evaluated

EDITOR'S NOTE: In the last months of 1993, our mailbox yielded several publications reporting on a decade of Chesapeake Bay clean up. One is the Chesapeake Bay Program's progress report; another a critique of the Program itself, a sort of "tough love" appraisal by the Chesapeake Bay Foundation, a watchdog organization. The Chesapeake Bay Foundation's *Review* and the Chesapeake Bay Program's *Progress* make fascinating reading for those interested in a restoration effort of these immense proportions. We recommend reading them side by side.

The Chesapeake Bay Program, born in 1983 with the signing of a restoration agreement by the governors of three states, the mayor of the District of Columbia, the EPA administrator, and the chairman of the Chesapeake Bay Commission, is in the process of examining its past and planning its future. Its *Progress at the Chesapeake Bay Program '92 & '93* depicts the ecological status of the Chesapeake Bay and reports on restoration efforts.

Nutrient Reduction a Clear Shot

The centerpiece of the Bay Program is its 40 percent nutrient reduction goal. In 1992, according to the progress report, the Program completed a model-based reevaluation that supports that goal. Not only is excessive nutrient input to the Bay strongly linked to the Bay's water quality and to its biological resources, it is also the Bay's largest easily quantified and potentially controllable problem. One of the Program's greatest accomplishments was the quantifying of the reduction targets for the entire Bay.

In addition, the Program successfully shifted the focus upstream to the tributaries' nutrient sources and established quantitative nutrient reduction goals for tributaries in the four signatory jurisdictions. In 1993, Maryland, Virginia, Pennsylvania, and the District of Columbia began to develop tributary strategies to meet the goals.

The progress report noted that phosphorus concentrations in the main part of the Bay dropped 16 percent between 1984 and 1992, largely because of upgrades in wastewater treatment plants and a regionwide ban on phosphates in detergents.

The Bay has held the line on overall nitrogen levels, but steady population growth around the Bay and its tributaries increased point source discharges of this nutrient. Many of the Bay area municipalities are planning wastewater treatment upgrades that curb nitrogen, but according to the report, such technologies will reduce nitrogen input to the Bay less than originally expected.

Progress on Aquatic Life a Mixed Bag

While progress for some species was realized, others presented frustrating obstacles for the Bay Program. According to the progress report, submerged aquatic vegetation in the Bay has increased a gratifying 75 percent since 1984 (although the Chesapeake Bay Foundation estimates this is only about 20 percent of the acres once covered by it). Several fish species were benefiting from harvest moratoriums, stocking programs, and fish passages.

Chesapeake Bay Restoration Progress Evaluated (continued)

However, oyster populations remained low because of overharvesting, pollution, and disease. The Bay's major fishery, blue crab, is rebounding slowly from population lows, but many consider harvest limits on the blue crab necessary to head off concerns about major damage to this population.

Much of the progress in the "living resources" category came in the form of increased understanding of interrelationships and habitat requirements of the Bay's vegetation, fish, shellfish, and birds. The report also cited accomplishments in the development of plans, strategies, and guidelines for managing species and habitats.

Uncertainty about Toxics

Much about the status and impact of toxics on the Chesapeake Bay remains uncertain. The report states, "No evidence was found of severe, systemwide responses similar to the effects seen throughout the Bay because of excessive levels of nutrients. Low levels of toxic substances have been observed, but they are below thresholds associated with adverse impacts." However, the Chesapeake Bay Program's Toxics Reduction Strategy Reevaluation noted that toxic effects have been seen in some regions of the Bay.

One particular category of toxics — agricultural and residential pesticides — has been the target of numerous voluntary efforts. (See also "News from the States and Localities" in this issue, pp. 16–17 and pp. 20–21.)

Bay Foundation Offers Constructive Criticism

The Chesapeake Bay Foundation is an independent nonprofit organization dedicated to the health of the Bay. With regard to the Chesapeake Bay Program, the Foundation describes its role as "a catalyst and a watchdog; . . . an advocate and an educator; . . . a partner and frequently . . . a constructive critic." Its *Review of the Chesapeake Bay Program's First Decade and Recommendations for the Future* reflects that function.

While recognizing a decade of great progress toward healing the Chesapeake Bay, the Foundation urges the Chesapeake Bay Program to execute the many strategies, policies, and plans that it has developed. Its report counsels the Chesapeake Bay Program to turn knowledge into what it calls "real ACTION PLANS," using quantifiable targets and indicators of progress like the ones developed for the nutrient reduction plan.

The review noted, for example, the need to fully implement the strong plans developed by the program for submerged aquatic vegetation, wetlands, and stock assessment. According to the Foundation, existing plans for such areas as toxics, oysters, and federal facilities should be strengthened.

The Foundation found that some of the Bay Program's six major categories of commitment (living resources; water quality; population growth and development; public information, education and participation; public access; and governance) are still lacking concrete plans of action. The review said, for example, that "unmanaged growth remains the single greatest challenge to the Bay's health," and noted that despite a 1988 report defining the steps needed in this area, only Maryland has passed growth management legislation. "Given the importance of this issue to the Bay, an effort as least as great as has been devoted to agriculture is warranted," the review said.

Tributary Strategies for Nutrient Reduction

The three states and the District specifically targeted this immense problem through the development of tributary-specific strategies designed to achieve the targeted reductions and to attain the water quality requirements necessary to support aquatic species and other wildlife. These tributary-specific strategies will be the tools by which the jurisdictions will meet the Baywide 40 percent nutrient reduction goal.

To develop these strategies, each of the jurisdictions conducted a series of "town meetings" throughout the year to gather ideas from the public about how to reduce nutrients at their source. General public meetings as well as targeted public meetings from groups such as local government officials, farmers, wastewater treatment plant operators, local planning officials, and local watershed restoration groups were all part of the "town meeting" concept. Relative cost effectiveness, environmental considerations, equity, and many other factors were included in the development of these strategies, which are expected to be completed and implementation begun later this year [1993] or early next year.

from *Progress at the Chesapeake Bay Program '92 & '93*

Chesapeake Bay Restoration Progress Evaluated (continued)

In each of the six major categories, following its assessment and criticisms, the Foundation's review offers recommendations to the Bay Program. For example, in the area of population growth and development, the Foundation recommends that the Chesapeake Bay Program Executive Council "actively advocate the passage of state legislation that provides strong guidance and incentives for improved land use planning, including measurable criteria for development, as well as implementation schedules and enforcement measures."

In addition, some of the Foundation's conclusions about the operation of the Bay Program as an entity will be of particular interest even beyond the Chesapeake Bay basin. As watersheds become the operative units for restoration and management projects, more agencies and organizations are confronting (albeit on a smaller scale) similar hindrances. The Foundation called on the Bay program to do a better job of telling the public who was responsible for meeting the Program's commitments, as well as how well they were being met. It also cited parochialism at the state level, and the need for greater public involvement as areas of concern.

While the Foundation's review finds many areas in the Bay Program worthy of improvement, its support for the Program is clear:

> *We are recognizing that the Bay Program is valuable and should be continued. . . . The Bay Program is a national and international model for restoring coastal waters. . . .*
>
> *The Bay Program is not afraid to change and grow as new information is gathered. . . .*
>
> *Although the Chesapeake Bay Foundation and many others may express frustration at the Bay Program's inability to fully implement solutions, most other regions are still struggling to diagnose the problems.*

[For more information on the Chesapeake Bay Program and to obtain a copy of Progress at the Chesapeake Bay Program '92 & '93 (or an accompanying Bay Program publication, A Work in Progress, that gives general background information about the Chesapeake Bay and its restoration), contact Elliott Finkelstein or Kate Naughten, Chesapeake Bay Program Communications Office, 410 Severn Ave., Ste. 109, Annapolis, MD 21403. Phone: (410) 267-5700.

