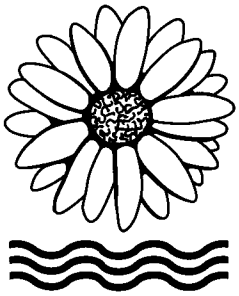
October 1993
#32



Nonpoint Source News-Notes

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

A New Look at the Management of Western Water and Related Resources

EDITOR'S NOTE: EPA's Office of Wetlands, Oceans and Watersheds' *Quarterly Highlights* newsletter recently reported: "On July 1, President Clinton released his forest ecosystem plan for federal lands in the Pacific Northwest. The goal of the plan is strengthening the long-term economic and environmental health of the Pacific Northwest. The plan is based on a phased approach to ecosystem management which establishes interim reserves for successional areas and threatened and endangered species and riparian areas to protect at-risk species such as salmon. Watersheds will form the basis for implementation of the ecosystem management plan. A system of key watersheds is established to protect priority areas for aquatic conservation and water quality.

"EPA Administrator Carol Browner praised the plan when it was released, stating, 'At the heart of this policy, and what makes this approach novel and important, is protection of watersheds. Watersheds are the critical environmental component. By protecting watersheds, we are protecting rivers and streams, the viability of the old-growth forest, and the species dependent upon these natural systems.'

"Monitoring and ecosystem restoration are emphasized in the plan, and these activities will also be implemented as part of the economic assistance or job creation efforts for timber-dependent communities. The plan establishes 10 adaptive management areas targeted toward these timber-dependent communities. Like the Watershed Protection Approach, implementation of the plan in Adaptive Management Areas is intended to involve local stakeholders in cooperative planning and ecosystem management."

A lot has been going on over the first half of 1993 as the President's Pacific Northwest plan was conceived and developed. In recent weeks, a batch of exciting and important stories have come across your editor's desk. We dutifully wrote them up and scattered them in appropriate places throughout this issue. Later, we realized that they all had common themes: the interdependency of the natural environment and human activity, ecosystem management, biodiversity, as well as local economic well-being and the need for local involvement in environmental decisions. So we gathered these stories together and printed them

INSIDE THIS ISSUE

A New Look at the Management of Western Water and Related Resources
Editor's Note 1
Forest Service Riparian & River Management Conference 2
A Rancher's View of the River 3
The State Role in Riparian Management 4
Ecosystem Management By Watersheds 6
BLM/Forest Service Western Fisheries Strategy Proposal 8
Scientists Ask Clinton to Protect Northwest Watersheds 9
BLM/Forest Service to Revise Federal Grazing Rules and Fees 11
BLM Defines Ecosystem Management Process 11

Notes on Riparian & Watershed Management
U.S. Court Upholds EPA Columbia River TMDL 12
Saginaw Bay Watershed Initiative 13
New Federal Wetlands Policy 14

Notes on Environmental Knowledge
MAHA — The Mid-Atlantic Highlands Assessment 15
PCB Contamination Legacy Survives in the Great Lakes 17

News From the States & Localities
Maine Shore Stewards Supports Local Water Quality 18
In Arizona, Volunteers Monitor an International River 18
In Nevada, Public Education Program a Success 20
In Washington, Regional Council Maps Stream Corridors 21
In Nebraska, Farmers Talk Conservation 22
New Dept. of Natural Resources in South Carolina 23

Notes on the Agricultural Environment
New Soil Loss Equation 23
National Farm*A*Syst Directory Available 24

Notes on Environmental Education
Water Quality Workshops for Teachers 25
F.I.S.H. Coalition Video on Coastal Protection 27

NPS Electronic Bulletin Board (BBS) News
Share Your News With The NPS Community 27

The Nonpoint Source News-Notes Staff 28
DATEBOOK 29
THE COUPON 31

All issues of *News-Notes* are stored in downloadable files on the NPS Electronic Bulletin Board System. Additionally, the Bulletin Board contains a searchable database that allows the user to search for and retrieve *News-Notes* articles on specific topics. To access the database from the main menu type OPEN. See page 27 for log-on information.

Editor's Note (continued)

here. We call this collection *A NEW LOOK*, and it is. It's not new wisdom. It's old wisdom organized, understood and applied better, as a part of a local, public, political decisionmaking process. State and federal agencies are at the table, but local stakeholders are also there by right! That's what makes it real and exciting. (See related stories in issue #31, *Reauthorizing the Clean Water Act* and *Entering the Watershed.*)

These stories relate recent happenings at the federal level, in the Interior Department's Bureau of Land Management and the Agriculture Department's Forest Service for the most part. Other agencies, including Ag's Soil Conservation Service and, especially, the Environmental Protection Agency, have major roles to play. At all levels, this environmental and ecosystem management, preservation, and restoration business is a team effort.

While these stories all focus on the West, the experiences, processes, and understandings related here are adaptable and applicable nationwide, in everybody's backyard. And, we predict, that's going to happen more and more, all over the place . . . North, South, Midwest, East as well as Northwest and Far West.

A Forest Service Conference on Riparian Management and Western River Management Strategies

by Hal Wise, Editor

Riparian Management: Common Threads and Shared Interests are the proceedings of a remarkable conference held to discuss "strategies for an integrated approach to management of riparian areas that cross jurisdictional boundaries." The views expressed are fresh, and they come from many disciplines and viewpoints. What they have in common is the understanding that the survival of rivers and their riparian areas requires the recognition that they are interdependent, functioning systems and essential ingredients to local healthy economies.

The conference was convened early in 1993 by the USDA Forest Service in Albuquerque, New Mexico. Delegates from federal land and resource management and environmental agencies sat down with state, local, and tribal governments; ranchers; private foresters; local business owners; academicians; and environmental and other public interest groups. There were over 300 participants in the discussions.

The conference's interests ranged over a wide spectrum of subjects affecting riverine health and well-being. Under the heading "Viewing Rivers Through Different Lenses," the proceedings present papers from all levels of government, including tribal governments. "User" points-of-view came from a rancher, the timber industry, public utilities (hydro-electric generation), and recreation and fish and wildlife interests.

In "Opportunities and Constraints," the conference dealt with legal issues, financing, water quality, floodplains, political factors, and power and dam issues.

Other sessions were "The Urban-Rural Interface," "Science and Decision Making," "The Importance of Communication," "Involving the Public," and "Dealing With Conflict."

"River Management Stories — Issues of Scale," "Some Success Stories," and "Looking to the Future" rounded out the deliberations.

The vibrant and contemporary nature of this conference can best be illustrated by some brief quotes from the preface to the proceedings, written by the conference technical coordinators.

> *As our values have changed, so have our approaches to resource management. It is increasingly recognized that we need to think holistically, be interdisciplinary, and include both natural and human components in our definitions of ecosystems. Both the spatial and the temporal scales involved in management of riparian areas must be expanded. Working closely with all interests and the public, we need to create the conditions that will sustain the use and enjoyment of riparian systems for the benefit of future generations of humans, wildlife populations, and vegetative communities.*

And consider the following as an integral part of this conference's 90's point of view (as contrasted to the 1950s through the 1980s):

> *Another key part of the conference was the interweaving of cultural and artistic expressions, portraying the relationships among lands, rivers, and peoples. The Interpretive Interludes recognized that values are formed and expressed by the myths, symbols, rituals and artistic expressions of particular groups. Such groups may be as specific as an agency, a business, a*

A Forest Service Conference on Riparian Management and Western River Management Strategies (continued)

special interest, a river preservation group, a specific ethnic group, or as general as society as a whole. Through the Interpretive Interludes, conference attendees experienced a variety of cultural perspectives toward the land, focused upon agency views, Native American expressions, and the western "cowboy" culture. The interpretive vignettes, including music, story telling, and poetry, opened and closed each day's session and some of the major presentations.

This hasty overview cannot do justice to the meaty content of the 419-page proceedings. They are meant to be sampled and browsed. They provide stimulation for further thinking and exploration. This reviewer recommends the publication for those involved in riverine-ecosystem-watershed management. Not all of the answers are here, of course, but an important point of departure is provided.

It is encouraging to read of this kind of a conference, with this mix of interests all seeking ways to build positive relationships in the use and management of major natural systems. Our rivers have been exploited and dominated for too long by single-purpose interests. The time to find ways for these resources to serve many purposes and still retain their all-important ecological viability as natural systems is long overdue.

[The title of the publication is Riparian Management: Common Threads and Shared Interests. (General Technical Report RM-226.) To order a copy, write to Publications, USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, 3825 East Mulberry, Fort Collins, CO 80524. Be sure to include the full title and publication number with your order. There is no cost.]

A Rancher's View of the River

by Gretchen Sammis

EDITOR'S NOTE: This article is an excerpt from a paper included in the proceedings of the Forest Service conference on riparian management reviewed above. Its author, Gretchen Sammis, a member of the Board of Directors of the National Association of Conservation Districts, is a retired school teacher and a full-time New Mexico rancher at Chase Ranch. She has run the Chase Ranch since 1954. She is a member of the Center for Holistic Range Management and the New Mexico Cattlegrowers Association.

"My river" — in varying degrees it is any and all rivers. But this one I know. It is the lifeblood of the ranch . . .

Without "my river" there would be very few livestock, no irrigation water, no irrigated pastures, no hayfields. The wildlife who share the ranch with the cows, horses, and people depend upon the river for water and the riparian area for food and shelter. The turkeys and pheasants nest there, while many of the deer and elk bear their young near the river, and many other wild animals and birds live close to the river year round.

A long time ago, my great grandfather straightened part of the river's channel to create larger farming areas. They still are not very big, and ever since then, part of the original river bed has become what we call a "slough." Others call it a swamp and the government a wetland (I would agree with them on this one).

This slough is home to so many birds and small animals that most of you would be amazed if you came, sat, and observed. In the spring, ducks, geese, red-wing blackbirds, an occasional blue heron, and many other species stop on their way north. The reservoirs are covered with birds—the ducks, geese, and blackbirds fill the slough with conversations. Many ducks and several pairs of geese nest in my slough and actually stay all summer. The eagles are here also and harvest the ducks when they can catch them. All of this makes my river just that much more important.

Sometimes, though, the animals are not as cooperative as I think they should be. Beavers, for example: sure, they are good to build up and improve riparian areas, and I appreciate that. However, when they decide my diversion dams need improving or are in the wrong place, or that the ditches are letting out too much water and they begin to dam them up every night, then they must go.

The deer and elk enjoy the freshly growing alfalfa and oats. So far we have put up with them, but the elk are becoming a big problem. Their numbers are increasing dramatically. They

A Rancher's View of the River (continued)

compete with the cattle for everything. They cost us at least one cutting of hay from each of the fields, and the riparian areas we try to protect from the cattle are beaten into the ground by the elk.

My river, for all its goodness, can also be a monster. This river has a large watershed which reaches to the high mountains with many tributaries. If it rains hard for several days on the entire watershed, there is nothing to stop the flood waters. Dams go, fences go, channels change, and fields and crops are damaged or destroyed. However, the ranch and all it encompasses cannot live without the river, so I willingly chance its destructive powers.

I believe that the water from my river is as clean or cleaner when it leaves the ranch as when it entered its boundaries. I also believe that all of us who are fortunate enough to have a river for a little while must do our best to protect its watershed and riparian areas and make it a better river as it goes on its way. We all know that without rivers there would be very little agriculture, or life for that matter, so in closing I quote William Jennings Bryant, who said:

> *Burn down your cities and leave our farms, and your cities will spring up again as if by magic; but destroy our farms and the grass will grow in the streets of every city in the country.*

The State Role in Riparian Management

by Jo Clark

EDITOR'S NOTE: This thoughtful observation was delivered at the Forest Service's riparian management conference reported on above. It is excerpted here. Jo Clark is the director of programs for the Western Governors' Association (WGA) and is responsible for programs related to land and water resources. She coordinates the Great Plains Initiative, a partnership among WGA, U.S. Fish and Wildlife Service, EPA, Nature Conservancy, and other groups to prevent decline of species and their ecosystems while maintaining the social and economic health of the region.

When you were a child, did you ever play with the wooden puzzles shaped like a ball or cube or pyramid? You may remember that once you took the puzzles apart, they could be put back together in the right order, and that order wasn't always easy to find.

Think of state riparian management as one of those puzzles. There is a piece for each use of riparian areas. There is one for parks, another for greenways . . . [and] pieces for beaches, boat access, effluent outlets, dumps, boat docking, fishermen, residential uses, commercial buildings, grazing, logging, mining, highways and railroads, bike paths, and campsites.

. . . those pieces are owned by a number of different people. Some work for the federal government and build dams or manage parks or control forests or protect wildlife or run military bases. Others are owned by state agencies — school lands, state-owned lands, and state parks. Some pieces are owned by local governments and others by tribal governments. . . . Most are owned by private individuals.

. . . Before you can start putting your puzzle together, you learn that you have to follow the rules — rules called for in the Clean Water Act, the Endangered Species Act, NEPA, FERC licensing, instream flow provisions, swampbuster, sodbuster, the Conservation Reserve Program, reclamation rules, flood control, navigation, and stream channelization.

To top it off, the people who own the pieces can't agree on what the shape should look like when the puzzle is completed. Should it be for fishing, hunting, habitat, water retention, soil retention, water cleansing, water supply, aesthetics, transportation corridors, or recreation?

When I began thinking about state riparian management for this conference, my first reaction was that there really isn't any because of all the complications I just mentioned and a few others besides. Riparian areas have historically fallen through the cracks — they aren't really water, and, therefore, water managers didn't worry about them. And land managers saw them either for their commercial value, or they ignored them.

