



NPS News-Notes

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

A Note on Fisheries and Watersheds

Fisheries Management and Watershed Development Debated and Explored at an AFS Symposium

by Hal Wise, Editor

EPA is emerging from 20 years of an effective but narrow, public-works approach to clean water and moving to a broader view. Today, in addition to measuring just the chemistry of the waters to gauge what needs to be done and the results of doing it, the agency is taking a more three dimensional management approach; in addition to chemical, it is factoring in hydrological (physical) and biological/habitat conditions. The three are equally important and completely interrelated.

In the process of shifting to a broader view of the nation's water resources, water quality managers at EPA (and at the state level) are learning a new language or two and meeting many new people in different disciplines.

The American Fisheries Society with its recently published proceedings of its Symposium #13, *Fisheries Management and Watershed Development*, held in Newport, Rhode Island, in November 1991. These proceedings are right on target. The American Fisheries Society, too, is searching for a broader base for its members, who are largely professional fisheries managers.

Kevin Coyle, president of American Rivers, Inc., spoke of "an emerging new constituency for fisheries conservation." He sees a shift away from recreation as the primary fishery management emphasis toward conservation and preservation. He said:

Fortunately, there are a host of specific programs coming up in the next one to five years that will give fisheries professionals abundant opportunities to forge a strong union between groups that are primarily environmental in focus and those that are primarily recreational.

Coyle discussed current issues of environmental concern:

- The reauthorization of the Endangered Species Act.
- The relicensing of more than 200 dams by the Federal Energy Regulatory Commission.

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- More emphasis on riparian habitat and fisheries protection in the western United States.
- The reauthorization of the Clean Water Act.

He concluded:

The role of the fisheries management professional is critically essential to build a constituency powerful enough to combat the forces that are destroying the fisheries in our rivers and streams.

John Cronin, for nearly a decade the Hudson Riverkeeper and a former state legislative and congressional aide, addressed the symposium on changes he saw coming to fisheries management. He said:

... local and regional efforts that are organized around specific waterbodies and specific ecosystems are going to move to the forefront of environmental issues in this country.

... the older fish-and-game approach, such as the hatchery approach and bringing in exotic species to please sport fishermen is going down the drain very fast. It's being replaced by a very aggressive citizen environmental movement that is interested in ecosystems in a way that's a lot more sophisticated than it was 20 years ago when we first used ecological catch-phrases.

John P. Harville spoke with nostalgia and sadness of the many lessons learned over the years from the Columbia River Basin experience in his informative paper, "Three Decades of Expanding Fishery Management Horizons."

This volume contains many outstanding papers. "Habitat Evaluation in a Watershed Context," "Flawless Fisheries Through Watershed Protection," "Developing Integrated Fisheries Objectives for Land and Water Resource Management: The Milwaukee River Experience," and "Resource Management Within National Forest Watersheds," to mention just a few.

This is an important document whose time is now. We look forward to a future symposium when fisheries professionals and the nation's water quality managers can sit down together and discuss what they have in common, how their missions complement one another, and how to continue to improve their communication skills.

[Copies of "Fisheries Management and Watershed Development" may be ordered from American Fisheries Society, 5410 Grosvenor Lane, Suite 110, Bethesda, MD, 20814. Cost: \$50 per copy, \$40 to AFS members.]

The Riverkeeper Program

The Hudson Riverkeeper Fund was created in 1983 by fishermen who believed that citizens must enforce our environmental laws if the Hudson River, its tributaries, and watershed lands are to be protected. They appointed a Riverkeeper who patrols the waterway and responds to citizen complaints of environmental damage with investigation, data collection, and research. They also hired a staff attorney, Robert F. Kennedy, Jr., to prosecute environmental wrongdoers. The Hudson Riverkeeper first came to national attention by uncovering and halting the Exxon Company's practice of sending oil tankers up the Hudson to rinse out and remove clean river water to use in the Exxon refinery in Aruba. To expand its capacity to enforce environmental laws, the Hudson Riverkeeper established an environmental law clinic at Pace University; to date, this program has brought over 40 polluters to justice.

from "The Riverkeeper and Baykeeper Programs" —by John Cronin in "Fisheries Management and Watershed Development."

Notes on Water Quality Management

EPA Region 10 Develops Streamwalk Program

Volunteer monitoring is becoming an increasingly widespread route for lay people to get involved in management of their local waters. By tapping the pool of enthusiastic volunteer workers, federal, state, and local agencies can educate residents and promote stewardship. Region 10's Streamwalk program for its four states (Washington, Idaho, Oregon, and Alaska) can serve as a model for those planning monitoring programs in other areas of the country.

The Streamwalk program is an educational program that allows people to understand and learn from what they see in a stream area. It is also a tool that citizens and students can use to monitor the health and condition of a stream. Finally, it is a simple and basic method to collect physical data to submit to EPA for inclusion in the regional stream condition trend database. EPA analyzes the submitted data and returns a stream health index report to Streamwalker.

The process for completing a Streamwalk is simple and direct. After locating the stream site and section on a topographic map and determining that location's longitude and latitude, the Streamwalker begins to respond to the 11 stream description questions in the Streamwalk manual. The manual's survey form includes a series of land-use and riparian condition questions. The rationale and meaning of each information point is clearly described in the

manual. Region 10 has developed a training video as a companion resource to the manual. This lively tape, starring members of David Douglas High School ecology club in Portland, Oregon, introduces the streamwalk concept and assists volunteers in completing their first streamwalk.

By using the Streamwalk program, local governments, conservation districts, educators, nonprofit organizations, and the public gain a sense of stewardship and knowledge of their local stream resources. Outstanding examples of local implementation are provided by the city governments in Bellevue and Olympia, Washington. Both cities sponsor "Stream Teams." Area volunteers are recruited and trained in stream ecology and water quality issues, and then gather data for their education, information and for use by local officials.

Schools and educational districts also play a significant role in the implementation of Streamwalk programs. Using the "Streamwalk Teachers' Guide," teachers lead students, fifth grade and higher, in learning about factors and indicators of water quality, the importance of streams, and the role they can play in collecting trend data. The largest Streamwalk education program has been developed by the University of Idaho. Project Idaho WET, a state K-12 water education curriculum, includes the Streamwalk activity. Educators have also enhanced the education program with computers to electronically link students within watersheds, enabling them to compare Streamwalk data and share results.

Individuals not connected with an organized program are also important Streamwalk participants. People with special concern or knowledge of a stream monitor and accumulate data, assisting EPA and assuring that threats to stream health will not go unnoticed.

Within Region 10, Streamwalk is designed for implementation at the local level. Region 10 has defined and limited its implementation role to providing support and information not readily available elsewhere within the region. Region 10 does not recruit volunteers, provide promotion and publicity materials, nor assign technical staff to investigate potential problems discovered by Streamwalkers. The region is firmly committed to the concept that the program is best implemented at the local level.

Booklets and teacher manuals are printed and distributed free of charge. Because of EPA's advanced computer capability, the database and the developing GTS system are kept within the regional office. The database program is freely shared with any regional entity having an adequate computer capability. Streamwalk Index reports are generated in the Region 10 office and returned to the surveyor.

[Because of the limited scope and resources of the Streamwalk program, materials and training cannot, at this time, be provided for other areas of the country. Initial plans for national training opportunities are being developed. To receive notification of the training when it is confirmed, mail your name and address to Susan Handley, U.S. EPA, Region 10, 1200 6th Ave., WD 139, Seattle, WA 98101.]

Oklahoma State U. Produces a Forestry BMP Manual & Riparian Buffer Factsheet

EDITOR'S NOTE: Here are two first-class, informative, user-friendly publications, plus a video on forestry BMPs, all developed by Oklahoma Cooperative Extension Service.

The Extension Forestry, Wildlife and Aquaculture Program at Oklahoma State University is emphasizing nonpoint source pollution in its educational efforts. Two recent publications include a fieldbook entitled "Best Management Practices for Forest Road Construction and Harvesting Operations in Oklahoma" and a fact sheet concerning "Riparian Forest Buffers."

The BMP fieldbook — intended for loggers, forest managers, and landowners — describes the voluntary Oklahoma BMPs for road construction and harvesting in an easy-to-read format that fits in a pocket for convenience in the field. It was published in cooperation with the Oklahoma Forest Stewardship Program, the Weyerhaeuser Foundation, and the USDA Extension Service Water Quality Initiative.

A videotape entitled "Logging, Best Management Practices and Water Quality" was also produced by Oklahoma Cooperative Extension. It discusses the reasons for BMPs and provides a brief overview of BMPs in Oklahoma. Funding is currently being sought to develop a state logger education program.

The riparian forest buffers fact sheet describes the values and functions of riparian areas in Oklahoma and provides guidelines for establishing a buffer. It also provides a list of additional references and videotapes.

Urban Targeting of Nonpoint Source Pollution in the Grand Calumet River Watershed

EDITOR'S NOTE: The following article was submitted by Michael L. Ketcham and Chad T. Jafvert, a graduate student and an assistant professor, respectively, in the Environmental Engineering Department of Purdue University, West Lafayette, IN 470907-1284.

Simple spreadsheet models are becoming popular tools to estimate nonpoint source (NPS) pollutant loads within a watershed. Accurate estimation of pollutant loads enables planners to prioritize watershed areas for Best Management Practice (BMP) implementation, thereby maximizing limited resources. Because these pollutant load models require as input the distribution of spatial features (i.e., land use and soil types), linking these models to Geographic Information Systems (GISs) becomes invaluable. GISs have the ability to simultaneously analyze numerous spatially distributed features.

Targeting Procedure

A U.S. EPA manual entitled *Urban Targeting and BMP Selection: An Information and Guidance Manual for State NPS Program Staff Engineers and Managers* outlines a targeting procedure for NPS pollution that incorporates pollutant load calculations, public input, ability to implement BMPs, and a measure of stream size. The goal of our project was to use the methodology outlined in the EPA manual to develop a prioritization scheme for the Grand Calumet River watershed. In effect, this project has resulted in a case study testing the usefulness of the EPA targeting methodology, and has identified elements within the methodology where refinement is possible and may be desirable.

