

Nonpoint Source **EPA** *News-Notes***A Commentary. . .***Agriculture's Role in Protecting Water Quality*

Excerpted from an article by Susan Offutt, senior examiner with the Natural Resources Division, Office of Management and Budget, Executive Office of the President, Washington, DC 20503. Published in the Journal of Soil and Water Conservation, January-February 1990. Excerpted and reprinted here with permission of the Journal.

- Agriculture is the remaining, major unregulated source of environmental, primarily water, pollutants.
- With the budget for fiscal year 1990, President Bush launched a federal government initiative to protect water resources from contamination by fertilizers and pesticides without jeopardizing the economic vitality of U.S. agriculture. Federal agencies will design water quality programs to accommodate both the immediate need to halt contamination...and the future need to alter farming practices that may threaten the environment.
- To both society at large and to farmers, a program of research and education aimed at water quality protection would have a number of advantages over compulsion through regulation. For farmers, education and voluntary compliance offer at least a partial cost-share through subsidization of the development of new farming practices and of the dissemination of information that aids in adoption...And, importantly, voluntary programs are...in the spirit of farm policy over the past 50 years.
- It seems difficult to accept the argument that farmers will adopt environmentally sensitive practices in their own self interest.
- The President's water quality initiative puts its eggs in the research and education basket. But it is a choice that can be revoked. And pressure is increasing to do just that. The threat of regulation of farming practices is very real and must be given credence by the agricultural community. Society likely will not extend its long-standing exemption of farmers from responsibility for polluting.
- For any other sector of the economy the allocation of the financial burden for prevention of pollution is an easily settled matter: the polluter pays and is compelled to do so through regulation. Whether agriculture cannot only escape regulation, but also avoid the costs of pollution prevention, however, is problematic. In the absence of federal budget constraints, society could choose to provide farmers with a monetary incentive to avoid polluting. Indeed, cost-sharing programs have a long history in agriculture conservation policy. However, the scope of the effort needed to avert water quality problems, compounded by a shortage of federal funds, precludes extensive cost-sharing as a viable federal option. The bottom line is that farmers must recognize that there will indeed be costs to preventing water resource contamination and that it may well be their responsibility to accept those costs in moving quickly to meet society's demands for protection of environmental quality.

Notes of National Statistical Interest

Released: *The Quality of Our Nation's Water and National Water Quality Inventory: 1988 Report to Congress*

EPA's *National Water Quality Inventory: 1988 Report to Congress* (EPA 440-4-90-003, April 1990), the seventh successive biennial report to Congress on water quality, has recently been released and is now available. The report, based on data presented to EPA by the States, indicates that while many water quality problems have been reduced as a result of pollution control programs, serious problems remain. Nonpoint source pollution (e.g., runoff from agricultural lands and urban areas), diffuse point sources (e.g., stormwater and combined sewer overflows), toxic pollutants, ground-water contamination, and wetland losses are among the important remaining problems affecting the nation's waters.

EPA Administrator Reilly highlights the current status of State water pollution control efforts in his transmittal letter:

The message presented by the States in these reports is that many point source-related surface water-quality problems, such as bacteria and oxygen-demanding materials discharged by sewage treatment plants, appear to be diminishing as a result of pollution control programs. At the same time, the pollution problems that are most difficult to assess and control—e.g., sedimentation, nutrient enrichment, polluted runoff from farmlands, and toxic contamination of fish tissues and sediments—are becoming more evident...

...[U]nder the impetus provided by the Water Quality Act of 1987, the States have identified specific waters with impairments due to toxic contaminants and diffuse sources of pollution. EPA and the States are beginning to develop and implement control programs for these waters. In future editions of this report, EPA will be reporting on the progress achieved by these programs.

The report is based on water quality analysis provided by 55 States, Territories and jurisdictions on their rivers, lakes, estuaries, coastal waters, wetlands, and ground water. The 1988 report is derived from data collected in 1986 and 1987.

The Inventory Report has four parts:

- Introduction
- Surface Water Quality (Rivers and Streams, Lakes and Reservoirs, The Great Lakes, Estuaries and Coastal Waters, Wetlands, and Public Health/Aquatic Life Concerns)
- Ground Water Quality
- Water Pollution Control Programs (Point Source Controls, Nonpoint Source Controls, Surface Water Monitoring, Costs and Benefits of Pollution Control, and State Recommendations)

A summary report has also been prepared entitled *The Quality of Our Nation's Water: A Summary of the 1988 Water Quality Inventory* (EPA 440/4-90-005, May 1990). The summary report deals with the nation's water resources and the control of pollution, with particular attention given to the condition of each category of surface waters: streams, lakes, estuaries, wetlands, etc. The summary report is a fine, concise statement of the situation and the programs at work. It should be widely read.

[For more information and copies of either or both of the reports contact: Alice Mayo, Assessment and Watershed Protection Division, (WH-553), U.S. EPA, 401 M Street, SW, Washington, DC 20460.]

Nonpoint Source News-Notes is an occasionally published bulletin dealing with the management of nonpoint sources of water pollution. NPS pollution comes from many diffuse sources, generally caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and manmade pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and ground waters. NPS pollution is normally associated with agricultural, silvicultural, mining, and urban runoff. **NPS News-Notes**, Hal Wise, Editor, is published by the Nonpoint Source Information Exchange, (WH-553), Assessment and Watershed Protection Division, OWRS, Office of Water, U.S. Environmental Protection Agency, 401 M St. SW, Washington, DC 20460.

Multi-State Fish & Wildlife Information Systems Established to Assist States

The Multi-State Fish and Wildlife Information Systems Project (MSFWISP) has been established at Virginia Polytechnic Institute and State University (VPI) to provide technical assistance to States as they develop, implement, and maintain a computerized fish and wildlife information system (CFWIS). Located at VPI's Fisheries and Wildlife Department, the Project also coordinates efforts among State and Federal agencies, trains database managers, and conducts research and development concerning CFWIS.

The MSFWISP is currently funded by a grant from the U.S. Fish and Wildlife Service of the Department of the Interior (DOI), with additional support from the U.S. Army Corps of Engineers through the Virginia Sea Grant Program. Other cooperators at the present time include the Bureau of Land Management of DOI, the International Association of Fish and Wildlife Agencies, and Virginia's Department of Game and Inland Fisheries.

According to the Project Managers,

A CFWIS can benefit management planning, permit reviews, and impact assessments, as well as research and teaching. Better decisions about fish and wildlife resources result from using a CFWIS.

Rod Frederick, Acting Chief, EPA Water Quality Analysis Branch, has indicated that MSFWISP's master species file will be considered as a data reference in EPA's Office of Water data systems modernization initiative. "Currently about half of the States make use of or are considering the Multi-State Project for their fish and wildlife information management," he said.

Using the species as the basic unit, State fish and wildlife information systems contain descriptive and profile information regarding legal and economic status, including endangered species lists; distribution by season, county, watershed, and other units; species-habitat association; environmental association by activity and lifestage; life history; management practices; and other areas.

Frederick indicated that general uses of a CFWIS in State and Federal water program management can include the following:

- Habitat model development and establishment of biological criteria in support of State water quality standards
- Water quality assessments and environmental impact studies
- Permit reviews

[For more information contact: Dr. Charles Cushwa, Multi-State Fish and Wildlife Information Systems Project, VPI and State University, 102 Colony Park, 2001 South Main Street, Blacksburg, VA 24060. Phone: (703) 231-7348; or Rod Frederick, WQAB, Assessment and Watershed Protection Division (WH-553), U.S. EPA, 401 M Street, SW, Washington, DC 20460. Phone: (202) 382-7046.]

U.S. Farmers Increase Percentage of No-Till for Nine Crops in 1989

More than 71 million acres of the nation's cropland were farmed with conservation tillage methods in 1989, according to the national survey conducted by the Conservation Technology Information Center (CTIC) of West Lafayette, IN.

Conservation tillage is any tillage or planting system that maintains at least 30 percent of the soil surface covered by residue after planting to reduce soil erosion by water. Where soil erosion by wind is the primary concern, conservation tillage means maintaining at least 1,000 pounds per acre of flat, small grain residue equivalent on the surface during the critical erosion period. The conser-

U.S. Farmers
(Continued) vation tillage methods studied in the survey included no till, ridge till, and mulch till. Two tillage and planting systems that do not meet the above definitions for conservation tillage were also included in the survey.

Soil and water conservation districts throughout the country, along with the Soil Conservation Service (SCS), are promoting conservation tillage. It is being chosen by farmers in many conservation plans as a means to bring highly erodible land (HEL) into compliance with the provisions of the 1985 Food Security Act. Eighty percent of these conservation plans employ the use of some form of conservation tillage on HEL.

Dan McCain, SCS Field Specialist and Liaison to CTIC, who directed the survey, reported increases for nine of the 11 crop categories produced under no-till conditions. With the no-till method, the surface is not disturbed except for the seedbed, which is a narrow slot or band. For the second year, the amount of acres of full season, no-till soybeans increased markedly. The 1989 figure is 18.5 percent higher than 1988's and 36 percent higher than the 1987 figure.

Corn

Among the individual crops, more than 23 million acres—or 32 percent—of the full season corn was produced under conservation tillage methods. More than 16 million acres of corn was grown under mulch-till, where previous crop residue covers the soil. Nearly 1.8 million acres of corn was grown by the ridge-till method, in which seed is planted in seedbeds prepared on a ridge and residue is left on the surface between the ridges. More than 5 million acres was grown by the no-till method.

Soybeans

More than 29 percent (18.5 million acres) of the 1989 soybeans were produced through conservation tillage, including almost 27 percent of the full season soybeans and more than 55 percent of the double-cropped soybeans (soybeans planted following a small grain harvest). Nearly 42 percent of the double-cropped soybeans were planted no-till. McCain says that on the basis of total planted acres, no-till soybeans accounted for the greatest increase in 1989. The no-till soybean acreage in 1989 surpassed the 1988 acreage by slightly more than 1 million acres.

McCain cites moisture conservation and planting timeliness as the main reasons for the increased popularity of no-till soybeans.

Illinois Leads in Several Categories

The State of Illinois' farmers planted the most no-till acres, at 1.9 million. This State's farmers also planted the most mulch-till acres, at almost 6 million, and had the highest total of conservation tillage, at 8.2 million acres.

Meanwhile, ridge-till is most popular with Nebraska farmers, who planted 878,449 acres in their State.

Mulch-till is the most wide-spread conservation tillage practice, according to McCain, involving 54.9 million acres of the 1989 crops.