Once their ecological and other values were recognized, they were still almost impossible to manage. For one thing, the fragmented ownership by various governments and various individuals is a problem. Second, there are property and other rights to riparian stretches — private ownership, various permits, historic uses, rights-of-way, easements, and the like.

Third, there are incidental but sometimes conflicting regulations — dredge and fill, nonpoint source, habitat for endangered species, conditions on FERC licenses, shoreline access, instream flow standards, navigation channels, flood plan insurance mandates, and others. A fourth problem is that even if those problems didn't exist, it still wouldn't be clear which agency should be in charge — water, fish and wildlife, environmental quality, transportation, or agriculture. And finally there is a fifth problem — research, data, and other critical information. Are riparian areas important corridors linking ecosystems to promote biodiversity? Or are they pathways for cats, dogs, and invading species to attack new ecosystems? Does the entire riparian corridor need protection or just key blocks of it? How do soils, vegetation, and water levels relate to ensure the healthiest system? What are the variables that must be factored in for effective restoration? And finally, how do you define healthy for an ecosystem that is inherently unstable?

After having given you all the reasons state riparian management has been almost non-existent, I'm pleased to say that is changing, and changing rapidly. If states are "laboratories of democracy," they are also laboratories of riparian protection. A number of states are looking at riparian management as part of new planning approaches — Kansas, Missouri, Oregon, and California. Others are drawing up regulations that include a variety of facets — stream access, business and residential setbacks, shoreline zoning, mandates to local governments to protect riparian areas, mitigation banking, drainage requirements, and grazing practices. Still others are collecting information and/or starting to build public support.

But what is exciting is that virtually all states are paying attention and starting to try various strategies. It is perhaps instructive to look briefly at the most recent state riparian law — Arizona's Senate Bill 1030, signed in December. That law directs three different departments to complete tasks by December 1, 1993. The Arizona Game and Fish Department is to undertake studies regarding identification and protection of riparian areas and instream flows, including mapping and classifying riparian areas in the state. The Arizona Department of Water Resources will evaluate the effect of groundwater pumping and surface water diversions on riparian areas and will evaluate alternative regulatory programs. The Department of Environmental Quality will evaluate a broad range of activities that impact riparian areas. The law builds in consideration of existing users and creates a Riparian Area Advisory Committee which ensures broad user representation.

Two things strike me about this law: one is the good-faith effort to recognize the complexities and take a system approach to the issue. The second is what appears to be the current lack of even baseline information on the state's riparian resources.

Now, what is it going to take to put our puzzle together? Using a phrase that is rapidly becoming a cliche — "partnership."

Partnership among

- those who own or manage a piece of the puzzle,
- those who have or are developing information on how to do it right,
- those who write the rules of the game, and
- those who have different visions of what the final product should look like.

Watersheds, joining land and water, appear to be the clear choice as the organizing logic for addressing riparian management.

Our completed puzzle, after all, is a kind of system. Bruce Hawkinson, in a draft of a book entitled *The Next Millenia,* describes a system as a whole that cannot be divided into independent parts. Every part has properties that it loses when separated from the system and every system has properties that none of its parts do. Hawkinson quotes Russell Ackoff in the book, *Creating the Corporate Future,*

> *If each part of a system, considered separately, is made to operate as efficiently as possible, the system as a whole will not operate as effectively.*

That statement contains a lot of wisdom about reining in the parts in the interest of the whole. Nowhere is that more true than with riparian management.

Ecosystem Management By Watersheds

by Jim Maxwell, Regional Hydrologist
USDA Forest Service, Rocky Mountain Region, Lakewood, CO

EDITOR'S NOTE: This article provides insight into the evolution taking place within the Forest Service on developing workable methods to implement ecosystem management at the field level. It deserves serious consideration and discussion since some of these ideas may become Forest Service policy. Other agencies, EPA included, are undergoing similar internal dialogue.

The concept of planning and managing watersheds as holistic units is included in bills reauthorizing the Clean Water Act now before Congress. In our view, protocols for achieving such watershed management should be interagency, intergovernmental, and interdisciplinary, bringing around the table all levels of government as well as hydrologists, fish and wildlife biologists, state water quality managers, and private timber and cattle ranch operators. As participants in this new adventure, we need a common language to guide us and to reach across agency, governmental, disciplinary, and special interest lines.

The concept took form over a year ago in a Denver Forest Service meeting of biologists and hydrologists in an effort to address issues such as the endangered salmon in the Pacific Northwest. Out of that meeting evolved a proposal printed in the *Watershed Management Council Newsletter* and summarized here. Some of the ideas in the paper were worked into the President's Northwest forest plan.

We'd like to hear from our readers on this — use the coupon to express your vision for future directions.

A new strategy is evolving within the USDA Forest Service — Management by Watersheds. This strategy is designed to fulfill the mandates of four key environmental laws, help solve critical environmental problems such as the endangered salmon issue in the Pacific Northwest, and help achieve Ecosystem Management goals by maintaining ecological processes that sustain biophysical watershed and aquatic systems.[See News-Notes # 22 for more on the Forest Service's Ecosystem Management policy.]

Management by Watersheds is based on the Organic Act of 1897, the Endangered Species Act of 1973, the National Forest Management Act of 1976, and the Clean Water Act of 1987. These laws require the Forest Service to secure favorable conditions of water flows on its lands by ensuring healthy watersheds and streams; preserve and restore the physical, chemical, and biological integrity of waterbodies; and protect soil productivity, aquatic habitat, and species viability.

Fundamental Principles

Management by Watersheds means that watersheds in National Forests are managed as ecosystems so that their hydrologic function sustains a balanced range of hydrologic conditions typical of healthy watersheds and streams. Watersheds form natural ecological units within which inputs of energy and water are synthesized with geomorphology, soils, and vegetation, producing an array of land and water forms and a range of hydrologic functions and processes. The balanced range of conditions sustained by hydrologic function of a healthy watershed includes:

1. INTEGRITY OF THE SOIL: Soil structure, organic matter, nutrients, and biological processes are preserved.
2. INTEGRITY OF STREAMFLOW: The watershed acts like a sponge and exhibits high infiltration rates that regulate runoff and recharge aquifers.
3. INTEGRITY OF STREAM CHANNELS: Channel form, function, and processes are in dynamic equilibrium and gully erosion is absent or rare.
4. INTEGRITY OF WATER QUALITY AND AQUATIC HABITAT: Aquatic life is diverse and productive, and a balanced range of aquatic habitats are present.
5. INTEGRITY OF AQUATIC GENE POOLS: All phenotypes and genotypes of fish and other aquatic life are preserved.

The Management by Watersheds Program

As the portion of Ecosystem Management that sustains watersheds and aquatic systems, Management by Watersheds seeks to maintain healthy watersheds through land stewardship and to restore ailing watersheds through restoration measures. The program includes analysis, management, and monitoring components.

Ecosystem Management By Watersheds (continued)

Watershed Analysis

Each watershed would be analyzed to diagnose its health in terms of its ability to provide favorable conditions of water flows, as well as the management factors contributing to the present watershed conditions. The level of analysis might vary depending on watershed values and their exposure to various risks.

The analysis would establish a DESIRED WATERSHED CONDITION that defines a healthy watershed. This desired condition is actually a range of conditions for certain land and stream attributes typical of the dynamic equilibrium found in healthy watersheds and streams in the local geoclimatic area. The EXISTING WATERSHED CONDITION would then be diagnosed relative to the desired condition, using the same land and stream attributes. This approach defines a range of natural variability and assesses deviations from that range.

The analysis would evaluate specific contributors to the existing watershed condition by analyzing the effects of management activities on the same land and stream attributes. This analysis would consider both inherent watershed hazards and the level of disturbance of activities in the watershed.

Watershed Management

The results of watershed analysis would help drive the management program for each watershed, implemented through the Forest Service's Nonpoint Source Management Strategy. The general approach in each watershed would be as follows:

- If watershed health is good (within the range of natural variability) and is stable or improving, land disturbing activities could continue at their present rate or perhaps even accelerate.
- If watershed health is good but declining, land disturbing activities would have to be slowed or adjusted through more rigorous application of watershed conservation practices.
- If watershed health is poor (outside the range of natural variability), the only land disturbing activities which could occur would be those that contribute to watershed recovery, and a watershed restoration program might be applied until good watershed health is restored.

Watershed Monitoring

Each watershed would be monitored on the regular 10- to 15-year cycle of Forest Plan revisions to track progress in restoring and maintaining watershed health. Monitoring would focus on the same land and field attributes mentioned above. The watershed management program would be adjusted as indicated by monitoring results.

Dynamic Equilibrium and Watershed Health

Major fires and floods occur in cycles in natural systems, and between such extreme events a healthy watershed operates in DYNAMIC EQUILIBRIUM. Streamflows and sediment yield, watershed and stream channel stability, water quality and aquatic habitat and biota vary within some RANGE OF NATURAL VARIABILITY. An extreme event throws the watershed out of equilibrium, but it immediately begins to recover to the prior, or new, range of natural variability.

The intent of Management by Watersheds is to maintain this balanced range of conditions between the extreme events; to avoid actions that would throw a watershed out of equilibrium or increase the frequency or severity of major events; and to speed rather than impede a watershed's recovery from such events.

Major events will still occur, but management actions should not make any watershed more susceptible to damage or further stress an unbalanced system. A prudent level of land disturbing activities can occur in a watershed that yet maintains its health. As long as floods or droughts are not worsened, sediment loads and bank erosion are not substantially increased, rills and gullies and landslides are not accelerated, and water quality and aquatic habitat features are maintained within the balanced range, a watershed will remain healthy.

Attributes of Watershed Health

Land and stream attributes of watershed health reflect the physical processes affected by climate, geomorphology, and management, as well as the values at risk in the watershed. The range of natural variability of these attributes indicates good watershed health and enables deviations from this range to be discerned.

Ecosystem Management By Watersheds (continued)

The range of natural variability for these attributes would be defined for each land and stream type within a given geoclimatic area. For example, in each such area, the range of attributes for each stream type would be established by sampling minimally disturbed reaches of that stream type throughout the area.

Implications

Management by watersheds demands a change. Watersheds must be recognized and managed as basic ecosystems. An interdisciplinary approach is needed in which all Forest Service employees consider watershed management to be critical. A permanent commitment of policy and resources is needed to place this program at the heart of the Forest Service mission. By building a structured program that maintains healthy watersheds and restores ailing ones, the Forest Service can assume a leadership role in managing lands wisely for the good of future generations.

[For more information, contact Warren Harper, Water Resources Program Manager, USDA Forest Service, Watershed and Air Management, 201 14th St., SW, Washington, DC 20250.]

BLM and Forest Service Propose PACFISH Strategy for West Coast Salmon and Steelhead Fisheries on Public Lands

> *. . . In many areas of the west coast, naturally reproducing stocks of Pacific salmon, steelhead and sea-run cutthroat trout are at risk of extinction. Of the more than 400 stocks from California, Idaho, Oregon, and Washington recently evaluated by the American Fisheries Society, 214 were considered to be at moderate or high risk of extinction or of "special concern," 106 were extinct, and about 120 were considered secure.*
>
> *About 134 "at-risk" stocks identified by the AFS report are found on National Forests and 109 are found on public lands administered by the BLM.*

So read the May 1 statement from the U.S.DOI Bureau of Land Management (BLM) and the USDA Forest Service announcing a new management proposal for the nation's Pacific salmon and steelhead fishery, *PACFISH STRATEGY.*

The joint statement on the PACFISH Executive Summary noted,

> *Over the past several years, significant new research information about the status of Pacific salmon and steelhead stocks, current habitat conditions, and habitat requirements has become available. This new information makes it necessary for the Forest Service and BLM to take immediate and long-term actions to assure proper management of fish habitat in Alaska, California, Idaho, Oregon and Washington.*

The statement went on to report,

> *The PACFISH effort is a proactive, ecosystem approach to management of watersheds and Pacific anadromous fish habitats . . . alternatives [being considered] include some combination and application of key watershed identification, watershed analysis, [the identification of] Riparian Habitat Conservation Areas and [the development of] standards and guidelines, and watershed restoration. The PACFISH strategy is building upon a scientifically sound assessment that characterizes current habitat conditions, provides an understanding of the elements of "good" habitat conditions, provides the knowledge of how to manage watersheds to maintain good habitat where it now occurs and achieve good habitat conditions in areas that currently are degraded.*

Elements of the PACFISH Strategy

- Riparian Management Objectives *are being refined that call for the maintenance or restoration of (a) water quality to a degree that provides for stable and productive ecosystems (i.e., timing and character of temperature, sediments and nutrients); (b) stream channel integrity, channel processes and sediment regime under which the ecosystems developed (e.g., timing, volume, and character of sediment input and transport); (c) instream flows to support desired riparian and aquatic habitats, stream channel stability and effective function, and ability to route flood discharges; (d) natural timing and variability of the water table elevation in meadows and wetlands; (e) diversity and productivity of native and desired non-native plant communities; (f) riparian vegetation so that the amount and distribution of large woody debris is characteristic of natural riparian and aquatic ecosystems; (g) habitat for populations contributing to the viability of riparian-dependent communities (i.e., native and desired non-native plants, vertebrates, and invertebrates); (h) riparian vegetation for adequate summer and winter thermal regulation; (i) riparian vegetation so the rates of surface and bank erosion and channel migration are similar to the rates under which the communities developed; and (j) riparian and aquatic habitats for the unique genetic stocks that evolved within that specific geoclimatic region.*