Project Area

The Grand Calumet River watershed is located in the northern half of Lake County, Indiana. Lake County is situated on the northwestern corner of Indiana and is on the southwestern shore of Lake Michigan. The watershed covers approximately 62 square miles and is one of the more industrialized areas of the United States. The Grand Calumet River and Indiana Harbor Ship Canal have been identified by the Water Quality Board of the International Joint Commission as one of 43 areas of concern within the Great Lakes Basin. In addition, field studies indicate that chemical loads to the river cannot totally be accounted for by known industrial and municipal point source discharges.

Pollutant Load Calculation

The calculation of pollutant loads for each watershed area is the basis of EPA's targeting process and requires generating several input parameters. Some of these input parameters were generated from GIS map layers using the geographic information system GRASS V4.0. A land-use map layer was created from municipal zoning maps, aerial photographs, and site inspections. A soils map layer was created from the latest U.S. Soil Conservation Service soil survey. GRASS performed spatial analysis of map layers simultaneously; thus, the areal extent of each soil series within each land-use category was calculated. Event Mean Concentration (EMC) data for each land-use category was derived from published data. Runoff coefficients were estimated for each land-use using the Soil Conservation Service runoff model "TR-55." The rainfall event values for the watershed were based upon National Weather Service data.

Public Input

A local public interest group conducted the public input to the ranking process at several meetings scheduled exclusively to inform municipal officials and the public about the targeting procedure. These meetings were held to obtain quantitative information regarding (1) beneficial uses of the waterbodies within the basin, and (2) weighting factors for the various parameters within the prioritization process.

BMP Implementation & Stream Size

Planners performing targeting procedure assigned values for BMP implementation and stream size. BMP implementation refers to the ease of installation, cost/benefit ratio, and overall effectiveness of BMPs in each watershed section. The numerical value assigned to stream size defines both waterbody size and importance for each area.

Concluding Comments

Using data from geographic information systems with simple pollutant load spreadsheet models (or targeting procedures that incorporate these models) is a powerful tool for planners in targeting areas for nonpoint source pollution control. However, several drawbacks to this procedure exist.

- (1) Little data exists pertaining to EMC values for heavy industrial land uses. This severely limited the accuracy of this project. In urban areas which are not predominately heavy industrial, published EMC data will suffice for targeting applications. However, published EMC values are often in different climatic and hydrologic systems; therefore, site-specific sampling data should be used when it is available.
- (2) The way a watershed is divided may largely determine which area or areas receive the highest rank. Division of the watershed by land-use categories seems more reasonable than division by topographic area, as selection of BMPs is based primarily on land-use classification. Unless a watershed section is composed primarily of one or two land-use classifications, effectively implementing BMPs over the entire area is very difficult to determine.
- (3) When the prioritizing is based on the total pollutant mass load generated within an area, disproportionally large areas will generally be ranked highest. A procedure that considers pollutant concentrations would prevent smaller, more sensitive areas from being outranked by larger areas.

[For more information, contact Michael Ketcham or Chad Jafvert, Civil Engineering Building, Purdue University, West Lafayette, IN 47907. Phone: (317) 494-2194.]

TMDL Case Studies Address Watershed Problems

Because the Total Maximum Daily Load (TMDL) process is one of the most powerful tools available for doing comprehensive watershed management, the Watershed Management Section is making available a series of TMDL case studies. The case studies address a variety of watershed problems that are transferable to a number of regions. So far, seven TMDL case studies are available.

TMDL Case Study	Location	Feature
#1	Denver Metro – South Platte River Segment 15, Colorado	Revision of TMDLs to meet Water Quality Standards
#2	South Fork of the Salmon River, Idaho	A phased TMDL for clean sediment developed using quantified goals based on a narrative standard
#3	West Fork of Clear Creek, Colorado	A seasonal TMDL using narrative standards for certain parameters
#4	Nomini Creek Watershed, Virginia	Use of GIS and watershed models to identify areas of critical nonpoint pollution
#5	Albemarle/Pamlico Estuary, North Carolina	A nutrient screening approach that uses GIS technology to model watersheds within a large, multibasin area
#6	Lower Minnesota River, Minnesota	A TMDL undergoing assessment as part of a basinwide river assessment project
#7	Sycamore Creek, Michigan	A watershed analysis that links dissolved oxygen problems to sediment loads and established NPS load allocations

[To obtain a case study, contact the Watershed Branch, WH-553, U.S. EPA, 401 M St., SW, Washington, DC 20460. Phone: (202) 260-7074.

These case studies are also available on the Nonpoint Source Bulletin Board TMDL Special Interest Group (SIG) (see page 24 of this issue). They can be downloaded from file area #1 in the SIG.]

EDITOR'S NOTE: This handbook focuses on the structural BMPs most relevant to northern Virginia's local parameters, including soil conditions and meteorology. The book's specific recommendations will be most appropriate for mid-Atlantic readers. It may, however, be useful as a starting point for local governments in other areas who want to compile similar documents, especially where a number of different entities have authority within an area or where a coordinated effort, like the Chesapeake Bay Program, overlays local requirements.

The recently published *Northern Virginia BMP Handbook: A Guide to Planning and Designing Best Management Practices in Northern Virginia* was written as a general reference guide for designers and reviewers of urban BMPs within the northern Virginia area. Although much of the information is available from other sources, the handbook provides a good synopsis of the stormwater quality requirements of local jurisdictions in northern Virginia.

The BMP designer will find the examples of design calculations and work sheets in the handbook helpful in selecting and designing BMPs appropriate for the northern Virginia area. Specific methodologies presented include procedures to calculate phosphorus removal and determine site coverage, storage volume, and outlet orifice size. Detailed design information, planning considerations, and site-selection criteria have been provided for the BMPs most commonly implemented in northern Virginia: extended detention dry ponds, wet ponds, and infiltration trenches.

The handbook also contains maintenance guidelines for privately maintained BMP facilities and a discussion on the implementation of unconventional and experimental BMPs. The information concerning BMP maintenance will be especially useful when selecting BMPs or planning long-term maintenance programs. In addition, sample maintenance agreements and BMP operation and maintenance inspection reports are provided in the appendix.

Copies are \$17 for Northern Virginia Planning District Commission member jurisdictions and Virginia state agencies and \$30 for all other organizations, plus postage and handling. Send payment with the purchase order.

[For more information, contact Northern Virginia Planning District Commission, 7535 Little River Turnpike, Suite 100, Annandale, VA 22003. Phone: (703) 642-0700.]

News From the States and Localities, Where the Action Is

Teamwork is the Key in Maryland's Targeted Watersheds

An effort to focus all agencies' existing pollution control programs on reducing nonpoint source pollution in tributaries to the Chesapeake Bay has promoted a cooperative approach in four Maryland watersheds.

The state is grappling with some important issues for the first time because of the new cooperative approach. For example, in one watershed the Maryland Department of the Environment sewage sludge management program is listening more closely to farmers' concerns, has met with farmers and sludge haulers, and is considering regulating farmland sewage application similar to existing animal manure and fertilizer application programs. In another watershed, biologists installed a fish ladder, and agricultural agents now use fishery restoration as an incentive for farmers and other upstream residents to join the water quality improvement effort. In the urban watersheds, the county agencies regulating stormwater now frequently consult with the state team members to get early opinions on state permit issues and to find ways of maximizing habitat benefits of stormwater BMPs.

In 1989, two urban watersheds and two agricultural watersheds were chosen as test cases for coordinated action to restore the state's streams. The Targeted Watersheds are between and 8 and 36 square miles — small enough to expect measurable improvements in 5 to 8 years. They are typical of the state's distinct regions and different nonpoint sources.

German Branch on Maryland's flat, eastern Coastal Plain represents a region heavily farmed for corn, soybeans, and wheat. Sawmill Creek, in a rapidly developing suburb of Baltimore, contains land slated for commercial and residential development, a major airport, and major

highways with expansion plans. Bird River watershed straddles the Piedmont Plateau and Coastal Plain and supports farming, heavy residential and commercial use, and sand and gravel mining. Finally, the Piney and Alloway creeks flow through a watershed of rolling Piedmont hills and contains both crop and dairy operations.

Interagency Management Teams

For each watershed, senior managers from four state departments selected a management team and an agency project leader with the greatest interest or local expertise. In one watershed, a leader was selected from the state department of natural resources; in another, the county soil conservation district. The third watershed leadership comes from the state agriculture department; the fourth comes from the county environmental agency.

The teams meet routinely to evaluate goals and objectives, find funding sources for restoration projects, and discuss progress. In the urban watersheds, the state and county agencies work primarily on stormwater management, contamination, and habitat creation. In agricultural areas, extension agents and agricultural water quality specialists target conservation practices. Biologists and trained volunteers monitor the water and biota to establish trends in water quality and habitat. Together, management and monitoring team members represent more than 45 state, local, and federal agencies.

Volunteer Assistance

From the earliest planning stages, the project's organizers recognized that effective control of nonpoint source pollution would take the participation of watershed residents. Ongoing public outreach establishes an informed citizenry willing to participate and lend political support for future nonpoint source initiatives.

Maryland Save Our Streams, Alliance for the Chesapeake Bay, and the Chesapeake Bay Foundation helped the state organize and train volunteers. Some of these individuals now assist with fish sampling, participate in management team meetings, and organize streamside trash pick-ups and citizen advisory committees.

Comprehensive Monitoring

A comprehensive monitoring program allows the project to compare methods and to relate biological health indicators with water quality improvements. The monitoring program includes biological monitoring, automated storm monitoring, and a practical test of recent EPA guidance on monitoring the impact of nonpoint source reductions on water quality.

Rapid bioassessment methods recommended by EPA are used to assess the overall health of streams as they pass through the watersheds.

Water quality measurements, using National Nonpoint Source Monitoring Program guidance, relate land use changes and BMP implementation to key measures of water quality. Storm sampling is conducted to determine trends at the lower ends of the watersheds. These data sets allow comparisons of monitoring methods as well as assessment of subwatershed water quality.

Maryland's Targeted Watershed Project brings together agencies and departments which frequently have conflicting management goals and provides cross-training in the perspectives of various agencies and a coordinated approach to watershed restoration.

[For more information on the Targeted Watershed Project or to discuss watershed monitoring programs in these four watersheds, call Stuart Lehman at the Maryland Department of Natural Resources, Coastal and Watershed Resources Division (410) 974-5780.]

In Maine: County Water Quality Team Spearheads Lake-Watershed Project

by Mary Ellen Dennis

EDITOR'S NOTE: The following article appeared in the Spring 1993 issue of the *Nonpoint Source Times: Rain, Infiltration & Runoff*, published by Maine's Department of Environmental Protection. This kind of grass-roots, on-the-ground leadership makes for successful holistic watershed/NPS projects.

