May 1993 #29

Nonpoint Source News-Notes

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

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Format Change

A guest editorial by Geoffrey Grubbs, Director, Assessment and Watershed Protection Division, Office of Wetlands, Oceans, and Watersheds, U.S. EPA

Many of you might not have noticed several issues ago that the Terrene Institute of Washington, D.C., began to publish and distribute *NPS News-Notes,* under a grant from EPA. I am pleased to announce that our close and successful relationship with Terrene will continue under a new grant amendment. Beginning with this issue, you may notice a few slight changes in the format of *NPS News-Notes* designed to comply with new EPA guidelines for grants.

One of these changes is that the EPA logo no longer appears on the masthead. Just in case anyone wonders whether this means that *NPS News-Notes* will no longer serve as a window into and about EPA: forget it. I read each issue just as eagerly as each of you — as do many of my colleagues. The Terrene Institute brings you the special character and insight of Editor Hal Wise, the layout and special feel of each issue, and a first class distribution system. *NPS News-Notes* is as strong and vibrant as ever and I encourage readers to continue to share their successes and problems with the editors, just as I do. Please join me in wishing the Terrene Institute continued success in bringing fresh and incisive news and notes.

A Commentary

Why EPA Should Be a Cabinet Department

by Carol M. Browner, EPA Administrator

EDITOR'S NOTE: *News-Notes* selects for its commentary for this issue the following statement by EPA Administrator Browner to the U.S. Senate Committee on Governmental Affairs (Senator John Glenn,D-OH, Chairman), delivered on February 18, 1993. Browner's statement is about what is happening on the environmental politics front, and what the administration's position is.

I am honored to testify before you today in support of creating a cabinet department on the environment, and to confirm this administration's commitment to improving environmental quality. I commend the leadership this committee has demonstrated in pursuing this matter.

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Why EPA Should Be a Cabinet Department (continued)

The administration supports elevation of EPA to a cabinet department and will provide to the committee suggested technical corrections to S.171 in the near future. . . .

We all share a strong commitment to the environment. However, without an adequate institutional framework, even principled commitment can be rendered abstract. The question is not whether to create a department on the environment, but when. The answer is now, at the beginning of this nation's third decade of federal environmental protection. A decade in which we will move from command-and-control, media-specific regulation to alternative approaches oriented toward pollution prevention, ecosystem protection, and incentive-based policies. It is time for a department on the environment to function as a permanent and equal partner in the president's cabinet, integral to any equation of federal decision making.

1993 is a Pivotal Point

Nineteen ninety-three is a pivotal point in time. We have the opportunity now to establish an environmental infrastructure ready to meet the challenges of the 21st century. We must move "upstream" and examine individual pollution sources as elements of larger systems. Preventing pollution by elimination or reduction of waste at the source is key to this administration's commitment to providing a healthy economy that meets our needs today, while preserving the environment for our children and future generations to enjoy.

A cabinet department on the environment will be well-positioned to accelerate efforts to integrate pollution prevention and multi-media decisionmaking into regulatory and compliance programs governmentwide, to promote the use of incentive-based policies, to improve technical assistance to small business, and to encourage corporate commitment to clean manufacturing processes and green products through innovative programs. A cabinet that includes an environment department will ensure that the environment is fully engaged and integrated into the president's examination of and decisions on national issues.

Likewise, EPA's international environmental programs provide cooperation with and technical expertise to developing and newly democratic countries and our industrialized partners. Cabinet status will be important in making the head of EPA a peer with cabinet colleagues in foreign environment ministries and promoting international cooperation on the environment. It will also make EPA a more effective collaborator with other cabinet departments involved in international environmental activities, including United Nations Conference on Environment and Development followup, programs in Central and Eastern Europe and the former Soviet Union, and environmental cooperation with Mexico.

Significant Progress Made

In the past 20 years, this country created most of our existing environmental infrastructure and body of law. To be sure, the national debate among federal, state, local, and tribal governments, industry, and the public on environmental matters has not always been successful. Nevertheless, significant progress has been achieved. The air, water, and land are demonstrably cleaner as a result of our joint efforts. Our "command-and-control" approach has worked well but has tended to focus on a relatively small number of large point sources of pollution. In addition, its limited scope ignores creative opportunities in terms of pollution prevention and ecosystem approaches. . . .

In 1993, concern for the environment affects individual, corporate, and governmental behavior. The environmental ethic has evolved and is taken seriously across economic, cultural, geographic, and governmental sectors. Just as civil rights issues gripped our nation in the 60s, and nuclear/cold war concerns dominated the 70s and 80s, integration of economic and environmental policy has seized the public's attention in the 90s. . . .

We now understand that we live in an enormously complex global ecosystem: "solving" one environmental problem can create a new one. Cleanup of surface water has contaminated groundwater and solutions to groundwater pollution have polluted the air. Actions taken by one country can affect the health of the citizens of another, thousands of miles away, and for generations to come. We also know that assessment of environmental achievement is a relative measure: our "successes" are meaningful only in terms of reducing overall risk. We have learned that we must not limit ourselves to cleanup, but must also seek to prevent pollution at the source. . . . We must force ourselves to address long-term and not just short-term consequences.

The 80s have shown us that environmental action or inaction has economic consequences, in turn affecting our environmental and business choices in a never-ending cycle of cause and effect.

Why EPA Should Be a Cabinet Department (continued)

Environmental opportunities can be economic opportunities. Money spent by companies to comply with environmental laws and regulations translates into revenues and jobs for other American businesses. . . .

This administration is committed to identifying the dynamic relationship between economic and environmental needs and to ensuring that environmental assets are reflected in our accounting of national well-being. Environmental protection and economic growth are not incompatible. . . .

Environmental Protection Not a Footnote

EPA is evolving as an institution grappling with today's challenges, but the EPA created by Reorganization Plan Number 3 in 1970 is positioned now to function as more than a regulatory agency. . . . An environment department must work closely with both its cabinet counterparts and with its state, local, tribal, and other government partners, and remain responsive to the individual citizen. We must rely carefully on sound science and research to better understand environmental issues such as biodiversity, global climate change, environmental equity, risk, and persistent toxic chemicals, and to better develop policy and solutions. An environment department must be a model environmental steward, both domestically and internationally. The department must also serve as a model for responsible fiscal practices and responsive accountable management. Financial integrity and sound control management are critical to fulfilling our environmental mission and to safeguarding the taxpayer's dollar.

Environmental protection is not a mere footnote, but encompasses all of the Earth's resources and human activity . . . It shapes our daily thinking, strategies, and budgets in every conceivable issue area. We are moving beyond thinking of environmental protection as a luxury or as a hindrance to economic growth. The growth of our economy depends on the availability of a clean, safe environment and the long-term availability of natural resources. We can best join the need for balancing growth and the environment by unleashing American ingenuity and creativity to revive our economy and create a new generation of environmental technology. . . .

Both our national environmental ethic and the nature of the ecosystem itself tell us that the president's cabinet currently is incomplete. In today's world a successful strategy for any public policy issue requires a holistic perspective that crosses traditional department boundaries. There is virtually no such thing as a policy or problem that does not have environmental aspects or that is simply "environmental." A sound approach to the environment is essential to the success and sustainability of our nation's economic, social, and trade policies . . . It is not enough that environmental considerations be part of cabinet discussions: the environment must be there in its own right as an equal priority and member.

Our experience over the last few weeks in fashioning the president's economic plan is illustrative of the role that environmental considerations should play in our federal decisionmaking process. As the numerous options for energy taxes were explored, environmental concerns and impacts were analyzed in a matrix alongside energy, economic, social, and trade considerations.

Cabinet Status Would Validate EPA Presence

Currently, EPA sits in the cabinet room at the president's invitation, but President Clinton agrees that we should validate its presence as a statutory matter, regardless of who sits in the White House Oval Office. It is time for a permanent chair at the table, institutionalizing the environment as a critical ingredient in the mix of any federal decisionmaking.

In addition to our children, students of democracy everywhere in the world should comprehend that an environment department is key to America's identity. The United States should join the majority of our major partners who count an environment minister as an equal among the top government tier. Not to do so sends the wrong message about our government's priorities here at home; it also prevents us from asserting the kind of leadership that the rest of the world is looking to us to provide on environmental problems affecting the entire planet.

In conclusion, I assure you that I believe the creation of an environment cabinet department means more than a new chair. Joining the cabinet ensures direct access to the president, and, consequently, a voice on behalf of citizens concerned about the environment their children will inherit and industry seeking to mesh environmental and business concerns. . . .

Finally, creation of an environment department signals at home and abroad the highest commitment of the United States to environmental stewardship . . . S.171 is consistent with President Clinton's three-part environmental framework: elevation *of EPA to a cabinet department, elimination of the Council on Environmental Quality and reassignment of its functions, and creation of an office of environmental policy in the White House.*

Notes on Water Quality Management

The Private Landowner's Wetlands Assistance Guide: Voluntary Options for Wetlands Stewardship in Maryland

The future of our nation's wetland resources is closely linked to the land-use decisions made by private individuals. More than three-fourths of the nation's remaining wetlands in the lower 48 states are privately owned, and the economic needs of private landowners often are the deciding factor when land management decisions are made. Landowners who wish to protect and conserve their wetlands need information on selecting land management plans that can meet their economic needs while preserving the wetlands on their properties.

The *Private Landowner's Wetlands Assistance Guide* takes a practical and pragmatic approach by acknowledging the importance of meeting landowners' personal economic needs while simultaneously protecting wetland resources. Developed for the "Land Ethic for Wetlands Stewardship" workshops held in 1992 in Maryland, the guide was produced through the cooperative effort of many federal, state, and local agencies and nonprofit and private organizations. It is targeted at the field staffs of federal, state, and local agencies, and private groups who provide information on public and private assistance programs that aid private landowners in wetland conservation and management. The guide contains information on selecting a management plan, describes existing voluntary management options and programs, and provides a list of contacts.

Practical Approach

Included in this reference booklet is information about private assistance programs for which landowners may be eligible if their land has certain natural values. The types of assistance programs discussed in this guide include:

- technical assistance in wetland creation and restoration, landowner master plans, management of wildlife, forestry, and agriculture
- financial incentives, including cash benefits, limited development opportunities, cost sharing, tax incentives, agriculture and forest lands, wildlife agreements, and conservation management agreements
- education and outreach opportunities for marketing voluntary wetland conservation programs

All of the options discussed in the guide have been used in the past, and the authors point out that many can be combined.

The guide begins with background information on the importance of protecting wetland resources and discusses federal and Maryland state requirements and conditions for use and management of wetlands on privately owned lands. Included in the guide is an explanation of the decision process often used by land trusts and state natural resource agencies to match voluntary programs and conservation options to the landowner's specific needs. Landowners should find this question-and-answer evaluation process useful in identifying the most appropriate programs for their own land. Questions on the landowner's overall financial needs and goals for the property are presented first and are followed by questions on the specific site characteristics of the property. Sample questions include:

- What are the land use patterns and interests of surrounding landowners?
- What are the real estate market conditions?
- What are the characteristics of the areas's natural landscapes and watershed, and their suitability for conservation and development?
- Can the property be developed without damaging any wetlands present?
- What is the suitability of the property for different uses, its current condition, and its proximity to highways and public facilities and services?

