

EPA News-Notes

The Condition of the Environment and The Control of Nonpoint Sources of Water Pollution

A Commentary . . .

Workshop Proceedings Provide Valuable "Hands-On" Info

We want to come right out and put in a plug for a new publication, and that publication is the proceedings of last January's *Nonpoint Source Watershed Workshop* held in New Orleans (see article on next page). The workshop was jointly sponsored by EPA's Office of Water Nonpoint Source Control Branch and the Office of Research and Development Center for Environmental Research Information. There are a couple of important things that set this publication apart and make it special, in our opinion.

- **First**, there were thirty-four papers given at the workshop in ten significant areas of nonpoint management concern and four case studies that gave workshop participants the opportunity to apply management techniques to actual nonpoint source pollution problems. *All* of the papers are included in the proceedings as well as complete reports on the case studies and participant discussions and conclusions. The completeness of the reporting is refreshing and welcomed.
- **Second**, all of the papers and the case studies cover vital, contemporary, areas of nonpoint source management concern. They were all prepared by practitioners in the field that are dealing, on a day-to-day basis, with the issues presented. The results are fresh and meaningful.

We here at *NPS News-Notes* are in the *NPS Information Exchange* business along with our companion effort, the *NPS Electronic Bulletin Board System (BBS)*. We are painfully aware of the shortcomings in the available nonpoint literature. There simply is not available an all inclusive text on nonpoint source management. Nor do we see such a compendium becoming available in the foreseeable future.

This *Seminar Publication, Nonpoint Source Watershed Workshop* proceedings, comes as close to covering the broad watershed/nonpoint concerns as we have seen yet. It might not have everything in it but it is a very good beginning — and a way to organize your thinking about the watershed management assignment. Further, the emphasis here is on process rather than on simple technical solutions.

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Our advice to the nonpoint/watershed management practitioners out there is to phone (or FAX) the Center for Environmental Research Information right now and order your copy. (The phone (or FAX) numbers are at the end of the article on the Workshop below.) This publication is information exchange at its best.

The sponsors of the Watershed Workshop are to be congratulated for getting a handle on a very broad, complicated subject.

Headquarters Notes of Interest

Wetlands Division Considering Opening Mini Electronic Bulletin Board on NPS BBS

The Wetlands Division within EPA's Office of Wetlands, Oceans and Watersheds is looking into the possibility of starting a mini bulletin board, or Special Interest Group (SIG) Forum, on wetlands and nonpoint source pollution for the Nonpoint Source Bulletin Board System (NPS BBS). Users of a SIG Forum would be able to send and receive messages, read bulletins on current wetlands issues, and download text and software files, all via their personal computers.

The relationship between wetlands and nonpoint source is an important one. Wetlands, as "waters of the U.S.," are valuable resources that are protected from adverse impacts by several provisions of the Clean Water Act. Yet, since many wetlands provide water quality improvement functions, protection and restoration of wetlands can be incorporated into watershed-based approaches to control nonpoint source runoff and improve water quality of adjacent or downstream waterbodies.

At present, the Wetlands Division is gauging the need for a Wetlands SIG Forum, assessing the type of information that could be covered, and identifying individuals who may be available to answer technical questions. If you are interested in using a Wetlands SIG Forum, have ideas about what issues could be covered, or know someone who would be available to answer technical questions on line, please call Benjy Ficks (202-260-1901) or Sherri Fields (202-260-1932) or contact us on the NPS BBS under the user name "Benjy Ficks" by Nov. 11.

Nonpoint Source Watershed Workshop Proceedings Available

The proceedings from the Nonpoint Source Watershed Workshop are now available. The workshop, held in New Orleans, LA, January 29-31, 1991, was jointly sponsored by EPA's Nonpoint Source Control Branch and the EPA Center for Environmental Research Information. The publication, titled *Seminar Publication — Nonpoint Source Watershed Workshop* (EPA 625/4-91/-27), has been produced through the cooperative efforts of these two offices.

A total of 183 people, representing a broad spectrum of individuals involved in watershed management and planning and the control of nonpoint source water pollution, participated in the workshop.

The workshop effectively combined formal presentations and small workgroup sessions to facilitate the exchange of information relating to the development and implementation of nonpoint source pollution control projects. In particular, the restoration and protection of water quality on a watershed basis was emphasized.

The papers that were presented at the workshop are included in the proceedings. Ten topics were addressed:

- Water Quality Problem Identification in Priority Watersheds
- Developing Goals and Objectives for Watershed Projects
- Designing Institutional Arrangements That Work
- Developing the Watershed Plan
- Site Planning and Selection of Nonpoint Source Controls
- Developing a Monitoring System
- Building Successful Technology Transfer Programs

- Planning and Implementing an Effective Information and Education Program
- Evaluating a Nonpoint Source Watershed Implementation Project
- Innovative State and Local Regulatory Programs that Support Local Nonpoint Source Projects

Presentations addressed watershed management in both urban and rural settings. To complement the presentation of papers, the workshop also included an opportunity for participants to apply watershed management techniques to actual nonpoint source pollution problems. The proceedings include the case studies used at the workshop, questions that were used to guide the discussions, and a summary of conclusions that were reached. At the workshop, small groups discussed the case studies and developed potential solutions to watershed problems from the following locations:

- Urban Setting — Barnstable, Massachusetts
- Eastern Agricultural Setting — Grove Lake, Minnesota
- Western Agricultural Setting — Otter Creek, Utah
- Forestry Setting — South Fork Salmon River, Idaho

The use of formal presentations and case study discussions proved to be an effective technology transfer format. By intertwining small group discussions through the program, participants could apply watershed management concepts described during the presentations to actual problem situations.

The proceedings can be obtained at no charge from the Center for Environmental Research Information in Cincinnati, Ohio. Orders can be placed by telephone (513) 569-7562/FTS 684-7562, or FAX (513) 569-7566/FTS 684-7566. A copy of the proceedings will be sent to all workshop participants.

Planning Ahead for New Pesticide Standards for Drinking Water

Some states are moving ahead to design prevention-oriented programs to head off problems in meeting new drinking water standards for pesticides in public water supplies. Under EPA drinking water regulations announced in January 1991, states must adopt new drinking water standards for 33 potential drinking water contaminants, including 18 pesticides. The regulations concern all public water supplies — both groundwater and surface water systems.

The regulations become effective in July 1992. However, monitoring for pesticides will be phased in after that time, thus allowing a "window of opportunity" for states to institute watershed and groundwater protection measures to keep pesticides out of drinking water supplies. States and water supply systems will have incentives to pursue prevention approaches, since high quality source waters will reduce the likelihood that expensive water treatment will be necessary.

The Office of Groundwater and Drinking Water is now exploring plans for communicating the implications of the new rules to the agricultural community, USDA, and state agencies. Some of the Farm Bill tools and efforts under the President's Water Quality Initiative could be used to address known or suspected problems with agricultural chemicals in drinking water supplies. Updates on these efforts will be provided periodically in *News-Notes*.

[For more information contact: John Reeder, Office of Groundwater and Drinking Water (WH-550), U.S. EPA, 401 M Street, SW, Washington, DC 20460. Phone: (202) 260-5512.]

Notes from The States and Localities (where the action is)

A 319 Project to Save Trout Threatened by Nonpoint Source Pollution

Concern about a federally listed threatened trout species is the driving force behind an ambitious stream restoration project in Nevada's Humboldt National Forest. The 319-funded project, currently being carried out in a cooperative effort among private industry, government

agencies and conservation organizations, will improve degraded habitat in Eightmile Creek in the Santa Rosa Range. The creek shelters a population of the Quinn River Lahontan cutthroat trout (LCT)—one of only five remaining populations of this strain.

"Eightmile Creek is a critically sensitive stream and riparian area," said Nevada's nonpoint source coordinator, Icyll Mulligan. "There are few streams left that support the Lahontan. It's a totally isolated species."

The Eightmile Creek Watershed Improvement and Demonstration Project's goal is to restore those features of the creek that are crucial to the survival and reproduction of the LCT. Cutthroat trout require cool, clear, deep water and a gravel substrate. The project addresses thermal pollution, as well as erosion, sedimentation, and nutrient pollution.

Wildfires, cattle grazing, and a severe flood event have denuded upland and riparian areas, resulting in bank erosion and sedimentation of the trout's spawning beds. Lack of vegetation shading the creek is responsible for thermal pollution to which the LCT, a cold-water species, is sensitive. Cattle straying from an adjacent unfenced grazing allotment contribute to creek pollution and degrade the isolated pools where trout survive during droughts.

According to Tina Gast, Humboldt National Forest Natural Resources Specialist, fish are waiting out the present drought in those pools, but two populations of the LCT have been lost in the last year and a half due to drought and severe winter temperatures.

Gast added that reaches of the stream are in very poor condition and Mulligan noted that "it's a pretty ambitious project to initiate the restoration of a watershed that has been virtually destroyed."

The project features a three-pronged attack on the range of problems confronting Eightmile Creek. First, the Forest Service will erect four miles of barbed-wire fence to keep cattle out of the drainage area. This crucial task will be completed next summer. At the same time, burned and flood-damaged stream banks will be protected with cut sagebrush and stabilized with willow propagated from larger plants already growing in the area. The restored stream-side vegetation will also shade the creek, lowering the overall water temperature. Third, project plans call for reducing sediment flow into the stream by seeding burned-over uplands in the basin, which is habitat for the re-introduced California big-horn sheep. These measures should improve water quality and increase the habitat's carrying capacity so that Lahontan brood stock from Eightmile Creek can be re-introduced into other streams.

The project draws upon the resources of Humboldt National Forest and project cooperators. Together, they are a team that functions as a well-oiled machine that has already completed two other projects.

"It's a committed group of people, and they've put together a really strong network. Now that they've figured out how to approach all the red tape, like documentation for 319, they are just stepping right into this project," said Mulligan.