For more information on the Chesapeake Bay Foundation and to obtain a copy of The Review of the Chesapeake Bay Program's First Decade and Recommendations for the Future, contact Michael Hirshfield, Senior Science Advisor, Chesapeake Bay Foundation Inc., 162 Prince George St., Annapolis, MD 21401. Phone: (410) 268-8816. The Review of the Chesapeake Bay Program's First Decade and Recommendations for the Future is also available as a downloadable file, CHES_RPT.ZIP on the NPS BBS. A second file, CHES_SUM.ZIP contains the report's summary. *See page 25 of this issue for log-on information.*

Morro Bay, California: Everyone's Pitching In

Located about halfway between San Francisco and Los Angeles, Morro Bay is a threatened jewel. Its precarious condition has attracted the attention and involvement of many local and state groups who want to reverse the trends imperiling this place of natural grace and beauty.

Morro Bay is the focal point of several projects melded together by an unusual degree of interagency and interorganization cooperation and participation. Part of the wide-ranging endeavor to halt sedimentation of the bay and its resources is a Central Coast Regional Water Quality Control Board monitoring project funded by 319(h) National Monitoring Program. The Regional Board, in cooperation with the California Polytechnic State University is monitoring several sites in the watershed for water quality and habitat improvements resulting from better land use practices, primarily on rangeland. Monitoring parameters include suspended sediment, turbidity, dissolved oxygen, temperature and other parameters.

Some of the cooperating projects are

- The California Coastal Conservancy's inventory of sediment sources to the Bay, and watershed enhancement plan, begun under contract with the Coastal San Luis Resource Conservation District with cost-share funds for BMP implementation by landowners. The SCS is also working through the Resource Conservation District on land improvements in the watershed.
- Cooperative Extension has watershed education programs for adults and youths.
- The California National Guard, a major landowner in the Morro Bay watershed, contracted with SCS to develop a management plan for grazing and road management on its holdings.

Morro Bay, California: Everyone's Pitching In (continued)

- State funding from the Coastal Conservancy and Department of Transportation has been used to purchase land that will be restored as a functioning floodplain.
- Central Coast Regional Water Quality Control Board is studying, with financing from EPA, the watershed's abandoned mines. The Board also obtained from EPA a Near Coastal Waters grant to develop a watershed work plan incorporating EPA's coastal NPS management measures and to develop guidance packages for agencies whose activities may affect the watershed's water quality.

[For more information, contact Karen Worcester, Central Coast Regional Water Quality Control Board, 81 Higuera St., Ste. 200, San Luis Obispo, CA 93401. Phone: (805) 549-3333.]

News from the States and Localities, Where the Action Is

In Maryland, Golf Courses Score Hole-In-One

Golf courses have historically required the alteration of considerable land area, consumed large volumes of water, and needed a heavy doses of fertilizers and pesticides to keep them green. Consequently, golf courses that are improperly located in sensitive areas, or are poorly designed, constructed, and maintained can degrade surface water, terrestrial and groundwater resources. For example, one study reported that more than 50 percent of the nitrogen in fertilizer leached from turf when improperly applied.

Maryland's Baltimore County is leading a movement toward environmentally friendly golf courses with its environmental guidelines for the design and maintenance of golf courses. According to Rocky Powell, a natural resource specialist in the county's Department of Environmental Protection and Resource Management, since the guidelines were implemented in 1989, they have been applied to seven private and two public golf courses in the Baltimore area.

Powell reported that the guidelines' principles have been applied in suitability studies on an additional 13 sites identified as potential public golf courses. The guidelines include protection of streams, wetlands, and other habitat; groundwater protection; and water quality monitoring as well as forest clearing limits and other specifications. The first golf course to implement the guidelines was the Caves Valley Golf Club.

Caves Valley began operation in the spring of 1991. Powell stated, "The environmental issues raised during the initial zoning and development review of this project in 1988 and the subsequent design modifications and mitigating measures required for approval, formed the basis for the guidelines." From that process, Baltimore County learned that close coordination between county staff and the developer's engineer and architect is key during the planning and design phases of a golf course.

The Baltimore County guidelines encourage golf course developers to begin thinking about existing natural resources and how they will be protected early in the planning process, according to Powell. Identification and mapping of geology, soils, topography, stream and wetland systems, vegetative communities, wildlife habitat, and an assessment of the local groundwater supply and its vulnerability to contamination are critical to determining the suitability of a prospective site for development, he said. Early environmental analysis allows resource protection measures required by ordinance and any original schemes introduced by the developer's engineer or architect to be incorporated during the preliminary phases of the project while the design is still conceptual and fluid.

Baltimore County's guidelines take the guesswork out of the process by providing developers with a checklist of specific environmental issues that must be addressed. The checklist includes aquifer testing, water balance assessment, situ (soil) permeability, baseline water quality, IPM plan, and other items. Also included are an outline of evaluation methodologies, design criteria, construction specifications, and maintenance practices developed to address each issue.

Caves Valley has implemented and continues to maintain the resource protection measures and best management practices included in the approved plan: forest buffers along streams and

wetlands, afforestation (converting of open land to forest), water quality management facilities, an integrated pest management program, and a monitoring program.

A surface water and groundwater monitoring component provides information on baseline (preconstruction) and operational conditions. Powell said that this data provides important feedback on the effectiveness of resource protection measures and golf course maintenance practices. Powell added that based on several years of experience, Baltimore County has decided to revise its surface water monitoring program, placing more emphasis on sampling of storm events.

The club has just completed its third and final year of operational surface water monitoring. Powell is encouraged by the results; they indicate that the golf course has had little or no effect on water quality and aquatic resources in the area. He anticipates that coordination and cooperation between the golf course superintendent and county staff will continue over the long term.

Golf Courses Topic of Environmental Conference

On Saturday, June 4, 1994, the Environmental Studies Department of Antioch–New England Graduate School will hold its fourth annual topical conference. This year, the four panel discussions will focus on the environmental impact of golf course development. Alexandra Dawson, director of the Resources Management Program in the Environmental Studies Department, said that last year's conference targeted the environmental impacts of ski resorts. At this year's conference, Dawson expects to have representatives of citizen groups that oppose golf course development as well as some "green" golf course managers. The one-day meeting will be held on the Antioch–New England campus in Keene, NH. For more information, contact Alexandra Dawson, Antioch–New England, Roxbury St., Keene, NH 03431. Phone: (603) 357-3122, ext.205.

A Golf Course Designed for Water Resource Preservation

Across the state, on the eastern coast of Maryland, Eagle's Landing Golf Course was designed as a model for environmental and water resource preservation, according to Course Superintendent Joseph Perry. Operated by the town of Ocean City, it was designed with a goal of retaining 70 to 80 percent of stormwater. Town officials contacted 30 architectural firms and reviewed three proposals before they finally selected a golf course architect with expertise in environmental planning, Perry reported.

According to Perry, in addition to building four ponds covering nearly 15 acres, shallow wetland ponds no deeper than two feet and totaling 12 acres were constructed. The wetlands are heavily vegetated with cattails, horsetails, rushes, and many marshland plant varieties.

"When the stormwater and point source pollution management designs were installed, we had created over 27 acres of wetlands, treated nearly all of our own stormwater and subsequently constructed a golf course which is rated nationally for its quality, esthetics, and playability," said Perry.

Consistent with the course's integrated pest management system, all wetland ponds have been stocked with Gambusia, a mosquito larva-eating fish.

Other environmental quality management features of this golf course, according to Perry, are use of slow release fertilizers; curative pest control programs; pest scouting; disease and insect resistant grass varieties on the fairways, greens, and tees. The course management also sets an established level of acceptable turf pests. "In over three years," reported Perry, "we have not made a single fungicide or insecticide application to our fairway areas."