Four case studies of landowner experiences in Maryland illustrate the process of evaluation and planning:

- A 6.5-acre, poorly drained and relatively unproductive section of corn and soybean cropland in Dorchester County was restored to wetland by berming, maintaining water levels, and allowing the return of natural wetland vegetation.
- A dairy operation in Harford County that previously released manure and milk solids onto cultivated fields and into a creek was equipped with a system that pipes

The Private Landowner's Wetlands Assistance Guide: Voluntary Options for Wetlands Stewardship in Maryland (continued)

the water through a solids separator, and channels it into a broad swale of former cropland. The water is retained at an average depth of 18 inches by a berm at the lower side of the swale. Natural wetland vegetation has been allowed to return to the saturated soil, and the newly created wetland now improves the water quality by taking up excess nutrients.

- A Kent Island landowner worked with the Maryland Environmental Trust to put a conservation easement on the 200 acres of his 380-acre farm that is wetlands and adjoining forest. The easement ensures that the environmentally sensitive wetland will remain as open space and provide the farmer with a property tax credit.
- Charles County landowners worked with a professional forester to improve the habitat quality of their land to protect threatened and endangered plant and animal species, while still meeting their needs for harvesting timber on their 100-acre property, which is 95 percent forested.

Decision Tree and Other Tools

A decision tree is offered as another evaluation tool that summarizes the process of choosing the best options for each individual landowner. The decision tree is built around the questions:

1. Does the landowner want to do something with the wetlands on his/her land?
2. Does the landowner wish to retain ownership of the land?
3. Does the landowner wish to manage the property exclusively? The decision tree is followed by comprehensive tables describing the options that will meet the needs identified by the three questions. The three tables of options (one for each question) also describe the advantages and disadvantages of each option.

A readily accessible source of information can be found in the "Sources of Assistance" matrix on page 12 of the guide. This matrix can help the user quickly match programs to specific land characteristics. The guide cautions readers that, while other factors also must be considered when selecting programs for the private landowner, if land characteristics are the major factor, the matrix should be very useful.

A major portion of the guide is a section called "Landowner Program Descriptions," which begins by discussing federal programs, including programs sponsored by the U.S. Fish and Wildlife Service and USDA's Farmers Home Administration, Forest Service, and Soil Conservation Service. Maryland state programs are discussed next, followed by nonprofit organizations and land trusts. Most of the federal programs are available nationwide. The state programs described are available only to landowners in Maryland, and this somewhat limits the applicability of the guide nationwide. However, many of the nonprofit organizations sponsoring the programs (for example, American Farmland Trust, Ducks Unlimited, and The Nature Conservancy) are available in other states.

The two appendices list addresses and telephone numbers of the federal and Maryland program offices, and of offices of nonprofit and private organizations that can provide more information on the programs described in the guide.

Summary

Overall, this guide provides useful information that can guide a landowner through a difficult decisionmaking process. It can help the landowner evaluate options and determine the most appropriate land management plan that meets both the economic needs of the landowner, and the need to protect and preserve wetlands on privately owned land.

Copies of the *Private Landowner's Wetlands Assistance Guide* are available from EPA's Wetlands Protection Hotline, (800) 832-7828. The 38-page guide will soon be made available on diskette so that other states can adapt it for use, adding pertinent information about their own programs.

[For more information, contact Majorie Wesley, Wetlands Division, (A-104 F), U.S. EPA, 401 M St., SW, Washington, DC 20460. FAX: (202) 260-8000.]

New York Stormwater Management Materials Available

by Robin L. Warrender, Nonpoint Source Section, New York State Dept. of Environmental Conservation

Two manuals related to stormwater runoff and erosion/sediment control have been produced in New York State and are now available. These documents are being used as the basic tools in programs that address these source categories.

New York Stormwater Management Materials Available (continued)

The first manual, *New York Guidelines for Urban Erosion and Sediment Control,* was originally developed by a committee chaired by the USDA Soil Conservation Service. In 1991, New York used Section 319 funds to pay SCS to update and reprint the more than 300 pages of guidelines and issue them in a loose-leaf binder. They contain standards and specifications for erosion and sediment control measures commonly used at construction sites. Both vegetative and structural measures (permanent and temporary) are included in the manual. It is a valuable tool for planners, engineers, local officials, contractors, and others involved in development activities.

The New York State Department of Environmental Conservation has recently completed work on a new manual titled *Reducing the Impacts of Stormwater Runoff from New Development.* While the primary audience for this manual is local government officials, the manual has also proved valuable for federal and state engineers and planners. The manual describes water quality problems caused by stormwater and explains opportunities for municipal governments to address these problems. The 180-page manual describes practices that can be used to address the quantity and the quality aspects of stormwater runoff. It lists potential performance standards and contains a model stormwater management and erosion control ordinance.

A special EPA grant permitted copies of this manual to be printed and mailed to the more than 1,200 chief elected officials in municipalities across the state. The manuals are also being used in enabling local governments to adopt local stormwater management programs.

Both documents are available through the Empire State Chapter of the Soil and Water Conservation Society. The price for the *New York Guidelines for Urban Erosion and Sediment Controls* is $25. *Reducing the Impacts of Stormwater Runoff from New Development* is available for $15. Checks should be made payable to Empire State Chapter-SWCS, and mailed to the chapter at P.O. Box 7172, Syracuse, NY 13261-7172.

[For more information, contact Robin L. Warrender, Nonpoint Source Section, New York State Dept. of Environmental Conservation, 50 Wolf Road, Albany, NY 12233-3508. Phone: (518) 457-6781]

Audubon's America Projects, an Update

EDITOR'S NOTE: For earlier articles about *Audubon's America* and the Student Conservation Association, see *News-Notes* issues #23 and #26.

by Majorie Wesley, Wetlands Division, U.S. EPA

The Environmental Protection Agency's Office of Wetlands, Oceans, and Watersheds is the federal lead agency for a new program. *Audubon's America* is aimed at inspiring federal, state, and local governments, private and non-profit organizations and individuals to take pride in our nation's natural heritage and to become partners in conserving and restoring natural areas within watersheds (for example, wetlands).

Audubon's America commemorates John James Audubon, the naturalist who saw the environment as a place of beauty and richness, worthy of preserving and protecting. The program is being developed to protect, conserve and restore the land and water in the 35 states where Audubon traveled, wrote, painted, and observed nature's beauty. Organizations and individuals can become part of *Audubon's America* by co-sponsoring the program. The Student Conservation Association (SCA) is one of the program's co-sponsors.

SCA is planning *Audubon's America* student demonstration projects in Pennsylvania and Maryland for the summer of 1993. SCA has joined with other co-sponsors in these states to initiate projects that will provide assistance to local communities to achieve wetlands protection, restoration, and enhancement, and natural resource management education.

For the Pennsylvania project, two college-level resource assistants will research Audubon's travels to lay the groundwork for wetlands restoration projects, an interpretive program, and a natural heritage exhibit. Other partners in the Pennsylvania project include the Delaware and Lehigh National Natural Heritage Corridor Commission, the Pennsylvania Bureau of State Parks, and the National Audubon Society.

In Maryland, eight students will assist Pocomoke City in the construction of a wetland nature and fitness trail boardwalk over the Pocomoke River Swamp. Co-sponsors in this project include the U.S. Soil Conservation Service, Eastern Shore Resource Conservation and Development Council, and local officials, including the mayors of Pocomoke City and Snow Hill. Co-sponsors have raised over $12,000 for the project, which will be completed in time for the fall festival.

Audubon's America Projects, an Update (continued)

SCA and EPA, along with the National Audubon Society, the Terrene Institute, and 10 other state and local organizations are also co-sponsoring the first *Audubon's America* Workshop on May 14-15, in Bethlehem, Pennsylvania. Workshop participants will be developing concept plans to undertake conservation and restoration activities in four watersheds in eastern Pennsylvania.

[For more information about the Audubon's America workshop and program, call EPA's Wetlands Protection Hotline, 1-800-832-7828.]

Stormwater Remediation in Marion, Mass. Involves Three Federal Agencies and Locals

by Suzanne Schenkel, Soil Conservation Service, Amherst, MA

The town of Marion, Massachusetts, is the site of a planned wetland restoration, designed by the Soil Conservation Service (SCS), to reduce pollution from fecal coliform bacteria that is affecting the water quality of Sprague Cove. The bacteria is carried from this small residential watershed by stormwater runoff. As a result, shellfish beds have been closed. The Buzzards Bay Project identified Sprague Cove as an area with a high bacteria count.

Using the concept of settling basins and detention areas, the runoff will be piped into a shallow marsh, and then into a deep pool. Any excess water will be discharged though an outlet into a grassed channel, which then outlets back into the existing channel. It is anticipated that this system will reduce the coliform levels reaching the cove, and will potentially open the area for shell fishing. Another benefit from the restored wetland will be wildlife enhancement.

For this wetlands system to function properly, it must be inspected regularly, and most particularly after significant storms. The Marion Conservation Commission will be responsible for inspection and maintenance of the wetland. A water quality monitoring plan is required by the EPA, which will be carried out by the Conservation Commission and a volunteer group.

Funding for this project was obtained through an EPA 319 grant. The town of Marion donated the land and in-kind costs. Also, the U.S. Fish and Wildlife Service provided a grant to fund this project under their Wetland Restoration Program.

[For further information, contact Suzanne Schenkel, Public Affairs Specialist, Soil Conservation Service, U.S. Dept. of Agriculture, 451 West St., Amherst, MA 01002. Phone: (413) 253-4354.]

Notes on Riparian and Watershed Management

Watershed Protection: Catalog of Federal Programs Is Available

The Watershed Branch of EPA's Office of Wetlands, Oceans, and Watersheds has published a catalog of federal (other than EPA) programs of use to states and local governments and organizations that engage in watershed protection projects.

Some 50 programs located in 12 federal agencies are included in the catalog, which states in its introduction:

> *The catalog will help lead agencies and others involved in watershed management to fully utilize and integrate appropriate federal program resources into holistic, ecosystem-based efforts to restore and maintain the chemical, physical, and biological integrity of the watershed's water resources.*

In the directory, federal programs are divided into two types:(1) comprehensive programs that can provide support for the project lead agency in coordinating the efforts of other agencies, and that provide both financial and technical assistance, and (2) support programs that provide special-purpose technical assistance or advisory services only.

The directory provides an overview of both comprehensive and support programs, giving detailed information, including funding levels and examples of projects, on the comprehensive programs and more concise descriptions for the support programs. In both cases, a contact point has been provided for catalog users searching for more information.

Watershed Protection: Catalog of Federal Programs Is Available (continued)

Bruce Newton, chief of the Watershed Branch, makes these observations in the foreword:

> *The purpose of this directory is to help those involved in watershed management to identify federal programs that may have a potential role in watershed management. It is intended to provide a starting point for further discussion on collaboration.*

The 12 federal agencies in the catalog, whose programs could be a part of integrated, holistic watershed protection/restoration projects, are:

- Agricultural Stabilization and Conservation Service
- Farmers Home Administration
- Federal Highway Administration
- Army Corps of Engineers
- Soil Conservation Service
- Forest Service
- U.S. Geological Survey
- Fish and Wildlife Service
- National Park Service
- National Oceanic and Atmospheric Administration
- Bureau of Reclamation
- Tennessee Valley Authority

A matrix displaying some 20 EPA water programs that can be applied to watershed activities is included in the catalog as an appendix.

To Order the Catalog

Publication title: *WATERSHED PROTECTION: Catalog of Federal Programs.* Publication number: *EPA-841-B-93-002.* Copies may be ordered from NCEPI, 11029 Kenwood Road, Bldg. 5, Cincinnati, OH 45242; or, by FAX: NCEPI, (513) 891-6685. There is no cost. (Be sure to include both the title and the publication number in all orders.)

Tulalip Tribal Laboratory Receives Accreditation for Water Quality Testing; Clean Water Needed for Fishery Management

by Annie Phillips, State of Washington Department of Ecology

Accreditation. A five-syllable, stuffy-sounding word that suggests anything but clean rivers, restoring salmon runs, or the livelihood and traditions of a tribe.