BLM and Forest Service Propose PACFISH Strategy for West Coast Salmon and Steelhead Fisheries (continued)

■ Key Watersheds *are being identified by determining which watersheds are important to at-risk stocks, and currently are in good condition, or have a high potential for restoration. Key watersheds will receive top priority for watershed analysis, maintenance, and restoration activities.*

■ Riparian Habitat Conservation Areas *(RHCAs) are being defined where particular management sensitivity is warranted. RHCAs include the traditional riparian corridor along permanent fish-bearing streams, and also include areas of unstable soils, wetlands, intermittent headwater streams, and other areas where proper ecologic functioning is crucial to maintenance of the stream's water, sediment, woody debris and nutrient delivery systems. Based on regional averages throughout the five-state area, minimum interim widths for delineation of RHCAs, in the absence of site-specific information, are as follows:*

- Fish-bearing streams and lakes = 300 ft
- Permanently flowing non-fish-bearing streams = 150 ft
- Ponds, reservoirs, and wetlands > 1 acre = 150 ft
- Seasonally flowing or intermittent streams, wetlands < 1 acre, landslides and landslide-prone areas = 100 ft

■ Modified Planning Direction *is being developed to improve consistency of content and approach in Forest Service and BLM planning documents.*

■ Interim Standards and Guidelines *for all National Forests and BLM administered public lands that support Pacific anadromous fish stocks are being developed.*

■ Watershed Analyses *will be conducted to identify problem areas that need immediate, corrective management. Watershed analysis also will allow the delineation of RHCAs to be tailored to site-specific conditions, and will provide the foundation for determining modifications to the interim standards and guidelines necessitated by site-specific conditions. Watershed analyses will be conducted in two steps. Level I allows for timely assessment and modification of existing practices and identification of "hot spots" that should immediately be targeted for maintenance and/or restoration. Level II allows for a more complete assessment of cumulative effects and refinement of RHCA delineation. Both Level I and Level II watershed analyses will be certified by appropriate line officers upon completion. Public involvement in watershed analyses will be encouraged.*

■ Watershed Restoration *efforts in key watersheds will receive priority. All restoration work will be designed at a watershed/landscape scale and will involve coordination between changes in land management activities and active restoration projects.*

Implementation Process

> *Direction provided by the PACFISH strategy will be science based, practical, and economically feasible. It also will provide assurance to the public that we are responding seriously to the situation. Because of the critical status of many of the at-risk anadromous fish stocks and the Forest Service and BLM's need to demonstrate commitments to improved habitat conditions on lands they administer, consideration is being given to the issuance of interim direction that will apply to Forest Service and BLM stewardship of all anadromous fish habitat on National Forests and Public Lands in the West. . . . Selection of final management direction will proceed with a full National Environmental Policy Act review of all alternatives that meet technical and legal requirements.*

[For further information or a copy of the PACFISH Executive Summary, contact Phil Janik, Assistant Director of Wildlife and Fisheries, USDA Forest Service, 14th St. and Independence Ave., SW, Washington, DC 20050. FAX: (202) 205-1599; or Dr. Jack E. Williams, Bureau Science Advisor, U.S.DOI Bureau of Land Management, 1849 C St., NW, Washington, DC 20240. Phone: (202) 208-7701.]

Scientists Ask President Clinton To Protect Northwest Watersheds, Salmon

EDITOR'S NOTE: This story came to us quite independently of the PACFISH story. We print it here to indicate that a lot is happening out there on the watershed front these days.

In mid-May, more than 125 scientists from across the country joined together to urge President Clinton to adopt a comprehensive watershed protection and restoration program on federal lands as part of his solution to the Pacific Northwest's timber crisis.

Scientists Ask President Clinton To Protect Northwest Watersheds, Salmon (continued)

The scientists' communication to the President said:

> *We urge you to use the ecological principles articulated at the April 2 Forest Conference to protect riparian areas and refugia on federal lands in Oregon, Washington, Idaho, and northern California. In addition, we urge you to implement a comprehensive watershed and salmon habitat restoration program. These steps will prove vital to Pacific salmon and water resources throughout the region. They may also set precedents for similar applications to federal lands nationwide, an approach that will meet the spirit of your call to make government agencies work together.*

The scientists — most of them aquatic ecologists and water-resource specialists — wanted to ensure that watersheds were addressed in the plan. (This did happen. See the Editor's Note in "A New Look" in this issue and our story, "An Action Plan to Protect and Restore River Ecosystems" in Issue #31 of *News-Notes*.)[1]

James R. Karr, director of the Institute for Environmental Studies at the University of Washington, delivered the letter to the White House. The letter, which pushed for a long-term solution based on sound scientific principles, was accompanied by 10 pages of signatures. Karr, who organized the effort in a little more than two weeks, said he was overwhelmed by "the quick and positive response."

"The fate of Pacific salmon — and of sustainable supplies of clear water, fiber, timber, fisheries, and productive soils — is inextricably linked to the future of watersheds," the scientists said in the letter. "We urge you to implement a comprehensive watershed and salmon habitat restoration program. These steps will prove vital to Pacific salmon and water resources throughout the region."

Karr said the plan should include three essential components:

- watershed refuges for at-risk species and protection of remaining healthy watersheds;
- ecological principles to protect riparian areas and floodplains; and
- watershed restoration programs that include riparian reforestation and a reduction in sediment runoff from roads.

The letter also told the President:

> *Watershed and landscape-level planning is central to a successful program — as is the need for action based on scientific principles rather than emphasis on procedural substitutes. Under your continuing leadership, your Administration can ensure that sound science is integrated with sound policy. Above all, we urge you to avoid the past tendency to ignore compelling scientific evidence in pursuit of short-term policy goals.*

"A great deal is at stake here," Karr said. "I hope the components of a new policy approach outlined in our letter will be used to set a new course for the protection and restoration of the nation's water resources, a goal articulated 20 years ago in the Clean Water Act. An integrative approach to land and water resources is essential to accomplishing that goal."

The letter was reported on in some length in the Seattle Times on May 13. The article quoted Karr as saying that while hydroelectric dams, irrigation and overharvesting have harmed the fish, logging roads are one of the most important contributors to poor health of streams.

"The slope instabilities that they create cause landslides and debris flows that basically destroy the passages," he told the newspaper.

---

[1] The American Fisheries Society national president, Carlos Fetterolf, Jr., and executive director Paul Brouha, are among the letter's 125 signers. Marsha L. Landolt, director of the University of Washington's School of Fisheries, and Robert Naimen, director of its Center for Streamside Studies, also signed the letter along with Ira Adelman, head of the University of Montana's Department of Fisheries and Wildlife; Kent Fausch, chairman of fishery biology at Colorado State University; William Trush, director of Humboldt State University's Institute for River Ecosystems in California; Bruce Menzell, chairman of Iowa State University's Department of Animal Ecology; Thomas Wissing, acting director of Miami University's Ecology Research Center in Oxford, Ohio; Erik Fritzell, leader of the fisheries and wildlife program at the University of Missouri-Columbia; and Richard Sparks, director of the Illinois Natural History Survey's River Research Laboratory. Daniel Bottem and Jeffrey Dambacher, research biologists for the Oregon Department of Fish and Wildlife, backed the effort as did state biologists from the North Carolina Division of Environmental Management, Maine Department of Environmental Protection, Wisconsin Department of Natural Resources, and Delaware Department of Natural Resources and Environmental Control.

Other universities represented in the letter include: Alabama, Alaska-Fairbanks, Arizona State, California-Berkeley, Cornell, Florida, Georgia, Idaho State, Kansas State, Maryland, Minnesota, North Dakota, New Mexico, Ohio State, Oregon State, Penn State, Pittsburgh, Purdue, Virginia Tech, and West Virginia.

Scientists Ask President Clinton To Protect Northwest Watersheds, Salmon (continued)

This effort illustrates a new way of looking at public policy matters — holistically, in a broad ecological systems context. Solutions to timber harvesting and employment problems must be considered in their total environmental context, on a watershed basis, including water quality and the severely depleted salmon fishery.

[For more information, contact James R. Karr, Director, Institute for Environmental Studies, University of Washington, FM-12, Seattle, WA 98195. Phone: (206) 543-1812.]

Bureau of Land Management and Forest Service Call For Major Revisions of Grazing Rules and Fees on Federal Lands

On August 13, 1993, the U.S. Department of Interior's Bureau of Land Management and the U.S. Department of Agriculture's Forest Service published notices in the *Federal Register*. The Forest Service called its notice "Range Management; Grazing Use and Grazing Fees; Proposed Rule" while BLM's notice was entitled "Grazing Administration Regulations, Proposed Rule." The effect was the same. As the *Washington Post* reported, "The Clinton Administration announced yesterday that it will impose higher fees and tougher environmental restrictions on ranchers who graze their cattle and sheep on 264 million acres of public rangeland in the west."

The *Wall Street Journal*, in its report on the announcement, commented that ". . . ranchers would be required to meet stringent new national ecosystem-management standards that would focus on the health of riparian areas. . . ."

Both agencies' proposed rules demonstrate a move toward adjusting grazing fees to more fairly reflect environmental and market values. The Forest Service notice said,

> *Revision of the grazing fee system is part of a comprehensive effort of the Forest Service and the Bureau of Land Management to improve the management of federal rangelands. Revision of the grazing fee system is intended to correct . . . the wide disparity between rates charged for livestock forage on private and federal lands and the failure to follow the trend of forage value in the private market.*

Both the Forest Service and BLM stressed the importance of ecosystem management and restoration.

The BLM notice commented,

> *Ecosystem management is a process that considers the total environment. It requires the skillful use of ecological, economic, social, and managerial principals in managing ecosystems to produce, restore, or sustain ecosystem integrity and desired conditions, uses, products, values and services over the long term.*

BLM Defines the Process of Ecosystem Management

EDITOR'S NOTE: In the process of developing its new *Standards and Guidelines for Rangeland Management*, BLM prepared this draft blueprint on ecosystem management. We are impressed.

1. With public and other agency participation, identify management units on a watershed basis.
2. With public and other agency participation, rapidly assess the functional condition of watersheds.
3. With public and other agency participation, assess their [watershed's] social, cultural, ecological, and economic characteristics and values as a measure of manageability and critical issues.
4. With public and other agency participation, select [priority] watersheds.
5. Form community of interest teams as partners for the management of selected watersheds. Form interdisciplinary science teams for the more detailed assessment of these watersheds, including ecological, cultural, social, and economic characteristics.
6. Using the best available science and knowledge, agree upon common goals and objectives for these watersheds and the management actions believed most appropriate for achieving them.
7. Implement these management actions and monitor their results.
8. While maintaining the relationship of interested parties and science, review the results of monitoring and/or new information to revise management actions as appropriate.

Bureau of Land Management and Forest Service Call For Major Revisions of Grazing Rules and Fees on Federal Lands (continued)

The notice indicated that the department intends to issue standards and guidelines for livestock grazing in rangeland ecosystems:

> *The standards and guidelines would reflect properly functioning conditions, or those conditions that must be met to ensure sustainability and healthy, productive ecosystems.*

The Forest Service notice summarized,

> *The National Forests System rangelands are receiving increasing demands from a growing population. Although traditionally the primary use of rangelands has been livestock production, the Forest Service also recognizes the importance of rangelands in providing for biodiversity, productive habitat for wildlife and fisheries, clean air, clean water, quality outdoor recreation opportunities, and long-term ecosystem stability. In addition, agency management of rangelands must be not only responsive to permittees, but also to an environmentally concerned public whose interests are much broader than livestock grazing alone and who are vocal in demanding that the agency improve those rangelands that are in unsatisfactory condition. Achieving rangeland management that is sensitive to the environment while sustaining productivity requires that agency direction allow the best use of technology and provide the flexibility to be responsive to change.*

A third Federal Register notice appeared on August 13 dealing with the intention of BLM to prepare a programmatic environmental impact statement (EIS) on the administration's rangeland management reform. While the EIS will be prepared by BLM, the Forest Service will be an active "cooperator" and participant, the Federal Register indicated. Both the BLM and the Forest Service have expressed a desire for increased consistency and cooperation between the two agencies.

Written comments on the scope of the proposed EIS will be accepted by BLM until September 13, 1993. Likewise, public comments are to be submitted to the agencies on the proposed Forest Service and BLM rules by September 13, 1993.

[For further information on the proposed regulations, contact Jerry W. McCormick, Range Management Staff, USDA Forest Service, P.O. Box 96090, Washington DC 20090-6090. Phone: (202) 205-1746. Mark W. Styles, Regulations Analyst, Division of Legislation and Regulatory Affairs, Bureau of Land Management, U.S. Department of the Interior, 1849 C Street NW, Washington DC 20240. Phone: (202) 208-4256. For further information on the proposed EIS, contact Jim Fox, BLM, at (202) 653-9193. FAX: (202) 653-9118.]

Notes on Riparian & Watershed Management

U.S. District Court Upholds EPA's TMDL on Dioxin Discharge to the Columbia River

At the request of the states of Oregon, Washington and Idaho, EPA Region X recently prepared a Total Maximum Daily Load Allocation (TMDL) on dioxin discharge to the Columbia River. The Clean Water Act calls for TMDLs to be prepared when technology-based effluent limitations are found to be not sufficient to meet water quality standards and more stringent water quality based regulations are required. TMDLs are developed for specific pollutants, in this case dioxin.

In EPA's TMDL, allocations were made for specific U.S. pulp and paper mills, and other pollution sources, including point sources, natural background and nonpoint sources, with an allowance provided for a paper mill in Canada. EPA was sued both by a coalition of paper mills and by environmentalists. The mills contended that EPA had not followed correct procedures required by law in the development of the TMDL. Environmentalists contended that EPA had not gone far enough.

