River Crossings

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Most Endangered Rivers of 2004

The river advocacy group *American Rivers*, on April 14, released its *Most Endangered Rivers List of 2004*. Their news release charged that America's rivers and streams are becoming more polluted — and the White House and Congress are making a bad situation worse by cutting clean water law enforcement and spending on pollution prevention. The Colorado River, confronting mounting problems with radioactive, toxic, and human waste, topped this year's list of ten rivers. It supplies the water for 25 million people, including residents of Los Angeles and Las Vegas.

Included on the list were 6 Mississippi River Basin (MRB) rivers, including No. 10, the Mississippi River itself. Other MRB rivers making the list are: No. 2 the Sunflower River (MS), No. 4 the Tennessee River (KY, TN, AL, MS), No. 5 the Allegheny and Monongahela rivers (WV, PA, NY), and No. 9 Big Darby Creek (OH). The rivers included on this year's list face particularly dire futures but they are not unique, said Rebecca R. Wodder, president of *American Rivers*. "They are poster children for a nationwide trend towards more polluted waters and less effort to clean them up."

America's waters became progressively cleaner for decades after Congress passed the Clean Water Act (CWA) in 1972, but recent monitoring data indicates that this trend has reversed itself. For example, sampling at estuaries across the country in 2000 found that more than half were "impaired" — up from 37% in 1994. Estuaries are good indicators of broad water quality trends as they receive pollution from every stream and river in their watershed. *American Rivers* predicted that actions taken by the Bush Administration will accelerate this decline.

Big Sunflower River (MS)

In particular, *American* Rivers says the Bush Administration has reduced the number of CWA enforcement actions, levied fewer and smaller fines on lawbreakers, and created new loopholes on behalf of polluting industries. The Bush Administration also failed to disclose the results of an internal audit, which found that one-quarter of all major industrial and wastewater treatment facilities are in "significant violation" of the law at any one time

"The President's clean water record can be summed up in three words: soft on crime," Wodder said. The White House and Congress have also shortchanged communities seeking a helping hand to clean up their waters. The federal government's share of sewage treatment construction costs has fallen from 20% to just 5% — and the White House seeks to cut federal funding by another third in 2005. Congress has effectively shifted the burden of cleaning up contaminated river bottoms and other toxic sites from polluters to the public, and the number of sites cleaned up each year has dropped by almost half. Also, Congress has yet to reauthorize the trust fund that pays for efforts to treat polluted water draining out of thousands of abandoned coal mines in the Ohio River watershed.

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"Letting our kids splash in the creek, eat a fish we caught on a camping trip, and drink water from the tap without worry are things that Americans should be able to take for granted," Wodder said. "Washington is misspending our money if our children won't enjoy these things, too."

American Rivers' list of *America's Most Endangered Rivers* is based on nominations solicited from thousands of river groups, environmental organizations, outdoor clubs, local governments, and taxpayer watchdogs. The report highlights the rivers facing the most uncertain futures. It is not intended as a list of rivers with the worst chronic problems, but:

- presents alternatives to proposals that would damage rivers,
- identifies the entities that will make the crucial river management decisions, and
- points out opportunities for the public to take action on behalf of each listed river.

The *Most Endangered Rivers List for 2004* follows:

1. Colorado River (CO, UT, AZ, NV, CA: While conflict over Colorado River water sharing has grabbed headlines for years, water pollution problems from human waste, toxic chemicals, and radioactive material have been largely overlooked and threaten to get much worse. Unless Congress and the federal government step in to bolster local cleanup efforts, the drinking water for 25 million Americans will be at risk. Contact: Eric Eckl, (202) 347-7550 ext. 3023

2. Big Sunflower River (MS): A pair of costly flood control boondoggles promoted by the U.S. Army Corps of Engineers (Corps) threatens Mississippi's Big Sunflower River. Unless the U.S. Environmental Protection Agency (EPA) vetoes the Yazoo Pumps, this single project will drain and damage seven times more wetlands than all the nation's private developers harm in one year. Without firm opposition from EPA and the U.S. Fish and Wildlife Service, the Corps will also dredge more than 100 miles of the Big Sunflower's riverbed, destroying even more wetlands, stirring up a toxic stew of pesticides, and endangering the health of those who eat fish caught in the river. Contact: Melissa Samet, (415) 482-8150

3. Snake (WY, ID, OR, WA): Dams on the Columbia and lower Snake rivers have caused dramatic declines in the Snake River's once abundant wild salmon population, with all the river's runs either extinct or sliding toward extinction. Studies show that local economies would benefit from thousands of new jobs and hundreds of millions of new dollars if wild salmon were restored to the Snake River. However, unless the Bush Administration delivers a credible plan to rebuild wild salmon populations, these economic opportunities will be lost and our generation could be the last to enjoy these legendary species. Contact: Michael Garrity, (206) 213-0330 ext. 11

4. Tennessee (TN, AL, MS, KY): Along the length of the Tennessee River, overloaded wastewater systems discharge large amounts of inadequately treated sewage into the river with distressing regularity. Unless the Bush Administration holds these sewer systems accountable — and Congress provides financial assistance — the Tennessee River will continue to be deluged with sewage. Contact: Jamie Mierau, (202) 347-7550 ext. 3003

5. Allegheny and Monongahela rivers (WV, PA, NY): Thousands of abandoned mines are leaking acid and other toxic substances into streams throughout the coal country of western Pennsylvania and West Virginia. Unless Congress reauthorizes the Abandoned Mine Land Trust Fund, ongoing efforts to fix this problem will cease and the amount of pollution reaching the Allegheny and Monongahela rivers will increase, threatening 42 public drinking water intakes, thousands of private wells, and fish and wildlife. Contact: Sara Nicholas, (717) 232-8355

6. Spokane River (ID, WA): More pollution concentrated in less water will be the future of the Spokane River unless new groundwater withdrawal applications are rejected, sewage plants meet stringent water quality standards, and mine waste is cleaned up. Contact: Ross Freeman, (206) 213-0330 ext. 16

7. Housatonic River (MA, CT): Irresponsible industrial activity has left the flood-

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plain and river bottom of the Housatonic River contaminated with some of the highest levels of toxic PCBs in the nation. People who consume contaminated fish and wildlife from along the river are at elevated risks for cancer, birth defects, and immune problems. Unless the EPA orders a cleanup of the remaining contamination, General Electric Company's toxic legacy in the Housatonic will remain a major health hazard for generations to come. Contact: John Senn, (202) 347-7550 ext. 3056

8. Peace River (FL): Phosphate mining in the Peace River watershed has been the source of serious environmental problems for many years, and large new mines are planned. Florida's Department of Environmental Protection and the *Southwest Florida Water Management District* must take measures to safeguard the river and communities in the watershed from mining impacts, including protecting the drinking water for more than 750,000 people and important tourism and commercial fishing industries. Contact: Serena McClain, (202) 347-7550 ext. 3004

9. Big Darby Creek (OH): Despite its close proximity to Columbus, OH, Big Darby Creek has managed to escape many impacts of urban sprawl. That may be about to change. Unless state and local governments adopt and enforce river-conscious land use planning in the Big Darby watershed, one of the highest quality streams left in the Midwest may become just another polluted, flood-prone urban ditch. Contact: Jack Hannon, (202) 347-7550 ext. 3025

10. Mississippi River (MN, WI, IA, IL, MO, KY, TN, AR, MS, LA): After decades of manipulation by the Corps, the Mississippi River is beset with problems. Unless Congress gives the agency marching orders that reflect the needs, desires and opportunities of today's communities, the river faces ecological collapse with vast negative economic impacts to tourism and recreation industries worth $21 billion per year. Contact: Kelly Miller, (202) 347-7550 ext. 3008

Source: *American Rivers News Release*, 4/14/04

River and Stream Health?

America's rivers and streams are generally suitable for irrigation, supplying drinking water, and home and recreational uses. However, according to the USGS in areas with significant agricultural and urban development, the quality of our nation's water resources has been degraded by contaminants such as pesticides, nutrients, and gasoline-related compounds.

A series of 15 reports on the health of major river basins across the country have been released by the USGS. The river basins are in Hawaii, Alaska, California, Washington, Wyoming, Montana, Utah, Idaho, North Dakota, Ohio, Indiana, Kentucky, Illinois, Wisconsin, Louisiana, Mississippi, Alabama, Georgia, Tennessee, Maine, New Hampshire, Massachusetts, Rhode Island, Pennsylvania, New Jersey, New York, Delaware, Maryland, and Virginia. Findings of regional and national interest are highlighted in a separate report "*Water Quality in the Nation's Streams and Aquifers - Overview of Selected Findings, 1991-2001.*"

For more than a decade, USGS hydrologists have looked at three questions related to water quality. What are the conditions of our nation's streams and ground water? How is water quality changing over time? And how do natural features and human activities affect the quality of streams? According to the USGS Chief Hydrologist Robert Hirsch, "By evaluating and assessing our nation's water resources, we have a better understanding of water quality and this gives us a comprehensive picture of the long-term health of America's rivers and aquifers. We have analyzed the effects of agricultural, urban, and forest land use practices on water quality, habitat, and biota."

Major challenges that continue to affect streams and ground water are sources of pesticides, nutrients, metals, gasoline-related compounds and other contaminants. In urban areas, insecticides such as diazinon and malathion, commonly used on lawns and gardens, were found in nearly all of the streams that were sampled. Streams in agricultural areas were more likely to contain herbicides — especially atrazine, metolachlor, alachlor, and cyanazine.

Hirsch also noted that, "Concentrations of contaminants in water samples from wells were almost always lower than current U.S. Environmental Protection Agency drinking-water standards and guidelines. However, the possible risk to people and to aquatic life can only be partially addressed because of the lack of criteria for many chemicals and their degradation or "breakdown" products. In addition, criteria were developed for individual chemicals and do not take into account exposure to mixtures or seasonal high pulses in concentrations."

Also, the detection of chemicals at low levels does not automatically translate into impacts on human or aquatic health. For example, USGS water quality assessments may be done at the parts per trillion levels, an amount that can be up to 100 times lower than the threshold used for setting standards and guidelines. Other notable trends related to water-quality over the past decade are:

- Changes in land management practices that can improve water quality in streams over time. For example, changing from furrow to sprinkler and drip irrigation in parts of Washington's Yakima River Basin has reduced runoff from fields resulting in less sediment and compounds such as DDT in streams. In fact, concentrations of total DDT in large-scale suckers, smallmouth bass, and carp from the lower Yakima River decreased by about half since the 1980's.

- Even low levels of urban development have an impact. In Anchorage, for example, the abundance and diversity of aquatic insects became affected when about 5% of a watershed was converted into areas like parking lots.

- Natural features, such as soils, climate, and geology, are an important influence on water quality in watersheds. For example, mercury concentrations in fish are affected by the amount of wetlands and chemical properties of soils and water, and therefore, fish in forested streams in New England had higher levels of mercury than fish in the more urban watersheds in the Boston metropolitan area.

- Contaminants can occur naturally, even in relatively pristine areas like Wyoming

and Montana's Yellowstone River Basin. Elevated phosphorus concentrations were noted as derivatives from igneous and marine sedimentary rocks. Elevated arsenic levels are most likely from sedimentary rocks in contact with geothermal waters.

The reports on water quality were completed by the USGS National Water Quality Assessment (NAWQA) program. Of the 51 areas studied in the first phase of the program, the USGS has already launched a second round of studies in 42 areas to determine trends, fill critical gaps in the characterization of water-quality conditions, and increase understanding of natural and human factors that affect water quality. Free copies of the NAWQA reports are available from 1-888-ASK-USGS, by fax 303-202-4693 or online at http://pubs.water. usgs.gov/nawqasum/.

Source: *USGS News Release*, 5/14/04

CBM Damaging Powder River

Coalbed methane (CBM) water discharges have degraded water quality in the Powder River (WY, MT), according to a study commissioned by the *Powder River Basin Resource Council* (PRBRC). Results of the two-year study indicate that "salt-loading" has significantly elevated the sodium adsorption ratio (SAR) in areas of the Powder, making it less useful for irrigation and more prone to noxious weed invasions on its banks.

Higher SAR values and other pollutants from CBM discharges also threaten several fish populations in the greater Powder River watershed, according to the study conducted by Montana-based *Confluence Consulting, Inc*. But industry members dispute the study results, noting that not enough baseline information existed on the Powder River and other streams in the area before CBM development began in the region. That makes it difficult to know for sure whether CBM discharges are to blame for any measured degradation. "It makes it a difficult case to prove what they are saying, and they are blaming the industry for what may be naturally occurring," said John Robitaille, vice president of the *Petroleum Association of Wyoming*.