[For more information on Baltimore County Golf Course Guidelines contact Rocky O. Powell, Natural Resource Specialist, Baltimore County Department of Environmental Protection and Resource Management, 401 Bosley Ave., Suite 416, Towson, MD 21204. Phone: (410) 887-3755. FAX: (410) 887-4804. For information specific to the Caves Valley Golf Club, contact Bruce Cadenelli, Superintendent, Caves Valley Golf Club, 2910 Blendon Rd., Owings Mills, MD 21117. Phone: (410) 356-1317. FAX: (410) 356-1367. For information on Eagle's Landing Golf Course, contact Joseph A. Perry, Superintendent, Eagle's Landing Golf Course, 8828 Bald Eagle Lane, Berlin, MD 21811. Phone: (410) 213-7277. FAX: (410) 213-7220.]

Pennsylvania's Conservation Districts Tailor NPS Education to Local Priorities

EDITOR'S NOTE: Thanks to Carl Rohr, of the Division of Nonpoint Source Management, Pennsylvania Bureau of Land and Water Conservation, for submitting this information to News-Notes.

A new twist on funding educational projects has spawned such programs in Pennsylvania as "Municipalities Land Development Education Program" for elected officials in Butler County, and "Sediment Pollution Control for Light Duty (Unpaved) Roads" for road maintenance supervisors in Indiana County. In Perry County, the "Methane Digesters Education Project" is being presented to the agricultural community, and Clearfield County school district educators are targeted in the "Acid Mine Drainage Educational Resource Program."

These and other information and education efforts with a local spin were funded by a FY92 Section 319 grant of $219,000 to Pennsylvania's conservation districts. Although past grants had targeted conservation districts within the state's Chesapeake Bay watersheds and those with primarily agricultural audiences, the state had never before achieved an educational program that would address multiple nonpoint source problems throughout the entire state.

The ball started rolling for statewide participation early in 1993, when a small committee of several conservation district managers and Bureau of Land and Water Conservation (BLWC) staff put together criteria for project proposals. The solicitation, open to all Pennsylvania conservation districts, required that each project address a local NPS problem and target a specific audience. Projects could be sponsored by single districts, with budgets ranging up to $5,000. Other projects, with multidistrict sponsorship could receive funding in excess of $5,000; however, their distribution and applicability had to be statewide.

"The idea," said BLWC's Carl Rohr, "was to invite a broad range of proposals that addressed different NPS pollution problems specific to counties."

By September, projects sponsored by nearly half of the state's conservation districts and addressing NPS culprits from agriculture to habitat modification had been signed off on. Thirteen were multidistrict projects.

According to Rohr, "We seem to have targeted a very diverse audience throughout the state. The one thing the projects have in common is a tie with the local community. So far, the program has been successful in distributing limited resources across the state." Rohr reported that most of projects are in full swing now, and he anticipates many new videos, displays and exhibits, brochures and newsletters, demonstration projects, and other educational materials. One conservation district is even building a miniature methane digester to use in exhibits.

A summary of Pennsylvania's conservation district Nonpoint Source Education Project under the section 319 grant is available on request. Educational materials may be available as projects are completed.

[For more information, contact Carl Rohr, Nonpoint Source Section, Division of Nonpoint Source Management, Bureau of Land and Water Conservation, P.O. Box 8555, Harrisburg, PA 17105-8555. Phone: (717) 787-5259.]

Nonpoint Source Management in New York State Grows Grass Roots

EDITOR'S NOTE: Thanks to Rick Georgeson of New York State Department of Environmental Protection's Division of Water for this story.

New York State has taken an innovative approach to encourage the cooperation and coordination based on *local* priorities that is essential for addressing nonpoint source pollution. Building from the bottom up, county Soil and Water Conservation Districts have asked counties to form county Water Quality Coordinating Committees and prepare water quality strategies to address nonpoint source pollution problems.

To help counties, the New York State Soil and Water Conservation Committee and the state Department of Environmental Conservation developed guidelines for preparing the county water strategies. The guidelines suggested committee membership and structure and described what should be included in a strategy. The guidelines outlined certain minimum criteria for a strategy, but counties were given wide latitude in exactly what individual strategies could contain.

Strategies must include a mission statement and describe the responsibilities, composition, and function of the county committee. County strategies must also include a watershed-specific list of prioritized water quality problems and a list of goals and objectives for public participation, ongoing problem assessment, and overall program evaluation. The strategy must also list tasks for achieving each objective, as well as who is responsible for each task, the estimated time for completing each task, potential funding sources, and estimated costs.

As an incentive, each county that developed a strategy meeting the minimum requirements by August 31, 1992, received a one-time payment of $4,750 that could be used to implement a portion of their strategies. Fifty-five of the 57 counties outside New York City completed their strategies in time to qualify for this payment. The remaining two counties have since completed their strategies.

Committee membership is voluntary and comprises representatives from local organizations involved in preventing nonpoint source pollution (i.e. local health departments, soil and water conservation districts, planners, county Extension offices, and community organizations). Each committee, through its strategy, identifies and sets local priorities for nonpoint source pollution prevention.

Counties found that preparation of the strategies helped organize and focus diverse constituencies on the complex problems of nonpoint sources. The committees have been successful in improving communication, reducing duplication, and maximizing resources among agencies. Turf conflicts have been reduced while the roles and responsibilities of participating groups and agencies have been clarified.

In addition, the strategies are helpful to agencies such as New York State Department of Environmental Conservation (DEC), New York State Soil and Water Conservation Committee, regional planning boards, and the USDA Agricultural Stabilization and Conservation Service when selecting projects for funding.

Key components of the strategies include the documentation of water quality problems and identification of actions to address those problems. Having this information readily available allows counties to move swiftly when funding opportunities arise.

Many of the goals and objectives of the strategies are similar throughout the state. Rensselaer County's goals, for example, are (1) to establish a coordinated water quality program emphasizing local roles and responsibilities to identify and address nonpoint source pollution, and (2) to enable the county to take advantage of future water quality funding as it becomes available through EPA, DEC, and other sources.

Rensselaer County's objectives include the following items, among others:

updating nonpoint source county assessment,

increasing local public awareness of water quality issues,

developing nonpoint source implementation guidelines and plans; and

establishing a method for evaluating and reporting nonpoint source projects.

To date, a number of county committees have put their incentive funding to good use:

- Chemung County held workshops on wellhead protection, septic systems as a source of nonpoint source pollution, and pesticide application in urban situations.
- Chenango County held a water testing clinic and distributed information on how to protect private water supplies from nonpoint sources of pollution.
- Cayuga County helped fund the removal of contaminated sediments from a priority waterbody.
- Chautauqua County worked with the Chautauqua Lake Association and other groups on a nutrient budget study to determine sources of nutrients in the watershed.
- Hamilton County helped fund a computer modeling project in the Sacandaga Lake watershed to examine different land uses and determine their relative contribution of nonpoint source pollution in the watershed.
- Ontario County conducted a soils-digitizing project on a priority watershed flowing to Seneca Lake.
- Schenectady County contributed funds to assist with a wellhead closure project.
- Steuben County helped fund the production of a local video on barnyard management problems.

Nonpoint Source Management in New York State (continued)

The strategies have proven an effective first step in recognizing and addressing nonpoint source pollution problems at the local level using local priorities.

[For more information about county Water Quality Coordinating Committees in New York State, contact James McCardell, Assistant Executive Director, New York State Soil and Water Conservation Committee, 1 Winners Circle, Albany, NY 12235. Phone: (518) 457-3738.]

Public's Interest in Water Quality Nurtured Through Lawn Care Program

Proclaiming "you're the solution to water pollution," a local Extension office in Virginia has launched an all-out effort to change residents' gardening practices. The program focuses on residential lawn, garden, and septic practices in rapidly developing Prince William County, where runoff from yards has been a problem for local waterbodies as well as the Chesapeake Bay.

