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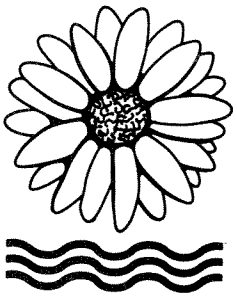

Nonpoint Source News-Notes

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

Commentary

Nonpoint Source Forum on Final Leg of Journey

by The Honorable John Engler, Governor of Michigan and Co-Chairman of the NPS Forum

As the governor of a state surrounded by the four Great Lakes, I am ever conscious of the importance of fresh water. I also know that nonpoint sources account for well over half of our nation's water pollution.

But on the latter point, at least, I'm in the minority — along with *News-Notes* readers. Most Americans do not even recognize the term "nonpoint source pollution." Even worse, they see little they can do to prevent water pollution; they still perceive it as an industry problem.

All that will change if the National Forum on Nonpoint Source Pollution does its job well. Convened by the Conservation Fund and the National Geographic Society, the Forum has no precedent; it is the first time heads of major corporations, all levels of government, environmental groups and other interested organizations have come together to focus on the nonpoint source issue. I chair the Forum, with Governor Howard Dean of Vermont as vice chair.

The Forum is a sunset organization — we are now on the downhill slope of our one-year life, the time we've been given to identify, and then recommend, voluntary, nonregulatory solutions to nonpoint source pollution.

Three working groups chart our course in the areas we believe need to be addressed: Education, Economic Incentives, and Voluntary Incentives. Their membership represents a cross section of nonpoint source expertise from all sectors — industry and government, public and private, Forum members, and other organizations.

INSIDE THIS ISSUE

All issues of *News-Notes* are stored in downloadable files on the *NPS Electronic Bulletin Board System*. Additionally, the *NPS BBS* contains a searchable database that allows the user to search for and retrieve *News-Notes* articles on specific topics. To access the database from the main menu, type OPEN. See page 18 for log-on information.

Nonpoint Source Forum on Final Leg of Journey (continued)

Each working group has met at least three times, with most of them functioning in subgroups throughout the project. The Forum itself has met twice, last February in Washington, D.C., and then in midsummer in my own state's Grand Traverse Bay. By the time we meet in February 1995 to formally conclude our mission, we intend to have set in motion an intensive, all-encompassing effort to convince Americans that preventing nonpoint source pollution is the right thing to do — and that each one of us is personally responsible for fulfilling this obligation.

Such a comprehensive goal must have a practical support system. We must prove that we can prevent and control nonpoint source pollution; thus, the Forum is seeking demonstration projects — productive, cost-effective field models that can be easily and voluntarily replicated to prevent nonpoint source pollution in communities and cities, fields and forests throughout the nation.

These demo projects and other recommendations the Forum will make in its final report next spring will fuel a massive effort to instill in the national consciousness the imperative to prevent nonpoint source pollution.

Maybe we won't even call it that. After all, early results from a national survey by the Education Working Group reveal that people understand what NPS means, even if they don't recognize the term. So the term itself may be irrelevant to achieving our goal.

I use "our goal" as an inclusive delineation. More than anyone, you who read *NPS News-Notes* understand the individual responsibility underlying nonpoint source pollution, and thus, the urgency of enlisting everyone's help in preventing this last remaining major pollutant impact on our nation's waters. Two Forum members, Gil Grosvenor of the National Geographic Society and *Business Week* publisher John Patten, bring to the Forum capabilities for reaching major segments of America.

As the chair of the Forum, I invite you to join us in this effort. Send us your suggestions for practical methods of preventing and controlling nonpoint source pollution, your ideas for innovative demonstration projects based on cost-effective, voluntary action involving partnerships, and your thoughts on how to involve the public. Please address your remarks to our director, Larry Selzer, at The Conservation Fund, P.O. Box 1746, Shepherdstown, WV 25443.

Although we are committed to recommending demonstration projects among other ways of addressing nonpoint source pollution, the Forum members' commitment reaches far beyond the final report you will read next spring. We *are* committed to doing the job right, and we believe that *now* is the right time. It is our hope that the success of this Forum will be measured far beyond our terminal year.

[See NPS News-Notes *#34 and #36 for previous pieces on the NPS Forum.]*

Notes on the National Scene

Comprehensive CWA Bill Derailed in House

Efforts in the House of Representatives to pass a comprehensive bill reauthorizing the Clean Water Act were abandoned last summer after negotiators made progress on many issues, including strengthened NPS programs, but could not reach consensus.

Disagreements over point and nonpoint source enforcement and several wetlands issues, proved insurmountable. Congressman Norman Mineta (D-CA), chairman of the House Public Works and Transportation Committee, finally gave up efforts to secure enough votes to move H.R. 3948, his comprehensive CWA reauthorization bill, out of committee.

Mineta's task was complicated by the circulation of an alternative proposal to H.R. 3948. The alternative, which had the support of Congressman Bud Shuster (R-PA), the Ranking Minority Member on the committee, and a number of other committee members, was perceived by environmentalists and EPA as an unacceptable weakening of existing law.

In the Senate, a comprehensive clean water bill, S. 2093, was voted out of the Environment and Public Works Committee in February, but Chairman Max Baucus (D-MT) was reluctant to bring the measure to the Senate floor before the House had moved forward.

Comprehensive CWA Bill Derailed in House (continued)

Congress Passes Simple CWA Funding Bill

The House and Senate passed the 1995 EPA Appropriations Bill in September. The bill includes $1.9 billion for State Revolving Loan Funds (SRF). The measure also includes $100 million for Section 319 nonpoint source grants, grants for needy cities, and numerous add-ons for regional projects.

Reauthorization action in the next session is uncertain as November elections carry the potential for a significant turnover in the 104th Congress.

Notes on Riparian and Watershed Management

River Cleanup and Fishery Restoration Boost Local Economy

EDITOR'S NOTE: Adapted from the *Potomac Basin Reporter*, with permission of the Interstate Commission on the Potomac River Basin.

Two recent agreements between West Virginia and Maryland mark milestones in an effort to restore the trout fishery in the North Branch Potomac River.

The two states, working with the Interstate Commission on the Potomac River Basin (ICPRB), local governments and other agencies seek to demonstrate how a regional economy can benefit from coordinated improvements in water quality and other environmental factors.

The first agreement, signed in December 1993, established a cooperative program to improve water quality and restore aquatic life to a section of the North Branch Potomac River. It also created a forum for determining infrastructure needs for improving outdoor recreation while protecting scenic and water quality values. The second agreement, a compact between West Virginia and Maryland, has already been ratified by both state legislatures, and congressional ratification is pending.

The North Branch Potomac, which forms a border between Maryland and West Virginia, has long suffered from a variety of environmental impacts; by far the greatest problems result from coal mining. Acidic runoff from abandoned shaft mines continues to suppress life in many miles of the region's streams.

In the initial phase of work, the states, ICPRB, the U.S. Army Corps of Engineers, and local governments will concentrate on developing a trout fishery and encouraging hiking and rafting in a 10-mile stretch of the river below the dam at Jennings Randolph Reservoir.

Before the dam was built, heavy storms sent slugs of highly acidified water down the river, killing not only fish, but the aquatic insect communities on which they fed. Now the reservoir, built and operated by the Army Corps of Engineers primarily for water supply and flood control, exceeds all expectations in mitigating the effects of mining upstream. The tower from which lake water is withdrawn selectively mixes water from different depths. Because acid stratifies in the reservoir, the structure ensures water of a more uniform pH downstream of the dam.

In the 12 years since the reservoir filled, that stretch of the river has been stocked as a put-and-take trout fishery by both states. The Maryland Department of Natural Resources begun by "growing out" fingerling trout in net enclosures floating in the tailrace of the dam. In the last few years, stocked trout have begun to reproduce on their own.

"Long-time residents who saw how bad the river was probably won't believe that trout are back in the North Branch, much less reproducing in it," notes ICPRB Associate Director Jim Cummins.

Thirteen acid runoff "hot spots" have been identified in the North Branch, and currently, the effects of the acid runoff are controlled with a temporary fix: dosing selected tributaries with lime to balance the low pH. Technologies for a more permanent solution exist (see *News-Notes* issues 2, 3, 9, 12, 26, and 35 for articles on other acid mine remediation projects using limestone drains, created treatment wetlands, or fly ash injections). The Surface Mining Control and Reclamation Act (SMRCA) of 1977 restricts federal funding for water quality improvements, although the task force of North Branch Potomac is working with Congress to change that.

According to Cummins, "In January, Senator Paul Sarbanes (D-MD) introduced a bill to amend SMRCA and allow states to use more federal mine reclamation funds for improving water quality. While senators from western states are attempting to block this bill, task force members

River Cleanup and Fishery Restoration Boost Local Economy (continued)

are hoping that either this bill or changes made in a new Clean Water Act, will make much-needed environmental restoration of the North Branch feasible."

The current improvements in the river resulting from the reservoir and other state and federal efforts to mitigate mining impacts are expected to encourage tourism and boost the area's flagging economy. Careful work on building the North Branch into a world-class trout fishery, including preservation of the river's beautiful shoreline scenery and promoting construction of necessary infrastructure to serve anglers and other recreationists, is the next step.

The task force will produce a work plan to guide water quality improvements, restoration of biological integrity, habitat improvement, preservation of the region's scenic beauty and public participation.

The signing of the North Branch agreements by the two governors and ICPRB sets the stage for more cooperative work. West Virginia Governor Gaston Caperton stressed his hope that the restoration effort will increase recreational and economic opportunities. Maryland Governor William Donald Schaefer noted that the achievements to date speak well for the project's long-term outlook. He hailed the work of the two states and the Conservation Fund toward protecting sensitive areas.

The Conservation Fund, along with the Mellon Foundation, was instrumental in West Virginia's acquisition earlier this year of 5,000 acres adjacent to the river.

The task force says that its work may establish a trout fishery that can rival those of the great western rivers. Though much work toward this dream remains to be done, the cooperative agreements help pave the way.

[For more information, contact Jim Cummins, ICPRB, Suite 300, 6110 Executive Blvd., Rockville, MD 20852. Phone: (301) 984-1908, ext. 106. FAX: (301) 984-5841.]