Each year the Nonpoint Source Program targets three or four watersheds to do "competitive" projects. These comprehensive projects are targeted to priority waterbodies to protect or improve threatened or impaired waters. Many of these projects develop because of strong support from local agencies, towns, or citizen groups. Such was the case for a project target in Washington County,

*In Maine: County
Water Quality Team
Spearheads
Lake-Watershed
Project
(continued)*

Maine, which developed because of the Washington County Water Quality Team. This team assembled in 1990, consists of representatives from Soil Conservation Service, the county Soil and Water Conservation District, University of Maine Cooperative Extension, Inland Fish and Wildlife, Washington County Regional Planning Commission, Passamaquoddy Tribe, the county commissioners, and Department of Marine Resources.

In conjunction with the State Department of Environmental Protection, the Water Quality Team targeted the Boyden Lake-Gleason Cove Watershed. Located in the towns of Perry and Robbinston, the watershed includes Boyden Lake — which empties into Boyden Stream — Little River Estuary, and Gleason Cove. This is a highly valuable resource for recreation; the lake-stream system is a water supply managed by the Passamaquoddy Water Company for about 2,500 people. The estuary is a productive clamflat, closed due to high bacteria counts. The high counts are attributed to both nonpoint source impacts and overboard discharges.

The Boyden Lake-Gleason Cove project, begun in summer 1991, consists of two components: the comprehensive watershed implementation project directed by the Washington County SWCD, and the volunteer monitoring component directed by Cooperative Extension.

The SWCD began the project by providing internships for two students from the Atlantic Center for the Environment. The interns, along with SWCD staff, carried out watershed mapping, a landowner's survey to encourage participation, a public meeting, and a public walk in the watershed. Inland Fish and Wildlife also completed surveys of fish habitat in tributaries to Boyden Lake.

A project's success is often due to information and education efforts and fostering public support. Because of the survey, public meeting, and watershed walk, the project began with solid public support that has carried through the project.

Through 1992, the watershed project has included the following activities. With a written workplan, the Soil Conservation District attended town meetings to discuss the project. The planning commission worked with the towns on shoreland zoning and comprehensive planning. Throughout the project, the Department of Marine Resources has continued its regular monitoring and has added 10 to 12 additional samples in each monitoring round. Landowners received technical assistance to address NPS problems caused by agricultural, silvicultural, and development land uses. Workshops on road erosion control, forestry BMPs, and water quality, and a septic pump-out and clean-up day were held.

The Cooperative Extension Service directed the volunteer monitoring component. Sessions on volunteer training and, in conjunction with Department of Marine Resources, an in-depth training program for bacterial monitoring was held. Ten volunteers continue to monitor 16 sites every two weeks, and about 70 students have been involved at some time. Materials developed to support volunteer monitoring are a volunteer application form, job description for volunteers, and a training manual on monitoring coastal waters.

[For more information, contact Mary Ellen Dennis at DEP's Augusta Office, 207/287-3901.]

In Olympia, Washington, Local Businesses Express Concern about Water Quality

by Eva Shinagal

EDITOR'S NOTE: *News-Notes* has previously written about *Water Works: Business For A Cleaner Future*, an NPS outreach program located at the southern end of Puget Sound, Washington, sponsored by Thurston County, the cities of Olympia and Lacey, and the state's Department of Ecology. The program focuses on businesses with the potential to contaminate the county's water resources. The program manager for Olympia dropped a note to us recently which read: "Thanks for printing my last release. So far I've gotten calls from Michigan, Wisconsin, Minnesota, & Oregon seeking information on the program. You folks do good work — making national linkages between local programs. Thanks a bunch."—*Eva Shinagal*. Thank you, Eva, for your contributions. We're in the business of spreading the word about what's going on at all levels in the interest of water quality and the local environment (where the action is) so that people can get in touch. Eva sent us her newest press release, updating the local action.

Concern with water quality was on many minds recently when 70 business people representing 60 Thurston County businesses attended the February 9 Operation: Water Works workshop at the Tye Hotel.

Fifty-seven percent of the participants said they came to the project's second round of educational workshops because of concern for water quality and waste management. Another 31 percent said they were concerned about regulations, while 11 percent said they were curious about the project.

Operation Water Works is a voluntary education project designed to provide technical assistance and community recognition to businesses with the potential to contaminate the county's water resources. It is sponsored by the cities of Olympia and Lacey and Thurston County and funded through a Washington Department of Ecology Centennial Clean Water Fund grant.

The workshop, endorsed by the Olympia/Thurston Chamber of Commerce and the Lacey Area Chamber of Commerce, offered ways that construction, landscaping, janitorial, and auto and equipment repair businesses can keep pollutants off the ground and out of the water. Each business area had a training section focused on their issues and typical business practices.

Nearly half of the registrants were from the construction industry, with 32 contractors attending a workshop section presented by Tim Stender, building trades instructor at the New Market Vocational Skills Center and owner of Stender Construction. Other trainers included Ted Slatten, executive director of the Automotive Services Association of Washington and Mary Jo Buza, owner of Gardens by Design, a landscape consulting firm specializing in integrated pest management (IPM).

In order to join Operation Water Works, interested businesses complete a self-evaluation, identifying areas to improve the way they manage wastes, educate and train employees, prevent erosion, and protect streams and shorelines. Next, businesses prepare a pollution prevention plan, in consultation with staff, which addresses how they will work to improve the areas.

These two steps qualify them as an Operation Water Works participant. They receive a recognition sticker, mention in the project's publications, and advertisements and public congratulations for their efforts to get educated. This year, the project is running half-page ads in the *South Sound Business Examiner* and the *Olympian* describing the changes that selected businesses have made.

[For more information, contact Eva Shingel, City of Olympia, Water Resources Program, P.O. Box 1967, Olympia, WA 98507, phone: (206) 753-8454; or Michael Kent, Thurston County Environmental Health, at (206) 786-5457.]

New Jersey's Great Swamp is a USDA Urban Hydrologic-Watershed Project

New Jersey's Great Swamp Hydrologic Unit Area (HUA) Project is one of the few urban projects of U.S. Department of Agriculture's (USDA) 74 HUAs in the country. The watershed includes portions of nine Morris County municipalities and two Somerset County municipalities.

The project area also includes a 7,261-acre National Wildlife Refuge, originally established in 1964 by the U.S. Fish and Wildlife Service. The Great Swamp's 55-square-mile watershed — only 26 miles from New York City — is a generally affluent, suburban area with approximately 114,000 residing in its 11 municipalities. Varying portions of each municipality lie within the Great Swamp watershed.

The HUA work program focuses on field studies and the development of hands-on tools to control nonpoint sources of water contamination. The project was begun by the Morris and Somerset-Union soil conservation districts with the encouragement of the New Jersey Department of Environmental Protection and Energy. In May 1991, three USDA agencies — Soil Conservation Service (SCS), Rutgers Cooperative Extension (RCE), and Agricultural Stabilization and Conservation Service (ASCS) — joined together to assist local agencies in developing the USDA-HUA effort.

According to Michael T. Olohan, Public Information Manager for the Great Swamp HUA Project:

The goal of the five-year interagency project is to provide local decision-makers (public officials and community leaders in the 11 watershed communities) with the tools to evaluate, recommend, and implement strategies to reduce nonpoint source contaminants from all sources within their respective municipalities.

Currently the project is developing as follows:

- **Application of a geographical information system (GIS)** to help planners, developers, citizens, public officials and environmental activists to work together, developed by SCS. The Great Swamp GIS has been concentrating on data acquisition and development. So far, a soils data layer (based on SCS county soil surveys), present land cover data layer (with Morris County Planning Board assistance), and a hydrologic data layer (showing stream networks) have been entered. Still to be added are layers on future land cover, aquifer recharge areas, freshwater wetlands, sewage and water infrastructure, the 1992 stream macroinvertebrate survey (see following) subwatersheds, topography, detention basins, population density, and 1988 and 1992 satellite imagery for watershed land cover.
- **A macroinvertebrate survey was conducted in the summer of 1992** to determine water quality in the five major tributaries. This biological survey identified numbers and diversity of pollution intolerant and pollutant tolerant organisms in each stream segment sampled. The analysis provided an overall ranking of each tributary based on the biota living there. The macroinvertebrate survey findings were disseminated and discussed widely at local public meetings and reported in media coverage. A follow-up survey will be conducted in 1993.
- **RCE is directing information and education activities**, including the production of a quarterly newsletter — *Swamp Sounds* — targeted mailings to specific audiences, news releases, audiovisual presentations, placement of six portable HUA displays, and fact sheets. These resources are targeted at specific audiences — local groups, home owners, local governments, agricultural land owners, environmental commissions, and others.
- **Interagency working groups produced a “Public Participation Plan”** in May 1992 and outreach activities to agriculture, business/industry, homeowners, public officials, and public-interest groups to inform them of the HUA effort and its benefits.
- **Currently, a watershed-wide hydrology study is underway to collect data on stream flow conditions.** This water quantity information will be useful in modeling efforts target future nonpoint source remediation efforts for short- and long-term improvements in local water resources.
- **One of the pilot efforts initiated by RCE of Morris County** will feature plots of different types of lawn grasses at Frelinghuysen Arboretum, Hanover Avenue, Morris Township. Ed Milewski, Morris County agricultural agent, has planted seven different grass varieties, ranging from common Kentucky bluegrass to perennial ryegrass and tall fescues. Milewski will vary the fertilizer amounts and applications for each type of grass to give home landscapers the opportunity to compare the low-input (less water, fertilizer, maintenance, and cost) versus the high-input grass types (continuous watering, fertilizing, maintenance, and expense).
- **Other 1992 accomplishments included** interagency meetings with local sanitarians, environmental commissioners, and planners; a Great Swamp bibliography; a watershed detention basin inventory report; a survey of selected watershed homeowners' lawn-care practices; further refinement of a watershed nonpoint source water quality model; and compilation of municipal nonpoint source ordinances for local dissemination.