Participating in the restoration are the Nevada Division of Forestry, Boy Scouts and Girl Scouts of America, Trout Unlimited, Coors Pure Water 2000, and the National Fish and Wildlife Foundation. While some of the involvement is chiefly financial, much of it is hands-on field work. The Scouts, for instance, will be planting more than one thousand willow whips next spring. Mulligan finds it exciting to see people "really *doing* things."

Monitoring is an essential part of the Eightmile Creek project. The Forest Service has been monitoring Eightmile Creek's physical and biological parameters since 1987 and plans to use the data to establish a baseline for progress to be measured in 1992 and then every three years. Additional water quality samples will be tested seasonally for dissolved oxygen, EC, pH, sediment, turbidity, nitrogen and phosphorus during 1991 and '92. Electronic recording thermographs will measure thermal pollution, while vegetation sampling will monitor plant community composition.

Macroinvertebrate monitoring is expected to establish indicator species for evaluating sediment load and other water quality variables. Aerial infrared photography is planned to analyze changes in the watershed. Mulligan expects to see improvements in water quality, riparian area and the stream habitat itself.

The final component of the Eightmile Creek effort is production of a slide program and a brochure for the public. A interpretive sign at the project site explains the project's scope, objectives, cost and cooperators.

Commitment, BMPs, inter-organizational cooperation, monitoring and outreach comprise a powerful arsenal that should combine to make the Eightmile Creek project a success for both the Lahontan cutthroat trout and the state of Nevada.

[For more information, contact: Icyll Mulligan, Nonpoint Source Coordinator, Bureau of Water Quality Planning, Department of Environmental Conservation and Natural Resources, Capitol Complex, 123 W. Nye Lane, Carson City, NV 89710 (702) 687-4670. Or contact: Tina Gast, Natural Resource Specialist, Santa Rosa District of Humboldt National Forest, 1200 Winnemucca Blvd.E, Winnemucca, NV 89445 (702) 623-5025.]

NPS Pollution at Major Interstate Service Area Targeted in Fairfield County, CT

According to Robert Frost, good fences make good neighbors, and a fence is one component of a Fairfield County, Connecticut 319 project at an Interstate 95 service area. Two neighbors, the Darien Land Trust and a McDonald's franchise in one of the busiest service areas in the country, are cooperating to improve the quality of a pond just across the property line from the service area.

Prior to 1986, the ten-acre pond owned by the land trust was the recipient of fast-food wrappers, styrofoam cups and other debris, as well as contaminated run-off from the service area. The six to twelve-foot fence erected in 1988 prevents litter from blowing or being thrown into the pond from the service area.

The Connecticut Department of Transportation (DOT), the land trust and McDonald's Corporation are cooperating with Fairfield County SWCD and SCS in planning and funding the project to prevent further damage to the pond. In addition to the fence, Jersey barriers now prevent trucks from parking near the property line and McDonalds has stepped up its policing of the area. Having tackled solid waste pollution, Darien Land Trust past president characterized the pond's condition as improved but said it still had a long way to go.

To continue that long journey, the demonstration project is now focusing on run-off from the service area carrying oil, salt and highway sand into the pond. Already a sediment curtain keeps pollution from spreading unchecked throughout the pond. The curtain is attached to a containment boom which protects against major oil spills. Spring 1992 will see the installation of an oil/ grit separator.

According to a fact sheet distributed by the Fairfield County SWCD, concerns about the potential for hazardous waste spills, inadequacies in run-off disposal systems and existing pollution from I-95 service areas were the impetus for the project. In 1986, SWCD Board Supervisor Al Kelley noticed that a parking lot resurfacing had created a sluiceway for service area run-off to flow almost directly into the pond. SCS examined the site as part of a cooperative agreement with the conservation district and contacted the state Department of Transportation (DOT) to begin planning the cooperative interagency project.

Water quality monitoring is planned to evaluate BMP effectiveness. Monitoring stations are located on either side of the separator to collect data on suspended solids and petroleum hydrocarbons.

Sampling will be done throughout the entire watershed to produce information about nitrogen, phosphorus, fecal coliform, and B.O.D. from other sources. This data will be used in a land-use study of the urban coastal watershed that drains partially into the pond and then into Long Island Sound.

Both the study and the demonstration project are funded through CWA section 319. Additional funds and in-kind services from DOT, McDonalds, the Darien Land Trust, and SCS have brought the total budget to about \$65,500.

[For more information contact Margaret McCauley, District Manager, Fairfield County SWCD, 67 Stony Hill Rd., Bethel, CT 06801. Or phone: (203) 744-6108.]

In Vermont, Loggers are Trained in Silviculture, Water Quality and Wetlands Rules

A recent mail brought in a COUPON clipped from our Issue #14, sent by Virginia Anderson, Chief of Conservation Education, Vermont Department of Forests, Parks and Recreation. Anderson wishes to share an item with her fellow NEWS-NOTES readers, so we pass it along:

Enclosed is the handbook that Vermont provides to loggers and foresters on "Acceptable Management Practices" for protecting water quality on logging sites in Vermont. I also enclose an example of a description given to landowners on the program to encourage participation through Forests, Parks, and Recreation District forestry offices. These offices work closely with the Vermont Timber Truckers and Producers Association (VTTPA). Loggers are encouraged to participate in workshops to improve their knowledge of silviculture, water quality and wetlands rules and are included in lists of loggers who have completed continuing education efforts by our department or VT extension service.

The full title of the handbook is *Acceptable Management Practices For Maintaining Water Quality on Logging Jobs in Vermont*. It starts out with these words:

In 1986, the Legislature passed amendments to Vermont's Water Quality Statutes which declared that "it is the policy of the state to seek, over the long-term, to upgrade the quality of waters and to reduce existing risks to water quality."

According to the revised law, permits are now required for discharges of "any waste, substance or material into the waters of the state." However, individual permits are not required for those discharges caused by logging operations if "acceptable management practices" (AMPs) are in place; that is, if loggers and land owners have followed proper measures to protect the waters of the state.

This booklet describes the AMPs for maintaining water quality on logging jobs in Vermont. The AMPs are intended to prevent "discharges," that is, mud, petroleum products and woody debris, from getting into our streams, ponds, lakes and rivers. They are also meant to maintain natural water temperatures by requiring that trees be left along stream and other water bodies.

The AMPs have the force of law and violations can be costly . . .

So the handbook is introduced and the framework for AMPs established.

EDITOR'S NOTE: We have examined the Vermont water quality handbook for loggers and find it first rate.

[For more information on the Vermont forestry education program and copies of the Handbook contact: Virginia Anderson, Chief, Conservation Education, Vermont Dept. of Forests, Parks & Recreation, 103 S. Main St., 10 South Bldg., Waterbury, VT 05676. Phone: (802) 244-8715; FAX: (802) 244-1481.]

Notes from the Coasts

EPA and NOAA Solicit Comments on Proposed Program Guidance for State NPS Coastal Programs

On October 16, 1991, EPA and NOAA jointly issued a proposed development and approval guidance for state coastal nonpoint pollution control programs. The public will have until December 15, 1991 to review and comment on the program guidance. When the final guidance is issued in May 1992, it will assist states in designing programs to combat the growing problem of nonpoint source impacts on the nation's coast.

This proposed *program* guidance is a complementary document to the proposed *management measures* guidance which specifies technology-based measures for states and local governments to implement to reduce pollutants entering coastal waters. The comment period for proposed *management measures* guidance, originally scheduled to end October 15, 1991, has been extended to November 14 so that the public may consider the two proposed guidances together.

The proposed *program guidance* identifies and explains provisions state coastal nonpoint programs must include in order to be approved by EPA and NOAA under section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA). State programs are required to:

- implement management measures "in conformity with" those specified in EPA's 6217(g) management measures guidance.
- identify land uses which may cause or contribute significantly to degradation of coastal waters.
- identify critical coastal areas adjacent to coastal waters which are impaired or threatened by nonpoint source pollution.
- implement additional management measures for land uses or critical coastal areas as necessary to achieve and maintain water quality standards.
- provide technical assistance to local governments and the public to implement management measures.
- provide for public participation in all aspects of the program.
- establish mechanisms to improve coordination among state and local agencies responsible for land use programs and permitting, water quality permitting and enforcement, habitat protection, and public health and safety.
- modify coastal zone boundaries as the state determines is necessary to implement NOAA's recommendations under section 6217(e) of the CZARA. This section requires NOAA and EPA to determine whether the landward coastal zone of each coastal state extends far enough inland to control significant upland sources of nonpoint source pollution.
- provide enforceable policies and mechanisms to implement the 6217(g) and additional management measures.

The *Federal Register* notice dated October 16, 1991, lists six major issues on which NOAA and EPA have asked for suggestions and alternative approaches. One such issue is the degree of flexibility states should have in adopting management practices appropriate to their circumstances.

Another issue concerns deadlines for implementation of management measures. The proposed program guidance suggests a deadline of three years after program approval for implementing 6217(g) management measures and an additional three years for additional measures.

Copies of the *Federal Register* notice may be obtained as follows:

- The proposed *program guidance* can be obtained from Marcella Jansen, Office of Ocean and Coastal Resource Management, NOAA, 1825 Connecticut Ave. NW, Suite 724, Washington, DC 20235. Comments on the proposed program guidance should also be addressed to Jansen.
- The proposed *management measures* guidance can be obtained from Steve Dressing, AWPD (WH-553), US EPA, 401 M St. SW, Washington, DC 20460. Comments on the proposed management guidance should also be addressed to Dressing.

