

River Crossings

Volume 15

September/October 2006

Number 5

Silver Carp Proposed for Listing as Injurious Species

Importation and interstate transport of both live silver and largescale silver carp would be banned under a proposed rule published in the September 5th issue of the Federal Register by the U.S. Fish and Wildlife Service (USFWS). The action was taken in response to a petition signed by 25 members of Congress outlining impacts of silver carp to humans and native species in waters of the U.S. The proposed rule – advanced under the injurious wildlife provisions of the Lacey Act – addresses those concerns.

Silver carp, native to Asia, were introduced into the U.S. in the early 1970s for use as algae control agents in sewage lagoons and fishery production ponds, but escaped into surrounding waters. The carp have established themselves in the Mississippi River Basin, but are not currently cultured in the U.S. Silver carp are difficult to handle and transport because of their tendency to jump – they are known to leap into moving boats injuring people and damaging equipment (see accompanying photo). They are also capable of growing up to three feet long and reaching weights of 100 pounds.

Biologists are concerned that the silver carp could spread throughout the U.S. and compete with native species for food and habitat. For example, the carp could threaten the multimillion-dollar Great Lakes fishery by competing with native fish for food.

Largescale silver carp, native to parts of China and Vietnam, are a distinct species



Eye level view of a jumping silver carp. (Chris Young, State Journal Register, Springfield, IL Photo)

related to the silver carp and warrant prohibition as well. While not yet known to be in the U.S., largescale silver carp could compete with native species for

food and habitat and may hybridize with silver and bighead carp, both of which are present in U.S. waters.

Public comment on the proposal will remain open for 60 days. Documents are available at <http://www.fws.gov/contaminants/Issues/InvasiveSpecies.cfm>, the web page for the Division of Environmental Quality. (See the Federal Register notice, at http://www.access.gpo.gov/su_docs/fedreg/a060905c.html#Fish%20and%20Wildlife%20Service, for instructions and deadlines for public comments).

In 2000, MICRA petitioned the USFWS to list the black carp, another Asian carp species, as injurious under the Lacey Act. MICRA members are concerned that the black carp, utilized by the fish culture industry to control snail infestations in catfish ponds, will escape captivity as the silver and bighead carp did earlier. If the black carp were to become established in the wild (which some people think it already has) biologists are concerned that

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many species of threatened and endangered mollusks and snails would be in jeopardy from black carp predation. Black carp can reach lengths of 4 feet and weights of 150 lbs. To date, no action has been taken on the MICRA petition.

Source: Joshua Winchell, *USFWS News Release*, Washington, D.C.

MICRA Hosts Daughterless Carp Presentation

In the March/April 2006 issue of *River Crossings* we featured an article on the "Daughterless Carp" technology being developed in Australia to control the common carp. We also included an introduction to other genetic engineering techniques being evaluated for invasive species control.

This summer we contacted Ron Thresher of the Commonwealth Scientific & Industrial Research Organization (CSIRO) in Australia to learn more about what is being done with the Daughterless Carp project. Then this fall MICRA and the *Upper Mississippi River Conservation Committee* co-sponsored a trip for Thresher to come to the U.S. and make presentations at the *Association of Fish and Wildlife Agencies (AFWA)* meeting in Snowmass, CO on September 19-20.

The AFWA is an organization of all of the state and federal fish and wildlife agency heads in the U.S., and controls much of the policy with regard to federal and state funding for fish and wildlife management projects in the U.S. Thresher made presentations to both the AFWA Fisheries and Water Resources Policy and Invasive Species committee meetings. According to Larry Riley, Chairman of the Invasive Species Committee and Norm Stucky, Fisheries Conservation Consultant for the *Bass Pro Shops*, Thresher's presentations stimulated a lot of interest.

Riley said that there is growing interest among AFWA members and associates to pursue the subject further through an AFWA sponsored symposia or workshop, probably next spring. Such a workshop would not only feature discussions of Daughterless Carp technology, but also of all of the other techniques and procedures being developed in genetic engineering to control invasive species infestations.

New Didymo Control to be Tested

New Zealand scientists will test the world's first solution to stop didymo (*Didymosphenia geminata*), a one-celled freshwater diatom or type of algae, from choking the country's waterways without killing fish or animal life. A copper-based formulation designed by scientists from the *National Institute of Water and Atmospheric Research (NIWA)* has killed the invasive freshwater weed in laboratory tests while having little effect on test fauna.

The invasive weed, known as "rock snot", has spread and bloomed rampantly since it was first detected in a Southland river in 2004. It now appears in more than 30 rivers and tributaries across the South Island, including the Waitaki River, which is a major source of hydro power.

NIWA's general manager of environmental information and international, Barry Biggs, said he was excited by the possibility of an end to didymo. Biggs

described the trial as extremely encouraging but stressed the tests had been conducted in a laboratory environment, not an infected river. "While it's not the magic bullet, we are hopeful we will soon be in a position to deal with new invasions. But as we move into spring, people must start vigorously checking, cleaning and drying their equipment and themselves to help stop the spread of this noxious alga," he said.

NIWA ran tests at its Monowai station during the winter, narrowing the range of chemicals to one secret, copper-based mix. Biggs, who has said untreated didymo could turn the country's waterways into an open sewer, said testing in natural river environments would begin this year. Next month, scientists will begin a two-month test in an artificial stream. If results are positive, the solution will be flushed through an infected tributary for several months. If that works, one river will be investigated over a season to experiment with the chemical.

River Crossings

Published by

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Didymo attached to a stick in the river. (Biosecurity New Zealand Photo)

Biosecurity New Zealand (BNZ) spokesman Phil Barclay said the department was pleased lengthy research was approaching a positive conclusion, but he did not want to raise false hopes until environmental testing had been completed. "The last thing we want to do is cause a worse problem than what we're trying to cure, so it is a cautious and very scientific process," he said.

BNZ spent \$5.9 million on the incursion during the last fiscal year and has budgeted \$6.5 million for 2006-07. This year, a report from the *New Zealand Institute of Economic Research* put the highest potential cost of unchecked didymo spread at \$285 million, including loss of native species, the cost to recreational river users and a drop in tourism expenditure.

Source: Beck Eleven, www.stuff.co.nz, 9/19/06

Toxic Algae Prompts Warnings in California Reservoir

A record bloom of toxic algae in Klamath River (CA) reservoirs prompted health warnings in August from state and federal officials. Concentrations of the algae *Microcystis aeruginosa* are so great that even breathing vapors caused by water skiing could cause illness, officials said, and swallowing even a few ounces of lake water could bring effects as severe as organ failure. The algae is not a new

problem on the Klamath River itself. But the bright green algae is so thick that parts of Irongate and Copco reservoirs look like radioactive putting greens. "It's no longer just a matter of fish. It's now a human health issue," said Zeke Grader, director of the *Pacific Coast Federation of Fishermen's Associations*.

The algae itself is usually not toxic and is common, at low levels, in many water bodies. But in warm, stagnant water it often blooms in huge floating mats, releasing a toxin, called microcystin, that can cause illness. "There isn't any way to dance around this. It's a serious situation," said Peggy Lehman, an environmental scientist at the state Department of Water Resources and an expert on the algae. Lehman is studying another large *Microcystis* bloom in the Sacramento-San Joaquin Delta suspected of contributing to the decline of several fish species.

A consultant hired by the Karuk Tribe tested water samples from the reservoirs and found algae concentrations 3,900 times greater than a standard set by the World Health Organization, the operating standard for California water agencies. In a joint news release, the U.S. EPA and California Water Quality Control Board warned that an adult who ingests just 4 ounces of water from the reservoirs could be exposed to microcystin at 100 times the standard. A child's exposure would be nearly 400 times the standard.

Officials warn people to avoid contacting the algal blooms, to avoid swimming near them and not to eat fish caught during the bloom. Children, pets and livestock should be kept away from the affected waters. Skin contact with the affected water can cause rashes, eye irritation and mouth ulcers. The toxin itself is invisible and highly stable in the water, persisting for weeks. As a result, the Karuk Tribe fears water running out of the reservoirs poses a hazard to people downstream. The reservoirs have not been closed to the public, and state officials have left that decision to Siskiyou County, which posted warnings. The hydroelectric dams that impound the reservoirs are owned by *PacifiCorp*, an electric utility based in Portland, OR. Spokesman Deston Nokes blamed the algae on pollution from upstream farms and towns, which provide nutrients for the algae to feed on.

Craig Tucker, spokesman for the Karuk Tribe, agreed pollution is a factor. But he

said stagnant water in the reservoirs gives the algae a chance to bloom, citing this as another reason the dams should be removed. The dams could be subject to new operating rules, and even removal, as part of a federal relicensing process now under way. "There's a real water quality problem up there and it's going to have to be addressed, but everyone's in denial about it," said Grader.

Source: Matt Weiser, *Sacramento Bee*, 8/15/06

Rusty Crayfish Removal in Wisconsin Lakes

A strategy to eliminate an invasive species of crayfish from a northern Wisconsin lake might provide a model for removing other nonnative species from the state's waterways, a team of researchers and state officials say. The rusty crayfish was introduced to Wisconsin waters in the 1950s, probably by nonresident anglers who used it as fishing bait. Since then, it has beaten out native crayfish, clear-cut aquatic plants and hurt fish populations by demolishing their feeding and hiding grounds.



Rusty crayfish (Minnesota Sea Grant Photo)

But scientists have been working to reduce its environmental impact with a two-pronged approach – using traps to catch the larger crayfish and enacting fishing rules favorable to the predators that would eat the smaller ones. "We were concerned about people who fish on these lakes, so we wanted to try to find a way to greatly reduce, or eradicate them (the crayfish) in way that a lake association or individual could do on their own," said Tim Kratz, the director of the University of Wisconsin-Madison's (UW) Trout Lake research station. In other words, without chemicals, high-tech equipment or huge budgets.

Since the program began five years ago, scientists have reduced the rusty crayfish population in Vilas County's Sparkling

Lake to about 10% of its peak. "It's a targeted approach," said Steve Carpenter, UW professor and co-investigator of the project. The strategy has proven harmless to all creatures except the rusty crayfish, which usually end up on the dinner plates of student volunteers.

Researchers, in conjunction with the state Department of Natural Resources (DNR), lined the 110-acre lake with 280 traps that they checked every few days. They freed the natives and eliminated the rustys. In the first two years, team members caught on average more than 30 crayfish per trap. Now, in the study's sixth year, they are finding fewer than one per trap.

Knowing that traps would catch larger individuals but miss the little guys, the scientists also worked with the DNR to set up fishing regulations on the lake that would ensure a steady supply of predators: one-per-day catches on all game fish, and minimum lengths of 18 inches for smallmouth and largemouth bass, 40 inches for musky and 28 inches for walleye. Local lake associations, including those at Plum Lake and Star Lake, have expressed interest in starting similar programs, Kratz and Carpenter said.