During the last three years, continuing study and political controversy has taken place over the health and fate of the Great Swamp, formed 12,000-15,000 years ago during the retreat of the Wisconsin glacier. Several recent studies have been completed, according to *Swamp Sounds*. These studies include

- U.S. Environmental Protection Agency 201 Facilities Plan for the Upper Passaic River Basin
- Great Swamp Watershed Association's Designing Our Future land-use study
- Draft report of the Great Swamp Watershed Advisory Committee (GSWAC) to the New Jersey Department of Environmental Protection and Energy

These studies are being analyzed by the USDA Great Swamp HUA project. The latter two studies are worthy of attention. The GSWAC draft report of 1990 lists five beneficial functions that the Great Swamp provides: stormwater infiltration / groundwater recharge; minimizing sediment runoff due to its woodlands and meadows; reducing stormwater runoff pollutants via filtering, settling, and plant uptake; and moderating downstream flooding via runoff storage/infiltration.

The report noted that the Great Swamp also provides valuable habitat to 220 species of birds, 600 species of plants, 24 species of freshwater fish, 39 species of amphibians and reptiles, a wide variety of mammals, and protected species such as the bog turtle, great blue heron, red-headed woodpecker and bobolink.

Designing Our Future was completed in late 1991 by the Great Swamp Watershed Association, a regional environmental group operating since 1981. Local and regional development options, planning/zoning recommendations, and stormwater management guidance are outlined. Also suggested are revised local development criteria, transportation linkages, infrastructure maintenance, and establishment of a regional forum for addressing issues that affect the entire watershed.

"The region (Great Swamp watershed) is rapidly approaching 'build-out,'" concludes the report. Build-out is defined as construction of the maximum amount of development units possible under existing municipal master plans.

In part, the report recommended

- that municipalities examine current zoning in critical areas and consider down-zoning to reduce future development;
- rezoning areas where development is not intended, such as golf courses and parks;
- examining carefully areas with water, sewer, and transportation infrastructure for infill/redevelopment opportunities;
- requiring projects with regional impacts to present environmental impact statements;
- exploring application of transfer of development rights (TDR) mechanisms to sewer credits/critical areas protection;
- establishing a regional decision-making framework with wide-ranging jurisdiction over land use and wastewater management;
- no expansion of sewer service areas within the Great Swamp's 55-square-mile basin;
- creating a regional stormwater management plan;
- sewage plant capacity be kept at current levels at the watershed's two sewage treatment facilities;
- instituting a continuous and standardized water quality monitoring mechanism capable of providing hard data for policy decisions;
- studying specific watershed subbasin land use, to identify areas under greater environmental stress;
- adopting compact forms of development; and
- applying water conservation measures in the Great Swamp's two sewer service areas.

Michael T. Olohan told *News-Notes*:

All of these efforts are providing new information and hands-on tools that are subtly influencing people's thinking about local land use, lifestyles, and regional environmental issues. Those are results that will pay big dividends for years to come.

The HUA Technical Advisory Committee (TAC) is composed of representatives of the U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, U.S. Geological Survey, National Park Service, Forest Service, Soil Conservation Service (Morris and Somerset Districts), Rutgers Cooperative Extension Service (Morris and Somerset Counties), Morris County Soil Conservation District, Somerset-Union Soil Conservation District, Morris County Planning Board, Somerset County Planning Board, State Soil Conservation Committee, State Department of Environmental Protection and Energy, New Jersey Farm Bureau, Great Swamp Watershed Association, and Passaic River Coalition. The TAC met at four quarterly meetings in 1992.

The USDA Great Swamp Project is seeking public input on all nonpoint problems affecting or potentially affecting the Great Swamp. This input will be used to develop a nonpoint source management plan during 1993.

(For more information, contact Michael T. Olohan, Rutgers Cooperative Extension, Department of Natural Resources, P.O. Box 231, Cook College, New Brunswick, NJ 08903. Phone:(908) 932-9634. FAX: (908) 932-8644.)

Commentary

The Road to Consensus: Agreement Reached on Solid Waste Planning and Management Issues in Maryland

Readers are familiar with the often wrenching travail involved in choosing policy options to deal with society's leftovers and throw-aways — garbage, junk, and solid waste. Political side-effects result in frustration, indigestion, trauma, riotous public hearings, and the like. Worse, everyone has an opinion or a non-opinion.

But Maryland has come up with a process that gives positive policy direction to future management of its solid waste — reaching a consensus about the future of throw-aways. *News-Notes* editorial staff think that their methods could be directly applied to watershed protection and control of nonpoint source runoff where often opinions conflict on the most beneficial management measures to employ . . . so we pass on the story and our observations.

In introducing the Maryland Solid Waste Planning Accord, Maryland Secretary of the Environment Robert Perciasepe said:

"Perhaps no single environmental issue is as contentious as how we handle the waste we generate. The accord participants agreed on our mission: to make Maryland the leader in environmentally and economically sound solid waste management by 1996. This agreement gives us the framework to do just that."

What Maryland did was to bring together the principle actors — "stakeholders" in the watershed protection approach parlance.

The selection and designation process that led to the formation and functioning of the discussion panel was the key. The Maryland Department of the Environment's (MDE) objective was to determine the extent to which the various contending "sides" in solid waste matters could reach agreement on common issues.

The Department identified six groups with an interest in the discussion:

- **citizens**, who must face the prospect of having solid waste facilities, such as incinerators and landfills, located in their communities;
- **counties**, who must plan for solid waste services;
- **local government**, which is involved in zoning decisions and often directly provides certain solid waste management services;
- **private industry**, both those that generate waste and those that collect, manage, and dispose of solid waste;
- **state government**, which legislates standards and establishes environmental policy; and
- **MDE**, which is responsible for regulating and enforcing solid waste management.

Reports on the process detailed how the panel was put together:

- Ten citizen representatives were selected through the Maryland Resource Network, a coalition of some 110 citizen groups. In addition, citizens who were not selected as delegates were invited to participate in an open and facilitated "issue-identification" session with the delegates to insure a broad base of input; they were also advised of the proceedings as the accord progressed. The intention of the selection process was to include citizens from throughout the state and those familiar with a wide variety of concerns. Citizen delegates were not authorized to speak on behalf of non-participants or required to be familiar with every issue that might arise in the discussion. However, the caliber of citizen participation was extremely high.
- The Maryland Association of Counties selected three county delegates.
- The Maryland Municipal League chose three representatives of local government.
- The Chamber of Commerce picked three representatives of private industry. The group included representatives familiar with the realities of recycling and obstacles faced in operating waste disposal facilities. Again, the level of expertise was extraordinarily high.

*The Road to
Consensus:
Agreement Reached
on Solid Waste
Planning and
Management Issues
in Maryland
(continued)*

- The Maryland legislature was represented by a leading environmental legislator.
- MDE was represented by its Secretary, Deputy Secretary, Director of Waste Management and the Director of the Office of Community Assistance.

Meetings of the participants were facilitated by the Dearborn Institute for Conflict Resolution of Chicago, Illinois.

Reaching an Accord

The final report on the accord, prepared by the Dearborn Institute facilitators, discussed steps taken to reach the consensus by groups who normally would not be talking to each other, much less developing policy.

The Accord was reached through a three-part process. First, all participants attended a one-day training session that provided some useful tools in communication and negotiation strategies. The "rules of engagement" were established.

Second, the group defined its common mission and an operating goal to achieve the mission. Each interest group met separately to define its goals and then addressed those concerns to the group as a whole. The facilitator then reframed the issues into 11 categories for discussion.

In the third stage of the proceedings, all participants worked to create consensus statements for each of the 11 areas of concern. Eventually, the 11 categories were distilled to seven and positions were adopted with respect to each.

Hats off to Maryland. The lesson learned is that those "at interest" must talk to each other and seek to understand each group's interests. From these understandings, parties must search for answers that are mutually acceptable and reach a consensus on issues facing the watershed. Command and control will not work at the watershed scale — too many actors at interest have, historically, not had to deal with each other at all. That's what this is all about.

[For further information or for copies of the accord, contact Michael Sullivan, Office of Community Assistance, MDE, 2500 Broening Highway, Baltimore, MD 21224. Phone: (410) 631-3003.]

Notes on Coastal Environmental Management

Coastal America Speeds Restoration of Florida's Cockroach Bay

EDITOR'S NOTE: See *News-Notes* issues #15 and #24 for more on Coastal America. See the Watershed Restoration Network on the *Nonpoint Source Electronic Bulletin Board System* for a list of the 1992 demonstration projects and fact sheets on several of the projects. The following article is based on one written by Paul Shuette. Thank-you to Pat Bonner for the update.

A \$300,000 grant to the Tampa Bay National Estuary Program (NEP) was the first award announced under the Coastal America initiative, now boasting 23 other projects. The Tampa Bay NEP grant helped launch an ambitious habitat restoration project expected to extend over the next 10 to 20 years.

After a public event in April 1992, work began last fall at Cockroach Bay. Despite its name — Cockroach Bay is the crown jewel of the Tampa Bay estuary system, one of the few remaining sanctuaries in a largely urban setting.

Planned work will restore a 651-acre site acquired by the Hillsborough County Environmental Lands Acquisition and Protection Program. A mosaic of wetlands and uplands will be created to improve water quality and restore estuarine and coastal habitats.

"With an estuarine system that has lost more than 11,000 acres of intertidal wetlands, the opportunity for restoration here is enormous," said Richard Eckenrod, director of the Tampa Bay NEP.

Florida's Largest Restoration Effort

"If the habitat restoration at Cockroach Bay progresses as planned, it will be the largest ever in Florida and one of the largest restoration construction efforts in the country," added Brandt Henningsen, an environmental scientist with the Southwest Florida Water Management District. The district's Surface Water Improvement and Management (SWIM) program has committed \$650,000 to the Cockroach Bay restoration.

Coastal America Director Virginia Tippie, who was in Tampa for the announcement of the project last April, said the first phase of the work will produce varied habitats in a series of interconnected water basins with differing salinity levels. New ponds to provide biological pre-treatment of stormwater before it enters the bay also are included in phase one, she said.

"These improvements alone will make the bay, all of Tampa Bay, a much better habitat for all kinds of wildlife," Tippie said. Cockroach Bay is "a casebook example of how various agencies from various levels of government can not only focus and coordinate their work but collaborate in jointly planning and executing something very concrete to improve the environment," she added.

In addition to funding from Coastal America and Florida's SWIM program, Tippie noted that the Florida Department of Environmental Regulation and the Hillsborough County Environmental Protection Commission have pledged \$200,000 each to the restoration effort. Hillsborough County's purchase of the site for \$2.04 million made the whole project possible, Tippie said. The Florida Department of Natural Resources and the Tampa Bay Regional Planning Council also are part of the sponsoring coalition.