On August 10, 1993, the United States District Court for the Western District of Washington upheld EPA's actions in all respects. *News-Notes* will have a more complete story on this important decision in our next issue.

Watershed Initiative Promotes Local Action Around Michigan's Saginaw Bay

In the two years since its inception, the Saginaw Bay Watershed Initiative program has kept 170 thousand tons of soil, 150 tons of phosphorus, and 100 tons of nitrogen out of Lake Huron's Saginaw Bay.

Program Manager Jim Bredin said that local participation will be the key to the long-term commitments needed to sustain the existing efforts. "Local interests are seeing implementation activities and are now playing an important role in the ongoing planning necessary to improve and protect the watershed."

Saginaw Bay, like many other waterbodies, has suffered contaminated sediments, an atrophied fishery, numerous fish consumption advisories, and the loss of recreational opportunities. However, Bredin notes that since discharges from point sources have been reduced during the past ten years, reduction of nonpoint sources will play a major role in restoring the bay's designated uses.

To that end, the initiative's focus has been directed toward three primary areas:

- implementation of local pollution control measures.
- development of a strong local-state-federal partnership.
- promotion of greater public awareness of the bay, its problems, and its resources.

Among the educational activities are river cleanups, volunteer monitoring, and teacher training.

Other ongoing activities in the watershed include soil conservation, pesticide control, and nutrient management programs; development of local water quality zoning regulations; design of low maintenance detention systems; development of erosion control training materials; water quality testing; and wetland restoration.

An excellent example, observed Bredin, is a wetland restoration/training/education project now underway. One soil conservation district that has been very successful in wetland restoration has received funding to provide restoration training to all 22 of the watershed's districts. The project includes distribution of educational materials, technical support, and cost-share funding for restoration in each county.

Along with on-the-ground activities, the initiative participants are crafting partnerships between the agencies and educating the most crucial partner of all, the public. Among these partnerships are the Saginaw Bay Watershed Council, bringing local government officials together, and the nonprofit group, the Saginaw Bay Alliance.

"The Saginaw Bay Watershed Initiative has brought together federal funding and funding through the Great Lakes Soil Erosion and Sedimentation Program, combined with significant state and local funding to actually implement nonpoint source pollution control measures in most areas of the over 8,700-square-mile watershed," said Bredin. The Michigan Department of Natural Resources, which administers the program, gives grants to local governments to support local water quality improvement efforts. Additional resources are brought in through other federal and state agencies. The Michigan Department of Natural Resources has funded projects such as watershed education plans, wetland handbooks for local officials, and redevelopment of contaminated sites. Federal agencies, such as U.S. EPA Region 5, provide funding for projects like a handbook on wetlands for prosecutors and law enforcement staff, and nutrient monitoring and modeling.

Besides the usual array of feds, local and state organizations play active roles: the state agriculture department, Michigan State University Extension, the Michigan Manufacturers Association, Resource Conservation and Development, Michigan Association of Drain Commissioners, and the state Farm Bureau.

[For more information, contact Jim Bredin, Program Manager, Saginaw Bay National Watershed Initiative, Michigan DNR, Saginaw Valley State University, Pioneer Annex 9A, University Center, MI 48710. Phone: (517) 791-7367.]

New Federal Wetlands Policy Seeks Balance Between More Wetland Protection and Landowner Needs

Heralding the new wetlands policy as an end to gridlock and agency wars, the White House on August 24 issued a comprehensive package of wetlands reform initiatives. The plan includes a number of protection and restoration actions, while adopting reforms designed to increase the fairness and flexibility of the regulatory program. Included in the package is withdrawal of a rule that would have greatly relaxed wetlands protection in Alaska. The plan appoints the SCS the lead agency for wetland delineations on agricultural land, a move that should reduce duplication and inconsistency for farmers.

The plan also directs the use by all agencies of the 1987 wetlands delineation manual pending completion and review of a National Academy of Science study, expected in September 1994. The plan, which encourages watershed planning, also includes initiatives addressing mitigation and mitigation banking. In addition, the plan addresses wetland restoration to achieve the Administration's interim goal of no overall net loss of wetlands and the long-term goal of increasing the quality and quantity of the nation's wetlands. Restoration will take place primarily through the Wetland Reserve Program. An Executive Order on the restoration issue is expected.

Jon Kusler of the Association of State Wetland Managers said that the association is strongly supportive of the overall policy.

The National Association of Conservation Districts' Gerald Digerness also expressed approval. "We welcome what appears to be a fair, flexible, and technically feasible approach that recognizes the environmental, economic, and social benefits of wetlands," said Digerness.

The reform initiatives:

- To affirm its commitment to conserving wetland resources, the Administration will issue an Executive Order embracing the interim goal of no overall net loss of the nation's wetlands . . . and a long term goal of increasing the quality and quantity of . . . wetlands;
- To increase fairness in the wetlands permitting process, the [Army] Corps [of Engineers] will establish an administrative appeals process so that landowners can seek speedy recourse if permits are denied without having to go to court;
- To reduce uncertainty for . . . farmers . . . the Corps and EPA issued a final regulation ensuring that approximately 53 million acres of prior converted cropland — areas that no longer exhibit wetland characteristics—will not be subject to wetlands regulations;
- To reduce duplication and inconsistency for . . . farmers, the Soil Conservation Service will be the lead federal agency responsible for identifying wetlands on agricultural lands under both the Clean Water Act and the Food Security Act;
- To close a loophole that has led to the degradation and destruction of wetlands . . . the Corps and EPA issued a final regulation to clarify the scope of activities regulated under the Clean Water Act;
- To emphasize that all wetlands are not [considered] of equal value . . . EPA and the Corps issued guidance to field staff highlighting the flexibility that exists to apply less vigorous permit review to small projects with minor environmental impacts;
- To ensure consistency and fairness, the . . . Corps, EPA, SCS, and the Fish and Wildlife Service will all use the same procedures to identify wetland areas;
- To increase the predictability and environmental effectiveness of the Clean Water Act regulatory program and to help attain the no overall net loss goal, the Administration endorses the use of mitigation banks;
- To reduce the conflict that can result between wetlands protection and development when decisions are made on a permit-by-permit basis, the Administration strongly supports incentives for states and localities to engage in watershed planning;
- To provide effective incentives for farmers to restore wetlands on their property, the Administration will continue to support increased funding for the USDA's Wetland Reserve program; and
- To help attain the long-term goal of increasing the quantity and quality of the nation's wetlands, the Administration will promote the restoration of damaged wetland areas through voluntary, nonregulatory programs.

[For copies of the wetlands policy, Protecting America's Wetlands: A Fair, Flexible, and Effective Approach, contact the (toll-free) Wetlands Protection Hotline, (800) 832-7828.]

Notes on Environmental Knowledge

MAHA — The Mid-Atlantic Highlands Assessment

EDITOR'S NOTE: This story is based on an ecological assessment fact sheet prepared by Region III and printed in EPA's *Water Monitor.*

The Environmental Protection Agency Region III (Philadelphia) is conducting a rigorous assessment of an area that comprises more than half the land in Region III. The Mid-Atlantic Highlands Assessment (MAHA) will evaluate the condition of the area's natural resources and help shape management plans.

The Mid-Atlantic Highlands are an important environmental resource for the eastern United States. The Highlands encompass approximately 65,000 square miles of oak-hickory forests and upland areas, which include six major watersheds in the states of Pennsylvania, Maryland, Virginia, and West Virginia. Six distinct ecoregions characterize the Highlands: the Western Allegheny Plateau, the Northern Appalachian Plateau and Uplands, the North Central Appalachians, the Central Appalachian Plateau, the Central Appalachian Ridges and Valleys, and the Blue Ridge Mountains.

Because the Mid-Atlantic Highlands account for roughly 55 percent of Region III, the EPA Regional Office has always been concerned about the area's natural resources. Protecting the environment of the Mid-Atlantic Highlands is especially crucial now because it is exposed to many stresses that threaten areas of high environmental and aesthetic value and areas that provide habitat for many unique and critical species.

Region III has designed the MAHA project to improve the effectiveness of local, state and federal environmental protection efforts on a scale and with a precision which has not been possible before. Activated by Region III's Environmental Services Division, MAHA will support improved planning and management for overall regional planning by states and EPA divisions in its regional office.

Environmental Threats

The Mid-Atlantic Highlands receive the highest rates of acid deposition in the United States. This deposition, coupled with poor buffering in some zones, has caused approximately eight percent of the streams in the area to become acidic. Many of the ecosystems within the Highlands suffer impacts from coal mining, including erosion, silting, and acid damage. Construction of new resort communities and subsequent increases in population are further stressing the natural aquatic and terrestrial resources of the area.

These environmental stresses are impacting fisheries, other recreational resources, forest and agricultural productivity, and fish and wildlife habitat. Also, the poor water quality of the streams and rivers of the Mid-Atlantic Highlands has direct effects on the Chesapeake Bay, the Great Lakes, and the Ohio and Mississippi river systems. For all of these reasons, Region III has placed a priority on solving the environmental problems of the Mid-Atlantic Highlands.

Ecological Monitoring and Assessment

Currently, Region III is undertaking a series of steps, collectively referred to as MAHA, to accurately gauge the current condition and environmental changes occurring in specific geographic areas of the Highlands.

MAHA combines a number of complex state, regional, and national environmental monitoring designs into an assessment process specifically targeted to the management needs of Region III. When fully developed, MAHA will provide a suite of environmental assessment tools to integrate land cover information, other measures of human-caused environmental stress, and the biological assessment of stream and fish communities, agricultural and forest ecosystems — factors that have not been considered on this scale in previous environmental assessments. These integrated assessment tools permit improved environmental management by focusing programmatic and technical tools on key problems.

MAHA Approach to Ecological Assessment

The Environmental Services Division of Region III is responsible for coordinating the several efforts that are part of the MAHA project. One effort directed by Region III is assessing the conditions of pristine upland streams that will serve as reference sites.

MAHA — The Mid-Atlantic Highlands Assessment (continued)

MAHA has borrowed two basic design features from the Environmental Monitoring and Assessment Program (EMAP). The first is a standard suite of biological measures to assess environmental quality, and the second is a set of rigorous, probability-based sampling designs to ensure that assessment results can be characterized with known confidence.

Together, these concurrent efforts will monitor 246 sites in the Mid-Atlantic Highlands during the coming year. This assessment and other monitoring efforts will be used to answer management questions such as the following:

- What streams are severely degraded, and where is degradation worst?
- Which areas require detailed environmental studies?
- How much of the Mid-Atlantic Highlands is forested, and how is it changing in extent and species?
- How much of the land is in agriculture, and how productive are the agricultural lands?
- What are the discernible effects of agricultural chemicals?
- What areas no longer support fish or wildlife?
- Which areas are in danger of the collapse of natural ecological conditions?

Interagency Cooperation

MAHA is distinctive for the high degree of inter-agency cooperation and data-sharing involved. Included are the monitoring and assessment activities of several programs:

- EMAP's Mid-Atlantic streams monitoring project,
- Region III's own efforts with the states to develop biological indicators of stream quality in the Appalachian Ridges and Valleys ecoregion, and the Temporally Integrated Monitoring of the Environment (TIME) program to measure water quality in acid-sensitive environments.
- In addition, Region III, EMAP's Landscape Characterization task group, the Chesapeake Bay Program, the state of Pennsylvania, and other groups are cooperating on the production of land cover/land use information for the entire Mid-Atlantic Highlands, based on Landsat Thematic Mapper satellite images. Additional inputs to the combined assessment process include monitoring and assessment information from the four states, and assessment results from other EMAP groups (e.g., Forests, Agroecosystems). Cooperation with monitoring activities of the U.S. Fish and Wildlife Service (USFWS BEST program) and the U.S. Geological Survey (USGS GAP program) is also being discussed.

In addition to the active cooperation that EPA's Office of Research and Development (ORD) has offered to MAHA through the various EMAP resource groups, Region III has been awarded a special two-year grant by ORD's Regional EMAP (REMAP) project to support this effort.

MAHA Implications for Environmental Management

The information obtained by MAHA will benefit the management of environmental and natural resource programs. Building on the specific concerns illustrated by the questions listed above, the MAHA products will provide:

- Priorities among various areas and ecoregions;
- Measurements of optimum environmental conditions to serve as goals for preservation, restoration, and remediation;
- Accurate mapping of areas of special concern for restoration or remediation;
- Identification of the environmental impacts of federal or state program actions, in terms of both geographic extent and quantitative/qualitative changes;
- Delineation of areas conducive to joint action with states, other federal, and private agencies.

Using MAHA results, Region III managers will be able to identify specific environmental problems in discrete geographical areas of the Highlands. With this information, managers will be equipped to characterize ecological risks, answer significant environmental questions, and identify the most severe problems. Prioritizing environmental problems in this way will lead to more efficient environmental management.

[For more information, contact Ron Preston (304) 234-0245 or Jim Green (304) 234-0243. U.S. Environmental Protection Agency, Region III, 303 Methodist Building, Wheeling, WV 26003]

Culprits of PCB Contamination Are Long Gone, But Deadly Legacy Survives In Great Lakes

by Ellen Goldbaum

EDITOR'S NOTE: This article was originally published in *Perspectives*, the newsletter of the State University of New York at Buffalo's Great Lakes Program and is reprinted here with permission.