In California, Surfrider Foundation/EPA Settle Suit Against Pulp Mill Beach Polluters

EDITOR'S NOTE: Although this case deals with point source violations of the CWA, its significance to nonpoint source managers lies in the application of toxicity testing against state water quality standards and the human health (swimmable) and aquatic life (fishable) goals of the act and the maintenance of the integrity of the aquatic ecosystem as a beneficial use. In addition to WQS and CWA goals, more and more watershed management programs will involve the application of biocriteria to both point and nonpoint sources of pollution within the aquatic ecosystem.

The Surfrider Foundation and EPA announced on September 9, 1991, the signing of consent decrees with owners of two northern California pulp mills which were in violation of the

Clean Water Act (CWA). The consent decrees will resolve violations of federal discharge permits issued under section 301(m) of the CWA.

The decrees require Louisiana Pacific Corporation and the Simpson Paper Company, which discharge effluent close to the shore of a Humboldt County beach, to each pay \$2.9 million, the third largest penalties levied by EPA for CWA violations, and the largest in the western United States. The settlements also require the mills to implement treatment measures or process changes which will abate the violations.

In a statement issued at the time of the settlement announcement, Daniel W. McGovern, EPA Region IX Administrator, said:

The Clean Water Act requires EPA to protect water quality for all beneficial uses, including marine life and public recreation. The pollution from these pulp mills clearly impacts recreation and risks harm to public health and marine life. Specifically, the effluent discharges from the pulp mills creates two different water pollution problems, both of which are addressed by the decrees.

First, the mills' effluents are toxic to marine life. Tests have shown that the effluents interfere with reproduction, normal development, and other basic life functions of marine organisms.

Second, surfers and others who have been exposed to the effluents adjacent to the mills complain of nausea, headaches, and skin and eye irritation. To illustrate this point, we have photographs of a typical day of surfing near the mills and the murky effluent plume frequently encountered by water users.

EPA and the Surfrider Foundation brought suit against the mills in 1989 to address CWA permit violations that have persisted for several years. EPA filed suit after administrative orders issued in November 1988 failed to fully abate the mills' permit violations.

Mark Massara, general counsel of the Surfrider Foundation, said:

This is a great victory for surfers and Surfrider, but more importantly, the case proves that 167 million people who annually use California's beaches can take back our shorelines. The environmental and legal implications are precedent setting and national in scope.

Former United States Congressman Paul N. McCloskey, a co-author of the CWA and Surfrider co-counsel said:

These are the types of actions Congress intended when we enacted the Clean Water Act. This case will result in the elimination of toxicity from over 40 million gallons of pulp mill effluent discharged into the Pacific Ocean daily.

Both companies will develop changes in the manufacturing processes designed to remedy the water pollution problems. The changes include reducing the use of chlorine in the pulp bleaching process. Reduction in chlorine use will decrease the level of dioxin and furans (highly toxic by-products of the chlorine bleaching process) in effluent discharged by the mills.

Other requirements of the consent decrees include the extension of outfalls to remove effluent from beach and surfing areas, the conduct of environmental audits, and the correction of any pollution problems detected during the audit.

In separate consent decrees-involving just the Surfrider Foundation and the pulp mills, the companies agreed to the following:

- Louisiana Pacific and Simpson will pay Surfrider Foundation \$500,000 for attorney's fees.
- The companies will contribute \$350,000 toward the creation of a recreational facility on federal land located near the companies' mills. This facility, which will be open to the public, will include camping facilities, a small conference room, and solar-assisted showers.
- Simpson will produce its environmental compliance reports on partially recycled paper.

*In California,
Surfrider
Foundation/EPA
Settle Suit Against
Pulp Mill Beach
Polluters
(continued)*

POSTSCRIPT: We sent a copy of this story to Mark Massara, Surfrider Foundation Chief Legal Counsel, so he could check out the accuracy of our reporting. We pass on his FAXed reply, as received:

You are correct in your Editor's note that true value of case lies in the use of chronic toxicity test results to enforce Act, thereby using effects of discharge on marine ecosystems as standard for enforcement (in addition to numerical parameters, not in lieu of). Surfrider Foundation catalogued over 40,000 violations of CWA by L-P + Simpson, making this case far + away biggest water pollution case we've ever seen. Vast majority of violations occurred on chronic toxicity + black plume parameters — both which affect the public's ability to recreate + marine environment. That's the real story.

[For more information contact: Lois Grunwald, U.S. EPA Region IX, 75 Hawthorne Street, San Francisco, CA 94105. Phone: (415) 744-1588; or Mark A. Massara, Esq., Surfrider Foundation, 1642 Great Highway, San Francisco, CA 94122. Phone: (415) 665-7008; FAX: (415) 665-9008.]

Blue Water Task Force is Surfrider Foundation's Beach Water Quality Volunteer Monitoring Arm

EDITOR'S NOTE: In the development of the above story, *NEWS-NOTES* received the following announcement. We pass it on to our readers as a matter of great interest. This is the approach used by Surfrider as it "catalogued over 40,000 violations of the CWA" in Humboldt County.

- TITLE:** The Blue Water Task Force
- CONCEPT:** Surfrider Foundation is mobilizing surfers, beach-goers and concerned volunteers to gather water samples along our shores in an effort to demonstrate the severity and extent of near-shore pollution. These water samples are then tested under rigorous scientific conditions for various toxics, and the results are compiled for specific environmental objectives.
- PURPOSE:** The objectives of the Blue Water Task Force are five-fold: 1) To provide concerned individuals with the opportunity for hands-on involvement in an environmental problem; 2) To gather coastal water samples with sufficient scientific rigor such that violations of NEPA and the Clean Water Act can be detected; 3) To use the data collected to bring polluters into compliance either through mitigation or litigation; 4) To raise the level of public awareness as to the extent and severity of the problem; 5) To develop a model program that can influence national legislation and enforcement.
- PRECEDENT:** Presently there exists no national beach water quality monitoring program. Yet the problems of the near-shore pollution from "non-point source" pollution such as urban run-off and toxic dumping into the storm drain systems are epidemic. Unfortunately, up until now, surfers have been the canaries in the coal mine, often contracting viral and bacterial infections obtained directly from this source. In addition, our children often play where these storm drains empty on the beach. A number of counties and companies are acting in direct violation of the Clean Water Act, but until there is positive proof of all this no one will take action.
- PROJECT STATUS:** Thanks to small grants from Body Glove and the Levinson Trust the actual water testing kits, accompanying instructions and chain of custody documents have been developed. Testing at the first ten sites has begun. Eight of the ten sites (which include such noted surf spots as Cardiff by the Sea, Doheny and Malibu) have tested in excess of 20 times the allowable level of fecal coliform in the water. The program has already been profiled on national television and in the major news media. The public reaction has been incredible. Surfrider is currently receiving up to 100 calls per month from volunteers wishing to participate in the program.
- DURATION:** We expect to carry out this precedent-setting water testing program for the next two years, submitting quarterly reports to national and state agencies as well as key local and national media. In addition, members in France, Australia, Japan and Peru are requesting test kits, enabling Surfrider to expand the Blue Water Task Force internationally.
- ESTIMATED BUDGET:** The cost of testing and compiling the data set for the Southern California Bight is between \$200,000 and \$300,000 over the course of the next two years. The project can then be "sized" to handle other regions on an available-funds basis.

[For further information contact: Dr. Scott Jenkins/David Skelly, (0209), Scripps Institute of Oceanography, Center for Coastal Studies, 9500 Gilman Drive, La Jolla, CA 92093. Phone: (619) 534-6480; FAX: (619) 534-0300.]

Notes on Watershed Management

Badger Creek, CO, Watershed Project A Joint Venture of 17 Federal, State, Local Agencies and Trout Unlimited, w/EPA \$\$, to Control Runoff on Public and Private Lands

In Colorado, Trout Unlimited has joined with 17 federal, state and local agencies in a watershed project to control runoff on both public and private lands draining into Badger Creek.

The creek is a perennial, Rocky Mountain/southern Colorado stream in the Arkansas River drainage. It begins in the southwest corner of Park County, travels south through Fremont County until it enters the Arkansas River¹, approximately seven miles east of Salida. Studies indicate that Badger Creek is a prime spawning ground for brown trout from the Arkansas River with the capability of producing *up to 300 pounds of fish per acre*.

The limiting factor in maintaining this fishery is the periodic flushing of the streambed by snowmelt and rainfall runoff. The watershed consists of 135,000 acres of pinyon-juniper, Douglas fir, and high mountain parks. The land is primarily used as a summer livestock grazing area. Ownership and management of the land is almost evenly divided between four groups:

OWNERSHIP

Private	31,320 acres
State of Colorado	33,760 acres
U.S. Forest Service (FS/USDA)	29,200 acres
Bureau of Land Management (BLM/USDOI)	40,760 acres

These groups have not been noted for cooperating in the past, but in Badger Creek where they share a watershed and the need for enlightened and environmentally sound grazing-land management, they are working together. In order to treat a watershed of this size and adequately address the needs of individual users, land owners and governmental agencies, the four groups of owners and managers have signed off on a formal memorandum of understanding. This unique agreement was developed in the last years of the 1980s under the leadership of the Sangre de Cristo Resource Conservation and Development Area (RC&D) and BLM.

The memorandum, among other things, calls for the development of a four-year program that prioritizes zones within the total watershed area (regardless of ownership/ management) and identifies site-specific data for costing out implementation projects.

The project looks at the watershed environment holistically. Its purpose is to protect and improve the fisheries, wildlife habitat, range resources, recreation, and water quality of the Badger Creek watershed. Treatment will also reduce sediment discharge into the Pueblo Reservoir and downstream water treatment plants and thereby improve the quality of Arkansas River water.

The agreement sets up a six-person coordinating team with the Sangre de Cristo RC&D as project leader. Other members are: BLM Royal Gorge Area Manager; USFS Salida District Ranger; State Land Board; State Division of Wildlife (DOW) Salida Area Wildlife Supervisor; and the Canon City Soil Conservation Service (SCS) District Conservationist.