Federal partners in the project include EPA, the National Oceanic and Atmospheric Administration (review of the biological monitoring program), U. S. Fish and Wildlife Service (technical expertise), U. S. Geological Survey (advice on modeling of tidal channels), and the Army Corps of Engineers (permitting, construction review, and technical assistance to SWIM).

Although the project is coordinated by SWIM, the Cockroach Bay Restoration Alliance — an advisory committee whose members represent business and all levels of government — is designing and implementing the plan.

Volunteers Pitch In

The conceptual plan for phase one's 200-acre area has been completed and approved for implementation at an estimated cost of \$2.1 million. Survey work and detailed design of the first six sections are complete. Volunteers have begun removing non-indigenous species and cleaning up the site. Actual construction should begin mid-1993. Coastal America's participation will speed up rehabilitation of Cockroach Bay by several years.

Coastal America is a partnership of ten federal agencies created in early spring of 1991 to provide coordinated support for environmental projects that address regional goals and local needs.

Coastal America was established as a mechanism for federal agencies to combine their efforts with those of other government and private agencies to combat habitat losses and pollution along the nation's shorelines. The cooperative effort is coordinated by the President's Council on Environmental Quality.

Coastal America's 24 projects have a total worth of approximately \$12 million. Fully 50 percent of the costs are non-federal dollars.

[For more information, contact Norm Edwards, Coastal America-CEQ, 722 Jackson Place, NW, Washington, DC 20503.]

Puget Sound Beaches under the Watchful Eyes of Extension Volunteers

When commuters and tourists board the Washington State Ferry to travel from Anacortes to Friday Harbor across Puget Sound this spring, included in their fares will be a short course on the Sound's natural history and water quality. The Ship's Naturalist Program, to be held weekly on two ferry lines, is just one of an assortment of public education endeavors sponsored by the Washington State University Beach Watchers.

The innovative model program began in 1989 with funding from Washington State University, the state Department of Ecology's Centennial Clean Water Fund, Island County, and private and corporate sponsors. Island County's WSU Cooperative Extension Education Center administers the program, which currently boasts over 80 volunteers. A new class of 20 is expected to complete the 100 hours of classroom and field instruction this spring. In return for the training, volunteers promise the program 50 hours of community service. But veteran WSU Beach Watcher Susie Nelson (who in her other life is the Extension composting/recycling program assistant) reported that volunteers are usually so interested and committed that they contribute far more than the required time.

Last year, the WSU Beach Watchers sponsored the Penn Cove Water Festival, a revival of historic Coupeville Water Festival, after a lapse of 50 years. The festival featured Native American canoe races as well as environmental education, cultural, maritime, and historic displays and events. Attendees were treated to Native American and Northwestern foods and entertainment. The festival's mission was to "educate the public about the water resources of Whidbey Island and their history, through an understanding of the ecology, geology, and cultures of humankind." The 1992 festival was attended by over 4,000 people. Its success prompted WSU Beach Watchers to hold a 1993 Penn Cove Water Festival in March.

Operating on an annual budget of \$30,000, the volunteer program has reached thousands of Island County residents. One of their latest efforts was an evening seminar called "Beaches, Bluffs, and Bulkheads," attended by 100 people. Several volunteers are deeply involved in the schools, assisting teachers in classroom studies of Puget Sound, and taking students on field trips. A publication, *WSU Beach Watcher's Guide to Successful Beach Field Trips*, to be distributed to Island County teachers, is in the works.

WSU Beach Watchers are a diverse lot of all occupations and ages, ranging from college students to retired people. Each WSU Beach Watcher adopts a section of beach and regularly observes it, noting erosion, debris, numbers of organisms, and other noticeable changes, and sometimes making a photographic record of the observations. WSU Beach Watchers also collect and analyze water samples and do beach transects. The program focuses mostly on public education and stewardship, but participants hope their monitoring efforts will eventually yield baseline information.

WSU Beach Watchers also do beach cleanups, guide beach and wetland tours, and promote environmental stewardship in classrooms, at fairs, in malls—in short, *everywhere*. In Island County, there is no getting away from WSU Beach Watchers, even on the ferry.

[For more information, contact Donald Meehan, Island County/WSU Extension Agent, or Susan Burta, Program Assistant, WSU Beach Watchers, Cooperative Extension, PO Box 5000, Coupeville, WA 98239.]

SCS & Extension Join to Combat Rangeland NPS Pollution in California Coastal Zone

EDITOR'S NOTE: The University of California Extension Service has joined with USDA's Soil Conservation Service to establish a *Rangeland Watershed Program* to aid California's rangeland owners and managers "to voluntarily comply with the Clean Water Act and the Coastal Zone Management Act." The following information is geared to cattlemen and other rangeland users. We find this approach to voluntary compliance with the "enforceable management measures" of the Coastal Zone Reauthorization Act creative and imaginative as well as instructive. Congratulations.

To voluntarily comply with the Clean Water Act and Coastal Zone Management Act, rangeland owners and managers need to be able to identify rangeland water quality problems and develop appropriate management solutions. University of California Cooperative Extension and USDA Soil Conservation Service have initiated the Rangeland Watershed Program of education and technical assistance to help rangeland owners identify problems and develop management solutions.

Rangeland activities such as grazing, construction, mining, and recreation can contribute to water quality impairment as nonpoint sources of pollution. The vast area and critical position of rangeland in California's water supply system creates an opportunity for rangeland owners and managers to improve water quality throughout the state.

Nonpoint source pollution is the diffuse discharge of pollutants over extensive areas throughout the environment. As water flows over and through the ground it picks up pollutants, eventually depositing them into lakes, rivers, wetlands, coastal waters, or groundwater.

Soil erosion and sedimentation are the primary contributors to water pollution on rangeland. Erosion is a natural process that can be accelerated by ranch and grazing practices. When grazing removes too much of the vegetative cover, the soil is exposed to the erosive action of water and wind. Eroded soil subsequently becomes sediment, resulting in water quality degradation. Areas of high rainfall and steep slopes are most susceptible to upland erosion.

Streambanks and riparian areas subjected to heavy grazing and trampling by livestock frequently show instability and accelerated erosion along the stream channel. Widening of the channel and removal of streambank vegetation exposes streams to more sunlight and increases summer water temperature, which is detrimental to cold water species such as trout.

Nutrients and pathogens are other nonpoint source pollutants related to livestock grazing and other agricultural practices. Nutrient problems (usually nitrate and phosphate) are most likely where animals congregate for water, feed, salt, or shade. Coliform bacteria sometimes increase in rangeland streams with intense livestock use. Although fecal coliform bacteria are not pathogenic, they indicate that pathogens could exist.

Grazing strategies that maintain adequate vegetative cover and disperse livestock away from streams appear to be the best means of reducing sediment, nutrient, and pathogen loading. To obtain information about rangeland water quality, contact your county UC Cooperative Extension or local USDA Soil Conservation Service office.

[For further information on the Rangeland Watershed Program, contact Melvin R. George, Agronomy & Range Science, University of California, Davis, CA 95616-8515. Phone: (916) 752-1720. FAX: (916) 752-4361.]

Two Coastal Nonpoint Pollution Control Guidances Issued: Management Measures and Program Development and Approval

The recently published guidance issued under the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) represents an innovative approach for controlling nonpoint pollution. First, it presents a joint program — state water quality and coastal zone management agencies are to work together to develop and implement coastal nonpoint pollution control programs. These programs are to build upon and integrate existing state and local authorities and expertise. Second, the program will employ initial “technology-based” management measures throughout the coastal management area, to be followed by a more stringent water quality-based approach, where necessary, to address known water quality problems. Finally, the state coastal nonpoint program requires some insurance, in the form of state enforceable policies and mechanisms, that nonpoint source controls are actually implemented. Section 6217, applicable in the 29 states and territories with approved coastal zone management programs, include several of the Great Lakes states. As reported in *News-Notes #26*, EPA and NOAA have made two guidance documents available to assist states and others in meeting the new program requirements. The first document, “Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters,” is EPA’s technical guidance on ways to reduce or prevent nonpoint pollution in coastal waters. The second document, “Coastal Nonpoint Pollution Control Program — Program Development and Approval Guidance,” was developed by EPA and NOAA to provide a road map for states to develop the coastal nonpoint programs required by section 6217 in a timely and resource-efficient manner.

Management Measures Guidance

Congress required EPA, in consultation with NOAA and other federal agencies, to develop guidance specifying the best available, economically achievable, management measures to control nonpoint pollution in coastal waters. The measures reflect the greatest degree of pollutant reduction achievable through the application of best available technology, siting criteria, operating methods, or alternatives.

The guidance includes a chapter for each of five major categories of nonpoint pollution: agriculture, forestry, urban (including new development, septic tanks, roads, bridges, and highways), marinas and recreational boating, and hydromodification. Also included is a chapter describing ways that wetlands and riparian areas can be used to prevent pollution from a variety of sources. Each chapter contains the management measures with which state programs must conform. In addition, each chapter describes management practices that may be used to achieve the measure, activities and locations for which each measure may be suitable, and information on the cost and effectiveness of the measures and /or practices.

The management measures are described in terms of management systems rather than individual BMPs. Many of these systems include actions that reduce the generation of pollutants — a pollution prevention approach — as well as actions to keep pollutants from reaching surface or ground coastal waters. Measures range from traditional activities, such as erosion control, to more comprehensive strategies, such as watershed planning, to help minimize urban runoff.

Agriculture

The primary agricultural nonpoint pollutants are nutrients (particularly nitrogen and phosphorus), sediments, animal wastes, pesticides, and salts. The guidance proposes the following measures:

Sediment/erosion control—The goal of this measure is to minimize the delivery of sediment from agricultural lands to receiving waters. Land owners have a choice of one of two approaches: (1) apply the erosion component of the USDA Conservation Management System through such practices as conservation tillage, strip cropping, contour farming, and terracing or (2) design and install a combination of practices to remove settleable solids and associated pollutants in runoff for all but the larger storms.

