



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

Reauthorizing the Clean Water Act— Where Do We Stand?

by Hal Wise, Editor

The *Washington Post* recently detailed the major pieces of environmental legislation now pending before the first Congress in almost a decade and a half where both houses of Congress and the White House are controlled by the same party.

The editorial, "Not a Green Congress," appeared the day after Christmas. Its tone made it clear that the joyous season was over and that the second session of the 103rd Congress was not going to be an environmentalist's love-in picnic in spite of what we had all believed and hoped.

The editorial started out with this message:

Earlier this year it looked as if this might be a Congress you could color green . . . With the shifts of administrations, several major pieces of environmental legislation that had been stuck in prior years appeared to have a promising chance of enactment. The possibilities included a strengthening of the Clean Water Act, restructuring of the Superfund program, an effort after twenty years of mostly false starts to modernize the regulation of pesticides, and a reauthorization of the endangered species statute.

Reasons cited for the shifts in prospects for the measures varied. Each has its own set of complexities and conflicts with a lot of political pushing and pulling and noise obscuring reasoned debate. And in a Congress facing off with a new administration that sees a need for many changes in priorities and direction for the nation, some or all of these measures may fall by the wayside in the upcoming legislative session.

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The *Post* did, however, give the reauthorization of the Clean Water Act the best chance for serious consideration and passage. The *Post* said:

The clean water package is the farthest along, and the one thought likely to have the best chance left to make it to the president. A Senate Environment and Public Works subcommittee is scheduled to start marking up in February a bill that has the blessing of both the full committee's chairman Max Baucus (D-Mont.) and its ranking Republican John Chafee (R.I.). The administration has embraced a similar outline, though not yet come up with a position on all the fine print. One reason for optimism about the prospects of a clean water bill is that it carries with it the promise of a lot of money. The legislation would authorize continuing federal contributions of billions of dollars a year to state revolving funds to build sewage treatment plants and pay other clean water capital costs. . . .

The two most important policy issues in the bill are what to do about so-called nonpoint pollution, the generalized agricultural and urban runoff that is the main remaining U.S. water pollution problem, and what approach to take to wetlands. Both of these push the federal government into the traditional state and local preserve of regulating land use. The bill tries to tread lightly. On nonpoint pollution, for example, it offers states funds for preparing plans that they would retain the responsibility to enforce. Some environmental groups think that, in this and other respects, the consensus-seeking bill is too weak. Conservatives, on the other hand, have indicated they will try to use a clean water bill as a vehicle for changing so-called takings law, so that the government can more readily be made to pay if, in the course of a regulatory proceeding, it reduces a property's value.

Clean water is a deserving cause that does well in the polls, but not even on clean water is it going to be an easy year.

In our recent talks around the Capitol with those known for their sageness in political affairs, we have found general agreement with the views outlined in the *Post's* editorial. There seems to be a good chance that the 103rd Congress will produce a new clean water bill, a bill greatly needed if any kind of nonpoint clean-up momentum is to be maintained. *But*, our guess is that when the final votes are counted, a lot will depend on the hometown views made known to members on the Hill.

Water Quality Notes on the National Scene

New Agreement Makes SCS the Lead Agency for Wetlands on Agricultural Lands

On January 6, 1994, the U.S. Department of Agriculture's Soil Conservation Service was recognized as the lead federal agency for delineating wetlands on agricultural lands. Four federal agencies with wetlands protection responsibilities signed the new memorandum of agreement, which will provide certainty for farmers and provide more effective coordination among federal agencies with wetlands protection responsibilities.

The memorandum of agreement between the Departments of Agriculture, Interior, and Army and the Environmental Protection Agency implements one of many recommendations regarding federal wetlands policies included in the Clinton Administration's August 24, 1993, approach to managing America's wetlands. (See *NPS News-Notes* #32.)

The agreement reflects the commitment of the Clinton Administration to implement wetland policies through a coordinated process focused on eliminating inconsistencies between agency policies, minimizing duplication of efforts, and providing an accurate delineation of wetlands for use by all agencies.

Robert Perciasepe, EPA Assistant Administrator for Water, said, "This agreement is based on one of the most important themes of this Administration's environmental program: interagency partnerships. Through interagency cooperation at the field level, we will all be able to provide better service to farmers while more effectively ensuring protection of the nation's critical wetlands resources."

Under the agreement, farmers will be able to rely on Soil Conservation Service wetland maps for determining the extent of wetlands under both the Farm Bill (also known as the Swampbuster program) and Section 404 of the Clean Water Act.

"The interagency agreement should result in an improvement in the accuracy of wetland delineations on agricultural lands through the use of standard methods and better training," noted G. Edward Dickey, the Acting Assistant Secretary of the Army for Civil Works.

Previously, farmers participating in U.S. farm programs received wetland maps from the Soil Conservation Service for Swampbuster purposes only. If that farmer needed a Section 404 permit for work in wetlands, the Corps of Engineers or the EPA required an additional wetland delineation. The agreement eliminates this duplication of effort and gives the farmer one wetland determination from the federal government. Farmers can now rely on a single wetland determination by the Soil Conservation Service for Swampbuster and Section 404 purposes. The Section 404 regulatory program will continue to be administered by the Corps of Engineers and the EPA.

Assistant Secretary of Agriculture for Natural Resources and Environment, James R. Lyons, said, "Consistent with the Administration's overall wetlands policy, this agreement is good for farmers and for the environment. It simplifies the process of identifying wetlands for farmers and will more efficiently inform them of federal wetland conservation programs. We look forward to working closely and cooperatively with the other agencies to make this agreement work."

Interior Assistant Secretary for Fish and Wildlife and Parks, George T. Frampton, Jr., agreed, calling the agreement "a common sense approach to administering wetlands programs affecting our nation's farmers."

[Copies of the MOA may be obtained by calling the EPA Wetlands Hotline at (800) 832-7828.]

Cost Sharing, Individual Attention, Cost-Effective BMPs, and Monitoring are Cornerstones in RCWP Successes

EDITOR'S NOTE: For the past several years, *News-Notes* has reported regularly on the Rural Clean Water Program (RCWP). See *News-Notes* issues # 1, 9, 10, 15, 18, 26, 27, and 28 for previous articles.

In 1980, a federally sponsored nonpoint source pollution control program began as an experimental effort to address agricultural NPS pollution problems in watersheds across the country. Thirteen years into the program's planned 15-year life span, the National Water Quality Evaluation Project (NWQEP) at North Carolina State University has released a comprehensive evaluation with some important lessons for other nonpoint source control/watershed projects. Here are some of the highlights.

Cost-Share Most Important Factor in Producer Participation

Though landowner participation in RCWP is voluntary, the evaluation showed that the availability of cost-share assistance is the most important factor in obtaining producer participation in voluntary NPS control programs.

NWQEP also discovered that farmer involvement in project planning and problem identification often results in greater participation in projects.

One-on-one contact between project personnel and farm operators turned out to be the most effective information and education approach to securing producer participation in a project.

Monitoring: Benefits Outweigh Costs

The RCWP is one of the few national NPS control programs that has combined land treatment and water quality monitoring in a continuous feedback loop to document the effectiveness of NPS controls. Not only did the evaluation show that the cost of monitoring is relatively low compared to its benefits, but also that at least two years of data are needed to identify critical pollutant sources and establish baseline water quality conditions before land treatment begins.

Conservation Tillage a Cost-Effective BMP

The evaluators determined that fertilizer and pesticide management and conservation tillage BMPs are the most cost-effective practices in terms of requiring the least cost-share for the greatest potential water quality benefit.

The analysis also revealed that a well-planned land treatment program that offers strong guidance, and yet encourages innovation, produces the most successful projects.

Full Funding Recommended

The RCWP analysis recommended that federal funds for experimental NPS pollution control programs and projects should be committed up front for the entire project period.

Particular emphasis was placed on the importance of funds for adequate monitoring. Monitoring is the primary and most defensible means for evaluating the effectiveness of an experimental NPS pollution control program.

The NWQEP report said that sufficient financial and technical resources must be available to support adequate water quality monitoring and evaluation when the purpose of the project is to document the effect of land treatment on water quality. Funding should include financial support for both pre- and post-BMP implementation water quality monitoring.

National Interagency Administration Advised

RCWP is administered by the USDA ASCS in consultation with EPA. The SCS, Extension Service, Economic Research Service, USGS, and many other federal, state and local agencies also participate. Programmatic and project-level decisions are made by national, state, and local interagency coordinating committees.

The report recommended that a national-level interagency coordinating committee should be assigned to carry out the main objectives of future NPS pollution control programs.

Availability of Funds Important in Project Selection

NWQEP recommended that first priority be given to projects with a high probability for reversing a water use impairment or containing highly valued resources threatened by NPS pollution.

Selection of experimental projects in federally-funded nonpoint source programs should be contingent upon demonstration that matching funds will be available to cover a portion of the project costs, the report said.

Land Treatment

NWQEP advised watershed / nonpoint source control projects to carefully delineate the critical area and to encompass major pollutant sources.

The evaluation also said that projects should be designed to be able to modify the types of BMPs cost-shared, location of the critical area, level of cost share, and information and education strategies based on water quality monitoring results.

Educate Farmers About Their Impact on Water Quality

Rural projects should include educational programs to encourage farm operators to accept responsibility for the effect of their farming operations on water quality, the report said. It also suggested that efforts be made to educate farmers about less familiar BMPs, such as animal waste management systems and pesticide and fertilizer management.

Monitoring Design Critical

With regard to monitoring and evaluation, NWQEP reported that water quality problems, pollutants, and impacts on designated uses should be clearly defined and documented. The evaluation also urged projects to select a good experimental design, such as the paired watersheds approach.

Reports Available

Four publications reporting on the results of the RCWP evaluation are available.

