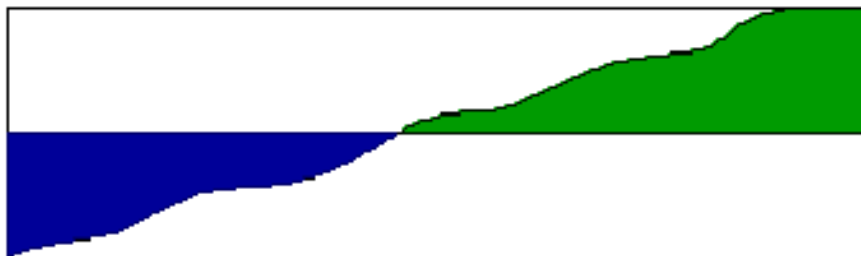




Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

Watershed Events



**A Bulletin on Sustaining Aquatic Ecosystems
Fall 1994**

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Coastal America: A Federal Partnership to Protect, Preserve, and Restore Our Nation's Coastal Ecosystems

On July 12, 1994, the Coastal America Principals from 10 federal agencies signed a new Coastal America Memorandum of Understanding which defines this unique partnership and ensures that the principles of ecosystem management and sustainable development guide all partnership efforts. Coastal America is a partnership for action to restore and protect the Nation's coastal resources. This partnership includes all federal agencies with management, regulatory, or stewardship responsibilities for coastal resources or whose operational activities affect the coastal environment. The federal partners are the Departments of Agriculture, Air Force, Army, Commerce, Defense, Energy, Housing and Urban Development, Interior, Navy, and Transportation and the U.S. Environmental Protection Agency. Nine regional teams make things happen through local projects in the Great Lakes, Northeast, Mid-Atlantic, Southeast, Gulf of Mexico, Southwest, Northwest, Alaska, and Pacific Islands.

In two years of operation this collaborative problem-solving partnership has demonstrated a new approach to addressing complex environmental problems in a time of limited resources— a new way of doing business that goes beyond conventional roles and demonstrates innovative aggressive action at the national, regional, and local levels.

In the spirit of reinventing government, Coastal America has formed a series of unique partnerships with state and local governments, the private sector, public interest groups, and community organizations to restore and protect the coastal environment. Today, Coastal America has over 90 action oriented projects underway in 23 states involving over 200 non-federal organizations. Examples include opening up over 150 miles of spawning habitat by removing dams and constructing fish passages along major tributaries in North Carolina and Virginia and restoring habitat in a 651-acre area of mangroves and seagrasses in Cockroach Bay, Florida by removal of non-indigenous species and general cleanup efforts.

For more information, contact Coastal America, 14th and Constitution Avenues, NW, Room 7843, Washington, DC 20230, (202) 482-5483.

Coastweeks 1994 Celebrates the Nation's Coasts

From September 17 - October 10, tens of thousands of Americans participated in a three-week national celebration of coastal and ocean resources called Coastweeks.

During Coastweeks a variety of federal, state, and private organizations reached citizens by hosting thousands of events to raise coastal awareness and understanding. Coastweeks activities target people of all ages and

include educational, conservation, and social events. Events in 1994 ranged from seafood festivals, boat races, beach walks, library displays, lectures, fishing contests, children's programs, marine exhibits, and canoe trips to taking part in the Center for Marine Conservation's (CMC) International Coastal Cleanup and the National Oceanic and Atmospheric Administration's (NOAA) Walter B. Jones Memorial Awards for Excellence in Coastal and Ocean Management.

The Coastweeks Evolution

This national celebration began in 1982, when Barbara Fegan, a Massachusetts volunteer dedicated to coastal awareness, created an educational program with a few events in Massachusetts and called it Coastweek. Over the years, using a network of local activity coordinators to focus attention on the value of our coastal ecosystems throughout the country, this one-week celebration each fall has grown to three weeks.

In 1994, CMC suggested a theme of "Celebrate, Educate, Participate" for Coastweeks and further proposed that Coastweeks events fall under three categories: pollution during the first week, "critters" during the second, and habitat during the third week. Local organizers adopted these suggestions as they saw fit and as was appropriate to their local activities.

Coastweeks Activities

This year CMC kicked off Coastweeks with the 7th International Coastal Cleanup on Saturday, September 17. International Coastal Cleanup Day has its roots in Texas where, in 1986, CMC organized a statewide beach cleanup, and 3,000 volunteers gathered garbage along the state's coast. From a single state in 1986, this cleanup effort has expanded to include 35 U.S. states and territories and 62 countries. Cleanups occur not only along the coasts but also along river banks and lake fronts.

Each year CMC analyzes the data collected during the cleanup and produces a national and international report. On September 7, 1994, CMC released the findings from the 1993 International Coastal Cleanup. The 1993 International Coastal Cleanup resulted in the collection of more than five million pounds of garbage, along 5,572 miles of coast by 222,116 volunteers around the world. Cigarette butts represented the most frequently collected debris item with more than 1.7 million reported in the U.S. alone.

In addition to sponsoring the International Coastal Cleanup, CMC served as National Coastweeks Coordinator in 1994. The Center published The National Coastweeks Directory, describing Coastweeks programs and activities by federal and state governments and nonprofit organizations.

NOAA and the U.S. Environmental Protection Agency (EPA) kicked off Coastweeks with National Estuary Day, a single day celebration of estuarine environments. All of NOAA's National Estuarine Research Reserves and many of EPA's National Estuary Programs participated with lectures, tours, nature hikes, water quality monitoring events, and exhibits. NOAA closed the national celebration during the final week by recognizing individuals, nonprofit organizations, environmentally conscious businesses, volunteers, and coastal and ocean resource managers through the Walter B. Jones Memorial Awards for excellence in managing coastal and ocean resources on October 5. Local Coastweeks activities continued through Columbus Day, October 10.