Contamination From Pesticides Minimal

Critics have expressed concern that conservation tillage requires greater use of pesticides than does conventional plowing. In addition, some fear that the increased water infiltration associated with conservation tillage increases the potential for pesticides and nitrates to move to ground water. However, researchers have found that the risk of water contamination from extensive adoption of conservation tillage is minimal. Actual use of pesticides by "conventional" moldboard plow farmers and by those practicing conservation tillage was found to be similar, especially after several years of farmers developing confidence with conservation tillage. In addition, conservation tillage's benefit of reducing the erosion of sediment and its attached contaminants far outweighed its potential negative impacts. Research results show that conservation tillage reduces soil loss by

U.S. Farmers (Continued) 60 to 99 percent, depending on such factors as percent of surface coverage, soil type, slope, and crop.

Runoff volume is usually reduced by conservation tillage systems. No-till systems reduce runoff volume less than other conservation tillage systems, and in a few cases no-till runoff volumes have been greater than from conventional tillage.

Conservation tillage has been promoted as a BMP for nonpoint pollution control, and farmers have adopted conservation tillage extensively because of its production benefits and potential for reducing water pollution from sediment and attached contaminants.

[For more information contact: Dan McCain, Field Specialist/SCS Liaison, CTIC, 1220 Potter Dr., Rm.

Office of Water Information Management Reports Released

The management and availability of water-program-related information is the subject of two new documents just released by EPA's Office of Water. These documents are intended to help water quality program managers quickly learn about data availability and information management activities within the Office of Water that might have useful applications as they implement their programs.

The first document, *Office of Water Information Resources Management Annual Report*, is a two-volume report that highlights information management activities completed in EPA's Water Program during Fiscal Years 1989-90. Volume I presents the report in brief. It provides a broad overview of information resources management (IRM) goals and highlights activities undertaken to support these goals.

Volume II, the full report, contains more detailed descriptions of projects summarized in Volume I, as well as other IRM initiatives. This volume is intended as an information/technology exchange tool for people working with water data.

The second document is the *Office of Water Environmental and Program Information Systems Compendium*. This document contains profiles for 19 key water program systems. The profiles consist of two sections, one narrative and one graphic, both of which describe the information in and management tools associated with the highlighted system. The document also contains an OW Environmental and Program Information Systems Inventory in which nearly 100 additional Office of Water (Headquarters) information systems are described. These short summaries focus on the purpose and key information available in these systems. Finally, a chapter describes 20 information systems that are frequently used by water program managers and maintained by organizations outside of the Office of Water. Such organizations include other EPA offices, other Federal agencies, and special interest groups.

[For more information and copies of either or both of these documents contact: Wendy Blake-Coleman, Office of Water (WH-556), U.S. EPA, 401 M Street, SW, Washington, DC 20460.]

Dam Inventory Database is Available

A new computerized tool aids users in relating water quality data to impoundments. The tool is the EPA Water Quality Analysis Branch (WQAB) Dam Inventory database and retrieval software. The database contains over 68,000 observations. Each observation contains 54 parameters that describe physical, operational, and regulatory aspects of the dam. The database also contains information related to the REACH* file. It is partly this capability that links the database to the water quality data found elsewhere in STORET** and related data files.

The Dam Inventory Database is now part of EPA data files, including water quality, water resources, chemical, and geographical databases located in WQAB.

*Damn Inventory
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Interactive software allows users to retrieve this information. The software provides capabilities for both graphical representations of data and generation of reports. A user can produce and incorporate high quality graphics into a study or report. On-line protocols use graphics to combine maps of the impoundment and the monitoring sites that surround the area. A nonpoint lake accumulation model could determine the sampling sites used in the calibration and verification process.

The interactively generated reports summarize the information associated with the dams. Placing reports on-screen allows quick access of information. The user can also direct the report to a file or a printer. In the near future, the user will be able to place information into a format transferable to a personal computer or generate larger volume reports in a batch mode. The download file will allow subsequent manipulation in a user's PC environment using database or spreadsheet software.

To aid the user community in applying the database and programs, user documentation has been written. It has become part of the WQAB library of such documentation.

*The REACH file is a hydrographic (locational) database of the surface waters of the continental United States. It provides hydrographic routing, identifying upstream and downstream elements, and provides a method to uniquely identify any particular point associated with surface waters.

**The STORET database contains data relating to the water quality of surface and ground water in America's waterways, including sediment, fish tissue, and waste water treatment facilities.

[For more information contact: Phillip Taylor or Cynthia Warner, WQAB (WH-553), Assessment and Watershed Protection Division, OWRS, U.S. EPA, 401 M Street, SW, Washington, DC 20460. Phone: 202) 382-7046.]

Notes From The Regions

Region X Initiates a Water Division Outreach Bulletin

EPA Region X's Water Division has begun the publication of Water Talk, a bulletin "to provide news and information from various environmental programs that deal with water related issues" of importance to agencies, organizations, and people within the States of Alaska, Idaho, Oregon, and Washington. Just as important, if not more so, is that Water Talk was initiated by the Water Division's Outreach Committee, which provides input and representation from each of the major water program activities within the Division: Drinking Water, Ground Water, Wetlands, Nonpoint Source, Wastewater (point source), and Education. Clean water in the Pacific Northwest is the over-arching mission of each of the programs represented on the Outreach Committee and the common goal of its publication.

Their publication advises: "We...want to encourage readers to copy articles from Water Talk for use in their own newsletters." We have taken this advice to heart. You will find in this issue three "news-notes" that we first read about in Water Talk. After a few phone calls to fill in some details, we are able to report to our readers concerning agricultural chemicals and pollution prevention; urban wetlands in Eugene, OR; and the SRF funding of corrections of failing septic systems in Jefferson County, WA.

Water Talk would also like to receive comments, advice, and suggestions from interested persons.

The editors of NPS News-Notes thank their counterparts at Clean Water a whole lot for the tips on some very good stories and send congratulations, best wishes, and a hearty welcome to the ranks of clean water communicators. It's good to hear from the new recruits. Enjoy.

Region X (Continued) [For more information and to send comments contact: Water Talk, U.S. EPA, WD-085, 1200 Sixth Avenue, Seattle, WA 98101; or phone: Bryan Yim, Chair, Water Division Outreach Committee, (206) 442-8575, or Laura Fox, Editor, (206) 442-8178.]

STREAMWALK—A Stream Monitoring Tool For Citizens

STREAMWALK is a stream monitoring tool developed by EPA Region X that focuses on conditions in the stream corridor rather than in the water column alone. It has been designed for use by volunteers for screening purposes. The tool's developers had in mind these objectives:

- Encouraging citizen commitment to protecting streams
- Educating people about the relationship between streams and watersheds
- Providing a standardized data collection method for regional and trend comparisons
- Developing a screening tool to identify potential problem areas to allow experts' limited resources to be focused on suspected problems

STREAMWALK was developed in response to requests by several groups for the creation of a standardized, easy-to-use screening tool for monitoring stream corridor health. A workgroup consisting of several citizens and public agency representatives was formed to develop both a monitoring checklist and a data management system. STREAMWALK is designed to be used by lay people who are interested in learning more about their streams and rivers.

The package prepared by Region X provides for the making and recording of observations regarding the nature and causes of potential problem conditions in segments of rivers and streams that are the subject of the surveyor's walk. Instructions tell the user to "note what you think might be of significant interest" using the provided checklist, Nature of Conditions categories, as a guide. Forms and checklists are provided, as are step-by-step instructions. User groups are to adapt the material to local conditions by using sections of appropriate USGS maps and other localized material.

Under Stream Characterization, the surveyor is to observe such items as stream width and depth, streamside modification, pools and riffles, stream gradient, and the condition of the stream bottom. Under Nature of Condition, citizens record streamside conditions including that of vegetation and stream banks; they also investigate in-stream conditions such as the presence of mud and silt, dredging, aquatic weeds, foam/oil/strange colors, junk in the stream, and so on.

It is anticipated that this monitoring data will help to focus public attention on potential areas of concern, and might help to direct further evaluation by experts. If good data is collected, the program will allow valuable comparisons and evaluations of trends for rivers and streams to be made over time.

Also included in the package are instructive examples of completed checklist forms and data summaries as well as results of a STREAMWALK project in the City of Ferndale, WA.

[For more information contact: STREAMWALK, U.S. EPA Region X, ES-097, 1200 6th Ave., Seattle, WA 98101; or phone: Gretchen Hayslip, (206) 442-1685.]

Region IV Reports on TVA Teacher/Student Water Quality Monitoring Operations

The Tennessee Valley Authority has a unique program that promotes environmental education among high school students and at the same time supports water-quality monitoring, reports Beverly Ethridge, EPA Region IV's NPS Coordinator. Beverly sent us the following information that we now pass on to our readers.

Region IV (Continued) The Teacher/Student Water Quality Monitoring Network was initiated in 1986 with two goals in mind. Says TVA environmental engineer Jan Strunk: "We wanted to get water-management concepts into the schools in a way that would be challenging and meaningful for students and teachers. And we wanted to build up a data base of water-quality information in the Tennessee Valley."

Here's how the program works:

- The network is made up of 24 teachers who are eligible to participate for up to three years. Eight new teachers are selected each year to maintain a balance of experience.
- Each teacher may bring two students to two-day workshops on water-quality basics each fall and to a four-day water-quality camp each spring.
- At this year's spring camp, morning classes covered safety, map-reading, basin characteristics, and water-quality variables. Afternoon field work allowed teachers and students to put theory into action as they donned chest-high waders and entered cold, clear creek waters to count fish, cull invertebrates ("bugs" to the uninitiated), and measure the health of the ecosystem.

"As a result of this program, we see teachers going back to the classroom charged up and excited about what they are teaching, and we see students who are much more knowledgeable about their environment and aware that they can have an impact on their environment," Strunk says. "At the same time, we are building up a body of information on the lakes and streams in the TVA watershed, adding more volunteer eyes and ears to help us collect and maintain data on pollution, dissolved-oxygen content, and other water-quality information across the service area."

From its beginning in February 1986, a total of 53 teachers and 176 students from 47 schools in six Valley States have attended one or more workshops. Each has conducted at least one field study. More than 6,000 students have received some instruction in water-resource concepts through these teachers' classes.

"We who are involved in this kind of work call ourselves 'water-quality managers'" Strunk says. "But in reality everyone is a water-quality manager."

And thanks to the monitoring network, a lot more people are taking that job very seriously.

[For more information contact: Jan Strunk, Environmental Engineer, TVA Water Quality Department, 2S273 Haney Building, 311 Broad Street, Chattanooga, TN 37402. Phone: (615) 751-8637. Story originally reported in Inside TVA, a biweekly publication for TVA employees, Jim Andrews, Editor. Quoted here by permission.]