Evaluation of the Experimental Rural Clean Water Program. 1993. EPA-841-R-93-005, 559 pages. (cost to cover postage: within the U.S. \$6; Canada \$30; all other countries \$45) (WQ-79). This complete evaluation report illustrates each lesson learned with examples from the RCWP projects, reports on the farmer survey, and provides detailed descriptions of all projects.

Executive Summary: Evaluation of the Experimental Rural Clean Water Program. 1993. 46 pages. (cost to cover printing and postage: within the U.S. \$5; Canada \$7; all other countries \$10) (WQ-84). The executive summary presents lessons learned and project synopses.

Evaluation of the Experimental Rural Clean Water Program: Abbreviated Version for Congressional Review. 1993. 109 pages. (cost to cover printing and postage: within the U.S. \$12; Canada \$20; all other countries \$25) (WQ-85). The abbreviated version contains lessons learned (without project examples), results of the farmer survey, and brief synopses of the RCWP projects.

Summary Report: Evaluation of the Experimental Rural Clean Water Program. 1992. 38 pages. (cost to cover postage: within the U.S. free; Canada \$4; all other countries \$7) (WQ-75). The summary report presents lessons learned and brief synopses of the projects.

Reports may be ordered from Janet Young, NCSU Water Quality Group, 615 Oberlin Road, Suite 100, Raleigh, NC 27605-1126 (email address: janet@ncsuwqg.wq.ncsu.edu). Please make checks out to NCSU-BAE-NWQEP and refer to the appropriate WQ # when ordering.

Court Upholds EPA Actions in Minnesota Lawsuit

EPA recently won a lawsuit challenging EPA's actions concerning CWA Section 303(d) and TMDLs in the State of Minnesota. The plaintiffs—the Sierra Club, Izaak Walton League, Audubon Society and Project Environmental Foundation—claimed that Minnesota failed to identify and prioritize waterbodies as required under Section 303(d) of the CWA and to establish TMDLs for those waterbodies. The plaintiffs also contended that EPA was in violation of its mandatory duties by failing to develop a 303(d) list and establish TMDLs in the absence of state action.

On December 13, 1993, the court ruled that EPA's actions were reasonable and consistent with its role under the CWA and that it acted in accordance with its mandatory duty within a reasonable time. The U.S. District Court, District of Minnesota, under Chief Judge Diana E. Murphy, agreed with EPA's argument that Minnesota's past and present activities demonstrate compliance with section 303(d). These activities include acceptable 303(d) lists, 43 approved TMDLs/WLAs, and a wide range of other activities that, like TMDLs, identify load reductions necessary to remedy water quality impairments.

[For more information, contact Theresa Tuaño, Watershed Branch (4503 F), U.S. EPA, 401 M St., SW, Washington, DC 20460. Phone: (202) 260-7074.]

Notes on Riparian & Watershed Management

Bureau of Reclamation Pledges

New Environmental Orientation

The Department of the Interior's Bureau of Reclamation announced last fall that its new "reinvented" mission would be

To manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

"We were stuck working on yesterday's issues," said Bureau Commissioner Daniel P. Beard. "We were reading off an old script. By adopting the goals of the National Performance Review through these reforms, we can help manage the water needs and problems of today, while preparing for the future."

The changes, contained in a document called "Blueprint for the Future," included these highlights:

- The Bureau said it would facilitate integrated water resources management on a watershed basis, stressing interagency cooperation, public participation, and local implementation.

- Federally owned irrigation water supply projects will not be initiated in the future.
- The Bureau pledged to be the agent of reforms needed to open the door to new uses of water that increase benefits to the largest numbers of people.
- The Bureau promised to conserve the West's distinctive character by using solid environmental practices in managing water and land resources.
- The Bureau said it would accept water conservation and efficient use as its fundamental responsibility in managing water supplies, and would try to use incentives rather than regulation.
- The establishment and continuance of Native American water rights will be a priority.
- The Bureau will emphasize the coordinated use and management of its existing facilities to improve the management of existing water supplies.
- The budget process will be changed to reflect the Bureau's new needs as a water management agency.
- Washington headquarters will develop policy and give guidance, but regional and area offices will have more direct decision-making power over projects in their regions.

[For more information, contact Lisa Guide, Department of the Interior, Bureau of Reclamation (202) 208-4662.]

EPA Redo of State Water Quality Standards Will Redirect Northern California's Water Use — Four Federal Agencies Join Forces in the Effort

On December 15, 1993, a package of federal proposals to protect the water quality and natural resources of the San Francisco Bay and delta were announced by a federal task force including the U.S. Environmental Protection Agency, the National Marine Fisheries Service (NMFS), the U.S. Bureau of Reclamation, and the U.S. Fish and Wildlife Service (FWS).

A couple of days earlier, an editorial in the *Washington Post* referred to the pending action as the "Water Ballet in California," summarizing the situation,

The Clinton administration is about to try to settle another of the nation's longest-running environmental disputes. This one involves the allocation of the most important natural resource in the state of California — water. Northern California is wet. Almost all the state's notable rivers arise in the northern mountains and converge in the San Francisco delta and bay. The Central Valley and southern California are, by contrast, desert. Over the years, in the name of reclamation, the federal and state governments have built a giant storage and pumping system to move a substantial share of the northern water south. The desert has prospered as a result; the water has enabled crops and metropolitan areas both to grow in the sun. But the bay and delta, which are — or were — major fish and wildlife breeding grounds, have been correspondingly degraded.

In making the announcement, the four agencies declared that "the plan is an innovative, ecosystem-based approach that protects the estuary while encouraging long-term economic growth."

EPA Regional Administrator Felicia Marcus (Region IX, San Francisco) commented:

This is an unprecedented proposal by four federal agencies to work with the state to end the gridlock in water policy in California. We believe this plan has many benefits for the state, including encouraging sustainable growth and giving water districts long-sought certainty about water supply. Our proposal is an attempt to give the state a great deal of flexibility in implementation, and we remain open to more public comment and advice on a plan that will work for all Californians.

The December 15 action meets the terms of a federal district court settlement reached in September between EPA, the Sierra Club Legal Defense fund and 16 other environmental groups, in which EPA agreed to propose water quality standards for the bay and delta by December 15, 1993. EPA had originally disapproved the state's standards in September 1991, and was required under the Clean Water Act to promptly propose federal replacement standards.

Significant first steps to be taken by the federal agencies include the following actions:

The U.S. EPA is proposing a set of water quality standards for the delta under the federal Clean Water Act. The FWS proposals include (1) listing the California population of California splittail as threatened under the Endangered Species Act; (2) identification of critical habitat for the delta smelt, a threatened species; and (3) the 1994 allocation of 800,000 acre feet of Central Valley Project water dedicated for fish and wildlife use under the Central Valley Project Improvement Act. The NMFS is announcing final action to reclassify winter-run Chinook salmon from "threatened" to "endangered."

The proposed rules will be followed by an extensive period of public review and comment before they become final. The agencies anticipate holding public hearings in late February.

"The coordination between federal agencies during the development of these proposals demonstrates the desire of the Clinton administration to speak with one voice," said Marvin Plenert, regional director of the Portland regional office of the Fish and Wildlife Service.

The U.S. EPA is proposing three sets of criteria for the delta. They are (1) salinity criteria of two parts per thousand in Suisun Bay, the productive nursery of the estuary; (2) survival targets for migrating young Chinook salmon, which are called smolts; and (3) salinity criteria to protect the striped bass spawning areas on the lower San Joaquin river.

U.S. EPA's proposed salinity criteria are designed to reflect the natural hydrological variability of the delta. The locations and length of time that the standard must be met at each location depend on whether it is a wet or dry year. The proposal requires that in wet years, the standard be met further downstream in Suisun Bay and for longer periods. In contrast, in drier years, the standard would be maintained farther upstream and for shorter periods.

EPA has been working closely with the state on the water quality standards; the agency intends to modify its proposed standards to address concerns raised by the state. According to EPA, the changes would reduce the water supply impacts of the standards while maintaining their environmental benefits. The state's suggestions include changing the averaging period for determining compliance and developing a more flexible, real-time approach to determining water year classifications. The public is being asked to comment on these issues as well.

"These proposals represent an ecosystem approach that protects the estuary while giving the water projects as much flexibility as possible," said Roger Patterson, regional director of the Bureau of Reclamation. "The federal agencies are committed to work with the state to implement these requirements in a way that minimizes impacts to water users."

Based on modeling by the state department of water resources, the federal agencies estimate that an average of 500,000 acre feet of additional fresh water, and 1.1 million acre feet in extended drought periods, may have to flow into the estuary to meet the announced proposals. In the announcement, the FWS said that a portion of the 800,000 acre feet allocated for fish and wildlife uses under the Central Valley Project Improvement Act would be used to meet the new federal proposals as well as existing Endangered Species Act requirements.

The agricultural, urban, and industrial water supply impacts of the proposals could be substantially reduced if all water users share responsibility for protecting the delta. Currently, the state and federal water projects shoulder the entire burden for protecting the delta. If all water users contributed, the impact of the federal proposals on water use would be reduced by over half, from 9 percent to 4 percent in an average year, and from 21 percent to 12 percent in an extended drought period.

The FWS proposal to list the Sacramento splittail is based largely on significant population declines due to habitat loss and other factors in the estuary. The splittail population has dropped an estimated 62 percent during the past 15 years.

The FWS proposal to designate critical habitat for the Delta smelt revises an earlier proposal and is based on significant new information made available to the FWS last year. The Delta smelt was listed as a threatened species in 1993 based on a 90 percent decline in its population during the past 20 years.

NMFS has reviewed the status of the threatened Sacramento River winter-run Chinook salmon and determined it should redesignate the fish as "endangered." The return of adult fish declined to a record low of 191 in 1991, from historic run sizes of 50,000 to 100,000 fish.