Water Quality Program Specialist Marc Aveni and Water Quality Technician Ludwig Hartung saturate the county with water quality-related articles, inserts, and promotional items. In addition, a demonstration component of this residential water quality program uses a cascading flow of information to educate at the grassroots level. Individuals are given training in applying Extension lawn care recommendations. After a year of practice, guided by one- on-one visits from the program's experienced Master Gardener volunteers, the resident's lawn is designated a neighborhood "demonstration lawn" and is identified with an attractive sign.

The four year old program also brings residents to local parks for fall and spring field days. Last year, the field days drew 521 people. Aveni explained that he schedules topics to coincide with the season. This spring, the four field days cover mowing and pruning, backyard composting, integrated pest management, and planting to avoid problems.

Interest in the last topic is particularly high. "After we had been doing this for a awhile," said Aveni, "we realized that a lot of issues were from people who planted the wrong thing in the wrong place." People in northern Virginia often want to grow Colorado blue spruce, or they plant tall-growing trees under overhead wires, Aveni observed. "We recommend plants that are known to grow well in this area. These plants generally require less in the way of fertilizers and pesticides. We also recommend varieties that fit the available space, reducing pruning and yard waste."

Aveni is not preaching to the choir. He is reaching the average person who simply wants his or her lawn to look good. In the beginning, he said, his primary message had been about water quality. It had been a good message — for people who were already knowledgeable and concerned about water quality. But the calls coming into his office were questions about what kind of fertilizer to use and what to do about pests. Aveni capitalized on that interest to show county residents how to have a good-looking lawn *and* protect water. The approach is working in both directions; according to a survey, participants both improved their water quality awareness and felt that the information they received improved their lawns' appearance.

The pre- and postsurveys provide what is often missing from educational efforts: a measuring stick for success. Aveni describes the surveys as "very encouraging so far."

He explained:

- The presurvey showed that less than 20 percent of the target audience tested their soil before fertilizing; this number rose to 98 percent in the postsurvey.
- Before participating in the program, only 40 percent fertilized in the fall (the proper season for cool-season grasses); that doubled following the program.
- Sixty-six percent used pesticides regularly both before and after participating in the program, but after the program, 72 percent took time to identify and target the pest before applying pesticides.
- The presurvey showed that 52 percent bagged their yard clippings to be land-filled; the postsurvey revealed that 62 percent were composting yard waste.
- Before being involved in the program, 37 percent did not know that nutrients were linked to the Chesapeake Bay's decline; 85 percent made the connection afterwards.

To a lesser extent, the program also focuses on another residential nonpoint source: septic systems. The county contains about 9,300 residential septic systems and estimates that 1,500 are experiencing system failure. Using information generated by Virginia Tech on alternative

Public's Interest in Water Quality Nurtured through Lawn Care Program (continued)

systems and maintenance practices, the program has held seminars with builders, the health department, and homeowners.

The Residential Water Quality Program is the recipient of a 1993 Governor's Environmental Excellence Award presented by then-Virginia Governor L. Douglas Wilder. In addition, the program is being looked at for possible expansion throughout the Chesapeake Bay region. A program guide containing the information needed for another locality or agency to conduct a similar program will be available in the fall of 1994.

[For more information, contact Marc Aveni, Water Quality Program Specialist, Virginia Cooperative Extension, Prince William County Office, 8033 Ashton Ave., Ste. 105, Manassas, VA 22110. Phone: (703) 792-4630.]

Pennsylvania Combats Acid Mine Drainage with Fly Ash

EDITOR'S NOTE: Thanks to Joseph Schueck and Melanie Sayers of Pennsylvania's Department of Environmental Resources for submitting this story.

Clinton County, in the midst of Pennsylvania's coal region, is a rural area of forested mountains and freestone streams that used to support a healthy population of brook trout. The waters of Camp Run and Rock Run are clear, but the rust-colored streambeds indicate a problem, one that is familiar to folks in this area — acid mine drainage (AMD). The two streams in the Sproul State Forest receive the drainage from a 37-acre mine site that was reclaimed in 1977.

The first indication of problems was a fish kill in 1978. Discharges of acid mine drainage estimated at about 35 gallons per minute destroyed five miles of native trout streams. The cost of remediation was much more than the bonds posted for the site, so the owner forfeited the bonds to the state.

Stopping the Chemical Reaction

In 1992 and 1993, using section 319 Nonpoint Source pollution funds, the state Department of Environmental Resources (DER), Bureau of Mining and Reclamation set out to remediate the acid mine drainage. They operated under the principle that if the pyritic spoil material is isolated from water and oxygen, the chemical reaction that results in acid mine drainage will stop. For stream recovery, aluminum levels must also be reduced, and data suggests that as pH increases, aluminum decreases.

First, DER used electromagnetic terrain conductivity, magnetometry, and very low frequency to characterize the site and identify pods of pyritic materials contained in the backfill. More than 600 holes were drilled into the pods and injected with a mixture of fluidized bed combustion (FBC) ash and water that formed a grout. The objective was to cap and fill the cracks and spaces around the piles of pyritic material with the grout, which forms a cement-like layer.

Only "Good" Fly Ash Used

FBC ash is different from fly ash produced in traditional pulverized coal combustion systems and does not leach deleterious amounts of heavy metals. Only good quality ash from an atmospheric fluidized bed combustion system, a method of power generation used by some electric plants, was used. The use of FBC in remediating the acid mine drainage was a beneficial use of a waste product that is usually disposed of in landfills.

Grout injection began in 1992, and the majority of grouting was completed in 1993. Throughout the procedure, workers tried to minimize disturbance of vegetation and wildlife that included a den of rattlesnakes residing on one of the downslopes.

Long-Term Monitoring Will Determine Procedure's Usefulness

Water quality data on the site has been collected since 1989. A total of 36 monitoring wells were drilled on and adjacent to the site for monthly water quality sampling. Fly ash is highly alkaline and is expected to help increase the site's very low pH. Prior to injection with fly ash, the pH of samples from the site averaged 2.1. Long-term groundwater and stream monitoring are planned to fully determine the ability of the fly ash grout to abate the production of acid mine drainage, but preliminary results are encouraging.

Remapping of the site using electromagnetic terrain conductivity will also be used to determine any changes in conductivity patterns.

Pennsylvania Combats Acid Mine Drainage (continued)

The Team

How was all of this work accomplished? Joe Schueck, a hydrogeologist with the Bureau of Mining and Reclamation, is the project leader. Volunteers from many bureaus throughout the department traded their normal duties for three days to a week to drive tank trucks, haul water, and shovel fly ash. There is nothing dirtier than fly ash. The days were long, the work was hard, but the volunteers shared the satisfaction of knowing that they were participating in a project that may help restore Pennsylvania's mountain streams. May the next trip to Camp Run be a fishing trip!

[For more information, contact Joseph Schueck, Bureau of Mining and Reclamation, or Melanie Sayers, Bureau of Land and Water Conservation, Department of Environmental Resources, P.O. Box 8555, Harrisburg, PA 17105-8555 Phone: (717) 787-5259. This work will be published in the proceedings of the International Lands Reclamation and Mine Drainage Conference and the 3rd International Conference on Abatement of Acidic Drainage, April 25-29, in Pittsburgh, PA. Contact Debbie Lowanse at (412) 892-6708 or FAX: (412) 892-4067 for more information on the conference or proceedings.]

News of the Coastal Nonpoint Pollution Control Program

EPA and NOAA Conduct Threshold Review of New York's Coastal Nonpoint Program

A threshold review of New York State's proposed coastal NPS program revealed that, in addition to using existing programs to address many management measures, the state is also planning to propose some creative legislation to address gaps in their current authorities. New York requested the threshold review for all six categories of its program: agriculture, urban, forestry, hydromodification, marinas and boating, and wetlands and riparian areas.