PRBRC officials said that very argument is one reason why it commissioned the study. PRBRC board member Clay Rowley said the study helps fill "data gaps" in the overall understanding of the Powder River watershed's ecological health. "While we can guess and make inferences from what we see happening, there is no body of scientific data that analyzes all the parameters in a systematic way," Rowley said. "I just wish the state or the BLM (Bureau of Land Management) had done this kind of analysis earlier so we'd have some pre-CBM baseline information," Rowley said. The Wyoming Department of Environmental Quality (DEQ) is responsible for issuing permits to discharge CBM water. In issuing a permit, the agency sets limits for SAR and various pollutants in the hopes of protecting the integrity of existing surface waters for fish, wildlife and agricultural uses. However, due to a lack of baseline information, those parameters are largely based on best guesses, said John Wagner, administrator of DEQ's Water Quality Division. "Admittedly, when we put those limits in the permits they are based on theoretical assumptions," Wagner said.

The DEQ did complete a whole effluent toxicity (WET) test of CBM water from the Big George coal seam last year and determined the water could potentially be toxic to a number of aquatic organisms. DEQ officials said the results persuaded them to impose more stringent pollution limits for certain areas. Industry officials estimate that nearly 70% of the CBM resource in the basin will come from the Big George coal seam.

Wagner said so far, no regulatory agency has measured a degradation of the overall health of the Powder River. A multi-agency monitoring group is still organizing a program to measure the impacts of CBM development on surface waters, but it has not produced any results yet. Agencies governing the CBM gas industry have said they have adopted an "adaptive management" plan so they can adjust regulations as they see impacts from CBM development.

Confluence, the firm that conducted the PRBRC study, concluded that an adaptive management approach is a good idea because it will allow "continual refinement of management activities." In the meantime, results of the study suggest that the Powder and its connecting waters are already being impacted. "*Confluence* found that the Powder River, in spite of its natural turbidity and tolerance for salt leaching from clay soils, is showing "the marked effects of water quality degradation" brought about by increased loading of salts from CBM discharge water and from other toxic constituents of the water, including arsenic," the PRBRC stated.

The *American Rivers* organization listed the Powder among its "Most Endangered Rivers of 2002."

Source: Dustin Bleizeffer, *Casper Star-Tribune*, 4/8/04; and *Greenwire*, 4/9/04

UMR Lock Expansion Opposed by Conservation Groups

To the disappointment of national and local conservation and watchdog groups, the U.S. Army Corps of Engineers (Corps) in April announced a Mississippi River management plan that is once again based on unsupported economic and river traffic data. In an interview with the press, Corps commander, Lt. Gen. Robert Flowers, described a plan to proceed with a $2.3 billion expansion of locks on the Upper Mississippi and Illinois rivers. A draft plan will be released to the public in early May.

Opposing conservation groups said the Corps has not shown that the budget busting lock expansion project is needed. The groups instead urged Congress to address congestion at river locks through management measures, like river traffic scheduling. In December 2003, the *National Academy of Sciences* concluded that it was "not possible" to evaluate the benefits of lock expansion until an efficient system for managing waterway traffic was implemented.

Also the Corps continues to use faulty economic tools to attempt to justify construction of longer locks even though river traffic has not increased in more than 20 years, and has actually declined in recent years. The groups called on the Corps to develop credible economic tools to determine whether the project is needed before asking Congress to spend as much as $2.3 billion on longer locks.

"Two panels from the *National Academy of Sciences* have concluded that the Corps is using economic tools like unrealistic traffic forecasts that produce the wrong results." said Scott Faber, *Environmental Defense* Water Resources Specialist. "We should not use bad math to decide the future of a river as important to the nation as the Mississippi."

"We recognize that Mississippi River navigation plays an important role in the

Midwest's agricultural economy and adequate funding needs to be provided for its continued operation and maintenance," said Mark Muller with *Institute for Agriculture and Trade Policy*. "But spending billions of dollars on lock extensions — particularly at a time when agricultural exports have been in decline and any new exports will likely emanate from the West Coast and not the Gulf — is absolutely foolish."

In an apparent effort to avoid such criticism, the Corps' Chief of Engineers told at least one reporter that immediate construction of seven new locks and the extension of five existing locks, was necessary because of the potential for a catastrophic breakdown in the navigation system. This rationale has never been expressed before, let alone predicted or evaluated in any Corps study.

The locks and dams are also subject to regular maintenance, with $140 million spent annually. In addition, according to the Corps, the agency has already spent $400 million since 1975 rehabilitating the system. "This is a case of twice-cooked pork," said Jeff Ruch, Executive Director of *Public Employees for Environmental Responsibility*, "But rather than cooking the books, the Corps has thrown out economic textbooks and is now writing fiction."

PEER represented the Corps economist who disclosed in 2000 that senior Corps officials ordered him to exaggerate the benefits of the lock expansion project. The Army Inspector General confirmed the disclosure, concluding that the Corps deceptively and intentionally manipulated data in an attempt to justify the lock expansion. "The Corps' blatant abandonment of basic benefit cost analysis to suit its construction agenda on the Mississippi is the smoking gun of how the agency has been conducting business across the country," said David Conrad, Senior Water Resources Policy Specialist at the *National Wildlife Federation*. "The Corps simply cannot be trusted to be objective about its work and it's up to Congress to set the agency straight."

The Corps has also proposed to immediately deploy helper boats at some locks to help reduce a 90-minute lockage by 20 minutes or more while the locks are constructed. "The Corps' proposal acknowledges what we have been saying for years. Small-scale measures can bring immediate relief to river users facing delays at a fraction of the cost of longer locks. By contrast, longer locks would take more than a decade to build," said Mark Beorkrem, Executive Director of the *Illinois Stewardship Alliance*. "We should reduce delays now by immediately implementing small-scale measures and should take the time that's needed to fairly evaluate whether we need to spend $2.3 billion on longer locks."

The groups called the Corps' proposal to link habitat restoration efforts on the river to the $2.3 billion lock plan a recipe for restoration failure. "The Corps' proposal would hold restoration hostage to a $2.3 billion boondoggle," said Melissa Samet, Senior Director of Water Resources at *American Rivers*. "Its bad for the river and bad for the taxpayers. The health of the Mississippi is in dire straits and full scale restoration should begin as soon as possible," Samet said.

"We should be restoring, not destroying, this great natural treasure," said Angela Anderson, Upper Basin Program Director for the *Mississippi River Basin Alliance*. "A healthy river supports more than 300,000 jobs in riverside communities — more jobs than are produced by the navigation industry and farming combined. The Corps should recognize that the needs of the living river are as important as the needs of the working river."

Source: *Public Employees for Environmental Responsibility (PEER) News Release*, 4/27/04
Contact: Scott Faber, *Environmental Defense*, (202) 387-3500 ext. 3315; Mark Beorkrem, *Illinois Stewardship Alliance*, (217) 498-9707; Jeff Ruch, *Public Employees for Environmental Responsibility*, (202) 265-7337; Kelly Miller, *American Rivers*, (202) 347-7550 ext. 3008; Mark Muller, *Institute for Agriculture and Trade Policy*, (612) 870-3420; Angela Anderson, *Mississippi River Basin Alliance*, (314) 776-6672 ext.102; and David Conrad, *National Wildlife Federation*, (202) 797-6697

Beneficial Uses for Illinois River Sediments

The Illinois River has long suffered from the effects of runoff and sedimentation from Illinois' fertile farmlands. In fact, many of the river's once rich backwaters have literally become filled with agricultural sediments. A prime example is Peoria Lake. This wide river lake, once rich in waterfowl and fish, now, in many locations, holds less than a foot or so of water over several feet of soft mud that can literally swallow up an unsuspecting person who might make the mistake of stepping out of a boat in shallow water. Once 6-8 feet deep, the lake has shrunk to depths more appropriate for a bathtub. Sauger, bass and sunfish are left searching for room to swim, and the duck population has fallen by 90%. Also boaters fear sucking mud, not water, into their motors. But what exactly can be done about all this muddy sediment, especially given the high prices of dredging and disposal?

That's where Dr. John Marlin, senior scientist with the Illinois Department of Natural Resources (DNR) came in. Marlin, working out of the DNR's *Waste Management and Research Center* has focused an interest on the problem for more than three decades. Marlin already knew that the City of Chicago had a need for mud, so the solution seemed simple enough – send the Peoria Lake sediments to Chicago.

On Chicago's South Side, 20,000 people had once labored in what used to be the *United States Steel Corporation's* South Works plant, a symbol beside Lake Michigan of this city's place in building a nation's bridges and skyscrapers. South Works, now empty and closed, filled 573 acres, making it larger than even the Loop, the city's downtown business district. Much of the land was glazed over in slag, a by-product of steel and another reminder of the past. So when *United States Steel* and city officials began dreaming several years ago of ways to turn the famed old mill into a new development — perhaps with businesses, homes, roads and parks — the slag posed a problem. How exactly would one set a grassy park on slag, where grass will not grow?

"There was no real epiphany moment," Marlin said of his realizing that the East Peoria and Chicago problems could be solved by the same action. "I just started looking at maps and thinking about it," he said. But the two cities are 165 miles apart, and, like most cities, neither had ever devoted much time to pondering the other's problem. Marlin began working on the issue several years ago, and the solution may have been found — for several weeks this spring barges loaded with mud dredged from the bottom of Lower Peoria Lake have made the 165-mile, two-day journey to the edge of Lake Michigan. There, hundreds of truckloads of mud were dumped on the slag-covered land. And by summer, Dr. Marlin says, grass will grow on the acres meant to become a city park.

Seventy barges made the trip, each with 1,500 tons of mud. In the end, more than 100,000 tons of mud will frost the top of this land. And the mud is safe, according to U.S. Environmental Protection Agency officials who analyzed core samples from the lake. And most of a $2 million grant from the state is paying for the transport — a deal that Chicago and East Peoria officials couldn't pass up. "We needed good quality soil," said Mayor Richard M. Daley, "and basically this solves two environmental problems, one urban and one rural."

On the rural end, East Peoria officials watched with relief as a public marina in Lower Peoria Lake got deeper. "We've waffled in the past as to whether our marina could even stay viable because of the expense of dredging," said Brad Smith, executive director of the *Fon du Lac Park District*. " This gives us somewhere to take the stuff."

If everything works out here, Marlin said, he has dreams of similar projects in other places, of other happy marriages between localities separated by so much distance. "Why not?" he said. In Peoria Lake alone, he estimated, there is enough extra mud to fill a football field that reaches 10 miles high. "Just imagine," he said.

Source: Monica Davey, *New York Times*, 4/22/04

Federal Court Hears Missouri River Arguments

Critics and backers of a plan to keep the Missouri River at consistent depths, rather than allowing a spring rise and summer low, made their cases to U.S. District Court (St. Paul, MN) Judge Paul Magnuson in late May. A half-dozen Missouri River lawsuits related to river flows and the environment were consolidated last year on Judge Magnuson's docket. A senior judge appointed 23 years ago during President Reagan's administration, Magnuson could rule as to whether the environmental imperatives of the Endangered Species Act (ESA) supersede Congressional orders made under the Flood Control Act of 1944 to manage the river primarily for flood control and navigation.

At stake is the volume of water in the lower river (Gavins Point Dam, SD to St. Louis) this summer along with the Corps of Engineers' (Corps) long-term plan for an annual spring rise to benefit wildlife. Shippers and southern river states argue that maintaining consistent water depths in the river is vital to barge traffic, while environmentalists, tourism backers and northern states say the ebb and flow of the river is necessary to protect endangered species and the river's recreation industry.

More that two dozen lawyers were on hand at the St. Paul federal courthouse for the May hearing. Lawyer Robert Vincze, representing Kentucky-based *Blaske Marine* whose primary business is moving barges on the Missouri, said that for businesses relying on the river for commerce "a split season is no season." Shippers generally need a summer flow of 28,500 cubic feet per second to maintain the depth needed for running barges down the river from Nebraska, through Iowa and Kansas to St. Louis, where the Missouri and Mississippi rivers meet. Upstream dams and reservoirs control that flow.

William Bryan of the Missouri attorney general's office said the Flood Control Act of 1944 required putting a priority on navigation. "Less water cannot be better for navigation," he said. But Brian O'Neill, lawyer for the group *American Rivers*, said the Flood Control Act does not require complete deference to navigation, but rather a balancing of different interests. "We recognize that navigation is a purpose — just not the (only) purpose," said Fred Disheroon with the Justice Department, in defense of the policy. Disheroon called the hearing "an important occasion." "This is the culmination of a 15-year epic," he said. "We're looking forward to hopefully getting resolution."

In recent years, the federal government has faced multiple lawsuits over management of the 2,400 mile river which runs through seven states, from Montana to Missouri. Upstream states — North Dakota, South Dakota and Montana — want more water in their reservoirs to support the summer recreation industry, while downstream states, including Missouri and Nebraska, oppose that and want more water for barges and other uses. The Missouri River's natural condition is very wide and shallow. Low summertime flows are necessary for birds such as the endangered least tern and piping plovers to nest on sandbars.