Other federal Coastweeks activities included EPA regional marine debris cleanups and opening NOAA research vessels for public tours. In addition, NOAA provided partial funding for hundreds of activities across the country through Sea Grant college programs, National Estuarine Research Reserves, National Marine Sanctuaries, and state coastal management programs, and the U.S. Fish and Wildlife Service funded local events through National Wildlife Refuge sites and Coastal Ecosystem Programs.

For more information, contact Linda Maraniss, Center for Marine Conservation, 1725 DeSales St., NW, Suite 500, Washington, DC 20036, (202) 429-5609.

Agencies Unite to Protect, Restore Louisiana Coastal Wetlands

by Robert Brown,

[U.S. Army Corps of Engineers](#)

The Twentieth Century has been a century of devastation for Louisiana's coastal wetlands. Since 1932, the state has lost over 1,600 square miles of marsh — an area roughly equal to all of Long Island and New York City combined. Gone are many expanses of marsh grass, ancient stands of cypress and tupelo, and much of the nursery habitat for America's largest fish and shellfish harvests, as well as wintering habitats for millions of the Nation's migratory ducks and geese. No single factor can be cited as the culprit in the deterioration of these coastal wetlands, but rather several natural and human-induced influences have combined to damage this invaluable resource. In southern Louisiana natural wetland loss factors include subsidence, sea-level rise, compaction, and storms, while human causes include the effects of land-use changes, levee systems, and oil and gas exploration canals.

Louisiana possesses roughly 40 percent of America's coastal wetlands and has shouldered as much as 80 percent of the Nation's annual coastal wetland loss. Wetland losses of up to 40 square miles per year have been documented for several decades, though more recent figures released by the New Orleans District of the U.S. Army Corps of Engineers (Corps) indicate the rate of loss has decreased to roughly 25 square miles a year. Still, if this rate is not slowed, by the year 2040 Louisiana will lose an area about the size of Rhode Island, and the Gulf shoreline will advance inland as much as 33 miles in some areas.

Stemming the Losses

Against this grim backdrop and the national "wetlands" definition debate, a tremendous wetland restoration and creation effort is underway in southern Louisiana. Five Federal agencies—the Corps, the Soil Conservation Service (SCS), the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (USFWS), and the U.S. Environmental Protection Agency (EPA)—as well as the state of Louisiana and the Citizens Participation Group, representing local special interest organizations, are pooling their resources and expertise in a monumental effort to preserve or create tens of thousands of acres of critical coastal marsh. This concerted outpouring of concern, hard work, and cooperation by all parties involved in the coastal zone is made possible by the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) enacted in 1990.

...a tremendous wetland restoration and creation effort is underway in southern Louisiana. ... A concerted outpouring of concern, hard work, and cooperation by all parties involved in the coastal zone makes this endeavor possible.

The CWPPRA has allocated approximately \$35 million a year since 1991 for wetland protection and restoration projects in Louisiana. The act is funded by a nationwide gasoline tax levied on small engines. The state contributes another 25 percent toward project construction costs of the program.

Task Force Identifies Priorities

The CWPPRA Task Force, which includes representatives from the five federal agencies and the state, is responsible for determining the candidate projects to be funded by the approximately \$240 million available through 1997 for projects in Louisiana. The Task Force has developed a priority list of projects on an annual basis. The Citizens Participation Group assists the Task Force by providing public review and comment on the priority list of projects to be funded. Fourteen projects were selected in the first year based on their potential for immediate and high impact on coastal wetlands. An additional 15 projects were selected in fiscal year 1993 and 17 more in fiscal year 1994. Following the guidance provided in the act, the Task Force screened each project for its potential long-term restoration, cost effectiveness, and overall quality of the wetlands to be preserved and enhanced. The projects vary in cost up to \$8.5 million and include several strategies for wetland enhancement, including using dredged material to create marsh, controlling erosion through the use of

structures, a variety of hydrologic restoration efforts, a large scale sediment diversion, and a series of vegetative plantings.

In addition to picking annual priority projects, the Task Force has developed a Comprehensive Coastal Wetlands Restoration Plan. This plan includes priority list projects, but also much larger efforts involving detailed study plans and hundreds of millions of dollars. The over \$1 billion worth of projects will require separate authorizations and funding, but taken as a whole they provide a blueprint for restoring much of the coastal zone.

A Diversity of Projects

Each of the lead governmental agencies is responsible for managing design and construction of their projects selected for funding. The Corps is using a tried-and-true method of marsh restoration at several locations: dredged material is deposited in places where it can benefit struggling marshland. A large scale sediment diversion through the west bank of the Mississippi River will create 9,831 acres of marsh over a 20-year period. EPA is overseeing a dredged material deposition project aimed at restoring two miles of a barrier island off the Louisiana coast. Controlling erosion through the use of various structures, such as Longard tubes filled with sand, a rock-armored structure, and sediment trapping devices, is the goal of two state projects. Similarly, USFWS projects involve the use of rock dikes and reconstructed levees, respectively, to control erosion and block saltwater intrusion. Fifteen oil fields criss-crossing coastal wetlands are the targets of a water flow restoration project to be managed by NMFS. SCS is overseeing a hydrologic restoration effort which involves constructing 24 to 26 plugs in abandoned oil field canals, weirs, and low-level rock dikes in an attempt to reduce wetland losses.

In the end, the success of these efforts will depend upon a lot of careful planning, extensive coordination with all interested parties, hard work, and even a little luck. If successful, the CWPPRA projects could usher in a new era of federal-state-local cooperation.

For more information, contact the Public Affairs Office, U.S. Army Corps of Engineers, New Orleans District, P.O. Box 60267, New Orleans, LA 70160-0267, (504) 862-2201.

SCS Works to Keep Beaches from Disappearing

by Cynthia M. Portalatin,

[USDA Soil Conservation Service](#)

The Mississippi Gulf Coast has "exploded" in the last two years due to a rapid growth in casino gambling. "This growth has been a boom for tourism, but has taken a toll on the area's beaches," says Joel Douglas, Plant Materials Specialist for the USDA Soil Conservation Service (SCS) in Mississippi. Many tourists are interested not only in the casinos but also the beauty of the Mississippi Gulf Coast. Excessive human traffic, coupled with the effects of wind erosion, has contributed to severe coastal dune erosion.