In addition, during the review, which was conducted in mid-January, the state discussed its proposals for other program elements, such as monitoring, critical coastal areas, and public participation.

New York's innovative legislation will address existing on-site disposal system inspection, agricultural pollution, and construction site sediment and erosion control. For example, the state is seeking legislation which would require the development of farm plans to address the applicable section 6217 agricultural management measures through a variety of practices tailored to each farm. Another example is legislation that would require on-site disposal systems to be inspected at the time of property transfer. The state is also proposing amending the state building code to include standards for the management of quality and quantity of stormwater runoff for activities subject to the code.

Both the federal and state participants felt that the open dialogue of the review meeting was an excellent opportunity to provide guidance and exchange ideas on addressing the management measures. In particular, EPA and NOAA were very impressed with the state's demonstrated initiative and progressive attitude toward development of its coastal nonpoint program. NOAA, in cooperation with EPA, has prepared and sent comments to New York.

[For more information, contact Stu Tuller, NPS Control Branch (4503 F), U.S. EPA, 401 M St., SW, Washington, DC 20460. Phone: (202)-260-7100; or Marcella Jansen, NOAA, 1305 East-West Highway, 11th Floor, Silver Spring, MD 20910. Phone: (202) 606-4181; or leave a message in the Coastal NPS Special Interest Group (SIG 8) on the NPS BBS for John Kosco of EPA's NPS Control Branch.]

Notes on Environmental Education and having fun at the same time

Public-Private Collaboration Encourages Kids to be Environmental Champs

It began with a request for positive publicity about happenings in the Columbia, South Carolina, school system and ended with a marriage of business, media, government, and education. Local television station WACH, and corporate sponsors, Union Camp Forest Products and E.I. DuPont, are working with the state nonpoint source program to present

Public-Private Collaboration Encourages Kids to be Environmental Champs (continued)

"Champions of the Environment." The innovative television campaign profiles students carrying out environmental projects such as the wetlands study conducted by the Environmental Studies class at Spring Valley High School. The Spring Valley students, featured in one of the 60-second news spots, were honored for their work in a nearby wetland.

Class Studies Wetlands

The class participated in a nationwide study that tracked the condition of the country's wetlands. The Spring Valley students collected data on dissolved oxygen, diatom diversity, animal and plant diversity, pH levels, and turbidity from the Rice Creek wetland. Students conferenced by satellite with the study's leaders at the University of Nebraska and shared information with other schools via computer.

The Spring Valley class was one of 18 Champions of the Environment to be chosen during the 1993-1994 school year. Two Champions, which may be classes or individual students, are selected each month for the news segments.

"Champions of the Environment" promotes hands-on learning by recognizing students working on exemplary environmental projects beyond the usual realm of the classroom. In each news segment, a fellow student interviews the featured student about the project. Scenes of the project are shown, and the interviewer presents the Champion with a medallion. WACH-TV shoots the segments on location, does the graphics and editing, and furnishes some of the air time. WACH-TV also designed the on-air concept and put it into news format.

The Partnership

"'Champions of the Environment' is an excellent program which allows Union Camp to channel our resources toward education, the environment, and our young people. It is an opportunity for industry and education to work together to provide young people with a unique educational experience," said Susan Vaughn McPherson of Union Camp. Union Camp's national headquarters in New Jersey provides funds for the Champions program from an educational grants program, but its role in the program is administered through its local plant in Eastover.

In contrast, DuPont's sponsorship is all from the local level, with funds coming from the company's Camden, South Carolina May Plant. "DuPont is happy to help cosponsor the Champions of the Environment educational program," said the environmental coordinator for DuPont's plant, Dwight Hanks. He said the program was a good opportunity for DuPont to interface with the schools at the local level. Hanks feels that industry needs to inform teachers about what is required to prepare students for the workplace of today.

As project cosponsors, DuPont and Union Camp each contribute $1,100 per month toward advertising, videotaping, and a scholarship prize, which will be awarded to one of the 18 Champions in April.

DuPont and Union Camp meet with an advisory board consisting of representatives of WACH-TV, the state Department of Education, South Carolina Science Council, and the state Department of Health and Environmental Control to select two Champions each month.

The goal of the partnership is twofold: to develop public awareness and solutions to water pollution and other environmental problems; and to recognize students and classes doing innovative projects.

The station airs each of the two spots featuring that month's Champions 25 times a month. WACH-TV estimates that the spots reach 670,000 viewers each month.

For educational guidance in selecting projects for the Champions program, the partnership turns to a new publication entitled *Benchmarks for Science Literacy* produced by the American Association for the Advancement of Science. The publication advocates enabling students to "do science" to achieve an increasingly comprehensive and reliable understanding of human beings and their environment.

Many of the student projects recognized by the Champions program were designed by the students themselves. Among those students selected to be Champions are

- a high school junior who studied the use of wood chips in absorbing oil spills,
- a senior at South Carolina Governor's School for Science and Mathematics who researched the filtering potential of oysters to improve the quality of effluent discharged from intensive and semi-intensive mariculture ponds, and
- another senior at the Governor's School who researched the ability of *Alcaligenes eutrophus* to produce a fully biodegradable plastic.

Public-Private Collaboration Encourages Kids to be Environmental Champs (continued)

All of the school-year's Champions of the Environment will be present April 9 at Riverbanks Zoo in Columbia, where they will be commended for their work. One recipient will be awarded a $3,000 scholarship. Will it be the wetlands study, kids cleaning up the environment, research on oysters, or another student project not yet announced? The judges have their work cut out for them choosing between the many innovative and thought-provoking endeavors.

[For more information, contact Phil Hayes, Public Information Division, Nonpoint Source Program, South Carolina Department of Health and Environmental Control, 2600 Bull Street, Columbia, SC 29201. Phone: (803) 734-5078; Lennie Philyaw, WACH-TV, 1221 Sunset Blvd, West Columbia, SC 29169. Phone: (803) 791-5757; Susan McPherson, Union Camp Corporation, PO Box B, Eastover, SC 29044. Phone: (803) 353-7653; or Dwight Hanks, E.I. DuPont, PO Box 7000, Camden, SC 29020. Phone: (803) 425-2558.

What Will She Ask?

Lauren Lucas, a seventh grade student at Northside Middle School, was the first Champion. She organized a group of students to do community environmental projects. Her project's name, KIDS ACT, stands for Kids Accepting Challenges Today. Lauren is currently being considered as a participant on a national TV special in which President Clinton will answer questions from children all over the country. She was recommended because she is a Champion of the Environment and a first place winner in a magazine essay contest.

Project WET Spins Water Education Network

EDITOR'S NOTE: Material for this article was contributed by Dennis Nelson, director of The Watercourse and National Project WET and Sandra Robinson, assistant director.

The idea that environmental education is a lifelong process is the common basis of two sister programs coordinated by the Watercourse, a national adult and youth water education program located in Bozeman, Montana, and funded by the Bureau of Reclamation. The Watercourse Public Education Program and National Project WET (Water Education for Teachers) share the goals of promoting and facilitating public understanding of water resources and related management issues. Project WET's creative activities and teaching aids target classroom (preschool and K-12) and community educators. The Watercourse Public Education Program focuses on contemporary water management issues for adults. Together, they are providing the public, from preschool through adulthood, with a continuum of water education materials, instruction, and training.

Project WET began to be developed in 1990, when the Watercourse formed a partnership with the Western Regional Environmental Education Council with funding from the U.S. Department of the Interior, Bureau of Reclamation. The Council's previous success with the national and international programs, Project WILD and Project Learning Tree, paved the way for National Project WET.

National Project WET's information network, the WETnet, allows state Project WET program coordinators to form alliances with a spectrum of water education interests, many with existing networks (Conservation Districts, Extension Services, local, state and national environmental education associations and private resource organizations). Through the network, associations and partnerships are able to collaborate on outreach activities.