"Significant steps have been taken in recent years to halt the decline and begin recovery of the population," said Dr. Gary C. Matlock, acting regional director of NMFS Southwest Region. "However, these actions have not had sufficient time to produce the expected results."

"The implementation of the U.S. EPA standards may contribute to the restoration of winter-run Chinook salmon and other depressed salmon runs in the Sacramento and San Joaquin rivers," Matlock added.

Earlier this year, the four agencies signed an agreement to coordinate all actions that affect the Bay and Delta.

In addition, the federal agencies have been working closely with the state to incorporate more flexibility into the proposals while maintaining their environmental benefits. The state and federal agencies are also developing options for greater state participation in implementing the proposals, and greater federal participation in a long-term planning process for the Delta.

The *Washington Post* editorial concluded its comments with these observations:

... the Clinton people have now taken a similarly comprehensive approach to a number of major environmental disputes. They worked out a plan to limit logging in the remaining old-growth forests in the Northwest; it seems to be sticking. They're trying to work out a plan to revive the Everglades and Florida Bay. The tactic, as it will doubtless be in the California water case, is to try to construct as far-flung a compromise as possible. The broader the deal, the greater the number of possible combinations and the greater the number of people who are likely to have a stake in its success; that seems to be the theory. You have to wish them well.

On December 16, the *Washington Post*, in an article reporting the federal water proposals, included the following comments:

"The big news here," said Tom J. Graff, a lawyer with the Environmental Defense Fund, "is that after 13 years of environmental protection agencies and Republican and Democratic administrations saying water quality standards for the estuary are inadequate, they are finally doing something about it."

Rep. George Miller (D-Calif.), a longtime critic of how his native state allocates water, hailed the plan as "a critical turning point" for California water policy. "The federal agencies have cooperated in an unprecedented manner in developing a comprehensive, scientifically based ecosystem approach for carrying out the law," he said.

[For more information, contact Lois Grunwald, U.S. EPA, 75 Hawthorne Street, San Francisco, CA 94105, Phone: (415) 744-1588; Jeff McCracken, Bureau of Reclamation, 2800 Cottage Way, Sacramento, CA 95825-1898. Phone: (916) 978-4919; David Klinger, Fish and Wildlife Service, 911 N.E. 11th Avenue, Portland, OR 97232-4181. Phone: (503) 231-6121; Scott Smullen, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910. Phone: (301) 713-2370.]

S.F. Bay/Delta Management Plan

Approved By U. S. EPA Administrator

EDITOR'S NOTE: The Bay/Delta Management Plan, as reported in the story that follows, is closely related to the actions taken by the four federal agencies reported above, though it occurred under a different section of the Clean Water Act, as the story indicates. This action was initiated by the governor of the state of California and was undertaken as part of EPA's National Estuary Program.

In mid-December, U.S. EPA Administrator Carol Browner approved the first-ever comprehensive plan to improve resource protection of the San Francisco Bay and Sacramento-San Joaquin delta estuary. The Comprehensive Conservation and Management Plan (CCMP) was prepared by representatives from the environmental community, government, industry, and the public.

In approving the plan, Administrator Browner commented

The bay and delta estuary is truly a resource of international significance that provides overwhelming benefits to the people of California. This plan represents a commitment by a variety of interest groups to achieve and maintain an ecologically diverse and economically productive natural environment. We look forward to working with the state of California to make this plan a reality.

The state of California and the U.S. EPA signed an agreement in 1987 to establish the San Francisco Estuary Project and prepare the CCMP. As part of the National Estuary Program, the estuary project headed up a management conference to study the problems and prepare the CCMP. Governor Wilson has already concurred on the plan.

The management plan, authorized under the Clean Water Act, identifies common goals and objectives and contains 144 actions. The following are among the key actions outlined in the plan:

- Preparing and developing watershed management plans to facilitate public-private partnerships for the ongoing stewardship of natural resources.
- Preserving stream habitats that contain indigenous aquatic species.
- Integrating state and federal resource protection efforts with local land use activities to prevent pollution, improve water quality, and safeguard biological resources.
- Improving wetlands protection in the bay and delta region through a state wetlands program coordinated among federal, state, and local entities.
- Establishing a regional monitoring program to assess ecological conditions, improve management decisions, and monitor the performance of the plan.
- Increasing direct public involvement opportunities through volunteer restoration and citizen monitoring programs.

The CCMP estimates that total federal and state costs for implementing the plan will be about \$1.6 billion over 20 years. A majority of these costs could be funded through existing programs in the various responsible agencies.

[For more information, contact Lois Grunwald, U.S. EPA, Region IX, 75 Hawthorne Street, San Francisco, CA 94105-3901. Phone: (415) 744-1588.]

Tools for Watershed Managers and Lake Users

Watershed Game is Tool for Decision Makers

Conceived and created by EPA Region 6's Susan Alexander, as part of a cooperative agreement between Terrene Institute and Region 6, the "Watershed Management Game" is a unique training tool for local governments, watershed planners, volunteer monitors, and decision makers. "I can see river authorities, county commissioners, county judges, industry representatives sitting down at the game board to learn about watershed management in a nonconfrontational way," Alexander commented. "It helps each player see his or her role in a larger context."

Players move across the board, traveling the length of a river, through 11 different land uses or ecoregions. They must manage the land so that water quality and watershed resources are protected and players earn a profit. To do this, says Alexander, players must balance jobs and production with the installation of BMPs to protect water resources. The game links each land use or BMP choice with specific environmental consequences like chemical water quality, riparian health, and biological resources.

The Watershed Management Game includes a user's guide that defines terms and explains basic watershed management principles, including Total Maximum Daily Loads (TMDLs). Each game also includes several blank cards so that the game can be customized with local BMPs and land uses. Two to four people can play the game, which takes about two hours to complete. Suitable for watershed and nonpoint source managers, planners, college environmental students, etc.

(Copies of the game can be obtained on loan from EPA Regional NPS coordinators or Region 6 state NPS agencies. Copies can also be purchased from Terrene Institute, 1717 K St., NW, Ste. 801, Washington, DC. Phone: (202) 833-8317; FAX: (202) 296-4071. \$39.95, plus \$4 shipping/handling. Please DO NOT send or FAX orders to NPS News-Notes.)

A Tool for Citizen Watershed Involvement

Also from Alexander's fertile mind comes *Clean Water In Your Watershed: A Citizens Guide to Watershed Protection*. Focusing on the citizen's role in protecting watersheds, the 90-page guide helps citizen groups work with local, state, and federal government agencies to design and complete a watershed protection or restoration project tailored to the economic, social, and environmental needs of their own communities.

"I wanted to give people a tool they could use themselves, and to stimulate citizens to help their state agencies get involved in watershed protection," said Alexander. She also told *News-Notes* that a companion document for watershed staff at the state level is in the works at EPA headquarters.

The guide was developed through a cooperative agreement between U.S. EPA Region 6 and the Terrene Institute. The bulk of the guides have been sent to EPA Region 6 states for use in their NPS and watershed programs.

(While supplies last, single copies can be supplied by sending a self-addressed adhesive mailing label to Susan Alexander (6W-QS) U.S. EPA Region 6, 1445 Ross Ave., Dallas, TX 75202. Copies may also be purchased from the Terrene Institute for \$19.95, plus \$3 shipping/handling. Phone: (202) 833-8317; FAX: (202) 296-4071. Please DO NOT send or FAX orders to NPS News-Notes.)

A Tool for Solving Lake Problems

Lake Smarts: The First Lake Maintenance Handbook—A Do-It-Yourself Guide to Solving Lake Problems is a 228-page manual of field-tested, easy, and affordable projects to help citizens clean up, improve, and maintain the lakes and ponds in their communities. *Lake Smarts* was developed from columns written for the *LakeLine* newsletter by Steve McComas of Blue Water Science. It covers common problems, including algae, aquatic weeds, sediments, muddy water, waste disposal, and undesirable fish and waterfowl. The guide also provides sources and costs of equipment. McComas field-tested the projects outlined in the guide in Minnesota, Wisconsin, and other states. Developed in cooperation with U.S. EPA's Clean Lakes Program and the Terrene Institute.

(Order from Terrene Institute, 1717 K St., NW, Ste. 801, Washington, DC. Phone: (202) 833-8317; FAX: (202) 296-4071. \$18.95, plus \$3 shipping/handling. Please DO NOT send or FAX orders to NPS News-Notes.)

Notes on the Estuarine Environment

USDA Will Implement Total Farm Resource Management in Chesapeake Bay Region

Under a new agreement with the Chesapeake Bay Executive Council, the USDA will implement a new program, total resource management, for agricultural lands in the bay region. The agreement results from the Chesapeake Bay Program's 1992 Agricultural Nonpoint Source Initiative to address nutrient pollution from farms. Excess nutrients entering the bay are the cause of its most severe problems and agricultural activities in the bay drainage are the chief contributors of nutrients.

Signed last month by USDA Assistant Secretary Jim Lyons and Maryland Governor Donald Schaefer, chairman of the Chesapeake Executive Council, the agreement is aimed at accelerating the bay cleanup. In 1987, Maryland, Virginia, Pennsylvania, the District of Columbia, and U.S. EPA pledged to reduce the bay's nutrient pollution 40 percent by the year 2000.

To implement total resource management, the USDA will direct its agencies—SCS, ASCS, and the Extension Service—to work with the bay jurisdictions to develop and begin the agricultural planning process. The integrated approach to farm management will feature a wide range of BMPs to help farmers protect natural resources while maintaining production goals.

In addition, under the pact, USDA will

- Work with the Chesapeake Bay Program to develop innovative methods to help farmers protect the bay.
- Coordinate federal agricultural efforts on behalf of the bay by participating in Chesapeake Bay Program committees.
- Cooperatively implement federal and state agricultural pollution prevention programs.
- Secure appropriate funding and staffing resources to carry out bay-related activities.