Last December, the water quality laboratory on the Tulalip reservation received accreditation from the Washington State Department of Ecology. Professionals and agency officials can now rely on the lab's results. The Tulalip reservation is located on Skagit Bay, a part of Puget Sound, 35 miles north of Seattle and four miles north of Everett.

Washington currently has 89 accredited labs. Most of these belong to local governments with sewage treatment plants or large industries with wastewater discharges. So far, the Tulalip laboratory is the only accredited Washington lab owned and operated by a tribe. It's also the first to use community volunteers in addition to professionals for monitoring and testing samples.

The Tulalip lab is certified to run analyses of nitrates and ortho-phosphates, fecal coliforms, pH, turbidity, and total suspended sediments. These tests are important to the Tulalips for establishing baseline data and solving pollution problems in salmon streams. The tribe monitors water quality in tributaries of the Stillaguamish and Snohomish rivers, as well as three streams on the reservation.

"Clean water in the rivers and up the spawning streams is the life-blood of the salmon," says tribal Fisheries Director Terry Williams. "And the salmon is the canary, or indicator species, for clean water. Whatever we can do to reduce pollution so the salmon will thrive and increase is good for the fish, the tribe, and anyone else who uses the water." Williams says many species of wildlife in the Stillaguamish basin are having problems, including two native salmon stocks, the marbled murrelet and the spotted owl.

Williams is proud the Tulalip lab passed the test. "Volunteer monitoring is much more meaningful if the results are reliable. It gives people a real sense of stewardship, of involvement in their watershed," he says. "In these times of budget crunch for state agencies like [the

Tulalip Tribal Laboratory Receives Accreditation for Water Quality Testing; Clean Water Needed for Fishery Management (continued)

Department of] Ecology, being able to get reliable data from a lab staffed partly by volunteers is important when you're applying for grants like we usually are."

Monitoring throughout the basin has identified major impacts from erosion due to forest practices in the high country, farming, septic systems that don't work, and municipal wastewater discharges.

"It's kind of like detective work, using lab results to identify the sources of water pollution. We don't want to point fingers," says Williams. "We just want to get all the information on the table and fix the problems. Now we're getting down to DNA to get the point across."

Williams is referring to the five-year breakthrough project the Tulalips and the University of Washington are completing. DNA from contaminated shellfish is used as a fingerprint to see where the fecal coliforms come from — human waste, septic systems, sewage treatment plants, livestock, marine mammals, or migratory birds. The Tulalip laboratory took samples from shellfish in Port Susan, and the University of Washington is doing the DNA analysis.

Tulalip laboratory staff includes water quality biologist Chiara DeNeve, tribal water quality lab manager Richard Miller, and two professional tribal technicians, Rob Skoog and Larry Charley. Ten adult volunteers are trained in water quality testing procedures, and about 120 Stanwood High School students perform field work like measuring stream depth, temperature, and dissolved oxygen.

"We take samples from 38 sites along the streams at least once a month and twice daily during storms," says DeNeve. "If one site is OK and the next one downstream is polluted, we know there's a problem between those points. Stormwater carries pollution into waterways. We can pinpoint the source by monitoring upstream and downstream from where we think the pollution comes in."

Three recent water quality projects funded by Centennial Clean Water Fund grants from Department of Ecology reduced contamination caused by livestock on farms along Church Creek and Freedom Creek, below Stanwood. Before the grant projects, cattle and horses had free access to the creeks, trampling the streambanks and causing erosion — and directly polluting the water.

"We put up fences to keep the animals away from the stream," DeNeve says. "We also did some habitat restoration, placing big rocks, tree stumps, and logs in the streams to slow down the current and give the fish a cool place to rest and hide." Volunteers from nearby communities and high school students contributed the labor.

Dale Van Donsel and Perry Brake of Department of Ecology's laboratory accreditation unit were responsible for accrediting the Tulalip lab. "It's basically a very good lab," Van Donsel says. "It's run by a very competent individual. Chiara demonstrated their procedures for what we call QA/QC, or quality assurance and control. This means consistency in monitoring and testing methodology. Are the samples always collected at the same time of day? Also, are the chemicals they use for the tests fresh and pure? Is the apparatus working properly? Do they double-check their findings?"

The lab must re-qualify each year by running tests on two sets of blind samples provided by the Environmental Protection Agency and submitting their results.

[For more information about accreditation, contact Dale Van Donsel or Perry Brake, Washington State Department of Ecology, P.O. Box 47600, Olympia WA 98504-7600. Phone: (206) 895-4649. To find out more about the Tulalip lab and its water quality monitoring program, contact Chiara DeNeve, Tulalip Laboratory, 10610 Water Works Rd., Marysville, WA 98271. Phone: (206) 659-4130.]

A Brief History of Water Resources Development in the Santa Ana River (California) Watershed

EDITOR'S NOTE: The Santa Ana Watershed Project Authority's (SAWPA) existence is proof that a union forged amidst tangles of red tape and blizzards of legal papers can evolve into a harmonious, productive partnership. SAWPA, a joint powers authority, is presently composed of Chino Basin Municipal Water District, Eastern Municipal Water District, Orange County Water District, San Bernardino Valley Municipal Water District, and Western Municipal Water District. The story of their alliance is closely tied to the region's history. Gordon K. Anderson, Chief of Planning, California Regional Water Quality Control Board, Santa Ana Region, contributed this article.

In the early 1800s, the only major agricultural activity in the Santa Ana watershed was grazing cattle and horses (or perhaps stealing someone else's). In contrast, when Mormons and others settled the area they raised crops, which required a dependable source of irrigation water. When there was little demand and essentially no competition, it was a simple matter to build a crude

dam of brush and sand at a point along the river sufficiently uphill from the fields to allow the water to flow down by gravity. As more and more settlers arrived and the communities that sprang up demanded their own water supplies, issues of water rights began to rise along with competition for the best diversion points. Some years, springtime must have been an entertaining season, watching dam-building crews from the various farms and settlements leap-frogging each other up the river and even into the canyon.

Before long, however, a system of rights was established and shares in a water supply became marketable commodities. First windmills, then motors and finally, deep well turbines were installed to produce more and more water. Burgeoning communities bought out irrigation districts and water companies, which then managed to pump so much water out of the ground that swamps, springs, and historic areas of artesian well flow dried up and petered out. Mineral water and hot springs resorts actually went out of business. Some cities' names still reflect the time when water gushed out of the ground: Fountain Valley in Orange County and Artesia in Los Angeles County, just up the coast.

Even when the rules of water appropriation and use are well-written (this has never happened), it is necessary for arbitrators or commissioners or judges to settle civilized disputes. Where there are legal disputes, there are invariably lawyers, some of whom will not have enough to do to keep them busy. The action of someone upstream damages the property or well-being of someone downstream. Entreaties, discussions, and threats are no use and the matter becomes the subject of a lawsuit. Developing parallel with the growing population in the watershed was a heightened awareness that the total water resources of the region were limited. Everybody and his cousin tried to make sure they had a share.

As the population grew, land holdings, water rights, established agriculture, a pool of labor, and systems of commercial and business support constituted a valuable base on which taxes could be levied to raise money to import water when local supplies ran short.

The Metropolitan Water District of Los Angeles (locally known as "Met") built and still operates the Colorado River Aqueduct, which has imported millions of acre-feet of water westward across the Mojave Desert and into the region. A second source of imported water, the California Water Project, pumps comparable amounts of water southward from the California Delta, upstream of San Francisco Bay, to Los Angeles and the rest of Southern California.

Before those projects were built, however, arguments still focused on locally available water supplies. Lawsuits were filed, matched by counter-suits, combined and divided and recombined, giving rise to follow-on suits, until eventually all the Orange County (the downstream) users sued all of the upstream users in Riverside and San Bernardino Counties. Although it is called *Orange County Water District vs. City of Chino, et al.*, when it was settled the parties to the agreement that emerged were Orange County Water District, Western Muncipal Water District (MWD), Chino Basin MWD and San Bernardino Valley MWD.

After organizing the case and hearing arguments, the court directed the parties to provide an engineering solution, one which established minimum annual flows at two key points on the river, Prado Dam and Riverside Narrows. Those flows could be provided through natural runoff, wastewater, imported water, or any combination thereof.

One of the biggest regional problems was salt balance. Salt (total dissolved solids, or TDS) buildup in the water results from excessive reuse of a given volume of water. Each cycle of use, whether for domestic use or industrial supply or for agricultural irrigation, adds salts directly or indirectly, either through partial evaporation or direct addition or both. Typically, each use of water adds 200 to 300 parts per million (ppm) of TDS. TDS begins to interfere with the use of water at something between 500 and 1,000 ppm TDS; at 2,000 ppm water is largely unusable.

A minimum quality was guaranteed; if the TDS is too high, more flows are required. All this was placed under the operation of a court-appointed watermaster. This Santa Ana River Stipulated Judgement was finally issued in 1969 and the watermaster has monitored compliance and issued an annual report ever since.

It is not too surprising that after nearly a decade in court and a short cooling-off period, the four large water districts began exploring ways to avoid a recurrence of what they'd been through. It had become clear, for one thing, that engineers are cheaper than lawyers. In addition, engineers actually design and build useful things. The four large water districts that had been given the responsibility of implementing the court's decision had to meet regularly to discuss progress,

problems, and so on. Discussions of legal matters drifted to projects of mutual interest, and it soon became clear that they had a lot of interests in common, particularly in the area of planning, in addition to simply managing water supplies. The Santa Ana Watershed Planning Agency seemed like a reasonable thing to organize.

At about the same time that SAWPA was being born, the Santa Ana Regional Water Quality Control Board was investigating the salt balance situation in the upper basin. An early computer model, though primitive and slow by modern standards, but providing answers of a kind never available before, had been used to tentatively assess the situation: Perhaps some adjustments to the model, a little tightening up here and there, some more data. . . . SAWPA got the contract to write the new basin plan for the regional board, using their improved model.

The kinds of actions required, based on the problems identified by the computer, were far beyond the powers of the regional board. But since SAWPA was made up of agencies that could build projects, SAWPA subsequently got involved in implementing regional solutions, having changed its name to the Santa Ana Watershed Project Authority. It later added the Eastern Municipal Water District as a member, completing organization and coverage of the developed areas of the watershed.

One part of the solution to the salt balance problem was to import and recharge large volumes of low-TDS State Water Project (SWP) water; a second involved a large wellfield to extract poor quality water already in place; and a third was a pipeline to the sea to export brines. As it turns out, the mix of projects has changed over the years. The brine line is largely built and one groundwater desalter is now in place. Plans for two more desalters are in preliminary design. Desalters replaced the "recharge, flush, and pump out" solution when it became clear that there would not be enough SWP water available to do the job. Nonetheless, SAWPA and the regional board continue to work toward a common goal—a well-operated basin that meets reasonable standards in an economical manner and provides high-quality water supplies when and where they're needed.

SAWPA Projects

Credit for implementation of the projects listed below (and numerous others) is readily shared among all SAWPA members. As someone once said, "You can get a lot accomplished if you don't care who gets the credit."