Tightening the screws on companies suspected of polluting the Great Lakes will not necessarily result in cleaner waterways, according to results of an Environmental Protection Agency-funded study of Lake Michigan's Green Bay. That's because the study, which used computer modeling to pinpoint sources and fate of PCB (polychlorinated biphenyl) contamination in large lakes, shows that the greatest concentration of PCBs is in sediments in the Bay and in Fox River, which flows into the Bay. The high concentrations and the depths at which PCBs were found demonstrate that the discharges have been occurring for decades.

"The conventional wisdom has been that you should monitor end-of-pipe polluters and crack down on them," said Joseph V. DePinto, Ph.D., director of the Great Lakes Program at the State University of New York at Buffalo and one of the project investigators. "But we have demonstrated in Green Bay that because the biggest source of PCBs is actually the river sediments; nothing you do to current discharges will improve those levels."

According to DePinto, the EPA study shows that point sources, such as industrial discharges, account for less than 10 percent of the total external PCB load in the Bay, while the remainder was released to the environment as long ago as the 1940s. Completed late last year, the five-year study is believed to constitute the largest set of coherent data ever compiled about toxic chemicals in a natural system, he said.

"We can't let industries and municipalities go back to the levels they were discharging before, because 10 or 20 years from now we'll be in the same boat again," said DePinto. "But what's contaminating Green Bay now was dumped a long time ago and has accumulated in bottom sediments over the years. The accumulated PCBs then get resuspended during what we call high-flow events, such as storms or snow melts."

During these high-flow events, contaminated sediment from the Fox River, which empties into the Bay, is resuspended and carried into Green Bay's water column, where it may enter the food chain. By analyzing samples taken from different depths in the floor of Fox River and Green Bay, the researchers were able to determine how long ago PCBs now buried in sediment had been discharged. Radioisotope dating of sediment cores showed that the highest levels of PCBs were deposited in the mid-1960s-1970s, about the time industrial production and use of PCBs in the U.S. peaked.

Data collected for the study show that while concentrations of PCBs in Green Bay's water column average 5-10 parts per trillion in the water, the average concentration in the sediments is on the order of 5 parts per billion, a thousand times higher. As a result of the project, the Wisconsin Department of Natural Resources is now working on evaluating alternative cleanup programs.

According to Dr. DePinto, Fox River Valley, where the Bay is located, is the site of perhaps the world's largest concentration of pulp and paper mills. Nevertheless, he said, the Bay, which in the study is characterized as a large freshwater estuary with many of the same characteristics as a whole Great Lake, continues to serve as a major recreational center for boating and fishing.

Constituting 20 percent of the world's freshwater, the Great Lakes were long believed to consist of such a large surface area that they could not become contaminated, DePinto said. It is now known that contaminated sediments present a direct environmental danger to the food chain that originates with organisms like worms that live in and feed off of sediments in the bottom of the Bay. These organisms accumulate contaminants directly from sediments and then pass them on to bottom-feeding fish like carp, which may then be consumed by humans. As they do so, the concentrations of contaminants increase by orders of magnitude.

"The concentrations of PCBs in Green Bay fish are more than a million times what they are in the water or the sediments," said DePinto. Strong correlations have been drawn between high levels of PCBs in fish and birds, who feed on contaminated organisms, and reproductive problems and deformities in these populations.

In Green Bay, levels of PCBs in many walleye — a prize game fish — exceed the FDA limit of 2 parts per million, and have triggered fish consumption advisories. These advisories warn people who fish in Green Bay and the Great Lakes in general not to eat more than one fish meal per

Culprits of PCB Contamination Are Long Gone, But Deadly Legacy Survives In Great Lakes (continued)

month from these waters, and warn pregnant women not to eat any. (In related research, DePinto is working with John Vena, Ph.D., a professor of social and preventative medicine at UB, on landmark studies tracking the health effects of the consumption of Lake Ontario fish on humans).

Although this project has focused exclusively on the Green Bay/Fox River area, DePinto noted that out of 43 geographical sections of the Great Lakes considered areas of concern, all but one of them have significant problems with contaminated sediments.

In addition to the EPA, funding and support for the project came from the Wisconsin Department of Natural Resources, the U.S. Geological Survey, the U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration, and the Wisconsin and Minnesota Sea Grant institutes.

[For further information, contact Dr. Joseph V. DePinto, Director, Great Lakes Program, State University of New York at Buffalo, 207 Jarvis Hall, Box 604400, Buffalo, NY 14260-4400. Phone: (716) 645-2088. FAX: (716) 645-367.]

News From the States and Localities, Where the Action Is

In Maine, Shore Stewards Partnership Supports Local Water Quality Initiatives

The Shore Stewards Partnership at the Maine State Planning Office is an umbrella organization that supports and coordinates many different types of local water quality initiatives in Maine's coastal area. Through technical and financial assistance, the Partnership helps grassroots groups survey pollution sources, collect marine debris, monitor local water, and educate their communities through slide shows, presentations, and public events.

Water quality monitoring has been a special focus area of the Partnership since the creation of the Partners in Monitoring program in 1992. Eleven conservation groups along Maine's coast have received funding and technical assistance to develop monitoring programs in conjunction with area high schools. The adult and student volunteers test temperature, dissolved oxygen, salinity, turbidity, pH, and fecal coliform in coastal waters and feeder streams. The objectives of the groups include collecting baseline data, identifying and mitigating pollution sources, and assisting in the opening of polluted shellfish flats. Eventually, the data collected as part of this effort will be entered into a state database (a software program for use by volunteers, VOLWATL, is under development) and used for water reclassification efforts and identification of priority nonpoint source areas.

The Partnership is a collaborative effort with contributions of in-kind staff time from the Maine State Planning Office, the University of Maine Cooperative Extension, and the departments of Marine Resources and Environmental Protection. Funding for the local outreach projects is provided by a number of public and private sources via the Shore Stewards Fund at the Maine Community Foundation.

[For more information about the Shore Stewards Partnership, call Kathleen Leyden at (207) 287-3261.]

In Arizona, An International River is the Focus of Unique Study; Five Agencies and Volunteer Monitors Do the Job

EDITOR'S NOTE: Ed Liu, Monitoring Coordinator for EPA's Region IX in San Francisco, filled us in about this project: "Arizona is a big state with little water. Arizona surface water is spoken for several times over by competing needs of cities, agriculture, tribes, and international interests. One problem area is the Santa Cruz River, which along one reach forms the boundary between Mexico and the United States. Needless to say, water quality issues along the Santa Cruz River are controversial. The Arizona Department of Environmental Quality's Tucson Southern Regional Office has responded to the need for water quality information in a creative and money-saving way that will provide essential, real-time monitoring data."

by Lin Lawson, Aquatic Ecologist, Arizona DEQ

The Arizona Department of Environmental Quality (ADEQ), like many public agencies throughout the country, has suffered budget cuts across departmental programs, making it difficult to respond to every environmental concern within the state. One such problem is a

In Arizona, An International River the Focus of Unique Study; Five Agencies and Volunteer Monitors Do the Job (continued)

controversial reach on the international Santa Cruz River in southeastern Arizona. ADEQ staff at the Tucson Southern Regional Office have creatively put together a multiagency, volunteer-centered, 12-month intensive study that should help provide extensive monitoring data at substantial savings to the public.

The Santa Cruz River originates as a small stream in Arizona, flows south into Mexico, takes a westerly turn, and then flows north back into the United States near Nogales, Arizona. The flow from the headwaters into Mexico is perennial, while the remainder of the river flows in response to seasonal precipitation events and treated effluent from the Nogales International Waste Water Treatment Plant (NIWWTP). The treatment facility serves the international twin cities of Nogales, Arizona, and Nogales, Sonora, Mexico. Effluent-dominated water (EDW) is a designated use for the 16-mile segment of the river, from the plant north to Tubac, Arizona.

Treated effluent has flowed in the Santa Cruz River for many years and has produced a lush and highly valued riparian corridor along the river. This EDW segment has become controversial because of three issues:

1. The East Nogales Wash, originating in Mexico and running through the twin cities, discharges into the Santa Cruz River immediately upstream of the NIWWTP discharge point. In the past, the wash carried raw sewage, heavy metals, enteric viruses, and industrial solvents into the United States. This problem has not been completely resolved, and the pollution potential from the wash remains.
2. Until recently, the NIWWTP did not have the capacity to handle the rapidly increasing amount of sewage from Nogales, Sonora. Consequently, the quality of the effluent discharged into the river was troublesome. Although the treatment plant has been enlarged and now operates in compliance with water quality standards, the public still perceives a pollution problem.
3. A commonly held opinion among many local Arizona residents is that the river from the Mexican border (inclusive of the EDW segment) north to Tubac is highly polluted and a threat to public health.

The public perception that the Nogales-to-Tubac reach of the Santa Cruz River is rigorously monitored for water quality violations and health safety by public agencies is inaccurate. Water quality data are only available from the immediate area surrounding the treatment plant. Questions from Tubac residents about water quality, health, and safety of the river water for recreational uses (e.g., full body contact), and potential groundwater contamination have gone mostly unanswered.

The manpower for the Santa Cruz River study is provided by volunteers recruited from the environmentally concerned, nonprofit organization, Friends of the Santa Cruz River, based in the Tubac area. A core of 15 volunteers were trained by ADEQ staff to take water samples, numerous field measurements, and to collect, sort, and identify aquatic insects.

ADEQ is providing for lab analyses of water samples from the four study sites. The money came by way of some skillful sleuthing into departmental lab budgets. However, ADEQ was unable to supply the volunteers with all the necessary equipment. This problem was solved by bringing two other public agencies into the partnership: Arizona State Parks and Santa Cruz County Health Department. The parks department funded much of the equipment and supplies as part of their site stewardship program and views the cooperative effort as a pilot project for future ventures. County officials were enthusiastic about participating in the project since the controversial reach lies within their political jurisdiction, and the data would be beneficial. They loaned the project two pieces of key equipment.

Arizona Game and Fish and the International Boundary Water Commission (IBWC) are supplying in-kind support. The Arizona Game and Fish Department is assisting with two fish surveys to be conducted six months apart at the four sample sites. The IBWC, which operates the NIWWTP on-site laboratory and has dual management responsibilities for the treatment plant with Nogales, is fulfilling two very important services that have been key to the success of the study: analyses of fecal coliform samples and a terminal for drop-off and pickup of sample bottles supplied by a contract lab. The NIWWTP was eager to participate in the study in hopes that the data will reveal the improved quality of the effluent and thereby promote better community relations.

[For further information, contact Lin Lawson, Aquatic Ecologist, Arizona Department of Environmental Quality, Tucson, AZ 85701. Phone: (602) 628-6739. FAX: (602) 628-6745.]

Truckee Meadows, Nevada, Public Education Program Makes Substantial Difference

EDITOR'S NOTE: John Cobourn, Water Resource Specialist, Nevada Cooperative Extension, provided the material that helped us develop this story. Thanks, John. Incidently, we later found out that John was selected for a 1993 national award in the National Association of County Agricultural Agents "Search for Excellence" contest, partly for his work as project leader on this project. Congratulations, John.

An award-winning program combining televised messages on water quality with distribution of fact sheets and newspaper articles has raised public awareness substantially in Reno and Sparks, Nevada. Because this educational program used television, it reached thousands of western Nevada residents with its message of pollution prevention. The televised messages aired approximately 300 times on the six Reno/Sparks television channels during the summer of 1992, and over 15,000 brochures were distributed to residents.

Two telephone surveys conducted by the University of Nevada's Center for Applied Research showed an increase in knowledge of ways to protect water quality. The percentage of respondents who knew that storm drains flow directly to the Truckee River increased from 30 percent in the pretest to 42 percent in the posttest. That percentage grew to 53.6 percent among respondents who had viewed the public service announcements (PSAs). The percent of people who change their own motor oil and take it to a service station accepting used oil increased from 52 percent to 70 percent. The percent of respondents who knew not to dump anything down street drains (not even pet droppings or lawn clippings) increased from 20 percent before the project to nearly 39.3 percent. Again, this percentage grew to 44.5 among respondents who had viewed at least one PSA.

Four of the seven public service announcements and fact sheets in the program were designed specifically to help the cities of Reno and Sparks and Washoe County meet the terms of a NPDES permit. The permit requires educational activities aimed at reducing discharges of pesticides, herbicides, fertilizers, oil, antifreeze, and hazardous materials to storm sewers. Three of the PSAs and fact sheets address protection of groundwater supplies.

Audiences Targeted by an Issue-Scoping Process

The Truckee Meadows Clean Water Program is sponsored by Nevada's Cooperative Extension Program and cosponsored by Washoe County's Department of Comprehensive Planning and Environmental Health Division. The program's goals were to increase the awareness of the general public about (1) problems with local surface and ground waters; (2) proper handling, use, and disposal of certain potential pollutants; (3) who to call for help with water quality management; and (4) how to implement appropriate best management practices.

Fifteen public entities that possess an understanding of local water quality issues participated in an issue-scoping process to identify and prioritize local water quality concerns and issues. This focus group established the topics for the PSAs and fact sheets. The target audience was identified as both English- and Spanish-speaking residents of Truckee Meadows.

Teaching Methods and Activities

The project's teaching methods and activities include seven televised PSAs in English, four televised PSAs in Spanish, seven fact sheets, and incorporation of project subject matter into Cooperative Extension newsletters and newspaper columns.

The 30-second television PSAs were developed jointly by the project sponsors and the University of Nevada's Instructional Media Service Department. Five major local television stations aired the PSAs. The Spanish-language PSAs were aired on a local channel that broadcasts in Spanish.