Pollution Prevention Projects to Demonstrate Ag Chemical Management

The Nonpoint Source Program in Region X has been awarded special funding to address pollution prevention through agricultural chemical management. This funding will total \$200,000 in FY 91, pending an appropriations bill. An additional \$200,000 is anticipated for FY 92, pending actual appropriations at that time.

The Region has indicated that it aims to fund four to six pilot projects, varying in cost from \$15,000 to \$45,000, over the next two years. These will be diverse, high quality, innovative education projects "...which will leverage agency resources to prevent or reduce pollution to surface or ground water in agricultural or urban areas through education or demonstration of BMPs and/or Integrated Pest Management [IPM]," according to its Request for Proposals.

The Region wants to demonstrate that preventing pollution through agricultural chemical management "...can be achieved through multi-agency efforts of EPA, state environmental agencies and USDA/Cooperative Extension Service."

*Pollution Prevention
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The program lists seven objectives:

- Pool agency talent and resources to demonstrate the effectiveness of cooperative efforts in geographic priority areas
- Link EPA and State agricultural chemical management programs with USDA resources for water quality improvement
- Develop and demonstrate the effectiveness of BMPs in preventing agricultural chemical pollution
- Develop and demonstrate the effectiveness of alternatives to chemical pesticides
- Utilize the USDA-CES communication network (workshops, demonstrations, newsletters, etc.)
- Provide extension agents, specialists, and SCS conservationists with an array of BMPs and IPM techniques they can recommend to their clientele
- Encourage the adoption of new methods as standard practices to prevent pollution by agricultural chemicals

Twenty-three proposals were received by the August 31 filing deadline. Region X staff are currently digesting and reviewing the proposals in preparation for a formal meeting of the 11-person Interagency Technical Advisory Committee early in October. "The choices will be difficult as there are many excellent proposals worthy of funding," commented Sharon J. Collman, Cooperative Extension Liaison to EPA Region X, who administers the pollution prevention project.

[For more information contact: Sharon J. Collman, Cooperative Extension Liaison to EPA, Nonpoint Source Program, WD-139, 1200 Sixth Avenue, Seattle, WA 98101. Phone: (206) 442-2960.]

Notes From The States

Canadians Visit Maryland's Sediment and Stormwater Administration

Maryland's Sediment and Stormwater Administration (MSSA) recently played host to some 25 technical experts and municipal officials from Ontario, Canada, who were in town to learn firsthand about Maryland's sediment and stormwater nonpoint source management programs.

The visit was prompted by efforts to protect and restore Ontario's Credit River Watershed, which is undergoing severe development pressures resulting in reduced water quality.

Maryland was selected by the Canadians as a model program because it has in place some of the nation's most innovative and advanced urban nonpoint source pollution control programs. The Canadians were especially interested in learning more about infiltration trenches and extended detention basins, two methods used in Maryland to trap pollutants and improve the quality of stormwater before it flows into streams.

During their two-day visit, the Canadians examined stormwater retrofit projects at BWI Airport, inspected State Highway sediment control projects along I-97, and learned about local sediment and stormwater management control programs underway in Prince George's County.

[For more information contact: Dianne Kline, 319 NPS Coordinator, Sediment and Stormwater Administration, MD Department of the Environment, 1500 Broening Highway, Baltimore, MD 21224. Phone: (301) 631-3551.]

Texas Builds a NPS Outreach to Newsletters

The Texas Water Commission has hit on a vehicle which produces multiplier results.

The vehicle is a single-page, nonpoint source note appropriate for inserting into anyone's newsletter. These inserts, called "Uncle Sam Papers," are currently being mailed nationwide to 700 newsletters, organizations, industry house organs, individuals, and others, according to Bill McLean of the Texas Water Commission Pollution Abatement staff.

Their most recent insert, the third, is entitled "Dead Rainbows -- Oil on the Water" and speaks to the disposal of used crankcase oil. The others were titled "Who? Me? Pollute?" and "Water 101 -- Majority of Pollution Sources Go Unregulated," both of which address personal responsibility for NPS pollution control.

In a telephone interview McLean said the reception of the Uncle Sam Papers has been amazing. Many calls and requests for additional papers and information have been received. The idea of developing one-page blurbs on NPS issues and mailing them to monthly or quarterly newsletters was suggested by the education sub-committee of the Texas NPS advisory committee. Thus did Uncle Sam Papers evolve. Printed on paper containing a background picture of Uncle Sam (in blue) and the words "I Want You to Stop Water Pollution" (in red), the inserts are eye-catching, to say the least. The agency's public information office assisted in generating the mailing list, which continues to grow.

[For more information contact: Bill McLean, Texas Water Commission Pollution Abatement, P.O. Box 13087 Capitol Station, 1700 N. Congress Ave., Austin, Texas 78711-3087. Phone: (512) 463-8444.]

Jefferson County, WA: First in the Nation to Use State Revolving Loan Funds for NPS Management

Jefferson County Commissioners and the Water Quality Financial Assistance Program of Washington State's Department of Ecology have approved a unique NPS management financing program. The State, in a loan agreement, will provide \$200,000 in State funds to the county for it, in turn, to loan to county residents in a low interest rate loan program—the Jefferson County Water Quality Improvement Fund—which will finance major nonpoint source pollution control projects. The county expects to pay the loan back to the State in ten years at an interest rate of four percent.

The funds for the State loan are a part of the State's Revolving Loan Fund (SRF) established under the provisions of the Water Quality Act of 1987 and State law. EPA has provided a capitalization grant to the fund while the State has contributed a match equal to 20 percent of the Federal capitalization grant. SRFs have been established to replace EPA's construction grant program, loaning money for the construction of local sewage treatment works and other water quality projects requiring significant capital outlays. Approximately \$166,600 of the Jefferson County loan will be Federal money and the remaining \$33,400 will come from the State.

The Jefferson County Water Quality Improvement Fund is designed to encourage and assist residents to voluntarily identify and correct water quality problems on their properties with the technical and financial assistance of the county. It is also designed to coordinate and consolidate water quality assistance services currently offered by various county agencies, thereby minimizing county costs, avoiding duplication of services, and maximizing program effectiveness for county residents.

Malfunctioning septic systems and some agricultural practices have been identified as nonpoint sources of pollution in Puget Sound. The Water Quality Improvement Fund seeks to repair or upgrade existing septic systems under the direction of the Jefferson County Health Department and to design and implement farm plans and agricultural BMPs under the

Jefferson City
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direction of the Jefferson County Conservation District. The Jefferson County Planning Department will provide loan administration services including determining loan applicant eligibility. The Public Utility District #1 will continue to provide septic system inspection services at a minimum fee per inspection.

County Commissioners made it a central point of the program to prioritize low income households for the greatest amount of financial assistance. "We want this money to go where it will do the most good," said B.G. Brown, County Commissioner for Jefferson County. Interest rates for low-income households are zero for the first five years of pay-back and 4% annually thereafter. Higher income households are also eligible, however. Interest rates for these residents are 6% for the first five years of pay-back and annually thereafter.

According to Rosemary Walrod, Department of Ecology Financial Assistance Officer, the Jefferson County Water Quality Improvement Fund will be the first NPS pollution control loan program in the nation. "This project is a real people-to-people effort," Walrod said. "We're lending the money to Jefferson County so they can make individual loans to homeowners for upgrading their septic systems and to farmers for installing Best Management Practices."

[For more information on the Jefferson County Water Quality Improvement Fund contact: Teresa Barron, Jefferson County Planning and Building Department's Water Quality Program, County Courthouse, P.O. Box 1220, Port Townsend, WA 98368. Phone: (206) 385-9149. For more information on the State of Washington's SRF program contact: Rosemary Walrod, Water Quality Financial Assistance Program, Department of Ecology (Mail Stop PV-11), Olympia, WA 989504-8711. Phone: (206) 459-6264.]

Wisconsin Legislature Establishes a Nonpoint Pollution Committee

Recognizing that while Wisconsin has long been a leader in environmental management, "we have not done enough," commented State Senator Charles J. Chvala as he announced the formation of his Legislative Council Nonpoint Pollution Committee.

"We achieved a balanced committee with members offering a variety of perspectives on the nonpoint problem," Chvala said. "We have environmentalists and builders, lake district officials and realtors, farmers, and municipal officials." He added that "a balanced committee is important because it means that the legislation which results from our work will be seen as more credible and therefore will be more likely to pass."

Committee members include four State Senators and six Representatives. Eleven citizen members represent the following groups and organizations: City of Milwaukee, Wisconsin Counties Association, Wisconsin Association of Conservation Employees, Wisconsin Association of Lake Districts, Environmental Decade, Lake Michigan Federation, Wisconsin Farmers Union, Wisconsin Builders Association, Wisconsin Geological and Natural History Survey, Wisconsin Farm Bureau, and Wisconsin Realtors Association.

The Committee will be looking at urban and rural NPS issues as they affect ground and surface waters, Senator Chvala's office said. The Committee will also examine the effects of NPS runoff into the Great Lakes and the Mississippi River.

Of particular concern is the problem of construction site erosion. Model ordinances have been developed but previous legislative efforts to mandate their adoption have twice been vetoed by the current Governor.

Senator Chvala indicated that his Committee would accept an invitation from Mayor John Norquist to hold a public hearing in Milwaukee during September. "I believe the Mayor makes a convincing case that it is important for the Committee to hear directly from Milwaukee officials and citizens about the importance they place on clean water," Chvala said.

In his invitation letter to Chvala, Mayor Norquist noted that, "[t]he City of Milwaukee is geographically unique, located at the mouth of three river watersheds: the Milwaukee River,

Wisconsin
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the Menomonee River, and the Kinnickinnic River. Because of this 'downstream' location, we find it difficult to control our water quality destiny. Often activities far up the watersheds have devastating impacts on Milwaukee's estuary."

The Mayor in his letter asked the Committee "to examine the creation of a regional water quality authority in southeastern Wisconsin."

Chvala said he also hoped that by holding a hearing in Milwaukee his committee would learn more about the sources of urban NPS pollution as well as the effects of NPS pollution on the Great Lakes.

The committee is to develop legislation on NPS matters for the upcoming session of the State Legislature, which will meet in January 1991.

[For more information contact: State Senator Charles J. Chvala, State Capitol, South Wing, P.O. Box 7882, Madison, WI 53707-7882. Phone: (608) 266-9170.]