Earlier this year, an official at the Interior Department, which oversees the U.S. Fish and Wildlife Service (FWS), said the Corps' plan did "not achieve the desired goal of avoiding jeopardy to listed species." But FWS officials later said the Corps had resolved those concerns and last month signaled the agency wouldn't stand in the way of barge shipping this summer on the river. Instead of creating a more seasonal ebb and flow to sustain fish and birds, as the FWS ordered previously, the Corps made plans to build 1,200 slow-moving, shallow-water acres of habitat for the endangered pallid sturgeon. About 600 acres have been completed so far. The Corps maintains that the new habitats will allow it to comply with the ESA without putting in place an ebb and flow that would hamper barge shipping. The Corps finalized its new Missouri River Master Flow Control Manual this spring.

Magnuson thanked all sides for handling the issue professionally, "My hat deeply goes off to you," he said, "There are tremendous divergent interests." He added that some people would be very unhappy with his decision and some might agree with parts of it. "Hopefully, we keep some common sense," he concluded.

But despite Magnuson's summary comments, the controversy did dip to a new low when Missouri officials resorted to citing the content of FWS emails (garnered from Freedom of Information Act requests) to almost humorously bolster their case. In particular, Missouri Attorney General Jay Nixon (D) cited a FWS e-mail which mocked Missouri and its residents, calling concerns of Missouri residents that management of the river could lead to more floods "chicken little stories ... emanating from the great state of Misery." Nixon said, "We see it [the correspondence] as evidence of having intent beyond science that is relevant and important, and we think the court should know that." Rob Ostrander, spokesman for Sen. Kit Bond (R/MO) added, "You really don't need to read the Fish and Wildlife Service's e-mails to understand their hostility to working people. The agency's animosity toward Missouri is

clearly evident in their actions regarding the river," he said.

The email in question was written from a FWS official to state biologists and FWS colleagues reportedly to provide some comic relief to the otherwise stressful debates. The FWS official, who wrote the email said that internal emails like this are meant to be taken in jest and are just a reflection of fun and banter between fellow employees. In fact, he said, colleagues living in Missouri often refer to his home state, Iowa, as "Corn-tucky". It is unclear whether use of the e-mails will have any bearing on the outcome of the case. But newspaper reports, claim they likely will fan the flames of a festering dispute between Missouri and government agencies over river management. And who knows, the good state of Kentucky may now be offended and choose to enter the Missouri River debates!

Missouri's legal brief also cited a letter written by a high-ranking FWS official to the Corps during the Great Flood of 1993 recommending that levees not be repaired so as to create a more natural flood plain. Lawyers for Missouri wrote in their brief, "Missourians were literally sandbagging to save what they could, and the service was already licking its chops over the flood-ravaged landscape."

Despite Missouri's claims about FWS intent, its no secret that the FWS, the Missouri Department of Conservation, the Corps, FEMA, and many other federal agencies worked in concert during the aftermath of the 1993 flood to return some of the floodplain to a more natural state, but they did so only by offering fair prices to willing sellers who were tired of facing the onslaught of continued flooding. In fact, the agencies were also working with landowners to both sandbag and to restore broken levees. And it is a fact, as pointed out by the 1994 White House-funded Galloway Report that some levees actually cause flooding and more natural flood plains are needed to protect critical infrastructure such as sewage and water treatment plants.

Missouri's court filings also include a declaration from Ron Kucera, deputy director for policy in Missouri's Department of Natural Resources, recalling a conversation with a spokesman for the advocacy group *American Rivers* in the late 1990s. Kucera quoted the spokesman, Scott Faber, as saying, "We want to put a hole in the middle of the season...When we are celebrating the Lewis and Clark Bicentennial, we cannot have barges on the Missouri River." Use of the quote was meant to buttress Missouri's argument that environmentalists and the FWS worked closely over the years to lower river flows in summer for wildlife and thereby prevent barges from operating. Faber, now a lawyer for the advocacy organization *Environmental Defense*, denied making the statement. "The worse the facts are for the state of Missouri in this case, the more outrageous their arguments have become," he said.

Missouri also takes issue in its brief with an assertion by Indian tribes in court filings that Missouri River management is a matter of environmental justice upstream — meaning that tribes along the river suffer unfairly when denied water from the river they need. Lawyers for Missouri said that, "The low-income and minority populations of Missouri deserve no less environmental justice than the residents of the upper basin, including members of the tribes."

Tex Hall, chairman of the Mandan-Hidatsa-Arikara tribes in North Dakota, a party to the suit, said in an interview that Missourians probably don't know that his tribes gave up 156,000 acres of their best land for one of the dams that affords flood control for downstream. "The people of Missouri and your attorney general should be commending us for taking care of that river before it reaches St. Louis. We lost six of our communities, and there were promises made to us that were broken," he said.

Missouri's aggressive court filings clearly reflect the state's bias, frustration and dismay over the recent Corps' management plan that will keep more Missouri River water in the upstream reservoirs for drought conservation

Sources: Ashley H. Grant, *AP/St. Paul Pioneer Press*, 5/21/04; Bill Lambrecht, *St. Louis Post-Dispatch*, 5/16/04

Plans for Mississippi/Missouri River Refuge Abandoned

An environmental group headed by brewery scion Adolphus Busch IV has stopped pushing for a massive federal wildlife refuge at the confluence of the Missouri and Mississippi rivers near St. Louis after running into high-level political opposition. However, the group, the *Great Rivers Habitat Alliance* (GRHA), is pursuing other strategies to achieve its goal of blocking commercial development in flood-prone areas. Such river confluence refuges were recommended in 1994 by the *Galloway Report*, prepared by the Clinton Administration in the aftermath of the 1933 flood. Their purpose is to reduce flood damages by providing more open space in cities like St. Louis and the surrounding area.

One avenue being used by the GRHA involves getting private donors to buy land that would be turned over to new nature preserves run by the county and possibly by the cities. Federal money also would be involved, through existing programs. "Our idea is that the feds would have zero control," said St. Charles County Councilman Joe Brazil, a Republican who is working with the GRHA on the revised plan. "It would all be local control."

Busch and some other GRHA members also have gotten involved recently in local election races, donating to candidates in St. Peters and O'Fallon, MO, who share their opposition to development in the flood plain. The GRHA's original concept of a national wildlife refuge near the Mississippi and Missouri rivers confluence was opposed by the state's two U.S. senators, Christopher "Kit" Bond and Jim Talent, as well as U.S. Rep. Todd Akin, whose district includes the area, and St. Charles County Executive Joe Ortwerth. Those four officials, all Republicans, had said the proposal could affect farmers' property rights. They also didn't like the federal price tag of more than $150 million. GRHA officials have insisted all along that the program would be voluntary.

In any event, Busch called the original plan "a dead issue now" because of the opposition. Wayne Freeman, GRHA executive director, said it was "indefinitely put on the back burner." The GRHA's revised proposal would cost less and cover a smaller amount of land — about 32,000 acres, all in St. Charles County. The earlier plan called for 55,000 acres to be protected, some in the national wildlife refuge and some outside. As in the original version, some acreage would be protected by obtaining easements on private property that commit the owner to barring future development. The amount of land protected that way would increase under the revision.

Farmers agreeing to take part would be paid for the easement and could continue using the land for agriculture. Or they and other landowners, such as duck hunting

clubs that include GRHA members, could donate an easement and get a tax break. The new plan calls for $22 million in purchases of land and easements plus $5 million in restoration costs. The tax breaks are anticipated to cost the federal government $45 million. The County Council is expected to consider the new GRHA plan in the next few months.

Mark Schlinkmann, *Kansas City Star*, 4/25/04; and *St. Louis Post Dispatch*, 4/25/04

Lawmakers Urge Classification of Asian Carp as harmful to the Great Lakes

More than 30 members of Congress have asked the U.S. Fish and Wildlife Service (FWS) to deem three species of Asian carp as a threat to the health of the Great Lakes and worthy of federal funding aimed at preventing invasive species from taking over the lakes' native ecosystems. House and Senate members of the Great Lakes Task Force told FWS officials in a 5/21 letter that preventing "an invasion of Asian carp is critical to prevent backsliding from the work put into restoring and protecting the Great Lakes Fisheries."

The letter, signed by task force co-chairmen Sens. Mike DeWine (R/OH) and Carl Levin (D/MI) and 30 other task force members, said that listing the carp "will help prevent new outbreaks in other regions, including the Great Lakes." The task force petitioned the agency to ban the fish under the Lacey Act prohibiting the import, export, transport, sale, purchase or acquisition of the species. FWS is considering whether to add the black carp, the bighead carp and the silver carp to the list of species targeted under the 1981 Lacey Act amendments. The Asian carp were introduced into the Mississippi River Basin to keep waters used by fish farms clear of algae, phytoplankton and parasites, and as a food source for some people. The Asian carp escaped captivity and have migrated into many reaches of the Mississippi River Basin, including the Ohio and Illinois river watersheds.

The carp now pose a threat to the food supply of native adult fish that rely on plankton as a food source, and they compete for food with all young, larval native fish. The bighead and silver carps can grow quite large, with individuals reported at more than 90 pounds by state biologists. Black carp subsist on mollusks and snails and can grow as large as 150 pounds, according to FWS officials. Silver carp also pose a public safety risk because they have a propensity to leap high into the air, colliding with boats and boaters. "A collision with a 20-pound fish at 20 miles per hour could easily prove fatal, and there have already been many serious injuries".

Members of the Great Lakes Task Force believe listing the carp under the Lacey Act is needed to augment the Army Corps of Engineers' ongoing construction of Asian carp barriers between the Mississippi River and the Great Lakes. FWS officials did not respond to requests for comment on the issue, but in the Illinois River, just 50 downstream from one of the barriers and Lake Michigan, an Illinois Dept. of Natural Resources email message from Kathy Higdon in mid May described the following situation with regard to Asian carp: *" For the past two days the silver and big head carp have been jumping just below the power house on the downstream side of Starved Rock dam. It is the most awesome sight I have ever seen! It looks like something from outer space. There are these HUGE fish jumping 6-8 feet out of the water...one, two and three at a time. . . it was just incredible. You don't even need binoculars. They are as clear as a bell out there. And they are scary too. Just think what they can do to the ecosystem of the river and also to the recreational boaters."*

Asian carp were first observed at the Starved Rock Lock and Dam (see figure below) in 2001, and now just three years later they are present in the huge numbers described by Ms. Higdon. As noted in the figure, Asian carp have already moved upstream from Starved Rock Dam and may soon be knocking on the door of the aquatic nuisance species barrier.

The electrical *Aquatic Nuisance Species Dispersal Barrier*, as yet untested by the Asian carp, forms the last obstacle between the carp and Lake Michigan. Many reputable biologists across the Mississippi River Basin have raised doubts that the electric barrier will actually stop the carp. To date, the only barriers stopping their upstream movements have been physical obstacles such as high dams. Consequently, many biologists favor closing the canal altogether by creating a physical barrier or levee between it and the lake, and thus creating a hydraulic separation between the two watersheds. Another alternative suggested is to create a two mile toxic zone in the canal that would prevent the existence of oxygen-loving aquatic organisms. Such a barrier existed before implementation of the 1972 Clean Water Act when largely untreated sewage and industrial wastes filled the canal.

Map showing proximity of Starved Rock Lock and Dam to the Cal Sag and Chicago Sanitary and Ship Canal, Lake Michigan and the aquatic nuisance species barrier.

Sources: Marty Coyne, *Greenwire*, 5/28/04; Kathy Higdon, *Illinois DNR email message*, 5/13/04

More Snakeheads Caught in Maryland and Virginia

In late April and early May a total of five snakehead fish were caught in the Potomac River watershed in Maryland and Virginia. The most recent catch, by a commercial

waterman using a haul seine, was in Pohick Bay near the Pohick Bay Regional Park and Fort Belvoir Military Installation. The fish, nearly 14 inches long was identified as an immature female about two years old. Three other snakeheads were taken by anglers in an eight-mile stretch of the Potomac and one in Pine Lake in Wheaton, MD. Maryland Department of Natural Resources (DNR) biologists confirmed all the catches, and both male and female snakeheads were identified.

The Virginia Department of Game and Inland Fisheries (DGIF), the Maryland DNR and the U.S. Fish & Wildlife Services (FWS) are coordinating efforts to confirm if there is an established population of northern snakeheads in the Potomac River. State officials will also work with the *Smithsonian Institution* to see if genetic testing can tell if the fish are related. Steve Early of Maryland DNR's fisheries division said the testing, which likely won't take place for a few months, is mostly a "curiosity" to try to determine the origin of the fish. "You've had two introductions of northern snakeheads," he said. "So you wonder if the fish were closely related or if they came from very different backgrounds."