Sources: *AP/St. Paul Pioneer Press*, 8/8/06; and *Greenwire*, 8/8/06

Federal Court Orders USEPA to Regulate Ballast Water Dumping

Finding that the U.S. EPA's regulation exempting ballast water discharges from the Clean Water Act (CWA) is "plainly contrary to the congressional intent," a federal court ordered the agency in mid September to come up with new regulations in two years. The order follows the court's finding last year that EPA had illegally exempted ships' ballast water discharges from CWA permit requirements. The current ruling directs EPA to take specific action by September 30, 2008 to ensure that shipping companies comply with the CWA and restrict the discharge of invasive species in ballast water.

Deborah Sivas, Director of the Stanford Law School *Environmental Law Clinic* and representing the three plaintiff groups (*Northwest Environmental Advocates*, *The Ocean Conservancy*, and *Baykeeper*), noted that, "If EPA had spent the last

seven years developing a permitting program for ballast water instead of fighting this court battle, not only would our water be safer but our economy would be better protected. Invasive species come at a tremendous cost to both the environment and taxpayers." Six Great Lakes states – New York, Michigan, Pennsylvania, Illinois, Minnesota, and Wisconsin – joined the environmental groups' lawsuit to persuade the court to require a federal permitting program.



Large ships can pump 5 million or more gallons of water into giant ballast tanks below their decks. This ballast water is used as weight to stabilize the ships in the ocean. When they reach ports thousands of miles away, they release the water, sending tiny clams, mussels, fish and other organisms out into the wild. About 21 billion gallons of ballast water are discharged into U.S. waters every year, and about 7,000 species of marine life are transported in ballast water throughout the world each day. "This is one of the worst types of pollution because the pollutants multiply and their impacts grow. It deserves every bit as much oversight and regulation as other dangerous contaminants," said Leo P. O'Brien, Executive Director of *Baykeeper*. "It is time for industry to do its fair share and to stop dumping its problems on the public.

Nina Bell, Executive Director of *Northwest Environmental Advocates* (NEA), one of the plaintiffs, said the court order will shift some of the burden of invasive species from taxpayers to shippers. "This is a very important ruling for the taxpayers, American businesses, and the environment that currently pay the huge price of EPA's continuing refusal to implement the CWA. Now we have a fighting chance to prevent further

invasions of species that are clogging the intake pipes of drinking water facilities and power plants, harming the commercial fishing industry, and destroying habitat," Bell said.

Tim Eichenberg, Pacific Region Director of *The Ocean Conservancy*, cautioned that shippers have already shifted their effort from fighting the groups' lawsuit to lobbying Congress. "The shipping industry has had a free ride while the public has paid billions each year. Now they are pushing for Congress to grant a special exemption from the CWA, to preserve their ability to pollute at the nation's expense," said Eichenberg. "Not only do they want an exemption from the CWA but they also want to prevent the states from taking any action to protect themselves from these prohibitively expensive invasions," he added.

But in the absence of effective federal action, combined with the high cost of invasive species to the environment, industries, and drinking water sources; at least two states have taken action to pass their own laws. Michigan will require shippers to have permits by early next year. And in mid September, California Gov. Arnold Schwarzenegger signed legislation that will force ships entering California's ports to treat ballast water. Existing state law requires that ships exchange ballast water at least 50 miles offshore, but that only removes about half the species, scientists say, because many remain in the mud at the bottom of the tanks and can end up in local waters while ships are at port. The new California law also increases fines from \$5,000 to \$27,500 for illegally dumping ballast water.

Meanwhile, shipping companies and state agencies are working together to develop new technologies— chemicals, ultraviolet light, heating, even onshore treatment systems— to kill the tiny stowaways. So far, however, there is no fail-safe system. "There is a legitimate issue here," said John Berge, vice president of the *Pacific Merchant Shipping Association*, in San Francisco, "But the science hasn't caught up with the problem yet. We're hoping it will."

Sen. Joe Simitian, D-Palo Alto and environmentalists say the new California law is needed to speed along these technological developments. "Most people really don't think about it, but invasive species have a profound effect,

especially in San Francisco Bay, which is one of the most invaded places in the world,” said Tim Eichenberg.

Sources: Paul Rogers, *San Jose Mercury News*, 9/19/06; Mark Martin, *San Francisco Chronicle*, 9/19/06; *Northwest Environmental Advocates* and *The Ocean Conservancy-Baykeeper News Release*, 9/18/06; and *Greenwire*, 9/19/06

Caspian Sea Protection Plan May Aid Caviar Trade and Sturgeon

Caviar consumers as well as American sturgeon and paddlefish populations may benefit from a five-nation deal to clean up the badly polluted Caspian Sea. *The Caspian Convention* – grouping Russia, Iran, Azerbaijan, Kazakhstan and Turkmenistan – is the first legally binding document on any subject adopted by the five shoreline states with widely differing political systems. The accord mirrors existing deals for the Mediterranean and Baltic seas and aims to stop pollution, protect wildlife, monitor the environment and work out joint responses to any emergencies. It formally went into effect on August 12.

“The Caspian Sea’s fragile environment is extremely vulnerable to the region’s current boom in oil and gas exploration,” said Achim Steiner, head of the U.N. Environment Programme (UNEP). “Climate extremes and economic and political challenges also put pressure on the Caspian’s natural resources,” he said in a statement.

Environmentalists say the deal, which lacks enough financing, is a belated start. Caspian Sea sturgeon, the fish whose black caviar eggs are one of the world’s most expensive delicacies, are close to extinction because of decades of overfishing, dams that block access to spawning grounds and pollution. The demise of Caspian Sea sturgeon populations, which occurred after the downfall of the Soviet Union, placed tremendous pressure on American sturgeon and paddlefish populations to fill the demand for the caviar industry. “This is a first step in a very fragile area that is in desperate need of protection,” said David Santillo, a senior scientist at the *Greenpeace* environmental group. “The convention will need some kind of teeth to impose sanctions,” he said.

Regional oil output reached 1.9 million barrels per day in 2004 and reserves of oil in the region rival those of the U.S., UNEP said. The slightly salty sea covers 143,200 sq. mile and is sometimes called the world’s biggest lake. Santillo said the fate of sturgeon and Caspian seals – the only seal species in a landlocked lake or sea outside Russia’s Lake Baikal – would symbolize whether the convention worked.

The five countries aim to cut pollution – toxic and radioactive wastes, agricultural run-off, sewage and leaks from oil extraction and refining. About 11 million people live around the Caspian shores. Among other goals scientists are trying to understand changes in sea levels, perhaps linked to earthquakes or sediment shifts. The Caspian dropped 13 ft. from 1880 to 1977 before an abrupt reversal in 1977 flooded coasts and caused billions of dollars in damage, UNEP said.

Source: Alister Doyle, *Reuters*, 8/11/06; and *Greenwire*, 8/11/06

Mississippi River Diversion

At an April meeting of researchers considering what to do about Louisiana’s dwindling wetlands, all attendees agreed that diverting the Mississippi was necessary to prevent rising sea levels, storms of increasing intensity and land loss associated with climate change. Such a diversion would be located in the bird-foot delta at the river’s mouth, well downstream of New Orleans. It would fix the river’s tendency to dump 120 million tons of sediment per year into deep water, rather than wetlands, due to the fact that the delta reaches too far out into the Gulf of Mexico and the river’s mouth now sits at the edge of the continental shelf. Under a diversion plan, water would enter marshes and shallow-water areas and eventually rebuild the coast.

Louisiana’s marshes have lost more than 1,500 square miles since the 1930s, researchers pointed out, about a quarter of their total area. “A major diversion in the lower part of the river is something that needs to be done,” said James R. Hanchey, deputy secretary of the Louisiana Department of Natural Resources. “I think it’s within the realm of possibility.” He added that nutrient runoff from chemicals used inland could stimulate marsh plants, rather than contribute to the dead zone of oxygen-poor water near the river’s mouth.

Virginia R. Burkett, coordinator of global-change science for the U.S. Geological Survey, said diversion was “the only practical solution.” Scientists have proposed making the diversion near Davant, 45 miles southeast of New Orleans, further down the river. Apart from technical concerns, other issues include land rights, minor relocations, oil and gas leases and river navigation.

Financing for the project could come from coastal oil and gas revenue and other funds approved for coastal restoration, said lawyer James T.B. Tripp, a member of the Louisiana Governor’s *Commission for Coastal Restoration* and an *Environmental Defense* attorney. “Is it practical? Yes,” he said. “Will it be expensive? Yes. But when you look at the alternatives it’s very cost-effective.” Designing the project could take three or four years, Hanchey said, followed by a construction period of five to 10 years.

Sources: Cornelia Dean, *New York Times*, 9/19/06; and *Greenwire*, 9/19/06

Rebuilding Louisiana’s Wetlands

A proposal to rebuild wetlands along a 7-mile stretch of eastern New Orleans, a vital move to shore up hurricane protection, took a major step toward approval in mid September. A technical committee ranked the \$19.6 million proposal first among four projects it recommended for approval by the Breaux Act Task Force at its Oct. 18 meeting. If the task force agrees, as expected, the federal Natural Resources Conservation Service and the state Department of Natural Resources would choose a contractor and oversee the work.

Rebuilding the land bridge, sandwiched between Lake Pontchartrain and Lake Borgne in an area known as Alligator Bend, would require the contractor to mine about 3 million cubic yards of sediment from Lake Borgne in order to fill in 410 acres of open water, in part created by Hurricane Katrina. The project also includes planting vegetation along 7 1/4 miles of the Lake Borgne shoreline, which retreated 5 feet during the storm.

The technical committee also recommended approving three other proposals:

- Protecting the Gulf of Mexico shoreline along the Rockefeller Refuge in Cameron

and Vermilion parishes, just south of Pecan Island, \$37 million.

- Creating new marsh, in part by building dirt platforms, called terraces, on which wetland grasses are planted, in Madison Bay on the east side of Bayou Terrebonne in Terrebonne Parish, \$32.3 million.
- Restoring the barrier shoreline west of Belle Pass, along the Gulf of Mexico in Lafourche Parish, \$32.6 million.

The committee also recommended approving a \$919,000 demonstration project that would test various methods of planting vegetation on barrier islands to hold their sand and dirt in place.

In choosing the four projects, the committee left the following six proposals on the table, but suggested the task force consider approving them too:

- Protecting the shoreline of Lake Salvador along the border of the Barataria Unit of Jean Lafitte National Historical Park and Preserve in Jefferson Parish, \$29.8 million.
- Restoring marshes on the Breton Land-bridge east of the river in Plaquemines Parish, \$13.6 million.
- Restoring and protecting the shoreline along five miles of Vermilion and Weeks bays in Iberia Parish, \$9.4 million.
- Reintroducing Mississippi River water and creating new marshes in Breton Sound by enlarging an existing siphon at Violet, \$53.2 million. The siphon, a set of pipes, funnels water from the river into the wetlands.
- Restoring the ridge along Grand Liard Bayou in Bastion Bay on the west side of the Mississippi in Plaquemines Parish, \$27.8 million.
- Cutting a path for the delivery of sediment from the Atchafalaya River, through Deer Island Pass to Atchafalaya Bay in St. Mary Parish, \$8.8 million.