- Groundwater Quality-Quantity Models (1970, 1982, 1988)
- Water Quality Control Plan, Santa Ana River Basin (1975)
- Santa Ana River Brine Line (1978-Present)
- Santa Ana River Water Quality-Quantity Model (1988)
- Arlington Groundwater Basin Desalter (1990)
- Regional Water Quality Data Base and GIS (1992)
- Santa Ana River Use-Attainability Analysis (1993)
- Chino Basin Groundwater Resources Management Study (1993)
- West Riverside Regional Wastewater Treatment Plant (1995)
- Chino Basin Groundwater Desalters (1995, 1997)

SAWPA Management and Operation

SAWPA is governed by a commission made up of two representatives from each member agency, usually the board chairman and the general manager. The SAWPA commission hires a general manager, presently Neil Cline, who oversees a staff of 20. SAWPA's annual administrative budget is slightly less than $2 million. The capital or project budget is presently about $30 million.

[For further information, contact Gordon K. Anderson, California Regional Water Quality Control Board, Santa Ana Region, 2010 Iowa Avenue, Suite 100, Riverside, CA 92507. Phone: (714) 782-4329. FAX: (714) 781-6288.]

EPA Discusses Control of Nonpoint Sources with Board of National Cattlemen's Association

EDITOR'S NOTE: On March 15, 1993, David Davis, deputy director of EPA's Office of Wetlands, Oceans and Watersheds spoke to the board of directors of the National Cattlemen's Association. *News-Notes* was able to obtain the "talking points" he used in his presentation. We did a modest editing job and pass them on to our readers.

The General Problem

- Nonpoint source (NPS) pollution is the largest remaining water quality problem in the Unites States, and agriculture is the nation's largest contributor to NPS pollution; states attribute 41 percent of their NPS problems to agriculture.
- Data from states indicate that approximately one-third of agricultural NPS pollution is caused by animal waste runoff from feedlots, pasture lands, and animal holding areas.
- Despite promulgation of regulations in the 70s under the National Pollutant Discharge Elimination System (NPDES) program and development of state NPS programs, state NPS assessments and 305(b) reports continue to identify animal operations as a significant cause of water quality impairment.

Analysis of the Magnitude of the Problem from Feedlot Waste

- EPA staff have been working on a report to estimate the level of feedlot pollution in U.S. waters.
- Specifically, the report compares the level of designated use impairments caused by feedlots with the level of impairments caused by other sources such as storm sewers/runoff and combined sewer overflows (CSOs), and industrial point sources. The report also characterizes the geographic distribution of the feedlot pollution.
- The major data sources used to estimate the level of water impairments from various sources were the most recent summary reports to Congress required under sections 305(b) (the 1990 305(b) report) and 319 of the Clean Water Act (CWA). These reports provide the best, most comprehensive data available.
- The analysis indicates that in rivers and streams *feedlots cause approximately the same amount of water use impairment as CSOs, storm sewers/ runoff, and industrial point sources.*

Point/Nonpoint Source

- In water pollution management programs, we have historically distinguished between point and nonpoint sources of water pollution. I will briefly discuss the nonpoint source programs.

Nonpoint Source Programs to Address Animal Waste

- A variety of NPS programs address animal waste problems associated with the smaller animal waste operations *not* covered by the NPDES permit program and animal operations that are not confined, such as pastured livestock. These programs can address the cumulative effect of many small operations, which can be significant.
- Section 319 of the CWA required states to assess NPS problems and develop management programs to address NPS problems.
- Section 319 provides funds to implement EPA-approved state NPS management programs (about $50 million per year since FY 1990; this year the president has proposed an extra $47 million for 319). Analysis of the grants indicates that agricultural projects received the most funds.
- Section 319 provides funds to states to support:
  - information and education programs;
  - technical assistance for installation of NPS controls such as animal waste practices;

- cost sharing for implementation of NPS controls in demonstration projects; and
- support for development of regulatory programs such as animal waste regulations.

Coastal Zone Act Reauthorization Amendments of 1990

- On November 5, 1990, the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 were signed into law.
- This law requires states and territories with approved coastal zone management programs to develop a *Coastal Nonpoint Pollution Control Program.*
- EPA and the National Oceanic and Atmospheric Administration (NOAA) jointly administer the new requirements, and this January we issued final guidance for the program — management measures guidance and program guidance.
- The coastal law required EPA, in consultation with other federal agencies, to issue guidance on NPS management measures that are the equivalent of technology-based controls for nonpoint sources.
- The law required the management measures to represent the best available technology for reducing NPS pollution of coastal waters and to be economically achievable.
- Management measures have been developed for a variety of sources, including agriculture.
- Of greatest interest to you all are the agricultural management measures in chapter 2 of the management measures guidance (blue book). The agricultural chapter of the management measures guidance addresses management of confined animal facilities and grazing as well as erosion and sediment control, nutrient and pesticide management, and irrigation management.
- Work groups were used to develop the proposed management measures and the agricultural management measures work group was co-chaired by the U.S. Department of Agriculture (USDA).
- States are to develop coastal nonpoint programs that provide for implementation of management measures "in conformity with" the management measures guidance and other statutory requirements within 30 months of issuance of EPA's final guidance, that is, by July 1995.
- State programs are also required to contain enforceable policies to implement the programs.
- In January, EPA/NOAA issued joint program implementation guidance that defines more clearly how the programs are to be developed and implemented. Both EPA and NOAA will be responsible for approving coastal nonpoint programs.

Management Measures for Confined Animal Facility Management

- In the final management measures guidance, we have taken a two-tiered approach to the management measures for confined animal facilities, in recognition of the potential economic impacts on smaller producers.
- The more stringent management measure applies to all new facilities and existing facilities over a certain size for example, more than 300 head beef feedlots, 70 head dairy cows, 200 swine, 200 stable horses). This measure requires these confined animal facilities to store wastewater and runoff caused by all storms up to and including the 25-year, 24-hour frequency storm.
- A second management measure applies to *smaller existing facilities* for exapme, from 50 to 299 head beef feedlots, from 20 to 69 head dairy cows, from 100 to 199 swine, from 100 to 199 stable horses, and so on). For these smaller existing facilities, the management measure is to limit the discharge of wastewater and runoff from the facility, through such practices as solids separation basins in combination with vegetative practices and/or other practices that reduce runoff.
- Both of these measures also require confined animal facilities, regardless of size, to manage stored runoff and solids through proper waste utilization and disposal methods that pose minimal impacts to surface/ground water. They will normally do this by developing and implementing nutrient management plans.

EPA Discusses Control of Nonpoint Sources with Board of National Cattlemen's Association (continued)

- Small facilities below the cutoffs above are exempt from the management measures (from 1 to 49 head beef feedlots, from 1 to 19 dairy cows, from 1 to 99 swine, and so on).
- In addition, as states implement the program, there may be additional flexibility — for example, to exclude sources without significant loads to coastal waters and to develop alternative management practices as long as they are as effective as the management measure.
- The management measures for confined animal facilities will *not* apply to existing confined animal facilities that are required to apply for and obtain permits under 40 CRF 122.23. In other words, this management measure for confined animal facilities does not apply to such facilities that already have permits under the NPDES program or a state administered permit program.

Grazing Management Measure

- The other management measure of interest to you is the grazing management measure. The emphasis of this measure is on protection of *sensitive areas* to reduce the physical disturbance of such areas and to reduce the discharge of sediment, animal waste, and nutrients to surface waters. Sensitive areas include:
  - streambanks,
  - wetlands,
  - estuaries,
  - ponds,
  - lakes shores, and
  - riparian zones.
- The following practices are to be implemented in these sensitive areas:
  - exclusion of livestock,
  - providing stream crossings and access for drinking,
  - providing alternative drinking water locations,
  - locating salt and additional shade, if needed, away from sensitive areas, and
  - using improved grazing management.
- In addition, the grazing management measure encourages better management *above* the riparian zone. The measure specifically calls for
  - implementing the range and pasture components of a Conservation Management System (CMS) as defined in USDA's Field Office Technical Guide, or
  - maintaining range, pasture, and other grazing lands in accordance with activity plans established by either the Bureau of Land Management or the Forest Service.

Michigan Conservation Districts Initiate Team Training

by Bill Schnitker, Michigan Association of Conservation Districts

Although Soil and Water Conservation Districts in Michigan have always had excellent training opportunities for staff and board members, this education process has been dramatically enhanced with the adoption of a new concept: Team Training.

Past training programs were specific to individual players such as foresters, water quality specialists, soil conservationists, and a dozen other miscellaneous technician-type specialists. These individuals have excellent knowledge and skill in their particular area of expertise.

Usually, one person in each district office is yoked with the task of providing support, leadership, and training: The Boss! Usually there is a group responsible for setting the overall priorities and policies, wages, and rules: The Board! And sandwiched somewhere between the boss and the board is the person who knows best that which must be done today: The Technician.

Michigan Conservation Districts Initiate Team Training (continued)

The Michigan Department of Agriculture and the Michigan Association of Conservation Districts have combined their efforts and resources to allow the transfer of what each player knows to the teammates. The team training program is tailored to the needs of the participating district. The program is provided to the players in their own offices, which further enhances program benefits because it is structured toward offices and not conference rooms.

The focus of this training experience is competency, and it is geared to the weakest link in the chain of district operations. A survey of district needs was used to identify and prioritize training modules. The team training program has eight training modules:

1. Introductory Module
2. Director & Staff Responsibilities
3. Employee/Employer Relations
4. Building Your District Team
5. Alternative Funding Strategies
6. Decisionmaking and Negotiations
7. Public and Media Relations
8. Building a Community Team

If, for example, a particular district has an excellent strategy for alternative funding, and very weak employer/employee relations, more emphasis is placed on staff relations. Training is geared where training is needed, and this priority is decided by the individual districts before the training. Each module consists of pre- and post- session tasks.

This comprehensive program will help districts set goals that are realistic and attainable, and will provide the tools for facilitating a group approach to accomplishing these goals.

[For further information, contact: Bill Schnitker, Communications, Michigan Association of Conservation Districts, 102 1/2 South Main, P.O. Box 539, Lake City, MI 49651. Phone: (616) 839-3360. FAX: (616) 839-3361.]

USDA Announces 1994 Water Quality Incentive Projects; Deadline for Proposals July 1, 1993

The USDA Agricultural Stabilization and Conservation Service (ASCS) has issued guidelines to its state offices for the submission of up to four new Water Quality Incentive Project (WQIP) proposals per state. Funded through the Agricultural Conservation Program (ACP), incentive payments are made to agricultural producers who agree to adopt management systems to achieve source reduction of agricultural pollutants. WQIP provides incentive payments to producers for irrigation water management, waste utilization, riparian management, range management, soil testing, field scouting, and other management-oriented practices that will enhance water quality.

ASCS is requesting the cooperation of other federal, state (including state water quality agencies), and private agencies in developing project proposals for the 1994 WQIP in watersheds of less than 64,000 acres. The maximum amount of funds that may be requested per project is $300,000.

To be eligible for WQIP, the proposed project area must match at least one of the following conditions:

- designated within a Clean Water Act Section 319 plan (state nonpoint source management); or
- karst topography; or
- area impacts a threatened or endangered species; or
- public wellheads; or
- area recommended by the governor; or
- land that if permitted to operate under existing management practices would defeat the purpose of WQIP.

The goal of WQIP is to achieve source reduction of nonpoint source agricultural pollutants in an environmentally and economically sound manner.

All WQIP proposals must be forwarded to ASCS's Washington, D.C., office, through county and state ASCS offices, by July 1, 1993. An interagency review of the proposals and final selection of 1994 projects will then be made.

[Additional information about the 1994 WQIP proposal development process may be obtained from state ASCS conservation specialists.]