South Carolina's Edisto River Basin Project: Setting a Standard for Comprehensive Planning

by Bill Marshall, Coordinator of Planning and Research, South Carolina Department of Natural Resources

A winding blackwater river, familiar to most South Carolinians, drains a diverse area known as the Edisto River Basin. In many ways, the Basin represents rural South Carolina at its best: a slow and easy pace of life, open spaces of forests and farmland, clean and free-flowing streams, and the frequent sights and sounds of wild creatures.

Although change from development activities has been relatively slow in the Edisto Basin, it continues to challenge the people who live in the Basin. Edisto Basin citizens must decide how to bring about beneficial change — change that conserves the region's natural and cultural qualities while allowing desirable economic growth and development. Edisto Basin residents are seeking to shape those changes proactively, rather than merely react or fall victim to them.

To assist them, the Water Resources Division of the South Carolina Department of Natural Resources and the National Oceanic and Atmospheric Administration established the Edisto River Basin Project in 1988. The state departments of Commerce and Parks, Recreation, and Tourism are partners in the project.

Since its beginning, the project has focused on developing information — primarily geographic information systems (GIS) — and a public process to increase knowledge and understanding of the ecology and economy of the region. The project will ultimately help local citizens make sound development decisions with less conflict over environmental values.

To accomplish the project's goals, two groups have been established — the Basin Task Force and the Expert Committees. The Task Force includes 38 local citizens representing diverse interests throughout the region. They are the ultimate decision makers who will guide the overall project and develop final recommendations.

The newly established Edisto Basin Task Force held its first meeting in November 1993, in the Orangeburg Arts Center at Edisto Gardens. This meeting officially kicked off an 18-month, citizen-based resource assessment and planning process focused on the entire Edisto River Basin. Its objective is to help Basin residents devise their own plan for the area's future. Specific goals for this process are to

- evaluate the natural, cultural, and economic resources of the Basin and categorize them according to their significance;

- understand the relationships between local economic needs and the value of the natural and cultural environment; and
- make recommendations based on scientific knowledge and local values, about how the Basin's resources should be used and protected.

While the Task Force is concerned with the big picture, the Expert Committees represent 15 distinct categories of local resources such as forestry, agriculture, industrial development, recreational fishing, and wildlife habitat. Each Expert Committee is responsible for evaluating the Basin's resources by developing criteria for determining the relative significance of particular uses and interests.

Using GIS, the project staff will apply the evaluation criteria to the data collected on the Basin's resources. The staff will ultimately generate maps that classify and compare the Basin's land and water resources for various resource interests. When the analyses and mapping are satisfactorily completed, each Expert Committee will provide a series of maps and a set of recommendations for the Task Force to consider. As many as 150 people are active on the Expert Committees and many other people, including representatives from regional, state, and federal governments, advise and assist the Task Force.

Substantial information on the Edisto River Basin has already been developed for use by the Task Force and Expert Committees. Three baseline studies were conducted to deepen understanding of the Basin and its resources. The results are documented in several reports:

- *Assessing Change in the Edisto River Basin: An Ecological Characterization* analyzes natural conditions and changes in the Basin related to land use, hydrology, water quality, and wildlife;
- *Socio-economic Conditions in the Edisto River Basin* describes conditions and trends for population, education, employment, incomes, and infrastructure in the Basin; and
- *Public Attitudes in the Edisto River Basin: A Public Opinion Poll* describes public attitudes, perceptions, and concerns regarding natural resources and economic issues.

Two comprehensive GIS for the Basin's natural resources and economic/infrastructure resources have been provided by the Water Resources Division and the Department of Commerce, respectively. Computer data in these information systems are being analyzed and combined in many different ways through the Expert Committees' resource evaluation process. The available geographic data include land use and vegetative cover, wetlands, soils, roads and rails, streams, water and sewer lines, environmental permits, business and industry location, demographics, wildlife and cultural resources, and other natural and economic resource information.

The Basin Task Force will begin developing its recommendations in early 1995 and will likely complete its work by June 1995. Final products will include

- a set of recommendations and a report from the Basin Task Force that addresses goals and priorities for the use and conservation of the Basin's resources;
- an atlas showing results from the Expert Committees' resource assessments, including a series of maps showing areas of compatible and conflicting resource values and uses; and
- a plan that addresses strategies and guidelines for implementing project recommendations.

In the end, the Edisto Basin residents will have access to information that will help them better understand the suitability and significance of the Basin's land and natural resources for different uses. Related problems and opportunities will be better understood, and citizens will have the tools to make informed decisions regarding economic development and resource conservation in the Basin.

[For more information or to request copies of the baseline study reports, contact Bill Marshall, Coordinator of Planning and Research, South Carolina Department of Natural Resources, Water Resources Division, 1201 Main Street, Suite 1100, Columbia, SC 29201. Phone: (803) 737-0800.]

University of California to Expand Rangeland Watershed Protection Program

EDITOR'S NOTE: Since issue #7 (August 1990), *News-Notes* has been reporting on efforts by ranchers, government, researchers, and others to protect rangeland watersheds. For other articles on this topic, see issues # 14, 15, 16, 17, 22, 23, 24, 32, 33, and 35.

A University of California (UC) program that teaches livestock producers how to develop grazing systems that tread more lightly on public and private lands has been awarded a $500,000 EPA grant to expand its efforts.

Mel George, a Cooperative Extension range and pasture specialist, began the UC Rangeland Watershed Program in 1991. The program's mission, according to George, is to foster an environmentally, economically, and socially comprehensive approach to livestock ranching. Therefore, he works with UC's network of local farm advisors and ranchers to implement specific techniques to improve ranch productivity and environmental quality.

The three-year grant from EPA's Environmental Research Laboratory in Athens, Georgia, expands the program to include the study of alternative grazing practices, document the impact of such practices on the environment, and distribute this information to other scientists and California livestock producers.

"With the involvement of John Buckhouse from Oregon State University and Sherman Swenson from the University of Nevada, Reno," George says, "the project will determine and demonstrate the technical, ecological, and economic feasibility of improved animal management on rangeland watersheds, especially in riparian areas."

Three field demonstration and monitoring sites are included in the project: an annual grassland watershed near Morro Bay on the central California coast; a watershed dominated by sagebrush and meadow along the Quinn River in northern Nevada; and a watershed dominated by juniper and sagebrush in eastern Oregon. Monitoring procedures will be developed to compare the three sites and assess conditions unique to each locale.

[For additional information, contact Mel George, Cooperative Extension Range and Pasture Specialist, Agronomy and Range Science Department, University of California, Davis, CA 95616. Phone: (916) 752-1720. FAX: (916) 752-4361.]

Notes on the Agricultural Environment

Recommendations Offered on USDA Water Quality Projects

EDITOR'S NOTE: Adapted from John D. Sutton, Donald W. Meals, and Ray H. Griggs. 1994. "Review of the Interim Evaluation of USDA Water Quality Projects." In *National Water Quality Evaluation Project Notes*, Number 64. North Carolina State University Extension Service, Raleigh.

In 1989, the U.S. Department of Agriculture initiated a five-year Water Quality Initiative in response to national concern about the declining quality of ground and surface water and to protect that water from contamination by agricultural chemicals.

Ninety projects resulted, all intended to provide farmers, ranchers, and foresters with the knowledge, technical means, and financial assistance to respond independently and voluntarily to agricultural and related state water environmental concerns and requirements.

The interim report looks at how 16 of these projects are improving or protecting water quality by reducing agricultural nonpoint source pollutants. The projects represent the major agricultural nonpoint source problems found throughout the Initiative's work.

Physical impacts of the sample projects were evaluated on the basis of three indicators of significant progress:

1. implementation of improved management practices and agrichemical management,
2. simulated reductions in pollutant loadings, and
3. monitored water quality changes.

Implementation of Practices and Agrichemical Use

The projects implemented 118 different types of practices, including 62 that have U.S. Soil Conservation Service national standards. Fifty-six of the practices are innovative applications of land, water, and agrichemical improvements appropriate to local conditions and often developed by state land grant universities, extension programs, or similar entities. Many of them (such as split applications of nitrogen, new livestock watering sites, and pest scouting) are components of practices defined in the SCS national practice handbook.

All 16 projects implemented nitrogen pollution reduction practices and 11 applied pesticide management and erosion or sediment control practices.

The 16 projects achieved sizable reductions in applied nutrient amounts — 6.7 million pounds of nitrogen and 4 million pounds of phosphorus. The full significance of these reductions is limited by insufficient data on preproject applications.

While several projects showed reduction in pesticide use, evaluation of such changes is more complex than the assessment of nutrient use. The type, rate, and method of application can vary greatly from year to year according to crop, weather, and pest pressure. Improvements in timing can reduce environmental damage even though the total amount of pesticides applied has not decreased. Several project teams promoted less toxic pesticides and better timing and methods of application; they also targeted producers farming soils with potentially high leaching or runoff.

Simulated Reductions in Pollutant Loadings

Project staffs used complex physical-process simulation models to project changes in pollutant loss from the surface of farm fields or below crop root zones resulting from new agricultural methods. Three projects have already documented a solid link between water quality objectives and simulated edge-of-field loading changes. Six others made significant progress in documenting such linkages. The field-scale models used most frequently were EPIC and GLEAMS; AGNPS was the most used watershed-scale model. Project staffs provide model developers with valuable feedback on how the models are being used and how they can be improved.

Monitored Changes in Water Quality Variables

Project teams did a fairly good job of documenting water quality problems in the project areas. Although water quality monitoring was not a project requirement, 14 of the 16 projects include some monitoring. However, in many projects, monitoring networks were established after the projects had already been planned (or even, in some cases, begun). Often these monitoring programs were designed based on objectives other than those of the USDA projects.

Except for three or four projects, it will be difficult to link practice installation to measured improvements in water quality. The primary reasons for this difficulty are insufficient attention during project formulation to the role, design, and execution of an integrated monitoring network; lack of emphasis on annual tracking of improvements in agrichemical use and land management; the dynamics of hydrologic cycles and weather; and short project lives (five years).

Interim Recommendations

Based on the experience of project staffs during the first three years of five-year projects, the following preliminary recommendations are offered:

- Project planners need to establish well-documented, clear, and quantifiable objectives and unbiased procedures to measure pre- and postproject levels for each objective, as well as changes during the project.