Confined animal facility control (e.g., feedlots) measure—The management measure for all new facilities and existing facilities over a certain size is to limit discharges from confined animal facilities to waters of the United States by storing wastewater and runoff caused by all storms up to and including the 25-year, 24-hour frequency storm. For smaller existing facilities, the management measure is to design and implement systems that collect solids, reduce contaminant concentrations, and reduce runoff to minimize the discharge of contaminants in both facility wastewater and runoff caused by all storms up to and including 25-year, 24-hour frequency storms. This measure also specifies management of stored runoff and solids through proper waste utilization and use of disposal methods that minimize impacts to surface/groundwater.

Nutrient management — This measure calls for development and implementation of comprehensive nutrient management plans including a nutrient budget for the crop, identification of the types and amounts of nutrients necessary to produce a crop based on realistic crop yield expectations, and an identification of the environmental hazards of the site.

Pesticide management — This measure is designed to minimize water quality problems by reducing pesticide use, improving the timing and efficiency of application, preventing backflow of pesticides into water supplies, and improving calibration of pesticide spray equipment. A key component of this measure is use of integrated pest management (IPM) strategies.

Livestock grazing — The goal of this measure is to protect sensitive areas including streambanks, wetlands, estuaries, ponds, lake shores, and riparian zones. Protection is to be achieved with improved grazing management that reduces the physical distance and direct loading of animal waste and sediment caused by livestock by restricting livestock access to sensitive areas through a range of options.

Irrigation — This measure promotes an effective irrigation system that delivers necessary quantities of water yet reduces nonpoint pollution to surface waters and groundwater. The measure calls for uniform application of water based on an accurate measurement of crop water needs and the volume of irrigation water applied. The measure also recognizes that conflicting state water laws will take precedence over the measure.

Forestry

The impacts associated with silvicultural activities vary depending on site characteristics, climatic conditions, and the forest practices employed. Pollutants commonly associated with forestry include sediment, nutrients, pesticides, and temperature variations in surface water. The forestry measures include

Preharvest planning — The objective of this measure is to ensure that silvicultural activities, including timber harvesting, site preparation, and associated road construction, are conducted in a way that takes into account potential nonpoint pollution of surface waters. It requires a preharvest planning process to address key aspects of forestry operations relevant to water quality.

Streamside special management areas — This measure establishes areas along surface waters that are managed to protect the adjacent water body, including the protection of trees that shade the water and moderate water temperatures.

Road construction/reconstruction — The purpose of this management measure is to reduce sediment from road construction or reconstruction. This is to be accomplished by following the preharvest plan layouts and designs for the road system, incorporating adequate drainage structures, and properly installing stream crossings.

Other forestry management measures include measures for road management, timber harvesting, site preparation and forest regeneration, fire management, revegetation of disturbed areas, forest chemical management, and wetland forest management.

Urban

Urbanization has many impacts on coastal waters. The major pollutants found in urban runoff include sediment, nutrients, oxygen demanding substances, road salts, heavy metals, petroleum hydrocarbons, pathogenic bacteria, and viruses. The urban measures include a range of preventative and remedial activities.

New development management — The new development management measure is intended to mitigate the effects of new development on water quality. This measure specifies that runoff from new development be managed so as to meet two conditions:

- (1) The average annual total suspended solid (TSS) loadings after construction is completed are reduced by 80 percent or are no greater than pre-development loadings; and
- (2) To the extent practicable, post-development peak runoff rate and average volume are maintained at levels that are similar to pre-development levels.

Watershed protection/site development — The purpose of these measures is to encourage comprehensive planning for development on a watershed scale and for small-scale site development as well, including planning and designing to protect sensitive ecological areas, minimize land disturbances, and retain natural drainage and vegetation whenever possible.

Construction erosion and sediment control — A sediment and erosion control plan should be developed and approved prior to land disturbance. This measure applies to construction sites of less than 5 acres. (Sites greater than 5 acres are addressed through NPDES stormwater regulations. See *News-Notes*, #27.)

Construction site chemical control — This measure addresses limiting the application, generation, and migration of chemical contaminants (i.e., petrochemicals, pesticides, nutrients) and providing proper storage and disposal.

Existing development — This measure addresses reduction of pollution loadings from previously developed areas. Watershed management programs should be developed to identify sources, specify appropriate controls (such as retrofitting or the establishment of buffer strips), and provide an implementation schedule.

New onsite sewage disposal systems (e.g., septic tanks) — The measure specifies that new onsite disposal systems (OSDS) are to be designed, installed, and operated properly and to be situated away from open waterbodies and sensitive resources such as wetlands and floodplains. Protective separation between the OSDS and the groundwater table is to be established.

In addition, management measures have been specified for the following: existing onsite disposal systems; pollution prevention; siting roads, highways, and bridges; construction projects for roads, highways, and bridges; construction site chemical control for roads, highways, and bridges; operation and maintenance measure for roads, highways, and bridges; and runoff systems for roads, highways, and bridges.

Marinas

Marinas, by their nature, are located on the water's edge. Pollutants from boats or marina maintenance area runoff are often not buffered. Potential impacts include dissolved oxygen deficiencies and high concentrations of toxic metals in aquatic organisms. In addition, construction of new marinas can lead to destruction of sensitive ecosystems. The marina measures focus on siting, design, and operation.

Marina flushing — The measure requires that marina siting and design allow for maximum flushing of water through the site.

Water quality assessment — This measure specifies that water quality be considered in the siting and design of both new and expanding marinas.

Habitat assessment — Marinas should be designed and located to protect against adverse impacts on shellfish resources and other important habitat areas as designated by local, state, or federal governments.

Stormwater runoff — This measure, which applies to runoff from the marina site only, specifies implementation of runoff control strategies that include the use of pollution prevention activities and the proper design of hull maintenance areas. At least 80 percent of suspended solids must be removed from stormwater runoff coming from hull maintenance areas.

Sewage facilities — To prevent the discharge of sewage directly to coastal waters, new and expanding marinas are to install pumpout, pump station, and restroom facilities where needed.

Additional marina management measures include shoreline stabilization, fueling station design, solid and fish waste management, liquid materials management, petroleum control, boat cleaning, public education, maintenance of sewage facilities, and boat operation.

Hydromodification

Hydromodification activities include channelization and channel modification, dams, and streambank and shoreline erosion. Results of hydromodification frequently include habitat impacts, sedimentation, and temperature impacts. The following are the hydromodification management measures:

Channelization and channel modification — The measure requires physical and chemical characteristics of surface waters to be considered when planning hydromodification activities. A measure for instream and riparian habitat restoration for channelization and channel modification is also included.

Dams — Three management measures for dams relate to construction, operation and maintenance. The measures include an erosion and sediment control measure, a chemical and pollutant control measure, and a measure for the protection of surface water quality and instream and riparian habitat.

Streambank and shoreline erosion — Eroding streambanks and shorelines should be stabilized where streambank and shoreline erosion is a nonpoint source problem. Vegetative measures such as marsh creation and vegetative bank stabilization are the preferred methods.

Wetlands

Wetlands and riparian areas provide a number of benefits including nonpoint pollution control. Changes to hydrology, geochemistry, substrate, or species composition may impair the ability of a wetland or riparian area to function properly. The measures are

Protection of wetlands and riparian areas — The purpose of this measure is to maintain the water quality benefits of wetlands and riparian areas to prevent them from becoming a source of nonpoint pollution.

Restoration of wetlands and riparian areas — This measure promotes the restoration of pre-existing wetland and riparian areas where the restoration of such systems will have a significant nonpoint source pollution abatement function.

Engineered vegetated treatment systems — This measure promotes the development of artificial wetlands or vegetated treatment systems to serve a nonpoint source pollution abatement function.

Program Development and Approval Guidance

The management measures guidance will be implemented through state coastal nonpoint programs. These programs will for the first time bring together the land use management expertise of state coastal zone management agencies and the water quality expertise of the state 319 agencies to address this important water quality problem. States are to build on existing Clean Water Act section 319 nonpoint source management programs and the coastal zone management programs approved under section 306 of the Coastal Zone Management Act.

The program guidance describes requirements for each state program to be approved by EPA and NOAA. States must address such issues as where the program will operate geographically, how the management measures should be selected and implemented, and how the program should be coordinated with other state, local, and federal programs. If EPA and NOAA disapprove of a state program, reductions in that state's 319 and 306 grants will occur.

Geographic scope — Where do the state programs apply?

As directed by section 6217(a), the geographic scope of each state coastal nonpoint program must be sufficient to ensure implementation of management measures to "restore and protect coastal waters." In the guidance, this area is known as the "6217 management area." As required by the statute, NOAA has reviewed the existing state coastal zone management boundaries and has made recommendations to the states on the area necessary to control nonpoint source pollution from land and water uses that have a significant impact on a state's coastal water. A state may respond to this recommendation by either modifying the coastal zone

boundary to implement NOAA's recommendation or by identifying other state authorities to implement the coastal nonpoint program throughout the 6217 management area. For example, a state may have a forest practices act that ensures implementation of the forestry management measures throughout the 6217 management area. Such state authorities must be networked into the state coastal nonpoint program.

Implementation of management measures

State programs must include management measures "in conformity" with those specified in EPA's management measure guidance. In general, the presumption is that states will implement all the management measures for the source categories (e.g., agriculture, forestry) specified in EPA's management measures guidance throughout their 6217 management area. However, states have the opportunity to exclude certain nonpoint source categories or subcategories in limited situations. States may exclude certain sources if they can demonstrate either (1) the source is neither present nor reasonably anticipated in an area, or (2) that sources do not, individually or cumulatively, present significant adverse effects to living resources or human health. Exclusions will likely need to be demonstrated on a watershed or local basis.

States will also have some flexibility adopting either the measure specified in EPA's guidance or an alternative measure to better meet local conditions. However, states must demonstrate that alternative measures are as effective as EPA measures in controlling coastal nonpoint pollution.

Coastal nonpoint programs must also provide information on how the state will implement the measure. States will need to ensure the implementation of management measures through the use of enforceable policies and mechanisms. These can range from traditional regulatory activities to innovative incentive programs. Incentive programs must be backed by state authorities to ensure implementation of the management measures.

Other program requirements

In addition to implementing the technology-based management measures specified in EPA's guidance document, states must also describe their process for implementing additional management measures needed to attain or maintain water quality standards or designated uses in coastal waters. These additional management measures will be determined by the states.

States are expected to provide technical assistance to local governments in implementing the additional measures. Opportunities for public participation throughout the development and implementation of state coastal nonpoint programs are also required.