Shutting Down Dead Bird Disposal Pits

The Arkansas Soil & Water Conservation Commission (ASWCC) and the Arkansas Water Resources Center at the University of Arkansas have just released an informative fact sheet about dead poultry disposal. Information from a nonpoint source pollution study being conducted in Arkansas shows that concentrations as high as 560 milligrams per liter (ppm) of ammonium can be found in shallow groundwater three feet from dead bird disposal pits and can register as high as 200 pm 15 feet down slope. These pits, long used in Arkansas and other poultry producing states, were thought to be a safe disposal method for poultry carcasses, but it has been found that many pits fail to work because the bacteria that decompose the birds lack oxygen. Thus, instead of decomposing, the birds become pickled or mummified and are a source of contamination for any water that moves through the pits.

Alternative methods for dead bird disposal being demonstrated by ASWCC as part of their nonpoint source control program include composting with subsequent correct land application of the compost material, and freezing to hold the birds for rendering into animal feed. But many disposal pits, use of which has been encouraged and cost-shared since the 1950s, are still being used. Others have been abandoned. This helpful publication offers practical advice for shutting down old pits. It cautions producers, "Remember, the idea is to remove an old problem, not create a new one."

[For more information, contact Steve Wilkes, information specialist at the Arkansas Water Resources Center, 113 Ozark Hall, University of Arkansas, Fayetteville, AR 72701 (501) 575-4403; or Bob Morgan, Arkansas Soil and Water Conservation Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201.]

Reauthorizing The Clean Water Act

Watershed Management Highlighted at Environmental and Energy Study Institute Conference

EDITOR'S NOTE: Patty Scott, of EPA's Office of Wetlands, Oceans, and Watersheds's policy and communications staff, attended the EESI conference. *News-Notes* editor Hal Wise prepared this story based on her report.

Key staffer Errol Tyler of the House Public Works and Transportation Committee said the time is ripe for a watershed-based approach to water management and protection. Tyler spoke at the March 26 Environmental and Energy Study Institute (EESI) conference on watershed management, held in Washington, D.C., in the Senate Dirksen Office Building.

Tyler said Clean Water Act of 1972 Section 208 (areawide water quality management planning based on *political* boundaries) failed, but that *watershed* management represents the most logical mechanism to address many nonpoint source problems from an economic, social and political standpoint. He said the watershed approach is the best way to galvanize the kind of local support needed to exert the necessary pressures and incentives for local and state legislatures to address nonpoint sources.

He said one way to provide funding may be to expand the application of the State Revolving Loan Fund (SRF). He cautioned, however, that the current fiscal climate will make resources very tight and despite Committee Chairman Norman Mineta's (D-CA) preference for $4 billion for the SRF, $2 billion will be more likely.

The conference drew a standing-room-only crowd of about 130 people, and speakers included Debra Knopman, USGS; Caren Glotfelty, Delaware River Basin Commissioner; Margot Garcia, Virginia Commonwealth University; Blake Anderson, Orange County Sanitation District, California. Several speakers noted the success of Watershed '93, held earlier in the week, in bringing people with a common vision of watershed protection together.

A National Water Agenda for the 21st Century (Water Quality 2000 Final Report) Ratifying Member Organizations

EDITOR'S NOTE: The January-February issue of *NPS News-Notes* (#26) reported on the Water Quality 2000, Phase III, Final Report, *A National Water Agenda for the 21st Century*, which contained recommendations on the reauthorization of the Clean Water Act and noted that some 82 national participating organizations had joined in endorsing and ratifying the report. Due to space limitations; we did not print the list at that time. We correct that omission here. The following member organizations have approved the Phase III report, as of October 30, 1992. Although each and every statement in the report may not be completely in concert with the organization's perspective, the ratifying organizations agreed that, taken as a whole, the report's recommendations will result in improved water quality. (See a related story on Water Quality 2000 in this issue of *News-Notes*, under *Notes on Environmental Education*, starting on Page 18.)

Academy of Natural Sciences
American Academy of Environmental Engineers
American Association of Port Authorities
American Consulting Engineers Council
American Farmland Trust
American Forestry Association
American Institute of Chemical Engineers – Environmental Division
American Planning Association
American Public Works Association
American Recreation Coalition
American Rivers
American Society of Civil Engineers
American Water Works Association
Association of Metropolitan Sewerage Agencies
Association of Metropolitan Water Agencies
Association of State Drinking Water Administrators
Center for Marine Conservation
Chemical Manufacturers Association [1]
Chesapeake Bay Foundation [2]
Connecticut Department of Environmental Protection
Adolph Coors Company [1]
DuPont Company (and Conoco)
Ecological Society of America
Environmental and Energy Study Institute [2]
Environmental Defense Fund [2]
Environmental Law Institute
Great Lakes Commission
Green Bay Metropolitan Sewerage District, Wisconsin
Harvard University – Division of Applied Sciences
Heidelberg University – Water Quality Laboratory
International City Management Association
Interstate Commission on the Potomac River Basin
Kansas Water Office
Lake Superior Center
League of Women Voters Education Fund
ManTech Environmental Technology
Minnesota Project [2]
National Agricultural Chemicals Association
National Association of Conservation Districts
National Association of Dredging Contractors
National Association of Water Companies
National Parks and Conservation Association
National Recreation and Parks Association
National Society of Professional Engineers
Natural Resources Defense Council [2]
North American Lake Management Society
Occidental Petroleum Corporation
Procter and Gamble Co. [1]
Rural Community Assistance Program
Society if Environmental Toxicologists and Chemists
Soil & Water Conservation Society
Spill Control Association of America
Sport Fishing Institute
Texas Lower Colorado River Authority
Trout Unlimited
Vanderbilt University
Virginia Polytechnic Institute and State University
Water Environment Federation
Water & Wastewater Equipment Manufacturers Association
Wisconsin Department of Natural Resources [2]
Wisconsin Wildlife Federation
World Wildlife Fund

FEDERAL AGENCIES (Non-Voting) [3]
Tennessee Valley Authority
U.S. Army Corps of Engineers
U.S. Department of Agriculture
Agricultural Research Service
Forest Service
Soil Conservation Service
U.S. Department of Commerce
NOAA/National Marine Fisheries Service
U.S. Department of Interior
Bureau of Reclamation
Fish and Wildlife Service
U.S. Geological Service
U.S. Department of Transportation
U.S. Environmental Protection Agency

[1] These organizations cooperated on a minority report that discusses several issues of concern to the industrial sector.

[2] These organizations cooperated on a minority report that discusses the need for a national groundwater protection policy.

[3] Federal agency members are non-voting and were not asked to take a position on the report.

Notes on Environmental Education

Water Quality 2000 Report Makes Forceful and Persuasive Arguments on Environmental Education

EDITOR'S NOTE: Water Quality 2000 is a unique and diverse coalition of industry, environmental groups, government, academics, and professional and scientific societies. Its final report, *A National Water Agenda for the 21st Century*, calling for major changes in U.S. policies and programs for the protection and management of the nation's water resources was reviewed in the January-February (#26) issue of *News-Notes*. In that issue we also reported on a half-dozen or so encouraging developments on the environmental education front. We are printing here, with permission, some of the report's more significant sections dealing with environmental education. The big picture contains some compelling ideas about environmental awareness as a way of life. (For a listing of the 82 participating and ratifying organizations of the Water Quality 2000 report, see page 17 of this issue.)

Education is the key to long-run change in the way individuals value their environment. To be sure short-run, measurable improvements in a particular river or lake probably are unattainable without, for example, targeted regulatory or economic incentive programs. Neither is education a substitute for these programs. But, like medicines that only lessen the symptoms of disease without affecting the cause, short-run solutions are designed principally to lessen environmental ills. Environmental education for all ages can promote long-run societal changes that address the causes of pollution. Education can shift individual attitudes toward total resource protection. Simply recognizing that ecosystems and economies are interrelated can build a lasting awareness of the critical value of natural systems to the quality of life. Knowledge can convert a "throw-away" society to one that thinks first about protecting natural resources and preventing pollution.

In this section [of the report], Water Quality 2000 presents a series of recommendations designed to build an environmental awareness — a conservation ethic — as a way of life. These recommendations constitute a long-run strategy with effects that will not reach full impact until today's schoolchildren are adults. Yet incremental progress will complement the more targeted regulatory recommendations presented in subsequent sections.

Our education strategy begins in grade school, where the goal is to introduce environmental sciences — nature — as a topic no less important than reading, writing, or arithmetic. In middle and high schools, as curricula are expanded to include civics, geography, and history, more formal instruction should be offered on ecosystems' structure and functions. College curricula should be considered incomplete without core courses on environmental or water resources systems. Following in the tradition already established at Tufts and the Colorado School of Mines, for example, universities should be encouraged to integrate environmental education into every degree program. As part of an environmental literacy goal, English majors can read works by authors, such as Henry David Thoreau, John Muir, Aldo Leopold, Rachel Carson, and Edward Abbey. Environmental education and training programs should be offered to a wide range of professionals, including locally elected and appointed officials, legislators, industrial and utility managers, journalists and other media professionals, and teachers. Finally, water resources professionals will require specialized training in related natural resources fields, as will other natural resources managers in water resources subjects.

Encourage Public Education to Promote a Conservation Ethic

American consumption patterns are responsible for much of our production of waste, since we are conditioned to expect and demand convenience and highly packaged goods, sometimes at great cost to the environment. Americans use energy half as efficiently per unit of economic output as do populations in other developed economies. . . . By-products of our relatively inefficient patterns of consumption frequently are disposed of without knowledge of the consequences to aquatic ecosystems and water quality.

■ *Recommendation:* As a society, we must encourage public education that helps instill in our children and the general citizenry a conservation ethic that applies to materials, water, and energy. Basic societal changes are necessary to eliminate, whenever possible, impairment of

Water Quality 2000 Report Makes Forceful and Persuasive Arguments on Environmental Education (continued)

water quality and aquatic ecosystems. Such changes hinge on promoting pollution prevention as a priority over pollution regulation and short-term economic gains. In the short run, we may have to rely on government regulatory and economic incentives to promote conservation within the context of watershed planning and management, such as those presented later in this chapter. In the long run, however, an intensive public education and awareness campaign is the only way we can equip citizens with the necessary tools for such a basic societal change.

As citizens, we can implement immediately a wide variety of solutions in our homes and daily lives, at very little cost but at a great savings to aquatic ecosystems. Wherever possible, we must educate citizens about the environmental consequences of excessive use or improper disposal of pesticides, fertilizers, animal wastes, and other nutrients, high phosphate products, solvents, paints, used motor oil, gasoline, and other common products. . . .

■ *Implementation Issues:* Public environmental education and awareness programs should incorporate education on the benefits of conservation measures that improve water quality in aquatic ecosystems. Once the general public becomes aware of the significant benefits that can be achieved through a conservation ethic that promotes "reduce, reuse, and recycle" as a society priority, citizens can exert leverage through buying power. Morever, consumers can then advocate precycling and demand environmentally compatible products, less packaging, and packaging materials that have benign effects on the environment.

Increase Environmental Education in Elementary, Secondary, and College Curricula

Failure to provide environmental education at elementary, secondary, and college levels has contributed to an uninformed public and missed opportunities to achieve long-term benefits through intergenerational efforts toward water quality improvement. . . .

■ *Recommendation:* A wide variety of agencies and organizations — federal, state, and local agencies as well as nonprofit and private organizations — should encourage and fund continued environmental education programs at all levels. Such programs should include environmental and natural resource information communicated in easy-to-understand terms without political bias. As much as possible, the curricula for these programs should be centered on field experiences. Hands-on conservation activities can provide a valuable learning experience at the same time that they contribute to environmental improvements. . . .