Seven fact sheets providing more detailed information were prepared by the Extension Service. The availability of a particular fact sheet was announced at the end of each PSA, and fact sheets were mailed to viewers who called and requested them. The titles of the fact sheets are:

- The Fragile Water System of Reno-Sparks
- Water Efficient Landscaping
- How to Prevent Urban Water Pollution
- Erosion Control Begins at Home
- Protect Your Wellwater
- Understanding Your Septic System
- Drinking Water Testing for Private Well Owners

Truckee Meadows, Nevada, Public Education Program Makes Substantial Difference (continued)

The Cooperative Extension's Master Gardener volunteers (approximately 30 individuals) also promoted the materials at plant clinics, the state fair, and other events. The Nevada Landscape Association distributed the fact sheets to their members. Fact sheets were also distributed by the Nevada Division of Environmental Protection, the Bureau of Health Protection Services, the Washoe County Department of Comprehensive Planning and Environmental Health Division, and local Boy Scout troops.

Information concerning important water quality concepts has been incorporated into the *Nevada Environmental Education Newsletter*, which is mailed to over 500 Nevada educators and policymakers, and into regular newspaper columns written by Extension faculty.

As a side benefit, the Cooperative Extension obtained additional funding to implement a storm drain stenciling program, in which dozens of volunteers are labeling hundreds of urban storm drains with the message "No Dumping - Drains To River." This program was identified by the focus group as a community need, and Cooperative Extension teamed up with a local nonprofit group, the Truckee River Yacht Club, to accomplish the first phase of the multiyear project. Two thousand storm drains have been labeled so far.

Evaluation Method

The local public's preproject awareness and understanding of water quality issues was documented by a baseline survey. The Center for Applied Research at University of Nevada, Reno, sampled 400 randomly selected adults residing within the project area via telephone interviews. The survey instrument was developed jointly between the project sponsors and Center for Applied Research personnel. Results of the survey served as a pretest which was used to evaluate project effectiveness upon completion of the posttest evaluation. The posttest was conducted about a year after the baseline survey, and it used essentially the same survey instrument. Evaluation of the project's effectiveness was measured in terms of change between the baseline survey and the final evaluation survey.

[For more information, contact John Cobourn, Water Resource Specialist, Nevada Cooperative Extension, 865 Tahoe Boulevard, Suite 204, P.O. Box 8208, Incline Village, NV 89450. Phone: (702) 832-4150. FAX: (702) 832-4139.]

In Washington State, Regional Planning Council Maps Regional Wetlands and Stream Corridors

by Steven W. Morrison, Senior Planner,
Thurston Regional Planning Council

Thurston Regional Planning Council (TRPC) in Olympia, Washington, has just completed a project to map all the wetlands and stream corridors in northern Thurston County. According to Bill Wilen, national wetland coordinator for the U.S. Fish and Wildlife Service, this is the only integrated digital parcel and wetland mapping system that he has encountered in the entire country.

The Thurston Regional Wetland and Stream Corridor Inventory used false color infrared aerial photography and a countywide Geographic Information System (GIS) to create 306 individual wetland section maps. In 1992, TRPC hired a wetland consultant to provide the aerial photo interpretation and to field check boundaries and wetland ratings in 52 square miles of Special Study Areas. The data from the photo interpretation and the field reconnaissance of the eleven Special Study Areas was digitized into the GIS to produce accurate boundaries and parcels. All map edits were completed during the spring of 1993, and copies of the maps are now available to the public.

The wetland and stream corridor maps are in color at a scale of 1 inch to 1,000 feet, which is large enough to also show individual property lines. These maps indicate whether the boundary is "certain" or not, a description of the type of wetland habitat using the National Wetland Inventory system, and the rating of the wetland according to the Washington State Department of Ecology (WDOE).

The staff collaborated with the WDOE to create the wetland rating system database. Most jurisdictions in Washington State that are planning under the State Growth Management Act have adopted WDOE's four-tier rating system.

This was the first comprehensive evaluation of the WDOE rating system, and it turned up some surprising results. TRPC's evaluation of WDOE's rating system has led to proposed changes by

In Washington State, Regional Planning Council Maps Regional Wetlands and Stream Corridors (continued)

WDOE to correct these issues. Steven Morrison, project manager, said, "The countywide GIS system allowed us to create colorful, easy-to-read maps with the most accurate information in the state, without having a wetland scientist visit each site."

In addition to the individual wetland section maps, other available products include a composite map of the entire inventory area, tabular and graphic databases, and custom maps upon request. These maps should help property owners, developers, assessors, real estate agents, engineers, conservationists, and regulators. Morrison said, "We refer to this project as our triple savings program; we saved the cost of consultants' reports for small projects, saved time in the permit review process, and, most important, saved the resource."

Over the last five years, TRPC has expended $340,000 of state and local funds to develop the mapping protocol and complete the northern county inventory. Local funding came from TRPC member jurisdictions with substantial assistance from the cities of Olympia, Lacey, Tumwater, and from Thurston County stormwater utilities and the county road fund. The state provided 75 percent of the funds with a Centennial Clean Water Grant from the Washington State Department of Ecology.

The next step is to secure funding to complete this mapping in the 275 square miles of southern Thurston County. While this would primarily aid four small towns and unincorporated areas of Thurston County, the local conservation district and three tribes are also interested in obtaining countywide mapping coverage. Discussions have also begun with federal agencies about doing a comparative study of wetland boundaries using the countywide GIS system. A comparative study of the TRPC database with the digital files of both the National Wetland Inventory and Soil Conservation Service map would be extremely useful for other jurisdictions who still rely on these as their primary source of wetland information.

"We are happy with our results and pleased with the positive response to our wetland maps," said project manager Morrison. He continued, "While there always seem to be funds for a pilot project like ours, the real test will be for us to convince enough people that it is equally important to finish the mapping in the rural portions of southern Thurston County."

[For additional information about the Thurston Regional Wetland and Stream Corridor Inventory, contact Steven W. Morrison, Senior Planner, at (206) 786-5480 or write to Thurston Regional Planning Council, 2404 B Heritage Court SW, Olympia, WA 98502-6031.]

Farmers and Ranchers Talk Conservation, Neighbor-To-Neighbor

Farmers and ranchers, long known for watching their neighbors' fields, are learning more about water quality and erosion management through SCS-sponsored "Neighbor-To-Neighbor" programs. According to Nebraska's Soil Conservation Service State Conservationist, Ronald E. Moreland, producers seek information from their neighbors more frequently than from any other source. Capitalizing on that traditional network, Neighbor-To-Neighbor recruits farmers who have implemented conservation practices to put their fields and farms "on display."

Although the primary focus is the demonstration of soil and water conservation practices, Neighbor-To-Neighbor includes demonstrations of many water quality BMPs, for example, nitrogen and fertilizer management, chemigation, groundwater recharge, irrigation management, and waste storage and treatment. Other practices like no-till and grass buffer strips play dual roles of erosion control and water quality management.

The Nebraska program started in 1989 with 360 host farmers and ranchers and has now expanded to more than 500 farms. The program is sponsored through a cooperative effort among the USDA SCS, University of Nebraska-Lincoln Cooperative Extension Service, Nebraska Association of Resources Districts, Nebraska Natural Resource Commission, Natural Resources Districts, USDA Agricultural Stabilization and Conservation Service, USDA Farmers Home Administration, and USDA Federal Crop Insurance Corporation.

Alice J. Jones, a former Cooperative Extension Service specialist in Nebraska, said the program encourages self-guided, drive-by tours of roadside demonstration sites, where a sign provides information about the site's conservation practices. Most hosts allow visitors to go into their fields, especially if they call before stopping by. "The idea is to get out there and walk around. The farmers and ranchers are enthusiastic about talking to visitors about advantages and disadvantages of these conservation practices," Jones said.

Farmers and Ranchers Talk Conservation, Neighbor-To-Neighbor (continued)

In Missouri, the "Show-Me" state, 600 farms currently participate in the five-year-old program, and according to Norman Klopfenstein, SCS Service public information officer, it is still growing. With a wide base of support from SCS, the Missouri Department of Conservation, and Soil and Water Conservation Districts, Missouri's program has developed the *Conservation Tour Book*, distributed in stores and restaurants throughout the state. Using the guide, readers can check out the host farms that demonstrate the practices they are interested in learning about. The book provides both general water quality/soil conservation information and names, phone numbers, and directions to host farms.

Besides Nebraska and Missouri, many other states have similar information-exchange mechanisms. Martin "Buck" Burch, SCS liaison in EPA Region VII, reported that all the states in Region VII have Neighbor-To-Neighbor programs in one form or another. "Several states in other regions of the country are also implementing programs, and they reflect strong water quality benefits," noted Burch.

[For additional information, contact Martin "Buck" Burch, SCS Liaison, U.S. EPA Region VII, 726 Minnesota Ave., Kansas City, KS 66101. Phone: (913) 551-7422. Or contact: Norman Klopfenstein, State Information Officer, SCS, Parkade Center, Suite 250, 601 Business Loop 70 West, Columbia, MO 65203. Phone: (314) 876-0911. Or contact Pat McGrane, Public Affairs Specialist, SCS, Federal Building, Room 152, 100 Centennial Mall North, Lincoln, NE 68508-3866. Phone: (402) 437-5328.]

New Department of Natural Resources Created in South Carolina

On July 1, 1993, the state of South Carolina created a new Department of Natural Resources made up of seven divisions.

The previously independent South Carolina Land Resources Commission became the Division of Land Resources and Conservation Districts and is expected to have expanded responsibilities in land use planning, growth management, and resource information services. "This new arrangement has the potential to be a great boost to conservation districts," said John W. Parris, Land Resources Commission Executive Director.

The Commission and the Executive Committee of the South Carolina Association of Conservation Districts endorsed the new role for the agency early in the 1993 legislative year.

The new Department of Natural Resources also includes the divisions of Wildlife and Freshwater Fisheries, Marine Resources, Natural Resource Enforcement, Water Resources, State Geologist, and Geological Mapping.

[For more information on the Division of Land Resources and Conservation Districts, contact John W. Parris, Executive Director, S.C. Land Resources Commission, 2221 Devine Street, Suite 222, Columbia, SC 29204. Phone: (803) 734-9100. FAX: (803) 734-9200.]

Notes on the Agricultural Environment

New Soil Loss Equation in Use — Impacts on Conservation Compliance Plans Vary

The Revised Universal Soil Loss Equation, known as RUSLE, that USDA Soil Conservation Service (SCS) field offices will be using starting in October, will significantly improve erosion predicting abilities, according to the agency. The new version of the equation, which is used to develop farm conservation compliance plans, will be phased in slowly to minimize its impact on existing plans.

RUSLE uses the same factors as the earlier version, USLE, but handles some of them differently. RUSLE more accurately estimates the influence of crop residue cover on soil loss and could indicate higher or lower levels of erosion control than the previous version, which has been used since the 1960s.

SCS Agronomist David L. Schertz, said, "The RUSLE equation causes some factors to go up and some to go down. Some differences are major and some minor." For example, USLE estimated 34 tons of soil loss per acre per year for continuous corn (fall-plowed) at a particular farm in

New Soil Loss Equation in Use — Impacts on Conservation Compliance Plans Vary (continued)

Iowa, while RUSLE estimated only 19 tons of soil loss per year, a significant decrease on the same site.

SCS cautioned against generalizations, as each site is different. Factors such as climatic differences and soil type have significant effects on the results, SCS warned.

SCS Policies for Minimizing Impacts

SCS announced the following policies to ease RUSLE implementation:

1. All Highly Erodible Land (HEL) determinations made using USLE will remain in effect. Also, at least until 1995, all new HEL determinations will be made using USLE.
2. All conservation systems developed using USLE and considered acceptable for compliance will continue to be considered acceptable upon implementation of RUSLE, even if a RUSLE analysis shows a higher erosion rate when compared to the rate computed using USLE.
3. The policy regarding revisions of compliance plans has not changed. Any farmer can request a revision of his/her compliance plan because of changes in farm size, farm enterprise, conservation system, or farm owner or operator. In those situations where the RUSLE analysis results in an estimate below the soil loss tolerance (T), farmers will have the option of keeping that system or switching to another system approved in the local SCS field office technical guide (FOTG).

RUSLE Computer Software Available

RUSLE 1.02 computer software and user's manual are available from the Soil and Water Conservation Society (SWCS), 7515 Northeast Ankeny Road, Ankeny, IA 50021. Phone: 1-800-THE-SOIL. Fax: (515)289-1227. The cost to SWCS members is $275, and for nonmembers, $299. The software requires an IBM compatible 386 PC using at least DOS 3.0; a math co-processor is recommended, but not required; 640K RAM; hard disk drive; and monitor (VGA color is recommended, but not required). A free brochure provides more details.

Conservation Compliance Required For Federal Benefits

As *News-Notes* issue #13 reported: *The Conservation Title of the 1985 farm bill dramatically changed soil and water conservation programs in this country. Instead of a purely voluntary .... delivery of technical and financial assistance, Congress linked eligibility for a variety of federal farm program benefits .... to appropriate conservation behavior on the part of farmers, specifically the application of soil erosion control measures and wetlands protection. .... The conservation compliance policy requires all farmers with HEL (about one third of all U.S. cropland, according to SCS), to obtain conservation plans for that land from their SCS office by December 31, 1989, and have those plans fully implemented by January 1,1995 (1.8 million plans were written).*

National Farm*A*Syst Directory Available

In less than two years, the Farmstead Assessment System (Farm*A*Syst) program has grown from two pilot programs in Wisconsin and Minnesota to a national network. Close to forty states are developing or operating interagency programs based on Farm*A*Syst. To consolidate information on these state programs, the National Farm*A*Syst Directory has just been published. In addition to listing important contacts on the national and the state level, the directory furnishes valuable information on the status of each state program.