For those projects to be financed under the Breaux Act, the state would have to use a separate source of federal money to pay for some or all of the other four projects. The state could choose to finance the Alligator Bend project and others with money from the Coastal Impact Assistance Program, passed last year by Congress, which allocates more than \$500 million in federal offshore oil revenue to coastal restoration efforts. State officials are expected to announce plans for spending that money in the next two years.

The Breaux Act Task Force, whose voting members represent the U.S. Army Corps of Engineers, U.S. EPA and the U.S. Agriculture, Commerce and Interior departments, is expected to choose four new projects this year. Louisiana has a non-voting position on the task force, but can effectively veto projects by refusing to chip in state money, which the act requires for all projects.

The Breaux Act funnels about \$70 million a year in federal and state financing into coastal erosion projects. Since its inception in 1990, the program has banked more than \$775 million and could receive another \$1.6 billion in funding through 2020. That infusion of cash would come largely from a share of excise taxes collected from fishing gear and small-engine fuel sales.

A lengthy engineering and design process has slowed progress, and as of February, only \$272 million had been spent on individual projects. Much of the remaining money is reserved for approved projects not yet ready for construction. Still, of the 134 projects remaining on the program's previous annual lists, only 67 were completed through February. Of the remaining, contractors have begun work on 16, and 20 more are scheduled to begin this fiscal year.

Source: Mark Schleifstein, *The New Orleans Times-Picayune*, 9/13 and 9/14/06

Settlement Will Restore the San Joaquin River

California's second-longest river, the San Joaquin, a polluted stream, sometimes called the colon of the Central Valley, will be restored under an agreement reached in early September. Once filled with salmon, the San Joaquin now runs dry in some reaches. The deal was reached after more than 18 years of acrimony and litigation between environmentalists and farmers.

The salmon runs died and stretches of the river dried up after federal officials built Friant Dam more than 60 years ago. The dam, a 319-foot monolith holds back nearly the entire river's flow and redirects it to farms and cities from Chowchilla to the Tehachapi Mountains. Sources, speaking on the condition of anonymity because of a federal gag order, told the *San Francisco Chronicle* that the settlement between water users and

environmental groups requires that Friant Dam release between 364,000 and 462,000 acre-feet of water in normal years to help restore spring and fall salmon runs. One acre-foot is equivalent to 326,000 gallons, or roughly enough to meet the annual needs of five people.

More water should start flowing down the San Joaquin River by around 2009 and around 2013, salmon should be reintroduced after hundreds of millions of dollars are spent on channel improvements. Even in the driest of years, there will be enough water in the river to keep it wet all the way to Sacramento-San Joaquin River Delta, according to the settlement details. A new "San Joaquin River restoration" administrator would oversee the complicated work.

A draft of the proposed legislation authorizes the federal government to buy land from "willing sellers" and stipulates that all environmental laws must be complied with – a blow to some water agencies that were hoping for exemptions. Outside parties – such as the *Merced Irrigation District* – would not be allowed to sue if they were unhappy with how the settlement works. The proposed legislation also establishes a "San Joaquin River Restoration Fund," which would include California state bond money and federal funds. Friant water users would not pay any more than they already do, but a portion of payments they make under existing water contracts would be devoted to the new restoration fund.

The settlement resulted from a lawsuit filed in 1988 by environmental groups and fishing advocates. In 2004, U.S. District Judge Lawrence Karlton ruled the U.S. Bureau of Reclamation's operation of Friant Dam violated state fish and game codes because salmon had been eliminated from the San Joaquin. Environmentalists called the settlement historic, and surprisingly, farmers who use the water say they think they can stand to use less water by managing it differently. Kole Upton, a farmer and chairman of the *Friant Water Users Authority*, said the judge's decision required everyone involved to compromise. "If you have a judgment inflicted from above, you can end up feeling like the Germans after the Treaty of Versailles," he said. "The important thing here is that we now have partners in restoration and mitigation, not adversaries. That makes all the difference."

“To be able to come up with an agreement that parties on both sides can agree to is a monumental step to a healthy river,” said Grant Davis, executive director of the *San Francisco-based Bay Institute*, one of the plaintiffs in the lawsuit. “Failure would not only harm the river, it would harm the San Joaquin Valley.” Steve Chedester, executive director of *The San Joaquin River Exchange Contractors Water Authority*, said the restoration may put water down the old channel where valuable crops now grow. He said the route should be further studied, and a lot of funding will be needed if the old river is the preferred route. “Our area will be the most expensive reach to restore,” Chedester said.

A government official, also speaking on condition of anonymity, said U.S. Sen. Dianne Feinstein and Rep. George Radanovich will carry legislation forward to implement the settlement agreement. Details have yet to be worked out, the source said.

Source: Glen Martin, *San Francisco Chronicle*, 9/13/06; Michael Doyle and Mark Grossi, *The Fresno Bee*, 9/13/06; and *Greenwire*, 9/13/06

New Rules for New Jersey Rivers

Building along New Jersey rivers and streams would become significantly more difficult under sweeping new environmental regulations announced by Gov. Jon Corzine. In an effort to reduce flood risks, Corzine has proposed doubling or tripling existing no-development zones on most of the state’s waterways. Builders have long complained that the buffer zones create onerous and arbitrary restrictions, but legal efforts have failed to overturn them.

The proposed regulations by the state Department of Environmental Protection (DEP) come after three successive and devastating floods along the Delaware River. The rules would increase buffers to 50 feet, 150 feet or 300 feet, on 80% of the state’s rivers and streams. The other 20% – previously dubbed the most pristine – are already protected by 300-foot buffers. The proposal was welcomed by environmentalists but is sure to anger builders and property owners, who would be unable to build on the property and not necessarily be eligible for any compensation.

Corzine also proposed, for the first time, requiring property owners in flood-prone areas to sell their houses to the state if the structures are repeatedly and seriously damaged. And he said that “ancient” Delaware River floodplain maps would be updated for the first time in 30 years, introducing the possibility that riverside homeowners could be required to buy flood insurance.

“We won’t ever stop floods from happening, but we can mitigate their impact,” Corzine said at a Trenton news conference with DEP Commissioner Lisa Jackson. “We think we can make a big difference in certain areas.” Experts consider the protection of floodplains and the swampy bogs around rivers from overdevelopment a key strategy in reducing flood damage, because they provide natural absorption of flood waters. Environmentalists have argued that flooding along the Delaware, most recently in late June, was greatly worsened by upstream development that increased rainwater runoff. In three successive years, roiling Delaware waters crested above the so-called 100-year flood mark.

A study released in August by the New Jersey Flood Mitigation Task Force – a group of local politicians, flood experts and environmentalists assembled after the first two floods – recommended better protection of the floodplain and restrictions on building. The report, while blaming the recent floods on unseasonably high rainfall, said better planning for development and protection of the floodplain could “significantly reduce economic loss.” “These buffers will allow nature to do what nature should do, which is act like a sponge,” said David Pringle of the *New Jersey Environmental Foundation*. “We can’t control how much rain falls from the sky, but we can let Mother Nature take its course.” Jeff Tittel, director of the state *Sierra Club* chapter, said his organization has been fighting to rework flood maps since the 1980s. “People are building in flood-prone areas and they don’t even realize it,” he said. The new maps, combined with expanded buffer zones, could make tens of thousands of acres newly off-limits for development, Tittel said.

Mark Mauriello, an assistant DEP commissioner, said the department was confident the rules would withstand a

legal challenge. “All streams will have their buffers doubled or tripled, so that is a big deal,” Mauriello said. “We’re basing this on the protection of these water courses, the protection of people and property, and we feel comfortable we’ve got it well justified.”

Corzine also vowed to pump more money into the state’s Blue Acres program, which was created in 1998 to buy out homeowners in flood-prone areas but has no funds left for riverine properties. The state also has begun discussions to find new open-space funds, and Corzine said he would like to give towns the right to ban rebuilding in flood-prone areas, allowing them to force homeowners to move and providing the funds to buy them out.

Source: Steve Chambers and Jeff Whelan, *Newark Star Ledger*, 8/23/06

Wyoming Sues EPA Over Montana Water Quality Regulations

Seeking to protect natural gas production in the coalbed methane (CBM) region of the state, Wyoming filed a federal lawsuit in early September against the U.S. EPA seeking to force the agency to reject Montana water quality regulations. Wyoming Gov. Dave Freudenthal said the Montana rules would impose a water quality standard on the Powder River, Little Powder River and Tongue River below the naturally occurring water quality of these rivers for much of any given year. The rules are “unacceptable to Wyoming and are a direct threat to Wyoming’s CBM industry,” he said.

Freudenthal said he’s hopeful the EPA will follow through on earlier indications that it would help resolve the dispute between the two states. He said Wyoming remains committed to finding a solution that allows continued gas production while maintaining existing water quality in the river drainages involved. But he said Montana’s proposed rules “do not even come close to achieving that result.”

Richard Opper, director of the Montana Department of Environmental Quality, said that he hadn’t seen Wyoming’s court filing and couldn’t comment on it specifically. “Obviously, Montana looks at this issue a little differently than our neighbors to the south,” Opper said. “We’d like to work this out in venues other than the court, but

it doesn't look like that is going to happen now." Opper said Montana's intention is to protect irrigation and other long-standing uses of the Powder River.

Gas producers pump water from the ground during the production of CBM, and much of that is allowed to flow into rivers and streambeds. "The nondegradation standard that our board passed in 2006 is designed to protect an increment of high quality water in the river," Opper said. He noted that the Tongue River becomes saltier as it goes downstream to the north. "Our concern is that meeting the water quality standards at the border may not be good enough to protect beneficial uses downstream," he said.

Freudenthal in April wrote to the EPA asking the agency to reject the Montana regulations. But Wyoming Attorney General Pat Crank said EPA failed either to reject or approve Montana's proposed regulations within specified periods after it received them this year. The state's lawsuit, assigned to U.S. District Judge William F. Downes in Casper, asks the federal court to review EPA's failure to disapprove Montana's regulations on time.

"If EPA were to adopt these standards, that we feel are not scientifically based or necessary, they could have an effect on our (pollution discharge) permits that we issue here in Wyoming, to discharge water during CBM operations," Crank said. "We feel it's a Wyoming issue, and important to Wyoming, and we would like to have a judge in Wyoming decide the question," he said.