There are several ways to facilitate or encourage volunteer efforts, both in the schools and in existing after-school youth programs. First, information exchange among school teachers and volunteers would help distribute and promote development of program materials. EPA or the U.S. Department of Interior could create a national clearinghouse of existing educational materials and other resources for effective environmental education programs. Second, a national program to recognize outstanding volunteer efforts in environmental education would increase the general public's awareness of the importance of these efforts and help promote such programs under the auspices of Boy Scouts and Girl Scouts, science and natural history museums, zoos, aquariums, and amusement parks. The U.S. Department of Education should also play a major role in promoting environmental education in elementary and secondary schools.

College curricula on the environment should engage a wide range of disciplines, bringing together engineers, economists, planners, geographers, biologists, chemists, lawyers, and political scientists. Environmental sciences degrees must require a thorough exposure to the theory and practice of environmental protection, from the perspectives of all disciplines that must come together in the field to attain environmental goals. Students in all curricula should be exposed to environmental issues through environmental themes woven through readings, case studies, field trips, and other exercises. Environmental curricula also should include exchanges of students with industry or government for a semester to gain practical experience and engage other sectors of society in the environmental education process.

While volunteer efforts should be encouraged, Congress should fully fund and consider expanding support for EPA as it implements the National Environmental Education Act. . . .

■ *Implementation Issues:* Because the nation's future depends on our children, the return on dollars invested in development of young minds will be high in relation to the investment in environmental education. Yet it may be difficult to measure the benefits of education directly or even at all in the short run.

Water Quality 2000 Report Makes Forceful and Persuasive Arguments on Environmental Education (continued)

Public Education on the Effects of Individual Actions on Water Quality Should be Given Higher Priority by Government Agencies and the Media

Improper disposal of yard waste, hazardous materials, and garbage into waterbodies by individuals are only a few examples of evidence of a lack of public commitment to water quality. Ordinary citizens remain largely unaware of how their individual actions contribute to water quality degradation. Communicating to citizens that they are responsible for water quality degradation caused by the wastes they produce has not been given high enough priority. Most of the public needs more information on public water supply systems, the costs of meeting water quality standards, and the consequences of delayed investments and underfunding.

■ *Recommendation:* To increase public awareness, all levels of government, and the media, should act to increase public education and enforcement efforts to convey that individual, corporate, institutional, and municipal water pollution is a socially unacceptable activity. Linkages between individual activities and water supply should be stressed; for example, by raising public consciousness about the impact of urban runoff on water supply systems and living resources of aquatic ecosystems.

While the American public speaks loudly on the need for governmental action to assure clean water, individual actions speak loudly in another direction. Virtually every American participates in practices — such as lawn care, home car care, or disposal of household products — that can degrade water quality directly. Because there appears to be little understanding of the connection between individual actions and water quality, it is important to raise the public consciousness of what individuals can do to prevent water quality degradation. . . .

■ *Implementation Issues:* Education is a continuing, long-term process that must begin with the very young to be most effective in communicating how everyday actions affect water quality; programs from kindergarten through college should stress the consequences of individual actions on the environment. Over time, children can modify their parents' attitudes and behavior. Educating citizens must become a higher institutional priority for regulatory agencies because, should education fail, enforcement is problematic.

Promote Education on Land Stewardship Practices

Public agencies must develop education in programs for a wide variety of sectors on the relationship between land use and water quality. Currently, there is a lack of funding to do the job. Without knowledge on how land use affects water quality and aquatic ecosystems and information on alternative practices, land users may not practice stewardship or adopt conservation systems.

■ *Recommendation:* Congress should appropriate adequate funding to public agencies that provide information to farmers, miners, loggers, developers, and rural landowners. All federal, state, and local agencies that deal with rural and farm populations must have adequate funds to provide technical education and technology transfer services. The federal government should reinforce the need for state and local governments to promote stewardship practices across all land uses. . . .

■ *Implementation Issues:* Some individual landowners within each land-use category have practiced conservation for years. Many more have not. Adequate infusions of funding to promote farmer education and technology transfer would have immediate and dramatic results to help continue and expand the roles of existing public agencies. Because funding authorities in Congress and state governments either do not understand or do not recognize the need for such technical education; intensive efforts are needed on the part of responsible citizens who are aware of aquatic habitat damage and of water quality impairment from economic activities that disturb the land. . . .

Educate Farmers and Private Landowners About the Economic Potential of Wetlands

Farmers are aware that they can make an individual difference on their lands in conserving soil and water, and many also are aware of certain new technologies that can be applied to achieve those goals. However, few are aware that they can realize economic gains or break-even situations by protecting and managing natural resources.

Water Quality 2000 Report Makes Forceful and Persuasive Arguments on Environmental Education (continued)

■ *Recommendation:* In part through Land Grant universities, EPA, USDA, NOAA, USGS, BLM, TVA, and state water and agricultural agencies should aggressively pursue adult education programs to teach farmers and private landowners how to realize economic returns by appropriate use of privately owned wetlands and waterbodies. To be successful, education efforts must be initiated at both the federal and state levels, aided where possible by the agriculture trade press (for example, *Farm Journal, Progressive Farmer, Cattle Business,* and like publications).

States and the federal government should develop and distribute information packages stressing positive approaches to wetland and water functions. Functions most critical to global survival and everyday quality of life should be emphasized; for example, groundwater discharge and recharge, surface water retention, floodflow alteration, shoreline protection, reduction of contaminants, and sediment management. Traditionally, fish and wildlife are among the few functions for which much public information exists, and these publications are often on negative impacts and conflicting land uses.

Mechanisms to realize economic returns include renting hunting and fishing rights, other non-consumptive, natural resource recreational benefits that people are willing to pay to use (for example, nature photography, birdwatching), and selected timber harvest. . . .

■ *Implementation Issues:* Implementing these education efforts will require new approaches to old problems by federal, state, and local agencies that deal with the rural public. For farmers and private landowners, it requires individual rethinking of land use priorities and their means of deriving a living from the land.

[Copies of the entire report, A National Water Agenda for the 21st Century, can be purchased from Water Quality 2000, 601 Wythe Street, Alexandria, Va. 22314-1994, for $25 per copy, plus postage and handling. Call 800-666-0206 and specify order number TT02. For further information, contact Tim Williams or Nancy Blatt at the above address. Phone: (703) 684-2418.]

Wyoming Outdoor Council Developing Curriculum Materials Combining Stream Rehabilitation and "Service Learning"

EDITOR'S NOTE: This article is reprinted with permission from the *Wyoming Riparian Newsletter*, published by the Wyoming Riparian Association, Mark McKinstry, Editor.

The Wyoming Outdoor Council (WOC) has recently received a planning grant from the Commission on National and Community Service to develop curriculum materials related to stream rehabilitation for a school-based service-learning project.

Called ConServe Wyoming, the effort will apply a model (developed on Squaw Creek and Baldwin Creek in Lander) for involving young people in watershed rehabilitation to other sites in the state. On each site, the goal is a program that integrates community service with classroom work.

Young people growing up in Wyoming tend to have a superficial investment in the land that nurtures them. Nearly all of them live in towns and a few small cities that afford them only infrequent contact with the abundance of natural resources that surround them. Neither do they have much awareness of the threads that tie their particular community together, the network of ecological relationships and personal commitments that make the community function as an integrated unit. Having such shallow roots, they are easily displaced by the perceived attractions of glittering economic opportunities outside the state. Many of them end up living somewhere else as adults.

The goals of ConServe Wyoming are two-fold:

- to bring about positive changes in watershed management practices, with an emphasis on innovative techniques of livestock management and reduction of nonpoint source pollution.
- to engage public school students in community service related to natural resource management at the hands-on level.

ConServe Wyoming will test the hypothesis that engaging public school students in community service related to a meaningful conservation project will cause them to sink deeper roots into

Wyoming Outdoor Council Developing Curriculum Materials Combining Stream Rehabilitation and "Service Learning" (continued)

the soil of their home state, making it less likely that they will move away from Wyoming. As they perform community service, students will be able to assess the value of being involved in purposes larger than their individual goals. Donn Kesselheim, WOC's director of education, explained, "Giving young people in Wyoming a 'sweat equity' in the natural resources of the area in which they grow up may make it less likely that they will want to live elsewhere as adults."

[For more information, contact: Donn Kesselheim, Wyoming Outdoor Council, 201 Main Street, Lander, WY 82520. Phone: (307) 322-7031.]

The Adopt-A-Watershed Program Provides Hands-On Learning in Trinity County, California

EDITOR'S NOTE: We received a letter the other day from Kathy Simpson of the Soil Conservation Service's Weaverville, California, field office. She said, "John McCullah of the Trinity County Resource Conservation District suggested we write an article for *News-Notes*. The Soil Conservation Service works with the RCD and the other agencies of the Trinity River Task Force, which has provided some funding for Adopt-A-Watershed. We have a new education coordinator and an intern working on the program, as well as myself assisting with the coordination with teachers." So an article in *News-Notes* was born. Thanks, Kathy and John.

Something exciting in resource education is happening in Trinity County, California! Students in the Adopt-A-Watershed Program adopt a specific watershed and follow its changes while the watershed becomes a focal point of their science curriculum from kindergarten through the 12th grade. This program gives students a chance to observe up to 13 years of change in one watershed, and develop their ability to recognize the effects of this change on their lives. The Adopt-A-Watershed program, currently coordinated by Kim Stokely, a Hayfork, California, science teacher, is becoming a popular way for science teachers to incorporate the required elements of the state science framework into their students' everyday lives. Students in the program develop a sense of stewardship for the watershed where they live.

Many of the program's projects supply hands-on experience in restoration, water quality, geology, wildlife populations, and soil erosion. These field projects involve partnerships with different agencies and promote cooperation in addressing resource problems. Each grade level completes experiments about different aspects of its watershed. The data from these experiments are compiled and are built from one year to the next, allowing students to interpret their own real scientific data as the years go by.

Along with facilitating community cooperation, the program provides a way to interest students in resource management careers. One of the activities that has been very well received is a "job shadowing" segment in which high school students accompany resource professionals during the day and observe them in action. In one job shadowing trip last year, Trinity High School students assisted the Trinity River Resource Conservation District in constructing a straw bale check dam.

Adopt-A-Watershed integrates the life, physical, and earth sciences. The Trinity County Office of Education developed the curriculum for the Adopt-A-Watershed Program for each grade level, kindergarten through 12th grade, and trained all Trinity River Basin teachers in the use of the curriculum. Many school districts from outside the basin are also implementing the program.

The Trinity River Restoration Program, which funded this education effort, saw the need to promote resource stewardship to maintain its watershed and river systems. The Restoration Program's Trinity River Task Force, a group of 14 federal, state, local and tribal agencies, is responsible for restoring Trinity River fish and wildlife population to levels that existed before the Trinity Dam was constructed. Education is a vital component of the comprehensive restoration effort because it will play a key role in ensuring that good, sound management decisions will be made in the future. The Adopt-A-Watershed Program was designed to meet this challenge.

Stokely called response from teachers "fantastic." Teachers are especially impressed by the unique continuity that allows kids to study the same segment of a watershed over an extended period of time. Most of the schools involved in the project have a fairly stable population, but a

The Adopt-A-Watershed Program Provides Hands-On Learning in Trinity County, California (continued)

few experience heavier turnover. Those schools solve the problem by assigning study data collected by former students to those who have newly arrived, thus giving the newcomers historic data with which to work.

A specific curriculum has been developed for each grade level, but four elements are included in every unit:

1. The student will learn a concept; for example, watershed, erosion, restoration;
2. Time is provided to return to earlier field studies;
3. Every unit contains a restoration project; and
4. Every unit requires the student to talk about what he or she has done — from kindergartners sharing with their parents to older students conducting training sessions.