Composted Dead Chickens Smell "Sweet" in Missouri

"Composting dead chickens is very impressive, everything they say, clean and sweet smelling too," reports Julie Elfving, EPA Region VII Nonpoint Source Coordinator, after visiting a recently installed composter at Monett, Missouri. This fast-developing, five-county poultry region in southwest Missouri is launching a demonstration project (supported by Section 319 funds and five major poultry processors) that will dispose of dead birds by a composting process. Formerly, dead birds were buried, burned, or dumped, raising environmental concerns.

Demonstration Project

The region has a normal annual poultry death rate estimated at two million birds. The composter, designed by University of Maryland researchers, will transform these birds into a high grade fertilizer. The demonstration project will consist of building and operating a dead bird composter on one poultry producer farm in each of the five counties, according to Betty Gagnon, Missouri's Nonpoint Source Coordinator at the Department of Natural Resources, Jefferson City. The project will also include the preparation of guidance instructions and videos for the construction and management of composters. Poultry producers can use these materials to conduct planning and building. Ms. Gagnon says the demonstration project is also being assisted by USDA's Soil Conservation Service and Cooperative Extension Service. One of the Monett area poultry producers noted that, while the composting is not currently widespread, it works well where it has been tried.

According to Gagnon and based on the 1987 poultry population, 33 million broilers and 10 million turkeys are produced annually and 4 million layers are maintained in the five-county area.

Composter an ASCS Cost-Share Practice

Another example of enthusiasm for the dead bird composter, says Ms. Gagnon, is that the Missouri State Committee of the Agricultural Stabilization and Conservation Service has approved the composter for Agricultural Conservation Payment (ACP) cost-sharing.

The poultry producers' objective is to annually compost the estimated two million dead birds from the area, furnish a high grade fertilizer, reduce the spread of poultry diseases, and reduce pollution contamination.

Broad Acceptance of Dead Bird Composter

The dead bird composter is receiving broad acceptance by the poultry industry to alleviate pollution, according to Dr. Dennis Murphy, Poultry Professor, University of Maryland. Dr. Murphy was instrumental in writing the basic design criteria for the composter. He indicated

Missouri
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that some 40 such composters are in operation in Maryland. Additionally, poultry producers in several States are trying the composters. He recommends that people investigate the necessity of obtaining permits from their State Veterinarian before building and operating a composter.

(Editor's Note: News-Notes earlier reported on the poultry industry's NPS pollution management efforts in EPA Regions III, IV, and VI [Issue #1, October 1989]. We are happy to update the industry's activities here.)

[For more information contact: Julie Elfoing, NPS Coordinator, Water Management Division, EPA Region VII, 726 Minnesota Ave., Kansas City, KS 66101. Phone: (913) 551-7475; or Betty Gagnon, NPS Coordinator, P.O. Box 176, Jefferson City, MO 65102. Phone: (314) 751-7144; or Dr. Dennis Murphy, Associate Professor, University of Maryland Department of Poultry, LESREC, Rt. # 2, Box 229A, Princess Anne, MD 21853. Phone: (301) 651-9111.]

Ohio Emphasizes Manure Nutrient Management

The Ohio Department of Natural Resources (ODNR) Division of Soil and Water Conservation (DSWC) has placed nutrient management among its Nonpoint Source Management Program's highest priorities. ODNR is emphasizing phosphorus reduction in 1990 through the implementation of better livestock waste management, particularly in counties having high livestock concentrations, reported Jerry Wager, Administrator of DSWC's Pollution Abatement/Land Treatment Section.

During 1987, the Division convened the Ohio Agricultural Pollution Abatement Advisory Board, whose deliberations resulted in several recommendations and changes in program emphasis. These included:

1. Requiring Conservation District approval of waste management plans for livestock facilities prior to their construction
2. Upgrading existing penalties for animal waste pollution from minor to first-degree misdemeanors
3. Authorizing the Chief of the Division to issue orders correcting agricultural sediment pollution problems comparable to the existing livestock waste pollution control authority
4. Broadening the authority for cost-sharing for pollution abatement
5. Requiring cost-share recipients to maintain facilities and to carry out waste management plans
6. Adopting a uniform policy for the application of manure to farmland
7. Increasing education and technical assistance efforts directed at livestock farmers

General Assembly Appropriates Funds

In part as a response to the recommendations of the Advisory Board, the Ohio General Assembly provided \$250,000 per year for each of FY 1990 and 1991 to implement the State Manure Nutrient Management Program (MNM) in counties with high livestock concentrations. According to Wager, 13 grants were made to conservation districts covering 15 counties to employ full-time technicians to assist livestock producers with manure management and land application. These State grants are limited to \$25,000 per county in the first year, declining to \$12,500 by the sixth year. Over the six-year grant period, counties' matching portions increase from 25 to 50 percent.

As a result of the program, soil and water conservation districts have implemented an intensive manure management educational program with farmers, including additional soil and manure testing, determining realistic yield goals and crop nutrient needs, and improving

Ohio
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calibration and environmentally safe use of manure application equipment. These efforts aim to increase farmer awareness of manure's value as a nutrient source and its detriment as a water pollutant, and to implement a land application regime which maximizes both. Wager said, "this has been a highly effective program."

Promoting Uses of Compost

Wager reports that the MNM program has already proven successful in many Ohio counties, based on the number of farm plans implemented and on fertilizer cost savings. But several counties produce so much manure that available cropland is insufficient for environmentally safe application. Therefore, the Division is looking to expand the outlets for manure.

In collaboration with other agencies and companies with concerns similar to those of the manure nutrient program, DSWC is also promoting the use of composted manure in the non-farm sector. During the 1990 State Fair packages of composted manure were given away from an educational booth at the ODNR exhibit.

A major demonstration directed at the farm audience was part of the Farm Science Review held in September by Ohio State University. The demonstration stressed opportunities for making money from composted manure. Wager reports that more than two million people visited the ODNR exhibit at the State Fair, while the Farm Science Review attracted more than 125,000 farmers and more than 500 agri-industry exhibitors.

Ohio Adopts Phosphorus Based Standard

Wager says that Ohio DNR, conservation districts, and the Soil Conservation Service in Ohio have adopted a phosphorus-based standard for land application of livestock waste. On many of the concentrated livestock farms, phosphorus levels are high to very high, exceeding crop requirements by many times. These high-phosphorus-level soils contribute to the eutrophication of streams and lakes through soil erosion and surface water runoff. For example, if the present build-up rate continues, by the year 2000 croplands of the central and northern Lake Erie basins will average approximately 120 pounds of phosphorus per acre. This level is double the 60 pounds per acre commonly required for plant growth, according to Wager. Also, heavy applications of livestock waste contribute to imbalanced nutrient levels in fields, reducing crop yields and impairing livestock health.

More than 95 percent of Ohio's ponds and lakes are eutrophic or hypereutrophic due to excessive nitrate and phosphorus loadings. Many of these water bodies experience severe oxygen depletion, which in turn leads to a relatively sterile environment. Eventually, taste and odor problems, lack of aesthetic beauty, and decline in recreational potential affects all users of these waters. The Ohio MNM program will be a factor in turning this situation around and charting a course for water quality improvement.

State and Local Funds Match Section 319 Grant

State and local funds supporting the MNM program are used to match the State's Section 319 Grant from EPA. \$80,000 of the Section 319 Grant pays for training MNM staff and the general livestock manure management educational program, Wager says.

[For more information contact: Jerry Wager, Administrator of Pollution Abatement/Land Treatment Section, Division of Soil & Water Conservation, ODNR, E-2 Fountain Square, Columbus, OH 43224. Phone: (614) 265-6619.]

Notes on Wetlands

Eugene, OR, Developing an Urban Wetlands Management Area

A draft wetlands plan is scheduled for public release during the fall of 1990 by the City of Eugene, OR, with local adoption planned in 1991.

*Eugene, OR
(Continued)*

These simple words report what is going on now, at the end of the summer of 1990. They do not tell the more complex story of how Eugene got to where it is today. This story involves the development of community sensitivity concerning the environmental effects of a broad range of past and current land use and management decisions and the need for a vastly improved way to make informed environmental decisions in the future.

The Setting and Flood Control

Located at the southern end of the broad Willamette Valley, the Eugene-Springfield urban area lies between the Coast and Cascade mountain ranges. It has an estimated 1990 population of 190,000, making it the second largest urban concentration in the State. Eugene's population exceeds 112,000.

While most of the metropolitan area drains directly into the Willamette and McKenzie Rivers, west Eugene drainage flows westerly via Amazon Creek into Fern Ridge Reservoir, which drains into the Long Tom River, then northward to the Willamette River.

Historically, flooding has been frequent. The Amazon was dredged and channelized in the 1950s and '60s as part of U.S. Soil Conservation Service (SCS) and U.S. Army Corps of Engineers (COE) efforts to control flooding and stormwater drainage and to promote farming to the north and west of Eugene. A series of dams was constructed by COE in the upper Willamette drainage basin. There are eight major dams on the upper Willamette and McKenzie Rivers in Lane County that alter flows within the Eugene-Springfield region. While three to six feet of water typically covered west Eugene during winter floods, the broad floodplain has been dramatically reduced by the dams and the Amazon channelization. Today, there is a fairly narrow floodway fringe associated with the Amazon, and minor flooding occurs about once every ten years during heavy storm events.

Accompanying the construction of flood control and drainage works was the clearing and conversion to agriculture and urbanization. As a result, the area lost numerous wetlands. The once vast extent of prairie grasslands and wet ash forests was significantly reduced by the 1980s.

1973 Statewide Land Use Planning Act

In 1973, Oregon, prompted by concerns over urban sprawl and loss of agricultural resources, adopted a Statewide land use planning act to control urbanization through careful management. The act directed each city to develop a defined urban growth boundary (UGB) within which urban development is to be concentrated. The local plans were also required to inventory wetlands and to develop programs to protect important natural resources.

However, wetlands law and its definitions were not well understood in the late 1970s when these inventories were undertaken. Wetlands and riparian definitions were combined, so many wetlands were not properly identified. Those that were tended to be commonly identifiable wetlands, such as marshes, willow thickets, and ash forests. A few small wet meadows were also mapped.

Two west Eugene sites were protected in the land use plan: 1) Bertelsen Slough, a 35-acre marsh with a forested edge, and 2) Willow Creek, a 100-acre ash forest wetland with one of the finest prairie grassland plant communities remaining in the Willamette Valley. Indeed, rare plants were discovered at Willow Creek. The Nature Conservancy now administers that site as a natural area through lease arrangements and recent land purchases.

Fill Permit Controversy Leads to a Modern Day Wetlands Discovery

A 1985 application for a permit to fill a pond adjacent to the Willamette River near a local shopping center stirred controversy among local environmental groups. The permit was never issued, but the controversy and the known problems with the 1977-78 inventory prompted the Cities of Eugene and Springfield to jointly fund a new natural resource inventory through a contract with a consulting biologist.