"Coastal dunes scattered along the beach not only add beauty to the area but also act as barriers to control blowing sand and flooding," says Douglas. They also serve as reservoirs of sand to replenish eroded beaches. To provide these benefits, however, the dune must be protected. "Coastal dunes are built by sand that blows into a vegetated area or artificial structure, such as a sand fence, erected on the beach," says Douglas. "Unless dunes are stabilized with adapted vegetation, they become vulnerable to degradation by wind and water."

But thanks to a coastal dune stabilization project being carried out by SCS and its plant materials program in Mississippi and Louisiana, there is hope for saving Mississippi's coastal dunes and beaches. In Mississippi, SCS is working with Soil & Water Conservation Districts in Hancock, Jackson, and Harrison counties; the Gulf Regional Planning Commission; the local Beach Management Department; and the Department of Marine

Resources to determine the best plant materials for stabilizing the dunes.

The Mississippi project is a spin-off of a coastal dune stabilization project that was initiated in 1984 in Georgia and Alabama. SCS released four new plants for stabilizing dunes in that earlier effort according to Don Surrency, Plant Materials Specialist in Georgia.

Hancock County was recently chosen as one of two coastal counties to serve as a test site to screen several plant materials with potential for dune stabilization in Mississippi. Douglas is working with SCS District Conservationists as well as local and state agencies to coordinate the plantings. Low growing, attractive plants such as sea coast bluestem and the [marshhay cordgrass](#) are preferred because of their visual appeal and their ability to survive in a coastal environment. Selected plants go through several years of testing before they are recommended for use in conservation programs.

Coastal counties spend approximately \$600,000 annually to replenish beaches and \$100,000 to remove sand that accumulates on U.S. Highway 90," says Douglas. Some examples of coastal dune erosion and destruction caused by human contact include:

- Excessive foot or vehicle traffic;
- Construction too close to the water;
- Flattening of dunes by buildings; and
- Sea walls.

Essential components of a successful dune stabilization program include:

- Crosswalks;
- Sand fencing;
- Temporary irrigation systems; and
- Adapted vegetation.

When properly stabilized and maintained, coastal dunes protect upstream areas from excessive erosion and flooding. Says Douglas, "If the dunes can be formed and vegetated, the coastal counties won't have to worry about replenishing the beaches as often."

SCS provides specialized assistance through the SCS plant material program in finding vegetative solutions to conservation problems. A network of 26 plant materials centers (PMC) is strategically located nationwide to provide these services as part of SCS's overall soil and water conservation program.

For more information on plants for stabilizing coastal dunes in the southeastern United States, contact Wayne Everett, Plant Materials Specialist, SCS, South National Technical Center, P.O. Box 6567, Fort Worth, TX 76115-0567, (817) 334-5282.

Watershed Management in Tampa Bay: A Strategy for Restoration

by Holly Greening and Richard Eckenrod,

[Tampa Bay National Estuary Program](#)

Tampa Bay was accepted into the National Estuary Program (NEP) in 1990. The Tampa Bay National Estuary Program (TBNEP) is a four year program charged with development and initiation of a "Masterplan" for long-term management of Tampa Bay. Partners in TBNEP include the [U.S. Environmental Protection Agency](#) (EPA); Florida Department of Environmental Protection; Southwest Florida Water Management District; the Counties of Hillsborough, Pinellas and Manatee; and the Cities of St. Petersburg, Tampa, and Clearwater.

Since initiation of the NEP in Tampa Bay, participants have agreed that the final goal for the program is the restoration, enhancement, and protection of the bay's critical living resources. This includes both the physical structure of important habitats and the animal communities which inhabit them. Tampa Bay is similar to other Florida estuaries in that the presence of seagrass is an indicator of estuary health, as well as being a critical habitat for many organisms. The TBNEP Management Conference has defined the restoration of seagrass to historical depths (1.5 to 2 meters) as a long-term goal.

The process used by TBNEP in developing its watershed management strategy involves a four- step approach.

The first step is to set clearly defined restoration targets. For seagrass, the NEP Management Conference has approved the use of the 1950 extent as an ultimate target for restoration throughout the bay. Using digitized aerial photographic information, it is estimated that approximately 40,000 acres of seagrass existed in Tampa Bay in 1950 while only 25,000 acres remained in 1990, a 40 percent loss. This approximate 15,000-acre difference has been adopted by TBNEP as the long-term restoration target for seagrass in Tampa Bay. A Geographic Information System (GIS) was used to estimate the locations of the acreage which has suffered seagrass losses. Much of the loss occurred in the more urbanized upper segments of the bay, but losses also were observed along the deeper margins of beds throughout the bay.

The second step of the process involves determining environmental requirements necessary to reach restoration targets. For seagrasses, several factors may affect growth and health, primary among them being the amount of light reaching the grass blades. To estimate water column conditions necessary to allow sufficient light to reach the bottom at depths to which seagrass occurred historically, statistical regression techniques were used to estimate the relationships between light levels which reach grass blades at target (i.e., historical) depths and "allowable" chlorophyll a concentration in the water column. A similar calculation was made to establish the relationship between light levels and suspended sediments. Color was not found to contribute significantly to light attenuation in the bay.

The final element in determination of allowable loading is to estimate nitrogen loading from watershed and in-bay sources associated with the "allowable chlorophyll concentration." The range of nutrient loads which is associated with water clarity requirements of sustained seagrass growth to target depth will then be used to determine pollutant load goals for watershed management action. The pollutant load goal is simply the existing load minus the allowable load needed to support seagrass growth to historical depths.