Sources: *AP/Billings Gazette*, 9/12/06; and *Greenwire*, 9/12/06

EPA Mercury Standards Tied to Fish Tissue Concentrations

States regulating mercury discharges to lakes and streams would base water quality criteria on concentrations of the toxic metal detected in fish tissue instead of in the water itself under a new U.S. EPA proposal. Draft guidance is aimed at reconciling what for many states has been a two-tiered system for regulating mercury – with a set of water samples to assess a waterbody's health and a set of tissue

samples to set human health standards for fish consumption.

EPA released the draft in mid August, about five years after setting new water quality criteria for methylmercury, the poisonous form of elemental mercury that accumulates in water and aquatic organisms. The draft "marks EPA's first issuance of a water quality criterion expressed as a fish and shellfish tissue value rather than as an ambient water quality value," the agency said. The proposal is open for public comment until Oct. 11.

John Wathen, assistant chief of standards and health protection for EPA's water office, said the guidance should help states overcome the problem of measuring tiny concentrations of mercury in water. "In many places, you have mercury appearing in fish tissue that's many, many times higher than what is occurring in the water column," Wathen said in an interview. "This is an attempt to cut to the chase and get the meaningful number that relates to human health, and that is methylmercury."

Rather than handing new mandates to the states, Wathen described the guidance as "a cookbook" to guide states on how to better get a handle on mercury concentrations. But while few states appear to have carefully reviewed the new draft guidance, regulators from at least one state with a history of mercury problems said they do not like the proposal. Dugan Sabins, a senior scientist with the Louisiana Department of Environmental Quality (DEQ), said the state has a proven method for measuring mercury in water, and DEQ regulators would prefer not to switch to a new, more complicated approach.

"There may be some relevance for doing this in some other states, but we've adopted a very solid water quality criterion and we've had it in our standards for many years," Sabins said. "In so far as we can tell, our method works fine," Sabins added, noting that Louisiana regulators can detect mercury in parts per billion and even lower using "clean metals technology." At the same time, Sabins said Louisiana has "a very active and long-term fish tissue sampling assessment and advisory program" that has served the state well. "It's based on real epidemiological surveys and known health impacts," he said.

High concentrations of mercury can lead to a waterway being designated "impaired" for fishing, swimming or other human contact. Under the Clean Water Act, waters designated as impaired are subject to "total maximum daily load" requirements, which target pollutants from both point and non-point sources. The new guidance could also have implications for how states regulate industrial plants, sewage treatment plants and chlor-alkali plants that discharge mercury. Such facilities are required to obtain permits under the National Pollution Discharge Elimination System, or NPDES, program.

"Not all of the mercury that comes into a waterbody is coming from a point-source discharge, so they obviously can't be held accountable for that which they did not contribute" EPA's Wathen noted. In fact, scientists believe the dominant domestic source of waterborne mercury pollution is power plants, which emit mercury not directly to water but into the air. Airborne mercury binds itself to rainwater molecules and returns to earth, where it accumulates in lakes and streams. After undergoing a chemical change called methylation, mercury can be absorbed by organisms and travel up the food chain to fish, shellfish and other wildlife.

People who eat mercury-contaminated fish face a higher risk of health problems as the metal accumulates in the bloodstream, EPA says. Children and pregnant women are especially cautioned against eating mercury-contaminated fish due to the metal's known links to neurological and developmental problems.

Government and industry have been working since the 1990s to try to reduce mercury emissions, both to air and water, with improved pollution controls. Since passage of the 1990 Clean Air Act amendments, EPA estimates that man-made mercury emissions have dropped by more than 45%.

New federal rules will require a 70% reduction in mercury from coal-fired power plants over the next several decades, according to EPA projections. Some states have gone even farther, calling for 90% reductions in less than 10 years. But despite the improvements, mercury remains a major pollution problem with widespread health implications. According to EPA, in 2004 mercury-related

fish consumption advisories covered 13.2 million lake acres and 765,000 river miles in 44 states.

Source: Daniel Cusick, *Greenwire*, 8/15/06

Air Pollution Contaminating Fish in Voyageurs National Park, MN

High mercury concentrations in fish native to Minnesota's Voyageurs National Park are largely attributable to man-made sources such as coal-fired power plants and do not occur naturally, a new University of Wisconsin-LaCrosse (UWL) study has found. Using soil core samples and other methods, UWL researchers found that "geologic sources of mercury were small, based on analyses of underlying bedrock and C-horizon soils" in the national park area, which abuts the Canadian border in northern Minnesota. By contrast, "nearly all mercury in the O- and A-horizon soils was derived from atmospheric deposition," meaning the heavy metal was introduced to the ecosystem from outside sources.



Voyageurs National Park, MN (National Park Service Photo)

James Wiener, the study's lead author and a senior biologist at UWL's *River Studies Center*, said the study found that 63% of the mercury deposited over the Voyageurs National Park study area between 1990 and 1996 came from anthropogenic sources like coal-fired power plants and waste incinerators. "The bottom line is that local [emissions] sources are important," Wiener said. While the paper's results were not "earthshaking, we did nail down some things in a definitive fashion," he said. Most important, he said, is the general finding that local and regional sources of mercury contributed more to Voyageurs' contamination than geologic sources or "global sources," pollution that travels over great distances on air currents.

The Bush administration has argued that a significant portion of the nation's mercury contamination problem is linked to global sources, such as coal-fired plants in developing countries like China and India. Scientists have long known that mercury from anthropogenic sources like coal-fired plants and waste incinerators contribute to elevated mercury levels in fish.

The closest coal-fired power plant to Voyageurs National Park is roughly 100 miles south, but the region's prevailing winds come from the southeast and carry pollution from as far away as northern Indiana, Illinois, and eastern Wisconsin said Larry Kallemeyn, a U.S. Geological Survey scientist who has studied pollution problems in Voyageurs. Kallemeyn was not directly involved in the UWL study, though he said it is the latest in a series of examinations of mercury contamination in the area. Voyageurs National Park encompasses 26 freshwater lakes and is one of the Upper Midwest's prized fishing grounds for species like walleye and northern pike.

Despite its remoteness from big cities and industrial plants, Voyageurs has recorded some of the highest concentrations of mercury in fish tissue in Minnesota, where the problem is widespread. Public health officials have issued fish consumption advisories for all of Voyageurs lakes, he said, which has dampened the

region's tourism-based economy.

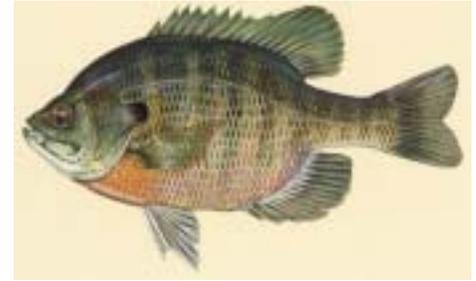
Kallemeyn said, however, that the region appears to be faring better as power plants begin installing mercury-control devices on their boilers. But he added, "There's already enough [mercury] in the system that the methylation process is ticking along quite well."

Source: Daniel Cusick, *Greenwire*, 9/7/06

Bluegill Used to Detect Possible Terrorist Attack

Taking a step beyond the canary in the coal mine, a California company has developed a system that utilizes bluegill fish to guard drinking water from possible terrorist attacks. *Intelligent Automation*

Corp. (IAC) has developed a suitcase-sized aquarium containing eight bluegill that when hooked up to the water supply of a river or reservoir can detect potentially lethal waterborne dangers.



Bluegill

The system works using a computer model that studies the bluegill's movements to determine if there is a contaminant in the water. By measuring the bluegill's motion, ventilation rates and average depth or cough rate, the sensors can extrapolate if there is a contaminant in the water. According to IAC, bluegills are particularly sensitive to a wide range of chemicals and offer a fast, reliable detection of toxic water conditions.

Combined with normal water-testing equipment, the system can remotely alert authorities to any toxins that may be in the water. "There's no man-made sensor, so I'm told by the Army scientists, that can detect toxicity, which is why the fish are great," said IAC Vice President Bill Lawler. Authorities in New York and San Francisco have already purchased the system, which starts at \$45,000.

Sources: Justin Cole, *Agence France-Presse*, 8/27/06; and *Greenwire*, 8/29/06

Effluents in Creeks Causing Sexual Deformities in Fish

Effluents from sewage treatment plants have now been found to cause sexual deformities in fish in widely separated localities across the country. Recent studies in creeks near Boulder and Denver, Colorado detected the problem in suckers, while studies in the East have found similar problems in smallmouth and largemouth bass across Virginia and Maryland, including in the Potomac River.

At the University of Colorado (CU) in Boulder a new study found strangely sexed sucker fish having both male and female organs, and others with sexual deformities in area creeks. "It's sort of a

sentinel for us,” said David Norris, a CU biologist and an author of the report. “Every major city in the Western U.S. is looking at it.” The paper, published in September in the journal *Comparative Biochemistry and Physiology*, is the first peer-reviewed study documenting the reproductive problems of fish downstream from Colorado wastewater-treatment plants.

Meanwhile in the East, U.S. Geological Survey (USGS) officials say that smallmouth and largemouth bass possessing both male and female characteristics are present in the Potomac River and its tributaries across Maryland and Virginia. Male fish with the capability to develop immature eggs inside their sex organs were first found in a West Virginia stream in 2003, and then in 2004, more abnormal bass were found in a section of the upper Potomac in Sharpsburg, MD. USGS fish pathologist Vicki Blazer said that tests carried out by her agency on smallmouth bass in the Shenandoah River in Virginia and in the Monocacy River in Maryland – both of which feed the Potomac – concluded that more than 80% of all the male bass were growing eggs. She said the intersex condition does not change the fish’s outward appearance, but it can be detected under a microscope. “There is this sort of widespread endocrine disruption in the Potomac, but we don’t know still what are the causes,” she said.

Skeptics have argued that any number of pollution sources – even natural effects – could be the cause. But CU scientists now say they’ve confirmed that wastewater effluent is to blame. Healthy male minnows placed in diluted effluent from Boulder’s treatment plant stopped making sperm within two weeks, said Alan Vajda, a CU research associate and another author of the new report. The new results raise concern about whether the stuff people dump down drains – from urine to cleaning products to cosmetics and medicines – can alter the hormonal systems of other animals, researchers said.

Many cities and towns pull drinking water from creeks downstream of wastewater-treatment plants. But there is no evidence yet that the so-called endocrine-disrupting chemicals found in wastewater are concentrated enough to cause significant problems in people, Norris said. People are bigger than fish, he said,

and don’t live in water. Research on the fish carried out at West Virginia University, including tests examining whether human cells exposed to water or mud from the Potomac react as if estrogen or estrogen mimics are present, has not reached any solid conclusions.