In 2002, biologists found the species in a Crofton, MD pond. Native to Asia and Africa, the snakehead is a voracious predator, devouring smaller fish, and is considered an anomaly because it can move short distances on land using its fins and live out of water for up to three days. Northern snakeheads live in shallow, vegetated waters and do not tolerate saltwater. They have been known to grow up to 33 inches in length, but are not known to harm humans. Concerned that the snakeheads would use their ability to "walk" on land to travel to nearby waterways, Maryland officials in 2002 poured herbicides into three area ponds to kill the dense grass and lily pads. Then they dumped the poison rotenone into the ponds and killed more than 120 juvenile snakeheads.

If breeding populations became established, the northern snakehead, an invasive species and a top-tier predator, would likely disrupt the Potomac River ecosystem by displacing native fish and competing for habitat. Consequently, the species was placed on Virginia's list of predatory and undesirable exotic species in 2002. That same year, the U.S. Department of the Interior banned the import of 28 species of snakeheads, including the northern variety. Those who owned snakeheads before that time could keep their fish but were barred from transporting them across state lines. The *National Audubon Society* issued a statement calling for passage of a federal law to ban all nonnative species from American waterways.

The Maryland DNR in May announced their own ban on the northern snakehead, prompting complaints from legislators who said they thought the agency had already done so when the Legislature gave them the authority last year. "I didn't realize they had failed to promulgate the regulations," said state Sen. Brian Frosh (D). DNR officials said they did not implement a state ban earlier because federal law already prohibited dumping of the fish in waterways.

Asian and African Snakehead Species

Also in May, Montgomery County (MD) Executive Douglas M. Duncan signed a temporary ban on the possession, sale and release of live northern snakehead fish in the county. The regulation is effective for 90 days, then the County Council must vote to make the ban permanent. Mr. Duncan said the ban fills in gaps in state laws and regulations. The regulation gives anyone with a northern snakehead a 90-day amnesty period to turn in the fish without penalty to the Montgomery County Humane Society. Violators will be charged with a Class A violation that could mean a $500 fine. The law doesn't apply to the possession or sale of dead snakeheads meant to be eaten at licensed restaurants.

"We now know they are spread out over about 10 miles (of the Potomac River)," Early said, "This raises my level of concern." "I think we're in trouble on the Potomac River..." said Bill Haire, director of the *Virginia Bass Federation's* Northern Virginia region. "Evidently there's quite a few of them out there. It's my understanding they'll impact all species; they eat just about anything and everything."

The first critical question is whether the snakeheads have reproduced in the river or whether the five that have been found were dumped there. Early said officials have not found any smaller fish or females ready to lay eggs. "I haven't seen reproduction," Mr. Early said. "At this point, three fish is just way too little to speculate about." "But when you catch two of them in such close proximity, it really worries me about how many more there might be" If game officials discover large numbers of juvenile fish — unlikely to have come from a market — it would indicate that snakeheads have been reproducing, Early said, and could be on their way to making a permanent home in the river. Scientists said there is not enough evidence yet to decide either way.

"The fact that we've found three fish of about the same size would tend to increase the likelihood that there was some reproduction in that system," said Donald Boesch, president of the *University of Maryland Center for Environmental Science*. But "it doesn't prove it by any stretch of the imagination." "Three fish doesn't make a population," said Paul Shafland, director for the nonnative fish research laboratory of the Florida Fish and Wildlife Conservation Commission and a member of Maryland's *Snakehead Scientific Advisory Panel*. "These could be incidental releases. However, there's certainly a suggestion there."

"If there were a pair [of snakehead] and they were able to repopulate, we would have a situation on our hands," said Julia Dixon Smith, a spokeswoman for the Virginia DGIF. "It was encouraging news not to find any others. That doesn't mean we won't be steadfast in watching the situation." The distances between the snakehead catches in the Potomac make it difficult for game officials to track down any more specimens or determine their origin. "It's like looking for a needle in a haystack," Early said. "We're looking for a hot spot." Early said his department has made up hundreds of signs, and plans to post them in Prince George's and Charles counties in Maryland, and Fairfax and Prince William counties in Virginia. He said he wants to enlist the help of area fishermen to keep tabs on the fish.

"The idea is that you've got hundreds of recreational boats out there covering a large area," Early said. "That's a much bigger area than we could cover with our resources." It is important to alert anglers now to look out for the fish, he said,

because the snakeheads appear "eager to take a lure." "We need to take advantage of that while we can," Early said. Officials are asking anglers who believe they have caught a snakehead to kill it humanely with a blow to the head, put it on ice as quickly as possible and report their catch to authorities immediately.

Regarding control measures such as the poisoning used in 2002 at the Crofton, MD pond, Boesch said that "the range of options for controlling a nonnative fish becomes much more constrained in a place as large as the tidal Potomac." "If they're in there, there's nothing anyone's going to be able to do about it," Virginia fisheries biologist John Odenkirk said. Odenkirk said people may have to accept the fact that the alien fish may likely join a long list of exotic animals that have adapted to the system. "Maybe 100 years from now, it'll become part of the ecosystem as common as largemouth bass," he said.

"It's bad news," said William F. Loftus, USGS fishery biologist at Florida's Everglades National Park. "If there is a large enough population of breeding adults in the Potomac, it's likely the animals will be moving into other states." But Loftus said it means little that local biologists haven't found anything yet. He said officials in Florida — which has a climate more suited than the D.C. area for exotic fishes — have in the past failed to combat the introduction of South American, African and Asian species into local ecological systems. "By the time we detect something, it's already out there," he said. "There's nothing we can do."

But scientists simultaneously caution against thinking that snakehead establishment would be an environmental catastrophe. "I certainly think it's farfetched to conclude that we could see the collapse of the ecosystem," Boesch said. A different species of snakehead has established itself in Florida's waterways but has not caused significant problems, Shafland said. The first snakehead documented there was in October 2000. "We feel it's going to be here forever," Shafland said. But "we have not seen the catastrophic effects that are so regularly speculated upon. Our rivers are more accommodating of these exotic species than some people think."

The northern snakehead — which is edible and considered a delicacy by some — is often sold in Asian markets or kept in tanks by collectors. This practice led FWS agents in mid May to arrest a Glendale, CA, man for allegedly importing northern snakehead fish from Asia. FWS agents, part of a federal team that included the Immigration and Customs Enforcement agency, arrested market owner Sung Chul "Daniel" Rhee. Officials suspect Rhee imported live snakehead from South Korea's *Hae Won Seafood* in three shipments in June 2003 via *Korean Air*. During the shipment, Rhee labeled the snakehead "sea bass" or "bass, fresh water fish," according to prosecutors.

A complaint filed against Rhee alleges three counts of illegally importing injurious fish into the U.S. Each count carries a maximum punishment of five years in prison. Authorities allege that he imported the live fish and sold them at *Assi Super* for $14.99 a pound. Extrapolating the amount of "sea bass" imported by *Assi Super*, the FWS estimated that Rhee generated nearly $23,000 in sales of snakehead fish in 2002 and the first half of 2003, the U.S. attorney's office said.

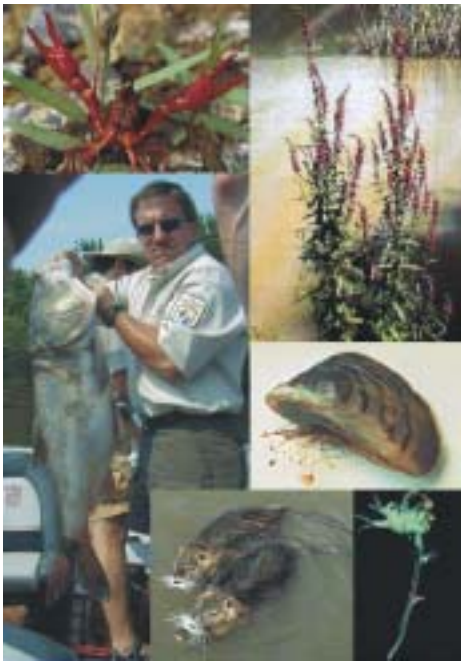
Sources: Susal Levine, *Washington Post*, 5/1/04; Dennis O'Brien, *Baltimore Sun*, 5/1/04; *AP/Baltimore Sun*, 5/3/04; Fahrenthold/Partlow, *Washington Post*; 5/14/04; *AP/San Francisco Chronicle*, 5/14/04; *USA Today*, 5/14/04; David E. Leiva, *AP*, 5/18 and 5/19/04; *AP/Hampton Roads [VA] Daily Press*, 5/27/04; Peter Whoriskey, *Washington Post*, 5/18/04; Leef Smith, *Washington Post* , 5//12/04; Allison Klein, *Baltimore Sun*, 5/13 and 5/14/04; Sean Salai, *The Washington Times*, 5/18/04; and *Greenwire*, 5/3; 5/14, 5/17, 5/18, 5/19 and 5/28/04

Exotic Species as Pollutants

Employing a new tactic in the fight to clean up the nation's waters, environmentalists have sued the U.S. EPA for not requiring California regulators to consider noxious seaweed and other invasive species as pollutants that impair the nation's waters, thus triggering strict cleanup plans.

The lawsuit, filed by *Earthjustice* in the U.S. District Court in San Francisco on behalf of the *Ocean Conservancy*, follows EPA's approval in 2003 of California's list of "impaired waters," essentially lakes, streams and estuaries that fail to meet their designated uses for drinking water, fish and wildlife, recreation or other uses. Once a waterway is flagged as impaired, the Clean Water Act (CWA) requires states to develop total maximum daily loads (TMDLs) establishing limits on pollutants believed to contribute to the impairment.

While most of the roughly 26,000 impaired waters around the country suffer from pollutants generated by industrial and commercial activities as well as pollution from stormwater and agricultural runoff, the growing problem of invasive species has failed to draw much attention of regulators or TMDL program officials. An EPA listing of the top 100 impairments to the nation's waters ranks invasive species 95th, with just 0.07% of the nation's waters believed to be suffering from such species. By comparison, more than 6,000 of the nation's waters are impaired by pathogens, according to EPA, while another roughly 5,000 are polluted by nutrients.



Exotic species in the Mississippi River Basin (clockwise from upper left): red swamp crayfish, purple loosestrife, zebra mussel, spiny waterflea, nutria, and bighead carp.

But environmentalists argue that there is a strong case to be made for greater regulation of invasive species under the TMDL program. And despite minor progress in developing TMDLs targeting invasives — EPA's Dallas field office approved a Louisiana TMDL for invasive aquatic species in 2002 — the agency remains behind the curve in addressing a growing problem. "Invasive species are moving in, and instead of slamming the door shut, EPA is putting out the welcome mat," said Linda Sheehan, director of the *Ocean Conservancy's* Pacific regional office. "By ignoring waters that are already impaired,

EPA is playing invasion roulette with the health of the rest."

California did develop a TMDL in 2000 to curb invasive species in San Francisco Bay, but never adopted it because EPA "interpreted exotic species as a stressor on the ecosystem but not necessarily a pollutant," according to the complaint filed in district court. Plaintiffs argue that the law defines the term pollutant to include "biological materials ... discharged into the water" or "the man-made or man-induced alteration of the chemical, physical, biological or radiological integrity of the water." Many of the nation's aquatic invasive species — including things like zebra mussels and exotic strains of seaweed — are discharged in ballast water from ships and by other human means.

Sheehan said that transoceanic vessels are the largest introducer of invasive species to U.S. waters. But other culprits include aquariums, which were responsible for the massive seaweed outbreak in the Mediterranean, and aquaculture, which often involves introducing fish species into environments where they would not otherwise exist. But Fred Andes, an industry lawyer and TMDL expert, doubted that the lawsuit would have any measurable effect on TMDL policy outside certain areas. "I'm not sure how much impact this will have, except on cruise ships and others with ballast water issues," Andes said.

The complaint cites several examples of California waters impaired by invasive species but not listed in 2002 by the state's Water Resources Control Board. One such species, an invasive algae known as C*aulerpa taxifolia*, was a "substantial threat" in the state's waters, according to the complaint, blanketing entire waterbodies and robbing underwater grasses of essential sunlight. The invasion of C*aulerpa taxifolia* has greatly disrupted the food web critical to survival of numerous native marine species, including the spiny lobster, California halibut and sand basses.

Another species, the Amur River clam, has invaded the San Francisco Bay estuary and "now exceeds densities of 50,000 clams per square meter," the complaint alleges. "The movements of these clams significantly disturb surface sediment layers, increasing suspended sediment loads and impairing aquatic life uses such as estuarine habitat and reproduction and early development."

Invasive species have also disrupted projects designed specifically for human benefit, like water diversion projects for agriculture and the operation of levees in the San Francisco Bay-Delta region of the state. These areas have been overwhelmed by the Chinese mitten crab, the plaintiffs argue, and are a host for the human parasite oriental lung fluke.