*Eugene, OR
(Continued)*

U.S. Fish and Wildlife Service National Wetland Inventory draft maps (available in 1982), the 1977-78 vegetative inventory, 1986 aerial photography, and improved methods were all used as the foundation for the biologist's inventory. A 765-acre concentration of wetlands was discovered in the west Eugene region using on-site or off-site vegetation identification to outline wetlands (wetland definition was based on the prevalence of wetland plant species).

The inventory methodology included an evaluation of wildlife habitat values for wetlands, riparian areas, waterways, and selected upland resource areas. For the first time, the region had an inventory which provided comparative quantification of relative resource values on a broad scale.

New Permit Issues Surface

One of the first wetland issues to surface in west Eugene was a plan by an existing electronics firm to expand into its third phase of development on twelve undeveloped acres. The west Eugene inventory indicated that the firm was completely surrounded by wetlands. By applying U.S. EPA Region X wetland mitigation guidelines, the firm redesigned its site plan and reduced the wetland impacts to 5.5 acres. When it applied for a fill permit, EPA required the firm to also mitigate for unauthorized fill which had unknowingly been placed on wetlands in 1979 and 1985 during the first two phases of development. The firm quickly complied and is currently constructing wetlands on 27.5 acres downstream along the Amazon Channel, at a total cost of more than \$600,000.

The discovery of wetlands and the issues faced by an existing company caused the Eugene City Council to reflect on its role and the impact of wetlands on the community. After considering two approaches—1) do nothing and let individuals go through the permitting process, or 2) develop a comprehensive approach to solving the wetlands dilemma to provide community benefit and assist development—the Council decided to develop a comprehensive wetlands plan for west Eugene.

The Plan Preparation

The City of Eugene funded initial wetlands studies through an intergovernmental contract with the Lane Council of Governments (L-COG). In 1988 a \$50,000 grant was made available through EPA Region X to fund a more detailed delineation of west Eugene wetlands, including an assessment of functions and values. Beginning in late 1988, the City budgeted for three consecutive years to fund L-COG support for the wetland planning efforts. In 1989, the Eugene City Council lobbied Congress for additional wetland, water quality planning, and study funds. Approximately \$250,000 was appropriated to EPA to provide additional assistance to the west Eugene study and wetlands plan.

The Wetlands Plan in the Urban Eugene Setting

The wetlands plan development has involved extensive citizen and public agency participation through newsletters, field trips, letters, news releases, educational handouts, and a series of workshops. Brochures on the planning process and on the functions and values of wetlands, and a self-guided tour of the west Eugene wetlands were prepared to inform citizens. A mailing list of interested groups and citizens was also developed, now totalling over 600 names.

Based on local needs, Oregon wetlands and land use planning law, and Federal direction for advanced identification and special area studies, the about-to-be-published West Eugene Study contains the following features:

- Introduction, purposes, study area, and citizen involvement
- Executive summary
- Wetlands definitions and description of types, functions, and values
- Historical perspective and background: wetlands, development history, and public infrastructure development

Eugene, OR
(Continued)

- Legal framework: Federal, State, and local law and regulations and permitting processes
- Issues analysis: mitigation, using EPA mitigation guidelines; multiple use objectives such as wetlands protection, wildlife habitat, water quality management, flood control, open space, recreation; monitoring, operating, and maintaining (who, what, when, and how); buffering techniques; land use protection measures
- Financing: costs and revenue for land acquisition, construction and mitigation, and on-going operations and maintenance
- Goals, objectives, and recommended policies: under Oregon law, a refinement to the local comprehensive plan has policies which have the effect of local land use law—eventually, the wetlands plan may lead to a regional permit
- Buildable land inventory analysis

In the preliminary staff proposal, some 1,160 acres of wetlands were identified in the West Eugene Study Area for protection and restoration, and 370 were identified for development.

The preliminary staff proposal also contains a vision concept statement, accompanied by a diagram, which shows what the completed system of wetlands would look like in twenty years upon successful completion of the project.

The plan will recommend methods for protecting important wetlands and for acquiring them or allowing some to remain in private ownership. Mitigation will emphasize enhancement of remaining wetlands and restoration of disturbed wetlands along with stream restoration. A multiple purpose plan will feature wetlands protection, water quality improvements, flood control, wildlife habitat enhancement, and recreation (trails, wildlife observation, fishing, canoeing, and nature study). The plan will contain role recommendations for Federal, State, local government, general public, non-profit group, and private funding for acquisition, construction, and on-going operations. A major thrust of the plan is water quality improvement to address anticipated EPA regulations for municipal storm water systems and nonpoint source management guidance.

In the interim, the City of Eugene's permit center staff has received wetland training. When an applicant for a building permit comes to the permit center, planners check the wetland and habitat inventory maps. They also check the SCS soils map for hydric soils (saturated soils conducive to the growth of wetlands plant species.) If any of these inventories indicate a wetland or potential wetland, the applicant is referred to the State and Federal agencies for a wetland determination. Only with a written response that no wetland exists or with proper wetland permits will a local building permit be issued.

Conclusions

A case study on the West Eugene Comprehensive Wetland Plan, prepared by the Lane Council of Governments in September 1990, had this to say on the experience:

...the question [has been] posed: "How can a community that cares about the environment and about carefully planned growth deal with the issues raised by the wetland discovery?" The West Eugene Wetlands Special Area Study (WEWSAS) serves as a model for answering that question.

Despite problems encountered over the past three years, the WEWSAS has been beneficial to the community. Awareness of wetlands issues and laws has increased. The community is seeking a positive solution to an environmental-development conflict. The solutions will provide a community compromise that will offer public and private benefits. Local governments developed positive working relationships with State and Federal representatives. The goal of finding a balanced solution which will serve as a model for other communities is achievable.

[For more information contact: Steve Gordon, Senior Program Manager, or Tim Bingham, Associate Planner, Lane Council of Governments, 125 E. 8th Ave., Eugene, OR 97401. Phone: (503) 687-4283.]

Notes on TMDLs for Nonpoint Sources

Editor's Note: Following are three articles dealing with total maximum daily loads (TMDLs). The second one, entitled Taking the Fear Out of TMDLs, was prepared by Tom Wilson, Chief of EPA Region X's Office of Water Planning in Seattle, WA. His article reflects that Region's experience in developing load reductions for nonpoint sources under Section 303(d) of the Clean Water Act (CWA). We share his viewpoint with our readers in the interest of a continuing dialogue concerning the management of nonpoint sources of water pollution.

To put Wilson's comments somewhat in context, our first article briefly reviews the processes provided by the CWA for the attainment and maintenance of clean water. This article will also define a TMDL. Finally, the third article reviews four different approaches being taken throughout the country to establish pollutant loading limits for nonpoint sources. We invite comments from others on their viewpoints and experiences.

A General Introduction to Water Quality Standards, TMDLs, and the Path to Clean Water

State Water Quality Standards

The stated statutory goal of the Clean Water Act, in place since enactment of the 1972 Water Pollution Control Act Amendments, "...is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

To achieve this goal, the Act requires States to adopt *water quality standards* (WQS). These standards must 1) designate the appropriate, beneficial uses of each of the State's waters and 2) establish criteria (e.g., measures of water quality) sufficient to protect those designated uses. The standards must also include an antidegradation policy protecting existing high-quality waters.

Potentially appropriate uses include public water supplies; protection and propagation of fish, shellfish and wildlife; recreation in and on the water; and agricultural, industrial and other purposes including navigation. In no case are States to adopt "waste transport" or "waste assimilation" as a designated use for any of their waters. Further, the designated uses of a water body and the appropriate criteria to protect those uses must take into account the attainment and maintenance of water quality standards of downstream waters. (See EPA WQS regulation, 40 CFR 131, November 8, 1983).

As indicated, States are also required to adopt a Statewide antidegradation policy and implementing procedures, which ensure that existing uses—and the level of water quality necessary to protect those existing uses—are fully maintained.

States must review their standards every three years and modify them if appropriate. EPA must approve any new or revised State standard. Lacking State action, EPA must promulgate a Federal standard to correct any deficiency.

Simply set forth, State water quality standards define the State's desired uses of its waters and the criteria necessary to protect those uses. These standards provide the legal basis for control decisions under the CWA and appropriate State law.

Technology-Based and Water-Quality-Based Controls

The CWA establishes a two-step approach for achieving these standards. The first step defines a level of pollution control technology (*technology-based* approach) for various classes of dischargers. The second step specifies additional actions to be taken in those cases where that treatment technology is inadequate to achieve the standards.

General Introduction
(Continued)

In the technology-based step, EPA establishes specific technology-based levels of effluent treatment for specific categories of point source dischargers, e.g., smelters, pulp mills, municipal sewage plants, etc. These specified levels of treatment are thus the same throughout the country, regardless of which particular water body is receiving the discharge.

Where technology-based limits or controls are not sufficient to achieve the designated water quality standards, additional action is needed and the water body is classified as *water-quality-limited*. States are required by Section 303(d) of the CWA to establish a priority ranking for such waters and, in accordance with the priority ranking, implement additional measures sufficient to achieve those standards.

For this "water-quality-based" step, the State must first determine the amount of pollutants the water body can safely assimilate while still meeting the desired standards. This amount is known as the *total maximum daily load* (TMDL) of pollutants for that water body. The State must also allocate that permissible load among the various pollutant sources—both point (*waste load allocations* or WLAs) and nonpoint (*load allocations* or LAs). The State is also required to add a margin of safety to compensate for any lack of knowledge. (See the Water Quality Planning and Management Regulation, 40 CFR 130, January 11, 1985.)

Once EPA approves the TMDL, dischargers implement their controls. The National Pollutant Discharge Elimination System (NPDES) permitting process is used to enforce controls for point sources under Federal law, and State or local authorities may enforce controls for nonpoint sources if State law provides such enforcement authority.

Section 319 and Water Quality Standards

Nonpoint source control programs, along with the various point source control programs, are thus simply tools for achieving the State water quality standards. Section 319(a)(1)(A) requires that each State's NPS Assessment Report:

...identifies those...waters within the State which, without additional action to control nonpoint sources of pollution, cannot reasonably be expected to attain or maintain applicable water quality standards or the goals and requirements of this Act...

These waters would in most cases be desired by States as water-quality-limited as required under CFR130.7(b)(1) and 130.2(1). As such the previously discussed requirements for TMDLs would apply.