"Partnerships and cooperation among federal, state, and local governments have been the key to our progress in restoring the bay. This agreement will ensure that the USDA is involved in the decision-making progress," said Schaefer.

"Farmers in the bay region have a strong commitment to the Chesapeake cleanup effort," added Lyons. "The USDA is now poised to help them become even more effective partners in the restoration."

[For more information, contact Elliott Finklestein, Chesapeake Bay Program, 410 Severn Ave., Ste. 109, Annapolis, MD 21403. Phone: (410) 267-0061. Or contact Rona Flagle, Maryland Department of Agriculture (410) 841-5877. Or call 1-800-YOURBAY.]

News From the States and Localities, Where the Action Is

In Wisconsin, Run-off Run Held

A fun-run and walk that followed the general path of runoff as it flows toward Lake Wingra in Dane County, Wisconsin, was a novel way to educate the public about nonpoint source pollution. Held on September 19, the course led through Madison and along the shore of the lake, which suffers from excessive weed and algae growth and other effects of nonpoint pollution.

Along the way, runners and walkers passed areas of potential pollution, which were marked with posters that drew attention to different pollutants and how individuals can prevent them from entering runoff. One of the areas was a football field; the sign there warned that improperly disposed oil from one automobile could cause an oil slick on surface water the size of two football fields. Other featured pollutants were leaves, phosphorus, and pet waste.

Despite rain the day of the race, seventy runners and walkers participated; and area television, radio stations, and newspapers gave the event excellent coverage. Participants were eligible to win donated "Earth-friendly" prizes ranging from a mulching lawn mower to a bicycle and compost bins.

Key to the success of the run, expected to become an annual event, were support from an advertising agency and advance coverage by a local radio station. Area businesses donated the prizes, and the Yahara-Monona Priority Watershed Project picked up the bulk of the project expenses with funds from the Wisconsin Department of Natural Resources in cooperation with the Dane County Lakes and Watershed Division.

[For more information, contact Danielle Dresden, Yahara-Monona Priority Watershed Project, Room 421, City-County Building, 210 Martin Luther King Jr. Blvd, Madison, WI 53709. Phone: (608) 266-2626].

In Rhode Island, Advanced Training for Water Quality Monitoring Volunteers

by Linda Taylor Green, Elizabeth M. Herron, Arthur J. Gold

Rhode Island Cooperative Extension and the Coastal Resources Center of the University of Rhode Island have initiated an advanced training program for water quality monitoring volunteers. Supported by an EPA Clean Lakes grant and the Rhode Island Department of

Environmental Management, the program was designed to create lay water quality "experts" to help ensure the collection of quality data from volunteer monitoring groups.

The program was prompted by the need for additional trained staff to cope with the successful growth of lay monitoring programs throughout the state. Currently, volunteers in at least a dozen programs monitor the water quality of urban and rural freshwater lakes, rivers, and streams, as well as estuaries and coastal lagoons throughout Rhode Island. Lay monitoring of the harbors and of Narragansett Bay is also beginning. Despite the differing goals and resources that these groups may have, they all want to see their data being used and helping to make a difference. Therefore, ensuring quality data is of great concern to these groups, and they welcome input from university personnel.

The advanced training program capitalizes on the growing number of experienced volunteers, some of whom have been active for five or more years, in the various monitoring programs. These seasoned volunteers have accumulated a wealth of expertise in lay monitoring, making them valuable resources. Some are looking for additional challenges to maintain their interest; others are seeking ways to more readily implement the results of their efforts.

The program was modeled after the successful Master Gardener programs offered by Cooperative Extension in many states. Master Gardener programs provide intensive training to individuals and in return expect the participants to donate their time to the public as lay "experts" or "mentors" under the supervision of Extension staff.

The Master Water Quality Monitor course began in May 1993 and consisted of six Tuesday evening lectures and/or laboratories with four Saturday morning field sessions. Registration was open to Rhode Island water monitors with at least one year's experience, and class size was limited to 25. Thirteen presenters from within and outside the University of Rhode Island community shared information on watershed hydrology; nitrogen and phosphorus in natural waters; identification and mapping of aquatic plants, macroinvertebrates, and zebra mussels; monitoring for bacteria; and lake restoration and management techniques. Woven throughout these sessions were discussions on assessing the quality of these measurements by lay monitors.

Upon successful completion of the course, the apprentice Master Water Quality Monitors were assigned locations being monitored by other lay monitors in their respective programs. Quality assurance site visits were scheduled for mutually acceptable times. During these visits, the apprentice met with the current volunteers to assess their monitoring techniques and to perform coincident sampling.

It was deemed vital that these visits be nonthreatening to the regular monitors; the apprentice mentors serve as resource personnel who provide additional information to the volunteers as a result of knowledge gained from the course. Needs varied between the different state monitoring groups; consequently, in several situations, the apprenticeship activities were tailored away from quality assurance visits and toward the development of educational programs or the performance of advanced monitoring tasks. Once the apprentice has completed his/her mentoring requirements, the volunteer will be considered a "Master Water Quality Monitor."

Participants gave the course high marks for overall structure and materials presented, noting the enthusiasm and expertise of the presenters. They anticipated that it would be useful in their monitoring efforts. The state department of environmental management has expressed an interest in having the course presented as supplemental training for some of its water resources personnel. The course was such a success that, depending on funding, the Extension and Coastal Resources Center hope to offer advanced training for water quality volunteers on a regular basis in the future. Current plans call for a several-year cycle of topics. This would allow the course to focus on a specific issue each year, such as aquatic plant ecology, identification, and mapping. The final result would be a pool of volunteers skilled in the range of water quality problems that confront lay monitoring groups.

[For more information, contact Linda Green or Elizabeth Herron, Rhode Island Watershed Watch, Woodward Hall, University of Rhode Island, Kingston, RI 02881. Phone: (401) 792-2905. Email: rww@uriacc.uri.edu]

Texas Seniors Receive Award for Survey of Groundwater Contamination Sites

Texas Governor Ann Richards presented the 1993 Governor's Award for Environmental Excellence to the Retired Senior Volunteer Program (RSVP) of El Paso for their work conducting a survey that identified nearly 2,000 potential sources of groundwater contamination around El Paso's 138 drinking water wells. The information was gathered in 1990 by going door-to-door, reviewing local tax and planning records, and examining aerial photographs. Many of the volunteers were long-time residents, and their own memories helped lead them to other sources of potential contamination.

"The Environmental Protection Agency and El Paso city officials had wanted to establish a local groundwater protection project for years," said Buck Wynne, EPA regional administrator, "but, as in most cities, there wasn't funding, time, or staff to do that."

The situation changed when the Texas Water Commission (TWC) and EPA joined forces to support such a project—using senior volunteers.

TWC geologist Brad Cross, who heads the project, said, "We wanted to identify potential hazards rather than react to existing damage, as we sometimes did in the past." TWC supplied educational materials and, in partnership with EPA staff and Oklahoma State University faculty, held seminars to train volunteers.

Volunteers Led Way to Forgotten Sites

The volunteers interviewed household residents and business people to discover long-forgotten underground gasoline storage tanks, covered-over cesspools, uncapped abandoned wells, and illegal garbage dumps. The RSVP survey, completed in three and one-half days, required 700 hours of labor by 23 volunteers, which, if performed by city staff or consultants, would have cost taxpayers \$35,000.

Vernon Haverstick, volunteer team chief, said that the survey would make it easier to identify exactly where groundwater pollution was coming from.

Haverstick recalled, "It was January, and it was cold. One of the places my group surveyed was an area to the north of town, out near the (New Mexico) state line—cattle country. We climbed over a lot of barbed-wire fences and traveled down many a dirt road."

Haverstick said the team found wells there that had not been used in many years. "In addition to the danger of people falling in them, if wells are not properly plugged and capped, people will dump toxic materials in them. It goes straight into the groundwater."

A report by Brad Cross, Texas Water Commission geologist, detailed the results of this pilot project and recommended best management practices for local government to use to protect groundwater. Potential contaminants are especially threatening when located near wells, the report said, because the wells act as a conduit to El Paso's aquifers. The city draws 80 percent of its drinking water from the aquifers. The TWC is now directing its attention to an aquifer-wide protection plan involving 50 Texas cities over the Edwards Aquifer, including Austin and San Antonio.

Program Spawns Nationwide Interest

Because of the pilot project's success, inquiries have been received from around the country. The project has been replicated in Houston and Sequin, Texas, and in Elkton, Indiana, using RSVP volunteers.

In addition to the Governor's Award, all twenty-three members of the survey team were named El Paso's Volunteers of the Year in 1991. At the 10th Annual United Way Volunteer Recognition luncheon in April 1991, the group received a Greg Wyatt sculpture and a \$1,000 award. EPA later presented RSVP with a plaque inscribed with the names of all twenty-three members of the original participants in the survey.

Lillian Madarchik, a former RSVP volunteer in El Paso, Texas, and current program coordinator of the El Paso RSVP has written the "How-To Manual for Groundwater Protection Projects."

The manual was funded by an EPA grant through the Texas Water Commission to the National Association of RSVP Directors.

An Environmental Task Force chaired by Vernon Haverstick has continued to volunteer by assisting the City-County Health and Environmental District in groundwater protection projects.

[The TWC report, *A Groundwater Protection Strategy: the City of El Paso #91-01*, may be obtained by sending a check (made out to TNRCC) for \$17.13 to Publication Section, TNRCC, PO Box 13087, Austin, TX 78711-3807. For more information on TWC's role in the project, contact Brad Cross, TNRCC, address above. Phone: (512) 475-4610.