Recent findings indicate that Tampa Bay chlorophyll concentrations may be at or near "allowable" concentrations. Recovery of seagrass is being observed in some areas of the bay. However, maintaining pollutant loads at current levels, given that population in the watershed is expected to increase 30 percent by 2010, will still be a considerable challenge.

Existing annual loads to the bay from all sources for total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS) has been estimated. As suspected, nonpoint urban and agricultural sources are a major contributor to TN loading, comprising 50 percent of the total load. Atmospheric deposition directly to the bay contributes about 27 percent of the total load.

The third step and one of the most difficult tasks facing the NEP conference will be the equitable allocation of long-term pollution load reductions needed to reach and maintain the allowable loading goal. As a non-regulatory entity, the NEP is acting as a forum for discussion among the major players (local governments, industries, and agriculture) and the regulatory agencies responsible for implementation. TBNEP has started a series of working sessions with this group, which are expected to be ongoing through the summer of 1995.

A major question during the allocation workshops will be costs estimated to reach allocated goals. One tool which may be useful during these allocation workshops is a Best Management Practices (BMP) Optimization Model currently under development. This model takes a watershed approach, providing estimates of the most cost-effective mix of agricultural and urban BMPs, given various levels of funding applied to a basin. Preliminary results of the model indicate that, for many watershed basins, the most cost effective and efficient management practices include implementation of agricultural BMPs first in mixed urban/agricultural basins.

The fourth step and a key component of the process is implementation: how agreed-upon reduction goals will be incorporated and enforced. A promising technique currently under consideration is the incorporation of nonpoint source controls into point source permit requirements. Through this process, each participant will commit to reach a percentage of their allocated final load reduction goal through the 5-year permit process. When permits are renewed, progress toward the ultimate goal will be evaluated and adjustments made toward achieving the final goal in the second 5-year permit renewal, and so on. The primary benefit to the regulated community is that participants are included in shaping their permit requirements at the ground floor level. A major benefit for the regulatory agencies is a true watershed-based approach, with a common goal for all sources in the watershed.

The TBNEP participants have committed to implementation of the final agreed upon allocation strategy. To date, EPA and the Florida Department of Environmental Protection have expressed support for the concept, and will be participating in the allocation discussions.

The Tampa Bay management community has agreed that the protection and restoration of living resources in the bay is of primary importance. Through the proposed watershed management process, Tampa Bay area governments have the opportunity to provide the water quality requirements necessary to meet long-term living resource restoration goals.

For more information, contact Holly Greening, TBNEP Scientist, TBNEP, 111 Seventh Ave. South, St. Petersburg, FL 33701, (813) 893-2765.

Understanding the Fate of Toxic Substances in Watersheds: U.S. Geological Survey Toxic Substances Hydrology Program

by David W. Morganwalp,

[U.S. Geological Survey](#)

[Locations of USGS Toxic Substances Hydrology Studies](#)

The objectives of the U.S. Geological Survey's (USGS) Toxic Substances Hydrology (Toxics) Program are to provide earth-science information that can be used to help prevent or mitigate contamination of the Nation's water resources and to develop methods of sampling, analysis, and data interpretation for use in water-quality assessments, site investigations, and remediation.

A four-part approach is used to achieve these objectives. The four parts are:

1. Conduct process-oriented research at contaminated sites. The sites chosen for research serve as field laboratories, where experiments are conducted to gain a better understanding of the hydrology of toxic substances.
2. Conduct research in an interdisciplinary atmosphere, where researchers from different disciplines work cooperatively on different facets of the same problem.
3. Conduct research at multiple spatial scales. The results from laboratory, field, and regional scale investigations are integrated to bring about a fuller understanding of contamination problems.
4. Emphasize the transferability of research results to other sites. Research is conducted at a contaminated site to gain information that can be applied or transferred, not to learn about the unique characteristics of the site.

USGS scientists funded by the Toxics Program conduct research on the fate and transport of toxic substances in ground water and watersheds. Three examples of such projects, described here, are studies of agricultural chemicals in the Mississippi Watershed and in the San Joaquin and Sacramento Watersheds (California) and a study of metals in a small mountain watershed in Colorado.

Agricultural Chemicals in the Mississippi Watershed

In 1991, an estimated 100,000 metric tons of pesticides and 6.3 million metric tons of nitrogen fertilizer were applied on cropland in the Mississippi Watershed. The Toxics Program sponsored a project to study the occurrence, movement, and fate of agricultural chemicals in the Mississippi Watershed, where 80 percent of the Nation's corn and soybeans are produced. A series of regional reconnaissance studies were done to determine the temporal and spatial patterns of occurrence of nitrate and selected herbicides in surface water and reservoirs.

A regional reconnaissance of 147 streams in the Mississippi Watershed was conducted from 1989 to 1990. Water samples were collected from the streams to determine the concentrations of nitrates and selected herbicides before and after the spring application of agricultural chemicals. This data resulted in a series of "snapshots" that demonstrated a spring "flush" of herbicides from agricultural fields into streams of the watershed. This reconnaissance was followed by an intensive temporal sampling of 9 streams that were selected from the original 147 and a series of temporal samplings of the main stem of the Mississippi River and its major tributaries. These subsequent samplings demonstrated that the spring flush of herbicides from agricultural fields is observable across a range of spatial scales throughout the watershed, from small streams to the entire Mississippi Watershed.

The Reservoir Reconnaissance was designed to determine the occurrence, temporal distribution, and persistence of selected herbicides and herbicide metabolites in the outflow from 76 reservoirs in the Mississippi Watershed. Preliminary results show that concentrations of herbicides in reservoirs remained relatively high throughout the year in contrast to streams, which have high concentrations only in the spring. However, the concentrations in reservoirs are not as high as the concentrations in streams during the spring flush. The higher reservoir concentrations throughout the year are caused when reservoirs are filled during the spring flush of herbicides and water from the flush is stored in the reservoir.

For more information on USGS research on pesticides in the Mississippi Watershed, contact Donald Goolsby, USGS, Box 25046, Denver Federal Center, MS 406, Denver, CO 80225-0046, (303) 236-5950 extension 209.