A voluntary program, Farm*A*Syst is a comprehensive pollution risk assessment designed to help farmers and rural residents evaluate practices and structures posing risks to groundwater and drinking water. Though focusing on private water wells, the assessment is also proving to be a useful tool in municipal wellhead protection programs.

Liz Nevers of the National Farm*A*Syst staff, reported some of the details of state programs:

> *Currently ten states have completed modification of the assessment materials for their own use and are implementing their Farm*A*Syst program. Those states are Alabama, Arkansas, Kansas, Michigan, Minnesota, Missouri, New Mexico, South Dakota, Texas, and Wisconsin. Their assessment packets are available, but staff support may be limited to targeted areas in a state. The price on the assessment packet varies but generally is in the $10-$20 range.*
>
> *Each state program is unique and, while most states have developed the standard ten work sheets, several states have developed special assessment sheets. Arkansas has an assessment for poultry producers. Alabama has developed materials for small rural businesses and for nonfarm rural residents, as well.*

*National Farm*A*Syst Directory Available (continued)*

Farm*A*Syst also publishes a bi-monthly newsletter that highlights critical issues concerning rural pollution prevention, including sources of groundwater contaminants, farm management practices, and environmental liability. Public agencies and private programs working with rural groundwater protection should be interested in these publications.

The newsletter is free. Single copies of the national directory are available at no charge; a modest fee for shipping and handling is charged for multiple copies. The national program is jointly supported and staffed by the U.S. Environmental Protection Agency, the USDA Extension Service, and the USDA Soil Conservation Service.

*[For more information, write or call the National Farm *A* Syst Program, B142 Steenbock Library, 550 Babcock Drive, Madison, WI 53706. Phone: (608) 262-0024. FAX: (608) 262-2775.]*

Notes on Environmental Education
(and having fun at the same time)

"WIT," "WET," Whatever, All Add Up To Water Quality Workshops

Water institute for teachers, water education for teachers; whatever you choose to call it, learning about water is how many teachers spent at least part of their summer vacations. Teachers came away from the workshops better understanding the science and issues related to water, and better prepared to guide their students.

Teaching Kids How to Think, Not What to Think

Gina Morrison, coordinator of Project WET Montana, explained, "At Project WET Montana, we believe children are the key to our future resources in Montana. By training teachers, WET hopes to strengthen students' awareness, appreciation and knowledge of this precious resource. . . . Like other successful natural resource education programs, Project WET emphasizes teaching students *how* to think, not *what* to think."

Montana's Project WET emphasizes values and basic concepts, such as the importance of water to all users (farmers, ranchers, recreationists, towns, fish, wildlife, power generators, and industry) and explains the principles of the hydrologic cycle. It also addresses more complex issues such as nonpoint source pollution.

In the three years since it was introduced, the Project WET Montana staff has grown from a part-time to a full-time coordinator and 17 trained facilitators, seven of whom work primarily with teachers of Native American students. Project WET trains between 500 and 700 educators each year and is funded by the Montana Water Quality Bureau's Nonpoint Source Pollution Control program. (See *News-Notes* #26, January-February 1993 for more information on the national Project WET program).

Blackboards and pH Meters

Most of the summer sessions for teachers did not limit teachers to books and blackboards — but added to their school bags equipment like waders, nets, and pH meters. Teachers got wet, got interested, and brought this enthusiasm back to their own students in programs like Wyoming's Water, Youth and Optimism (WYO) curriculum.

The WYO curriculum was developed recently for grades K-6. Instruction in the curriculum is provided at the Water Institute for Teachers, and facilitator training courses were held around the state this summer with a grant provided by the Wyoming Game and Fish Commission.

In the Water Institute for Teachers (WIT), Wyoming teachers ventured into the field to learn techniques like measuring the snowpack and evaluating instream flow, and to tour irrigation systems and water treatment plants. The two-week course covered Wyoming's water sources and uses; water quality and treatment; water law, management, and policy; and the aquatic section of Project WILD, an international educational curriculum with segments addressing different conservation topics. The workshops, sponsored by the Wyoming Water Resources Center and the Wyoming Institute for the Development of Teaching at the University of Wyoming, were led by University of Wyoming professors. Guest lecturers often included U.S. and state senators, the state engineer and the state attorney general.

Alabama's workshops encouraged volunteer monitoring as a teaching tool. They are now in their third year of nonpoint source water quality workshops. The Alabama Department of Environmental Management works with environmental educators to deliver the workshops. The

"WIT," "WET," Whatever, All Add Up To Water Quality Workshops (continued)

four-day workshops are designed primarily for high school and junior high teachers, but other interested persons, such as nature center staff, parents, Scout and 4-H leaders are welcome. Along with the workshops, a six-hour certification course in volunteer monitoring is offered.

Alabama's volunteer monitors trained at the workshops performed stream assessment and monitoring on watershed projects at ten major active sites that are tributaries to the Mississippi River Project, which impacts on the Gulf Coast Project and the Gulf of Mexico Program.

The Tennessee Wildlife Resources Agency's eight summer workshops for educators took a watershed approach, familiarizing teachers with the unique hydrologic characteristics and water issues of their own areas. The 25 to 30 teachers attending each workshop practiced water sampling, seining and identifying fish and other aquatic organisms, in addition to attending classroom sessions. Aquatic habitat and the damaging effects of nonpoint pollution were emphasized in the sessions, which were part of the Conservation Education Now for Tennessee Students Program funded by the Tennessee Wildlife Resources Agency.

Water Education Links Environmental and Educational Agencies

While state environmental agencies fulfill their mandate for water education, educational institutes are finding water the ideal medium for linking diverse topics like history and aquatic habitat. Many of the teacher training courses are jointly sponsored by these agencies.

The integrated curriculum that South Carolina teachers explored at their workshops is a good example of this partnership. Chip Berry of the South Carolina Land Resources Commission noted, "I think the most important thing people can do to implement conservation education is to work from the very beginning with the state department of education in the design and development of curriculum."

A joint project of the South Carolina Department of Education, South Carolina Land Resources Commission, and Clemson University, the teacher workshops focused on SC MAPS, a curriculum that incorporates four subjects (Earth science, life science, social studies and literature) in a geographic framework.

Berry explained, "Water quality is a geographic issue, and that is why SC MAPS is centered around maps. Maps help people understand the water basin concept."

Schools enrolled teams composed of teachers from the four disciplines in the three-day workshops. The SC MAPS curriculum emphasizes problem-solving skills and employs a portfolio containing 80 laminated maps, aerial and satellite film images, and other geographic resources. After completing the workshop, the teacher teams will share the portfolio as a tool to tie together lessons in geology, history, and environment. The curriculum includes information about 10 study sites, with each study site representing different landforms and land uses in the state.

An interactive computer curriculum is currently being developed around one study site, Congaree Swamp National Monument, the largest old-growth stand of bottomland forest in the United States. This extension of SC MAPS uses a Geographical Information System (GIS) software available to schools. The data will be provided on a CD or laser diskette. Using the software, students will learn about the floodplain's ecological functions of filtering pollutants and providing groundwater recharge.

The growing importance of water education is highlighted by these and other programs across the country. Some teachers spent their summer knee-deep in streams, others studying maps, and some learning about western water law, but all came away with a greater understanding of how to teach kids about the values and science of water.

*[For more information contact: **In Montana:** Gina Morrison, Coordinator, Project WET Montana, Montana State University, 201 Culbertson Hall, Bozeman, Montana 59717. **In Wyoming:** Jeanne Unruh, c/o Natural Science Department, University of Wyoming 82071, (307) 766-6381, or Ari Michelson, University of Wyoming, Wyoming Water Resources Center, PO Box 3067, University Station, Laramie, Wyoming 82071-3067, (307) 766-2143. **In Tennessee:** Jennifer Thompson, Tennessee Department of Environment and Conservation, Division of Water Pollution Control, 401 Church Street, Nashville, TN 37243-1534. (615) 532-0889. **In Alabama:** Mike Mullen, Center for Environmental Research and Service, Troy State University, Troy, Alabama 36082. (205) 670-3624, or Patti Hurley, Alabama Department of Environmental Management, 1751 Congressman W.L. Dickinson Drive, Montgomery, Alabama 36130. (205) 271-7938. **In South Carolina:** Chip Berry, South Carolina Land Resources Commission, 2221 Devine Street, Columbia, SC 29205. (803) 734-9100.]*

F.I.S.H. Coalition Releases Video on Coastal Protection

The F.I.S.H. (Fishermen Involved in Saving Habitat) Education Program has released a 19-minute video about coastal habitat and pollution problems. In "No Safe Harbor," actor Ted Danson tours the country speaking to fishermen and scientists about the state of our coastal resources.

The video is an educational outreach tool for those concerned with protecting coastal habitat. Suggested audiences include fishing groups, conservation groups, coastal Chambers of Commerce and service groups, and high school and college students.

In the video, Danson speaks of the need for a national desire to save the oceans. He says that only when individuals believe they can make a difference will they be able to turn the tide.

The F.I.S.H. Habitat Program is conducted by the Pacific States Marine Fisheries Commission in coalition with the Marine Resources Management Center and with the nonformalized coalition group F.I.S.H. The Center provides fiscal support for the program while F.I.S.H. provides programmatic support.

The Pacific States Marine Fisheries Commission also sponsors a marine pollution prevention program; a gill-net recycling program in which used nylon gill net webbing is collected from fishermen and recycled into bicycle seats, zippers, combs, and telephone casings; and an educational program for students in the fourth through twelfth grades.

[To order a copy of "No Safe Harbor," send a check for $8.00, payable to the "National Fish and Wildlife Foundation" to the F.I.S.H. Habitat Education Program, PSMFC, 45 S.E. 82nd Drive, Suite 100, Gladstone, OR 97027-2522. For more information on the programs, contact Fran Recht at the above address. Phone (503) 650-5400.]

NPS Electronic Bulletin Board (BBS) News

EDITOR'S NOTE: This portion of *News-Notes* is prepared by Elaine Bloom (Tetra Tech), for the benefit of the ever-increasing numbers of *News-Notes* readers who are regular users of U.S. EPA's *NPS BBS*. Tetra Tech is the contractor for the operation and content of the *NPS BBS*.

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

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

All articles from all issues of *News-Notes* are stored on the *NPS BBS* and may be retrieved on your personal computer. A searchable index is available to help find the information you need.

A *NPS BBS* User's Manual is available; *U.S. EPA Nonpoint Source Information Exchange Computer Bulletin Board Sysytem (BBS) User's Manual* (EPA 503/8-92/002.) Copies may be ordered by mail or FAX from NCEPI, 11029 Kenwood Road, Bldg 5, Cincinnati, OH 45242. FAX: (513) 891-6685. There is no cost. (Be sure to include both the title and the publication number in orders sent to NCEPI.)

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

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

Share Your News with the NPS Community

The *NPS BBS* can be the ideal distribution system for many types of materials, eliminating printing, reproduction, and postage costs and making your document (or database, or software program) available to a wide audience. Materials to consider for *BBS* distribution include

- anything that is frequently or regularly updated
- meeting/training calendars and contact directories
- newly published reports
- computer programs and database files
- educational curricula and training materials

Share Your News with the NPS Community (continued)

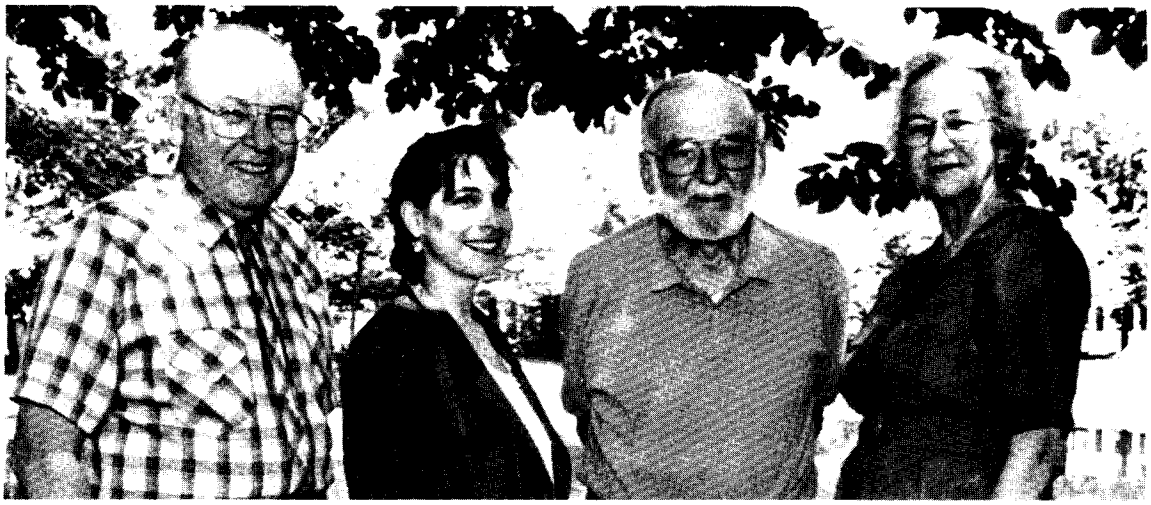
- newsletters or selected articles
- local NPS-related regulations and legislation
- program summaries
- notices

Materials from our users are easiest to incorporate into the system if they are electronically transmitted to the *NPS BBS* (uploaded). Most documents on the *BBS* have been converted to ASCII or DOS-text format so that all *BBS* users can access them no matter what type of word processing software they have. However, if the document has indispensable graphics or other necessary features that would be eliminated if changed to the generic format, you may wish to make it available in original form (along with a note about which software it is in).