- Acceptable physical objectives for water quality projects should fall into one of three categories: (1) improvements in land treatment and agrichemical management; (2) reduction in pollutant losses from crop or livestock enterprises (this could also be stated as reduction in potential pollutant loadings to water); or (3) improvement in specific water quality variables. Simulated or monitored values for variables in the first two categories (such as tons of animal waste managed properly or nitrate leaching past the bottom of the crop's root zone) should be considered as indirect measures of water quality protection or improvement since they do not measure actual receiving water

Recommendations Offered on USDA Water Quality Projects (continued)

quality. Monitored values for variables in the third category (such as nitrate concentration in water or dissolved oxygen levels) should be considered direct measures of progress toward water quality protection or improvement objectives.

- Project staff should be trained in cost-effective methods for tracking land treatment and agrichemical management.

- Unbiased statistical methods for tracking improvements in land treatment and agrichemical management should be developed to allow: (1) estimating actual agrichemical application rates and acreage under improved management and taking account of units of practices installed; (2) ascertaining whether producers who have received assistance to install annual practices, such as nutrient management, continue in subsequent years to implement those practices as designed; and (3) determining the degree of independent adoption by producers or practices demonstrated by project staff.

- Staff should be trained in selecting and using appropriate field- and watershed-scale simulation models, including output interpretation and sensitivity analysis. Proper use of models includes their role in the project planning process to help identify critical pollutant source areas, identify the nature of the pollutant problem, design water quality monitoring, and determine potential (and relative) effects of alternative management systems on pollutant loadings.

- Agencies should continue to place a high priority on developing and training in the use of screening tools for nitrogen, phosphorus, and sediment to assist in identifying potential pollutant source areas and areas to target management improvements. Linkage to total maximum daily load (TMDL) tools could be useful. Water quality monitoring and evaluation must be an integral part of project planning, design, operation reporting, and evaluation.

- Water quality data should be used, to the extent possible, to help target land treatment and assess interim progress.

- Project staffs should participate in water quality monitoring activities and in data management and interpretation to the fullest extent possible.

- Project planners and staffs should be trained in basic concepts of monitoring and evaluation.

[For further information or copies of the free report, contact John Sutton, Soil Conservation Service, U.S. Department of Agriculture, Room 6808-S, P.O. Box 2890, Washington, DC 20013, FAX: (202) 720-9030.]

Pennsylvania Moves Toward One-Plan Farm Management

EDITOR'S NOTE: Although Pennsylvania's attempts to ease farmers' participation in conservation programs is newsworthy, it is not alone. A number of other states are heading in the same general direction. Indeed, it is likely that some version of holistic natural resource management on agricultural lands will be included in the next Farm Bill.

by Barry Frantz, Program Coordinator, Pennsylvania Association of Conservation Districts

Public and private agencies and organizations in Pennsylvania are continuing efforts toward the development of a single, comprehensive natural resource management plan for farmers and landowners. An August 1993 Memorandum of Understanding between 11 public agencies and private organizations supported the "One Plan" concept, which was piloted in Lehigh, Northumberland, and York counties in 1992 and 1993.

Funded by the Pennsylvania Department of Environmental Resources with a Clean Water Act Section 319(h) grant, the project was sponsored by the Pennsylvania Association of Conservation Districts and guided by a multiagency coordinating committee. Conservation districts coordinated the projects locally. Districts, SCS, the Pennsylvania Bureau of Forestry, the Pennsylvania Game Commission, the U.S. Fish and Wildlife Service, and industry consultants provided planning assistance to 23 participating farmers. Other federal and state agencies also consulted on the project.

Pennsylvania Moves Toward One-Plan Farm Management (continued)

Coordination of Plans First Priority

As a first step toward a fully integrated single-plan system, the project encouraged, but did not require, a comprehensive approach. In the pilots, coordination of plans was the foremost priority. Farmers and advisors worked together to develop plans to address any or all of the following items: soil conservation, nutrient management, pesticide safety, integrated crop management, forestry, and wildlife habitat. Most farmers chose to develop plans that addressed requirements of the Pennsylvania Clean Streams Law (covering sediment and manure runoff) or the U.S. Food Security Act (soil conservation compliance).

The process uses an integrated planning approach for problems that cannot be solved by individuals. In one county, a multiagency team representing the Conservation District, SCS, and Cooperative Extension worked with farmers on water quality concerns associated with pesticides. To protect groundwater, an Extension agent incorporated a locally adapted Farm*A*Syst assessment into his educational programs, while the District and SCS tailored management alternatives to specific farms. (For more information on Farm*A*Syst, see *News-Notes* #32.

The one plan approach to farm management emphasizes farmer involvement in problem solving and management. Both farmers and government agencies see this involvement as the best way to help people deal with regulations. Thus, aspects of the one-plan approach are being incorporated into regulations now being written for Pennsylvania's 1993 Nutrient Management Act (see *News-Notes* #30.)

Combining Water Quality, Profit, and Habitat

Feedback from participants indicated that the planning process helped them make more informed management decisions and that a single, integrated plan saved time and simplified record keeping. Farmers were especially impressed with the single numbering system for fields, preferring it to the burden of keeping track of different field numbers for each program.

The participants also favored practical, profitable BMPs. For example, farmers considered Integrated Crop Management and Nutrient Management BMPs beneficial because they improve crop production and reduce input costs while benefiting water quality. A number of farmers were also interested in new practices that are not profit-oriented, such as wildlife habitat improvement.

Project advisors achieved an excellent rate of plan implementations, which they attributed to the time spent discussing alternatives with farmers. However, they also indicated that the need for additional time may be the biggest obstacle to widespread implementation of the approach.

Additional projects in at least 16 Pennsylvania counties in 1994 will focus more on developing familiarity with the approach than on producing a large number of plans. The approach will be incorporated into several new Water Quality Improvement Projects recently approved by USDA.

[For more information, contact Barry Frantz, Program Coordinator, Pennsylvania Association of Conservation Districts, Inc., 225 Pine Street, Harrisburg, PA 17101. Phone: (717) 236-1006.]

Poultry Producers Use Waste While Protecting Water

"We've got to be good stewards and take care of our water quality," Dennis Maze, a third-generation poultry producer from Horton, Alabama, told a recent poultry waste management forum in Sheffield, Alabama. The meeting, sponsored by the Poultry Water Quality Consortium and Land & Water 201 (a state/USDA/EPA/TVA conservation program), brought together poultry producers, scientists, industry representatives, and environmentalists to discuss better ways of using the wastes produced by this rapidly growing industry.

The continued success and growth of the poultry industry in the Tennessee Valley and southeastern United States is one of the bright spots for agriculture in the region, according to the forum's sponsors. Alabama alone produces 900 million birds with a value of more than $1.2 billion each year or 43 percent of the state's annual farm cash receipts. However, the disposal of dead birds and litter is a major constraint to continued growth. Alabama poultry farms generate about 1.5 million tons of litter and 880 tons of dead birds each year. Poultry producers are aware

that this waste poses a water quality problem. They also recognize that if the waste is properly managed, it can be a valuable commodity.

According to TVA, the nutrients found in litter and dead birds from Alabama farms equal more than half the nitrogen, all the phosphorus, and three-fourths of the potassium in commercial fertilizers purchased by the state's farmers in 1992. However, the litter actually has a greater cash value as a beef-cattle feed (up to $90 per ton).

The Alabama Cooperative Extension Service at Auburn University notes that processed poultry litter has become a popular feed supplement for cattle because of its high nutrient value and low cost compared to traditional feed ingredients. Poultry litter can also be used as a soil amendment and in potting mixes.

TVA Vice President and Senior Scientist Ronald Ritschard told the forum that poultry litter is a major research area for TVA. TVA, SCS, and universities are cooperating to develop better field application methods and to determine how much broiler litter can safely be applied to land.

The development of the dead bird composter and the dry-stack storage facility helps make the change from waste to resource possible. Assisted by the Alabama Cooperative Extension Service, broiler producer Maze built one of the first dead bird composters and dry-stack storage facilities in the state. He told the forum that he had tried other methods of dead bird disposal, including digging pits, incineration, and landfill, but prefers his composting and dry-stack system.

"It is the best management tool I have," said Maze, who produces 750,000 broilers a year. After the 60- to 90-day composting process, Maze uses the material to top-dress his coastal bermuda grass pasture.

Demonstrations Convince Many to Compost

Some small poultry producers, unlike Maze, have been reluctant to invest in composters. According to James O. Donald, Jr., professor of agricultural engineering at Auburn University, mini-composters that better suit the requirements of small producers are now available to help them compost dead birds at a reasonable cost. In fact, more than 700 dead bird composters are now in use by Alabama poultry producers, as a result of demonstrations by TVA, SCS, and the Alabama Cooperative Extension Service. Many producers in Tennessee, Georgia, Mississippi, Kentucky, and other states are also using composters. USDA's Agricultural Stabilization and Conservation Service now provides cost-sharing assistance for dead bird composting.

To deal with the volume of litter that results from his operation, Maze uses dry-stack storage. In a covered facility, he stores 150 loads of broiler litter at a time until it is needed. Sheltering the litter from precipitation keeps runoff from carrying away the nutrients, thus protecting water quality and preserving the litter's value at the same time.

Maze reported that the demand for poultry litter is high: "I have received several calls that I can't supply," he said. More than 1,500 poultry producers and others in the industry have visited Maze's farm observe his environmentally protective management practices. That interest and a record high attendance at the forum clearly indicate that poultry producers are interested in practices that benefit the environment as well as their businesses.

[See News-Notes issues 1, 8, 15, 22, 23, 29, and 36 for other articles on poultry producers' endeavors to prevent nonpoint source pollution. For additional information on the use of dead bird composters and dry-stack storage facilities, and on marketing broiler litter, contact Dennis Maze, 616 Stevenson Drive, Horton, AL 35980. Phone: (205) 429-2649.

For information on the design of dead bird composters and dry-stack storage, contact James O. Donald, Jr., Professor of Agricultural Engineering, Alabama Cooperative Extension Service, 228 Agricultural Engineering Building, Auburn University, AL 36849-5633.]

For a compendium of poultry waste management practices, see the Poultry Water Quality Handbook, a 1994 publication of the Poultry Water Quality Consortium (available as individual fact sheets). Contact: Ed Schwille, TVA-CST 17D-C, 1101 Market Street, Chattanooga, TN 37402-2801. Phone: (615) 751-7297; FAX: (615) 751-7479.]