The problem is, that sewage effluent is not the only source of this type of chemical, Norris said. “It’s in our food, it’s in our plastics, it’s in pesticides. ... We’re being bombarded all the time.” People eating fish probably aren’t at risk of harmful exposure, said Larry Barber, a researcher with the USGS in Boulder. Endocrine-disrupting chemicals are at low levels in sucker fillets, Barber said. Patti Tyler, science adviser for the U.S. EPA’s Denver office, also said, “We’re still not clear about ... whether exposure to these compounds has effects on humans.”

Pollutants that mimic hormones have emerged as a worldwide concern in the past decade, blamed for problems in animals as diverse as alligators, minnows and polar bears. Although scientists say the research is in its infancy, they have identified a large array of pollutants that might affect animals, including human estrogen from processed sewage, animal estrogen from farm manure, some pesticides and additives to soap. Blazer said water tests in the upper Potomac have detected low levels of a few known endocrine disruptors. But she said none of them has been pinpointed as a cause for the intersex condition, and the problem might be several pollutants acting in combination.

Also unclear is the effect on the Potomac’s bass population. There have been several bad spawning years in the past decade, scientists said, and several large die-offs of smallmouth bass in the Shenandoah in recent years. But neither has been conclusively linked to the intersex problem.

The CU research team has been given about \$800,000 in EPA grants to continue investigating the strange fish maladies downstream from state wastewater-treatment plants, Vajda said. Other EPA offices are also funding similar work around the country on endocrine-disrupting chemicals in waterways, Tyler said. Also, the EPA has recommended limits for some of the chemicals, such as the nonylphenols found in cleaning products.

In 1996, Congress required the U.S. EPA to help answer questions on the issue by developing a screening program to identify which chemicals are endocrine disruptors. Ten years later, the agency hasn’t tested a single chemical, officials said. Environmental groups have accused the EPA of proceeding too slowly. But agency officials have defended their efforts by saying the research has been more complex than expected. “I would have hoped it would have been faster, but this is a very difficult program,” said Clifford Gabriel, director of the EPA’s Office of Science Coordination and Policy. “We want to make sure we get the science right.”

Sources: Katy Human, *Denver Post*, 9/6/06; David A. Fahrenthold, *Washington Post*, 9/6/06; and *Greenwire*, 9/6 and 9/7/06

Scrapping CRP Would Carry \$33B Price Tag

Federal taxpayers would spend almost \$33 billion more on farm programs over the next eight years if farmers planted crops on land enrolled in the Conservation Reserve Program (CRP), according to a report released in early September. University of Tennessee researchers predicted that if land enrolled in CRP – which pays farmers to idle land – was put back in production, the influx of corn, soybeans and wheat would cause a drop in prices and bring on a 34% increase in other federal support for marketing loans and counter-cyclical payments.

“While CRP was not primarily designed to be a supply management program, it clearly has an impact on supply and thus crop prices,” the report states. In total, the researchers estimated the \$12 billion on rental payments the Agriculture Department could save by eliminating CRP would be dwarfed by the extra \$45 billion it would dole out in program support payments, for a net increase of \$32.6 billion in federal spending.

The report comes as some farm groups have proposed eliminating or reducing CRP to grow more corn for ethanol. USDA’s chief economist predicted in September that farmers would need to plant 10 million more acres of corn by 2010 to meet the ethanol demand, much of which he said could come from land idled under CRP. And the chairman of the

House Agriculture Committee's conservation panel, Rep. Frank Lucas (R/OK), has targeted CRP as one of the programs ripe for revision in the next farm bill, saying he would consider whether some of the CRP enrollments due to expire in the next several years should be returned to productive use.

About 35 million acres of farmland are enrolled in CRP, the farm bill conservation title's biggest program. The program was first created 20 years ago, with the goal of reducing erosion on cropland.

Landowners sign 10 to 15 year contracts and agree to idle lands for certain conservation uses. In exchange, the government doles out rental payments for the land, as well as cost-share payments for vegetative restoration.

In recent years, the CRP has become more controversial, as some farmers and rural groups with high enrollment in their regions contend it has been devastating to their communities, taking land out of production and sometimes giving payments to absentee landlords. But wildlife groups have hailed the 20-year-old program for restoring wetland and wildlife habitat. CRP lands produce 15 million pheasants and support 2.2 million ducks per year, according to the *Theodore Roosevelt Conservation Partnership* (TRCP).

"CRP is one of the most effective programs for promoting wildlife populations that this country has ever seen," said TRCP President Matthew Connolly Jr. The groups hailed the study yesterday as evidence that CRP enrollment should be increased, not lowered. The study estimated that increasing CRP enrollment to its statutory cap of 39.2 million acres by 2015 would raise net farm income by \$600 million.

Source: Allison A. Freeman, *Greenwire*, 9/8/06

Bush Administration's Grade on the Environment Falls

More Americans than ever disapprove of the Bush Administration's handling of the environment, according to a *Los Angeles Times/Bloomberg* poll released on August 4. Fifty-six percent of respondents in the national poll said the Bush Administration was doing too little to protect the environment. The negative rating was up consid-

erably from *The Times'* last major survey on the environment, in 2001, when 41% said he wasn't doing enough. Respondent Lisa Brutvan, 42, a real estate consultant from Atlanta who is not registered with any political party, said she voted for Bush because of his stance on terrorism. "I knew in making that decision that I was making a choice against the environment. I figured that for eight years we could survive it," she said. "But I think it's reaching a little bit more of a critical mass. At some point you've just got to look at things realistically and realize we're not leaving much of a legacy for our grandchildren if we don't address these issues," she said. She faulted Bush's position on global warming in particular. Nevertheless, most people share the president's preference for investment in new technologies over mandatory caps on greenhouse gas emissions.

The survey of 1,478 adults, conducted over five days, revealed a growing awareness of global warming. More than seven in 10 said it was a serious problem, and 58% said the Bush Administration was doing too little to reduce it. Three-quarters said they had cut back on household spending or taken steps to conserve energy in response to rising energy costs. Forty-five percent said they approved of oil drilling in the Arctic National Wildlife Refuge in Alaska; 51% opposed it.

Less than 10% said the government should mandate stricter mileage standards to reduce reliance on foreign oil, whereas 52% said the government should invest in alternative energy sources such as wind and solar power. An additional 3% volunteered that the government should take both those measures and more. And to cut carbon dioxide emissions linked to global warming, 56% favored market incentives to develop new technology, compared with 11% in favor of capping emissions from vehicles and businesses; 12% volunteered that the government should do both, and 15% said the government did not need to do anything more.

The survey also asked about nuclear power, with 61% saying they would support increased use of such energy "in order to prevent global warming."

Although the public agrees with the administration on some points, in general

Americans say they want more action on environmental problems. By a margin of more than 2 to 1, they also say congressional Democrats do a better job on the environment than Republicans. A strong partisan divide, as well as a regional divide, marked people's assessments. The president got his worst marks in the West and East, where slightly less than a third approve of his handling of environmental issues. He got his best score in the South, where 54% approve. Most Republicans, 74%, backed him on the environment, compared with 18% of Democrats. "I think he's done an extremely poor job," said Democrat Herb Alston, 43, a real estate agent in San Francisco, complaining that Bush's appointees to agencies responsible for the environment had been too closely linked to business.

Three-fourths of respondents said they believed business would "cut corners and damage the environment" without strong government regulation. Fifty-seven percent of respondents – including two-thirds of Westerners – said that if improving the environment conflicted with economic growth, the environment should take priority. Twenty percent said environmental standards should be relaxed to allow more gas and oil drilling to lessen the nation's reliance on foreign oil. But in the West, where the Bush Administration has moved aggressively to expedite energy production on public land, half that proportion favored looser drilling regulations.

Although the Bush Administration has advocated increased access for snowmobiles and other forms of motorized recreation in national parks such as Yellowstone, a substantial majority opposes such measures. In the West, home to many of the nation's most popular parks, 80% called for limiting access to snowmobiles and all-terrain vehicles to protect natural habitat and wildlife. Nationally, the figure was 77%. "I'm not a huge fan of snowmobiles," said Democrat Dasal Ridgley, 26, a student from Iowa City, IA. "It gives people easier access, but it also destroys the land."

But support has risen 11 percentage points since 2001 for another Bush initiative: opening the Alaska wildlife refuge to oil drilling. "It can be drilled with minimal environmental harm," said Republican Bill Leslie, 65, a retired motion picture producer who lives in Dallas. He has a brother who supplies inspection and

safety equipment to the Alaskan oil industry. "There's always a risk when you drill," Leslie said. "But there's a lot of stuff in place that keeps the spillage from seeping into the ground.... It's not something where you find hundreds of moose running into sludge."

On the whole, Americans exhibited a strong environmental bent in the *Times/Bloomberg* poll, which was conducted under the supervision of *Times* Polling Director Susan Pinkus and had a margin of sampling error of plus or minus 3 percentage points.

Sources: Bettina Boxall, *Los Angeles Times*, 8/4/06; and *Greenwire*, 8/4/06

ACA Recommended Water Trails for 2006

Pamela Dillon, Executive Director of the American Canoe Association (ACA), announced on September 13 the selection of twelve water trails from around the U.S. as "ACA-Recommended



Water Trails" for 2006. "Today, more and more Americans are looking for great ways to enjoy the outdoors. These twelve trails provide them with outstanding recreational paddling opportunities, and give them the tools they need to enjoy themselves safely and with minimal impact on our natural environment," Dillon said in announcing the trail selections. ACA President Kirk Havens added that "traveling by water is one of the great American experiences. These water trails provide a wonderful, natural experience to both families and the solo paddler."

ACA-Recommended Water Trails must meet the following criteria and stand out as particularly good destinations for paddlers:

- The trail must be a contiguous or semi-contiguous waterway or series of waterways that is open to recreational use by paddlers;
- The trail must have public access points for paddlers;
- The trail must be covered by a map, guide, signage or a website that is of

reasonable quality and detail and available to the public.

- Published or printed materials for the trail (e.g. guidebook, map, signs, website) must communicate low-impact ethics to trail users; and
- The trail must be supported and/or managed by one or more organizations.

ACA-Recommended Water Trails earn the right to use a special ACA logo in maps, signs and other printed material related to the trail. This year's selections join twelve other outstanding trails selected as ACA-Recommended Trails in 2005.