For more information on RSVP's involvement or to obtain a copy of the *How-To Manual*, contact Lillian Madarchik, El Paso RSVP, Two Civic Center Plaza, El Paso, TX 79901. Phone: (915) 541-4374. Or contact Maureen Mulligan, President, National Association of RSVP Directors, c/o Passaic County RSVP, 703 Main Street, Paterson, NJ 07503. Please include \$2.50 to cover mailing costs for the manual.]

Michigan Stream Restoration A Many-Faceted Endeavor

By Ramon R. David, Grand Valley State University, Water Resources Institute, Allendale, Michigan

EDITOR'S NOTE: The restoration and rehabilitation of stream systems is a potentially powerful tool that can be used within the context of current water quality programs (including activities related to CWA section 303[d], the Total Maximum Daily Load [TMDL] process, and nonpoint source control programs) to correct impairments and prevent future deterioration. Author Ra David reminds us that beyond the technical challenges of such projects, the human component always keep things interesting.

For the past two years, EPA's Office of Wetlands, Oceans, and Watersheds has been funding a project to demonstrate how restoration techniques affect the chemical, physical, and biological components of an aquatic ecosystem.

Bear Creek is a third order stream draining an area of 27,000 acres in central-west Michigan. Land use in the area is dominated by crops and forest, although a considerable number of riparian trees have been removed from some parts of the creek and tributaries. The stream and several tributaries show significant sedimentation from agriculture, development, and road construction.

The First Fifteen Months

We chose a one-mile segment in the middle of Bear Creek as the starting point for the restoration project. Here, sediment loadings have had severe impacts on the creek and several of its tributaries. After achieving restoration success in one segment, we anticipate expanding the project to the balance of the watershed.

The first year was devoted mostly to documenting the chemical, physical, and biological degradation of Bear Creek. Sampling identified problems in three stream attributes:

1. Physical: sedimentation; bank erosion; and lack of pools, cover, and suitable habitat.
2. Chemical: high nutrients and elevated temperatures.
3. Biological: excessive coliform bacteria, only a moderate diversity of macroinvertebrates, and only a single species of trout. (Anecdotal evidence suggests that it has only been a few years since much larger browns, as well as rainbow and brook trout, inhabited the system.)

Our goal is to restore the stream to a more pristine condition, improve water quality, and enhance the creek's biological diversity. Bank stabilization methods, techniques to reduce nonpoint source loadings of sediment, and in-stream structures that facilitate the removal of existing sedimentation are being designed and implemented in the creek.

Citizens Excited about Project

From the very beginning, we realized that interaction with the citizens of the watershed would be important to the project's success. We felt that explaining our goals to them and asking for

their input would develop a sense of ownership in the watershed and in the project. We hoped residents would view the project as an "us" effort instead of something imposed by outsiders.

Local government officials, public township meetings, and concerned citizens and landowners appreciated learning the who, what, when, where, and why of the project. Meanwhile, our presentations to these groups taught us that while people often know of problems caused by industrial discharges, they are much less aware of the components of a healthy stream—riparian vegetation, in-stream pools, and streambed substrate. The good news is that they were very excited about learning these things. The "ah-ha" look on their faces when they understood why the fish are gone and what they can do to help bring them back have brightened our long field hours.

For example, one of our seminars was held at a ski lodge that sits right next to the stream, and we planned on showing participants the impact that the ski lodge has on Bear Creek. But as we prepared to show how to stabilize banks, remove sediment, and provide shade, the attendees surprised us by asking, "What's wrong with having a stream with a nice sandy bottom that is easier on bare feet than gravel and cobble?" and "Aren't streambanks better off being sloped like the beach, rather than being undercut?" We came to the seminar prepared to show them "how to . . ." without realizing they had never been taught "why."

We discovered that getting to know the people of "our" watershed at the beginning of a project paid off when it came to finding volunteers to assist with the labor intensive parts of restoration. The people from the ski lodge learned the importance of gravel and cobble, stable streambanks, pools, and cover before we installed the first in-stream structure. Now, instead of raising objections to our work in the stream, they volunteer to help us at every turn.

Reaping the Benefits of Cooperation

Public support has been exceptional, and additional support has come from an EPA 319 project in the watershed. It was one of the reasons we chose Bear Creek. We met early on with project manager Patti Van Dyke to eliminate duplicate efforts and decide what data could be shared. We hoped that both projects would benefit from the synergy that developed, and that is exactly what has occurred.

For example, after we began monitoring the stream, we noticed that sometimes the coliform values would increase from already-too-high to ballistically high. After doing some scouting, one of our student assistants located an upstream area where cattle had free access for drinking and socializing; hence our coliform problem. We talked to the 319 project manager; she met with the farmer. She explained our problem with the coliform and then offered him a solution (fencing and an alternate source for water) *and* sources to fund the solution.

The Next Three Years

Throughout the next three years, undergraduate students will carry out research projects focused on interactions between organisms in the stream. One student has been studying trophic interactions within the stream community and will attempt to determine if restoration efforts alter current interactions. Another experiment that we have proposed will include competitive interactions between sculpin and predatory stoneflies that are currently rare or absent in Bear Creek. Restoration of Bear Creek may facilitate colonization of Bear Creek by these predators and alter the current trophic structure of the creek.

We now have our first in-stream structure in place and will begin to evaluate changes and improvements during the winter and spring. During the winter and spring months we will also continue meeting with the Bear Creek community. When summer comes, we will continue construction and stabilization efforts.

One of our goals is to make this project as cost effective as possible, document these expenses versus accomplishments, and then produce a "how-to" primer to show that restoration projects can be implemented successfully without huge amounts of funding.

[For more information, contact Ramon David, Lab Director, Bio-Chem Environmental Laboratory, 1340 108th St., Byron Center, MI 49315 Phone: (616) 878-1188. Or contact Mark Luttenton, Grand Valley State University, Water Resources Institute, Allendale, MI. Phone: (616) 895-2503.]

News of the Coastal Nonpoint Pollution Control Program

Lessons Learned from the First Threshold Review

EDITOR'S NOTE: As you know, coastal states are now in the process of developing their coastal NPS programs as provided for in the Coastal Zone Act Reauthorization Amendments of 1990. See *NPS News-Notes* issues # 26, 27, 28, 30, 31, and 33 for previous columns on EPA and NOAA's coastal NPS program.

South Carolina's proposed coastal nonpoint program was the first to undergo a threshold review with EPA and NOAA. Under the Coastal NPS Pollution Control Program, a state may request that EPA and NOAA conduct such an initial review of a state's approach to specific elements of its program, prior to drafting the program. According to the *Program Development and Approval Guidance* of January 1993,

The intent of this early review is twofold. First, the process would allow the state, NOAA, and EPA to discuss the state's approach to certain program elements before the state invests substantial resources in program development. Second, it would help states set priorities and focus early on the final program, particularly on elements such as enforceable policies and mechanisms that may take time to adopt.

The following description of the South Carolina review is based on a memorandum from EPA's NPS Control Branch and NOAA's Coastal Programs Division to state coastal management program managers and state water quality program managers.

Pre-Threshold Review Activities

Prior to the review, South Carolina developed public outreach materials in an attractive folder and distributed these materials widely. The staff took advantage of existing materials developed by EPA and NOAA for text, but repackaged them in state-specific brochures on individual issues.

A public hearing on the threshold review proposal was conducted prior to the meeting and written comments were solicited. The threshold package included a written transcript of the public meeting along with copies of letters received following the meeting. "These materials were extremely useful in demonstrating South Carolina's commitment to meet the public participation requirements," said Ann Beier of EPA's NPS Control Branch.

South Carolina identified agriculture and forestry as particularly important to the program and formed committees to work on these. These committees, which will continue to play a role in program development, gave the state a good sense of where existing programs may meet the management measures and where additional work is needed.

South Carolina submitted its threshold review package just over three weeks prior to the meeting. While NOAA and EPA were able to complete review of the package prior to the meeting, it was difficult in light of the comprehensive nature of the review. EPA and NOAA advise other states that future reviews should provide for the full time period outlined in the threshold review guidance.

Threshold Review Package

EPA and NOAA felt that South Carolina's threshold review package was well organized. The state proposed a comprehensive review that included all of the source categories as well as specific program elements (such as coastal zone boundary, alternative management measures, etc.). South Carolina organized the review by source category or program element.

The package included a written analysis of existing programs and how they address the management measure as specified in EPA's technical guidance document. It also included tables that provided a listing of existing laws and regulations applying to each management measure.

South Carolina included separate packages of the laws, programs, and regulations that were referenced in the body of the text. Inclusion of these materials is essential, since it helps NOAA and EPA fully understand the context to the laws and regulations cited.

In addition to describing existing programs, sections of the document for each source category included identified gaps in existing programs. EPA and NOAA noted that this "gap analysis" is important and will help the state identify where additional authorities may be needed to meet program requirements. To the extent that states have drafted legislation or have proposals to address these gaps, it would be helpful to include them as part of the threshold review package, or indicate generally how the state proposes to address the gaps, the memo stated.

Threshold Review Meeting

An agenda and procedures agreed to prior to the meeting allowed the discussions to stay focused and each section of the threshold package to be addressed in a timely fashion.

The format for the meeting worked well. South Carolina presented the state's proposed approach for each of the program elements/ source categories to be discussed. After NOAA and EPA response to the proposal, the discussion was open to all attenders. This discussion was followed by an identification of action items and follow-up steps for completion of the threshold review.

The face-to-face dialogue and open discussion of existing state programs allowed for better understanding of the written material presented in the package, said the EPA and NOAA reviewers. State staff were able to describe programs in more detail and federal agencies could clarify points from both the program guidance and management measures guidance.

Participation by other state agencies allowed more detailed explanations by those agencies of how they play a role in nonpoint source control efforts.