Kentucky Legislature Passes Agriculture Water Quality Bill

by Barry Tonning, Gateway District Health Department NPS Program Manager

An effort by Kentucky farmers to avoid strict NPS enforcement laws through self-regulation and voluntary compliance may represent the wave of the future. This year, Kentucky producers and farm organizations helped push a water quality protection bill through the state legislature.

The new state law, adopted as Senate Bill 241, creates an Agriculture Water Quality Authority composed of representatives of farm groups, state agencies, university Extension programs, and environmental organizations. The authority is charged to

- develop statewide agriculture surface and groundwater quality plans;
- review and research suspected surface and groundwater pollution problems; and
- provide technical assistance in the development and implementation of best management practices.

All agricultural operations in the state will be required to develop and implement water quality plans within five years, with federally mandated conservation or management plans satisfying this requirement. After approval of the statewide water quality plan, individual operators must amend their plans and adopt compliance schedules if runoff or seepage from their operations is found to be contaminating groundwater or surface streams.

The law beefs up state water monitoring programs and contains a "bad actor" section to deal with operators who refuse to comply with regional or individual water quality plans. Enforcement provisions include civil penalties and the loss of eligibility for federal cost-share programs and other financial assistance.

While some state conservation and environmental organizations note that the law is relatively weak and offers few new provisions, it does mark the first time that Kentucky producers and farm organizations have squarely faced the issue of seepage and runoff pollution from agricultural operations.

Environmentalists in the state have adopted a wait-and-see attitude toward the measure, since the ball of pollution prevention is now clearly in the court of producers. The agriculture community is hoping it will work. If, however, the new law fails to reduce runoff and seepage from farms, the advocates of enforcement will have another example to cite in their case.

[For more information, contact Barry Tonning, Gateway NPS Program Manager, P.O. Box 555, Owingsville, KY 40360. Phone: (606) 674-6396.]

Coastal Nonpoint Pollution News

North Carolina Coastal Management Recommendations Presented to Governor

In 1974, North Carolina's Coastal Areas Management Act (CAMA) represented some of the nation's most progressive thinking on coastal management. It banned sea walls and other "hard" beach stabilization structures that inhibit natural beach processes, and it delineated Areas of Environmental Concern where a permit system now guides development. CAMA's planning program prompted the adoption of local land-use plans in all of the state's coastal counties. But despite CAMA's success, the state's coast is still vulnerable to threats from nonpoint sources and pressures related to coastal development.

This year, North Carolinians have been celebrating CAMA's 20th anniversary by examining its results and exploring choices for the next 20 years and beyond. Designating 1994 as the Year of the Coast, Governor James B. Hunt appointed 15 people to the newly created Coastal Futures Committee. The committee, whose appointed members include a retired federal court judge, a former governor, a marine biologist, several developers, and a town manager, was charged with soliciting public comment across the state's coastal area and assessing CAMA's effectiveness.

After a year of intense study and discussion, compromise and consensus, the committee presented its recommendations to the Governor on September 7 in a report, *Charting a Course for Our Coast*. Governor Hunt expressed support for the recommendations, saying, "This is the kind of document that we can all come together behind."

North Carolina Coastal Management Recommendations Presented to Governor (continued)

The committee's recommendations focus on five areas: land use and growth management, coastal water quality, protection of natural areas, CAMA regulatory program organization, and environmental education.

Nonpoint Sources Scrutinized

The panel recommended tighter nonpoint source controls in coastal areas. Marinas, agriculture, forestry, construction, and hydromodification received special scrutiny, resulting in recommendations that include

- development of a comprehensive marinas policy with requirements for pumpout facilities for marinas above a certain size and sealed heads for all boats;
- development of water quality guidelines for boat owners and marina builders and operators;
- limits on the numbers and sizes of marinas,
- allocation of cost-share funds for BMPs in agricultural-coastal watersheds;
- requiring site-specific BMPs in prioritized agricultural areas and initiating enforcement actions as needed;
- BMPs for wetland forestry activities;
- increased tracking of forestry activities;
- enforcement for forestry BMP implementation;
- expanding to all waters the requirements for construction sediment removal BMPs on high quality waters;
- factoring in of the cumulative impacts from land-disturbing activities when determining the need for sedimentation and erosion control plans for small construction sites; and
- improvements on prioritized channelized streams, including restoration of headwater wetlands, water control structures, and buffers to protect water quality standards and uses.

"The recognition that we need better control of runoff from road construction sites overseen by the state department of transportation is important," said state NPS Coordinator Lisa Huff. She also called attention to some "excellent" monitoring recommendations, for example, the recommendations to step up water quality monitoring and evaluate the indicators of environmental stress (including algal blooms and fish kills) for incorporation into water quality standards.

Many of the committee's recommendations on nonpoint source pollution seek to complete a comprehensive management approach that will meet requirements of Section 6217 of the federal Coastal Zone Reauthorization Act of 1990 (see *NPS News-Notes* #28, April 1993). In the committee's view, localities should be required to specify strategies for NPS control, including ordinances, in their land-use plans. However, a recommendation to clean up the chronically polluted South River as a demonstration of the state's ability to enforce management measures required under 6217 drew criticism from Huff. She pointed out that the state does not currently have enforceable mechanisms to control all categories of coastal nonpoint source pollution.

Another recommendation calls for a special classification for impaired waters such as South River. The "Use Restoration Waters" classification would trigger mandatory site-specific BMPs for forestry, farming and waste treatment facilities. Huff applauded the committee for the recommendation, saying that it is critical for the state to develop this special classification.

Nonpoint Source Enforcement

Pointing out that "despite many strong environmental laws, nonpoint source pollution continues to degrade coastal waters," the committee urged the state Department of Environmental Management to develop a comprehensive nonpoint source enforcement program. Such a program would identify NPS problems, apply stronger corrective actions, track new activities to ensure preventive controls, increase staff and resources for enforcement, and coordinate with other agencies to detect and correct violations quickly.

The committee also recommended better enforcement of rules that require BMPs for specific agricultural, forestry, or other land uses that violate water quality standards or interfere with water uses.

North Carolina Coastal Management Recommendations Presented to Governor (continued)

The recommendations are timely because North Carolina's coastal population has grown at a rate almost twice that of the entire state, and it continues to surge. Consequently, the committee devoted much consideration to land use and growth management, stating, "Effective local land use management offers the best chance for developing a common vision and goals for the future that will balance the economic development and resource protection that are both necessary for a healthy coastal area."

However, Dave McNaught, director of the Pamlico-Tar River Foundation and member of the North Carolina Coastal Resources Commission, believes that the recommendations do not go far enough. The question of how best to prepare the future of the North Carolina coast is complex, he said. "Despite the fact that the recommendations are a valuable step in the process, they fail to offer an ultimate vision for the future. To protect the environmental quality of coastal North Carolina, we're going to have to change our fundamental notions of what constitutes economic prosperity. We cannot continue to rely on traditional patterns of economic growth without significantly undermining the quality of life in coastal North Carolina."

One key recommendation for managing growth is to provide financial and technical assistance to local governments that agree to implement their approved plans. Coastal localities that do not comply risk a moratorium on state-issued development permits and funding.

The Coastal Futures Committee called for an individual plan for each of the state's estuarine systems and their tributaries. The plans would establish reduction targets for nutrients, sediments, and fecal coliform and would outline steps to achieve the targets, which would protect indicator species. "This recommendation merges well with North Carolina's current basinwide management planning initiative," commented Huff.

Committee Calls for More Public Lands

North Carolina has a long history of setting aside public lands, starting with the 370-year-old Public Trust Doctrine, and more recently, CAMA's fund for the purchase of important coastal ecosystems. However, land acquisition and conservation must play an even greater role in future coastal resource protection, according to the committee's report, which emphasized "There are limits to what can be accomplished through a regulatory program."

The panel offered a number of alternatives, including expanding the coastal reserve program to conserve key environmental systems and suggestions for revenue-raising. It also emphasized the coast's economic stake in preserving high quality beaches, estuaries, and other natural resources that form the basis for the region's tourism and fishing industries.

Throughout its report, the committee stressed comprehensive planning and action and the importance of considering cumulative and secondary impacts of growth:

> *For instance, before approving construction of a new bridge or marina, officials should consider not only the effects on the immediate environment but also on the community's ability to deal effectively with the increased need for wastewater treatment and other infrastructure, as well as the estuary's ability to handle the increased wastewater load.*

This emphasis should, according to NPS coordinator Huff, be expanded. "The secondary impacts of regional sewering [recommended in the report] could be devastating for coastal water quality." She said that road-building and sewering are two of the most devastating "activities because they bring so many new residents into coastal areas. "Essentially, with roads and sewers, if we build them, they will come," she said.

The committee called for a comprehensive approach in environmental education, beginning with preschool and continuing into adulthood with public outreach programs. "They do a good job of showing how teaching about the environment should be incorporated into the normal curriculum," said Huff. "Science, arithmetic, history and geography — all the things that people need to learn — are also perfect ways to teach about the environment."

In offering these recommendations, the Coastal Futures Committee cautioned that they should not be seen as "just another report that sits on a shelf. . . . These recommendations are intended to serve as a guide for administrative, legislative, and citizen action and as a call for a public commitment to wisely manage our coastal resources for years to come."

[For more information, contact the North Carolina Coastal Futures Committee, P.O. Box 4429, Emerald Isle, NC 28594. Phone: (800) 232-6210. FAX: (919) 393-7508.]

News from the States, Tribes, and Localities, Where The Action Is

Bay Community to Enhance Human and Wildlife Habitat

Citizens of Olympia, Washington, have embarked on an ambitious plan to enhance the habitat of Puget Sound's East Bay for fish and wildlife — and humans.

Filling and dredging activities since early in the century have irrevocably changed the bay's shoreline. Several city blocks now stand on what was once an estuary filled with fish, shellfish, and wildlife. While local officials concede that East Bay will never be restored to its former pristine state, the East Bay Shoreline Environmental History and Restoration Project believes it can be changed for the better.

The state Department of Ecology has made a Coastal Zone Management Grant of $33,000 to help start the East Bay project. Joining the effort are the Port of Olympia, the city's Parks, Recreation, and Cultural Services Department, the Squaxin Island Tribe, and the Fish and Wildlife and Natural Resources departments.