Schedule

States have until July 1995 to submit programs to EPA and NOAA for review and approval. The federal agencies have until January 1996 to review the programs. Once approval is granted, the states have three years (until January 1999) to implement the technology-based management measures. EPA and NOAA have provided a two-year monitoring period (until January 2001) for states to assess the effectiveness of the measures. States then have an additional three years (until January 2004) to implement additional measures where necessary to attain or maintain water quality standards.

EPA and NOAA are committed to the successful implementation of CZARA. The agencies welcome questions on the program and will continue to provide programmatic and technical assistance during the development of state coastal nonpoint programs to states, local governments, and other interested parties.

Congress passed section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (codified as 16 USC s. 1455b) to give special protection to coastal waters in light of increasing beach closures, shellfish harvesting prohibitions, and the loss of biological productivity.

For more information or for copies of the documents, contact NPS Control Branch, WH-553, U.S. EPA, 401 M St., SW, Washington, DC 20460. The management measures are also available on the NPS BBS. See page 24 for more information.

[The management measures guidance (EPA 840-B-92-002) and the program development and approval guidance may be ordered free from EPIC, 11029 Kenwood Road, Bldg. 5, Cincinnati, OH 45242. For further information, contact Stuart Tuller at EPA, (202) 260-7112; or Marcella Jansen at NOAA, (202) 606-4181.]

Notes on Agriculture

American Farm Bureau Federation Shares Perspective on Lessons Learned from the National Rural Clean Water Program

EDITOR'S NOTE: Jim Porterfield, Associate Director, Natural Resources Division of the American Farm Bureau Federation, sent the following material to *News-Notes* with a note. He said, "While I did the vast majority of writing . . . I did have direct input from about a dozen individuals. Most of them and I attended the National RCWP Symposium in Orlando, Florida, in September 1992. It is based solely on our notes and impressions from that meeting and our collective experiences with water quality issues and projects. We feel it would detract from the purposes of the paper to list anyone as the author."

While there may not be total agreement on all of the points made, we print this contribution in the interests of a continuing dialogue on the subject of effective clean water projects where agriculture is the predominate land use.

The document was co-signed by all state farm bureau federations, some 14 commodity associations, five agricultural industries, and seven others, including trade associations. Thanks for your contribution, Jim.

The Rural Clean Water Program (RCWP) was a 10-year pilot program for assessing the effectiveness of agricultural nonpoint source pollution control practices. The program ran from 1980 to 1990.

The RCWP culminated in a symposium in Orlando, Florida, in September 1992. About 260 federal, state, and local agency staff and 40 to 50 private sector representatives heard 43 presentations about the 21 nationwide pilot projects included in the RCWP.

Overall Impressions: The RCWP pilot program and the final RCWP symposium have been valuable because extensive information was gathered in a coordinated manner on nonpoint source pollution. Efforts should be made to fully brief key federal officials who were unable to participate in either the projects or the symposium. Also, this information should be helpful to those who are currently involved with new or proposed watershed projects.

Specific impressions and suggestions for future improvements

■ **Voluntary Programs Are Key.** Most of the presenters at the symposium were supportive of voluntary nonpoint source control efforts with emphasis on education, technical assistance, and incentives to landowners. We endorse this approach. Involvement of producers, local agribusiness, conservation districts, and other local government agencies must occur from the outset of any project. Local "ownership" of the project is important.

■ **Cost-share Necessary.** RCWP projects found cost-share monies were necessary for implementation of many BMPs, especially certain manure management practices, which are cost-prohibitive without financial assistance. Availability of cost-share funds will be important to the success of future projects.

■ **Useful Federal Initiatives.** Several good things happened with the RCWP including (1) the project was funded in full and up front, (2) a federal review team that retained a stable membership throughout the program helped resolve problems and make mid-course corrections, and (3) the overall information and evaluation was contracted with North Carolina State University. We must continue these successes.

■ **Better Scientific Assessment and Monitoring Needed.** Scientifically accepted, peer-reviewed monitoring programs are crucial to any water quality improvement effort. Many agricultural BMPs were attempted for the purpose of improving water quality, but some monitoring programs were not as comprehensive or evaluative as needed to determine levels of improvement. Also, sound baseline information should be developed from which future change can be measured. In the future, additional professional consultation on the design, management, and follow through on monitoring programs will repay projects by providing a better understanding of the potential water quality improvements, possible via best management practices. Pre-implementation monitoring is needed to explain existing situations and historical loadings from wildlife and naturally occurring pollutants. Measurements of water quality improvement should also be taken in the inflows, not just within the receiving waterbody, since other dynamics come into play.

■ **Lengthy Lag Time to Water Quality Improvement.** Year-to-year variability in weather can mask actual water quality improvement. In addition, lag time between BMP adoption and water quality change can be several years or more. For example, several speakers pointed out that phosphorus (P) levels in lake water did not change much, even though the total amount of P coming into the lake was greatly reduced. This appears to be due to natural cycling processes from P contained in the lake sediment and P load levels within the soil/subsoil system. Once BMPs are instituted, considerable time will elapse before a new equilibrium is established. Similar findings occurred with pesticides. Care must be taken that designers of new projects consider the potential for phosphorus resuspension from lake sediments and residual high phosphorus levels in soils to delay apparent water quality improvements.

■ **Soil Erosion Control Efforts Still Vital.** Despite the new focus on water quality, soil erosion control should not be forgotten, as its benefits of reducing sediment movement and transport of agricultural chemicals into surface water are substantial. Stream bank and stream bottom erosion need further evaluation as naturally occurring sources of sediment and pollutants.

■ **Manure Management.** Human and animal manure management, including containment and land application, appear to be major components of water quality issues. Total nutrient movement into and out of watersheds needs to be evaluated (commercial nutrients, livestock, grain, urban waste, runoff).

■ **Attitude Pre-tests Needed.** In the future, conducting random pre-tests of farmers' attitudes and perceptions about nonpoint source pollution and the proposed project would be beneficial.

■ **Post Project Survey.** A follow-up evaluation three years after the project's completion should be done to determine if practices are still performing as designed, and if not, why not.

■ **Education is Key.** Education is the key for program success and should include planners, implementors, and producers.

American Farm Bureau Federation Consensus Nonpoint Source Water Quality Project Checklist

Following is a checklist of ideas and tactics gleaned from the National Rural Clean Water Program Symposium held September 13-17, 1992, in Orlando, Florida, and from other sources. We feel these are key to efficiently and successfully implementing any new federal, state, or local water quality programs or projects on a watershed basis.

We encourage program managers to develop a project checklist by integrating their ideas with the following points. In general, projects should:

- have a clearly stated goal, supported by realistic assessment of the problem and the feasibility of solving it;
- stress voluntary participation through education, technical assistance and incentives, and emphasize project benefits;
- stress target audience involvement at project initiation;
- target areas where realistic water quality benefits can be maintained and/or obtained. It should be recognized that because of forces of nature or the natural environment, some areas may not respond to water quality treatments;
- concentrate on one-on-one education and demonstration programs;
- have full funding for the project committed up front;
- include necessary cost-share funds;
- be long-term (10 years) in order to understand causes of nonpoint source pollution and the effects BMPs have on water quality;
- have a clear understanding of BMPs already in place prior to the study;
- have adequate pre-implementation assessment and monitoring;
- evaluate all sources of potential pollutants that might override water quality improvements produced by individual BMP practices (e.g., phosphorus loading and cycling from existing lake bottom sediments, existing soil nutrient concentrations, erosion from stream banks, point sources, and non-agricultural nonpoint sources). If necessary, take additional measurements to demonstrate that BMPs are producing water quality improvements that will succeed in the long-term;
- evaluate land uses in detail for each year for *all* land in project, regardless of participation. (Actual water quality improvements produced by a majority of the farmers upstream can be underestimated because of impacts of a few non-participating landowners preceding the monitoring station);
- have a written, agreed upon, plan (protocol) and time lines;
- have sufficient funding to accomplish scientific assessment and evaluation, which should include measurements such as long-term continuous flow discharge records and flow proportional sampling. (This may require anywhere from 10 to 50 percent of the budget);

(continued)

Project Checklist continued . . .

- have a separate, independent group of recognized experts/professionals overseeing design and implementation of monitoring and analyses procedures, and evaluation of data; and
- measure participating and non-participating landowner and other interested groups attitudes and perceptions pre- and post-project.

Local project teams should

- implement processes for getting people to work together. One of the best processes involves five crucial steps that should be taken in the following order:

Step #1 is the most crucial part of working together on any local project. It must be done first and foremost to ensure an efficient and successful project— too often people want to jump right to step #4 and ignore the first three steps.

Step # 1. At the first meeting develop a written statement of group's beliefs that are relevant to the project.

Step # 2. Determine wants/needs of group members relative to the issue and prioritize them.

Step # 3. Develop and agree on obtainable, measurable written objectives for priority wants/needs.

Step # 4. Develop plan of implementation for the most significant objectives including (a) necessary resources of persons, finances, equipment, time and space, and (b) appropriate techniques (committees, meetings, training sessions, newsletters, tours, demonstration projects, etc.).

Step # 5. Periodically evaluate group's performance against the plan of implementation and make adjustments to plan or to written beliefs, if necessary.

- recognize existing accomplishments of farmers and ranchers. Don't incriminate; instead, say "Let's build and do better";
- develop and agree upon at the start of the project a written set of limitations about what the project *can't* do;
- staff for adequate one-on-one educational and technical assistance with landowners who choose to change practices. Project organizers should also work closely with Extension Service and Vo-ag instructors;
- tailor BMPs to the local situation or objective;

- make producers aware, up front, of both the positive and negative economic potentials of every BMP. Positive economic benefits, coupled with environmental effectiveness, are very powerful motivational forces;
- use small watersheds (no bigger than the size of county, preferably smaller);
- be an interagency and interdisciplinary effort;
- include a local coordinating committee of *no more* than seven to 11 members. Landowners should compose at least 1/3 to 1/2 of the committee;
- have core project staff designated from participating agencies;
- have a project coordinator who is retained for the life of project;
- agree upon a system of regular two-way communication between Local Coordinating Committee and State Coordinating Committee;
- establish, in advance, estimates of the necessary quality of data recorded to demonstrate impact of BMPs;
- involve secretarial staff of all participating agencies. They should meet with project leaders near the start of the project to help develop key reporting forms that will be used to document project progress and results;
- do things designed to bring the team together, such as
 - a) post a large 6'x 7' map or aerial photo in the central meeting room or "war room" for the group
 - b) have some "fun" meetings every once in a while (tours, barbecues)
 - c) give awards and public recognition to those who adopt BMPs
- meet with local land improvement contractors up front;
- share ideas with other local area conservation projects early on. (The state coordinating committee should be responsible to ensure the "best" approaches are circulated where relevant to other groups);
- allow participation in certain project meetings to count as credits towards pesticide applicator certification to encourage participation and hold attention at meetings;
- develop an information and education program including regular newsletters, printed information, and fact sheets;
- keep everyone updated on progress (successes and failures) of the project; and
- develop a plan to generate local media coverage, including new releases, and a designated media contact person for the project.