Participating federal land management agencies have used their funds to undertake treatment projects on their own land while EPA Region VIII, through the state of Colorado, has provided 319 nonpoint source management funds². In the memorandum of understanding, BLM agreed to continue its watershed precipitation monitoring.

1 After meandering through four mid-America states, the Arkansas joins the Mississippi River in Desha County, Arkansas on the Mississippi state border.

2 \$164,300 has been awarded to date; \$106,800 in 319(h), nonpoint source demonstration funds and \$57,500 in 201(g)(1)(B) funds (transferred to NPS from sewage treatment construction grant funds at the option of the state)

The Badger Creek project is finishing its second year of a four year-planned program. As of September 1991, the project has undertaken three workshops for project participants and three team building meetings, both led by the Sangre de Cristo RC&D. In addition, EPA Region VIII led a Holistic Resource Management Workshop for private ranchers, Trout Unlimited, Nature Conservancy, FS, SCS, BLM and DOW personnel. The workshop was developed using EPA education funds.

Extensive treatment projects have been undertaken on the ground by the cooperating agencies.

On a non-cost-shared basis, 43,478 acres of planned grazing systems have been installed. The systems rely on the amount of time cattle are in a pasture rather than the numbers of cattle in a pasture. In addition, two acres of willow were planted on private land.

BLM has been testing intensive grazing in riparian areas to demonstrate that time-controlled grazing can assist in streambank stabilization. Additionally, BLM has constructed erosion control dams, erected precipitation monitoring stations, and, with USGS, has installed automated measuring devices.

SCS has concentrated on riparian planting, with black willows, buffalo berry and cottonwood planted in BLM riparian areas to determine survivability of wood species in the upper watershed along Badger Creek.

The Forest Service has built erosion control dams and installed 200 cubic yards of rock riprap on its lands.

EPA's 319 funding has been essential in the building of 19.5 miles of cross fencing, 3 miles of pipeline for water distribution, seven water supply tanks — 30 foot diameter, three erosion control dams on private land, two spring development projects, and two solar systems.

The Water Quality Control Division of the Colorado Health Department (with the cooperation of the State Forest Service and the state DOW) has been concerned with the monitoring of fish habitat, including streambank analysis, fish counts, and existing food sources for fish population.

The Memorandum of Understanding has a five-year term, renewable at the option of the signatories. Signatories to the agreement are:

STATE OF COLORADO

Department of Natural Resources, Division of Wildlife
State Land Board
State Forest Service
State Soil Conservation Board
State Conservationist, SCS

U.S. DEPARTMENT OF AGRICULTURE

Forest Service, Pike-San Isabel National Forest
Soil Conservation Service
Agricultural Stabilization and Conservation Service

U.S. DEPARTMENT OF THE INTERIOR

Bureau of Reclamation

SOIL CONSERVATION DISTRICTS

Sangre de Cristo Resource Conservation and Development Area
Upper Arkansas Soil Conservation District
Fremont Soil Conservation District
Teller-Park Soil Conservation District

LOCAL AND AREAWIDE GOVERNMENTS

Upper Arkansas Area Council of Governments
Fremont County, Board of County Commissioners
Park County, Board of County Commissioners
Southeastern Colorado Water Conservancy District

PUBLIC INTEREST GROUPS

Colorado Trout Unlimited

In summing up his views on the history and outlook of the project, John Valentine, Coordinator, Sangre de Cristo RC&D, observed:

It was felt that the most effective approach to watershed rehabilitation and stabilization, and to management of grazing and other impacts, would be to expend efforts in the upper reaches of the watershed where land treatment practices would have the most immediate impacts. This conclusion was reached after having completed an action plan in 1982 that assigned work to the various agencies to collect data on the watershed. Soils, range conditions, forestry, wildlife, fisheries, and hydrologic data were gathered, compiled and analyzed. The federal land agencies, the Forest Service and the Bureau of Land Management, are accelerating their conservation treatment programs. Private and state lands that can be quickly impacted by working in the upper range of the watershed are being assisted with 319 nonpoint source funds as well as Colorado State Land Board funds. We are all working together to achieve common, and agreed to, environmental goals for the watershed.

[For more information contact: John Valentine, Coordinator, Sangre de Cristo RC&D, 821 Desert Flower Blvd., Pueblo, CO 81001. Phone: (719) 543-8385.]

Settlement Announced in A Suit Against City of Seattle and Others For Damages to Natural Resources From Toxic Stormwater Runoff

The Suit and the Law

Under the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), the United States, on behalf of the National Oceanic and Atmospheric Administration (NOAA), filed a lawsuit in March 1990 against the City of Seattle and METRO¹ for damages to natural resources in Elliott Bay and the Duwamish River believed to be caused by contaminants in storm drain and combined sewer overflow (CSO) discharges. (The Bay and the River are a part of the Puget Sound drainage/watershed.)

NOAA was joined in the lawsuit by the Washington Department of Ecology (Ecology) and the Squamish and Muckleshoot Tribes.

A proposed settlement to the suit, in the form of a consent decree filed with the Federal District Court, was arrived at early in September of this year. The settlement, which provides \$24.25 million for clean-up and habitat restoration, is directed at resolving all existing claims for natural resources damages, except those relating to treaties between the United States and the tribes.

It is estimated that 50 or more additional parties may be liable for damages in Elliott Bay and the Duwamish River. This settlement will not affect claims the trustees acting under CERCLA will have against any other party.

Under the CERCLA law, certain agencies of the United States, states and tribes are empowered to act on behalf of the public as trustees for natural resources. In this case, the four parties to the suit will be the trustees. The four trustees and the two liable parties will each have one representative on an oversight panel specifically convened to implement the settlement.

Obligations Under The Settlement

Under the proposed settlement, METRO and the City of Seattle will commit to spending a total of up to \$24.25 million in cash or in-kind services over a six year period starting in 1992.

This money must be used for a package of sediment cleanup, habitat creation and restoration, and efforts to reduce the amount of contaminants released into the environment (source controls).

All of these efforts are associated primarily with METRO and city storm drain and combined sewer overflow outfalls in Elliott Bay and the Duwamish River.

¹ METRO is the public agency that builds and operates facilities for sewage collection and treatment and stormwater management throughout the Seattle metropolitan area in those geographic areas where local municipal systems do not operate. METRO also operates the metropolitan-wide bus transportation system.

The financial obligations include:

- \$12 million to clean up contaminated sediments (cash or in-kind services)
- \$5 million to create habitat (cash or in-kind services)
- Up to \$5 million worth of property for habitat development sites
- Up to \$2 million for source control in addition to existing programs, aimed at preventing recontamination of sediment cleanup and habitat restoration sites (in-kind services)
- \$250,000 to NOAA for damage assessment and habitat planning costs

Oversight Panel Responsibilities

Representatives of the four trustees and the two liable parties that compose the oversight panel, in addition to general administration of the settlement, will oversee four issues of concern:

- **Sediment Remediation (cleanup):** The panel will select the sites associated with Metro and City CSO and storm drain outfalls. Cleanup levels will be determined using Department of Ecology Sediment Management Standards.
- **Habitat Development:** The panel will direct projects to create or enhance habitat in the lower Duwamish River and Elliott Bay. Sites near parks and other public facilities that are compatible with habitat development goals will be selected.
- **Source Control:** The panel will establish goals for source control to prevent recontamination of cleanup and habitat development projects. The panel will also review and approve new actions or changes to existing programs proposed by Metro and the city to meet source control goals.
- **Public Participation:** CERCLA requires the panel to plan and develop its programs with input from the public. Additional opportunities for public input will be available through comment processes already required as part of environmental reviews and permits.

Trustees Retain Additional Rights

The settlement does not cover natural resource damages in Elliott Bay or the lower Duwamish River caused by future releases of hazardous substances.

The trustees also retain regulatory authority for violations of permits, failure to comply with the settlement, and other criminal liability.

The Suquamish and Muckleshoot Tribes also retain rights relating to their treaties with the United States.

Public Comment Period to be Announced Soon

Under the law, the trustees will be seeking public comment on the settlement before it becomes final. If public comments disclose facts or considerations which show that the consent decree is inappropriate or inadequate, the trustees have the right to withdraw.

During the comment period interested parties may:

- Review the consent decree
- Attend and participate in a public hearing at a date to be announced. The trustees will present information about the settlement and will accept formal comments. All parties to the suit will be available to listen to and respond to questions and concerns of the public in attendance.
- Submit comments in writing

In commenting on the suit and its settlement, Robert A. Taylor, General Counsel at NOAA's Damage Assessment and Restoration Center in Seattle, said:

We were able to arrive at a settlement ultimately because the parties agree that it was better to use public monies to address environmental damage than to litigate. We agreed on the

Settlement
Announced in A
Suit Against City of
Seattle and Others
For Damages to
Natural Resources
From Toxic
Stormwater Runoff
(continued)

settlement terms only after a period of hard bargaining, and only after the natural resource trustees had satisfied themselves that the settlement will adequately address the damage to natural resources that prompted us to file the lawsuit.

[For further information contact: Ron Langley, Department of Ecology, Toxics Cleanup Program, Mail Stop PV-11, Olympia, WA 98504-8711, Phone: (206) 438-7360 and/or Robert A. Taylor, General Counsel, NOAA Damage Assessment and Restoration Center, BIN C15700, 7600 Sand Point Way NE, Seattle, WA 98115. Phone: (206) 526-6604. FTS 392-6604. FAX (206) 526-6665.]