Most would also agree that the Asian carp represents a significant biological pollutant in the rivers of the Mississippi River Basin. They have disrupted natural food chains and they compete for space with all native fish species. The Asian carp invasion has also caused biologists to think twice about dam removal and opening up floodplains to restore habitats for native species, undoing much of the river restoration research and philosophy developed over the past 30 years.

Marty Coyne, *Greenwire*, 4/7/04

Extinction and the Endangered Species Act

One-hundred-eight species became extinct in the first 21 years of the Endangered Species Act (ESA) according to a recent *Center for Biological Diversity* (CBD) report. This is far in excess of the four species that would have been expected to go extinct from natural causes during this time period. "These species never had a chance," said Kieran Suckling, executive director of the CBD. "If extinction is the ultimate criteria by which to judge...implementation of the Endangered Species Act, the failure has been spectacular."

All told, 1,260 plants and animals have been listed as threatened or endangered in ESA's 30-year history. Jeff Fleming, spokesman for the U.S. Fish and Wildlife Service (FWS), said the agency could not comment on the CBD report. "But it is clear to anyone that by the time any species makes it to the [endangered species] list, they are in trouble," he said. "It's a lengthy process because of the way the act is constructed"

According to the CBD report the primary failure was not the fact that endangered species went extinct, but that protection for all of these species was delayed either by the ESA being created too late, or there being too long a lag-time between creation of the Act and protection of the species. Only 21% of the extinctions involved species that were actually on the endangered list — all were at extremely low population levels when listed and thus were virtually unsavable.

The vast majority of extinctions (79%) involved species that were not on the endangered list.

While a small number of species went extinct so fast, it was not possible to put them on the list, most could have been protected had the FWS acted more swiftly. Placement of species on the endangered species list is the first line of defense against extinction. There was a systematic and in several cases purposeful failure to invoke this defense. Long delays — often for more than a decade, sometimes for more than twenty years — contributed to the extinction of both unlisted and listed species. Seventy-seven percent of extinctions involved significant delays in the listing process. In every instance where agency discretion permitted delay, delay occurred.

Use of the candidate list as a tool to defer listing for many years was particularly dangerous the report said: 24 species became extinct after being placed on the candidate or warrant-review list. Listing petitions were also routinely ignored: 17 species became extinct while their listing petition was under review.

Reviewers of the ESA listing program, including the U.S. General Accounting Office, the Department of Interior Inspector General, the Congressional Research Service, the U.S. Congress, and scientists both inside and outside the agency have repeatedly pointed out that the program has been hampered by:

- chronic underfunding,
- political intervention, and
- lack of leadership.

The situation, however, has gotten worse, not better. Under the current Bush Administration the annual rate of listing has reached its lowest point in ESA history. Budget requests and allocations continue to fall far short of the funds identified as needed by the FWS. Political pressure also continues to slow protection for imperiled species. And just as importantly, the program lacks leadership and drive. The agency is almost entirely lacking a sense of urgency and a desire to reform, revamp and accelerate the process.

Consequently, the CBD report recommended the following:

- Fully fund the FWS to list all species currently on the candidate list and

designate critical habitat for all species that require it. This can be done in five years with an annual budget of $31 million per year.

- A proposal to list all current candidates should be immediately issued as a matter of policy. The FWS has already declared that these species warrant listing proposals. There is no need to engage in a lengthy, expensive listing process that will certainly result in another decade of delay for many of the current candidates. Once the listing proposal is issued, the agency can develop a schedule to complete individual listing rules.
- The agencies should return to the multi-species listing rules of the 1990s. They resulted in the highest annual listing rate in ESA history. The shift back to single species rules has slowed, complicated, and driven up program costs.
- The candidate list has become an extinction waiting room. Species regularly spend 15 or 20 years on the list, and 27 species have become extinct on the candidate list. Regulations should be adopted to require that all candidates receive a final listing decision within five years of being put on the list.
- Listing petitions have been routinely ignored, contributing to the extinction of 17 species. Previously, conservationists could sue to enforce ESA listing requirements. This caused a dramatic increase in the annual listing rate between 1990 and 1996. However, the Clinton Administration established regulations in 1996 that effectively prevented conservationists from enforcing this aspect of the ESA. The annual rate of listing immediately began to drop, and under the Bush Administration descended to the lowest level in ESA history. Citizen enforcement worked well, policies for eliminating it should be rescinded.

Sources: *Extinction and the Endangered Species Act*, Kieran Suckling, Rhiwena Slack, and Brian Nowicki, *Center for Biological Diversity*, 5/01/04; Janet Wilson, *Los Angeles Times*, 4/22/04 and *Greenwire*, 4/22/04

Fish and Humans Suffer From 5th Year of Drought

Ongoing drought will prevent Western Slope reservoirs from releasing extra water for four species of endangered fish in the Colorado River again this year. The additional flows, when available, help scour out new habitat for the fish in a crucial 15-mile stretch of river near Grand Junction. But this is the fifth year that the fish will miss out on the surplus water, said George Smith with the Endangered Fish Recovery Program. Reservoir owners can't make releases this year because they're trying to capture incoming river flows to refill their reservoirs.

"These big flows are mainly channel-forming flows," Smith said. "They rework the channel . . . They keep it so it's not just a big irrigation ditch." When available, the voluntary water releases come from Lake Granby, Dillon Reservoir, Green Mountain Reservoir, Wolford Reservoir, Williams Fork Reservoir and Ruedi Reservoir. The flows primarily benefit two of the four federally protected fish in the Upper Colorado Basin — the razorback sucker and the Colorado pikeminnow.

Meanwhile, the state of Montana is calling on Wyoming to shut off junior water rights in the Tongue, Powder and Little Powder rivers to provide much-needed drought relief to more senior water rights holders in Montana, who officials say have priority. The Montana Department of Natural Resources and Conservation (DNRC) hopes it can reach an amicable settlement with Wyoming, but is prepared to take action to protect water rights under a 1950 compact the two states signed. Failing the cooperative approach, Montana is prepared to undertake whatever action we believe is in the best interests of our citizens to protect our rights that are secured in the compact," Jack Stults, administrator of the DNRC's water resources division, said in a recent letter to Wyoming officials. He said he was giving Wyoming a week to respond.

Harry LaBonde, Wyoming deputy state engineer, said the state engineer's office is drafting a response to Stults, urging a cooperative solution. But in the meantime, he said Wyoming has no plans to order changes in how water rights in that state are handled. "Quite frankly we need to get together with Montana officials before we can really make a determination on which rights should be satisfied and which rights will go out of priority," LaBonde said.

The Powder and Tongue rivers both originate in north-central Wyoming and flow north into Montana, eventually dumping into the Yellowstone River. Much of north-central Wyoming and south-central Montana currently are classified as being in "severe" to "extreme" drought. The seniority of water rights along rivers becomes especially important during drought, because priority for what little water is in the rivers goes to those with the oldest rights first.

Montana and Wyoming both signed the 1950 *Yellowstone River Compact* to address management of water rights in both states. But Rich Moy, chief of Montana's water management bureau, said only two pre-1950 water rights in Montana are being met. LaBonde said Wyoming faces similar shortages. Moy said this is the first time under that compact that Montana has requested that Wyoming cut off junior water rights holders until all senior rights in Montana are met.

"One of our concerns is that Wyoming is taking and using water for uses established after 1950 to the detriment of our uses that were established prior to 1950," Moy said. "The economic implications for us are very significant." LaBonde said he'll be working to get some data on which Wyoming water rights are being met and which aren't.

Most of the water rights which Montana says are not being met are irrigation rights, though some are municipal water rights. Moy said agriculture is suffering. "If you can't get water for irrigation and then you cannot produce hay, you're going to have a very difficult time maintaining your livestock operations," he said. LaBonde said his office plans to get together with Montana officials. "The purpose of the compact is to bridge that state boundary and say that we're going to work cooperatively to allocate these water resources because they flow through both states," he said.

Rocky Mountain News, 5/24/04; and Sarah R. Craig, *AP/Casper Star Tribune*, 5/22/04

Bush Administration Changes Wetland Policy

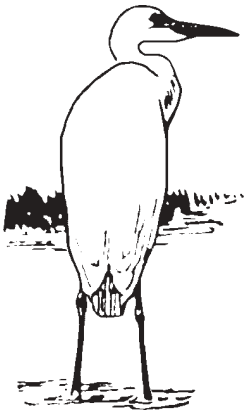
President Bush changed his administration's position on wetlands in late April, reversing a "no net loss" policy adopted by his father to one calling for a 3 million-acre net increase in wetlands. The goal is reasonable, administration officials said, partly because of federal data showing an increase in wetlands formerly used for growing crops and other farming activities.

"We will move beyond the no net loss of wetlands in America to having an overall increase of Americans' wetlands over the

next five years," Bush said in comments at the *Wells National Estuarine Research Reserve* in Maine. The reserve is home to 1,600 acres of salt marsh wetlands.

"The benefits of these outcomes will be enhanced by further efforts to improve associated uplands and river habitat so that, for example, ducks not only will have the wetland they need for food, but good dry land habitat nearby for nesting," according to a policy fact sheet released by the White House. The Bush policy aims to create at least 1 million acres of new wetlands, while enhancing or protecting an additional 2 million acres, according to the policy fact sheet.

White House Council on Environmental Quality Chairman James Connaughton, who answered questions on the new policy at the White House press briefing, touted new data from the Agriculture Department's Natural Resource Conservation Service (NRCS) showing a net increase of 131,400 acres of wetlands on agricultural lands between 1997 and 2002. Most of these increases occurred in the Midwest and South where farmers and ranchers have implemented the Wetlands Reserve Program (WRP), which provides grants to farmers who set aside wetlands that otherwise would be drained or filled for growing crops, according to USDA.



The President called the goal of increasing the wetlands acreage "realistic" because of plans to expand NRCS programs and similar efforts at the Interior and Commerce departments. Bush's fiscal year 2005 budget proposal would boost by $15 million the $280 million WRP. WRP funding has increased by $106 million since 2001, and almost all of the government's voluntary wetlands programs would receive more money under Bush's proposed budget.

The White House Office of Management and Budget has compiled a table showing that increases in voluntary programs at the Agriculture, Commerce and Interior departments, as well as the U.S. EPA, have increased from $2.85 billion in 2001 to $4.36 billion today.

The President's proposal drew mixed reactions from interest groups concerned about wetlands. The *National Wildlife Federation* (NWF), while offering measured support for the new policy, released a white paper claiming the Bush Administration has done little to no examination of the quality of wetlands lost or the functions they provide. "Wetlands expand like sponges to provide flood control, purify drinking water, create habitat for the wildlife we treasure and support biodiversity. These values are just as important as acres of land," said NWF wetlands specialist Julie Sibbing.

Sibbing and *Earthjustice* attorney Joan Mulhern also noted that the Bush Administration has issued guidance instructing the regulators with the Army Corps of Engineers (Corps) and EPA to avoid imposing restrictions on isolated wetlands without pre-approval from superiors in Washington, D.C.

The measure was lauded, however, by the *National Wetlands Coalition*, an industry group that tracks wetlands policy. "If we're not in a net gain situation already, we're very close to it," said Howard Bleichfeld, the coalition's attorney. The president's announcement points to the need to create a federal policy that encourages alternative approaches to wetlands preservation, such as mitigation banks, he added. Mitigation banks allow developers to pay for the off-site creation or restoration of wetlands as a condition of getting permits to fill wetlands for development purposes. The Corps and the EPA can give preference to mitigation banking in implementation of the program.

Ducks Unlimited offered unqualified praise for the president's proposal. Bush clearly "understands the critical benefits wetlands provide as habitat for hundreds of wildlife species as well as their environmental benefits for people," said Don Young, executive vice president of the group. "We're very pleased with his plans to commit more federal funding toward wetlands conservation and improved wetlands monitoring," Young said.

But Senator and Presidential candidate John Kerry (D/MA) responded to Bush's proposal by saying that the administration's previous policies have resulted in 20 million acres of lost wetlands and that the new proposal will most likely never become a reality. "You know as well as I do, once they get re-elected, they'll walk away from that promise the same way they walked away from all the others," Kerry said. "And why is it that we have a president who waits until the fourth year, waits until election time, waits until the criticisms are out there, before he even announces the possibility of what he could have been fighting for the last three and a half to four years".

Marty Coyne, *Greenwire*, 4/23 and 4/26/04; and James G. Lakely, *Washington Times*, 4/24/04

Recreation User Fee Controversy on Federal Lands

An increase in recreational users is slowly changing the public's perception of the services that should be offered on lands maintained by federal resource agencies such as the Forest Service (FS), Bureau of Land Management (BLM) and the Fish and Wildlife Service (FWS), Bush Administration officials say.

Recreation demand has increased by 65% on BLM lands and 80% on FWS wildlife refuges since 1985, and visitors today expect services and infrastructure to match facilities available on National Park Service lands, administration witnesses told the House Parks and Public Lands Subcommittee. Permanent fee authority would allow sites to charge visitors and use the money to maintain and upgrade facilities in line with increasing demand.