The 2006 list of ACA Recommended Water Trails includes the following:

- Apalachicola Paddling Trail System – Florida Panhandle
- Blackwater National Wildlife Refuge Paddling Trails – Maryland's Eastern Shore
- Conodoguinet Creek Water Trail – Southern Pennsylvania
- Hudson River Water Trail – Eastern New York
- Lower Mattaponi and Pamunkey Canoe Trail – Eastern Virginia
- Middle Allegheny River Water Trail – Northwest Pennsylvania
- Milwaukee Urban Water Trail – South-east Wisconsin
- Muskingum River Water Trail – South-east Ohio
- Ohio River Water Trail - Markland Pool Section – Southwest Ohio/Northern Kentucky
- Potomac River Water Trail – Maryland, Virginia and West Virginia
- Tilghman Island Water Trail – Chesapeake Bay, Maryland
- Willamette River Water Trail – Western Oregon

The 2005 list of ACA recommended water trails include the following:

- Bartram Canoe Trails — Alabama
- Big Bend Saltwater Paddling Trail — Florida
- Cascadia Marine Trail — Washington
- French Broad River Blueway — Tennessee
- Janes Island Water Trail — Maryland
- Lake Superior Water Trail — Minnesota
- Lake Tahoe Water Trail — California and Nevada
- Maine Island Trail — Maine
- Northern Forest Canoe Trail — New York, Vermont, New Hampshire, Maine and Quebec
- Schuylkill River Water Trail — Eastern Pennsylvania.

- Susquehanna Water Trail — New York, Pennsylvania and Maryland. .
- Thousand Islands Water Trail — Ontario, Canada

The ACA is the nation's largest and oldest paddlesports membership association. First formed in 1880 on the shores of Lake George, NY, the ACA provides paddlesport education, supports paddlesports recreation programs, and advocates for sound stewardship of our nation's waterways. The Association's interest in water trails can be traced to its founders, who cited "the exploration, creation and preservation of water trails for recreational use by Americans of all ages" as a key reason for the creation of the ACA. The ACA's website features the most comprehensive on-line database of water trails on the web. It can be found at: <http://www.americancanoe.org/recreation/watertrails.lasso>. Short descriptions of each trail can be found on the website.

Source: American Canoe Association, 7432 Alban Station Blvd. Suite B-232, Springfield, VA 22150-2311, www.americancanoe.org

Climate Change Update

The period from January to July 2006 was the hottest such period in the U.S. since government record keeping began in 1895. And July was the hottest month in the U.S. in 70 years and the second-hottest month on record, according to National Climatic Data Center (NCDC) statistics released in August. The contiguous 48 states had an average July temperature of 77.2 °F, well above the monthly average of 74.3 and just short of July 1936's record of 77.5. July also set more than 2,300 records for daily high temperatures, mostly in the Midwest and West, as well as 3,200 records for high nighttime temperatures.

The report said that residential customers used 22% more electricity than they would have if July temperatures had been closer to average. NCDC Climate Monitoring Bureau head Jay Lawrimore said the weather was consistent with global warming models. "The bottom line is we expect this to occur more frequently in the future, so I think people need to get used to it," he said.

The July "heat storm" in California not only saw record energy use but also claimed the lives of 138 people. While the

power system held up “surprisingly well,” California Energy Commission deputy director Scott Matthews said, “we as a state were not prepared for the heat-related deaths.” Such events might well become more common as a result of global climate change, said Dan Cayan of the *Scripps Institution of Oceanography*. “In 20 years or so, we will see two to three times as many heat waves as we’ve seen historically,” Cayan said. “You’ll never see the term ‘heat storm’ in meteorology,” said Byron Marler, a meteorologist for *Pacific Gas & Electric*. “But it affects utilities just like a wind storm or a winter storm.” Among a plethora of statistics set out in a discussion of weather/energy interactions, Marler called this summer’s event “the longest, hottest heat storm” ever recorded in the state.

Meanwhile, greenhouse gas (GHG) emissions from the world’s leading industrialized nations were at their highest levels in 10 years in 2004, according to a survey of U.N. Climate Secretariat data compiled by *Reuters* and released on August 31. Most of the 2004 rise was caused by a 1.7% gain in emissions in the U.S. to a record 7.07 billion metric tons. Emissions also rose in Europe and Canada, but they dipped in Japan. Overall, emissions from 40 industrialized nations climbed 1.6% to 17.8 billion metric tons of carbon dioxide (CO₂) in 2004 despite surges in oil prices. Power plants, factories and cars were identified as the chief causes of the rise.

A core of 800,000-year-old ice from the Antarctic shows evidence that human activity has increased CO₂ concentrations with unprecedented speed, scientists on a 10-nation project told British Association for the Advancement of Science (BAAS) delegates in early September. Bubbles of air trapped in the core show that while CO₂ levels change with the climate, present levels are outside previous ranges. “It is from air bubbles that we know for sure that CO₂ has increased by about 35% in the last 200 years,” said Eric Wolff of the British Antarctic Survey (BAS) and the 10-nation *European Project for Ice Coring in Antarctica*. “Before the last 200 years, which man has been influencing, it was pretty steady.” CO₂ levels over most of the past 800,000 years have been 180-300 parts per million by volume (ppmv) of air,

Wolff said. Today, concentrations are at 380 ppmv. “The most scary thing is that CO₂ today is not just out of the range of what happened in the last 650,000 years but already up 100% out of the range,” Wolff said.



The rise in sea level caused by climate change is also increasing faster than U.N. scientists predicted five years ago, the BAS director said in mid September. The U.N. Intergovernmental Panel on Climate Change (IPCC) in 2001 estimated sea levels would rise between nine and 88 centimeters by the end of the century, with a best guess of about 50 cm. BAS Director Chris Rapley cited a number of studies published this year, including two U.S. studies released in mid September that showed Arctic winter sea ice melt has accelerated in the past two years, removing an area the size of Turkey in just 12 months. Ice from Greenland’s vast sheet is melting at a rate 250% higher than it was two years ago, according to a study published in a mid September issue of the journal *Nature*. The research used data from NASA’s two GRACE satellites. Greenland ice is melting at a rate of about 248 cubic kilometers per year, the equivalent of a sea level rise of about 0.5 millimeters per year. Greenland’s contribution to rising sea levels is almost 0.7 mm per year when other factors like glacier melt are taken into account. IPCC estimates in 2001 put Greenland’s contribution at about 0.5 mm.

European scientists released satellite images in mid September that showed Arctic ice cover receding to the point that a ship could sail from the Norwegian island of Svalbard to the North Pole unimpeded. The images, taken Aug. 23-25 by the European Space Agency (ESA), showed

sea ice normally present year-round had disappeared from an area larger than the British Isles. “This situation is unlike anything observed in previous record low-ice seasons,” said ESA’s Mark Drinkwater.

Climate change is also driving glaciers along the Andes Mountains to melt and weather in the Caribbean to grow more erratic and dangerous, according to a new report. Andean glaciers are melting and could disappear within 15-25 years. Some glaciers in Colombia are now less than 20% of the mass recorded in 1850 and Ecuador could lose half its most important glaciers within 20 years. The Chacaltaya glacier in Bolivia, the source of fresh water for the cities of La Paz and El Alto, is expected to completely melt within 15 years if present trends continue. A report by 20 environmental and development groups based in the United Kingdom that drew on national scientific assessments predicted the melting glaciers would cause flooding before the glaciers completely disappeared, after which tropic zones near the mountains would start to disappear. The drastic melt would force people to farm at higher altitudes to grow their crops, adding to deforestation, which in turn undermines water sources and leads to soil erosion. The report said the shrinking glaciers will also leave Caribbean and Latin American nations facing greater threats of catastrophic weather, as evident by last year’s hurricane season. Glaciers, which store about 70% of the world’s fresh water, are also melting faster than previously measured in the Alps and the Himalayas. Researchers predict the snow on Africa’s Mount Kilimanjaro will be gone within 14 years.

Southeastern Alaska glaciers are also shrinking twice as fast as scientists had previously estimated, according to a study undergoing peer-review and intended for publication in the *Journal of Geophysical Research*. The study used NASA topographic mapping technology to conclude that between 1948 and 2000, the glaciers of Southeast Alaska lost an average of 14.6 cubic kilometers of ice per year, raising global sea levels by 2.4 mm. Study co-author Roman Motyka said that a previous 2002 study profiling ice loss at 12 glaciers in Southeast Alaska significantly underestimated regional ice loss. “The repercussions of this are very scary,” said *Scripps Institution of Oceanography*’s Tim Barnett. “When the glaciers are gone, they are gone.... There’s no way to replace it until the next ice age.”

Skiing in Aspen, Colo., could also be nonexistent by 2100 as Colorado's central mountains become 6-14 degrees hotter, according to new projections from the *Aspen Global Change Institute*. The institute took three widely accepted scenarios for global change: one assuming humans will be able to decrease GHG emissions; one assuming pollution will climb along with industrialization; and one falling between the two extremes. The three models produce the estimated 6-14 degree rise in annual average temperature, which researchers said would force plants and animals to higher elevations or extinction, make trees more susceptible to insect outbreaks and wildfires, and decrease streamflows in summer and fall. Skiing conditions would worsen as peak snowpack could occur in early February rather than March, and more precipitation would fall as rain rather than snow. Warm temperatures and competition for water precludes artificial snowmaking as a solution. "By 2100, there will be no consistent winter snowpack at the base of the ski areas except possibly under the lowest GHG concentrations scenario," the study said.

Rising ocean temperatures in areas where hurricanes form are likely a result of global warming caused by GHG emissions, according to a study released in mid September. The new research should "close the loop" on an ongoing debate over the causes of an increase in the overall intensity of hurricanes in recent years, said Tom Wigley, an author of the study and a senior scientist at the *National Center for Atmospheric Research* in Boulder, CO. Using 22 different climate models, Wigley and his co-authors – 18 authors spanning 10 research centers – analyzed changes in sea surface temperature recorded between 1906 and 2005. After examining several factors known to influence hurricane formation and strength, researchers concluded there is an 84% chance that human-induced factors – largely GHG emissions – are the driving force behind increasingly intense storms. The study is the first to focus on conditions in areas of the Atlantic and Pacific oceans that serve as breeding grounds for most hurricanes.

Dramatic changes to the normally stable North Atlantic currents could also occur if freshwater from shrinking ice sheets and melting glaciers continues to pour into high-latitude oceans, causing the waters to become less salty. Normally, cold water

from the Arctic is exchanged for warm water from the tropics in a self-propelling cycle. When the warm water arrives in the north via surface currents (i.e. the Gulf Stream) the cold water sinks and flows back to warmer climes through the deep ocean. Because fresher, less salty water is less dense, it does not sink as far as salty water would at the same temperature. If the trend continues, then changes to the climate system may be significant, *Marine Biological Laboratory* scientist and review lead author Bruce Peterson said in the journal *Science*. "It is expected that the North Atlantic circulation will slow down," he said. But more research is needed to ensure that rising global temperatures are to blame for the condition, the authors said. "For the last 50 years, oceanographers have been cruising seas at northern latitudes taking vertical profiles of salinity, and they have observed gradual declines," Peterson said. "The salt water, although still very salty, is getting fresher." It is not yet possible to be sure to what extent global warming can be blamed for the changes, say the authors. "I suspect parts of it are due to global warming. It's a difficult quandary," said Professor Peterson.