Additional Information on the Elliott Bay Settlement

In response to several of our questions, NOAA's Robert Taylor has provided NEWS-NOTES with some additional information on the processes surrounding the Elliott Bay Natural Resources Damage Settlement and some of the implications of that settlement:

The Federal Register notice of lodging of the Consent Decree was published on September 17, 1991 (56 FR 47106). The Department of Justice will accept written comments on the Consent Decree for 30 days from the publication date (through October 17 by my count). The public hearing on the settlement is tonight at 7:00 pm. (September 26, 1991)

A brief bit of background: NOAA has been designated as the federal trustee under CERCLA for marine resources. The Washington Department of Ecology is the state trustee for marine resources. The Muckleshoot Tribe and the Suquamish Tribe also have trustee rights over affected marine resources. The trusteeships of the federal, state and tribal entities overlap to some extent in this case. NOAA filed suit under section 107(a) of CERCLA, 42 U.S.C. sec. 9607(a)(C). The other trustees were brought into the settlement discussions in order to arrive at a settlement of all natural resources damage claims against the defendants for the covered area and activities. If the trustees decide, after reviewing the public comments, to seek entry (approval) of the Decree by the Court, the state and tribal trustees will be formally made parties to the lawsuit at that time.

The State of Washington has a state statute that is similar to CERCLA — the Model Toxics Control Act (MTCA). The State is also settling its MTCA natural resource damage claims in this Consent Decree. The public hearing we are holding is only required by MTCA, but all the trustees will attend and we will address both the CERCLA and the MTCA aspects of the settlement. The Department of Ecology is also accepting public comments on the settlement during the same public comment period.

The settlement covers only natural resource damages. EPA and Ecology retain their authorities to take additional remedial action if they determine it is needed.

This is the only lawsuit we are aware of in which natural resource trustees have filed suit against a public entity for natural resource damages resulting from the releases of hazardous substances due to stormwater discharges or combined sewer overflows. However, private party defendants in a CERCLA natural resource damage case in Southern California have brought into that suit the local sewer and sanitation utilities in a effort to seek contribution from those utilities for their discharges of hazardous substances.

A settlement is not technically precedential for other cases in the sense that a court or agency would be obliged to follow it in similar circumstances. To the extent that it is determined to pursue a similar case in another part of the country, NOAA would be the federal trustee responsible for marine resource damage claims. State or tribal trustees could also bring similar claims along with the federal trustee or on their own. However, the right to bring actions under CERCLA for natural resource damages is limited to designated federal, state or tribal trustees.

Seattle Post-Intelligencer Writes an Editorial on Settlement

On September 11, 1991, the area's leading daily newspaper took a hard, and long-range, look at the settlement. The Seattle Post-Intelligencer observed:

The humiliating \$24 million out-of-court settlement agreed to by the city of Seattle and Metro with the National Oceanic and Atmospheric Administration should be just the bitter medicine required to speed local effort to cleanse the infected Elliott Bay and Duwamish River.

Unfortunately, that's not what this particular settlement is about. The money will be used mostly to help pay for past damages and restore the bay and river to healthy habitat for marine life, including salmon. That, of course, is a worthy goal.

But only \$2 million of it will be spent on studies aimed at curbing present polluting practices. Storm water runoff, for example, will continue to run untreated into the bay. This raises unsettling questions of whether present pollution discharge laws really do prevent ecological damage. And it raises concern over whether the city and Metro will be sued in future years for causing the very same kind of damage by engaging in the same practices.

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The state, which has not seen fit to use its authority to harass the city and Metro for their past discharge practices, meanwhile is now imposing stricter new standards for sediment pollution that should help in the effort to cleanse the sound.

NOAA counsel Tom Campbell's message to polluters is long overdue and right on target: "We've subsidized your activity by allowing you to destroy and diminish our natural resource base, but this subsidy is discontinued."

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But the purpose of this exercise ought to be changed behavior: less pollution entering the bay now, rather than decades from now.

In that respect, we hope this prod in the right direction does not fall short of the goal.

Monocacy Watershed Demonstration Project Encourages Adoption of Agricultural Management Practices

A Maryland Scenic River is the focal point of a national water quality demonstration project sponsored by the U.S. Department of Agriculture (USDA) in response to the President's 1989 Water Quality Initiative. One of 16 such projects, the Monocacy River Watershed Water Quality Demonstration Project seeks to advance widespread adoption of agricultural BMPs. The systematic approach to farm planning demonstrated in the project helps farm operators understand how each farm operation and practice improves or degrades water quality.

The Monocacy River watershed ranks high on Maryland's list of rivers with nonpoint source pollution problems. Covering 476,200 acres in the Piedmont geologic province, the Monocacy watershed includes portions of three Maryland counties and extends into Pennsylvania. More than 3,500 farms are in the drainage area. Livestock operations, especially dairies, are the primary agricultural activity and, not surprisingly, are the most significant source of pollutants in the watershed. The primary pollutants are nutrients (particularly soluble nitrate-nitrogen), suspended sediments and agrichemicals.

Farmers scattered throughout the three target sub-basins have been recruited to install BMPs or test new technologies and management strategies at 42 demonstration sites. The demonstrations provide local farmers with the opportunity to see BMPs operating on farms similar to their own. They can ask questions about installation expenses or potential savings, learn about labor and maintenance requirements, and hear first hand the pros and cons of adopting various water quality protection practices. BMPs being demonstrated include: nutrient management planning, nutrient management test plots, animal waste storage facilities, grass filter strips and integrated pest management.

BMPs Benefit Water Quality and Save Farmers Money

Farmers cooperating in the project receive technical assistance from Cooperative Extension Service specialists, who help design whole-farm nutrient management plans. The plans are incorporated into farm Soil Conservation and Water Quality Plans developed by the Soil Conservation Service (SCS). More than 65 nutrient management plans, which consider nutrients from animal wastes, sludge, soil reserves, crop residues and chemical fertilizers, have been developed. Fifteen farmers have set up demonstration plots to compare different nutrient

management strategies, including use of the new pre-sidedress soil nitrate quick test. According to a report issued by project coordinators, the nitrate quick test allows fine-tuning of crop fertility recommendations, and farmers using the test have cut their commercial nitrogen application by an average of 30 pounds per acre.

In addition to protecting water quality, the nutrient plans are saving farmers an average of \$22 per acre. "I don't need to spread anything on some of my fields. I'm saving a lot with this system," project participant Charles Fry told the *Monocacy Watershed Farmer* newsletter. Fry is following a soil testing program and spreading manure on the fields needing fertilizer. Another important component to Fry's manure management system is a "no frills" earthen basin with a concrete floor to collect animal waste. Cost-share payments helped Fry pay for the holding basin. Fry reported that he has realized a forty-dollar-per-load savings in fertilizer. He paid for his investment the first year after installing BMPs.

According to Jeffrey R. Loser, State Resource Conservationist, SCS, participants have three sources of cost-share funds to help them pay for installing BMPs. They include: USDA/ASCS Agricultural Conservation Program, USDA/SCS Linganore Creek Watershed Project, and Maryland Agricultural Cost-Share Program. In addition, SCS and Cooperative Extension Service provide technical assistance.

Monitoring and Evaluation

The project is being evaluated to determine the effectiveness of multi-agency cooperation and the demonstration method as an educational outreach tool. The project will also test the impact of widespread adoption of new technology and management strategies on water quality. An EPA 319 grant is supporting water monitoring in one of the sub-basins of the watershed.

Loser reported that additional FY91 319 funds have been made available for expanded monitoring activity to cover the entire watershed.

This project is a joint effort of Frederick and Carroll Counties, the Maryland Cooperative Extension Service, SCS, and the Agricultural Stabilization and Conservation Service.

Tour Shows Off BMPs

A tour held recently in the Monocacy River watershed visited three farms and attracted 170 people, 75 percent of whom were farmers, according to Loser. Loser attributed the tour's success to the strong cooperative effort of the sponsoring agencies.

BMPs viewed by the tour participants included animal waste management systems, integrated pest management (IPM), nutrient management, and erosion and sediment control practices.

[For additional information contact: Jeffrey R. Loser, State Resource Conservationist, SCS, 339 Revell Highway, Annapolis, MD 21401. Phone: (301) 757-4160. FAX (301) 757-0687, or Dr. Richard Weismiller, Acting Chairman Department of Agronomy, University of Maryland, College Park, MD 20742. Phone: (301) 405-1312. Loser and Weismiller are co-chairmen of the project technical committee.]

Agricultural Notes

USDA and EPA Cooperate in Private Well Protection Project

USDA and EPA will soon announce an inter-agency agreement to support a private rural well protection project called Farm-A-Syst. The agreement will support an expansion of the Farmstead Assessment System — piloted initially in Minnesota and Wisconsin — for use nationally. The system, designed by the Wisconsin and Minnesota Cooperative Extension Services and EPA Region 5, provides a series of 12 work sheets (and fact sheets) that can help farm owners assess how effectively their farmstead practices protect drinking water supplies. Farmers are given information on identifying, prioritizing, and reducing risks to their private wells.

So far, 35 states have requested Farm-A-Syst information. The project will be carried out in conjunction with the University of Wisconsin's Environmental Resource Center, in close cooperation with EPA's Region 5.

[For more information contact: John Reeder, Office of Groundwater and Drinking Water (WH-550). U.S. EPA, 401 M Street, SW, Washington, DC 20460. Phone (202) 260-5512.]

GAO Reports Traditional USDA Management Not Up To Handling Cross-Cutting Environmental Issues

The United States General Accounting Office (GAO), reported to Congress that USDA's traditional programs, processes and planning, which successfully encourage farmers to produce an abundant supply of reasonably priced food, are increasingly conflicting with major national issues. GAO listed these issues as involving the environment, world competitiveness, public health, and safety.

In calling for the need for a strategic planning approach for all such cross-cutting issues, the GAO said:

... USDA has made some progress in organizing its structure to address key issues in biotechnology, water quality, and food safety. But USDA has not developed an approach for managing the issues in a way that provides a cohesive Department-wide strategy in any given area. Rather, management generally relies on ad hoc groups or individual agencies to develop policies and plans. These agencies implement and monitor their specific responsibilities in a cross-cutting issue. However, uncoordinated agency efforts cannot achieve an integrated, departmental perspective. As a result, USDA is missing opportunities to deal with pressing national needs, duplicating efforts to meet specific concerns, and delaying overall departmental progress because differences among agencies are not quickly resolved.