"This increase in visitation means an increase in visitor demand for adequate visitor facilities and services," said Tom Thompson, deputy FS chief. Furthermore, the public no longer distinguishes between different types of federal land, Thompson said. "They just know that when they go they want an experience." Thompson and Interior Assistant Secretary Lynn Scarlett lent their support to a bill sponsored by Rep. Ralph Regula (R/OH) that would establish permanent authority for the federal government to charge user fees.

Currently, Interior agencies and the FS are operating under a fee demo program that, according to the General Accounting Office, has brought in over $1 billion since it was established via a Regula rider to a 1996 spending bill. Regula said his efforts to establish permanent user fees is a result of the FS, BLM and other agencies "getting more and more in the recreation business." "What's happened in my experience is that the FS and BLM lands are getting growing pressure to be used as recreation areas rather than for timber or minerals," Regula

said. "They're taking on the status of a park."

Implementation of the fee demo has been controversial from its outset, as opponents charge the program has been haphazardly and unfairly implemented and claim it is wrong for the federal government to collect user fees for access to public lands already funded with taxpayer dollars. But Aubrey King, president of the *National Alliance of Gateway Communities*, said many of the problems with the fee demo has been the result of lack of cooperation and coordination among different agencies. Because visitors to federal lands often do not distinguish between the different agencies managing the lands, an expanded and comprehensive fee collection program is necessary to ensure public support, King said.

But fee demo opponents say the administration is exaggerating public expectations when it comes to recreation activities. "The public knows full well the difference between the national parks and lands managed by other agencies," said Robert Funkhouser, president of the *Western Slope No-Fee Coalition*. "The agency people wish to have the go ahead to develop infrastructure on all public lands that is as developed, scripted, Disney-fied and commercial as the parks," said Scott Silver, executive director of *Wild Wilderness*.

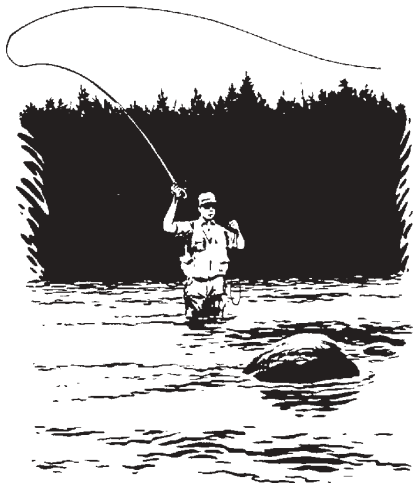
Senate Forests Subcommittee Chairman Larry Craig (R/ID) said he would oppose a basic entrance fee to Interior and FS public lands like those already in place for national parks. "These are public lands, and they should remain open to the public," Craig said. "We are not going to start treating the FS, BLM and wildlife refuges as if they were national parks"

Sources: *Energy & Environment Daily*, 4/22/04; and Dan Berman, *Greenwire*, 5/7/04

Hunting and Fishing Rights

Among the constitutional protections enjoyed by all Americans are (1) the right to free speech, (2) the right to assemble and (3) the right to bear arms. But what about the right to hunt and fish?

Among the flurry of constitutional amendments being pushed by lawmakers around the nation — including state and federal bans on gay marriage — comes a groundswell of support for the right of citizens to harvest game and fish from state lands and waterways. Indeed, more than half of the 50 state legislatures have considered adding language to their constitutions protecting hunters and fishermen, efforts driven in part by fears that animal rights are in many quarters trumping citizen rights. Some states already have language guaranteeing the right to hunt and fish, including Vermont whose founding fathers included it in that state's constitution in 1777. Others, like Georgia, Indiana, Missouri and Pennsylvania, have considered adding such language only recently.



Georgia state Sen. Eric Johnson (R), a lifetime member of the *National Rifle Association* and president pro tempore of the Georgia chamber, introduced a bill in December to provide a constitutional guarantee for state citizens to "hunt, fish, and harvest game, subject only to reasonable restrictions as the General Assembly may prescribe by law." Johnson said the bill is not driven by any specific threat, but rather is an attempt to protect hunting rights from groups that may want to see them scaled back or ended. "It is very important for us to take this critical step in protecting the rights of sports men and women across Georgia," Johnson said. "There are a number of individuals and groups out there who would like to take away these traditional rights."

One such perceived threat is the *Humane Society of the United States*, the nation's largest animal protection organization with more than 8 million members. The *Society*, calling itself "a mainstream voice for animals," has lobbied for (1) protection of wildlife habitat, (2) ensuring humane treatment of animals for research and agriculture, and (3) stepping up law enforcement against animal cruelty. But the *Society's* senior vice president, Wayne Pacelle, said the group is largely ambivalent about the state bills on hunting and fishing. "We don't believe that they have much practical effect," he said. That is because the states most likely to pass such amendments "would be the least likely to ever have meaningful restrictions on hunting," said Pacelle, noting that hunting and fishing groups in states like Georgia wield substantial political influence. As such, he characterized the constitutional amendment campaigns as "gratuitous" and "political window-dressing."

Pro-hunting and fishing groups, like the *U.S. Sportsmen's Alliance* (USSA), which represent the opposite end of the political spectrum from most animal rights activists, say they too are ambivalent about the state bills, but for entirely different reasons. The USSA supports all legal efforts to secure hunting and fishing rights, but USSA vice president, Tony Celebrezze, said the language being considered in most of the state legislatures is too weak. "It doesn't provide the safety net that sportsmen want to provide," he said of the amendment language. "It sounds really good, but just doesn't do what guys envision it doing."

For example, many states have adopted language guaranteeing the right to hunt and fish, so long as the activities comply with state and federal laws. But Celebrezze said those laws in some cases are exactly what infringes on the rights of sportsmen. For example, many states have banned certain activities, like hunting with dogs, bear baiting or animal trapping, because animal rights groups lobbied hard for the bans.

As a result, the USSA has drafted its own, stronger language and provided it to state groups wishing to pursue constitutional amendments. The language asserts that hunting and fishing is a guaranteed right subject to certain laws, but that states must continue to provide sportsmen with the opportunity to hunt, fish and trap. The USSA language also says that hunting, fishing and trapping are consistent with efforts of state wildlife agencies to manage wildlife. Such activities actually support wildlife management, the group argues, given that fees from hunting and fishing licenses provide a boon to state wildlife conservation.

So far, Utah is the only state to adopt the USSA's language, according to Celebrezze. As for the weaker amendments, Celebrezze said his group will not support them. "We've got a lot of other issues we need to

deal with, and unfortunately none of these amendments get [sportsmen] where sportsmen need to be," he said. In fact, the passage of weak hunting and fishing bills could breed complacency among sportsmen when they need to remain vigilant against efforts to erode hunting and fishing rights, according to Celebrezze. "Our initial stand is not to pass one of these...because you're going to get people thinking they're protected, and animal rights groups can't affect their ability to hunt," he said.

But Heidi Prescott of the nonprofit *Fund for Animals* said the sportsmens' efforts reflect a fear among the "hook-and-bullet lobby" that its influence will dwindle as hunting and fishing loses its appeal with younger demographic groups. "The legislators pushing it are fearful as the number of hunters decline, they're going to lose the political clout they currently enjoy," Prescott said. As for the state bills, Prescott said they will have little long-term effect. "They're just going to make hunters feel better about their sport," she said, "about killing animals for recreation."

Perhaps the most telling — and encouraging — trend for animal rights groups is a documented overall decline in hunting nationwide. According to surveys of the U.S. Fish and Wildlife Service (FWS), the number of sportsmen — including those who hunt, fish and watch wildlife — fell from 40 million in 1991 to 37.8 million in 2001. Hunting saw the greatest overall drop in activity, at 7%, while fishing declined by 4%. But while their overall numbers have diminished, U.S. spending on hunting and fishing increased significantly during that time period, by 29% and 17% respectively. Also, according to FWS data, the number of big game and migratory bird hunters remained constant over the decade, meaning the decline is largely attributable to the diminished popularity of small-game hunting.

Natalie M. Henry, *Greenwire*, 4/8/04

Climate Change Update

Global warming is hitting the Arctic more than twice as fast as the rest of the planet in what may be a portent of wider, catastrophic changes, the chairman of an eight-nation study said in May. Inuit hunters are falling more frequently through thinning ice, habitats for plants and animals have been disrupted, and the icy Hudson Bay in Canada could be uninhabitable for polar bears within just 20 years. The melting is also destabilizing buildings on permafrost and threatening the Alaska pipeline.

Meanwhile, benefits, for human commerce, will likely accrue from the opening up of a now largely icebound short-cut sea route from the Pacific to the Atlantic. Robert Corell, a senior fellow at the *American Meteorological Society*, said that the sea route between the Pacific and the Atlantic via the Arctic could open far earlier than expected by most previous studies, cutting shipping times compared to routes via the Suez or Panama canals. "On average our models show that by 2050 the Northern Sea Route will be open about 100 days a year. Now it's open about 20 days," he said. Russia might also win easier access to oil and gas as the icecap shrinks and permafrost retreats.

The broader consequences are however disturbing. "There is dramatic climate change happening in the Arctic right now...about 2-3 times the pace of the whole globe," said Corell, also chairman of the *Arctic Climate Impact Assessment* (ACIA), an 1,800 page report to be handed to Kyoto Treaty ministers in Iceland in November. "If you want to know what the rest of the planet is going to see in the next the generation, watch out for the Arctic in the next 5-10 years," he told *Reuters*. The ACIA report combines input from scientists, indigenous peoples and eight Arctic rim nations.

The dramatic Arctic impacts from global warming, are caused partly because dark-colored water or earth, once exposed, soaks up heat far faster than white ice or snow. In fact, some parts of Alaska have heated up 10 times more than the global average, Corell said. Future temperature rises in the Arctic are likely to be twice the 1.4-5.8 ^{o}C (3-11 ^{o}F) gain by 2100 forecast by a U.N.-led panel of scientists, he said. "I think it (climate change) can be stopped but we will need an aggressive response," Corell said.

Global climate change may bring everything from disastrous floods or droughts to a rise in global sea levels that could swamp low-lying Pacific islands. But environmentalists doubt that governments will decide strong action based on the ACIA report because the United States has pulled out of the U.N.'s Kyoto protocol, the main international scheme to tackle climate change. Russian President Vladimir Putin said that he favored ratifying Kyoto, which has already been backed by the other six Arctic rim nations — Canada, Sweden, Finland, Norway, Iceland and Denmark.

"The (ACIA) report underlines how critical it is that we take action as soon as possible, first under Kyoto, to reduce emissions and invest in renewable energy," said Samantha Smith, director of the *Arctic Program* for the *World Wildlife Fund* environmental group. Among signs of change in the Nordic region, birch trees were taking over traditional reindeer lichen pastures, Corell said. The reindeer now have to compete with elk and red deer moving north.

Meanwhile, air pollution and thick clouds which cause less sunlight to reach the Earth is the subject of a growing body of research on another climate change topic — this one called "global dimming." According to studies using surface radiation meters and water evaporation, large parts of the earth's surface get about 15% less sunlight than 50 years ago. Scientists at NASA, the *Scripps Research Institute* in La Jolla, CA, and the Colorado-based *National Center for Atmospheric Research* are among the teams of researchers looking into this topic.

Researchers say global dimming, also known as solar dimming, partially offsets the effects of global warming. The solar dimming effect is "about half as large as the greenhouse gas warming," said James Hansen, director of NASA's *Goddard Institute for Space Studies* in New York. In global warming, gases in the atmosphere, such as carbon dioxide, trap some of the sun's heat and keep it from radiating back out to space, thereby raising the Earth's temperature. Clouds and air pollution, on the other hand, block a portion of the heat energy that's coming in from the sun — just as it's cooler sitting under a beach umbrella than under a bright sky.

"The conclusion that, on average, there has been a reduction in surface solar irradiance over the past half-century is pretty clear," NASA's Hansen said in an e-mail. Support for the theory comes from two types of data collected in recent decades:

- Radiation meters - black metal plates that absorb the sun's rays aren't heating up as rapidly as they previously did; and
- The rate at which water evaporates from special measuring pans placed in the sunlight has slowed over the years. Scientists measure the height of water in these pans at 9 a.m. each day, subtracting any rain that may have fallen and then calculate how much has evaporated from the day before. The measurements indicate that the amount

of energy from the sun — solar radiation — is shrinking by about 3% per decade, according to Gerald Stanhill, a biologist at Israel's *Agricultural Research Organization*. There's less evaporation out of pans of water all around the world, and that's consistent with global dimming.