Agricultural Chemicals in the San Joaquin and Sacramento Watersheds

The study of agricultural chemicals in the San Joaquin and Sacramento Watersheds is part of a larger study on the fate of anthropogenic contaminants in the San Francisco Bay Estuary, California. The San Francisco Bay receives a diverse group of anthropogenic contaminants from its watershed. The Bay's major subwatersheds are the watersheds of the San Joaquin and Sacramento Rivers, which drain the Central Valley of California. The Central Valley is an area of intensive agriculture, where farmers apply approximately 18,000 metric tons of pesticides annually, 10 percent of the Nation's total pesticide usage.

The objectives of the San Francisco Bay project are:

1. To determine how contaminants from riverine and local sources are transported and transformed under varying hydrologic conditions;
2. To determine the ultimate fate of these contaminants; and
3. To develop approaches to detect and quantify ecological responses to contaminants in this river-estuary system.

This project has included studies on the fate of pesticides discharged into the San Francisco Bay's river-estuary system; the fate and distribution of organic contaminants in bay sediments; the history of organic, as well as inorganic, contaminants in the bay; and the adverse effects of trace metals on benthic aquatic organisms.

Studying the fate of pesticides in the Bay has shown that the primary determinants of pesticide distribution in the river-estuary system are the geographic location of the pesticide source(s), the biogeochemical properties of the pesticides, and the hydrology of the system. For example, USGS researchers have shown that several peaks of pesticide concentrations occur with the first rains after pesticide application. These peaks are highly

episodic, and their magnitude and duration are dependent on the timing of application, the intensity of rainfall, and the hydrodynamics of the river systems. The peaks can be tracked all the way into the eastern part of the San Francisco Bay. Field studies such as these measure the distribution of pesticides in the water column, sediments, and biota. When combined with laboratory studies of the biogeochemical properties of the pesticides and hydrodynamic modeling, these results can be used to predict distributions of organic contaminants under different conditions or in other environments.

For additional information on USGS research on pesticides in the San Francisco Bay Watershed, contact Kathryn Kuivila, USGS, Room W-2510, Federal Building, 2800 Cottage Way, Sacramento, CA 95825, (916) 978-4648 extension 357.

Metals in a Small Mountain Watershed in Colorado

Years of mining in the Leadville, Colorado area have resulted in acidic mine drainage from mine wastes and tailings that contributes heavy metals to the Upper Arkansas River. These metals are toxic to aquatic life in the watershed. Under the auspices of the Toxics Program, USGS researchers have been investigating the transport of metals in St. Kevin Gulch—a small mountain watershed in the Upper Arkansas River Basin. St. Kevin Gulch is affected by acidic mine drainage from abandoned silver and zinc mines. USGS researchers have shown that the chemistry and cycling of colloidal aggregates of iron oxyhydroxides and iron oxyhydroxysulfates control the transport of arsenic, copper, lead, and zinc in the stream by sorption. In addition, photoreduction by sunlight also exerts a control on the transport of metals in the stream. Photoreduction of the ferric iron in colloids to ferrous iron can release metal ions to the stream. These instream transformation processes that affect metals have been studied by tracer-dilution experiments. These experiments defined the hydrologic transport processes, and allowed the identification of the controlling chemical processes.

Studies of St. Kevin Gulch have provided valuable insight into the mechanisms of metal transport and transformation in streams contaminated by mine drainage. For more information on USGS research on toxic metals in St. Kevin Gulch, contact Briant Kimball, USGS, 1745 West 1700 South, Room 1016 Administrative Building, Salt Lake City, UT 84104, (801) 975-3384.

Conclusion

It is hoped that these interdisciplinary studies of the hydrology of toxic substances in watersheds will provide scientific underpinning for the decisions that water resource managers have to make. For more information on the Toxics Program, contact David W. Morganwalp, USGS, 412 National Center, Reston, VA 22092, (703) 648-5720.

New Geographic Information System Used to Analyze Tijuana Watershed

by Eliot Hurwitz and Eileen Kane,

[National Oceanic and Atmospheric Administration](#)

A new high-technology project, spearheaded by the National Oceanic and Atmospheric Administration (NOAA), will bring the latest computer-based environmental and management tools to bear on development issues in the Tijuana River Watershed. The project will focus around the Tijuana River Estuary, a peaceful, 2,500-acre zone straddling the U.S.-Mexico border where the Tijuana River meets the Pacific Ocean.

Only a few miles from San Diego, the estuary is the largest remaining functional wetland in southern California and provides an important habitat for hundreds of plant and animal species, including threatened and endangered species. In recent years, the health of the estuary has been severely compromised due to unplanned development throughout the Tijuana River watershed.

With seed funding from NOAA, plans are now underway to create a computerized Geographic Information System (GIS) for the watershed that will conjunctively display dozens of environmental, political, and social variables. The heart of the GIS will be a new digital model of the entire watershed, a three-dimensional map created by shooting and digitizing a series of super-high resolution aerial photographs of the region. Once this digital base map is created, the GIS can correlate inventories of water levels, population distribution, agricultural areas, sources of pollution, soil types, industrial and agricultural areas, vegetation, urban development, and many other factors. Once completed, trends and changes to the watershed can be measured, providing a tool for planning and management of the estuary.

The project will also include a bilingual outreach program to educate the public about the important links between the watershed environment, economic development, and public health. Mobile exhibits, brochures, and school curricula will provide current information produced by the GIS.

NOAA's partners in the project represent both sides of the U.S.-Mexico border and include a long list of government and academic partners. Among others, participants include the U.S. Fish and Wildlife Service, the City and County of Tijuana, the U.S. Environmental Protection Agency (EPA), SEDESOL (Mexico's counterpart to EPA), the California Coastal Commission, the University of California at San Diego, COLEF (Colagio do la Fronera Norte), The Nature Conservancy, and the World Wildlife Fund.