National Project WET's first networking effort was a 1992 regional writing workshop. Since then, the Project has conducted several more workshops involving hundreds of educators and resource specialists from fifty states, the District of Columbia and three U.S. Territories. At the workshops, attendees generated water-related activities and lessons that covered concept areas such as the physical and chemical properties of water; life and earth systems; water as a natural resource; water management; and social, cultural and historical associations. These activities will be published in the Project WET Curriculum and Activity Guide, available December 1994. The guide will be available to educators through workshops.

Nonpoint Source Targeted for Materials Development

Project WET has identified nonpoint source pollution as a major area of concern and has launched an aggressive materials development program.

Project WET is incorporating NPS lessons and activities into its publications. One of its chief goals is to instill an environmental ethic that leads to positive action. Learners are encouraged to

Project WET Spins Water Education Network (continued)

recognize that their own roles affect the nonpoint source problem and its solution. The following is a highlight of publications and teaching aids that will include nonpoint source information.

Project WET Curriculum and Activity Guide. This guide will include 100 activities, many dedicated to nonpoint source pollution. The lesson format includes "Charting the Course," a series of activities that provides educators with a systematic course of study dedicated to a particular topic. Each activity contains an "Action" component which moves learners beyond the classroom and describes how they can involve friends, family, communities, and state and national audiences in their learning process.

Liquid Treasure Water History Trunk: Learning From the Past. Water issues today are a reflection of past actions or inaction. This water-based environmental history project discusses the importance of water from a historical perspective. The program is appropriate for all ages and adds scope to any environmental education program.

The Liquid Treasure guide is currently available. In development is a water history module. This module will contain 25 to 30 original water history activities and a wealth of background information.

Groundwater Education Program. Project WET's groundwater education program centers around a model originally designed by the University of Wisconsin-Stevens Point and replicated by groups across the country. Project WET will create a groundwater module with the support of several major groundwater organizations to supplement its existing program.

Discover a Watershed Project Series. In partnership with the South Florida Water Management District, National Project WET is developing "The Everglades," as the first title in this series. The District will use this publication in its secondary environmental education program, and National Project WET will distribute the materials nationwide and internationally. National Project WET will form partnerships with organizations from other watersheds in subsequent projects in the series.

A Wet Future

Currently, the network has over 20 state Project WET programs and is hoping to involve all 50 states by the year's end. In 1995, Project WET will initiate its international program. Canada, Spain, Australia, Japan and others have expressed interest in an international affiliation. As the network of national and international water educators, managers, and learners grows, the earth's waters will not only be recognized as a shared resource, but also as a shared responsibility.

[For more information, contact National Project WET, 201 Culbertson Hall, Montana State University, Bozeman, Montana 59717. Phone: (406) 994-5392.]

NPS Electronic Bulletin Board News

This portion of *News-Notes* is prepared by Elaine Bloom (Tetra Tech), for the benefit of the ever-increasing numbers of *News-Notes* readers who are regular users of U.S. EPA's *NPS BBS*. Tetra Tech is the contractor for the operation and content of the *NPS BBS*.

Nonpoint Source Electronic Bulletin Board System (NPS BBS). EPA's *NPS BBS*, through the user's personal computer, provides timely, relevant NPS information; a nationwide forum for open discussion; and the ability to exchange computer text and program files.

Special Interest Group Forums (SIGs or minibulletin boards) are dedicated to specific topics. Currently, there are eight SIGs on the *NPS BBS*: Watershed Restoration, Agriculture, Fish Consumption Risk Management, TMDLs, Waterbody System Support, NPS Research, Volunteer Monitoring, and Coastal NPS Control.

All articles from all issues of News-Notes are stored on the *NPS BBS* and may be retrieved on your personal computer. A searchable News-Notes database helps you find the information you need.

The *U.S. EPA Nonpoint Source Information Exchange Computer Bulletin Board System (NPS BBS) User's Manual* (Publication number EPA 503/8-92/002,) may be ordered by mail or FAX from NCEPI, 11029 Kenwood Road, Bldg 5, Cincinnati, OH 45242. FAX # (513) 891-6685. There is no cost. (Be sure to include both the title and the publication number in orders sent to NCEPI.)

To access the *NPS BBS*, you will need • A PC or terminal • Telecommunications software (such as Crosstalk or ProComm) • A modem (1200, 2400 or 9600 baud) • A phone line.

The *NPS BBS* phone number is (301) 589-0205. Parameters are N-8-1.

New BBS Features!

You may have noticed that the *NPS BBS* looks a little different. In the spirit of the new year, we have installed a new version of PCBoard (version 15.0), the software that runs the *BBS*. This new version of PCBoard is much more versatile and will allow us to greatly customize the *BBS*, making many functions more user friendly. While we will continue changing the look and feel of the *BBS* over the next few months, there are a few changes that are already in place. Main Board Bulletin #14, which can be read online by typing B 14, describes the most significant of these changes. For example, the "chat" function, which allows users online simultaneously to communicate, is now much more versatile. Be sure to read Bulletin 14 before trying the new "chat."

There are also a few features that we either have not yet enabled or have not yet figured out. We will update you on these in the future.

In addition, be sure to take advantage of the *BBS* help screens. From the "Main Board Command?" prompt, type H followed by the command you want help with. From any other command prompt, simply type H for help with the options for that prompt.

The manual for the *NPS BBS* has not yet been updated. We want to further configure the new software to make it even more flexible and easy to use. We will revise the online menus and prompts to make them more self-explanatory. Then, and only then, will we undertake the revision of the manual. Until the new manual comes out, please use the online help screens which are already updated.

Reviews and Announcements

In South Dakota, Twin Videos Educate Urban and Rural Residents

The fictional Meyers family goes for an outing to its favorite lake and finds it polluted. They say, "Who could have done such a thing? There are no industries dumping stuff into the lake."

This is the common beginning to these twin videos, one targeting urban residents and the other rural. In the first, viewers visit the Meyers' urban home and find the family doing common household tasks and unknowingly contributing to polluted runoff. It also explains how construction sites, snow and ice removal, and abandoned wells can pollute.

The second video features the Meyers living on a farm and again carelessly polluting the lake and even their own well. In a humorous, low-key way, the video suggests many alternatives that reduce pollution.

The videos describe things city and country dwellers can do to prevent pollution, such as becoming active in an environmental group or writing to elected officials. The common conclusion to both videos shows an enlightened Meyers family more aware of their actions and vowing to use Best Management Practices.

Entitled "Nonpoint Source Pollution — Community" and "Nonpoint Source Pollution — Rural," the videos were produced by the South Dakota Department of Environment and Natural Resources as a part of the department's Nonpoint Source Information and Education Program. The creative film makers saved production money by using the same opening and closing sequences.

The videos are suitable for civic or service club meetings and, since they don't refer specifically to South Dakota, may be useful throughout the country.

[For more information about the videos, contact Roy Richardson. Phone: 1-800-GET-DENR. Copies can be purchased for $8.45 (including shipping) by contacting Lawrence & Schiller, Inc., 3932 South Willow Avenue, Sioux Falls, SD 57105-6293. Phone: (605) 338-8000 or 1-800-888-8470, ext.104.]

Film Shows How Colorado River (Texas) Has Fared in Last Half Century

EDITOR'S NOTE: Our thanks for this review to regular *News-Notes* contributor Susan Alexander, reporting "on location" in Dallas, Texas, at EPA Region 6.

A Run Unto the Sea—The Adventures of the Abilene Boys is as much a story of a river as it is the story of two 600-mile journeys taken half a century apart. In 1937, three teenagers from Abilene,

Film Shows How Colorado River Has Fared (continued)

Texas, loaded up a wooden canoe and paddled the length of the Colorado River to the Gulf of Mexico. In 1991, the same boys, now 73-year-old men, made the trip once more.