According to Beate Liepert, a climatologist at the *Lamont-Doherty Earth Observatory* of Columbia University, about two-thirds of the dimming is caused by more water vapor in the clouds, a by-product of global warming. Less sunlight reaches the ground, she said, because "the clouds are optically thicker. As global warming increases, clouds can hold more water. There's not more rain; it just stays up there." The rest of the dimming is due to increasing air pollution. This problem affects the world, not just smoggy cities such as Houston and Los Angeles. For example, NASA scientists reported in early May that air pollution can travel on high-speed winds from the Indian Ocean clear across the Pacific and into the southern Atlantic. "When I fly from New York to California, I see very high brownish layers. That's old aerosol layers hanging on," Liepert said. "As we get more aerosols and more warming, we get more dimming."

She said she expects to see the dimming trend continue in places such as China and the Western United States, where population and industry are increasing. In contrast, economic decline in the former Soviet Union has begun to clear the air somewhat in Eastern Europe. Although global dimming is not as accepted as global warming, proponents of the theory say it is gaining support. "We still face a lot of controversy, but it's getting accepted," Liepert said "We've found it in the United States, Europe, Israel and Asia. Already, major research institutions are changing their point of view"

In yet another study — this one funded by the Energy Department, the *National Science Foundation* and NASA — University of Washington – Seattle (UW-S) scientists have shown that temperatures in the Earth's lower atmosphere have been rising "much faster" than experts thought. For years, scientists have released studies showing evidence that the Earth's surface temperatures have been increasing, but most research has not detected temperature rises in the troposphere — that portion of the atmosphere from the surface to 7.5 miles in the sky.

While human-caused global warming would be expected to raise the temperature in the lower atmosphere, computer models have shown it would have the opposite effect in the upper layer called the stratosphere. And indeed that is what UW-S scientists found. Because satellite measurements from the different layers overlap, Qiang Fu, the study's lead scientist, suspected the cooling in the stratosphere might be masking any temperature increase in the lower atmosphere. To measure this effect, Fu's team developed a statistical approach which subtracted the stratosphere's influence and found that temperatures in the lower atmosphere rose about one-third degree per decade, slightly more than the increase seen at the planet's surface during the same time frame. I believe this shows that satellite temperatures can no longer be used as evidence to claim that global warming is not happening in the atmosphere," said Fu. "I think this could convince not just scientists but the public as well." Fu and his colleagues published their work in the May 6 issue of the journal *Nature.*

But John Christy of the *Earth System Science Center* at the University of Alabama-Huntsville criticized the study. "The method they used creates a false warming signal," Christy said. "Most of the predictions are too alarmist" But Fu deflected the criticism and predicted his team's new study will be the final answer to the long-standing puzzle about atmospheric warming. "I'm confident this will not be an issue anymore," he said. But Mike Wallace, a UW-S climate-change expert who was not involved in the study predicted that "It's going to be a very healthy scientific debate." "It will take a while to sit down and look at these arguments dispassionately." As an independent observer, Wallace said he thinks that Fu's approach seems reasonable, but that the debate won't be settled until all the scientists involved have time to hash out the data and the methods. "I won't profess to claim the verdict is in yet," he said.

Meanwhile, after being temporarily stalled by a Bush Administration review process, a new National Oceanic and Atmospheric Administration (NOAA) Web Site addressing the theory of abrupt climate change went live on May 28. The site details scientific studies showing evidence of rapid climate shifts throughout the history of the planet. Posting of the Web Site coincides with the national release of a new motion picture, "*The Day After Tomorrow*," whose plot centers on an extreme and scientifically uncredible version of the theory. Some inside the government have speculated that concern over public misconception due to the movie's content contributed to concerns within the White House that the Web site should not be posted. However, spokespersons for the White House Council on Environmental Quality and the Office of Science and Technology Policy firmly denied such suggestions, saying they were not aware of the NOAA Web Site.

According to David Anderson, director of NOAA's paleoclimatology program, the Web Site includes between 20 and 30 Web pages of content aimed at educating the public about how rapidly the climate has changed in the past. The site was peer reviewed by experts and then cleared through NOAA's *National Climatic Data Center* in Asheville, N.C., which is tasked with monitoring U.S. climate and researching historical trends.

Abrupt climate change is viewed by many scientists as a wild card theory for how the buildup of greenhouse gases will alter the Earth's climate system. The site details evidence that as the climate was changing from a cold glacial to a warm interglacial state about 14,500 years ago, temperatures in the Northern Hemisphere rapidly returned to near-glacial conditions for about 1,000 years, a period known as the *Younger Dryas*. Then the climate abruptly returned to a warmer state, with temperatures in Greenland rising as much as 10 ^{o}C in a decade.

Susanne Moser, a scientist with the *National Centers for Atmospheric Research* in Boulder, CO who reviewed an early draft of the Web content, said her understanding is that the Web pages were reviewed by the White House as part of the administration's *Climate Change Science Program* (CCSP). "They had to check it at the highest level with the White House, and some staff members in the White House decided it shouldn't be put up because it was sensitive," she said, adding, "There was nothing in there that was in any way political, not even in the early version that I saw."

Criticizing the Bush Administration, Peter Frumhoff, director of the *Union of Concerned Scientists' Global Environment Program*, said the Administration has amassed a long record of manipulating science for political purposes. "It certainly is consistent with [the administration's] efforts to stifle public education on science that appears to run counter to their political

agenda," he said of the Web site. "The first responsibility of government is to educate the public about serious threats and what can be done about them. And on climate and on other issues, this administration is failing that responsibility," he said.

With regard to the film "*The Day After Tomorrow*," U.K. chief scientific adviser David King argues that climate change may lead to a weakened thermohaline circulation (THC), which drives the Gulf Stream, but that is not likely to halt the stream and cause an ice age. "The film brings events together into a highly unlikely or even impossible scenario" by using flawed science, King said. Canadian oceanographer Andrew Weaver agreed, "Claims for a doomsday scenario are exaggerated", he said . "It is safe to say that global warming will not lead to the onset of a new ice age". In ancient times markings on cave stalactites and stalagmites have shown that Asian monsoons halted for several hundred years at a time, said Chris Hendy, a scientist at Waikato University. "We don't know what causes these abrupt climate changes," Hendy said.

What we do know, according to two reports released in late April by the *Pew Center on Global Climate Change* (PCGCC), is that climate change during the next century will have significant effects on the U.S. economy as well as on its natural assets. The question of whether climate change will produce a net economic benefit or cause harm is central to policy debates over what actions to take to reduce greenhouse gas emissions.

The *Pew* report states that low levels of climate change might benefit the economy, but that those benefits are likely to be eclipsed by negative impacts with further temperature rise. The report titled, "*U.S. Market Consequences of Global Climate Change*," includes an integrated assessment of potential impacts of climate change on the U.S. market economy through 2100. It examines economic sectors such as agriculture and forestry, energy services, commercial water supply, and coastal assets. Due to scientific uncertainties regarding the magnitude of expected temperature changes, the researchers simulated a variety of scenarios involving rises in temperature and sea levels.

The report also takes into account the economic implications of increased morbidity and mortality that could result from climate change-related health problems, such as a rise of heat stroke cases in the summer. The authors analyzed "low," "central" and "high" levels of predicted climate change ranging from an average temperature rise between 1.7 to 5.3 ^{o}C by 2100, as well as optimistic and pessimistic market outcomes to come up with a total of six market outcomes. The study also attempts to factor in precipitation patterns and sea level changes.

According to the report, optimistic scenarios could boost gross domestic product by about 1%, however, the authors predict that those benefits likely will diminish with time, although they give the caveat that "there is a distinct possibility that some degree of climate change can provide modest overall benefits to the U.S. economy during the 21st century." The study shows that as temperatures climb, the economic scales tip towards the negative end. The most pessimistic assumptions resulted in a 3% drop of real U.S. Gross Domestic Product by 2100 compared to a baseline without any climate change.

Much of the debate focuses on the agricultural sector. Some experts maintain that warmer temperatures will benefit crop growth and boost the economy, while others believe any agricultural benefits will be overwhelmed by harmful impacts in other economic sectors. The report identifies agriculture as the sector that will be most altered by climate change, primarily because crops are highly dependent upon temperature and precipitation patterns that may change in a warmer world. However, while higher temperatures and increased greenhouse gases might improve agricultural productivity for a time, the study found that those benefits will disappear once "critical thresholds" are crossed. Perhaps the most important point made is the fact that most, if not all, potentially positive impacts of climate change under optimistic assumptions are likely to be transient and unsustainable over the long run in the face of steadily rising temperatures.

Many scientists believe an increase in temperature is likely to change the hydrological cycle, as more water vapor evaporates into the atmosphere, and researchers found that higher amounts of precipitation would produce greater economic benefits than drying. That also adds uncertainty to predictions of agricultural output, since that sector is so dependent upon adequate water supplies. "There's a pretty lively debate" about how agriculture will change, said Billy Pizer, a fellow at *Resources for the Future* (RFF) who reviewed an early draft of the report. Pizer noted that the price of subsidized water could rise if supplies become scarce, making farming less profitable.

Overall the report provides further ammunition for advocates of climate change mitigation and adaptation policies. "Early intervention would reduce the long-term damage under either set of assumptions, and reduce the need for more costly measures if pessimistic scenarios materialize," stated Eileen Claussen, president of the PCGCC. Neil Strachan, staff economist at the *Pew Center*, likened mitigating climate change to "trying to turn around an oil tanker." "It takes a long time, unless you start now you are going to have to spend much more effort to turn it later," Strachan said.

Pew also released a summary report which pulled together a series of studies on how climate change will affect different parts of the nation's natural assets, from water resources to marine ecosystems. According to the summary report, the U.S. is in a good position to adapt to a limited amount of climate change because of the nation's wealth, size and established infrastructure, but ecosystems do not have that luxury. "Biodiversity and natural ecosystems are much more limited in their abilities to do that," the report states.

The report states further that the effects of climate change vary on a regional level just as they do from country to country across the globe. The Southeast and southern Great Plains are particularly vulnerable, the report says, because of low-lying coastal areas and potential shifts in agricultural production. "The things you worry about are already dry areas becoming dryer, there's already water problems in the southeast for example. If Georgia gets hotter, it's already stressed, it would be stressed even more," RFF's Pizer said.

Sources: Andrew Freedman, *Greenwire*, 4/29/04, 5/13 and 5/28/04; Alex Kirby, *BBC News Online*, 5/12/04; Simon Collins, *New Zealand Herald*, 5/12/04; Mark Henderson, *Times of London*, 5/6/04; Sandi Doughton, *Seattle Times*, 5/6/04; Robert S. Boyd, AP/*Kansas City Star*, 5/9/04; Alister Doyle, *Reuters/Yahoo News*, 5/24/04; *Greenwire*, 5/6, 5/10 and 5/13/04; and http://www.ncdc.noaa.gov/paleo/abrupt/

Meetings of Interest

Jul. 21-23: Climate Change and Aquatic Systems: Past, Present and Future. Plymouth, U.K. See: www.biology.plymouth.ac.uk/climate/climate.htm. Contact: Martin Attrill, matrill@plymouth.ac.uk

Jul. 26-30: Riparian and Aquatic Ecosystem Monitoring – A Technical Training Workshop. Pacific University, Forest Grove, OR. See: http://www.swrp.org/Training/workshop_info.htm. Contact: SWRP, (503) 725-2342, renfro@pdx.edu

Aug 21-26: 134th Annual Meeting of the American Fisheries Society**.** Madison, WI. The Gathering: Leopold's Legacy for Fisheries. Contact: Betsy Fritz, bfritz@fisheries.org, (301) 897-8616

Aug. 23-Dec. 18: Fish Genetics Online, Kentucky State University. Fish Genetics (AQU 407/507), undergraduate and graduate internet courses. Contact: Dr. Boris Gomelsky, KSU Assistant Professor, bgomelsky@gwmail.kysu.edu

Aug. 25: Asian Carp Symposium. 134th Annual Meeting of the American Fisheries Society. Madison, WI. Contact: Betsy Fritz, bfritz@fisheries.org, (301) 897-8616

Sept. 12-17: 5th International Symposium, ECOHYDRAULICS, Madrid, Spain. The main focus will be restoration of aquatic habitats. Contact: Dr. Diego García de Jalón, ecohydraulics@montes. upm.es

Sep. 19-24: 13th International Conference on Aquatic Invasive Species, Ennis, County Clare, Ireland. See: http://www.aquatic-invasive-species-conference.org/

Sep. 20-22: Wild Trout VIII Symposium: Working Together to Ensure the Future of Wild Trout. Yellowstone National Park, WY. See: www.wildtrout8.org. Contact: Robert Carline, rcarline@psu.edu, (814) 865-4511

Sep. 23-24: Assessing and Re-naturalizing Streams Impacted By Dam and Dam Removal, University of Montana, Missoula. See: http://www.umt.edu/rivercenter/Conf_Program04.htm. Contact: Manny Gabet, manny.gabet@mso.umt.edu

Congressional Action Pertinent to the Mississippi River Basin

Endangered Species Act (ESA) of 1973

S. 369. Thomas (R/CA). Amends the ESA to improve the processes for listing, recovery planning, and delisting, and for other purposes.