According to the memo,

One lesson clearly learned from this review is that there is a great need for coordination at both the state and federal level to ensure that the threshold review process runs smoothly. State coastal zone and water quality agencies should both participate in preparation of the threshold package and the threshold review meeting.

Participants in this initial review were generally pleased with the meeting and felt it was productive. Because this was the first threshold review, there has been considerable interest expressed by other states in learning how the meeting was conducted and what lessons were learned for future threshold reviews.

Both NOAA and EPA agreed that South Carolina's willingness to share its perspectives will be very helpful in future reviews in other states.

EPA and NOAA have published two documents that contain guidelines for developing and implementing these programs: *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*, a technical guidance on the best management measures for reducing or preventing NPS, and *Coastal Nonpoint Pollution Control Program - Program Development and Approval Guidance*, a "road map" for states to use in developing coastal nonpoint programs. Both documents are available as a series of downloadable files in SIG 8 of the *NPS Electronic Bulletin Board System*. See page 23 for information on accessing the NPS BBS.

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

Notes on the Agricultural Environment

Farmers Waiting in Line for Turkey Litter and Compost Fertilizer

A Kansas study indicates that turkey litter and compost (consisting of dead birds, litter, and straw) can replace some commercial fertilizers for crops and forage production. And with prices currently hovering around \$12.50 per ton in Cherokee County, Kansas, where the study took place, crop producers are waiting in line for the material. The findings are encouraging since, in the past, turkey waste and dead birds were often disposed of in pits which contributed to nonpoint source contamination. (See *NPS News-Notes #29*.)

Speaking to the American Society of Agronomy, Kansas Agricultural Extension Agent R.E. Wary, Jr., reported that the study showed litter and compost to be useful nutrient sources on the claypan soils in Cherokee County. Since the nutrient content of litter is quite variable, however, he recommended a litter and soil testing program to balance the available nutrients with appropriate crop needs. In most cases, some commercial fertilizer was needed to achieve this balance.

Wary cautioned that testing was necessary to avoid both crop nutrient deficiencies and overapplication. "There is . . . a risk of environmental hazards if used at high rates so that large amounts of nutrients accumulate in the soil and then erode or leach to the ground or surface waters. This is especially true of nitrogen and phosphorus," the study pointed out.

In the study, turkey litter applied at rates between two and four tons per acre produced crop yields comparable to commercial fertilizer treatment. Litter applied at rates of four tons per acre per year or higher resulted in rapid increases in soil phosphorus and potassium levels, with the accompanying risk of nutrient runoff and leaching.

The response among crop producers in the county has been enthusiastic. Wary said, "Turkey producers have waiting lists of crop producers wanting turkey litter/compost for fertilizer." At the present price of about \$12.50 per ton spread on the land, farmers consider turkey litter/compost a relatively cheap source of nitrogen, phosphorus, and potassium. Wary concluded, though, that the material's bulk would make it economically impractical to transport long distances.

The 22 turkey growers in Cherokee County produce about 1.5 million birds and 20,000 tons of litter annually.

[For more information, contact R. E. Wary, Jr., County Agricultural Extension Agent, P.O. Box 148, Fairgrounds, Columbus, KS 66725. Phone: (316) 429-3849.]

National Pork Producers Focus On Environmental Quality

Christopher A. Novak, director of environmental services for the National Pork Producers Council (NPPC) reported that pork producers are working hard to be proactive on the environment. Two recent educational efforts are products of that effort.

The "Choice Farm," a 16' x 24' travelling exhibit featuring thirty different water quality practices that can be used in a total farm resource management program, was unveiled at the 1993 World Pork Expo held in Des Moines where it was viewed by an estimated 25,000 attendees. The exhibit was also featured at the Farm Progress Show, held in September at Amana, Iowa.

A second item is an educational publication entitled *Guide to Environmental Quality in Pork Production*. The booklet's 31 pages discuss principles of environmental pork production management and manure handling and utilization.

According to the guide, pork producers genuinely care about the environment and want to ensure that air, soil, and water quality are maintained in and around production facilities. The booklet also reminds pork producers that sound environmental management can enhance production. The publication guides readers to seek management assistance from the Soil Conservation Service, the Cooperative Extension Service, private engineers, or related experts when planning major changes to ensure proper protection of the environment. The guide, which recognizes that appropriate environmental management methods and solutions are specific to climate, geography, site, and production system, refers readers to its resource directory to tailor assistance to their own needs.

The publication sets forth some progressive guidelines for pork producers. For example, with respect to soil and siting factors, the guide advises producers to

avoid close proximity to streams, ponds, sinkholes, coarse textured soils, wells, abandoned wells, sites underlain with fractured limestone, or tile lines. Also avoid sites with high groundwater levels or in floodplain areas. . . .

Under "Land Application," the guide recommends that producers ensure that sufficient land area is available to use the manure produced and informs readers that the land should be available for manure spreading at "appropriate times for application." Producers are cautioned that nutrients from manure should not exceed the crops' needs or state water quality regulations.

Sections on manure handling, treatment, transportation, and utilization show similar concern for its potential to pollute water and counsel producers on how to prevent pollution.

The National Pork Producers Council and the state producers associations have been involved in formulating individual state programs for managing animal waste. (*News-Notes* #30 described the 1993 animal nutrient and water quality workshops for pork producers, scheduled in each state throughout EPA's Region VII and involving NPPC and state associations, SCS, Agricultural Stabilization and Conservation Service, state departments of natural resources or environment, and others.)

Lending a supporting hand in developing the exhibit were NPPC, Pioneer Hi-Bred International Inc., SCS, EPA Region VII, Iowa Association of Soil and Water District Commissioners, Ertl Toy Company, Farm Progress Companies, and the Iowa Department of Agriculture and Land Stewardship, Division of Soil Conservation. Funding from EPA's Region VII office was provided through a 319 grant to the Iowa Department of Natural Resources.

[Copies of the guide are available, at no cost, from NPPC, P.O. Box 10383, Des Moines, IA 50306. Phone: 1-800-456-7675. For additional information on NPPC educational programs contact Christopher A. Novak, Director, Environmental Services, NPPC. Phone: (515) 223-2633. FAX: (515) 223-2646].

Conservation Tillage—Putting the Plow to Rest

EDITOR'S NOTE: *News-Notes* #31 reported on what conservation tillage is and the progress made in 1992. Here, we update you with the latest statistics on this fast-growing practice for erosion control.

The Conservation Technology Information Center's annual survey of the country's cropping practices shows that more farmers are abandoning the plow for the economic and environmental benefits of conservation tillage. Leaving crop residue on the soil after harvest protects soil from erosion, reducing surface water pollution. The Soil Conservation Service identifies conservation tillage as leaving a crop residue covering at least 30 percent of the soil surface after planting. (See *News-Notes* #31 for more information on crop residue management.)

According to survey coordinator Jerry Hytry, the number of planted acres that benefit from less tillage could soon outpace the acres that are plowed or clean-tilled leaving little or no crop residue. "Economics are driving this transition," said Hytry.

According to the report, an average of 9 million new acres was farmed using conservation tillage each of the last two years, bringing the total nationwide to 97 million acres. Conservation tillage accounted for 35 percent of total cropland planted in 1993, compared to 39 percent clean-tilled. More than 3,000 counties were included in the survey.

Some farmers who do not yet practice conservation tillage practice mulch-till, leaving only 15-30 percent crop residue cover and still gaining some erosion control. When CTIC combined those numbers with its conservation tillage statistics, more than 170 million acres, or 61 percent of the planted acres in the United States, are under some form of crop residue management. This is an increase of 38 million acres in four years.

Producers in the Corn Belt states led in 1993, with a high of 49 percent of crop acres in mulch covered fields. Illinois farmers were the conservation tillage leaders, with 12 million acres.

[For state/county summaries (single state), please write or fax CTIC at 1220 Potter Drive, Room 170, West Lafayette, IN 47906-1383. FAX: (317) 494-5969. For additional information, contact Jerry Hytry, Dan McCain, or John Becherer, Conservation Technology Information Center. Phone: (317) 494-9555.]

Farm Journal Reports To Farm Families on Water Quality

Farm Journal, a periodical published for "families who own or operate farms and ranches," highlighted water quality in its December issue. A guest editorial by EPA head Carol Browner leads off the issue's 10-plus pieces on water, which together convey a positive, realistic perspective.

"Clean Water, Healthy Cows" describes a watering system that keeps cows from trampling stream and pond banks.

"Caught in the Clean Water Act" reports on legislation addressing agriculture's impact on water quality.

"Clean-Water Crusade" describes the Farm-A-Syst program, which helps farmers improve the quality of their well water, and *Farm Journal's* contribution to it. The journal is making it possible for Future Farmers of America to learn how to conduct the assessments.

"Five Lessons from the Bay" outlines lessons farmers can learn from the Chesapeake Bay Program. The lessons instruct farmers to learn all they can about the problem, document their successes, help write the rules, look to the future, and not to perceive themselves as victims.

A column on policy is devoted to the practical issue of where to find water-quality money, while another on production praises cover crops for their ability to keep root-zone nitrate out of groundwater. A third column explains how tile terraces can conflict with triazine use.

The issue's "Environment Today" section discusses manure management, conservation tillage statistics for '93, upcoming conservation tillage conferences, and an American Farmland Trust proposal to replace commodity payments with expanded conservation payments.

"Your Place in the Watershed" focuses on Brownstone, Indiana's Starve Hollow Lake, which has lost 20 acres to siltation since 1945, and what area farmers are doing about it.

A short piece on last summer's flood discloses USGS hydrologist Donald Goolsby's findings that although total amounts of pesticides in Midwest rivers were higher, dilution kept concentrations "about the same as other years."