For more information, contact Nina Garfield, NOAA, 1305 East-West Hwy., N/ORM2, Silver Spring, MD 20910, (301) 713-3087.

IT'S COMING: WATERSHED '95

In response to the overwhelming success of WATERSHED '93 and the demand for a repeat performance, 15 federal agencies are working together to plan WATERSHED '95. This national conference will provide a forum for information sharing, clarify linkages with other initiatives, examine roles/partnerships/cooperation/coordination, explore how the federal government can better assist watershed efforts, and set an agenda for the future. The conference will be held in the Fall of 1995 in the Washington, DC area. Final dates and locations are still being set. The conference will include plenary sessions, concurrent sessions, exhibits, a resource fair, and a national videoconference broadcast by satellite. The participating federal cosponsors are:

- U.S. Army Corps of Engineers
- U.S. Bureau of Land Management
- U.S. Bureau of Reclamation
- U.S. Department of Energy
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Geological Survey
- USDA Forest Service
- USDA Extension Service
- USDA Soil Conservation Service
- Council on Environmental Quality
- Federal Energy Regulatory Commission
- Federal Highway Administration
- National Oceanic and Atmospheric Administration
- Tennessee Valley Authority

For more information, contact Janet Pawlukiewicz, U.S. EPA (4501F), 401 M St., SW, Washington, DC 20460, (202) 260-9194.

Interagency Group Coordinates Federal Surface- Water Data Collection Activities

by Will Thomas, U.S. Geological Survey

The Hydrology Subcommittee is one of seven Subcommittees of the Interagency Advisory Committee on Water Data (IACWD). The IACWD is composed of representatives of 23 federal agencies that acquire or use water information. Most of the projects of the Hydrology Subcommittee are surface- water oriented. The other six IACWD Subcommittees focus on Ground Water, Sedimentation, Water Quality, Water Use, Spatial Water Data, and Data Management. Hydrology Subcommittee projects are conducted by five current working groups of the Subcommittee. Following is a brief description of the activities of these working groups.

Hydrologic Radio Frequency Working Group

The Hydrologic Radio Frequency Working Group recommends, to the Interdepartmental Radio Advisory Committee of the National Telecommunications and Information Administration of the U.S. Department of Commerce, the assignment of specific frequencies for the transmission of hydrologic data by federal agencies and non-federal users. A range of frequencies has been allocated primarily for hydrologic purposes and the coordination of specific frequencies is the responsibility of the Hydrologic Radio Frequency Working Group . The working group, comprised of representatives of seven federal agencies, routinely processes about seven requests per month for radio frequencies.

Satellite Telemetry Interagency Working Group

The Satellite Telemetry Interagency Working Group enhances and improves hydrologic data collection through the use of Geostationary Operational Environmental Satellites (GOES) that orbit the Earth. The working group provides advice and support to the National Environmental Satellite, Data and Information Service (NESDIS) who has the responsibility for coordinating GOES hydrologic data collection. Recent efforts of the working group include a project to acquire high data rate transmitters/demodulators for NESDIS at Wallops Island, Virginia, preparation of a National GOES Operation Plan, and acquisition of new high density disks for data storage at NESDIS.

Network Analysis Working Group

The Network Analysis Working Group encourages interagency coordination in the planning, installation, use and management of hydro-meteorological data networks. The working group has prepared an issue paper on the stream-gaging program that discusses the effectiveness of the current surface water quantity information system, identifies unmet data requirements of federal agencies and proposes actions needed to improve the availability of surface water quantity information. One of the recommendations in the issue paper is to identify a National Baseline Network (NBN) of critical stream-gaging stations needed to meet national objectives and priorities. The Network Analysis Working Group, including representatives from six federal agencies, has undertaken the identification of the NBN primarily by documenting the uses of data at existing streamflow stations and identifying unmet data needs.

Guidelines For Determining Flood Flow Frequency (Bulletin 17B) Working Group

The Bulletin 17B Working Group is developing additional guidance for flood-frequency analysis that will supplement the existing Bulletin 17B Guidelines used by all federal agencies. The working group, comprised of representatives of six federal agencies and an observer from Environment Canada, has prepared a draft report entitled "Evaluating the effects of watershed changes on the flood- frequency curve." This report describes statistical techniques for detecting trends and nonhomogeneity in annual flood peaks caused by watershed changes and describes techniques for flood-frequency analysis that could be used under changing watershed conditions. The report, which will include computer programs for performing the various analysis techniques, will likely be published in 1995.

Water Surface Profile Models Working Group

The Water Surface Profile Models Working Group is evaluating the applicability of standardizing input and output from models for computing water-surface profiles. This working group has just recently been formed and is in the early stages of defining their purpose and scope. An initial effort of the working group may be to define the input requirements, capabilities and utility of one-dimensional steady and unsteady flow models.

For further information about the IACWD and its Subcommittees, contact Nancy Lopez, Chief, Office of Water Data Coordination, 417 National Center, Reston, VA 22092, (703) 648-5014.

Local Council Guides Protection for McKenzie River

by Tracy Brown, Lane Council of Governments

The McKenzie River in Oregon flows about 90 miles from the crest of the Cascade Mountains westward to join the Willamette River near the Eugene-Springfield metropolitan area. With headwaters in three wilderness areas, the McKenzie River contains some of the cleanest water in America. The 1,300-square mile McKenzie Watershed provides a multitude of benefits to the local area including drinking water for over 200,000 residents, outstanding fisheries, hydroelectric generation facilities, various recreation opportunities, wildlife habitat, and rich soil for growing trees and agricultural goods.

In 1991, Lane County and the Eugene Water & Electric Board contracted with Lane Council of Governments to do a scoping study of the feasibility of developing an integrated watershed management program for the McKenzie Watershed. Since that time, U.S. Environmental Protection Agency and USDA Soil Conservation Service funds were appropriated to begin a three to four year program and develop an action plan for the watershed. In 1993, a watershed council was formed to guide the program and today it includes 20 partners representing 19 organizations. The mission of the council is to foster better stewardship of McKenzie Watershed resources; deal with issues in advance of resource degradation; and ensure sustainable watershed health, function, and values. The council uses a consensus decisionmaking process to make decisions. The council hopes to provide a framework for coordination and cooperation among key interests in the watershed.