The report concludes by saying, in part:

USDA is at the end of one era and facing the challenges of another ... the Department must now meet the health, safety, and environmental needs of food and fiber consumers throughout the world ... If successful, USDA will begin a new growth stage, retaining its position at the forefront of global agribusiness. If USDA does not respond to the new challenges, other countries ... will ...

[For copies of the report (GOA/RCED-91-168) /up to five are free) write to the U.S. General Accounting Office, P.O. Box 6015, Gaithersburg, MD 20877. Orders may also be placed by calling (202) 275-6241.]

Notes on NPS Technology

Ecoregion Concept Evaluated by Science Advisory Board

An ecoregional framework is a "potentially powerful" tool for watershed management, the Science Advisory Board (SAB) reported in its *Evaluation of the Ecoregion Concept*, but further research and state applications will require renewed EPA support.

The January 1991 report to EPA Administrator William Reilly recommends further research to quantify methodology, and tests to determine whether the framework performs better than other methods of regionalization. The report called the development of the ecoregion concept, which was done with support from EPA's Office of Research and Development, Office of Policy, Planning and Evaluation, and Office of Water, an example of "creative and proactive scientific research within the Agency."

EPA supported development of the concept as a framework for assessment and management of surface water quality. James Omernik and Alisa Gallant of Corvallis Environmental Research Laboratory, who have been at the forefront of this research, wrote in 1986,

The ecoregion maps are intended to help water quality managers better understand the regional patterns of ecosystem quality and the relative importance of factors that may be determining this quality. . . . Most important, this geographic framework can establish a logical basis for characterizing ranges of ecosystem conditions or quality that are realistically attainable.

Because waterbodies reflect the ecological properties of areas they drain and because they vary regionally, ecoregion boundaries are based on natural regional patterns of geographic characteristics, including soil-type, land surface form, potential natural vegetation and land-use. In general, there is less variability within an ecoregion than between ecoregions. The similarities within an ecoregion and the differences between adjacent regions are important in setting achievable goals, prescribing appropriate BMPs, identifying reference sites and developing chemical and biological criteria.

The SAB report stated:

[Ecoregions are] potentially very useful in recognizing deviation . . . from a regional norm in response to changing water, soil and air quality. It provides a sounder basis than is currently used (state boundaries) for establishing environmental quality standards . . .

Currently, more than 12 states in at least six EPA regions are using the ecoregion approach. Several states have used ecoregional frameworks to organize information in 305(b) reports, and states are finding ecoregions particularly useful in setting water quality criteria and in understanding regional differences in nonpoint source pollution.

Ohio, for example, uses its ecoregion-based biological criteria to evaluate discharge permits for its rivers and streams. Minnesota has established lake quality goals and criteria using the framework to summarize lake transparency and phosphorus levels. In Arkansas, ecoregion-specific criteria helped identify streams with natural levels of dissolved oxygen below and above existing national or statewide criteria. Similarly, the state was able to distinguish those regions with streams where aquatic life uses were not adequately protected by existing criteria.

The SAB subcommittee pinpointed state reference site and biocriteria development as key areas which could benefit from an ecoregional approach. Reference sites, on which both biological and chemical criteria are based, are defined as relatively undisturbed locations which are biologically, physically and chemically typical of the region. Ecoregion researchers Hughes, Whittier, Rohm and Larsen wrote in 1990,

Values for the biological, physical, and chemical variables at reference sites indicate the range of conditions that could reasonably be expected in the ecoregion, given natural limits and present land use practices. These regionally attainable values represent the range of realistic recovery potentials for the more perturbed sites in the same ecoregion.

Because they are used to set water quality goals for degraded sites, choosing reference sites is a critical issue. Using reference sites that are not representative of the natural patterns of an area can result in over- or under-protective criteria. Hughes warns that criteria development methods that seek to sidestep natural ecological variability may be expensive and risk deceptive results; laboratory methods may oversimplify complex natural ecosystems, while criteria from site-specific field studies may not apply to larger areas. The ecoregion design, based as it is on natural variability, avoids these stumbling blocks.

Other potential ecoregion applications listed by the SAB subcommittee included:

- Estimating restoration and remediation potential.
- Using ecoregions to develop biological criteria integrating point and nonpoint sources, and habitat destruction into a single quantifiable parameter.
- Transferring studies and ecological understanding from one ecoregion to another ecoregion to save the cost of duplicating studies.
- Providing a framework for assessing national issues, setting national goals, planning resource use, and summarizing and reporting accomplishments.

The subcommittee was enthusiastic about ecoregion uses in water quality management but expressed concern about EPA's lack of continued support. The report recommended that EPA renew support for research on identifying boundaries and reference sites, and provide guidance and assistance to states in establishing subecoregions.

Subdividing and statistically validating ecoregions are the next necessary steps in refining the framework for use by states, the report said. Other areas requiring further research are application of the concept to larger waterbodies, methods for describing variability within a region, methods of depicting the uncertainty of boundaries, and quantitative methods for identifying regions.

Although the report states that the concept is "an advance over other, more subjective frameworks," it suggested a pilot project to assess the concept's performance and limitations. Calling the accomplishments of the ecoregion development team "excellent," the report closed by urging EPA to support and fund further development and technology transfer of the ecoregion approach.

[For more information on the SAB report, contact: Ken Dickson, Director, Institute of Applied Sciences, University of North Texas, P.O. Box 13078, Denton, TX 76203-3078. For information on ecoregions, contact: James Omernik, EPA ERL, Corvallis, OR 97330.]

EDITOR'S NOTE: Watch the *Nonpoint Source Bulletin Board System (NPS BBS)* for files containing some key papers on ecoregion research and applications.

Puget Sound Water Quality Authority Issues Its Second Annual Ambient Monitoring Program Report

The Puget Sound Basin is an area of extraordinary beauty and rich natural resources. The Sound is a system of deep fjord-like estuaries connected to the Pacific Ocean via the Strait of Juan de Fuca . . . Three million people live in the Puget Sound basin; many others visit the area every year. They use the Sound as their waterway, food source, recreational area, and place of business. The variety and abundance of plants and animals, as well as numerous opportunities for fishing, boating, shellfishing, and hunting, make the Puget Sound area important to the economy of the state, the region, and the nation.

These are the opening words to the Puget Sound Water Quality Authority's Second Annual Report of its Puget Sound Ambient Monitoring Program (PSAMP), released in July.

There are two basic operational elements to PSAMP's monitoring program that make it unique among monitoring programs:

- It is concerned, in the broadest sense, with the health of the Puget Sound aquatic ecosystem as a whole . . . and the inter-relatedness of living things and things that are the result of human activities within the natural environment.
- It is accomplished in an integrated and coordinated manner by six state agencies, each with its own specific statutory operating responsibilities for specific resources or activities within that environment.

The 12-county region contains ten major rivers and numerous smaller rivers and streams that, together, discharge about ten billion gallons of fresh water into the Sound each year, mostly during the winter rainy season or after the snow melts from the Cascade and Olympic mountains that rim the basin.

Scientists and managers have been collecting information on the Sound for many years, although most studies have had limited geographical coverage and lasted for relatively brief periods of time.

PSAMP's monumental current effort establishes an information base and coordinates the collection of information on those parts of the Puget Sound ecosystem that might be affected by pollution. As the report indicates:

PSAMP is a comprehensive, long-term monitoring program for measuring ambient, or background, conditions in Puget Sound, as well as the cumulative effects of contamination and habitat degradation from many individual human actions . . . The information collected by PSAMP investigators will characterize the condition of the water, sediments, plants, animals, and habitats in Puget Sound and its watersheds.

The sixty-five person PSAMP Monitoring Management Committee (MMC) designed PSAMP. MMC members have expertise in water quality or natural resource management; most have responsibilities for protecting and cleaning up Puget Sound and its resources. They are scientists and managers representative of federal, state, local and tribal governments and groups, as well as university faculty.

The report says:

The program is achieved through the coordinated efforts of six state agencies (Washington Departments of Ecology, Fisheries, Health, Natural Resources, Wildlife, and the Puget Sound Water Quality Authority), with support and cooperation from other government agencies, business, industry, voluntary citizen monitors, and the public.

The PSAMP Steering Committee, composed of representatives of the six state agencies, augmented by members from U.S. EPA, the city of Seattle and the Tulalip Tribes, manages the implementation of PSAMP, various elements of the data collection and monitoring efforts. It is chaired by Andrea Copping, Ph.D., who heads PSAMP for the Authority.

The Authority oversees the ambient monitoring program and has responsibility for data management and coordination; the Department of Ecology is responsible for sediment, marine water and fresh water monitoring; the Department of Fisheries monitors fish; the Shellfish Section of the Department of Health monitors shellfish; the Aquatic Lands Division of the Department of Natural Resources monitors nearshore estuarine habitats; and the Department of Wildlife monitors bird and marine mammal populations. Federal agencies, local government, tribes, business, industry and the public also assist the process.

"Although the general health of Puget Sound is good, there is need for caution," said Nancy McKay, executive director of the Authority. "Virtually no area of Puget Sound is pristine and free of contamination. The problems that we encounter in the urban bays and a few other areas are often severe."

PSAMP is a long term program, specifically called for in the Authority's authorizing legislation and in the 1991 Puget Sound Water Quality Management Plan. The scientists who designed PSAMP recognized that five to ten years of data are needed before changes can be observed and trends identified in contamination levels and in fish and wildlife populations in many parts of the ecosystem.

The state's current biennial budget allocates \$5.2 million to the six agencies responsible for monitoring. This is a significant increase over the previous biennium's allocation for monitoring, which was set at \$1.4 million.