In the months ahead, States and EPA will be developing the techniques and processes to implement the language of the Act, the "additional action[s] to control nonpoint sources."

Taking the Fear Out of TMDLs

Tom Wilson, Chief, Office of Water Planning, EPA Region X

Total maximum daily loads (TMDLs) are probably one of the most misunderstood, and for many people, one of the most frightening requirements in the Clean Water Act (CWA, or the Act). For others, they are one of the most powerful, but also one of the most under-utilized, tools in the Act. Mention their applicability to NPS pollution and the debate really heats up.

In actuality, the most effective NPS managers have been informally doing TMDLs for years. They just haven't realized it. Even EPA's national NPS guidance pushes TMDLs without acknowledging it. "Targeting," "geographic focus," "environmental results," etc.—these favorite NPS buzz words are just another way of emphasizing the problem-solving focus of TMDLs.

Clean Water Act Requirements for TMDLs

This problem-solving focus for TMDLs arises from Section 303(d) of the Act. It's actually a very simple and surprisingly logical problem-solving process.

For those waters where the application of technology is not sufficient to meet water quality standards in accord with a State's priorities for its identified degraded waters, the State shall establish TMDLs by

- Determining how much pollution reduction is needed to obtain standards
- Allocating that permissible pollution load among the various sources

EPA's role in this process is twofold:

- Reviewing and approving State-developed TMDLs to ensure they are adequately protective
- Developing TMDLs itself if the State fails to do so

Two important legal points must also be kept in mind regarding the above requirements. First, under EPA's Water Quality Management Regulations, EPA-approved TMDLs automatically become part of a State's Water Quality Management Plan. The significance of this fact is explored later on in this article.

Second, by statute, EPA is given only 30 days to identify and establish any TMDL needed because of State inaction. This short deadline, along with the margin of safety requirement discussed below, almost guarantees that any EPA-developed TMDL would be more stringent than a State-developed one.

But what happens if the State (or EPA) doesn't have enough data to establish a scientifically precise TMDL? That brings up one of the most fascinating aspects of the Act's TMDL requirements:

Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. [CWA Section 303(d)(10)(C)]

In other words, Congress says ignorance is no excuse for inaction. Just add a margin of safety to compensate for the lack of knowledge and keep moving. No other program has such a strong statutory endorsement for action in the face of an incomplete database. This "margin of safety" requirement can encourage the regulated community to support the acquisition of additional data if they feel that the resulting limits are overly stringent.

How do TMDLs Apply to NPS?

Clearly, the TMDL process has important consequences for both point and nonpoint sources of pollution. This process, however, has traditionally been applied to waters with significant point source dischargers. NPS contributors have typically been considered as part of the uncontrollable "background." Thus, waters where NPS pollution makes up a major part of the pollution loading have been ignored. The excuse frequently heard is "we don't have any regulatory controls over NPS, so what good would a TMDL do for us anyway?"

[Editor's note: This attitude is open to a good deal of dispute, as will be pointed out later in this article and in the third article.]

The utility of TMDLs for NPS does vary dramatically, both by the nature of the sources and by the ownership of such sources. However, even in the worst case, its utility is much higher than commonly recognized. For example, even when there is no direct control of the sources, a TMDL still forces managers to define both the actual amount of pollution reduction needed

and the actions necessary to achieve that reduction. That procedure alone can ensure more effective NPS programs.

In many other cases, there may actually be many more control options available than are first apparent. This is especially true whenever any governmental entity must "approve" a potential pollution-generating activity, e.g., logging, construction permits, etc. This is because such actions are, in most cases, required to be consistent with the State's Water Quality Management Plan. (Remember that TMDLs automatically become part of the State's plan upon approval by EPA).

Suppose, for instance, that a developer proposes to build a shopping center whose runoff would significantly increase the nutrient loading to a nearby lake or stream. If the State had established a nutrient TMDL for that water body, the county or local agency issuing the building permit could be required by the State to ensure that their action would not cause a violation of that TMDL. If the local authority did not properly honor the TMDL, the State, or potentially even a private citizen, could sue under state and local law to block the permit based in part upon a failure to achieve the State TMDL.

The case can be made much stronger where it involves a Federal agency (e.g., USFS, BLM, etc.) that has been designated by the State as the water quality management agency for the Federal lands it manages. Such agencies now routinely verify that the actions they are approving will not cause violations of the State's water quality standards. Hence they would also need to ensure that their actions complied with any TMDL established by the State to protect those standards. In fact, it can be argued that a TMDL would have to be established (at least on water-quality-limited waters) before such agencies could even determine their standards compliance.

Such TMDLs should, in theory at least, be fairly easy to establish. The data that Federal agencies need to determine their compliance with State standards are also basically the same data that the State would need to calculate a TMDL for the water body in question. Since Federal agencies already routinely certify their standards compliance, they should also be able to assist the State in calculating the appropriate TMDL limits. (Perhaps the most efficient process would be to have such agencies work with the States to develop needed TMDLs as part of their EA/EISs on proposed actions.)

The situation can become most interesting when there is a mix of point and nonpoint sources of pollution. The State of Oregon, for example, established a stringent nutrient TMDL for the Tualatin River as a result of a citizen lawsuit. The pollutant load limits could most efficiently be met by a combination of point and nonpoint controls. However, the State, unable to regulate NPS pollution directly, was left with only the very expensive option of requiring the county to remove its sewage plant outfalls from the river.

The local sewage agency, when faced with these costs, chose instead to develop a more cost-effective program built on a mix of point and nonpoint source controls. In fact, they hired the State's NPS coordinator to design and implement what has the potential to be a very successful NPS program.

TMDL Activities in the Pacific Northwest

Environmental groups in the Northwest have been aggressively demanding TMDLs for problem waters. In Oregon, the Northwest Environmental Defense Center sued EPA for its failure to force the State to develop TMDLs. EPA subsequently signed a consent decree establishing a schedule for State development of TMDLs on all major problem waters, including those impacted by NPS. EPA agreed to develop TMDLs if the State failed to meet that schedule.

In Idaho, the Sierra Club notified EPA of its intention to sue the Agency for its failure to prepare a TMDL to control sediment from logging of USFS land in the Salmon River basin. The

*Taking the Fear Out
(Continued)*

Sierra Club withdrew its suit when the USFS substantially revised its planned logging and the State legislature adopted extensive changes to the State's forest practices act, including procedures for implementing the State's antidegradation policy.

In Alaska, the Trustees of Alaska are currently suing EPA specifically for its failure to require TMDLs on streams impaired by NPS activities such as logging, urban runoff, and so on.

In addition to these nonpoint-source-related activities, EPA Region X also recently developed a draft TMDL for dioxin in the Columbia River basin. This TMDL, which primarily focuses on reducing pulp mill discharges, will be the nation's first EPA-developed TMDL. The States requested EPA assistance to ensure consistency and equity throughout the region.

Summary

TMDLs can be very effective tools in controlling NPS problems. At a minimum, they force us, as NPS program managers, to clearly identify our problem waters, to determine our pollution reduction targets, and to define the actions we need to achieve those desired reductions. At a maximum, TMDLs can actually provide us with the legal muscle we need to achieve those pollution reduction goals. In this imperfect world, who could ask for anything more?

Targeting the Reduction of Pollutant Loads: Some Examples

Editor's Note: We briefly report here on four recent examples where pollution reduction goals have been or are being set. These examples are, in fact, utilizing the TMDL process as reported in the above two articles, although the provisions of CWA Section 303(d) may not have been formally applied. In any event, it should be noted that in each case the application of appropriate provisions of State law was or is necessary to enforce (or apply) the required pollutant load reductions. Some would argue that had Section 303(d) been fully utilized, a stronger legal basis for the specified pollutant controls would have been made available.

North Carolina's Tar-Pamlico River Basin

This case was reported in greater detail in *News-Notes* #7 (August 1990). After fully documenting the current results of pollution loadings (sediment and nutrient loads, algal blooms, low dissolved oxygen, and fish diseases), North Carolina's Environmental Management Commission has, under existing State law, designated the basin as "Nutrient Sensitive." This designation requires the development of a nutrient management process involving

- Identification of nutrient sources
- Establishment of nutrient reduction goals
- Development and implementation of a nutrient reduction strategy

The nutrient reduction strategy includes evaluation of existing sewage treatment plants to determine if operational or minor capital improvements can meet nutrient limits. If not, operators of sewage treatment plants (members of the Basin Association—see below) can engage in nutrient trading with farmers to achieve limits by application of BMPs to agricultural operations.

Further, the Tar-Pamlico Basin Association is required to provide approximately \$400,000 to develop a nutrient model for the basin. This model will be used to establish and verify final nutrient target levels. (Interim limits have been established for guidance purposes, while the process, including trading, is getting underway.)

In this example, the State is dealing with an entire drainage basin and is establishing nutrient reduction goals for the basin. It is leaving the selection of point and nonpoint options for

Some Examples
(Continued)

meeting those goals to the waste treatment plant operators. The trading option, using NPS controls, offers a less costly alternative for the operators.

[For more information contact: David Harding or Beth McGee, Division of Environmental Management, P.O. Box 27687, Raleigh, NC 27611-7687. Phone: (919) 733-5083.]

Chesapeake Bay

As reported in *News-Notes* #5 (June 1990), the Governors of Maryland, Virginia, and Pennsylvania; the Mayor of the District of Columbia; and the Administrator of EPA have, in signing the Chesapeake Bay Agreement, agreed "to achieve the goal of attaining water quality conditions necessary to support living resources of the Bay." They have further agreed

by July 1988 to develop, adopt, and begin implementation of a basin-wide strategy to equitably achieve by the year 2000 at least a 40-percent reduction of nitrogen and phosphorus entering the main stem of the Chesapeake Bay.

Here again, the Chesapeake Bay Program and the Army Corps of Engineers are sponsoring a "second generation" Bay model. Its completion is scheduled for 1991. At that time, 1) the 40-percent load reduction goal will be re-evaluated in light of new monitoring and modeling results, and 2) the ability of the mix of State programs in place (or to be put in place) to achieve that goal by the year 2000 will be re-evaluated.

The amount of required reduction loads has been calculated for each State and the District of Columbia, and steps have been outlined and agreed to that will refine and accomplish the nutrient strategy.

Here each of the States (and the District) will use their laws and legal apparatus to achieve the nutrient goals. Significantly, however, this recently adopted part of the Chesapeake Bay Agreement establishes for the first time a numerical, measurable water quality target—a fairly simple, easy-to-understand goal.

[For more information contact: Alliance for the Chesapeake Bay, 6600 York Road, Baltimore, MD 21212. Phone: (301) 377-6270.]