Copies of an eight-minute "Adopt-a-Watershed" video are available on a free, two-week loan basis from the Soil Conservation Service, Trinity County Resource Conservation District, PO Box 1414, Weaverville, CA 96093. Phone: (916) 623-3991

[For more information contact: Teresa Lafferty, District Watershed Information and Education Coordinator. Phone: (916) 623-6004.]

NPS Electronic Bulletin Board (BBS) News

EDITOR'S NOTE: This portion of *News-Notes* has been prepared by Associate Editor Elaine Bloom of TetraTech. TetraTech is the contractor for the operation and content of EPA's *NPS BBS*.

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

Special Interest Group Forums (SIGs or mini-bulletin boards) are dedicated to specific topics and have all of the features of the main *BBS*. Currently, there are six SIGs on the *NPS BBS* dealing with: Watershed Restoration, Agriculture, Fish Consumption Risk Management, TMDLs, Waterbody System Support, and NPS Research.

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

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

For a copy of the User's Manual, complete THE COUPON on page 27, and mail or FAX it in.

The BBS is BACK!

Those of you who attempted to call the NPS BBS during the first 10 days of April found something amiss. The BBS was temporarily offline during negotiation of a long-term contract for maintaining the system.

Some callers saw the notice we posted regarding the temporary shut-down as soon as they called the *NPS BBS*. Unfortunately, however, other established users were asked to register as new users before they were shown the notice. This caused quite a bit of confusion for which we apologize! If you were a registered *NPS BBS* user before the disruption, you are still registered. We apologize, too, for any other inconveniences that the system being off-line may have caused. We know many of you have come to rely on it for electronic mail, news, and documents.

We spent the "downtime," preparing some exciting new materials. Log on and check out the groundwater fact sheets, the ASCII version of EPA's coastal NPS management measures, the catalog of federal assistance programs for watershed protection, and volunteer monitoring information.

Watershed Registry Form to Mail In

This issue of *News-Notes* contains a four-page insert to fill out for inclusion in the Watershed Registry. (See *News-Notes* #27 for more information on the Watershed Registry.) Watershed

The BBS is BACK! (continued)

project coordinators, managers, engineers, hydrologists, chemists, biologists, educators, planners and administrators can use this issue's mail-in form to register in the Watershed Registry.

We have someone to enter data in the Registry database for only a few months, so please send your form in by July 31, 1993. Online registration is ALWAYS available.

DON'T send the completed form to *News-Notes*—that will only delay things. Please mail to: **Watershed Management Council, c/o Water Resources Center, University of California, Davis, CA 95616,** by July 31, 1993. Online registration is available through the *NPS BBS,* (301) 589-0205. After this date, you may register only through the *NPS BBS.*

The form you fill out (either online or offline) sends pertinent information about your project and your area of interest into an online database that can be searched by others doing watershed management or restoration projects.

Datebook

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

Meetings and Events

1993

May

4-5 — *Joint USGS-USNRC Technical Workshop on Research Related to Low-Level Radioactive Waste Disposal,* Reston, VA. Contact: Peter Stevens, USGS. (703) 648-5721. FAX: (703) 648-5295 or Thomas J. Nicholson, NRC. (301) 492-3856. FAX: (301) 492-3696.

5-7 — *Enhancing the State's Lakes Management Programs: Strengthening Local Lake and Watershed Protection Efforts,* Chicago, IL. Contact: Bob Kirschner, NE IL Planning Commission, Natural Resources Dept., 400 W. Madison Street, Room 200, Chicago, IL 60606. (312) 454-0400. FAX: (312) 454-0411.

7-8 — *Solutions for the Future: Actions for the Present, 1993 Merrimack River Watershed Management Conference,* Bedford, NH. Contact: Barbara Rich or Tom Groves, New England Interstate Water Pollution Control Commission, 85 Merrimac St., Boston, MA 02114.

10-12 — *Wetlands and Watershed (Water Resources) Management,* Sparks, NV. Contact: Assoc. of State Wetland Managers, P.O. Box 2463, Berne, NY 12023-9746. (518) 872-1804. FAX: (518) 872-2171. Sponsored by U.S. EPA-Wetlands Division. Technical workshop for local, state, and federal wetland regulatory personnel, planners, water resources managers, consultants, landowners, environmental organizations, and others.

15-21 — *2nd USA/CIS Joint Conference on Environmental Hydrology and Hydrogeology,* Arlington, VA. Contact: Helen Klose, American Inst. of Hydrology, 3416 University Ave., SE, Minneapolis, MN 55414-3328. (612) 379-1030.

25-28 — *From Rio to the Capitols—State Strategies for Sustainable Development,* Louisville, KY. Contact: Ann James, Office of the Governor, Room 103, State Capitol, Frankfort, KY 40601. (502) 564-2611. FAX: (502) 564-2517.

June

5 — *Snowjob: The Effects of the Ski Industry on the Environment,* Keene, NH. Contact: Dr. Alexandra Dawson or Julie Sperling, Antioch NE Graduate School, Environmental Issues Conf., Roxbury Street, Keene, NH 03431. (603) 357-3122 ext. 205. Sponsored by the Antioch New England Graduate School. Topics include: initiatives by local activists, effects of snowmaking on wetlands, streams, and ponds; appropriate use of public lands; impacts of ski expansions on wildlife; and social impacts (increased traffic, infrastructure strain).

5 — *Walk-for-Water,* Croton, NY. Contact: Caroline Woodwell, Open Space Institute, 145 Main Street, Ossining, NY 10562. (914) 762-4630. Sponsored by the Open Space Institute and the Hudson Riverkeeper. Objective: To raise awareness about the need to protect New York City's watershed.

11-13 — *Federation of Lake Associations Tenth Annual Conference: Strategies for Protecting Water Quality,* Clinton, NY. Contact: Federation of Lake Associations, 2175 Ten Eyck Avenue, Cazenovia, NY 13035. (315) 655-4760 or (315) 655-9777. Focus is on techniques that can be applied by the average citizen.

1993

June

14-16 *Water Organizations in a Changing West,* Boulder, CO. Contact: Katherine Taylor, Conference Coordinator, University of Colorado, School of Law, Campus Box 401, Boulder, CO 80309-0401. (303) 492-1288. FAX: (303) 492-1297. Sponsored by the Natural Resources Law Center of the University of Colorado School of Law. Will address issues facing both urban and agricultural water supply organizations in the West.

15-19 *International Wetland Symposium: Improving Wetland Outreach, Training and Education, Interpretation,* Madison, WI. Contact: Assoc. of State Wetland Managers, P.O. Box 2463, Berne, NY 12023-9746. (518) 872-1804. FAX: (518) 872-2171. Hosted by Wisconsin Department of Natural Resources, University of Wisconsin, and the International Crane Foundation. Topics: gaps in outreach, training, and interpretation; scientists as educators; special issues of wetland regulation; and designing slide shows, videos, workshops, and wetland courses for schools and universities.

17-19 *Volunteer Monitoring Conference: Building the Network to Protect and Improve Water Quality,* Carlisle, PA. Contact: Terrene Institute, 1717 K St, NW, Suite 801, Washington, DC 20006. (202) 833-8317. FAX: (202) 296-4071. Sponsored by U.S. EPA Region 3. For citizens, organizations, and agencies who are or would like to be involved in volunteer monitoring efforts.

21-25 *Management of Riparian Forests,* Kansas City, MO. Contact: Terry Robison or Frank Hersey, Riparian Forest Workshop, Forestry Division, P.O. Box 180, Jefferson City, MO 65102-0180. (314) 751-4115. FAX: (314) 893-6079. Topics include buffer and filter strips, silviculture and harvesting BMPs, selling farmers on forestry, NPS, benefits of trees to streams, and economic benefits of riparian and watershed forestry.

23-26 *Environmental Education 2000: Building a Solid Foundation for the Future,* Leesburg, VA. Contact: Alliance for Environmental Education, 51 Main Street, P.O. Box 368, The Plains, VA 22171. (703) 253-5812. FAX: (703) 253-5811. Topics: successful model programs, innovative networking, corporate/industry programs, university research, government programs, and computer use.

July

7-9 *7th Annual Watershed Conference: Citizens and Clean Water,* Springfield, MO. Contact: Watershed Committee, The Ozarks, Inc., 300 West Brower, Springfield, MO 65802-3817. (417) 866-1127. FAX: (417) 866-1918. Sponsored by the Watershed Committee of the Ozarks, Inc. Topics: volunteer monitoring, watershed protection, water conservation, environmental enforcement, and citizen involvement in planning and zoning issues.

16-18 *1st National Youth Environment Summit: Partners for the Planet Branching Out,* Cincinnati, OH. Contact: (800) 473-0263. Hosted by 14 organizations and agencies including EPA, FFA, USDA, and Kids for a Clean Environment.

August

9-13 *Prairie Ecosystems: Wetland Ecology, Management and Restoration,* Jamestown, ND. Contact: Dr. Ned Euliss, U.S. Fish and Wildlife Service, Northern Prairie Res. Center, RR 1, Box 96C, Jamestown, ND 58401.

15-18 *Opportunities for Agroforestry in the Temperate Zone Worldwide,* Ames, IA. Contact: Carole Seifert, Iowa State University, Continuing Education, 102 Scheman Building, Ames, IA 50011-1112. (515) 294-1400. Topics: environmental/ecological, socio-economic, and institutional/political impacts, design and management aspects of alley-cropping, silvipastoral, shelterbelt, riparian zone systems, and sustainable agriculture.

14-19 *International Symposium on Soil and Plant Analysis,* Olympia, WA. Contact: Benton Jones, Jr., 183 Paradise Blvd., Suite 108, Athens, GA 30607. (706) 548-4557.

September

12-17 *ICUSD '93 - 6th International Conference on Urban Storm Drainage,* Niagra Falls, Ontario, Contact: Jiri Marsalek, 6th ICUSD, National Water Research Instit, P.O. Box 5050, Burlington, Ontario, Canada, L7R 4A6. (416) 336-4899. FAX: (416) 336-4989. Sponsored by the International Association on Water Quality and the International Association for Hydraulic Research, co-sponsored by the American Society of Civil Engineers. Focus: urban storm drainage planning, analysis, design, construction, operation, and maintenance.

19-24 *1st International IAWPRC Conference on Diffuse (NPS) Pollution: Sources, Prevention, Impact and Abatement,* Chicago, IL. Contact: Dr. Vladimir Novotny, IAWPRC Conference, Dept.Civil & Envir. Engineering, Marquette University, 1515 West Wisconsin Ave., Milwaukee, WI 53223. (414) 288-3524. FAX: (414) 288-7082.

23-24 *4th Annual Utah Nonpoint Source Water Quality Conference,* Logan, UT. Contact: Denise Stewardson, Conference & Institute Div., Utah State University, Logan, UT 84322-5005. (801) 750-1713. Focus: choices and trade-offs in sustainable natural resource management.

23-24 *6th Annual Symposium of the Arizona Hydrological Society: Emerging Critical Issues in Water Resources of Arizona and the Southwest,* Casa Grande, AZ. Contact: Peter Livingston, CH2M Hill, Inc., 5210 E. Williams Circle, Suite 550, Tucson, AZ 85711-4486. (602) 748-9144. FAX: (602) 748-1316. See CALL FOR PAPERS (following) for topics.

1993

September

28-29 — *Symposium on Agricultural Nonpoint Sources of Contaminants: Focus on Herbicides*, Lawrence, KS. Contact: Larry Fergusun, U.S. EPA, 726 Minnesota Ave., Kansas City, KS 66101. Phone (913) 551-7447. Topics: health and environmental impacts of herbicides, regulatory implications, and management of herbicides to minimize environmental impacts. Sponsored by EPA and USGS.