(Parts of this article were adapted from *Soundwaves*, the newsletter of the Puget Sound Water Quality Authority.)

[For a copy of Puget Sound Update, the second annual report of the Puget Sound Ambient Monitoring Program, call the Authority at (206) 493-9300 or write: Puget Sound Water Quality Authority, Mail Stop PV-15, P.O. Box 40900, Olympia, WA 98504.]

Transparency of Minnesota Lakes

In August 1991, the Minnesota Pollution Control Agency released the *1990 Report on the Transparency of Minnesota Lakes*. This report includes statistical calculations for the data collected by the Citizen Lake-Monitoring Program (CLMP) participants during the 1990 summer monitoring season.

During this season, 558 volunteers monitored 489 lakes in 54 counties, making significant contributions to the state's collection of water quality data. The program participants used

Secchi discs to take 5754 measurements of lake water transparency. These CLMP records are the only source of water monitoring data on many of the state's lakes. The amount of data collected by these volunteers far surpasses what would have been possible to collect with state resource agency staff alone.

The CLMP volunteers' contributions received national recognition when "Renew America" included the program in its 1991 Environmental Success Index.

[For more information contact: Judy Bostrom in the Water Quality Division of the Minnesota Pollution Control Agency, who coordinates the Citizen Lake-Monitoring Program. Phone: (612) 297-3363.]

What's New on The Nonpoint Source Electronic Bulletin Board (BBS)

Fish Consumption Advisory SIG and Waterbody System SIG To Go On-Line

Two new Special Interest Group (SIG) Forums sponsored by EPA's Office of Water will be opening soon on the NPS BBS. SIG Forums are mini-bulletin boards that concentrate on one subject area. The new SIG Forums are the Fish Consumption Advisory SIG and the Waterbody System SIG. They join the Agriculture SIG already on-line.

Fish Consumption Advisory SIG

The Fish Consumption Advisory SIG will provide state officials with access to:

- Information about the fish consumption advisories and bans in their own and other states
- Bibliographic data about supporting documents on topics related to these advisories and bans
- Information about state fish consumption surveys
- An electronic mail system allowing users to exchange technical information with each other and with EPA

Development of the SIG is in progress, and beta testing should begin by the end of October. Anyone interested in participating in the testing can call Tom Davis at (703) 385-6000. The technical monitors will be Skip Houseknecht ((202) 260-7055) and Alison Greene ((202) 260-7053) of the Risk Assessment and Management Branch.

Up to 500 users are anticipated for this SIG.

Waterbody System SIG

The Waterbody System (WBS) database is an EPA management tool to track state assessments of ambient water quality for surface waters. This SIG is designed to keep users of WBS up to date on the new 1992 version of the software and new 305(b) guidelines. It will provide a forum for comments and questions regarding the system. The target audience is state and regional Waterbody System and 305(b) coordinators, but other users will find pertinent and useful information here as well.

The Technical Monitor for this SIG is Mary Baechtel. Questions and comments regarding the SIG should be addressed to her through the bulletin board or by phone at (202/FTS) 260-7057. The Waterbody System SIG will be on line by November 1.

SIG Forums have the same capabilities as the main bulletin board. Users may send and receive messages, read and post bulletins, and upload and download files containing text or public

domain software. To join a SIG from the NPS BBS Main Board type "J" and the number of the SIG as displayed on the Main Board.

To access the BBS, use your telecommunications software and modem (1200 or 2400 baud) to dial (301) 589-0205. For more information, use the COUPON in the back of *News-Notes* to write for the free NPS BBS user's manual.

Reviews

Ohio Video Presents Construction Site BMPs

The Ohio Department of Natural Resources' Division of Soil and Water Conservation has recently released a video training course titled *Keeping Soil on Construction Sites: Best Management Practices*.

This video was formatted to provide basic training for people involved in the design, construction, and inspection of erosion and soil control practices. The authors have done a laudable job of clearly presenting the fundamentals of erosion and sediment control for construction sites. The techniques and recommendations provided in the video have broad applicability, and viewers across the country will find it useful.

The video begins with a brief description of erosional processes and the impacts of sediment on water quality. After establishing the importance of erosion and sediment control, the authors provide the viewer with a systematic approach to use in preventing erosion and controlling off-site movement of sediment. To illustrate these principles, management practices such as phased construction, vegetative stabilization, perimeter controls, and sediment traps are discussed. Both advantages and drawbacks of individual practices are covered, as well as recommendations for effective BMP placement and design.

In addition, the authors provide commonly accepted technical recommendations for practices such as vegetative stabilization and the sizing of sediment basins. Although these recommendations have been implemented widely, it should be recognized that they are only minimum standards and some areas may require more stringent measures. Maryland is in the process of adopting a 3600 cubic feet-per-acre requirement for construction site sediment basins and recommends vegetative stabilization within 72 hours of site disturbance in critical areas of the Chesapeake Bay. Also important to the viewer are the discussions in the BMP section which stress the relative cost effectiveness of preventative BMPs such as planning and vegetative stabilization.

Two versions of the video are available. The 50 minute version was designed to be used in a workshop or self-study context and is accompanied by a workbook. The abbreviated 25-minute version will provide a useful overview for planning and enforcement agencies responsible for erosion and sediment control.

The training package, containing both the full length and the shorter versions on a single video cassette, sells for \$20.00. Included in the package are ten workbooks and an instructor's manual. Additional workbooks and manuals cost one dollar each. The videos are also available for duplication on 3/4 inch tape and ASCII or WordPerfect files.

[To order copies of the video, contact Dan Mecklenburg, Ohio Department of Natural Resources, Division of Soil and Water Conservation, Fountain Square, Building E-2, Columbus, OH 43224. Phone: (614) 265-6610. Checks should be made payable to the Ohio Federation of Soil and Water.]

Guide for Lake Associations Available

Organizing Lake Users: A Practical Guide encourages citizens to take "ownership" of their lake resources by providing information on how to organize lake protection associations. Released in June 1991, this instructive publication was prepared by the Terrene Institute in cooperation with the Tennessee Valley Authority and the U.S. EPA. The concise "how to" document covers the following topics:

- **Lake Ownership** — determining who has the responsibility for maintaining the integrity of the lake
- **Logistical and Business Issues Involved in Organizing the Lake Association** — how to set up the initial and subsequent meetings; how to develop by-laws for the association; legal and tax issues; organizing as a not-for-profit vs. profit-making group; initial incorporation of the association; IRS registration, accounting; different types of organization schemes; funding; and insurance
- **Building Membership**
- **Making the Association a Success** — communication with members; organized activities; hiring a lake manager
- **Managing the Lake** — educating citizens about basic lake processes and the effects of watershed activities on lake water quality; assessing the goals of the community; defining and solving lake problems; hiring consultants; how to make and fund management plans; legally protecting the lake; lake monitoring; maintaining dams
- **Networking with the Lake World**

The booklet also provides model bylaws for lake associations, state and provincial contacts, additional lake management resources, and the U.S. EPA's Clean Lakes Program Guidance.

[Copies of the booklet are available from The Terrene Institute, 1000 Connecticut Avenue, NW, Suite 802, Washington, DC, 20036. Phone: (202) 833-8317; Fax: (202) 466-8554.]

"Idea Book" For Water Quality Projects Released

One of the most frustrating problems faced by those at the local level charged with improving water quality is designing plans for projects. Local water quality managers may have limited opportunities to share experiences about what works and what doesn't. Because creative, effective solutions don't evolve in a vacuum, the Chesapeake Bay Local Government Advisory Council (LGAC) has produced a catalog of water quality-related projects carried out by cities, counties, boroughs, and townships within the vast Chesapeake Bay watershed.

The preface to *Chesapeake Bay Restoration: Innovations at the Local Level* describes the booklet's purpose:

The LGAC developed this manual to provide cross-sharing of information among local governments. It is being circulated throughout the three state and District of Columbia watershed to assist local governments in developing and adopting similar programs . . . without "reinventing the wheel."

The manual gives local governments the opportunity to review the methodology and implementation experience for land-use programs like . . . a greenways creation ordinance being implemented in Pequea Township, Pennsylvania or a highway interchange zoning program ongoing in Adams County, Pennsylvania.

Local governments working to protect water quality can find guidance by following the examples of Anne Arundel County, Maryland's emergent grasses program, or Fairfax County, Virginia's household hazardous waste initiative.

Although targeted at communities in the Chesapeake Bay watershed, many ideas presented in the manual will be valuable nationwide. Localities contributing to the catalog display grass roots initiative in using tools garnered from every realm at their disposal—technological, educational, legislative and financial. Catalog entries address a wide variety of natural resources issues, including local land use, water quality, public information and education, intergovernmental cooperation, and project financing. Projects included in the manual range from Richmond County, Virginia's computerized Resource Information System and Allegany County, Maryland's "Adopt A Dump" program to Newport News, Virginia's ordinance creating buffer zones around reservoirs and streams. Overall, the outstanding features of the programs are their innovative approaches to solving both local and watershed problems.

Section One of the manual describes creative land-use strategies employed by various localities, while Section Two, Water Quality, is divided into chapters on watershed protection, restoration and monitoring; wetlands; nutrient management; household hazardous waste disposal; and boating pollutant discharge.

Each project description contains the particulars on what, where, why, how and *how much*. Most important, names, addresses and phone numbers of prime contacts are included, enabling readers to communicate person-to-person with their counterparts in other localities.

In addition to its function as an "idea book," *Innovations* functions as a primer on contemporary issues facing communities as they attempt to balance environmental quality and increasing development. Each section and chapter is preceded by an introduction describing the technological, environmental, historical, social or political context in which local programs have been developed. For instance, the section on water quality is introduced by the following discussion:

The restoration of the Chesapeake Bay relies on an integrated approach to protecting the water quality of the Bay and surrounding watersheds. The local role in water quality management is as critical as it is diverse. Local officials are working to protect not only their own water quality needs, but those which contribute to the state of the Bay as well.