Maine's Phosphorus Loading Controls

On May 2, 1988, the legislature of the State of Maine enacted P.L. 842, An Act to Protect Lake Water From Phosphorus Pollution. This law addresses the issue of phosphorus as a major cause of lake eutrophication and degradation.

It directs the State Department of Environmental Protection (DEP) to develop a technical assistance program, in conjunction with the State's regional planning agencies, that will assist municipalities and land users in protecting lake water from phosphorus pollution as new development takes place. DEP has implemented this program by using the local development review process to identify and control new permanent sources of phosphorus.

In carrying out the Act, DEP has also developed a method for estimating the amount of additional phosphorus loading a lake can reasonably accept. This amount is then allocated over a watershed that is likely to be subjected to development pressure. This allocation can be applied by municipal and State governments to development proposals within the lake watershed.

Developers are responsible for 1) applying the allocation to their development proposals, 2) calculating permitted phosphorus export from the development, and 3) designing on-site runoff and other phosphorus controls to meet area allocations.

As the State's technical guide on "Phosphorus Control in Lake Watersheds" states,

...evaluation of proposed development plans...should be prepared by the developer for submission to the [local] Planning Board. There are two advantages to this: 1) it frees the Planning Board from

Some Examples
(Continued)

the time-consuming detailed review of design plans; and 2) it allows the applicant to design and modify site plans in response to the results of the calculations required by the methodology....The Planning Board can obtain assistance with the review of worksheets as needed from staff [town planner], regional planning agency, soil and water conservation district, watershed district, a consultant hired by the town, or DEP's Technical Assistance Unit, the Division of Environmental Evaluation and Lakes Studies.

The control of temporary increases of phosphorus loadings caused by soil and associated erosion during construction is also noted.

The strength of the State of Maine's phosphorus control program is its methodology for

- The development of phosphorus loading limits for individual lakes
- The area allocation of permitted loads (phosphorus export limits) on a watershed basis, and then the further allocation of these loads to individual development proposals within the watershed
- The establishment of water quality goals for individual lakes and the application and enforcement of controls to meet those goals on a local government basis, with technical assistance from local regional planning agencies and from the State's Department of Environmental Quality.

[For more information contact: Jeffrey Dennis, Department of Environmental Protection, DEELS/Attn: Technical Assistance Unit, State House Station 17, Augusta, ME 04333. Phone: (207) 289-3901.]

EPA Region X's TMDLs for Clean Lakes

Region X has decided to combine the strengths of the TMDL process with the benefits of the Federal Clean Lakes Program. Thus, the Region now requires TMDLs as a condition for receiving Clean Lakes funds. All new Clean Lakes projects now must submit a TMDL upon completion of their Phase I planning activities. EPA approval of the TMDL is required prior to the award of Phase II implementation funds.

For those of you not familiar with the Clean Lakes Program, it consists of two phases. Briefly, Phase I consists of assessing the problems of a specific lake and developing a restoration plan. Phase II consists of implementing a restoration plan. Federal funds require a 50 percent State/local match; strong local citizen involvement is mandatory.

A well conceived and implemented Phase I project results in a plan that contains many elements characteristic of a TMDL. It identifies pollutants of concern, the loading capacity of the lake for those pollutants, and the point and nonpoint sources contributing to the load. Most importantly, it lays out a management plan for reducing (allocating) the load so that the loading capacity is not exceeded.

Thus when a Phase I project is completed, the results can be translated into a TMDL. Much of the hard work should have been completed during the project.

Region X adopted this requirement after past experience showed that hard-won gains in lake quality were often lost to subsequent developments. Citizens and agencies watched helplessly as uncontrolled new watershed activities overloaded their lakes and ruined years of hard work. Now, once a TMDL is in place and a Phase II project completed, water quality improvements can be protected on a long-term basis.

At this point, the TMDL requirement has been included as a grant condition in the three most recent Clean Lakes projects.

Some Examples (Continued) [For more information contact: Sally Marquis, U.S. EPA, Region X, ES-097, 1200 6th Ave., Seattle, WA 98101. Phone: (206) 442-2116.]

Concluding Editor's Note: In each of the above four cases, all parties found it necessary to establish pollutant load limits in order to resolve their environmental problems. Each also recognized the need to allocate that permissible load among the various sources. That's the easy part.

The hard part is finding a way to actually control the pollutant discharges to the desired level—particularly for nonpoint sources. The examples illustrate several creative methods being tried in various parts of the country. It would seem that TMDLs clearly have a role to play in this effort.

For Your Information

Livestock Grazing on Western Riparian Areas

Produced for the United States Environmental Protection Agency by the Northwest Resource Information Center, Inc., Eagle, Idaho. Ed Chaney, Wayne Elmore, and William S. Platts, Ph.D., Authors, July 1990. 45 pages.

This valuable publication was reviewed in the last issue of *News-Notes* (#7, August 1990). EPA Region VIII (Denver) is very pleased with the wide interest it has generated and notes that their supply is practically exhausted. The USDA Soil Conservation Service has arranged for a second printing. Future orders for the grazing document should be directed to:

Conchita Donaldson, Soil Conservation Service, Room 0054, US Department of Agriculture, P.O. Box 2890, Washington, DC 20013

North Carolina State is Recruiting to Fill Water Quality Group Leader Vacancy

Mike Smolen is leaving his position as Director (Group Leader) of the National Water Quality Evaluation Project at North Carolina State University to join the faculty at Oklahoma State University. Consequently there is now a vacancy at NCSU and active recruiting is under way. Information on this position follows.

- **Location:** North Carolina State University, Raleigh, North Carolina.
- **Position:** Visiting Assistant/Associate Professor—Water Quality Group Leader.
- **Nature of the Work:** Provide technical and administrative leadership for our Water Quality Group. The current group's activities and objectives include technical assistance to agricultural nonpoint source pollution projects (water quality monitoring, BMP effectiveness and statistical analysis), regional assessment of surface and ground water quality for water quality management planning, and development of BMPs and practice manuals for erosion control at construction sites. The group consists of 4 to 6 Extension Specialists, two secretaries, several research associates, and student assistants. This is a grant-supported position. Position holder is responsible for developing new proposals in addition to coordinating presently funded projects.
- **Position Availability:** October 1, 1990.
- **Closing Date:** Open until a suitable candidate is found.

[To apply and/or to obtain more information contact: James H. Ruff, Professor and Head, Department of Biological and Agricultural Engineering, North Carolina State University, Box 7625, Raleigh, NC 27695-7625.]

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NPS Publications List/Order Form

Here is an order form for nonpoint source publications now available through the NPS Information Exchange. Publications are available on a first-come, first-served basis until the supply runs out. To order, simply indicate on the form the number of copies of each publication desired. Clip and Mail (or FAX) to the NPS Information Exchange. Our address and FAX number are on the Coupon on the previous page in this issue.

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Phone: _____ **Fax:** _____

Publication Number	Publication Name	Check to order
EPA/USDA	<i>Best Management Practices for Agricultural Nonpoint Source Control—Pesticides.</i> September 1984. 87 pp.	_____
EPA	<i>Creating Successful Nonpoint Source Programs: The Innovative Touch.</i> August 1989. 12 pp.	_____
EPA/Northwest Resource Information Center	<i>Livestock Grazing on Western Riparian Areas.</i> July 1990. 53 pp.	_____
EPA 503/9-90-004	<i>National Directory of Citizen Volunteer Environmental Monitoring Programs.</i> April 1990. 43 pp.	_____
EPA 440/5-89-001	<i>Off-Site Assessment—A National Workshop.</i> August 1989. 53 pp.	_____
EPA	<i>Polluted</i> (colorful eight panel brochure on nonpoint source pollution and what you can do)	_____
EPA Pub. U-1	<i>Retrofitting Stormwater Management Basins for Phosphorus Control.</i> August 1989. 4 pp. (Urban stormwater management)	_____
EPA 506/2-89/003	<i>Selecting Priority Nonpoint Source Projects: You Better Shop Around.</i> August 1989. 39 pp.	_____
EPA-7-87	<i>Setting Priorities: The Key to Nonpoint Source Control.</i> July 1987. 51 pp.	_____
EPA Pm-221	<i>Share the Cost—Share the Benefits: Agricultural Cost-Share Programs.</i> March 1990. 53 pp.	_____
SCS-TP-160	<i>Water Quality Field Guide.</i> Revised March 1988. 63 pp.	_____
SWCS-1990	<i>Journal of Soil and Water Conservation, Vol. 45, No. 1.</i> <i>The Promise of Low-Input Agriculture: A Search for Sustainability and Profitability.</i> (From conference papers). January-February 1990. 159 pp.	_____
Wilderness Society	<i>National Forests—Policies for the Future, Vol. 1. Water Quality and Timber Management.</i> August 1988. 68 pp.	_____

Datebook

This DATEBOOK has been assembled with the cooperation of our readers; *Conservation Impact*, the newsletter of the Conservation Technology Information Center, 1220 Potter Drive, Room 170, West Lafayette, IN 47906-1334; and *NWQEP NOTES*, the newsletter of the National Water Quality Evaluation Project, North Carolina Agricultural Extension Service, North Carolina State University, 615 Oberlin Rd., Suite 100, Raleigh, NC 27605-1126. Their cooperation is appreciated. If you have a date you want placed in the DATEBOOK contact the editors of *NPS News-Notes*.

1990

Meetings and Events

October

22 - 24

Florida Acidic Deposition Conference, Tampa Hilton Hotel at Metrocenter. Sponsored by the Florida Department of Environmental Regulation. A forum to address the current understanding of acid deposition in Florida. Session topics will include atmospheric deposition monitoring, effects on forestry, limnology and fisheries. Contact: Curtis E. Watkins, Florida Department of Environmental Regulation, 2600 Blair Stone Road, Tallahassee, FL 32399-2400. Phone: (904) 488-0782.

30 - 31

Well Construction Workshop, Des Moines, IA. Iowa Groundwater Association and Iowa Water Well Association Fall Meeting. Contact: Paul VanDorpe, IGWA-IWWA Program Committee, P.O. Box 155, Oakdale, IA 52319. Phone: (319) 335-1580.

November

4 - 9

The Science of Water Resources: 1990 and Beyond (American Water Resources Association Annual Conference), Denver, CO. Topics include hydrologic trends, legal issues, water resources development, and emerging issues (NPS pollution, urban impacts on water quality, water resources education, radon, hazardous wastes, and biomonitoring). Contact: Jim Loftus, Colorado State University, Rm. 100, Engineering South, Ft. Collins, CO 80523. Phone: (303) 491-7923; or Bob Montgomery, Woodward-Clyde Consultants, 4582 Ulster Parkway, Suite 1000, Denver, CO, 80237. Phone: (303) 694-2770.