East Bay and its tidal mudflats are important to the health of local wildlife. They contain rich stores of food for wintering waterfowl and salmon that spawn in Indian and Moxlie creeks. They also serve as a flood control mechanism for the city and a filter that enhances water quality in Puget Sound.

Early History

The mudflats of East Bay, a small arm off Budd Inlet, played an important role for settlers and the Nisqually, Squaxin, and Duwamish tribes that once harvested shellfish, salmon, and berries there. Despite increasing settlement by Anglo-Americans, Native Americans continued to harvest oysters and clams from East Bay until the 1890s. The first dredging and filling of East Bay in 1902 destroyed the shellfish beds, forcing the tribes to discontinue their harvests.

Eventually, settlement in Olympia increased the demand for land. The Carlyon fill of 1909 provided 29 blocks on which homes and businesses could be built, it eliminated most of the productive estuary, and permanently altered the shoreline.

Industrial activities along East Bay in the 1940s and 1950s led to more dredging and additional land at the northern end of the peninsula. The pattern of dredging and filling ended only recently, in 1982, when the East Bay Marina Project was finished. That project eliminated 54 acres of tidelands along the southern and western shores of East Bay.

Plans for the Future

About 35 people attended the recent first community forum to help "bring back East Bay." They listened to city officials and experts speak about shorebirds, waterfowl, and the importance of estuaries for salmon. The discussion that followed assured leaders that Olympia's citizens are interested in improving the bay.

Preliminary goals and objectives developed by the East Bay Shoreline Environmental History and Restoration Project were to improve the water quality and habitat for fish and birds, provide public access to the bay, and develop educational opportunities about marine habitat for the community.

After several months of study, the city planners recommended beginning with shoreline restoration, including revegetating the eastern shoreline and establishing a 100-foot-wide vegetative buffer along part of the western shoreline. Abandoning or moving the road system serving the Port Peninsula and the construction of a pedestrian trail will buffer the shoreline and improve community access.

A task force will be appointed to develop a comprehensive habitat plan. Monitoring and correcting contaminated discharges to East Bay are also central to the project.

Other components target education and stewardship-building. These plans include developing an education and training program for monitoring East Bay habitat, implementing a historic

Bay Community to Enhance Human and Wildlife Habitat (continued)

shoreline walk through downtown Olympia, and developing a long-range communications and education framework focused on Budd Inlet.

A second phase, estuary enhancement, will require a level of technical and financial ability beyond the current plan, according to project staff. Constructing salt marshes and improving the habitat of an existing freshwater wetland are on the agenda after issues of technical feasibility, competing uses, public access and views, and costs are addressed. While East Bay can never be fully restored, with community support, it may once again provide a welcome refuge for human and aquatic life and a glimpse into the area's rich history.

[For more information, contact Liz Hoenig, City of Olympia, Public Works Department, Water Resources Program, P.O. Box 1967, Olympia, WA 98507. Phone: (206) 753-8494 or (206) 753- 8598.]

News-Notes Update

Coastal America Partnership Renews Commitment

EDITOR'S NOTE: *News-Notes* #14 (July-August 1991) announced the birth of Coastal America. As this update shows, its first three years have been productive.

Members of Coastal America, a partnership of federal, state, and private organizations formed in 1991 to protect, preserve, and restore the nation's coastal ecosystems, have signed a new Memorandum of Understanding. The new agreement, dated July 12, 1994, renews and strengthens the unique, collaborative partnership.

As Robert Perciasepe, assistant administrator for EPA's Office of Water and one of the 10 federal signatories, commented

> *Over the past two years, the Coastal America partnership has provided an excellent opportunity for the EPA to accomplish many of our major objectives during this time of limited resources. Today, there are more than 90 action-oriented projects underway in 23 states involving more than 200 nonfederal organizations.*

Projects encompass a broad range of coastal ecosystems from the Gulf of Mexico to New England to the Great Lakes.

Protecting Whooping Crane Habitat in the Gulf

Designated a critical habitat for the whooping crane, the Aransas National Wildlife Refuge on the Gulf of Mexico is threatened by erosion along the Gulf Intracoastal Waterway. The Aransas Shoreline Protection Project installs cement bags to form short-term, temporary shoreline protection and stabilization structures until a permanent solution can be found.

The U.S. Navy, the U.S. Fish and Wildlife Service, and the Corps of Engineers have provided federal leadership in the Aransas project, but the work was done by 400 volunteers. They came from 38 businesses, three conservation or other special interest groups, four scouting groups, five Texas state agencies, and seven federal agencies. They contributed over 7,000 hours of labor worth an estimated $500,000. The majority of supplies, services, and equipment were contributed or donated by the private sector or by individuals. The project has so far protected 3,859 linear feet of shoreline. (See *News-Notes* #20 [April 1992] for another article about Aransas National Wildlife Refuge.)

Restoring a Salt Marsh on Rhode Island's Coast

Reestablishing marsh elevations and tidal flooding will restore and enhance approximately 130 acres of salt marsh that comprise the Galilee Bird Sanctuary in Narragansett, Rhode Island. The restored marsh will improve water quality and increase wildlife habitat.

The Corps of Engineers, EPA, Department of the Interior, Waterways Experiment Station, and the Department of Transportation represent the federal involvement in the project.

Nonfederal sponsors are the University of Rhode Island, Ducks Unlimited, and the state departments of transportation and fish and wildlife.

Coastal America Partnership Renews Commitment (continued)

Preventing Agricultural Pollution in Lake Erie

Three-year demonstration projects are in place on several farms in each of eight Ohio counties in the Maumee watershed to determine the economic feasibility of prescription fertilizer application. (See *News-Notes* #31 for more on how prescription farming customizes fertilizer applications within farm fields.) The Soil Conservation Service is the lead agency and provides federal funding for the Maumee Nonpoint Source Pilot Project.

Nonfederal sponsors are the Ohio Environmental Protection Agency, the Ohio Department of Natural Resources, Ohio Soil and Water Districts, Sierra Club, Audubon Society, and the League of Women Voters. Additional sponsors are the farmers involved in the demonstration projects. Participants hope that the project will substantially improve downstream water quality.

The Maumee watershed, which is spread over three states, has been identified as a major contributor of nonpoint phosphorus loading to the western basin of Lake Erie and one of the International Joint Commission's 43 Areas of Concern. An estimated 65 percent of the phosphorus loading to the Maumee River originates from runoff from overfertilized cropland exposed to winter rains and snows.

"Working together on projects like these, the Coastal America partnership has restored thousands of acres of wetlands, reestablished spawning streams for anadromous fish, reduced agricultural nonpoint source pollution, and protected several endangered species of fish, birds, and marine mammals," Perciasepe said.

[For more information, contact Betsy Tam, Oceans and Coastal Protection Division, (4504F), U.S. EPA, 401 M Street, SW,, Washington, DC 20460. Phone: (202) 260-6466.]

Notes on Environmental Education and having fun at the same time

EPA Awards $3 Million in Environmental Education Grants

The U.S. Environmental Protection Agency awarded grants totaling almost $3 million in fiscal year 1994 to fund public and nonprofit projects that educate adults and children on how their activities affect the environment.

The projects are as varied as the development of water testing kits in rural Alaskan villages, the study of marine science in the Virgin Islands, and teacher training focusing on 1993's midwestern floods. Recipients range from American Indian tribes to the Massachusetts Audubon Society. A number of the grants went to water-oriented projects.

Grants Send Students into the Field

- ☆ The Alaska Pacific University of Anchorage received $3,941 to construct kits to help students in rural villages test water quality.
- ☆ Outward Bound Adventure of Pasadena, California, received $4,948 for Meaningful Water Conservation, a project for inner-city students. Funds will be used to prepare a curriculum and provide field trips illustrating the journey of a drop of water or melted snow through the Los Angeles water delivery system.
- ☆ In Colorado, Woodland Park School District RE-2 received $2,191 to provide a wetlands learning environment for students.
- ☆ Gifted, culturally diverse inner-city students in metropolitan New York will also be studying wetlands, thanks to a $4,974 grant to the Anderson Program.
- ☆ The city of Hillsboro, Oregon, received $15,000 to produce a 10-week wetland education program to be broadcast via the Oregon Ed-Net satellite video-telecommunications system.

- ☆ The Massachusetts Audubon Society and Wellfleet Bay Wildlife Sanctuary received $5,000 for a cooperative project. Through classroom sessions, field trips, and other activities, Project Pond will educate 240 10th-grade biology students in the natural history and management of coastal kettle ponds.

Adult Environmental Education Aided

- ☆ The Farmington River Watershed Association in Simsbury, Connecticut, received $4,975 to help a partnership of diverse groups in seven communities develop a multitown river corridor conservation plan for the lower Farmington River.
- ☆ In Bowie, Maryland, the Alliance for Community Education will use its $5,000 grant to start an adult education program on nontoxic lawn and garden care. The environmental objective is to reduce nonpoint sources of pollution to the Chesapeake Bay.
- ☆ A $5,000 award to the Grand Traverse Band of Ottawa and Chippewa Indians in Michigan will enable them to develop a master environmental education plan for the reservation. The plan will establish a framework for a comprehensive land use plan that combines traditional practices with the preservation, restoration, and conservation of local natural resources. The plan may include the restoration and stocking of a stream that flows through the reservation.

Teacher Training Projects Get Grants

- ☆ The University of Iowa will develop the Iowa Floods Follow-up Project with an EPA grant of $24,974. To improve their environmental awareness, teachers will travel throughout the state studying the effects of the 1993 floods. When they return, the teachers will help design teaching modules based on their travels.
- ☆ Rough Rock School Board of Chinle, Arizona, received $5,000 that teachers will use to involve students on the Navajo Reservation in the Four-Corners region. The students will participate in projects that address waste management and water pollution on the reservation.
- ☆ A teacher education project at Michigan State University received a grant of $5,000 for a three-week interdisciplinary workshop in physical environmental science for 30 high-school chemistry, physics, and earth science teachers.
- ☆ A $7,800 grant to Pacific Lutheran University in Tacoma, Washington, will be used to fund a four-week summer course for K-12 teachers. The course will provide hands-on, interdisciplinary approaches to watershed evaluation focused on the Clover Creek watershed (see *News-Notes* #34 [January-February 1994] for an article about Clover Creek).