The council's adopted work program focuses on four topic areas: water quality, fish and wildlife habitat, recreation, and human habitat. Part of the work program includes the development of a comprehensive basinwide Geographic Information System database. Considerable work has occurred in compiling existing base data layers from federal, state, and local agencies such as land use, zoning, hydrology, vegetation, and soils. Additional data layers and analysis will occur as needed.

Citizen involvement has been an important part of the council's work. The council spent its first year holding a series of meetings to gather ideas from various interest groups and the public at large. Open houses were held at three separate locations in the watershed to introduce the public to the watershed council and its activities. In July, the council produced an eight-page newspaper education and information piece about the watershed management program, the council, and general information about watersheds. The newspaper was distributed to about 60,000 people in the area through local newspapers and mailed directly to all residents in the rural portion of the watershed. Copies of the newspaper are available upon request.

For more information, contact Kathi Wiederhold or Tracy Brown, Lane Council of Governments, 125 E. 8th Ave., Eugene, OR 97401, (503) 687-4283.

Recent Releases

Give Water A Hand - A 1994/95 Youth Action Program which promotes good water management practices at

home and in the community. Choose from among four action guides for home, school, farm, and community. Comes complete with a Leader's Guide. Participating groups may enter their project into competition by submitting a project report by March 1, 1995. For more information, call 1-800-WATER20.

National Wetland Mitigation Banking Study, First Phase Report (IWR Report 94-WMB-4) - One of a series of reports documenting the Congressionally authorized National Wetland Mitigation Banking Study. Presents accomplishments of the first phase of the study, including a nationwide inventory of banks, assessment of the opportunities provided by entrepreneurial banking, potentials for banking within a watershed planning framework, and potential contribution to national wetland goals. Contact Robert Brumbaugh, Institute for Water Resources, U.S. Army Corps of Engineers, 7701 Telegraph Rd., Alexandria, VA 22315, (703) 355-3069.

Summary of National Standards and Guidelines for Pesticides in Water, Bed Sediment, and Aquatic Organisms and Their Application to Water-Quality Assessments (U.S. Geological Survey Open-File Report 94-44) - Summarizes current national standards and guidelines pertaining to pesticide contaminants in water, sediments, and fish and shellfish tissues. For each standard or guideline, the following information is provided: 1) definition, including the underlying assumptions and mathematical derivation; 2) originating agency; 3) statutory authority; 4) regulatory status and, for standards, the agency responsible for enforcing the standard; 5) applicable sampling medium; and 6) beneficial uses and resource protected. The report is designed to facilitate comparison of measured concentrations of pesticides in environmental samples with applicable standards and guidelines. Contact USGS, Earth Science Information Center, Open-File-Reports Section, Box 25286, MS 517, Denver Federal Center, Denver, CO 80225. The price of the paper copy is \$27.00; microfiche \$4.00. Check or money order, in the exact amount, should be made payable to U.S. Geological Survey, Department of Interior.

Calendar of Events

November 14 - 16, 1994, Watershed WISE: A Workshop on Watershed Ecology, Grand Junction, Colorado
This workshop is intended to encourage and support practical and effective approaches to watershed stewardship, and allow participants to share experiences and exchange ideas, tools, technology, philosophy, and values useful to watershed initiatives. The workshop focuses on western watersheds. For more information, contact Thorne Ecological Institute, 5398 Manhattan Circle, Suite 120, Boulder, CO 80303, (303) 499-3647, FAX: (303) 499-8340.

November 14 - 18, 1994, Wilderness: The Spirit Lives, Santa Fe, New Mexico
This conference marks the 30th Anniversary of the Wilderness Act. The conference will review the wilderness mandate, assess accomplishments in wilderness management and research, and plan future actions. Ecosystem management will be among the topics covered. For more information, contact Peter Keller, National Park Service, Room 3230, 1849 C St., NW, Washington, DC 20240, (202) 208- 7029, FAX: (202) 208-3762.

November 15, 1994, Women Thinking Globally, Acting Locally: On the Road to Beijing and the 21st Century, Oakland, California
This official U.S. preparatory meeting for the Fourth United Nations (U.N.) Conference on Women, which will take place in Beijing, China in September 1995, will provide workshops for participants to examine issues such as the particular susceptibility of women to certain health effects (breast cancer, reproductive damage) due to consumption of contaminated fish or shellfish and how women can increase their access to environmental decision-makers. For the first time the U.N. Platform for Action on the Status of Women will address the relationships between women and their environments (home, work, community, global). For more information, contact Betsy Tam, U.S. EPA (4504F), 401 M St., SW, Washington, DC 20460, (202) 260-6466, FAX: (202) 260-9960.

November 17 - 18, 1994, 1994 Groundwater Guardian Conference: "Communities Leading Groundwater Protection," Washington, DC
This conference focuses on ground water, ground water protection, and citizen and community mobilization. It includes interactive workshops on resources and available assistance. The conference is designed for community leaders and officials interested in ground water protection and government officials and

representatives of organizations that work with communities on ground water. For more information, contact The Groundwater Foundation, P.O. Box 22558, Lincoln, NE 68542- 2558, (800) 858-4844.

December 12 - 13, 1994, Protecting Ground Water: Promoting Understanding, Accepting Responsibility, and Taking Action, Washington, DC

This conference is designed to foster an exchange of practical information on ground water pollution and to educate stakeholders on the tools and techniques they can use to address ground water pollution in their communities. "Ground water and watershed issues: nonpoint sources, ecosystems and surface water" is one of six topics being covered at this conference. For more information, contact Ground Water Protection Conference, c/o Terrene Institute, 1717 K St., NW, Suite 801, Washington, DC 20006, (202) 833-8317, FAX: (202) 296-4071.