4-9

Symposium on Transferring Models to Users, Denver, CO. To be held simultaneously and in conjunction with *The Science of Water Resources: 1990 and Beyond*, AWRA 26th Annual Symposium (see above). Topics include: geographic information systems, decision support systems, numerical ground-water monitoring, models for land management, distributing and supporting Hydrologic Engineering Center programs, water quality modeling and decision making. Contact: William R. Hotchkiss, USGS, Bldg. 25, MS406, P.O. Box 25046, Denver, CO 80225. Phone: (303) 236-593; or Eric B. James, Bureau of Land Management, Bldg. 50, SC325A, P.O. Box 25047, Denver, CO 80225. Phone: (303) 236-0170.

4-9

Symposium on Urban Hydrology, Denver, CO. To be held simultaneously and in conjunction with *The Science of Water Resources: 1990 and Beyond* (see above). Sponsored by AWRA. Contact: Marshall E. Jennings, USGS, 8011 Cameron Road, Austin, TX 78753. Phone: (512) 832-5791.

6 - 10

North American Lake Management Society's 10th International Symposium on Lake, Reservoir and Watershed Management, Springfield, MA. Contact: NALMS, P.O. Box 217, Merrifield, VA 22116. Phone: (202) 466-8550.

8 - 9

Pesticides in the Next Decade: The Challenges Ahead, Hyatt Richmond, Richmond, VA. A national research conference. Topics include pesticides in drinking water, policy and decision making, economic and environmental tradeoffs, resistance and residues, testing and monitoring, risk analysis, and registration and regulation. Registration fees: \$120 (\$60 for students); after October 31, \$135 (\$70 for students). Fees include conference proceedings, published presenters' abstracts, two luncheons, coffee breaks, and an evening reception. Contact: Susan Parker, Virginia Water Resources Research Center, 617 N. Main St., Blacksburg, VA 24060-3397. Phone: (703) 231-5624. For room reservations contact: Hyatt Richmond, P.O. Box 6535, Richmond, VA 23230. Phone: (804) 285-1234. Special room rates are \$67 (single) and \$72 (double).

Datebook (Continued)

November

- 12 - 14 *Conference on Application of Geographic Information Systems, Simulation Models and Knowledge-Based Systems For Land Use Management, Virginia Polytechnical Institute and State University, Blacksburg, VA. Contact: Dr. J. P. Mason, Coordinator, 212 Seitz Hall, VPI & State University, Blacksburg, VA 24061.*
- 12 - 16 *Nonpoint Pollution Control for Forestry and Agriculture, Durham, NC. A Duke University School of Forestry and Natural Resources short course on strategies and methods for control of NPS, building on a basic understanding of soil and water resources. Contact: Intensive Course Program, School of Forestry and Environmental Studies, 212 Biological Sciences Bldg., Duke University, Durham, NC 27706. Phone: (919) 684-2135.*
- 27 - 29 *New Perspectives for Watershed Management: Balancing Long-Term Sustainability with Cumulative Environmental Change, Seattle, WA. Contact: Continuing Education Office, College of Forest Resources, AR-10, University of Washington, Seattle, WA 98195. Phone: (206) 543-0867.*

December

- 2 - 5 *The Environmental and Economic Status of the Gulf of Mexico, The First Biennial Symposium, Clarion Hotel, New Orleans, LA. Sponsored by U.S. EPA, Gulf of Mexico Program Office; NOAA; Army Corps of Engineers; SCS; and Florida Department of Environmental Regulation. Full materials fee: \$45 (\$65 after October 31); \$25 for students (\$45 after October 31). Make checks payable to Gulf Symposium and mail to: Judy Sutterfield, Conference Coordinator, P.O. Box 65792, Washington, DC 20035. For more information call (800) 726-GULF.*
- 9 - 12 *National Urban Conservation Symposium, Balancing the Environment and Urbanization, Hyatt Regency Hotel, Kansas City, MO. Sponsored by the National Association of Conservation Districts. Symposium will focus on the kinds of programs that conservation districts can assist and implement to manage urban conservation problems. Topics will include water conservation, quantity and quality; urban forestry; waste recycling and reduction; erosion and sediment control; stormwater management; floodplain management; etc. Contact: Lynn Sprague, NACD Coastal and Urban Committee, P.O. Box 260, Dover, DE 19903. Phone: (302) 734-7337. FAX: (302) 734-7487.*
- 10 - 12 *Water Quality Standards for the 21st Century: Second National Meeting, Hyatt Regency Hotel, Crystal City, Arlington, VA. Sponsored by the Criteria and Standards Division, OWRS, Office of Water, U.S. EPA. This meeting aims to identify scientific, technical, and policy guidance EPA should develop to assist States in strengthening the role of water quality standards in the management of the nation's aquatic resources. Hotel reservations should be made prior to November 9 directly with Hyatt Regency, 2799 Jefferson Davis Highway, Arlington, VA 22202 (refer to the national water quality standards meeting). Phone: (703) 418-1234. For registration contact: Mark Southerland, Dynamac Corp, 11140 Rockville Pike, Rockville, MD 20852. Phone: (301) 468-2500.*
- 12 - 14 *Biological Criteria: Research and Regulation, Arlington, VA. A symposium on the development of biological criteria descriptive of the uses and supporting natural conditions for all surface water types (streams, rivers, lakes and reservoirs, wetlands, estuaries and near coastal waters) and the integration of such criteria into State water quality standards. To be held immediately following the Water Quality Standards conference (see above) and at the same location. For further program information contact: Suzanne Marcy, U.S. EPA, Criteria and Standards Division. Phone: (202) 382-7144. For hotel reservations see above. For registration information contact: Anthony F. Maciorowski, Battelle Columbus Division, 505 King Avenue, Columbus, OH 43201. Phone: (614) 424-7575.*

December

12

Mid-Atlantic Conservation Tillage Conference, Camp Hill, PA. Contact: Craig W. Yohn, Chairman, 44-4 Wiltshire Rd., Kearneysville, WV 25430. Phone: (304) 728-7413.

18 - 21

Our Biosphere -- Our Responsibility (ASAE Winter Meeting), Chicago, IL. Hydrology and drainage group presentations related to agricultural impacts on water quality and pollution control. Contact: ASAE, 2050 Niles Rd., St. Joseph, MI 49085. Phone: (616) 429-0300.

1991

January

6 - 8

Farm/Ranch Expo '91, Phoenix, AZ. Contact: Show Management—Farm/Ranch Expo '91, 600 Talcott Road, Park Ridge, IL 60068. Phone: (708) 823-1010.

28 - 30

NPS Watershed Implementation Workshop, Clarion Hotel, New Orleans, LA. This EPA-sponsored workshop will present a wide range of tools and approaches for successfully implementing nonpoint source management practices and programs in watersheds. The workshop will effectively combine presentation and workshop formats and encourage the sharing of ideas and experience among NPS professionals involved in the day-to-day implementation of watershed projects. For registration information contact Kate Shalk at (617) 641-5324. For conference content information contact Dan Murray at (513) 569-7522.

February

20 - 23

International Erosion Control Association: 22nd Annual Conference, Orlando, FL. Conference will cover effective control methods and how they relate to improved environmental quality. Contact: Ben Northcutt, Executive Director, International Erosion Control Association, P.O. Box 4904, 1485 S. Lincoln, Steamboat Springs, CO 80477. Phone: (303) 879-3010. FAX: (303) 879-8563.

24 - 28

Surface and Ground Water Quality: Pollution, Prevention, Remediation, and the Great Lakes (AWRA Symposium), Cleveland, OH. Topics include wetlands management, agricultural impacts on water quality, basinwide water quality management, behavior and mobility of water contaminants, and data acquisition/management. Contact: Aaron Jennings, Department of Civil Engineering, University of Toledo, 2801 W. Bancroft St., Toledo, OH 43606. Phone: (419) 537-2476.

March

18 - 21

Fifth Federal Interagency Sedimentation Conference, The Riviera Hotel, Las Vegas, NV. Subjects include sedimentation as a NPS pollutant, reservoir and stream modeling, transportation and deposition, yield and sources, aquatic ecology, sampling and analysis, and trend assessment. Contact: G. Douglas Glysson, USGS, 417 National Center, Reston, VA 22092. Phone: (703) 648-5019.

19 - 20

Georgia Water Resource Conference, Athens, GA. Contact: Institute of Natural Resources, Ecology Building, Rm. 13, University of Georgia, Athens, GA 30601. Phone: (404) 542-1555.

20 - 21

NONPOINT SOURCE POLLUTION: The Unfinished Agenda For the Protection of Our Water Quality, Tacoma, WA. Sponsored by the Water Research Centers and Institutes of the Pacific Northwest/Oceania region. Contact: State of Washington Water Research Center, Washington State University, Pullman, WA 99164-3002. Phone: (509) 335-5531.

April

17 - 18

Environmentally Sound Agriculture, Orlando, FL. The conference objective is state-of-the art technology for sustaining an environmentally sound and productive agricultural industry in the urbanizing southeastern United States. Topics include NPS control, point sources on farms, air pollution, wildlife and habitat preservation, and the urban/agriculture interrelationship. Contact: Del Buttcher or Ken Campbell, Dept. of Ag. Engineering, University of Florida, Gainesville, FL 32611. Phone: (904) 392-8535 or fax (904) 392-4092.

July

8 - 12

Coastal and Ocean Management, The Seventh Symposium, Hyatt Hotel, Long Beach, CA. Sponsored by the Coastal Zone Foundation, the American Shore and Beach Preservation Association, U.S. National Oceanic and Atmospheric Administration, Port of Long Beach, and the American Society of Civil Engineers. Themes include Coastal and Marine Policy; Institutional Relations; Global Environment; Public Participation, Information, and Access; Environment and Information; Development and Resource Management; and International Issues. Contact: Orville Magoon/Gail Oakley, Coastal Zone '91, P.O. Box 279, 21000 Butts Canyon Road, Middletown, CA 95461. Phone: (707) 987-0114.

Call for Papers

Due
November 15, 1990

Water Management of River Systems (AWRA Annual Conference), to be held September 8 - 13, 1991, New Orleans, LA. Topics are the watershed as a river system, management of the water resources, managing extreme hydrologic events, data collection and analysis for management of river systems, and institutional and legal issues in management of river systems. Abstracts are due by November 15, 1990 to Harry C. McWreath, Conference Technical Chairman, USGS, P.O. Box 6976, Ft. Worth, TX 76115. Phone: (817) 334-5551.

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