S. 1178. Enzi (R/WY). Amends the ESA to require the Federal Government to assume all costs relating to implementation of and compliance with that Act.

S. 2009. Smith (R/OR) and **H. R. 1662.** Walden (R/OR) and 18 Co sponsors. Amends the ESA to require the Secretary of the Interior to give greater weight to scientific or commercial data that is empirical or has been field-tested or peer-reviewed, and for other purposes.

H. R. 1194. Herger (R/CA). Amends the ESA to enable Federal agencies to rescue and relocate any endangered or threatened species that would be taken in the course of certain reconstruction, maintenance, or repair of man-made flood control levees.

H. R. 1235. Gallegley (R/CA) and Gibbons (R/NV). Provides for management of critical habitat of endangered and threatened species on military installations in a manner compatible with the demands of military readiness, and for other purposes.

H. R. 1835. Gallegley (R/CA) and 3 Co sponsors. Amends the ESA to limit designation as critical habitat areas owned or controlled by the Department of Defense, and for other purposes.

H. R. 1965. Gibbons (R/NV). Limits application of the ESA with respect to actions on military land or private land and to provide incentives for voluntary habitat maintenance, and for other purposes.

H. R. 2602. Otter (R/ID). Amends the ESA to make the authority of the Secretary to designate critical habitat discretionary instead of mandatory, and for other purposes.

H. R. 2933. Cardoza (D/CA) and 17 Co sponsors. Amends the ESA to reform the process for designating critical habitat under that Act.

Energy

H. R. 1013. Radanovich (R/CA), Hastings (R/WA), and Walden (R/OR). Amends the Federal Power Act to provide for alternative conditions and alternative fishways in hydroelectric dam licenses, and for other purposes.

Global Warming

S. 17. Daschle (D/SD) and 15 Co sponsors. Initiates responsible federal actions that will reduce global warming and climate change risks to the economy, the environment, and the quality of life and for other purposes.

S. 139. Lieberman (D/CT) and McCain (R/AZ and **H. R. 4067**. Gilchrest (R/MD) and 19 Co sponsors. Provides for scientific research on abrubt climate change, to accelerate reduction of U.S. greenhouse gas (GHG) emissions by establishing a market-driven system of GHG tradeable allowances; limit U.S. GHG emissions; and reduce dependence on foreign oil, and ensure benefits to consumers from the trading in such allowances.

H. R. 1578. Udall (D/CO). Promotes and coordinates global change research, and for other purposes.

Federal Water Pollution Control Act (FWPCA) Amendments:

S. 170. Clean Water Infrastructure Financing Act of 2003. Voinovich (R/OH) and **H.R. 20.** Kelly (R/NY) and Tauscher (D/CA). Amends the FWPCA to authorize appropriations for State water pollution control revolving funds, and for other purposes.

S. 473. Feingold (D/WI) and 3 Co sponsors and **H.R. 962.** Oberstar (D/MN) and 21 Co sponsors. Amends the FWPCA to clarify the jurisdiction over waters of the U.S.

H. R. 738. Pallone (D/NJ) and 16 Co sponsors. Amends the FWPCA to clarify that fill material cannot be comprised of waste.

H. R. 784. Camp (R/MI) and 17 Co sponsors. Amends the FWPCA to authorize appropriations for sewer overflow control grants

H. R. 1560. Duncan (R/TN) Amends the FWPCA to authorize appropriations for State water pollution control revolving funds, and for other purposes.

Floodplain Management

H. R. 67. Flake (R/AZ) and Hayworth (R/AZ). Provides temporary legal exemptions for certain management activities of the Federal land management agencies undertaken in federally declared disaster areas.

H.R. 253. Two Floods and You Are Out of the Taxpayers' Pocket Act of 2003. Bereuter (R/NE) and Blumenauer (D/OR). Amends the National Flood Insurance Act of 1968 to reduce losses to properties for which repetitive flood insurance claim payments have been made.

Forestry

S. 32. Kyl (R/AZ) and 4 Co sponsors and **H.R. 460.** Hayworth (R/AZ) and 7 Co sponsors. Establishes Institutes for research on the prevention of, and restoration from wildfires in forest and woodland ecosystems of the interior West.

S. 1208. Collins (R/ME) and Reed (D/RI). Amends the Cooperative Forestry Assistance Act of 1978 to provide assistance to States and nonprofit organizations to preserve suburban forest land and open space and contain suburban sprawl, and for other purposes.

S. 1453. Leahy (D/VT) and Boxer (D/CA) Expedites procedures for hazardous fuels reduction activities and restoration in wildland fire prone national forests and for other purposes.

H. R. 1042. Udall (D/CO) and Udall (D/NM). Authorizes collaborative forest restoration and wildland fire hazard mitigation projects on National Forest System lands and on other lands, to improve the implementation of the National Fire Plan, and for other purposes.

Invasive Species

S. 144. Craig (R/ID) and 9 Co sponsors and **H.R. 119.** Hefley (R/CO). Requires the Interior Secretary to establish a program to provide assistance through the States to eligible weed management entities to control or eradicate harmful, nonnative weeds on public and private land.

S. 525. Levin (D/MI) and 15 Co sponsors and **H. R. 1080.** Gilchrest (R/MD) and 67 Co sponsors. Amends the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA) to reauthorize and improve it.

S. 536. DeWine (R/OH) and 5 Co sponsors and **H.R. 266.** Ehlers (R/MI) and Gilchrest (R/MD). Establishes the National Invasive Species Council, and for other purposes.

H.R. 273. Gilchrest (R/MD) and Tauzin (R/LA). Provides for the eradication and control of nutria in Maryland and Louisiana.

H. R. 989. Hoekstra (R/MI). Requires issuance of regulations to assure that vessels entering the Great Lakes do not discharge ballast water that introduces or spreads nonindigenous aquatic species and that such ballast water and its sediments are treated through the most effective and efficient techniques available.

H. R. 1081. Ehlers (R/MI) and 67 Co sponsors. Establishes marine and freshwater research, development, and demonstration programs to support efforts to prevent, control, and eradicate invasive species, as well as to educate citizens and stakeholders and restore ecosystems.

H. R. 2310. Rahall (D/WV) and 17 Co sponsors. Protects, conserves, and restores native fish, wildlife, and their natural habitats through cooperative, incentive-based grants to control, mitigate, and eradicate harmful nonnative species.

H. R. 3122. Miller (R /MI). Amends the NANPCA directing the U.S. Coast Guard to prohibit vessels with ballast tanks containing more than 5% ballast water from entering the Great Lakes.

Mining

S. 2049. Specter (R/PA) and **H.R. 3778**. Petersen (R/PA) and Sherwood (R/PA). Amends the Surface Mining Control and Reclamation Act of 1977 (SMCRA) to reauthorize collection of reclamation fees, revise the abandoned mine reclamation program, and make sundry other changes.

S. 2208. Rockefeller (D/WV), Bond (R/MO) and Bunning (R/KY). Amends the SMCRA to reduce the amounts of reclamation fees, modify requirements relating to transfers from the Abandoned Mine Reclamation Fund, and for other purposes.

S. 2211. Rockefeller (D/WV) and **H.R. 3796**. Cubin (R/WY) and Rahall (D/WV). Amends the SMCRA to reauthorize and reform the Abandoned Mine Reclamation Program, and for other purposes.

H. R. 504. Udall (D/CO). Provides for the reclamation of abandoned hardrock mines, and for other purposes.

Public Service

S. 89. Hollings (D/SC) and **H.R. 163**. Rangel (D/NY) and 5 Co sponsors. Provides for the common defense by requiring that all young persons in the U.S., including women, perform a period of military service or civilian service in furtherance of the national defense and homeland security, and for other purposes.

S. 2188. Feingold (D/WI), McCain (R/AZ) and Daschle (SD/D) and **H.R. 2566.** Kind (D/WI) and 3 Co sponsors. Provides for reform of the Corps of Engineers, and for other purposes.

Public Lands

S. 124. Roberts (R/KS). Amends the Food Security Act of 1985 to suspend the requirement that rental payments under the conservation reserve program be reduced by users, through the establishment of a National Forest Ecosystem Protection Program.

S. 1449. Crapo (R/ID) and Lincoln (D/AR) and **H. 1904.** Cochran (R/MS). Improves the capacity of the Agriculture and Interior secretaries to plan and conduct hazardous fuels reduction projects on National Forest System and Bureau of Land Management lands and for other purposes.

S. 1938. Corzine (D/NJ) and 3 Co sponsors. Amends the Forest and Rangeland Renewable Resources Planning Act of 1974 and related laws to strengthen the protection of native biodiversity and ban clearcutting on Federal land and for other purposes.

H. R. 380. Radanovich (R/CA). Provides full funding for the payment in lieu of taxes program for the next five fiscal years, to protect local jurisdictions against the loss of property tax revenues when private lands are acquired by a Federal land management agency, and for other purposes.

H. R. 652. Andrews (D/NJ). Assures large areas of land in healthy natural condition throughout the country to maximize wildland recreational opportunities, maximize habitat protection for native

wildlife and natural plant communities, and to contribute to the preservation of water for use by downstream metropolitan communities and other users, through the establishment of a National Forest Ecosystem Protection Program.

H. R. 749. Udall (D/CO). Directs the Secretary of the Interior to establish the Cooperative Landscape Conservation Program.

H. R. 2169. Leach (R/IA) and 89 Co sponsors. Saves taxpayers money, reduces the deficit, cuts corporate welfare, protects communities from wildfires, encourages Federal land management agency reform and accountability, and protects and restores America's natural heritage by eliminating the fiscally wasteful and ecologically destructive commercial logging program on Federal public lands, restoring native biodiversity in our Federal public forests, and facilitating the economic recovery and diversification of communities affected by the Federal logging program.

H. R. 3324. Shays (R/CT) and 7 Cosponsors. Provides compensation to livestock operators who voluntarily relinquish a grazing permit or lease on Federal lands, and for other purposes.

Water Resources

S. 323. Landrieu (D/LA) and Breaux (D/LA). Establishes the Atchafalaya National Heritage Area, Louisiana.

S. 531. Dorgan (D/ND) and Johnson (D/SD). Directs the Interior Secretary to establish the Missouri River Monitoring and Research Program, to authorize the establishment of the Missouri River Basin Stakeholder Committee, and for other purposes.

S. 561. Crapo (R/ID) and 5 Co sponsors. Preserves the authority of States over water within their boundaries, and delegates to States the authority of Congress to regulate water, and for other purposes.

S. 993. Smith (R/OR). Amends the Small Reclamation Projects Act of 1956, and for other purposes.

S. 2244. Hutchison (R/TX) and Breaux (D/LA) and **H. R. 2890.** Saxton (R/NJ). Protects the public's ability to fish for sport, and for other purposes.

S. 2301. Inouye (/HI). Improves the management of Indian fish and wildlife and gathering resources, and for other purposes.

S. 2470. Bond (R/MO) and 7 Co sponsors. Enhances navigation capacity improvements and the ecosystem restoration plan for the Upper Mississippi River and Illinois Waterway System.

H.R. 30. Bereuter (R/NE). Amends the Water Resources Development Act of 1992 to authorize the Secretary of the Army to pay the non-Federal share for managing recreation facilities and natural resources on water resource development projects if the non-Federal interest has agreed to reimburse the Secretary, and for other purposes.

H. R. 135. Linder (R/GA) and 3 Co sponsors. Establishes the "Twenty-First Century Water Commission" to study and develop recommendations for a comprehensive water strategy to address future water needs.

H. R. 961. Kind (D/WI) and 5 Co sponsors. Promotes a Department of the Interior effort to provide a scientific basis for the management of sediment and nutrient loss in the Upper Mississippi River Basin, and for other purposes.

H. R. 1517. Graves (R/MO) and 6 Co sponsors. Amends the Land and Water Conservation Fund (LWCF) to limit the use of funds available from the LWCF Act of 1965 for maintenance.

H. R. 2557. Young (R/AK) and 4 Co sponsors. Authorizes the Secretary of the Army to construct various projects for improvements to rivers and harbors of the U.S., and for other purposes.

Wild and Scenic Rivers

H. R. 987. Herger (R/CA) and Doolittle (R/CA). Amends the Wild and Scenic Rivers Act to ensure congressional involvement in the process by which a river that is designated as a wild, scenic, or recreational river by an act of the legislature of the State or States through which the river flows may be included in the National Wild and Scenic Rivers System, and for other purposes.

Source: *U.S.. Congress On Line; http://www.access.gpo.gov/congress/cong009.html*

River Crossings

Mississippi Interstate Cooperative Resource Association
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