April 3 - 7, 1995, 1995 Marine and Estuarine Shallow Water Science and Management Conference, Atlantic City, New Jersey

The objectives of this conference are to increase understanding of the relative functions and values of shallow water habitats, to identify additional high-priority information needs, and to consider how to focus research to address current management questions. Shoreline Alteration and Dredging will be the focus of two day-long sessions. For more information, contact Ralph Spagnolo, Wetlands Protection Section (3ES42), U.S. EPA Region 3, 841 Chestnut Building, Philadelphia, PA 19107- 4431, (215) 597-3642, FAX: (215) 597-7906 or Edward Ambrogio, Marine & Estuaries Section (3ES41), U.S. EPA Region 3, 841 Chestnut Building, Philadelphia, PA 19107-4431, (215) 597-3642, FAX: (215) 597-1850.

April 19 - 21, 1995, Public Works and the Human Environment, Seattle, Washington

This international symposium will provide a forum for public works professionals to present their work, exchange information, and increase their understanding and practical treatment of environmental issues which impact public works projects and programs. Session topics will include transportation, water resources, wastewater, waste management, and technical management systems. For more information, contact APWA Symposium, University of Washington, Engineering Professional Programs, XD-51, 3201 Fremont Ave. North, Seattle, WA 98103, (206) 543-5539, FAX: (206) 543- 2352.

May 21 - 24, 1995, Fourth National Watershed Conference: Opening the Toolbox: Strategies for Successful Watershed Management, Charleston, West Virginia

This conference will examine the similarities and the constraints of current watershed management programs with a view toward recommending an integrated approach to watershed management. The conference will address federal watershed and floodplain management programs currently existing or being proposed. For more information, contact the National Watershed Coalition, 9150 W. Jewell Ave., Suite 102, Lakewood, CO 80232, (303) 988-1810.

July 17 - 22, 1995, Coastal Zone 95, Tampa, Florida

This conference will focus on implementing successful solutions to ocean and coastal management issues. The conference will examine three major themes: building partnerships, managing ecosystems, and exploring the human dimension. Within these themes, the conference will also explore three subthemes: sustainable development, technology and tools, and regional solutions. For more information, contact the CZ 95 Program Committee, c/o Dr. Billy Edge, Ocean Engineering Program, Civil Engineering Department, Texas A&M University, College Station, TX, 77843-3136, (409) 847-8712.

Reclamation Plays Active Role in Watershed '94 Expo

by John Redding,

[Bureau of Reclamation](#)

The Bureau of Reclamation actively participated in the Watersheds '94 Expo in Bellevue, Washington, sponsored in part by the U.S. Environmental Protection Agency (EPA).

The September 28-30, 1994 event drew an estimated 800 to 1,000 participants representing a variety of public and private interests involved in watershed management activities.

Aside from participating on the planning committee, Reclamation employees also helped with financial contributions and other services.

Reclamation's Regional Director John Keys addressed the general session during a panel discussion which deliberated the topic, "Advancing Watershed Protection: Challenges and Opportunities." The panel discussion offered Keys an opportunity to explain Reclamation's commitment to watershed management. "There is no single solution to all of these issues and problems facing us with watershed management," Keys said. "We need to build a strong consensus among all who live and work in the watershed. There is a lot of work yet to be done, but there are also clear examples of progress already taking place."

As an example of workable solutions to watershed management, Keys referred to the efforts by the Henry's Fork Council in eastern Idaho. The council is made up of public and private sector representatives with diverse interests and goals. "We have people on that council who would never have been together in the same room a year ago. Yet today, they play an active and vital role in preserving one of the most pristine waterways in Idaho," Keys said.

Other panel participants included: Chuck Clarke, EPA Region 10 Administrator; Linda Crerar, Washington State Watershed Council Member; and Walton Poole, Idaho Division of Environmental Quality Assistant Administrator. Kathy Fletcher, People for Puget Sound Director, served as panel moderator.

A new portable display and video featuring the AgriMet program, an initiative in the Bureau's Pacific Northwest Region, was on display during the expo. AgriMet is a major water conservation tool using satellite link-up to determine site-specific weather elements throughout the Northwest.

For more information, contact Jane Ludwig, Bureau of Reclamation, Pacific Northwest Region, 1150 North Curtis Road, Boise, ID 83706, (208) 378-5089.

Request for Submissions

Lessons from the Mississippi Flood

The winter issue will focus on lessons learned from the Mississippi Flood as they apply to watershed management and on changes that are taking place at the federal level. To broaden the perspective provided in this issue, submissions are invited from our readers. We are interested in both state and local perspectives as well as a personal perspective. Send submissions to Watershed Events, c/o Office of Wetlands, Oceans and Watersheds, Policy and Communication Staff, U.S. EPA (4501F), 401 M St., SW, Washington, DC 20460. Direct questions about submissions to Leigh Skaggs, (703) 355-3091. Submissions are due Friday, January 20, 1995. All submissions will be given full consideration.

Watershed Events

Anne Robertson, Editor

- U.S. Environmental Protection Agency

Contributing Editors:

- Carrie Carnes, U.S. Bureau of Reclamation
- Ginny Finch, Federal Highway Administration
- Nancy Garlitz, USDA Soil Conservation Service
- Denise Henne, U.S. Fish and Wildlife Service
- Elleen Kane, National Oceanic and Atmospheric Administration
- Debbie Hubbs, Tennessee Valley Authority
- Leigh Skaggs, U.S. Army Corps of Engineers
- Terry Thompson, U.S. Geological Survey

Watershed Events seeks to update interested parties on the development and use of watershed protection approaches. These approaches consider the primary threats to human and ecosystem health within the watershed, involve those people most concerned or able to take actions to solve those problems, and then take corrective actions in an integrated and holistic manner. Direct questions and comments about Watershed Events to:

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Revised: undefined