October

2-7 — *1993 Water Environment Federation Annual Conference*, Anaheim, CA. Contact: Maureen Novotne, WEF, Technical & Educational Serv., 601 Wythe St., Alexandria, VA 22314-1994. (703) 684-2400.

4-8 — *International Symposium on the Ecological Effects of Arctic Airborne Contaminants*, Reykjavik, Iceland. Contact: Debra Steward, Technical Resources, Inc., 3202 Tower Oaks Blvd., Suite 200, Rockville, MD 20852.

27-29 — *1993 Rocky Mountain Ground Water Conference*, Albuquerque, MN. Contact: Michael E. Campana, Dept. of Earth & Planetary Sc., University of New Mexico, Albuqurque, NM 87131-1116. (505) 277-3269. FAX: (505) 277-8843. See CALL FOR PAPERS (following) for topics.

November

1-3 — *4th National Pesticide Conference: New Directions in Pesticide Research, Development, Management, and Policy*, Richmond, VA. Contact: Dr. Diana Weigmann, VA Polytech, VA Water Resources Res. Center, 617 North Main St., Blacksburg, VA 24060-3397. (703) 231-5624 or 231-6673. Sponsored by the VA Water Resources Research Center, Research Division of VA Polytechnic Institute and 17 cosponsors.

December

11-15 — *55th Midwest Fish & Wildlife Conference - New Agendas in Fish and Wildlife Management: Approaching the Next Millennium*, St. Louis, MO. Contact: Wayne Porath, MO Dept. of Conservation, 1110 S. College Avenue, Columbia, MO 65201. (314) 882-9880.

13-14 — *Integrated Resource Management and Landscape Modification for Environmental Protection*, Chicago, IL. Contact: ASAE, 2950 Niles Road, St. Joseph, MI 49085-9659. (616) 429-0300.

Calls For Papers — DEADLINES

April

9 — *Remediating Hazardous Waste and Groundwater Contamination Sites: New Approaches*, March 1, 1994, Miami, FL. Contact: Libby Strickland, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400. FAX: (703) 684-2475.

May

28 — *1993 Rocky Mountain Groundwater Conference*, October 27-29,1993, Albuquerque, MN. Contact: Michael E. Campana, Dept. of Earth & Planetary Sci, University of New Mexico, Albuqurque, NM 87131-1116. (505) 277-3269. FAX: (505) 277-8843. Held in conjunction with the 6th Annual Conference of the New Mexico Section of the American Water Resources Association. Topics: aquifer and wellhead protection; groundwater ecology; resource management, vadose zone flow and transport; changing government agency roles; geophysical and geotechnical aspects; interstate and international issues; legal and political aspects.

28 — *6th Annual Symposium of the Arizona Hydrological Society: Emerging Critical Issues in Water Resources of Arizona and the Southwest*, September 23-24, 1993, Casa Grande, AZ. Contact: Peter Livingston, CH2M Hill, Inc., 5210 E. Williams Circle, Suite 550, Tucson, AZ 85711-4486. (602) 748-9144. FAX: (602) 748-1316. Topics: water management, water quality programs, wells, CAP issues, hydrologic studies.

August

5 — *The International Land Reclamation and Mine Drainage Conference and the 3rd International Conference on Abatement of Acidic Drainage*, April 25-29, 1994, Pittsburgh, PA. Contact: Debbie Lowanse/Bob Kleinmann, U.S. Bureau of Mines, P.O. Box 18070, Pittsburgh, PA 15236. (412) 892-6708. FAX: (412) 892-4067. Co-hosted by U.S. Bureau of Mines, Office of Surface Mining, U.S. EPA, and Tennessee Valley Authority. Topics: acid mine drainage prediction, chemical and biological treatment of AMD, geotechnical engineering in mined areas, mine closure/bond release, mine chemistry, mine hydrology and groundwater protection, mine soil productivity, mine subsidence, mine waste management and characterization, regulations and policy issues, reclamation of derelict/abandoned mined lands, revegetation case studies, slope stability/erosion control, wetlands on mined lands, and wildlife/habitat restoration.

The Coupon

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

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

NEWS-NOTES Editor: Hal Wise (Terrene Institute); Associate Editor: Elaine Bloom (TetraTech). For inquiries on editorial matters, call (202) 260-3665 or FAX (202) 260-1517.

For additions or changes to the mailing list, please use the COUPON on page 27 and mail or FAX it in. We are not equipped to accept mailing list additions or changes over the telephone.

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THE WATERSHED REGISTRY

THE WATERSHED REGISTRY is a national registry for watershed project coordinators, managers, engineers, hydrologists, chemists, biologists, educators, planners and administrators. We hope you'll use it to share technological, educational, legislative and financial problems and solutions with your colleagues across the country.

The information you enter about your project and your interests goes into a searchable database on the NPS Electronic Bulletin Board. (Log on by dialing (301) 589-0205. For the Bulletin Board user's manual or more information, use the COUPON on page 27.

PLEASE RETURN THE COMPLETED FORM BY JULY 31, 1993. MAIL TO: Watershed Management Council, c/o Water Resources Center, University of California, Davis, CA 95616.

PERSONAL INFORMATION (name, organization and address required for registration)

First Name: _____ Middle Initial: _____ Last Name: _____

Your position or watershed assignment: _____

Your organization/agency/company: _____

Street Address: _____

City: _____ State: _____ ZIP Code: _____

Country (if other than U.S.): _____

Area code and phone number: _____ Extension: _____

Fax number: _____

Circle up to 4 keywords to describe management or restoration activities you are involved in.

1) Administration
2) BMP design/implementation
3) Emergency response
4) Enforcement
5) Environmental restoration
6) Farm management
7) GIS
8) Land management/acquisition
9) Law/legislation
10) Monitoring
11) Permitting
12) Planning
13) Policy/lobbying
14) Pollution cleanup
15) Pollution prevention
16) Public utilities
17) Public information/education
18) Regulation
19) Soil conservation
20) Technology transfer
21) TMDLs
22) Volunteer activities
23) Wildlife/fisheries management

Please describe any area of expertise you would like to share on the line below.

_____

PROJECT LOCATION (all questions optional)

Watershed name: _____

Project name (if different): _____

What is the name of the major surface water that your watershed drains into? _____

Please enter up to two 6- or 8-digit USGS Hydrologic Unit Codes for your watershed.

1) _____ 2) _____

What state(s) and/or tribal lands are in your watershed project area?

State(s) or territory: _____

Tribal lands: _____

Please list the counties in your watershed on the line below:

_____

Circle the range below that represents the size of your watershed.

1) 0 - 100 sq. miles
2) 101 - 1,000 sq. miles
3) 1,001 - 2,500 sq miles
4) 2,501 - 10,000 square miles
5) greater than 10,000 square miles

ADMINISTRATIVE INFORMATION *(all questions optional)*

Name of lead agency : _____

Circle the number that best represents the type of lead agency:

1) State environmental
2) State water agency
3) State agriculture
4) State natural resources
5) State geology
6) State coastal
7) State transportation
8) State health
9) State extension service
10) Tribal
11) Local planning
12) Local environmental
13) Regional council
14) Watershed council/agency
15) Soil & water conservation dist.
16) Resource conservation & dev.
17) Interstate agency
18) Tennessee Valley Authority
19) EPA
20) USDA Forest Service
21) USDA SCS
22) USDA ASCS
23) USDA Extension Service
24) USDA other
25) Farmers Home Administration
26) DOI Bureau of Land Management
27) DOI Bureau of Reclamation
28) DOI Bureau of Indian Affairs
29) DOI USGS
30) DOI Fish & Wildlife Service
31) DOI National Park Service
32) DOI other
33) NOAA
34) DOD Army Corps of Engineers
35) DOD other
36) Department of Transportation
37) Other federal agency
38) International agency
39) Non-Governmental organization

Names of up to 5 cooperating agencies/organizations, project partners:

1) _____

2) _____

3) _____

4) _____

5) _____

Circle up to 5 types of cooperating agencies/organizations or project partners from the following list:

1) Federal 2) State 3) Local 4) Private 5) Other

What is your approximate annual budget: _____

What is your primary source(s) of funding: _____

What is your secondary source(s) of funding: _____

Project's approximate starting and ending dates (e.g. 10/91-10/94): _____

ON-THE-GROUND INFORMATION (all questions optional)

Circle up to 3 major types of impaired waterbodies in the watershed:

1) River/Stream 2) Lake/Reservoir 3) Bay/Estuary 4) Wetland 5) Aquifer

Choose up to 4 major land uses characterizing your watershed. Estimate the percentage next to your selections.

1) Urban
2) Rural
3) Residential
4) Industrial
5) Commercial
6) Crop production
7) Livestock
8) Forestry/silviculture
9) Resource extraction
10) Public utility
11) Undeveloped/open space

Briefly describe any other major land use on the line below.

_____

Circle up to 8 keywords from the list to describe water quality/habitat problems you are targeting.

1) Ammonia
2) Atmospheric deposition
3) Bank/beach erosion
4) Combined sewer overflows
5) Contaminated sediment
6) Dissolved oxygen
7) Eutrophication
8) Fecal coliform
9) Habitat degradation
10) Hazardous waste
11) Hydromodification
12) Industrial discharge
13) Landfills
14) Metals
15) Mine drainage/tailings
16) Nutrients
17) Organics
18) Pathogens
19) PCBs
20) Pesticides
21) pH
22) Public utility discharge
23) Salinity
24) Sedimentation
25) Septic systems
26) Stormwater
27) Streambank devegetation
28) Superfund site
29) Thermal modification
30) Total suspended solids
31) Toxics
32) Urban/highway

Other water quality/habitat problem targeted:

_____

Please circle up to 5 keywords that apply to the type, purpose, or design of the monitoring you are doing.

1) Ambient
2) Baseline
3) Bioassay
4) Biocriteria
5) Biological
6) BMP effectiveness
7) Chemical
8) Compliance
9) Continuous
10) Fixed station
11) Habitat
12) Long-term
13) Model development/ verification
14) Nonpoint source identification
15) Physical
16) Point source identification
17) Program evaluation
18) Regulatory enforcement
19) Remote sensing
20) Research
21) Risk assessment
22) Sediment
23) Storm sampling
24) Synoptic
25) Toxicological
26) Trends

Please describe any other type of monitoring on the line below:

_____

Please circle the keywords that describe your data storage and analysis approach.

1) ARC/INFO
2) commercial analysis package
3) commercial database/ spreadsheet
4) customized analysis package
5) customized database/ spreadsheet
6) GIS
7) IBM compatible
8) LAN system
9) Macintosh compatible
10) mainframe system
11) ODES
12) other GIS software
13) STORET
14) SAS
15) SYSTAT
16) UNIX
17) Waterbody System
18) WQ STAT2
19) WQ HYDRO

Please describe any other data storage & analysis approach on the line below:

_____

Circle all the ways that volunteers are involved with this project.

1) Cleanups
2) Fund-raising
3) Information and education
4) Local government
5) Monitoring
6) Planning/organizing
7) Political action
8) Restoration

Please describe any other ways volunteers are involved in this project on the line below:

_____

Please describe your primary objective in the project on the line below:

_____

Please describe your major success to date on the line below:

_____

Please describe your major technical or administrative obstacle on the line below:

_____

WORDS OF WISDOM

Please use up to 3 lines to expand on those that are important to you and skip the ones that are not.

What benchmarks or indicators are you using to measure your success?

_____

_____

_____

What innovative techniques or technology are you developing?

_____

_____

_____

How are you integrating non-structural or land use measures into watershed management?

_____

_____

_____