[For more information, contact Jim Porterfield, American Farm Bureau Federation, 225 Touhy Avenue, Park Ridge, IL 60068. Phone (312) 399-5700. FAX (312) 399-5896.]

NPS Electronic Bulletin Board (BBS) News

How To Use NPS Electronic Bulletin Board (BBS) News

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

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

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

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

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

Coastal NPS Management Measures Can Now Be Downloaded

To facilitate the exchange of information regarding the Coastal Nonpoint Source Pollution Control Program, the NPS BBS has established an online library devoted to coastal NPS management measures. File area 3 on the Main Board now holds all the management measures in EPA and NOAA's "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters" required by section 6217(g) of CZARA, commonly referred to as the 6217(g) Guidance.

The document, which in its printed form weighs three and a half pounds, has been broken down into 23 files for easy downloading of the specific sections that interest you. Another file contains ASCII versions of fact sheets that summarize various aspects of the 6217(g) Guidance and its companion document, "Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance."

The individual fact sheets on the various management measures are also on the BBS as bulletins, so you can read them online before you download.

To view the list of files in the coastal NPS file area, type **f 3** at the "Main Board Command?" prompt. To speed downloading time, all of the files are compressed or "zipped." If you don't already have an unzipping utility called PKUNZIP, you will need to download PKZ110.EXE also.

Watershed Registry Better Late than Never

In other BBS news: we didn't mean to jump the gun, honest we didn't. In our last issue of *News-Notes*, we prematurely announced the new Watershed Registry before it was actually online. You'd think we'd learn. . . . But, it IS online now, so please log on and log in.

Datebook

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

Meetings and Events

1993

April

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- 2-3 *Transportation Planning for Livable Communities*, San Francisco, CA. Contact: National Trust, Transportation Conferences, 1785 Massachusetts Ave, NW, Washington, DC 20036. (202) 673-4100 or (800) 937-6847. Regional conferences to bring together citizens and transportation professionals. Discussion will focus on the New Intermodal Surface Transportation Efficiency Act (ISTEA).
- 6-8 *Bear River Water Quality Symposium*, Logan, UT. Contact: J. Kent Hortin, Bear River RC & D, 1260 North 200 East, Suite #4, Logan, UT 84321. (801) 753-3871. Cooperative effort of Bear River RC&D, Bear Lake Regional Commission, and the Ecosystem Research Institute.
- 4-8 *25th International Symposium on Remote Sensing and Global Environment Change*, Graz, Austria. Contact: Nancy Wallman, ERIM, Box 134001, Ann Arbor, MI 48113-4001. (313) 994-1200. FAX:994-5123.
- 20-22 *National Agriculture Nutrient Management Conference*, St. Louis, MO. Contact: Lyn Kirschner, CTIC, 1220 Potter Dr., Room 170, West Lafayette, IN 47006-1383. (317) 494-9555.
- 23-24 *Transportation Planning for Livable Communities*, Atlanta, GA. See listing for April 2-3.
- 27-29 *Northeast Watershed Monitoring Workshop*, Moravia, NY. Contact: Deb Grover, Watershed Monitoring Workshop, 110 Fernow Hall, Department of Natural Resources, Cornell University, Ithaca, NY 14853-3001. (607) 255-2114. For educators and volunteers from Maryland to Maine, including West Virginia and District of Columbia. The *NPS Electronic Bulletin* will be demonstrated at this workshop. Space is limited.
- 30-5/1 *Transportation Planning for Livable Communities*, Winter Park, FL. See listing for April 2-3.

May

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- 4-5 *Joint USGS-USNRC Technical Workshop on Research Related to Low-Level Radioactive Waste Disposal*, Reston, VA. Contact: Peter Stevens, USGS, (703) 648-5721, FAX: (703) 648-5295; or Thomas J. Nicholson, NRC, (301) 492-3856, FAX: (301) 492-3696. Topics include surface water and groundwater pathway analysis, groundwater chemistry, infiltration and solute transport, vapor-phase transport of volatile radionuclides, and groundwater flow and solute transport field studies.
- 5-7 *Enhancing the State's Lakes Management Programs: Strengthening Local Lake and Watershed Protection Efforts*, Chicago, IL. Contact: Bob Kirsner, NE IL Planning Commission, Natural Resources Dept., 400 W. Madison Street, Room 200, Chicago, IL 60606. (312) 454-0400. FAX: 454-0411. Sponsored by U.S. EPA, Region 5, Clean Lakes Program. Coordinated by Northeastern Illinois Planning Commission in cooperation with North American Lake Management Society. Will focus on cooperation among state lake programs, state lake associations, and local lake management. Long-term protective strategies explored.
- 7-8 *Solutions for the Future: Actions for the Present, 1993 Merrimack River Watershed Management Conference*, Bedford, NH. Contact: Barbara Rich or Tom Groves, New England Interstate Water Pollution Control Commission, 85 Merrimac St., Boston, MA 02114.
- 15-21 *2nd USA/CIS Joint Conference on Environmental Hydrology and Hydrogeology*, Arlington, VA. Contact: Helen Klose, American Inst. of Hydrology, 3416 University Ave., SE, Minneapolis, MN 55414-3328. (612) 379-1030.
- 25-28 *From Rio to the Capitols—State Strategies for Sustainable Development*, Louisville, KY. Contact: Ann James, Office of the Governor, Room 103, State Capitol, Frankfort, KY 40601. (502) 564-2611. FAX: 564-2517. For information on exhibits, contact G.R. Promotions, 4868 Cloverhill, Cincinnati, OH 45238-6106. (800)288-3248. The purpose is to educate decision-makers about sustainable development and methods to address job creation and environmental preservation. The conference will feature successful case studies as models.

June

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- 11-13 *Federation of Lake Associations Tenth Annual Conference: "Strategies for Protecting Water Quality,"* Clinton, NY. Contact: Federation of Lake Associations, 2175 Ten Eyck Avenue, Cazenovia, NY 13035. (315) 655-4760 or (315) 655-9777. Focus is on techniques that can be applied by the average citizen. Topics range from individual lake association success stories to strategies for a statewide approach to lake management.

1993

June

- 14-16 *Water Organizations in a Changing West*, Boulder, CO. Contact: Katherine Taylor, Conference Coordinator, University of Colorado, School of Law, Campus Box 401, Boulder, CO 80309-0401. (303) 492-1288. FAX: 492-1297. Sponsored by the Natural Resources Law Center of the University of Colorado School of Law. Conference will address the broad array of issues facing both urban and agricultural water supply organizations in the West.
- 23-26 *Environmental Education 2000: Building a Solid Foundation for the Future*, Leesburg, VA. Contact: Alliance for Environmental Education, 51 Main Street, P.O. Box 368, The Plains, VA 22171. (703) 253-5812. FAX: 253-5811. Topics: successful model programs, innovative networking, corporate/industry programs, university research, government programs, and computer use.

July

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

August

- 9-13 *Prairie Ecosystems: Wetland Ecology, Management and Restoration*, Jamestown, ND. Contact: Dr. Ned Euliss, U.S. Fish and Wildlife Service, Northern Prairie Res. Center, RR 1, Box 96C, Jamestown, ND 58401.
- 14-19 *International Symposium on Soil and Plant Analysis*, Olympia, WA. Contact: Benton Jones, Jr., 183 Paradise Blvd., Suite 108, Athens, GA 30607. (706) 548-4557.

September

- 19-24 *First International IAWPRC Specialized Conference on Diffuse (Nonpoint Source) Pollution: Sources, Prevention, Impact and Abatement*, Chicago, IL. Contact: Dr. Vladimir Novotny, IAWPRC Conference, Dept. Civil & Envir. Engineering, Marquette University, 1515 West Wisconsin Ave., Milwaukee, WI 53223. (414) 288-3524. FAX: 288-7082.
- 28-29 *Symposium on Agricultural Nonpoint Sources of Contaminants: A Focus on Herbicides*, Lawrence, Kansas. Contact: Larry Ferguson, U.S. EPA, 726 Minnesota Ave., Kansas City, KS 66101. (913) 551-7447. Topics: health and environmental impacts of herbicides, the regulatory implications, and management of herbicides to minimize environmental impacts. Cosponsored by EPA and USGS.

October

- 2-7 *1993 Water Environment Federation Annual Conference*, Anaheim, CA. Contact: Maureen Novotne, WEF, Technical & Educational Serv., 601 Wythe St., Alexandria, VA 22314-1994. (703) 684-2400.
- 4-8 *International Symposium on the Ecological Effects of Arctic Airborne Contaminants*, Reykjavik, Iceland. Contact: Debra Steward, Technical Resources, Inc., 3202 Tower Oaks Blvd., Suite 200, Rockville, MD 20852.

November

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

December

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

Calls For Papers — DEADLINES

1993

April

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

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

Hal Wise (Terrene Institute-grantee), Editor; Elaine Bloom (TetraTech-contractor) Associate Editor. Contributors: Susan V. Alexander (EPA, Region VI), Anne Weinberg (EPA-Assessment and Watershed Protection Division), Margherita Pryor (EPA-Oceans and Coastal Protection Division), Sherri Fields (EPA-Wetlands Division), John Reeder (EPA-Office of Ground Water and Drinking Water), and Kim Hankins (EPA-Stormwater Outreach Coordinator, NPDES Program Branch, Office of Wastewater Enforcement and Compliance). Unless otherwise attributed, all material in this bulletin has been prepared by the editors and the views expressed are not statements of EPA policy, unless specifically identified as such, and do not necessarily reflect the views of EPA. Mention of commercial products or publications does not constitute endorsement or recommendation for use by EPA.

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