Growing populations and shifting land use patterns within the Bay region impact the water quality and accentuate the priority of these issues. In addition, discussions about acid deposition, global warming, potential droughts, and other environmental impacts are placing emphasis on protecting present water quality and quantity while preparing for the future.

The issues of quality and quantity are inseparable. Historically, the federal government has played the major role in water quality efforts, while establishing the tone for regulatory efforts. In recent years, state and local governments have assumed a larger portion of these responsibilities. At each level, greater emphasis has been placed on the availability and quality of water, its adequate delivery, treatment and necessary reuse.

Local governments in the watershed are assuming increasing responsibilities for water quality. A number of these local programs are included on the following pages.

To gather the information presented in the manual, LGAC sent out surveys to more than 1500 local governments. According to LGAC Director Eric Jenkins, the survey asked for specific information about projects: purpose, what kinds of implementation problems local government had encountered (including controversy and political considerations), financing, and special legislation or ordinances enacted as part of an endeavor.

In choosing feature projects, the committee looked for innovative efforts that represented large, medium and small scales. "Of course, then we had to wrestle with the question of what was innovative," the director said. "We tried to get away from those programs local governments were doing as a result of state or federal requirements."

Jenkins said that it took about one and a half years of research, writing, and layout to produce the book. U.S. EPA printed the 74-page book. He said that one of the most time-consuming components was the extensive follow-up needed on projects featured in the manual. In many cases it was necessary to interview local decision-makers and project managers in order to complete an entry.

In addition, the survey included a section where respondents were asked indicate those environmental areas in which they had developed specific programs. The appendix lists 275 of the over 300 communities that responded and categorizes the types of programs they sponsor.

Although the type of information contained in this unique manual is invaluable, it would be even more useful if it included when the project was initiated, how long it continued, and results to date. All in all, this is an excellent resource from which water quality managers across the country can benefit.

[For information on how to compile a similar document or to obtain a copy of the manual (free), contact LGAC Director Eric Jenkins at Chesapeake Bay Local Government Advisory Committee, 777 North Capitol St., NE, Suite 300, Washington, DC 20002-4201 or call him at (202) 962-3360 or (800) 446-5422.]

Position Available

NOAA is Recruiting Nonpoint Source Staffer

The National Oceanic and Atmospheric Administration (NOAA) is actively recruiting an additional staff person to participate in the new NOAA/EPA Coastal NPS Management Program (see *NEWS-NOTES*, #9, December 1990). The NOAA announcement had this to say about the position:

The incumbent works as a member of a technical assistance unit, and uses his/her experience in water quality to advise division staff and states on matters related to the development of programs to address nonpoint source pollution of coastal waters. He/she identifies the technical and information needs of state coastal management programs in the area of nonpoint source pollution management, and develops and implements technical assistance programs to meet those needs. He/she reviews state applications for financial assistance and makes recommendations on the technical merits of the applications. He/she reviews draft and final state coastal nonpoint programs. He/she participates on intra- and interagency working groups to develop policies and programs to assist states in reducing nonpoint pollution of coastal waters.

The position is titled Environmental Protection Specialist (GS-028-11/12).

For more information call (301) 427-2506. NOAA/ Personnel Operations Division/NOS-OAR Operations Branch, SSMC-1. OA213, #3230, 1335 East-West Highway, Silver Spring, MD 20910.

Datebook

This DATEBOOK has been assembled with the cooperation of our readers and *Conservation Impact*, newsletter of the Conservation Technology Information Center (1220 Potter Drive, Room 170, West Lafayette, IN 47906-1334). If there is a meeting or event that you would like placed in the DATEBOOK, contact the *NPS NEWS-NOTES* editors. Due to an irregular printing schedule, notices should be in our hands at least two months in advance to ensure timely publication.

Meetings and Events

1991

October

25-27

Citizen Monitoring Conference, Seattle, WA. Contact: Susan Handley (206) 553-1287.

30

Legal and Technical Basis of Groundwater Protection and Management: Iowa Groundwater Association 1991 Fall Meeting, Des Moines, IA. Contact: Paul Van Dorpe / IGWA, DNR-GSB, 123 N. Capitol, Iowa City, IA 52242. Topics include: Iowa groundwater ownership and water rights, federal statutes and regulations affecting groundwater management, surface water and the future of groundwater.

November

6-7

Restoring Our Home River: A Conference on Restoring Water Quality and Habitat in the Anacostia Watershed, College Park, MD. Contact: River Conference, c/o Terrene Institute, (800) 726-4853. Topics include watershed restoration, stormwater retrofits, wetlands, stream and riparian restoration, CSO abatement and urban fishery management.

10-13

Water: Enough for Tomorrow, 1991 International Irrigation Exposition and Technical Conference, San Antonio, TX. Contact: Martha Lindauer, Irrigation Association, 1911 N. Fort Myer Dr., Arlington, VA 22209. (703) 524-1200.

10-13

Showcase of Sustainable Agriculture Information and Educational Materials at the Int'l Conference on Agriculture and the Environment, Columbus, OH. Contact: John Ikerd (314) 882-4635.

11-12

Wetlands Regulation Conference, Washington, DC. Contact: Executive Enterprises (800) 831-8333. Will be held at the Washington Marriott (202) 872-1500.

11-16

Lake, Reservoir, and Watershed Management in a Changing Environment, 11th Annual International Symposium, Denver, CO. Contact: J.F. LaBounty, NALMS Denver 91, PO Box 101294, Denver,

November

- CO 80250. (303) 236-6002. Sponsored by US Bureau of Reclamation, US Environmental Protection Agency, USDA Soil Conservation Service. Hosted by North American Lake Management Society. Student registration: \$55. Single day registration: \$50/day, \$75/2 days. Sessions include: alum treatment, macrophytes in streams, nonpoint source pollution control, development of lake management plans, Clean Lakes Program diagnostic-feasibility studies.
- 12-14 *Southeastern Water Pollution Biologists Association 1991 Annual Meeting*, Hilton Head Island, NC. Contact: Lythia Metzmeier, Kentucky Division of Water, 18 Reilly Rd., Frankfort, KY 40601. (502) 564-3410. Biocriteria development, nonpoint source monitoring, standardization of sampling methods and habitat assessment.
- 12-15 *Fisheries Management: Dealing with Development in the Watershed*, Newport, RI. Contact John Boreman, U Mass/NOAA CMER Program, Blaisdell House, University of Massachusetts, Amherst, MA 01003-0040. (413) 545-2842. Individuals must make their own hotel reservations at (401) 849-2600, ext 2330. Topics: the fisheries manager and watershed development, methods for assessing impacts of development, prevention vs mitigation, realistic management, outreach activities.
- 13-14 *Pesticides and Water Quality: Cooperative Extension Annual Water Quality Conference*, Corvallis, OR. Contact: Ron Miner, Oregon State University, Bioresource Engr. Dept., (503) 737-6295. Register by November 1. Occurrence, fate and significance of pesticides in Oregon waters. Risk assessment and management. Roles of various agencies in addressing water quality issues.
- 15-16 *Riparian Issues: An Interdisciplinary Symposium on In-Stream Flows*, Tucson, AZ. Contact: Placido Dos Santos / Mike Caporaso, Arizona Dept of Water Resources, Tucson Active Mgmt. Area Ofc. (602) 628-5858 or (602) 628-5980. Presentations on riparian issues by federal and state agencies, universities and the private sector. Field trip to one of the most pristine and unique riparian habitats in southern Arizona.
- 18-19 *Sewer System Infrastructure Analysis and Rehabilitation*. Boston, MA. Registration Hotline (617) 648-7811. Or contact: Michelle Roden (617) 641-5346 or Susan Brager (617) 641-5347. Sponsored by EPA and CERL.
- 21-22 *Sewer System Infrastructure Analysis and Rehabilitation*. Omni Tampa Hotel, Tampa, FL. See November 18-19 for details.

December

- 4-6 *3RD Conference on Hydrology, Ecology, Monitoring and Management of Groundwater in Karst Terrains*. Nashville, TN. Contact: Karst Conference, Nat'l Well Water Assoc., P.O. Box 182039, Dept.017, Columbus, OH 43218. (614) 761-1711.
- 8-11 *Coastal Depositional Systems in the Gulf of Mexico: Quaternary Framework and Environmental Issues*, Houston, TX. Contact: Shea Penland, LA Geological Survey, University Station, Baton Rouge, LA 70893. Issues covered might include coastal erosion and wetlands loss, global climate change impacts, sediment geochemistry and pollution, human impacts on coral reefs, oil spills.

1992

January

- 28-30 *Montana Water Quality Conference*. Butte, Montana. To provide landowners, managers, educators, cooperators, and the general public with up-to-date water quality information. DATEBOOK will publish details as they become available. Contact: (406) 444-2406.

February

International Erosion Control Association Annual Conference, Reno, NV. Contact: IECA, PO Box 4904, Steamboat Springs, CO 80477.

March

- 19-21 *Southeast Regional Lake Management Conference*, Marietta, GA. Contact: NALMS, 1 Progress Blvd, Alchua, FL 32615. (904) 462-2554.
- 12-16 *Availability of Groundwater Resources*, Raleigh, NC. Contact: Robert C. Borden, Technical Comm. Chair, Dept of Civil Engineering, North Carolina State Univ, PO Box 7908, Raleigh, NC 27895. (919) 737-7665.

Nonpoint Source NEWS-NOTES is an occasional bulletin dealing with the condition of the environment and the control of nonpoint sources of water pollution. NPS pollution comes from many diffuse 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 ground waters. NPS pollution is normally associated with agricultural, silvicultural, mining and urban runoff.

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