For more information on how to format and upload your materials to the *BBS*, log on and read the bulletin, GUIDE TO FORMATTING AND UPLOADING MATERIALS FOR THE U.S. EPA NPS BULLETIN BOARD SYSTEM.

Note: Copyrighted materials should not be posted on the *NPS BBS* without express written permission from the author. Government publications are never copyrighted and may always be used in whole or in part on the *NPS BBS*.

The Nonpoint Source News-Notes Staff



EDITOR'S NOTE: With this issue of *News-Notes* we begin our fifth year of publication. We've had several requests to shed our anonymity. So, although we've talked over the phone to hundreds of our readers as we have tracked down and checked out stories, here's a picture to go with the names. (With this issue, *News-Notes* circulation will approach 13,000 for nationwide distribution.)

Left to right: Harold Owens, before "retiring" to cover agricultural NPS issues at *News-Notes*, worked in the Extension Service, at both county and federal levels, and also spent several years as executive secretary of the Missouri Soil and Water Conservation Commission. Associate Editor Elaine Bloom, who has a degree in Natural Resources from Cornell University, was working at a county Extension office in upstate New York in 1991 when she answered the ad that brought her to *News-Notes*. We feel very fortunate that she found us. Next in line, Hal Wise, ye editor from the very beginning, spent forty years as a consultant in public policy, urban development and environmental concerns, primarily with state governments and federal agencies, although he worked extensively with city government and metropolitan agencies. Carol Forshee, a "retired" middle school science teacher, reports on environmental education, reviews videos, and keeps the mailing list and other databases straight. We couldn't do it without her.

Hal, Harold and Carol have been with *News-Notes* from the first issue. Elaine joined us two and a half years ago. Harold and Carol are employed under EPA's Senior Environmental Employment Program. Elaine is employed by Tetra Tech. Hal started eight years ago with EPA's Senior Environmental Employment Program. His services are now provided by the Terrene Institute.

We're a happy team. We all enjoy our work and look forward to continuing to share information on the condition of the environment and what's being done about it. We want to thank our readers for their help in passing along the stories we report to you and for keeping us informed about the real world ou there. Keep in touch.

Incidently, three of the four pictured above are more than seventy years young and still going strong.

Datebook

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

Meetings and Events

1993

October

4-5 *1st Annual Virgin Islands Conference of Nonpoint Source Pollution: Problems and Solutions,* St. Thomas, VI. Contact: Janice D. Hodge, Dept. of Planning and Natural Resources, Nisky Center, Ste. 231, St. Thomas, VI 00802. (809) 774-3320. FAX: (809) 775-5706.

10-13 *47th Annual Conference of the Southeastern Association of Fish and Wildlife Agencies,* Atlanta, GA. Contact: Tim Hess, Wildlife Resources Division, 2070 U.S. Highway 278, S.E., Social Circle, GA 30279. FAX: (706) 557-3030. Theme: The Ecology of Growth and Development.

13-16 *Rural Community Assistance Program 1993 Annual Conference: Moving Forward,* Washington, DC. Contact: Kathleen Stanley, 602 South King St., Ste. 402, Leesburg, VA 22075. (703) 771-8636 or in the DC area (703) 478-8652. FAX: (703) 771-8753. Focuses on needs of rural areas and small towns and other minority and underserved populations. Topics include wellhead protection, legislative updates on the Safe Drinking Water Act and Clean Water Act reauthorization, environmental equity.

15-16 *Watershed Management Council Meeting: Upper Stony Creek Watershed Total Project Resource Management Field Tour,* Stonyford, CA. Contact: Wendell Gilgort, USDA SCS, 132 B North Enright, Willows, CA 95988. (916) 934-4601 FAX: (916) 934-0184. Cosponsored by University of California Cooperative Extension, Society for Range Management, USDA SCS and FS, and California Department of Forestry and Fire Protection. Observe off-road vehicle trail rehab, glade restoration, erosion control, grazing management, riparian area management, brush management, and wildlife management on public and private lands. Open to members and nonmembers. Registration $50-75.

21-22 *Mid-Atlantic District American Water Resources Association Conference: Instream Flow Management and the Clean Water Act,* Clinton, NJ. Contact: Bill Bauersfeld, AWRA, (609) 771-3980 or Greg Westfall (908) 246-1977 ext.133.

27 Earth Observations and Global Change Decision Making: A National Partnership, Washington, DC. Contact: ERIM Conferences, P.O. Box 134001, Ann Arbor, MI 48113-4001. (313) 994-1200 ext. 3234. FAX: (313) 994-5123. Sponsored by NASA, NOAA and the Environmental Research Institute of Michigan. Topics: the view from the Hill; the private sector and state and local government; international partnerships.

27-29 *1993 Rocky Mountain Groundwater Conference,* Albuquerque, MN. Contact: Michael E. Campana, Dept. of Earth and Planetary Science, University of New Mexico, Albuquerque, NM 87131-1116. (505) 277-3269. FAX: (505) 277-8843.

November

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

4-7 *The Future of America's Rivers: A Celebration of the 25th Anniversary of the National Wild and Scenic Rivers Act,* Arlington, VA. Contact: Jennifer Paugh, JT&A, 1000 Connecticut Ave., NW, Ste. 802, Washington, DC 20036. (202) 833-3380 FAX: (202) 466-8554.

7-10 *NACD Urban and Community Conservation Symposium: Partnerships for Livable Communities,* Minneapolis, MN. Contact: Debra A. Bogar, National Association of Conservation Districts, Northeastern Region, P.O. Box 320, Leeds, MA 01053. (413) 585-8895. FAX: (413) 585-8897.

10-13 *The Second International Conference on the Environmental Management of Enclosed Coastal Seas (EMECS 93),* Baltimore, MD. Contact: Helene Tenner, EMECS'93 Director, MD Dept. of Natural Resources, Tawes State Office Building, 580 Taylor Avenue, Annapolis, MD 21401. (410) 974-5047. FAX: (410) 974-3158. Sponsored by EPA, NOAA, Department of Commerce, Center for Global Partnership, National Science Foundation, and other national and international organizations. Participants from Asia, Africa, South America, Europe, and North America. Conference will examine mechanisms for governing coastal seas when multiple states or nations have jurisdiction over them.

12-14 *8th Annual Sustainable Agriculture Conference: Building Sustainable Communities,* Raleigh, NC. Contact: Keith Baldwin (919) 542-0122 or Marjorie Bender, Carolina Farm Stewardship Association, 115 W.Main St., Carrboro, NC 27510. (919) 968-1030. Topics include drip irrigation, protecting wells, organic farming, biological pest control, permaculture, wildlife as part of sustainable agriculture, philosophy of sustainable communities, linking different disciplines and resources to support sustainable agriculture and communities.

14-18 *14th Meeting of the Society of Environmental Toxicology and Chemistry—Ecological Risk Assessment: Lessons Learned,* Houston, TX. Contact: Phil Dorn, Shell Development Co., 3333 Hwy. 6 South, Houston, TX 77082. (713) 493-7213. FAX: (713) 493-8727.

1993

November

19 — *Wetlands Issues in Resources Development in the Western United States*, Denver, CO. Contact: Rocky Mountain Mineral Law Foundation, 7039 East 18th Ave., Denver, CO 80220. (303) 321-8100. Sponsored by the Rocky Mountain Mineral Law Foundation, cosponsored by the American Bar Association. Topics include steering a new project through the wetland regulatory requirements, bringing existing projects into compliance, and new federal wetlands policy.

29-12/4 — *13th International Symposium of the North American Lake Management Society*, Seattle, WA. Contact: Bob Schroeder, NALMS, PO Box 101294, Denver, CO 80250. (303) 781-8287. Theme: Lake protection and enhancement. Scientific and technical sessions, workshops on macrophytes and algae identification, and sessions targeting the volunteer audience.

December

5-8 — *American Water Works Association/Water Environment Federation Joint Residuals Management Conference*, Phoenix, AZ. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400.

6-8 — *Marina and Boating Environment Conference and Trade Show*, Atlanta, GA. Contact: Susan Santoro, International Marina Institute, 35 Steamboat Avenue, Wickford, RI 02852. (401) 294-9558. FAX: (401) 294-1630. Sponsored by the International Marina Institute with the Clean Marina Program Consortium.

9 — *2nd Annual Fertilizer Research and Education Conference*, Davis, CA. Main topic will be efforts in the public and private sectors to reduce nitrate groundwater contamination in several areas of California. Contact: Jacques Franco, CDFA, 1220 N St., PO Box 94281, Sacramento, CA 94271-0001.

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

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

1994

January

31-2/2 — *Second Thematic Conference on Remote Sensing for Marine and Coastal Environments: Needs, Solutions, and Applications*, New Orleans, LA. Contact: ERIM, Marine Management Conference, P.O. Box 134001, Ann Arbor, MI 48113-4001. (313) 994-1200 ext. 3234. FAX: (313) 994-5123.

February

15-18 — *The International Erosion Control Association 25th Annual Conference and Trade Exposition*, Reno, NV. Contact: IECA, P.O. Box 4904, Lincoln Avenue, Suite 103B, Steamboat Springs, CO 80477-4904. (303) 879-3010. FAX: (303) 879-8563.

27-3/2 — *American Water Works Association/Water Environment Federation Water Reuse Symposium*, Dallas, TX. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400.

March

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

3-5 — *NALMS 3rd Annual Southeastern Lakes Management Conference - Watershed Management: From Concept to Implementation*, Columbia, SC. Contact: Kathy Stecker, Water Quality Monitoring, SCDHEC, 2600 Bull Street, Columbia, SC 29201. (803) 734-5402. FAX: (803) 734-5216. Topics: regional issues, developing watershed management strategies, reservoir interactions, education, lake studies and assessment, conflict resolution, building coalitions. Organized by the North American Lake Management Society. Cosponsored by EPA, Tennessee Valley Authority, and Duke Power Company.

6-9 — *Innovative Solutions for Contaminated Site Management*, Miami, FL. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400.

27-30 — *Second International Conference on Groundwater Ecology*, Atlanta, GA. Contact: John Simons, General Chairperson, EPA, Ground Water Protection Div., WH-550G, 401 M St., SW, Washington, DC 20460. (202) 260-7091.

Calls For Papers — Deadlines

1993

November

1 — *Responses to Changing Multiple-Use Demands: New Directions for Resources Planning and Management, American Water Resources Association Annual Spring Symposium*, Nashville, TN, April 17, 1994. Contact: Ralph H. Brooks, General Chairperson, Tennessee Valley Authority, Water Management, Evans Bldg., Rm. 1W 141, Knoxville, TN 37902. (615) 632-6770.

1 — *NALMS 3rd Annual Southeastern Lakes Management Conference - Watershed Management: from Concept to Implementation*, Columbia, SC, March 3-5, 1994. Contact and topics: see March 3-5, 1994, conference listing.

16 — *Second International Conference on Groundwater Ecology*, Atlanta, GA, March 27-30, 1994. Contact: see March 27-30, 1994, conference listing.

The Coupon

Nonpoint Source Information Exchange Coupon #32

(Mail or FAX this coupon to us)

Our Mailing Address: **NPS News-Notes,** c/o Terrene Institute, 1717 K Street, N.W., Suite 801, Washington, D.C. 20006

Our Fax Number: **NPS News-Notes** (202) 260-1517

Use this Coupon to (check one or more)

- ❑ *Share your Clean Water Experiences*
- ❑ *Ask for Information*
- ❑ *Make a Suggestion*

Write your story, ask your question, or make your suggestions here:

Attach additional pages if necessary.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

- ❑ *Please add my name to the mailing list to receive News-Notes.*
- ❑ *Change my address. (Please send us your old address, too.)*

Your Name: _____

Organization: _____

Address: _____

City/State: _____ **Zip:** _____

Phone: _____ **Fax:** _____

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

Editorial contributions from our readers sharing knowledge, experiences and/or opinions are invited and welcomed. (Use the COUPON on page 31.) However, *NEWS-NOTES* cannot assume any responsibility for publication or nonpublication of unsolicited material nor for statements and opinions expressed by contributors.

NEWS-NOTES Staff: Editor: Hal Wise (Terrene Institute), Associate Editor: Elaine Bloom (Tetra Tech), Staff Writers: Carol Forshee and Harold Owens (EPA's Senior Environmental Employment Program). All material in *NEWS-NOTES* has been prepared by the staff unless otherwise attributed. For inquiries on editorial matters, call (202) 260-3665 or FAX (202) 260-1517.

For additions or changes to the mailing list, please use the COUPON on page 31 and mail or FAX it in. We are not equipped to accept mailing list additions or changes over the telephone.

Nonpoint Source NEWS-NOTES is produced by the Terrene Institute under an EPA Cooperative Agreement (# 820957-01) from the Assessment and Watershed Protection Division, Office of Wetlands, Oceans and Water, U.S. Environmental Protection Agency. Views expressed do not necessarily reflect those of EPA or the Terrene Institute. Mention of commercial products or publications does not constitute endorsement, or recommendation for use, by EPA or the Terrene Institute.

NONPOINT SOURCE
News-Notes
c/o Terrene Institute
1717 K Street, N.W.
Suite 801
Washington, DC 20006

BULK RATE
U.S. Postage
PAID
Permit No. 328
Merrifield, VA