In the Classroom

- ☆ The Spokane, Washington Conservation District will use a $9,663 grant to extend an existing project that incorporates watershed education in the social studies, science, and language arts curricula for 1,000 high school and middle school students. Students who have completed field studies and riparian habitat restoration work will return to the classroom to learn about individual and cultural choices that impact water quality.

These and other water-related education projects were among the 255 proposals that received grants. EPA headquarters awarded 14 grants ranging from $25,001 to $250,000. EPA regions awarded 241 grants in amounts up to $25,000. At least 25 percent of the total awards were grants of $5,000 or less.

The solicitation, evaluation, and award processes through which EPA makes these grants are described in EPA's annual environmental education grants solicitation notice. Grant awards for 1995 will be announced in April.

[For more information about environmental education grants, contact George Walker, U.S. EPA Environmental Education Grants, Environmental Education Division (1707), 401 M Street, SW, Washington, DC 20460. Phone: (202) 260-8619.]

NPS Electronic Bulletin Board News

This portion of *News-Notes* is prepared for the benefit of readers who are regular users of U.S. EPA's *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.

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

All issues of *News-Notes* are stored on the *NPS BBS* and downloaded to your personal computer. A searchable *News-Notes* database helps you find the information you need.

To access the *NPS BBS*, you 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.

The *NPS BBS* may also be accessed from the Internet by typing TELNET FEDWORLD.GOV. Once on FedWorld, turn ANSII graphics off and go through the Gateway to NPS-BBS, or command D 79.

A Host of Environmental Bulletin Board Systems

Now that everyone is either eagerly or resignedly embracing the "information age," we thought you'd be interested in a sampling of other bulletin boards on water or other environmental information. Most of the BBS's in this listing are "free," meaning that there is no fee for using the BBS services. However, unless a toll-free number is provided, users must pay any phone charges. Systems are listed in alphabetical order by name. A more extensive list can be found on the *NPS BBS* in a downloadable file.

AGRICULTURAL ELECTRONIC BULLETIN BOARD — AgEEB

Sponsor: Food and Agriculture Policy Research Institute of the University of Missouri

Subject: Public domain software programs related to agriculture and long-range agricultural forecasts.

Modem Phone: 314/882-8289
Voice Phone: 314/882-4827
Baud/Parameters: Up to 2400 - 8-N-1
Hours/Cost: 24 hours / 7 days / Free

THE BIOLOGIST'S ELECTRONIC NETWORK — BIOTRON

Sponsor: American Institute for Biological Sciences

Subject: Information for professionals in the field of biological science, including employment opportunities and the AIBS Forum journal.

Modem Phone: 202/628-2427
Voice Phone: 202/628-1500
Baud/Parameters: 300, 1200, 2400 - N-8-1
Hours/Cost: 24 hours / 7 days / Free

For more information, contact: American Foundation for Biological Sciences, 730 11th Street, NW, Washington, DC 20001-4521

CALIFORNIA DIVISION OF MINES AND GEOLOGY BBS — CDMG ONLINE

Sponsor: State of California, Department of Conservation, Division of Mines and Geology

Subject: Geology in California.

Modem Phone: 916/327-1208
System Operator: Ted Smith / Steve Newton-Reed
Baud/Parameters: 300, 1200, 2400 - N-8-1
Hours: 24 hours / 7 days

COMPUTER-ORIENTED GEOLOGICAL SOCIETY NETWORK — COGSnet

Sponsor: Computer-Oriented Geological Society (COGS) and the Society of Mining Engineers (SME)

Subject: Dedicated to providing information and public-domain software to earth scientists who are interested in using computers.

A Host of Environmental Bulletin Board Systems (continued)

Modem Phone: 303/740-9493
System Operator: Tom Bresnahan
Baud/Parameters: 300, 1200, 2400 - N-8-1
Hours: 24 hours / 7 days

CONTINENTAL DIVIDE BBS

Subject: Science, engineering, and environmental awareness.
Modem Phone: 601/957-3016
System Operator: Mike Seal
Baud/Parameters: 1200, 2400, 9600 - 8-N-1
Hours/Cost: 24 hours / 7 days / Free

DOUBLE HELIX

Subject: All areas of science, including the environment.
Modem Phone: 212/865-7043
System Operator: Jim Henderson
Voice Phone: 212/956-8076
Baud/Parameters: 300, 1200, 2400 - N-8-1
Hours/Cost: 24 hours / 7 days / Free

ELECTRONIC ENVIRONMENTAL BULLETIN BOARD — E_2B_2

Sponsor: National NonPoint Source Federation, JT&A, inc.
Subject: Environmental information — primarily NPS: legislation, technical assistance, programs, projects, calendar. Internet E-Mail & newsgroups. Subscriber info exchange—papers, announcements, etc.
Modem phone: (913) 897-1040 / Also access through CRIS
Voice phone: (202) 833-3380
Baud/Parameters: N-8-1; ANSI, duplex full. Up to 14.4 K
Hours/Cost: 24 hrs/7 days / $7.50/month (1st hr free)

EARTH ART BBS

Sponsor: International Duck Stamp Print Exchange
Subject: Information on, and sales of, collectable conservation prints. Also includes connection to GreenNet, RelayNet Outdoors conference, SC Sierra Club hub, and the Green BBS list.
Modem Phone: 803/552-4389
System Operator: Bob Chapman
Baud/Parameters: Up to 57.6k - N-8-1
Hours/Cost: 24 hours / 7 days / Free

EARTHNET ENVIRONMENTAL INFORMATION SERVICE — EARTHNET (NY)

Subject: Provides a forum and a tool for environmentalists and concerned citizens to exchange information that pertains to the environment. Participating organizations are the Public Interest Research Group, Environmental Leaders Network, H. Frank Carey Ecological Society, Earthwatch, and many others.
Modem Phone: 516/321-4893
System Operator: Byron Arnao
Voice Phone: 516/669-0138
Baud/Parameters: 1200, 2400 - N-8-1
Hours/Cost: 24 hours / 7 days / Free

EPA ALTERNATIVE TREATMENT TECHNOLOGY INFORMATION CENTER — ATTIC

Sponsor: U.S. EPA, Office of Environmental Engineering and Technology Demonstration
Subject: Most comprehensive network providing up-to-date information on innovative treatment technologies. Provides information on hazardous waste clean-up alternatives, technical experts, and vendors who can help decisionmakers implement remediation.
Modem Phone(s): 301/670-3808
301/670-3813
System Operator: Mary Stevanus
Voice Phone: 301/670-6294
Baud/Parameters: 1200, 2400 (2nd line 9600) - 8-N-1
Hours/Cost: 24 hours / 7 days / Free
For more information, Contact Joyce Perdek, Work Assignment Manager, Office of Research and Development, U.S. EPA, MS-104, 2890 Woodbridge Avenue, Edison, NJ 08837-3679. Phone: 908/321-4380. Fax: 908/321-6640

A Host of Environmental Bulletin Board Systems (continued)

EPA CENTER FOR EXPOSURE ASSESSMENT MODELING ELECTRONIC BULLETIN BOARD SYSTEM — CEAM BBS

Sponsor: U.S. EPA's Office of Research and Development, Athens, GA.

Subject: Designed to meet increasing demand for exposure assessment models. Provides efficient communication between users and support staff and immediate acquisition of models by users subject to extreme time pressures.

Modem Phone: 706/546-3402
System Operator: Shawn Turk
Voice Phone: 706/546-3549
Baud/Parameters: 300 - 19.2k - N-8-1
Hours/Cost: 24 hours / 7 days / Free

For more information, contact: Athens Environmental Research Laboratory, College Station Road, Athens, GA 30613.

EPA CLEAN-UP INFORMATION BBS — CLU-IN BBS

Sponsor: U.S. EPA Office of Solid Waste and Emergency Response (OSWER), Technology Innovation Office

Subject: Designed for hazardous waste cleanup professionals who need information about innovative technologies, consultation with one another on-line, and access to databases. CLU-IN is used by those involved Superfund cleanups and Resource Conservation and Recovery Act (RCRA) corrective action sites, including EPA, other federal and state agency personnel, consulting engineers, technology vendors, remediation contractors, researchers, community groups, and individual citizens.

Modem Phone: 301/589-8366
System Operator: Beth Ann Kyle
Voice Phone: 301/589-8368
Baud/Parameters: 1200, 2400 - N-8-1
Hours/Cost: 24 hours / 7 days / Free
Note: EPA users can access CLU-IN through EPA's x.25 network without a modem.

EPA GULF OF MEXICO PROGRAM BBS — GULFLINE

Sponsor: U.S. EPA Gulf of Mexico Project

Subject: Free exchange of environmental information. Includes searchable on-line databases of Gulf specialists as well as the EPA National Telephone Directory.

Modem Phone(s): 800/235-4662
601/688-2677
System Operator: Kay McGovern
Voice Phone: 601/688-1065
Baud/Parameters: Up to 9600 - N-8-1
Hours/Cost: 24 hours / 7 days / Free

EPA POLLUTION PREVENTION INFORMATION EXCHANGE — PPIC-PIES

Sponsor: U.S. EPA Office of Environmental Engineering and Technology Demonstration, Pollution Prevention Information Clearinghouse, Office of Pollution Prevention.

Subject: Provides access to Pollution Prevention Information Exchange System (PIES), International Cleaner Production Information Clearinghouse (ICPIC), Ozone Action Information Clearinghouse (OAIC), technical experts, calendar of events, case studies, program summaries, and documents.

Modem Phone(s): 800/424-9346
703/506-1025
System Operator: Myles Morse
Voice Phone(s): 202/475-7161
703/821-4800
Hours/Cost: 24 hours / 7 days / 90 minutes use per day. Toll free access to state agencies. Call second voice phone listed for 800-number or ask sysop online.

EPA REGION IV TECHNOLOGY TRANSFER BBS

Sponsor: Technology Transfer Unit, Municipal Facilities Branch, Water Management Division, U.S. EPA, Region IV

Subject: Topics relating to wastewater, small communities, innovative and alternative technology, water supply, water quality, and stormwater. Emphasis on EPA Region IV activities.