They found a much-changed river. Dams, developments, intensified agriculture, modern campgrounds, mining, hydroelectric plants, and much more trash and pollution were some of the sights that greeted the Abilene boys during their second journey. The film eloquently tells the unique story of river and men with clips from the original journey interspersed with action from the 1991 trip.

Produced by the Lower Colorado River Authority and narrated by Walter Cronkite, this one-hour color film has won numerous awards. *News-Notes* readers may remember the Authority's first nonpoint source film, *Pointless Pollution*, aired on PBS affiliates in 1990 and 1991. Still timely and accurate, that film may soon be shown again on local PBS stations. Contact Pat Friese at the Authority (phone number below) or your local PBS station to find out when and where.

[A Run Unto the Sea may be borrowed from the Lower Colorado River Authority for a $25 shipping and handling fee. Call (800) 776-5272 for more information.]

"Field Guide" to Funding

EPA's Nonpoint Source Control Branch is distributing a handy guide to understanding basic ways to raise capital for environmental projects, locally or statewide. *A State and Local Government Guide to Environmental Program Funding Alternatives* is only 26 pages long, but those few pages contain clear, concise explanations and examples of seven types of tried-and-true options: state revolving funds, leases, grants, public-private partnerships, taxes, fees, and bonds.

For the more creative decision-maker, the booklet delves into pollutant trading and highlights such innovative revenue-raisers as Maryland's specialty Chesapeake Bay license plates (see *News-Notes* #14) and the Kansas lottery-funded water resources management programs.

Readers who want to dig more deeply into funding sources have only to flip to the back of the book for a list of where to turn for more information on specific alternatives described in the guide.

"Funding is a critical problem for states and localities trying to develop and implement NPS control programs. We think this will help," said EPA's Rod Frederick.

[The guide is free and may be obtained by contacting the Center for Environmental Research Information (CERI). Phone: (513) 569-7562. FAX: (202) 260 6257. Please include the booklet's name (A State and Local Government Guide to Environmental Program Funding Alternatives) and publication number (EPA 841-K-94-001) with your request.

The guide may also be downloaded from the Nonpoint Source Electronic Bulletin Board System. It is in an ASCII file called FUNDING.ZIP. See page 25 of this issue for log-on information.]

Watershed Protection Techniques, A New Publication and A Major Breakthrough

by Hal Wise, Editor

The Center For Watershed Protection has launched a new publication, *Watershed Protection Techniques*, which promises to set the standard for some time to come. We are happy to give our unqualified endorsement to this solid evidence that watershed protection is coming of age and attracting more and more dedicated practitioners.

The opening article, "The Emerging Field of Watershed Protection," says it like it is:

> *Today, thousands of environmental professionals across the country are engaged in the challenging task of protecting our urban streams, lakes, and estuaries. They represent diverse disciplines such as environmental planning, stormwater management, urban forestry, wetland science, sediment control, and stream restoration. They call themselves planners, engineers, inspectors, plan reviewers, landscape architects, scientists, and environmental consultants. Together they are on the front line of an emerging practice known as watershed protection. Their commitment is to mitigate the adverse impact of development on water quality and habitat resources in hundreds of communities.*

The publication is billed as "a quarterly bulletin on urban watershed restoration and protection tools," and has four sections: feature articles, an "Open Forum" on a selected subject, lots of

Watershed Protection Techniques (continued)

Technical Notes — the "heart" of the publication — and, finally, a resource section, which describes current books, journals, workshops, and courses.

The first issue is packed with useful, highly practical, and worthwhile material. The editors have set themselves a high standard.

The editor and publisher are well known and highly regarded in this newly emerging field. Editor Tom Schueler was long associated with the Metropolitan Washington Council of Governments and is the principal author of their highly acclaimed *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs*. Publisher Harvey Olem, Ph.D., P.E., is the president of the Center for Watershed Protection and was formerly president of the Terrene Institute.

The first two issues (February and May, 1994) have been underwritten by EPA with the understanding that the bulletin will ultimately become self-supporting.

If the place and use of water in the urban scene is your thing, this is for you. The timid may want to buy the first issue, peruse it, and make their own judgement. Our advice is to dive in and subscribe now. It's worth the price.

[Single issues are priced at $14. Subscriptions per year (4 issues) are individuals, $34; students, $18; organizations, $54. Subscriptions should be sent to Watershed Protection Techniques, Suite 205, 1020 Elden Street, Herndon, VA 22070.]

Paired Watershed Design Fact Sheet

Dr. John Clausen of the University of Connecticut, and Dr. Jean Spooner of North Carolina State University, have prepared a fact sheet describing the paired watershed approach for conducting nonpoint source water quality studies. U.S. EPA supported the preparation of the fact sheet. The 8-page fact sheet may be obtained by writing or faxing a request to NCEPI, 11029 Kenwood Rd., Bldg. 5, Cinncinnati, OH 45242. FAX: (513) 891-6685. Please include the publication number 841-F-93-009 with your request.

Datebook

This DATEBOOK has been assembled with the cooperation of our readers. If there is a meeting or event that you would like placed in the DATEBOOK, contact the *NPS NEWS-NOTES* editors. Due to an irregular printing schedule, notices should be in our hands at least two months in advance to ensure timely publication. A more complete listing can be found on the *NPS BBS*.

Meetings and Events

1994

April

10-13 — *Toxic Substances and the Hydrologic Sciences*, Austin, TX. Contact: AIH, 3416 University Ave., S.E., Minneapolis, MN 55414-3328. (612) 379-1030. FAX: 379-0169. Sponsored by the American Institute of Hydrology.

17-20 — *Responses to Changing Multiple-Use Demands: New Directions for Resources Planning and Management*, Nashville, TN. Contact: Ralph H. Brooks, General Chairperson, Tennessee Valley Authority, Water Management, Evans Bldg., Rm. 1W 141, Knoxville, TN 37902. (615) 632-6770. American Water Resources Association Annual Spring Symposium.

17-20 — *The Coast: Organizing for the Future*, Charleston, SC. Contact: Leigh Handal, S.C. Sea Grant Consortium, 287 Meeting Street, Charleston, SC 29401. Sponsored by the Coastal Society.

18-20 — *7th Annual Virginia Water Resources Conference*, Richmond, VA. Contact: Ann Bell, 11743 Ledura Court, #204, Reston, VA 22091. (703) 620-6168. Presented by the Virginia Water Resources Research Center and the Virginia Lakes Association.

18-20 — *Stormwater Solutions in Alaska*, Anchorage, AK. Contact: University of Alaska Fairbanks, Conferences & Special Events, 117 Eielson Building, P.O. Box 757800, Fairbanks, AK 99775-7800. In-depth conference on stormwater, snowmelt, and runoff contamination and flooding. Sessions include: federal regulation compliance, structural and nonstructural best management practices, planning your community's stormwater and runoff management goals, and a special field trip to Anchorage's stormwater projects.

1994

April

19-22 — *Rivers Without Boundaries*, Grand Junction, CO. Contact: Denny Huffman, American River Management Society Symposium Chairperson, Dinosaur National Monument, P.O. Box 210, Dinosaur, CO 81610. (303) 374-2216. FAX: 374-2414. Cosponsored by the BLM, National Park Service, Forest Service, Colorado State Parks, Bureau of Reclamation, and National Park Service Rivers and Trails.

20-22 — *Second Environmentally Sound Agriculture Conference*, Orlando, FL. Contact: Wendy Graham, University of Florida, P.O. Box 110570, Gainesville, FL 32611-0570. (904) 392-9113. FAX: 392-4092. E-Mail: graham@agen.ufl.edu. Sponsored by the Institute of Food and Agricultural Sciences, University of Florida.