"When Conservation Plans Conflict" discusses the pros and cons of integrating all of a farm's conservation/environmental protection responsibilities into a single Farm Plan.

"Why a water quality issue?" Conservation Editor Darrell Smith asks in his introduction to the December *Farm Journal*. "Nothing will affect the way you farm as much as the push for clean water," he answers his readers. "For this reason, our editors have put together this special issue examining all aspects of clean water—from the practical to the political—as it relates to your life and your business."

[Copies of the December 1993 Farm Journal are available from the publisher for \$14 for 14 copies or \$1.75 for single copies. Write to Farm Journal, Inc., 230 W. Washington Square, Philadelphia, PA 19106.]

Notes on Environmental Education (and having fun at the same time)

In Washington State, High School Students Rescue Clover Creek

A creek flowing by a high school in Pierce County, Washington, has gotten a lot of attention lately. A grassroots restoration project, which has the support of the Pierce County Conservation District, has drawn together students from several schools, businesses, and community residents. One school won a \$1,500 Phillips Environmental Partnership Award for their plan to restore Clover Creek.

Clover Creek, a small waterway that in the last three decades has fallen victim to development, runs near Washington High School on its twelve-mile journey to Puget Sound at Chambers Bay. Principal Jim Mancuso can remember when it was clogged with Coho salmon in season. But in 1967, the stream was straightened, and two miles of the bed were covered with asphalt. Modern use also brought diversions, road crossings, gutters, urban runoff, and a dam creating Lake Steilacoom. The dam brought an end to the salmon and trout runs, and the asphalt destroyed spawning beds and raised the water temperature.

In early 1993, under the leadership of sophomore Robert Kondrat, and with guidance from the Clover Creek Council, the student body of Washington High School drew up a plan for participating in restoration of the creek. They submitted their plan to the Phillips Environmental Partnership, and were selected as one of seventy-three recipients of the award from over nine hundred applicants nationwide.

Paperwork done, they began work in the spring. More than 150 local citizens, students, teachers, and administrators worked in the cold water to improve the stream's habitat.

Stream Flow Restored

The plan was designed to increase the creek's flow and lower its temperature. Because of existing buildings, it was not possible to restore the creek to its original course. The restoration team covered the asphalt section of streambed with a four-inch layer of gravel. Members of Trout Unlimited directed the placement of logs, stumps, and boulders for fish habitat enhancement, and at least 1,100 cedar, alder, and willow trees were planted along the banks for shade. Workers also cleared away undesirable vegetation and created a footpath covered with wood chips along 2,000 feet of the stream.

According to the Pierce County Conservation District, remaining sections of the original stream had suffered damage to the natural lining of silt and plant life that allowed the streambed to hold water, reducing the flow downstream. About ten major sources of water loss were repaired by hours of sweat and tons of clay and bentonite. Long-time residents say that 1993 marked the first time water had flowed over the asphalt section during August in almost thirty years.

Contagious Enthusiasm

Caught up in the students' enthusiasm, many others also joined in the effort, including the local Lions Club and students from several other schools. Several construction, landscaping, and sand and gravel companies provided operators, trucks, and other equipment, and the local light and water company supplied a tractor and boom truck. A refuse company picked up trash. The local paper and radio station promoted the event. Local businesses donated \$1,500. An outdoor clothing company in California sent \$1,000, and the Rotary Club of Tacoma gave their 1993 Environmental Award of \$2,000 to the restoration.

Hopes for successfully reestablishing anadromous fish populations are high. The state Department of Fisheries estimated that Clover Creek could theoretically produce a returning run of about 1,800 adult fish if the stream were once again in full fish production.

Toward that end, the Department of Fisheries and the Pierce County Department of Public Works have built a fish ladder around Lake Steilacoom Dam, and installed another temporary passage for fish around a waterfall above the lake. Students from Clover Park High School and Charles Wright Academy are working on securing the necessary permits to install a permanent device, and the U.S. Fish and Wildlife Service has granted \$3,000 to install the fish ladder. Interest in Clover Creek by area schools is high. Three teachers at Washington High School gave students who participated in the project extra credit, and at Clover Park High School, a monitoring program is being developed.

Clover Park High School will be the site of a laboratory for performing water testing and research on Clover Creek. A local firm, Tenaska, Inc., has donated \$300 to start the project. Glen Hamerick, a citizen who has years of microbiology experience, has volunteered to operate the lab and train people. In the lab, students will run bioassays using macroinvertebrates sensitive to pollution. In the spirit of enthusiasm and generosity that has characterized the entire project, Hamerick recently paid his own way to attend a conference to learn the latest techniques. So far, he has concluded that Clover Creek's water is of high quality. However, water in Ponce de Leon Creek, which flows into Steilacoom Lake, may not be; organisms in water from one test site near the middle of Steilacoom Lake died, he reported.

Elementary Students Raise and Release Fish

Last April 1, fourth-graders from Pioneer Valley School stocked 500 Coho salmon fingerlings in Clover Creek, after raising the fish at their school as part of a state fisheries salmon incubation program. Federal, state, and local officials turned out to watch as more than 100 excited children participated in the event, which was organized by Trout Unlimited.

Yet another project involves teaming the Franklin Pierce School District with Clover Creek Council to apply to Pierce County to acquire eight acres along the stream for a habitat preservation and education area. The county's new "Conservation Futures" program will

provide some funding and \$10,000 will be solicited from schools and the community to complete the project if it is approved.

Clover Creek Council Puts it All Together

The common denominator and moving force behind the work is the Clover Creek Council. Says Council member Al Schmauder, "We are a real grass roots organization and are having fun at improving our watershed." The Council holds regular work parties and produces a newsletter, *Living In Harmony With Nature*. It tries to involve as many of the watershed's residents as possible.

Owners Maintain Roadside along Creek

Recently, for example, the Council recruited owners of property along roads that flank the creek to cooperate in maintaining roadside vegetation. Grasses and low bushes along the road will help improve stream habitat.

Schmauder, who claims his wife sometimes has trouble recognizing him lately, makes contact with landowners to get permission to work on their property, finds people who are willing to make in-kind donations, such as trucks or gravel, and makes the connections with others willing to do the work.

Schmauder sets up many short-lead-time projects and holds them in readiness until a person or an organization—such as Robert Kondrat or a Cub Scout den asks for a project they can do.

Kondrat, now student council president at Washington High School and thinking about a career in environmental engineering, continues to spearhead student involvement in the creek project. He said the project has provided kids in his school with an alternative to drugs and gangs, as well as involving the residents of his small community.

[For more information, contact Al Schmauder, Clover Creek Council, 1602 129th Street, E., Tacoma, WA 98445. Phone: (206) 596-8222, FAX: (206) 536-5055, or Robert Kondrat, 770 South 110th Street, Tacoma, WA 98444. Phone: (206) 532-6888.]

Survey Shows Americans Eager for Water Education

A National Geographic Society-sponsored survey conducted in June 1993 revealed that 75 percent of American adults and young people say they want and need to know more about fresh water. All ages said they consider fresh water pollution among the most serious concerns facing the next generation. The majority said that protecting fresh water should be a national priority, and that they are willing to spend money to keep water clean and available. However, while most felt that while business, industry, and governments should do more to protect water, only about a third felt that individuals should do more.

The survey, conducted by the Roper Organization, "uncovered a gulf between American's attitudes and actual behavior," according to a National Geographic press release. Despite the belief that activities by individuals to improve water quality or conserve water were easy, few in the survey had actually taken such steps.

Generation Gap

Interestingly, nearly half of the survey participants aged 12 to 17 believed that one of the most important reasons for safeguarding water is to protect plant and animal life. Only 34 percent of adults agreed. However, the survey showed that young people as well as adults need more education about fresh water. In a quiz about water, young people answered only 2.8 out of 10 questions correctly. Adults did only a little better, getting the right answers to just 3.3 questions. Less than half the young people said they had been taught much about fresh water in school.

Household water use and availability were two other areas where knowledge was lacking. Many were unaware of where their drinking water comes from or how much water is required for activities such as taking a shower.

Regional differences were apparent in Americans' beliefs about water availability, with 64 percent of Westerners feeling that severe water shortages were possible in the near future compared to 57 percent of Northeasterners and 41 percent of Midwesterners.

The survey of 1,000 adults and 291 youths was done as part of an initiative called the "Geography of Fresh Water," sponsored by the National Geographic Society, the Conservation

Fund, and the U.S. Geological Survey. (See *NPS News-Notes* #33 for more on the initiative.) The survey results, unveiled November 9 in a speech by Society President Gilbert Grosvenor to the National Press Club, will provide a baseline for the national water education effort.

"We must act now to maintain our quality of life tomorrow. Stop squandering water; preserve and conserve today, and our children will thrive tomorrow," Grosvenor told the Press Club.

National Geographic Society Calls Forum

The Society's next step is a forum on nonpoint source pollution sponsored by National Geographic and The Conservation Fund.

Business, government, and nonprofit leaders have been asked to come together several times in 1994 to look at nonregulatory ways to address this major problem as it relates to fresh water. Governor John Engler of Michigan will chair the group, and Governor Howard Dean of Vermont will be co-chair. Secretary of the Interior Bruce Babbitt, Secretary of Agriculture Mike Espy, and EPA Administrator Carol Browner have also agreed to join the forum. By the end of 1994, the members of the forum will make recommendations for innovative policies and practices that they hope will improve water quality across the nation.

Grosvenor closed his speech with this challenge:

It's been said that a weakness of this nation is that it takes a crisis to move us to action. But our great strength is that, when galvanized, we can solve any problem.

Today, I hope the nation hears our wake-up alarm. Americans must understand that we have a looming water crisis. This is the moment to stop squandering this resource. It's up to each of us, as individuals, to do our part . . .

Now is the time to take action to protect and preserve all the water we'll ever get for ourselves and for future generations. The challenge is to each of us.