Modem Phone: 404/347-1767
System Operator: John Harkins

A Host of Environmental Bulletin Board Systems (continued)

Voice Phone: 404/347-3633
Baud/Parameters: 1200, 2400 - N-8-1
Hours/Cost: 24 hours / 7 days / Free

EPA REGION 10 BBS

Subject: Facilitates communication on environmental concerns among EPA, state and local governments, and the public.
Modem Phone: 206/553-2241
System Operators: Tom Denning / Christine Parker / Ken Kerner
Voice Phone(s): 206/553-1026
206/553-2987
Baud/Parameters: T1200, 2400 - N-8-1
Hours/Cost: 24 hours / 7 days / Free

EPA WASTEWATER TREATMENT AND INFORMATION EXCHANGE — WTIE BBS

Sponsor: U.S. EPA Small Flows Clearinghouse — U.S. EPA Office of Municipal Pollution Control, and Office of Water.
Subject: Wastewater.
Modem Phone(s): 800/544-1936
304/293-3150
System Operator: Brad Maust
Voice Phone(s): 800/624-8301
304/293-4191
Baud/Parameters: 300, 1200, 2400 - N-8-1
Hours/Cost: 24 hours / 7 days / Free

FEDWORLD

Sponsor: National Technical Information Service
Subject: Many subjects of national importance. Provides gateway from Internet to many BBSs.
Modem Phone: 703/321-8020
Voice Phone: 703/ 487-4608
Baud/Parameters: 1200, 2400, 9600/ N-8-1
Hours/Cost: 24 hours / 7 days / Free
From Internet, type TELNET FEDWORLD.GOV; the IP address for FedWorld is 192.239.92.201.

GLOBAL ACTION NETWORK

Sponsor: Global Action Network, Environmental Citizenship Program, Lincoln Filene Center, Tufts University, Medford, MA 02155
Subject: Consolidates information from environmental organizations, congressional offices, and research institutes.
System Operator: Joe Geierman, Coordinator
Voice Phone: 617/381-3423
Hours/Cost: 24 hours / 7 days / Call for fee information

GREENLINE

Subject: Direct line for environmental action, events, information, goods, and sermons. Daily environmental news, instant letters to government and business leaders.
Modem Phone: 900/446-4761
Cost: Cost of 900 number call

GREENPEACE ENVIRONET

Sponsor: Greenpeace Action
Subject: For groups and individuals interested in ecological and peace issues.
Modem Phone: 415/512-9108
System Operator: Dick Dillman
Voice Phone: 415/474-6767
Baud/Parameters: 300, 1200, 2400 - N-8-1
Hours/Cost: 24 hours / 7 days / Free
For more information, contact: Greenpeace Action, 16 Townsend Street, 4th Floor, San Francisco, CA 94109; or Greenpeace USA, Inc., 1611 Connecticut Avenue NW, Washington, DC 20007. Phone: 202/462-1177.

A Host of Environmental Bulletin Board Systems (continued)

NATIONAL AGRICULTURAL LIBRARY BBS — ALF

Subject: Provides users with access to technical information including the AGRICOLA database, bibliographies, and expert system programs on topics such as groundwater technology, irrigation, alternative crops, pesticides, and herbicides.

Modem Phone:	301/504-6510
	301/504-5111
	301/504-5496
System Operator:	Karl Schneider / Becky Thompson
Voice Phone(s):	301/504-5113
	301/504-5414
Baud/Parameters:	Up to 9600 - 8-N-1
Hours/Cost:	24 hours / 7 days / Free

[This list was updated in May 1993. To help update the list, leave on-line messages for NPS BBS content editor Judy Trimarchi.]

Reviews and Announcements

Rice BMPs on Video

The Lower Colorado River Authority (LCRA) has produced an 11-minute educational video that highlights environmentally and economically beneficial techniques for growing rice.

"Rice: A Better Way," illustrates best management practices currently used by rice producers in the lower Colorado River basin. The video encourages other rice farmers to adopt similar practices, including water conservation methods and limiting pesticide and fertilizer use. A second purpose is to inform the nonfarming community about pollution prevention measures undertaken by rice growers.

The video describes an entire rice-growing season. It illustrates soil collection and analysis before planting, precision-leveling a field, various water conservation techniques, use of a chlorophyll meter to determine plant nutrient needs, and techniques to determine the correct timing of pesticide applications.

The video grew out of an effort undertaken by rice growers in Matagorda County, Texas, several years ago; they wanted to develop a formal program to demonstrate best management practices to various local organizations. At the same time, the LCRA was seeking to develop an informational program using videos to promote best management practices for growing crops in the lower Colorado River region. The two groups combined their efforts and "Rice: A Better Way" is the result.

Production was jointly sponsored by the LCRA, local Texas Agricultural Extension Service county agents, the Texas Agricultural Experiment Station, various area rice farmers, and Haskell Simon, a Matagorda County rice farmer and chair of the Matagorda Water Council, and various other rice farmers in the area.

"While the video will be particularly useful to rice farmers, we believe it will be of value to broader audiences such as school and service club groups as well," Simon said. The video is earmarked for distribution to various state and local agencies and environmental organizations.

[For a copy of "Rice: A Better Way," send a check for $5 to the LCRA, Clean Colorado Project, P.O. Box 220, Austin, TX 78767, or call Rusty Ray, LCRA. Phone: (800) 776-5272, Ext. 7632].

Call for Photos and Children's Artwork

EPA's Assessment and Watershed Protection Division (AWPD) invites you to submit (by December 31) photos and children's artwork for possible use in the *National Water Quality Inventory: 1994 Report to Congress*. Photos and artwork should depict the value of our nation's waters to the public, threats to water quality, and water quality protection activities.

[For more information contact Barry Burgan, U.S. Environmental Protection Agency (4503F), 401 M Street, SW, Washington, DC 20460. FAX: (202) 260-1977.]

Team Agriculture Plans National Conference

"Team Agriculture" will bring together agricultural and environmental partners working to protect the nation's water resources for a national conference in Kansas City, Missouri, March 5-8, 1995.

Under the title "Clean Water — Clean Environment: 21st Century," agricultural and environmental professionals will report water quality accomplishments during the last five years, identify emerging issues, and discuss the mutual implications of agricultural and water quality issues.

A major purpose of the conference, which emphasizes current and expanding partnerships, is to "develop strategies to protect water quality in economically, socially, and environmentally rational ways."

Sponsored by USDA's Working Group on Water Quality with the participation of more than 50 cooperating agricultural and environmental organizations, the conference is being coordinated by the American Society for Agricultural Engineers.

Expected attendees include commodity groups, state and local agricultural and environmental agencies, agribusiness, farm suppliers, farm and ranch managers and operators, farm media, environmentalists, and other groups.

A major water quality resource fair will feature poster presentations and exhibitors.

[For more information, contact Fred Swader, USDA-OSEC, 324-A Administration Building, Washington, DC 20250. Phone: (202) 205-5853. FAX: (202) 720-1767.]

RUSLE is Evolving

EDITOR'S NOTE: Adapted from "RUSLE Revisited: Status, Questions, Answers, and the Future." In the *Journal of Soil and Water Conservation* 49(3), May–June 1994. *News-Notes* #32 described the early version of RUSLE and its use by SCS.

The Revised Universal Soil Loss Equation (RUSLE) software has been evolving continually since its original release by the Soil and Water Conservation Society (SWCS) in December 1992. Recent changes in RUSLE software are driven by specific needs and requests from users, according to SWCS. RUSLE SWCS1.03 was released in January 1994, and version 1.04 is scheduled for release soon.

RUSLE is a modern soil erosion prediction and conservation planning tool based on factors affecting erosion. The latest version of RUSLE incorporates an easy way to model manure and sludge applications that is useful on no-till and conservation-tilled croplands. It will also yield more accurate results for rangeland and disturbed land. Improvements include having model "incorporated" residue for no-till, separating the effect of plant roots from the effect of residue, and simplifying the procedure for analyzing manure injection into soil.

User-Requested Changes

Another evolutionary change in RUSLE has been the incorporation of new features suggested by users. For example, in early RUSLE development, users expressed little interest in modeling manure injection; when this change was requested recently, it was incorporated into version SWCS 1.04.

Even after extensive testing, most complex software has combinations of inputs that cause problems for users. RUSLE's program developers have corrected these "bugs" in the latest versions.

The USDA Agricultural Research Service (ARS) has been the lead agency in the development of RUSLE and is responsible for its science. Additions and revisions developed by the ARS and by SCS, a principal user, have been instrumental in updating RUSLE.

[RUSLE computer software and user's manual are available from the Soil and Water Conservation Society, 7515 Northeast Ankeny Road, Ankeny, IA 50021. Phone: (800) THE-SOIL. FAX: (515) 289-1227 The cost to SWCS members is $275 and for nonmembers, $299. The software requires an IBM compatible 386 PC, using at least DOS 3.0, 640K RAM, and hard disk drive. A math co-processor and a VGA color monitor are recommended, but not required.]

New Program Offers Soil Testing Labs a Reality Check

A first-ever laboratory exchange of soil samples for nutrient testing took place in July 1994. Sponsored by the Soil and Plant Analysis Council, the soil sample exchange is the core of the new Proficiency Testing Program available to public and private soil testing laboratories in the United States and Canada.

The soil sample exchange involves testing certain constituents prescribed by the council in five samples twice a year. For each semiannual exchange, the council will provide each participating laboratory with a confidential statistical analysis of its performance compared to all other laboratories testing a given sample by a particular method. By setting stringent standards for accuracy, the program offers a real-world check on each laboratory's quality assurance program.

Proficiency Testing Coordinator J. Benton Jones reported that 70 laboratories participated in the first semiannual testing exchange — 56 from the United States; 14 from Canada.

According to Jones, the testing program helps soil testing laboratories evaluate their analytical performance by comparing the results of tests performed on reference samples. Participating laboratories benefit through improved data quality and documented evidence of satisfactory performance. In other words, said Jones, the exchange program will verify the accuracy of a laboratory's service.

A subcommittee of the Soil and Plant Analysis Council, chaired by Ann M. Wolf of Pennsylvania State University, and assisted by Resources Washington, Inc., developed the Proficiency Testing Program.

[For additional information or an application form, contact J. Benton Jones, Georgia University Station, P.O. Box 2007, Athens, GA 30612-2007. Phone: (706) 546-0425. FAX: (706) 548-4891.]