25-29 — *The International Land Reclamation and Mine Drainage Conference and the 3rd International Conference on Abatement of Acidic Drainage*, Pittsburgh, PA. Contact: Debbie Lowanse/Bob Kleinmann, U.S. Bureau of Mines, P.O. Box 18070, Pittsburgh, PA 15236. (412) 892-6708. FAX: 892-4067. Cohosted by U.S. Bureau of Mines, the Office of Surface Mining, EPA, and TVA.

25-30 — *Clean Water Expo'94*, Chattanooga, TN. Contact: Land and Water 201, NFE2L-M, P.O. Box 1010, Muscle Shoals, AL 35660-1010. (205) 386-2543. Program includes boat trips and water sampling exercises for students, educational exhibits, music and entertainment, tours of water quality improvement projects, a clean water conference, and other activities.

27-28 — *Clean Water Conference*, Chattanooga, TN. Contact: Vanessa Loven, TVA Water Management, 311 Broad Street HB 2C, Chattanooga, TN 37402-2801. (615) 751-7318. FAX: 751-7479. Sponsored by the USDA, U.S. EPA, TVA, and the Land and Water 201 Agencies in Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, and Virginia. Topics include watershed management, gaining public participation, who pays and who benefits?, value and use of water resources, landowner views and private property rights, and future challenges in the areas of resource management, human health and public attitudes.

27-29 — *Wildlife Water Development: Integrated Approach to Wildlife Management and Conservation*, Laramie, WY. Contact: Susan Powell, School of Extended Studies and, Public Service, P.O. Box 3972, Laramie, WY 82071-3972. (800) 448-7801. Sponsored by the Water for Wildlife Foundation, the U.S. DOI Bureau of Land Management, the University of Wyoming, and others. Topics include recent developments in the field, developing low maintenance water for wildlife, developing wetlands and riparian areas for wildlife, managing water developments for wildlife, maximizing multiple-use options, optimizing habitat values in association with water developments, and using water produced from industry and agriculture for water developments for wildlife.

May

9-12 — *Tenth Thematic Conference on Geologic Remote Sensing*, San Antonio, TX. Contact: Nancy Wallman, ERIM Conferences, P.O. Box 134001, Ann Arbor, MI 48113-4001. (313) 994-1200 ext. 3234. FAX: 994-5123. Sponsored by the Environmental Research Institute of Michigan.

16-18 — *Nutrient Management on Highly Productive Soils*, Atlanta, GA. Contact: Potash & Phosphate Institute, 2805 Claflin Road, Suite 200, Manhattan, KS 66502. (913) 776-0273. FAX: 776-8347. Organized by the Potash and Phosphate Institute and the Foundation for Agronomic Research. Topics include maintaining soil fertility, fertilizer recommendations and spatial variability, site-specific nutrient management, roles of fertilizer placement in improving productivity, economic and environmental impacts of intensive cropping systems, outline of the U.S. Agricultural Pollution Prevention Plan, and a discussion of regulatory effects on fertility use.

24 — *Dynamics of Wetlands: New Approaches to Assessing Wetland Structure and Function*, Orlando, FL. Contact: Jerry Diamond, Tetra Tech, Inc., 10045 Red Run Blvd, Suite 110, Owings Mills, MD 21117. (410) 356-8993. FAX: 356-9005 or contact Brian Hill, U.S. EPA, (513) 533-8114, FAX (513) 533-8181. 7th Annual Technical Information Workshop, 42nd Annual Meeting North American Benthological Society. Speakers from EPA, and state and federal resources agencies will present in-depth discussions and a workbook concerning landscape modeling, biocriteria, restoration and mitigation issues, and wetland productivity.

June

4 — *Environmental Impacts of Golf Course Development*, Keene, NH. Contact: Alexandra Dawson, Antioch–New England, Roxbury St., Keene, NH 03431. Phone: (603) 357-3122, ext. 205. The fourth annual topical conference organized by the Environmental Studies Department of the Antioch–New England Graduate School.

7-9 — *Restoring or Rehabilitating Damaged Ecosystems*, Pullman, WA. Contact: Ed DePuit, Conferences and Institutes, 208 Van Doren Hall, Washington State University, Pullman, WA 99164-5222. (509) 335-3530. FAX: 335-0945. A workshop on principles and their application in reclaiming forest and rangeland

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ecosystems following drastic land disturbances. Topics include foundational ecological concepts and principles, reclamation planning, plant materials, reclamation methods, and postreclamation management.

16-18 — *The Unfinshed Agenda: Nonpoint Source Pollution,* Springfield, MO. Contact: Loring Bullard, Director, Watershed Committee of the Ozarks, Inc., 300 West Brower, Springfield, MO 65802-3817. (417) 866-1127. FAX: 866-1918. Eighth Annual Watershed Conference of the Watershed Committee of the Ozarks. Topics include surface and ground water monitoring in the Ozarks, quality of region's lakes, and successful NPS projects. Floating water quality workshop on Saturday 5/18. Renewal credit certification for water and wastewater operators.

19-22 — *The Management of Water and Wastewater Solids for the 21st Century: A Global Perspective,* Washington, DC. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400. Sponsored by the Water Environment Federation. Topics: residual management experiences and practices in Europe, the Pacific Rim, Australia, Canada, the Middle East, South America, and United States; and current regulatory programs around the world and their impact on management plans and programs for wastewater solids management and biosolids recycling.

26-29 — *Effects of Human-Induced Changes on Hydrologic Systems,* Jackson Hole, WY. Contact: David L. Naftz, General Chairperson, U.S. Geological Survey, 1745 West 1700 South, Rm. 1016, Admin. Bldg., Salt Lake City, UT 84104. (801) 975-3389. American Water Resources Annual Summer Symposium. Topics: hydrologic effects of land use, water quality impacts of land use, competition between water users, water policy and management, research tools, in-stream flows, and special-study topics and regional issues.

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10-13 — *A Global Perspective for Reducing CSOs: Balancing Technologies, Costs, and Water Quality,* Louisville, KY. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400. Sponsored by the Water Environment Federation. Topics include national and international perspectives on state-of-the-art CSO abatement approaches, technologies, and management methods; information on upgrading, maintaining, and managing CSOs; and practical guidelines.

August

7-10 — *Agroforestry and Sustainable Systems Symposium,* Fort Collins, CO. Contact: Kim Isaacson, USDA Forest Service, Rocky Mountain Research Station, Center for Semiarid Agroforestry, East Campus-UNL, Lincoln, NE 68583-0822. (402) 437-5178 ext. 13. FAX: 437-5712. Focus: how trees, integrated into sustainable agricultural land-use systems in the semiarid west, will enhance agricultural productivity, natural resource conservation, and natural and human environments.

7-12 — *Stormwater NPDES Related Monitoring Needs,* Crested Butte, CO. Contact: Barbara Hickernell, Environmental Foundation, 345 East 47th Street, New York, NY 10017. (212) 705-7837. FAX: 705-7441. Cosponsored by ASCE Urban Water Resources Research Council, American Public Works Association, U.S. EPA, and USGS. Focus: to explore the needs and technology of stormwater monitoring under municipal and industrial NPDES stormwater discharge permits.

Calls For Papers — Deadlines

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30 — *American Water Works Association/Water Environment Federation Joint Management Conference,* Tulsa, OK, February 1995. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400. FAX: 684-2492. Abstract deadline is 4/30/94. Focus: management issues for water and wastewater utilities, rate methodologies, privatization, partnering, quality management, and customer relations.

July

1 — *Biosolids and Residuals Management Conference,* St. Louis, MO, July 30-August 2, 1995. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400. FAX: 684-2492. Call for papers: abstract deadline 7/1/94. Sponsored by the Water Environment Federation. Meeting will relate cost data to the topics presented, including technical case studies, alternative and innovative programs, research findings, and compliance issues.

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