If salt levels continue to decline, and currents change, the implications for aquatic ecosystems would be dramatic. "The organisms in the oceans are affected by the distribution of sea ice, and by temperatures and salinity fields, and all of these would change," the author explained. "Changes in these currents would have tremendous impact for fisheries and other species important to man." For example, a warm-water Atlantic triple fin fish is now being caught off the coast of Britain, an area where it has never been seen before, an event experts are citing as evidence of species migrating north in response to rising global temperatures. The triple fin fish is usually caught off the coasts of Africa, South America and the Mediterranean, not the Bristol Channel where it was found this summer, expert Julian Carter said. Also, in August, a fisher off the northeast coast of England caught a swordfish, far from its native Mediterranean waters. And in July, scientists spotted a shoal of sunfish off the coast of southwest Britain, rather than in its normal habitat in the equatorial Atlantic. They speculated the sunfish followed its food, jellyfish, into British waters.

Another concern related to global warming is the fact that ocean plankton are absorbing less carbon dioxide (CO₂) than previously thought, according to a study published in the August 31 issue of the journal *Nature*. The tiny ocean plants are absorbing 2 billion tons of CO₂ less than earlier estimations because their growth is being limited by a lack of iron, which provides nutrients for the microbes. Original estimates calculated that phytoplankton absorbed about 50 billion tons of CO₂. The new estimation could mean that up to 4% less CO₂ is being sequestered globally, Oregon State University scientist and the study's lead author, Michael Behrenfeld, said. Behrenfeld's team identified three large areas of the Pacific Ocean where plankton appeared to be suffering from a lack of iron: the southern ocean around Antarctica, the sub-arctic north below Alaska and a vast area in the tropical Pacific centered on the equator.

Also, methane – a GHG 23 times more powerful than CO₂ – is being released from permafrost at a rate five times faster than thought, according to a study in an early September issue of the journal *Nature*. The findings are based on new, more accurate measuring techniques. "The effects can be huge," said lead author Katey Walter of the University of Alaska at Fairbanks. Scientists worry about a global warming vicious cycle that was not part of their already gloomy climate forecast: Warming already under way thaws permafrost – soil that has been continuously frozen for thousands of years. Thawed permafrost releases methane and CO₂. Those gases reach the atmosphere and help trap heat on Earth in the greenhouse effect. The trapped heat thaws more permafrost and so on. "The higher the temperature gets, the more permafrost we melt, the more tendency it is to become a more vicious cycle," said Chris Field, director of global ecology at the *Carnegie Institution of Washington*, who was not part of the study. "That's the thing that is scary about this whole thing. There are lots of mechanisms that tend to be self-perpetuating and relatively few that tend to shut it off." Vladimir Romanovsky, geophysics professor at the University of Alaska at Fairbanks, said he thinks the big methane or CO₂ release hasn't started yet, but it's coming. In Alaska and Canada – which have far less permafrost than Siberia – it's closer to happening, he said. Already, the Alaskan

permafrost is reaching the thawing point in many areas.

Also, methane stored within the oil deposits on the seafloor could alter current predictions for climate change, according to research published online in late August by the *Proceedings of the National Academy of Sciences*. Tessa Hill, an assistant professor of geology at University of California-Davis, documents a new source of methane gas within oil deposits that has not yet been factored into previous analyses of historic climate change. Hill and her co-authors looked at ocean sediments in the Santa Barbara Channel and measured the amount of tar left behind after methane seepage. They compared this with global temperature records, obtained by analyzing oxygen isotopes in the shells of tiny fossilized sea animals. They found that methane emissions from natural offshore petroleum sources peaked between 16,000 and 14,000 years ago, and again between 11,000 and 10,000 years ago. Both were periods when glaciers melted and the ocean became warmer. The findings are potentially troubling because methane is a far more potent GHG than CO₂. “We need to learn more about this process, about how globally widespread it is,” said Hill. “But I think we can certainly say this methane seepage out of this source clearly responds to climate warming”.

Forest fires, drought and flooding are also likely to become more common and more intense as a consequence of global warming, according to a new study by British government researchers. Moreover, if Earth’s climate warms by 3 degrees Celsius or more over the next 200 years, forests and other vegetation could begin to release more carbon than they absorb, concluded Marko Scholze and colleagues at the U.K. *Natural Environment Research Council*. To put that in perspective, Earth’s climate warmed an average of 0.6 degrees C during the past century. That rate has increased nearly threefold since 1976. Scholze and his colleagues examined 52 climate models to determine the effects of varying degrees of global warming. Among their conclusions: Warming of 2 degrees C increases the risk of forest loss by 30% in Eurasia, eastern China, Canada, Central America and Amazonia. A 3 degree C increase would bump the risk to 60%. Such forest loss would increase the chance of flooding in tropical parts of Africa and South America – but decrease

the availability of freshwater in West Africa, Central America, southern Europe and the eastern U.S. Overall, the regions most at risk are the Amazon and Arctic, the researchers found – the Amazon from drought, forest loss and wildfire, and the Arctic from forest encroachment. The study was published in mid August in the online version of *Proceedings of the National Academy of Sciences*.

Climate change could also lead to more outbreaks of bubonic plague, according to a study published in late August in the journal *Proceedings of the National Academy of Sciences*. Flies, the main transmission vectors, thrive in spring temperatures above 50 degrees followed by wet, humid summers. A warm, frost-free spring leads flies to breed earlier, which creates a larger population of insects that feed off rodents, the plague’s hosts. The study showed that a 1.8-degree increase in spring temperatures led to a 59% increase in the disease’s prevalence. “Analyses of tree-ring proxy climate data shows that conditions during the period of the Black Death (1280-1350) were both warmer and increasingly wet,” said the University of Oslo’s Nils Stenseth. “The same was true during the origin of the Third Pandemic (1855-1870) when the climate was wetter and underwent an increasingly warm trend,” he added. About 3,000 human plague cases per year are reported in Asia, Africa, South America and the U.S.

University of East Anglia professor Paul Hunter told BAAS members in early September that climate change could also cause infectious diseases to migrate and flourish in previously cold regions. Hunter cited bluetongue disease, which affects cattle, as an example of warmth-exacerbated illness in Belgium, Germany and the Netherlands. He also said the marine virus *Vibrio vulnificus*, previously existent only in the southern U.S., has infected three people in the Baltic states this year. “Although the direct threat from climate-related infectious diseases in the U.K. is likely to be limited to food and waterborne disease, mass migration of peoples displaced from developing nations that are more severely affected is likely to have a far greater impact, causing a rise in cases of diseases like tuberculosis and HIV,” he said.

Grey jaybirds are already at risk of dying out in southern Canada and parts of the U.S. because their food stocks are not

remaining frozen over the winter, according to a study published in the journal *Proceedings of the Royal Society B*. Ohio State University researcher Thomas Waite said the study illustrated an unusual case of climate change in one part of the year affecting breeding success months later. Warmer autumns in Maine, Vermont and Rocky Mountain states are hurting the birds because they nest relatively early and need stores of frozen food, kept in pine trees, to feed their young. Birds living near an extra source of food in the winter, such as a bird feeder, did better after a warm autumn than those in a remote forest. “The birds are getting less food and they may also suffer from food poisoning from eating rotten food,” Waite said. “Warm autumns are hostile to the jays because they rely on a cold climate and cold storage.”

The State of Vermont is concerned that climate change could be causing a decline in syrup production, a drop in ski resort profits and a decrease in fall foliage tourism. Consequently, state officials have taken action reduce GHGs by attempting to regulate the fuel emissions of cars sold in the state. But the *Alliance of Automobile Manufacturers* is suing the state in U.S. District Court over this attempt. Automakers contend that the state is trying to regulate fuel economy which is under federal jurisdiction. “Of concern for the eastern U.S. is the possibility that warmer coastal areas may allow hurricanes to survive longer and strengthen, thus making this region vulnerable to storms that have long been associated more with the southeast U.S.,” James Hansen, NASA climatologist said. “If such [emissions] reductions are matched by other states, they may have a snowballing feedback effect leading to similar technologies and reduced emissions being adopted by other states, and in turn such actions in the U.S. are likely to affect technologies and emissions in other countries,” he said. “If, on the contrary, such reduced emissions are not initiated in the U.S., other countries will be less disposed to initiate their own greenhouse emission reductions.” University of New Hampshire professor Barrett Rock said that Vermont’s warming has been about double the rate of regional warming both annually and during the winter.

Meanwhile, a scientist who won a Nobel Prize in 1995 for work on the ozone layer hole proposes an “escape route” to be

put into effect if global warming begins to spiral out of control. Paul Crutzen's plan, to appear in the journal *Climate Change*, advises releasing particles of sulfur into the upper atmosphere to reflect sunlight and heat back into space. The sulfur could be released using high-altitude balloons or heavy artillery shells. Such a project would cost \$25-\$50 billion for two years of sulfur launching, he said. The plan is based partly on 1991's Mount Pinatubo eruption, when thousands of tons of sulfur ejected into the atmosphere caused global temperatures to fall by 0.5 degrees Celsius on average the following year. Crutzen, of Germany's *Max Planck Institute for Chemistry*, said the "grossly disappointing" international political response to climate change makes such a contingency plan necessary. "If sizable reductions in GHG emissions will not happen and temperatures rise rapidly, then climatic engineering, as presented here, is the only option available to rapidly reduce temperature rises and counteract other climatic effects," he said. "Such a modification could also be stopped on short notice, if undesirable and unforeseen side effects become apparent, which would allow the atmosphere to return to its prior state within a few years." *National Center for Atmospheric Research* scientist Tom Wigley agreed that such a plan may be feasible.

Also, conditions deep beneath the ocean floor are ripe for the permanent storage of heat-trapping CO₂ emissions, according to research published in the *Proceedings of the National Academy of Sciences*. The new study – conducted by researchers at Harvard University, the Massachusetts Institute of Technology and Columbia University – raises the possibility of injecting the atmosphere's most abundant GHG at least 3,000 meters below sea level. At that depth, the researchers say high pressures and low temperatures are ideal for holding the CO₂. The GHG will remain below a layer of more buoyant fluid, and it also will form hydrate ice crystals that block its rise through rock pores. Ultimately, the CO₂ will dissolve over millions of years in surrounding waters. Commercial applications may be limited based on the costs of transporting the CO₂ in its liquid form from industrial sources. But the academic researchers maintain that the deep-sea floor is a potentially significant option for taking CO₂ emissions out of the atmosphere, thereby addressing what scientists say is the chief culprit causing global warming.

"The total CO₂ storage capacity within the 200-mile economic zone of the U.S. coastline is enormous, capable of storing thousands of years of current U.S. CO₂ emissions," the researchers said. Outside the U.S., the researchers said deep-sea sediments are "essentially unlimited."