Datebook

DATEBOOK has been assembled with the cooperation of our readers. If you would like a meeting or event placed in the DATEBOOK, contact the *NPS NEWS-NOTES* editors. Because *News-Notes* follows an irregular printing schedule, notices should be submitted two months in advance to ensure timely publication. A more complete listing can be found on the *NPS BBS*.

Meetings and Events

1994

October

31-11/3 — *1994 International Hazardous Material Spills Conference,* Buffalo, NY. Contact: Sarah Bauer, U.S. EPA, Office of Solid Waste and Emergency Response, 401 M Street, SW, Mail Code 5101, Washington, DC 20460. (202) 260-8247. Sponsored by the EPA Office of Solid Waste and Emergency Response.

31-11/5 — *Managing Water Resources in the 21st Century: Finding Workable Solutions—North American Lake Management Society's 14th Annual International Symposium,* Orlando, FL. Contact: Lorraine Duncan, One Progress Blvd., Box 27, Alachua, FL 32615-9536. (904) 462-2554. FAX: 462-2568. Topics include management of aquatic macrophytes, the role of wetlands in water resource management, forest watershed management, lake restoration case studies, and contaminants in aquatic systems. Other sessions will be targeted toward laypersons, teachers, and students. Cosponsored by U.S. EPA; the South Florida, Southwest Florida, and St. Johns River water management districts; University of Florida; and TVA.

November

6-10 — *American Water Resources Association's 30th Annual Conference and Symposia,* Chicago, IL. Contact: Michael C. Fink, Director of Meetings, AWRA, 5410 Grosvenor Lane, Suite 220, Bethesda, MD 20814-2192. (301) 493-8600. FAX: 493-5844.

8-10 — *U.S. Trust Responsibilities: Building Government-to-Government Partnerships,* Denver, CO. Contact: Julia Johnson, Terrene Institute, 1717 K Street, NW, Suite 801, Washington, DC 20006. (202) 833-8317. FAX: (202) 296-4071. Sponsored by Terrene Institute in partnership with the USDA Soil Conservation Service. Topics include trust responsibilities and land ownership issues, coordination with Indian organizations, vision for Native American agriculture and resources, territorial programs, and case studies.

1994
November

9-10 — *2nd Annual Virgin Islands Nonpoint Source Conference*, St. Croix, VI. Contact: Virgin Island Resource Conservation and Development Council, PO Box 4399, Kingshill, VI 00851-4399. (809) 778-9838.

10 — *Community Economic Benefits from Land Conservation: Nonregulatory Approaches to Coastal Resource Protection*, Pine Knoll Shores, NC. Contact: Laura Lynch, North Carolina Coastal Federation, Hadnot Creek Farm, 3223-4 Highway 58, Swansboro, NC. (919) 393-8185. Sponsored by the North Carolina Coastal Land Trust, North Carolina Coastal Federation, and Lyndhurst Foundation.

14-16 — *Management of Environmental Problems for Elected Officials*, Richmond, VA. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400. FAX: 684-2492.

14-16 — *Watershed WISE: A Workshop on Watershed Protection*, Grand Junction, CO. Contact: Susan Foster, Thorne Ecological Institute, 5398 Manhattan Circle, Suite 120, Boulder, CO 80303. (303) 499-3647. FAX: 499-8340. Steering committee and sponsors include U.S. EPA Region VIII, Western Governor's Association, MT Dept. of Health and Environmental Sciences, SD Dept. of Environment and Natural Resources, CO Dept. of Health, SCS, The Nature Conservancy Western Regional Office, BLM, and Thorne Ecological Institute.

15-16 — *Canada/United States Technical Workshop on the Upper Columbia River Basin: An International Dialogue*, Spokane, WA. Contact: Diane Weber, State of Washington Water Research Center, Washington State University, Pullman, WA 99164-3002. (509) 335-5532. FAX: 335-1590. Presented by Lake Roosevelt Water Quality Council, Environment Canada, State of Washington Water Research Center, and U.S. EPA.

16-18 — *Watersheds '94: Respect, Rethink, and Restore: Watershed Management Council Symposium*, Ashland, OR. Contact: Hannah Kerner, University of California, ESPM Extension, Forestry, 163 Mulford Hall, Berkeley, CA 94720. (510) 642-2360. kerner@nature.berkeley.edu.

December

4-7 — *56th Midwest Fish and Wildlife Conference - The Future of Fish and Wildlife is Now*, Indianapolis, IN. Contact: Debbie Fairhurst, Division of Fish and Wildlife, Atterbury Fish & Wildlife Area, Edinburgh, IN 46124. (317) 232-7535.

8-9 — *Regional Riparian Conference: Diverse Values Seeking Common Ground*, Boise, ID. Contact: Peggy Hammel, Idaho Water Resources Research Institute, University of Idaho, Moscow, ID 83843. (208) 885-6429. FAX: (208) 885-6431.

12-13 — *Protecting Ground Water: Promoting Understanding, Accepting Responsibility, and Taking Action*, Washington, DC. Contact: Terrene Institute, 1717 K Street, NW, Suite 801, Washington, DC 20006. (202) 833-8317. FAX: (202) 296-4071. Sponsored by Terrene Institute in partnership with the U.S. Environmental Protection Agency. Topics include ground water and watershed issues: nonpoint sources, ecosystems, and surface water; tools for local programs; solutions through coalitions; promotion of ground water friendly businesses and farms; implementing effective state programs; and the visibility of ground water policy on the national agenda.

14 — *Third Annual Conference of the Fertilizer Research and Education Program of the California Department of Food and Agriculture*, Parlier, CA. Contact: Jacques Franco, Program Coordinator, California Dept. of Food and Agriculture, 1220 N Street, P.O. Box 942871, Sacramento, CA 94271-0001. (916) 653-5340. Conference will include a grower/industry panel on current water quality and agricultural issues.

1995
January

12-14 — *Puget Sound Research '95*, Bellevue, WA. Contact: Tim Ransom, Puget Sound Water Quality Authority, PO Box 40900, Olympia, WA 98504-0900. (206) 407-7323.

February

1 — *American Water Works Association/Water Environment Federation Joint Management Conference*, Tulsa, OK. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400. FAX: 684-2492. Will address management issues for water and wastewater utilities, including rate methodologies, privatization, partnering, quality management, and customer relations.

23-24 — *Water, Nitrogen, and People: An International Conference*, Everett, WA. Contact: Craig MacConnell, Washington State University Extension, Whatcom County, 1000 North Forest St., Suite 201, Bellingham, WA 98225-5594. (206) 676-6736. Sponsored by WSU Cooperative Extension, Washington State Department of Health, BC Environment, and U.S. EPA. Focuses on sustainability of the water resource and understanding

1995
February

the effect of nitrogen on water. Targets health officers, land use planners, public policy makers, agricultural commodity groups, environmental groups, tribes, local governments, conservation districts, and agricultural and water quality professionals.

28-3/3 — *International Erosion Control Association's 26th Annual Conference and Trade Exposition*, Atlanta, GA. Contact: John T. Price, IECA Program Chair, Price & Company, Inc., 425 36th Street, SW, Wyoming, MI 49548. (616) 530-8230. FAX: 530-2317. Topics include policy and management practices; methods and techniques; case histories; research and development; product introduction; and special topics.

March

2-3 — *1995 Conference on Stormwater Management and Water Quality Modelling*, Toronto, Ontario. Contact: Evelyn James, CHI, 36 Stuart St., Guelph, ON, Canada N1E 4S5. (519) 767-0197. FAX: 767-2770. Sponsored by the American Society of Civil Engineers Water Resources Research Council, U.S. EPA, and the Ontario Ministry of Environment and Energy.

29-4/1 — *Steering a Course for the Future: 3rd Gulf of Mexico Symposium*, Corpus Christi, TX. Contact: (800) 699-GULF. Presented by the Gulf of Mexico Program. Will address marine debris, toxics and pesticides, habitat degradation, nutrient enrichment, coastal erosion, public health, living aquatic resources, and freshwater inflow.

April

1 — *Toxic Substances in Water Environments: Assessment and Control*, Cincinnati, OH. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400. FAX: 684-2492. Technical data, research efforts, and innovations in toxic substance assessment and control will be addressed. Municipal and industrial operators, scientists, engineers, and regulatory agency staff will be provided with the most up-to-date information.

May

14-18 — *Water Resources at Risk-1995 Annual Meeting of the American Institute of Hydrology*, Denver, CO. Contact: Helen Klose, AIH, 3416 University Ave., SE, Minneapolis, MN 55414. (612) 379-1030. FAX: 379-0169. Purpose is to describe issues, management strategies, and technologies in hydrology, hydrogeology, and mining hydrology.

15-17 — *International River Basin Management for Sustainable Development*, Kruger National Park, South Africa. Contact: Alan Vicory, Jr., International Program Committee, c/o Ohio River Valley Water Sanitation Commission, 5735 Kellogg Ave., Cincinnati, OH 45228. (513) 231-7719. Registration deadline January 31, 1995. Sponsored by the South African National Committee of the International Association of Water Quality (IAWQ), the River Basin Management Technical Division of the Water Institute of Southern Africa, and the South African National Parks Board under the auspices of the IAWQ's Specialist Group on River Basin Management.

Call for Papers—Deadlines

1994
November

15 — *Second International Conference on Diffuse Pollution*, Brno and Prague in Czech Republic, August 14-18, 1995. Contact: Vladimir Novotny, Marquette University, 1515 West Wisconsin Avenue, Milwaukee, WI 53233. (414) 241-8832. FAX: 241-5066. Sponsored by the Environmental Programme, the U.S. Department of Agriculture and the Czech Ministry of Agriculture.

1995
January

30 — *Third Thematic Conference on Remote Sensing for Marine and Coastal Environments*, Seattle WA, September 18-20, 1995. Contact: ERIM/Marine Environment Conference, PO Box 134001, Ann Arbor, MI 48113-4001. (313) 994-1200, ext. 3234. FAX: 994-5123. Internet: wallman@vaxb.erim.org. Sponsored by the Environmental Research Institute of Michigan.

February

15 — *Interdisciplinary Conference on Animal Waste and the Land-Water Interface*, Fayetteville, AR, July 16-19, 1995. Contact: Arkansas Water Resource Center, 113 Ozark Hall, University of Arkansas, Fayetteville, AR 72701. (501) 575-4403. FAX: 575-3846.

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