The survey shows that Americans can take the first step toward meeting that challenge by educating themselves about water.

[For more information, contact Barbara Moffet, Communications Division, National Geographic Society, Washington, DC 20036. FAX: (202) 828-6679.]

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 mini-bulletin boards) are dedicated to specific topics and have all of the features of the main *BBS*. 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 keyword index is available to help find the information you need.

The *U.S. EPA Nonpoint Source Information Exchange Computer Bulletin Board System (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.

Internet users may access the board by Telnet-ing to fedworld.gov. The IP address for FedWorld is 192.239.92.201. FedWorld has gateways to over 100 federal BBSs, including the *NPS BBS*.

Datebook

This DATEBOOK has been assembled with the cooperation of our readers. If you would like to place a meeting or event in the DATEBOOK, contact the *NPS News-Notes* editors. 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

February

- 1-4 *Human Dimensions in Ecosystem Management (short course)*, Pullman, WA. Contact: WSU Conferences and Institutes, 208 Van Doren Hall, Washington State University, Pullman, WA 99164-5222. (509) 335-3530. FAX: 335-0945. Cost: \$495.
- 9 *Partners in Policy Forum V: Agriculture and Clean Water*, Austin, TX. Contact: Lower Colorado River Authority, (512) 473-4085. Sponsored by the Lyndon B. Johnson School of Public Affairs, the USEPA Region 6, the Lower Colorado River Authority, and the Austin American-Statesman.
- 13-18 *Rangeland: Diversity and Responsibility*, Colorado Springs, CO. The Society for Range Management promotes an ecosystem/watershed approach to resource management. Contact: Dr. Bud Rumburg, SRM, 1839 York St., Denver, CO 80206. (303) 355-7070.
- 15-18 *The International Erosion Control Association 25th Annual Conference and Trade Exposition*, Reno, NV. Contact: IECA, P.O. Box 4904, Lincoln Avenue, Suite 103B, Steamboat Springs, CO 80477-4904. (303) 879-3010. FAX: 879-8563.
- 16-17 *Managing Nonpoint Source Pollution in the Urban/Community Environment*, Philadelphia, PA. Contact: Jennifer Paugh, Terrene Institute, 1717 K Street, NW, Suite 801, Washington, DC 20006-1504. (202) 833-8317. FAX: 296-4071. Will address NPS pollution prevention and correction; erosion, sediment, and stormwater management programs and laws; and public education and technical assistance. Technical workshops: science of water quality, stormwater management, erosion and sediment control, and urban stream restoration.
- 18 *Shaping Agriculture's Future: New Players, New Realities: Colorado Governor's Agricultural Outlook Forum*, Denver, CO. Contact: Colorado Department of Agriculture, 700 Kipling St., Lakewood, CO 80215. (303) 239-4100. FAX: 239-4125. One session led by the president of American Farmland Trust is devoted to Farm Bill economics and the environment. Cost: \$80.
- 22 *National Marina Environmental Workshops*, various dates and locations: Feb. 22 in Boston, MA; Feb. 25 in Fort Lauderdale, FL; Feb. 28 in Baltimore, MD; Mar. 4 in Chicago, IL; Mar. 7 in Houston, TX; Mar. 25 in San Francisco, CA; Mar. 28 in Portland, OR. Contact: International Marina Institute, 35 Steamboat Ave., Wickford, RI 02852. (401) 294-9558. For marina/boatyard managers, trade association leaders, and federal, state, and local regulators. Topics: marina environmental management, nonpoint pollution guidelines, EPA and Clean Vessel Act boat sewage controls, etc. Presented under a grant from EPA. No cost.
- 27—3/2 *American Water Works Association/Water Environment Federation Water Reuse Symposium*, Dallas, TX. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400.
- 28—3/4 *Stormwater Management Modeling*, Toronto, Ontario. Contact: Evelyn James, CHI, 36 Stuart St., Guelph, ON, Canada, N1E 4S5. (519) 767-0197. FAX: 767-2770. Three hands-on workshops on the SWMM model sponsored by the ASCE Water Resources Council, EPA, Ontario Ministry of Environment and Energy. Two-day conference sponsored by CHI.

March

- 1 *Remediating Hazardous Waste and Groundwater Contamination Sites: New Approaches*, Miami, FL. Contact: Libby Strickland, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400. FAX: 684-2475.
- 3-5 *NALMS 3rd Annual Southeastern Lakes Management Conference - Watershed Management: From Concept to Implementation*, Columbia, SC. Contact: Kathy Stecker, Water Quality Monitoring, SCDHEC, 2600 Bull Street, Columbia, SC 29201. (803) 734-5402. FAX: (803) 734-5216.
- 6-9 *Innovative Solutions for Contaminated Site Management*, Miami, FL. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400.

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March**

- 7-10 *National Pesticides Management Conference*, St. Louis, MO. Contact: Lynn Kirschner, Conservation Technology Information Center, 1220 Potter Dr., West Lafayette, IN 47906. (317) 494-9555. FAX: 494-5969.
- 7-11 *The Role and Meaning of Economics in Resource and Ecosystem Management Decisions (short course)*, Pullman, WA. Contact: WSU Conferences and Institutes, 208 Van Doren Hall, Washington State University, Pullman, WA 99164-5222. (509) 335-3530. FAX: 335-0945. Cost: \$595.
- 14-18 *Water Quality and Aquatic Ecosystems (short course)*, Pullman, WA. Contact: WSU Conferences and Institutes, 208 Van Doren Hall, Washington State University, Pullman, WA 99164-5222. (509) 335-3530. FAX: 335-0945. Cost: \$895.
- 26-27 *16th Annual New England Environmental Conference*, Medford, MA. Contact: Caroline Simmons, 1994 Conference Director, Lincoln Filene Center, Tufts University, Medford, MA 02155. (617) 627-3451.
- 27-30 *Second International Conference on Groundwater Ecology*, Atlanta, GA. Contact: John Simons, General Chairperson, EPA, Ground Water Protection Div., WH-550G, 401 M St., SW, Washington, DC 20460. (202) 260-7091.

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. Topics include USGS's Toxic Substances and Hydrology Program, estuarine hydrodynamics and water quality, well tests and other field methods in contaminated hydrogeology, aquifer remediation in the presence of NAPLs, toxic substances in surface waters, the hydrology of the 1993 Mississippi Flood, watershed hydrology, hydrogeology of low-level radioactive waste management, and the Edwards Aquifer of central Texas.
- 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. Topics: water use trends, water-resources forecasting, hydrologic modeling, GIS tools, water pricing policies, water allocation, water law, BMPs, environmental impact mitigation, reservoirs, and hydropower licensing.
- 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. Topics include management, policy, and legal issues; wetlands and estuarine governance; mitigation; status and trends of coastal resources; marine education; habitat; erosion; and fisheries management.
- 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. Opportunity to exchange information on current water resources developments, issues, and research in Virginia.
- 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. Topics: river planning and management.
- 20-22 *2nd 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. Topics: surface and ground water management, wildlife and habitat preservation, and urban/ agriculture relationship.
- 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. Co-hosted by U.S. Bureau of Mines, the Office of Surface Mining, EPA, and TVA. Topics: acid mine drainage prediction, chemical and biological treatment of AMD, geotechnical engineering in mined areas, mine closure/bond release, mine chemistry, mine hydrology and groundwater protection, mine soil productivity, mine subsidence, mine waste management and characterization, regulations and policy, reclamation of derelict/abandoned mines, revegetation, slope stability/erosion control, wetlands on mined lands, and wildlife/habitat restoration.

Calls For Papers — Deadlines

1994

February

- 11 *Animal Wastes and the Land-Water Interface*, Fayetteville, AR, July 16-19, 1995. Contact: Patti Snodgrass, Arkansas Water Resources Center, 113 OH, University of Arkansas, Fayetteville, AR 72701. (501) 575-4403. Abstracts due 2/11/94.

March

- 31 *Disaster Preparedness and Recovery Planning for Water and Wastewater Facilities*, Savannah, GA, January 1995. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400. FAX: 684-2492. Abstract deadline is 3/31/94.

April

- 1 *Toxic Substances in Water Environments: Assessment and Control*, Cincinnati, OH, April 1995. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400. FAX: 684-2492. Abstract deadline is 4/1/94. Technical data, research efforts, and innovations in toxic substance assessment and control.
- 15 *Agroforestry and Sustainable Systems Symposium*, Fort Collins, CO, August 7-10, 1994. 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. Deadline for papers 4/15/94. 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.
- 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.

Nonpoint Source NEWS-NOTES is an occasional bulletin dealing with the condition of the water-related environment, the control of nonpoint sources of water pollution and the ecosystem-driven management and restoration of watersheds. NPS pollution comes from many sources and is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural pollutants and pollutants resulting from human activity, finally depositing them into lakes, rivers, wetlands, coastal waters, and groundwater. NPS pollution is associated with land management practices involving agriculture, silviculture, mining, and urban runoff. Hydrologic modification is a form of NPS pollution which often adversely affects the biological integrity of surface waters.

Editorial contributions from our readers sharing knowledge, experiences and/or opinions are invited and welcomed. (Use the COUPON on page 27.) However, *NEWS-NOTES* cannot assume any responsibility for publication or non-publication of unsolicited material nor for statements and opinions expressed by contributors.

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Nonpoint Source NEWS-NOTES is produced by the Terrene Institute under an EPA Cooperative Agreement (# 820957-01) from the Assessment and Watershed Protection Division, Office of Wetlands, Oceans and Water, U.S. Environmental Protection Agency. It is distributed free of cost. Views expressed do not necessarily reflect those of EPA or the Terrene Institute. Mention of commercial products or publications does not constitute endorsement, or recommendation for use, by EPA or the Terrene Institute.

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