Finding ways to offset global warming can be a profitable enterprise, BP's CO₂ Program Manager Charles Christopher told 32 mayors on the final day of a three-day climate change conference in Anchorage, AK. BP is creating new businesses in response to the onset of the global phenomenon, Christopher said, citing the fact that the company is the world's third-largest producer of solar cells. BP will also have two wind turbine farms and plans for more in Europe and the U.S. by 2008, he said, adding that the company will complete construction work by the end of the year on the world's first two commercial power plants that generate electricity from hydrogen. "We think [climate change] is a huge business opportunity," he said. "We're going to triple the amount of solar cells we produce in three years. Our commitment is to show that the set of technologies being used are commercially available, can be used at scale and will produce pollution-free electricity." Christopher added that BP believes global warming is real and that the transition period from fossil fuel usage to alternative and renewable energy usage will be an important economic period for the whole of the energy industry.

But a survey by the United Kingdom-based *Carbon Disclosure Project* of more than 2,100 companies on their climate change policies showed that fewer than half said they have programs to cut GHG emissions and fewer companies than last year felt climate change threatened their business. Survey conductor *Innovest Strategic Value Advisors* CEO Matthew Kiernan said he thought more companies would respond once they realized the economic benefits of having emissions plans.

On the other hand, nearly three-quarters of Americans say they are more convinced now than they were two years ago that global warming is happening, according to a *Zogby* poll released in late August. Seventy-four percent of 1,018 survey participants said they are "more convinced" or "much more convinced" that global warming is already under way. Just 22% said they were "somewhat" or

"much less convinced," while 4% said they were unsure. The results show a split down party lines. Eighty-seven percent of Democrats and 82% of independents believe that global warming is happening, compared with 56% of Republicans. A majority of those polled also said they believed global warming was at least partially responsible for specific weather events. Sixty-five percent said they believed climate change influenced heat waves this summer, while 68% said global warming is a factor in intense storms, such as Hurricane Katrina. When asked about actions to mitigate climate change, nearly three-quarters of poll participants – 72% – said major industries should be required to cut GHG emissions. The *National Wildlife Federation* sponsored the poll of likely voters, which *Zogby* conducted. The results have a margin of error of plus or minus 3.1%.

Sen. Barack Obama (D/IL) said in late August that the Bush Administration's refusal to join the Kyoto Protocol is an ecological loss for the entire world. Speaking in Nairobi, Kenya, Obama said: "My attitude is that even if the Kyoto Protocol wasn't the perfect arrangement, we should have continued to negotiate." Also in late August Pope Benedict XVI called on Christians around the world to do their part to protect the environment, saying the poor suffer the most. "Damage to the environment makes the life of the poor on Earth particularly unbearable," the pontiff said from his summer residence of Castel Gandolfo in Italy.

Meanwhile, states, environmental groups, scientists and energy companies filed their opening legal briefs with the Supreme Court in late August in a lawsuit aimed at forcing the U.S. EPA to regulate GHG emissions from motor vehicles. The High Court will hear oral arguments this term on *Massachusetts v. EPA*, concerning an appeals court decision upholding the Bush Administration's refusal to regulate CO₂ as a pollutant under the Clean Air Act. The states that brought the lawsuit include: California, Connecticut, Illinois, Maine, Massachusetts, New Jersey, New Mexico, New York, Oregon, Rhode Island, Vermont and the District of Columbia. Among other parties filing "friend of the court" briefs were energy companies *Entergy Corp.* and *Calpine*, former Secretary of State Madeleine Albright, Alaska native groups, the *Aspen Skiing Co.*, the *National Wildlife Federation*,

hunting and fishing groups, four former EPA administrators, the *National Council of Churches*, and the *U.S. Conference of Mayors*. “This case makes for strange bedfellows,” *Entergy Corp.* noted in its *amicus* brief. The power company acknowledged that it has taken a position that is “atypical of an industry largely opposed to CO₂ regulation” but said it believes EPA’s position on the regulation question will not stand the test of time. “The unusual coalition arose because climate change “affects every American sector,” said Carl Pope, executive director of the *Sierra Club*, a plaintiff in the case. “We are profoundly troubled by the misunderstanding or misrepresentation of the current state of knowledge of climate change evident in [EPA’s] denial of the petition ... to regulate emissions of GHGs from mobile sources,” reads a brief filed by several notable climate scientists, including NASA climatologist James Hansen and University of California-Irvine professor Sherwood Rowland, who won the Nobel Prize in 1995 for discovering the destructive effect of aerosols and coolants on the ozone layer. Moreover, the agency’s decision to require “unequivocal proof” linking GHG emissions to global warming before it takes regulatory action is a break with EPA authority and

precedent, the administrators – former EPA heads Carol Browner, William Reilly, Douglas Costle and Russell Train – wrote in a separate brief. “Had such a flawed approach been followed by EPA in the past, [we] would not have been able to protect the public health ... from the hazards of leaded gasoline, airborne benzene, ozone-depleting CFCs, and particulate matter,” said the four former officials.

The president of the BAAS said in early September that global warming is inevitable. Frances Cairncross gave a speech at the BAAS’ Festival of Science in which she called current mitigation efforts like the Kyoto Protocol “ineffectual” because the U.S., China and India are not included. “Adaptation policies have had far less attention than mitigation, and that is a mistake,” Cairncross said. “We need to think about policies that prepare for a hotter, drier world, especially in poorer countries. That may involve, for instance, developing new crops, constructing flood defenses, setting different building regulations or banning building close to sea level.” “There are some things that we can’t adapt; we can’t relocate the Amazon rainforest or replace bleached coral reefs,

but we have to think about adaptation with mitigation,” she said.

Sources: Brad Heath, *USA Today*, 8/8/06; Alister Doyle, *Reuters*, 8/31/06; Michael McCarthy, *London Independent*, 9/20/06; *Agence France-Presse*, 8/27, 9/19 and 9/20/06; John Vidal, *London Guardian*, 8/29/06 *BBC News online*, 8/22, 8/28 and 8/30/06; Doug Struck, *Washington Post*, 7/29/06; Elizabeth Bluemink, *Juneau Empire*, 8/2/06; Scott Condon, *Vail Daily News*, 7/29/06; Elli Leadbeater, *BBC News online*, 8/30/06; Alister Doyle, *Reuters/PlanetArk*, 8/21/06; Steve Connor, *London Independent*, 7/31/06; Jim Erickson, *Rocky Mountain News*, 9/15/06; Dan Joling, *AP/Anchorage Daily News*, 9/19/06; Ian Hoffman, *Oakland Tribune*, 8/29/06; Matt Weiser, *Sacramento Bee*, 8/29/06; *Reuters*, 9/4/06; Seth Borenstein, *AP/AOL News*, 9/7/06; Carew/Wynn, *New Zealand Herald*, 9/19/06; Louis Porter, *Barre Montpelier [Vt.] Times Argus*, 8/22/06; Bosire/Bakano, *Agence France-Presse*, 8/28/06; Mark Henderson, *London Times*, 9/4/06; Hilary Osborne, 9/4/06, *London Guardian*; Arthur O’Donnell, *Greenwire*, 8/30/06; Lauren Morello, *Greenwire*, 8/15, 8/22, 9/5, 9/12/06; Darren Samuelsohn, *Greenwire*, 8/8/06; and *Greenwire*, 7/31, 8/3, 8/9, 8/22, 8/28, 8/29, 8/30, 8/31, 9/18 and 9/19/06

Meetings of Interest

Nov 2-3: 3rd Annual Conference on Ecosystems Restoration and Creation, Plant City, FL. Contact: Patrick Cannizzaro, pcannizzaro@hccfl.edu, (813) 253-7523.

Nov 5-8: 60th Annual Southeastern Association of Fish and Wildlife Agencies Conference: Wildlife Management in the Next New World, Norfolk, VA. See: <http://seafwa2006.org>.

Nov 7-9: Science Symposium: Sources, Transport, and Fate of Nutrients in the Mississippi and Atchafalya River Basins, Minneapolis, MN. See www.epa.gov/msbasin/taskforce/reassess2005.htm and www.epa.gov/msbasin/actionplan.html. Contact: Janice Ward@usgl.gov.

Nov 8-10: North American Lake Management Society’s 26th Annual International Symposium: Making Connections—People, Lakes, Watersheds, Indianapolis, IN. See: www.nalms.org. Contact: Carol Winge, winge@nalms.org, (608) 233-2836.

Dec 3-6: 67th Midwest Fish and Wildlife Conference, Omaha, NE. See: www.midwest2006.org. Contact: Mark Porath, Mark.Porath@ngpc.ne.gov, (402) 471-7651.

Dec 15-19: Ninth Biennial Conference of the International Society for Ecological Economics, Delhi, India. See: www.ISSE2006.com.

Jan 7-9: Coolwater Fish Culture Workshop, Allamuchy, NJ. Contact: hatchery0@comcast.com.

Feb 7-11: Southern Division of the American Fisheries Society and Tennessee Chapter of AFS, Memphis, TN. See: www.sdafs.org/meetings/2006.

Feb 18-23: Sixth International Symposium on Ecohydraulics, Christchurch, New Zealand. See: www.conference.co.nz/echohydraulics2007. Contact: Rachel Cook, rachel@conference.co.nz.

Jun 6-9: Fourth International Reservoir Symposium: Balancing Fisheries

Management and Water Uses for Impounded River Systems, Atlanta, GA. See www.sdafs.org. Contact: Mike Colvin, Mike.Colvin@mdc.co.gov.

Jul 11-16: American Society of Ichthyologists and Herpetologists Annual Conference, St. Louis, MO.

Aug 22-27, 2007: 2nd National Conference on Ecosystem Restoration, Hyatt Regency Crown Center, Kansas City, MO. See: <http://conference.ifas.ufl.edu/NCER2007/>

Sep 2-6, 2007: American Fisheries Society, 137th Annual Meeting, San Francisco, CA. Contact: Betsy Fritz, bfritz@fisheries.org, (301) 897-8616, ext. 212

Sep 16-19, 2007: International Symposium: WILD TROUT IX, West Yellowstone, MT. See: www.wildtrout-symposium.com/. Contact: Dirk Miller, Dirk.Miller@wgf.state.wy.us, (307) 777-4556

Congressional Action Pertinent to the Mississippi River Basin

Climate Change

S. 245. Collins (R/ME) and 5 Co-Sponsors. Provides for the development and coordination of a comprehensive and integrated U.S. research program that assists in understanding, assessing, and predicting human-induced and natural processes of abrupt climate change.

S. 342. McCain (R/AZ) and 12 Co-Sponsors and **H. R. 759.** Gilchrest (R/MD) and 25 Co-Sponsors. Provides for scientific research on abrupt climate change, to accelerate the reduction of greenhouse gas (GHG) emissions in the U.S. by establishing a market-driven system of GHG tradeable allowances, to limit GHG emissions in the U.S. and reduce dependence upon foreign oil, and ensure benefits to consumers from the trading in such allowances.

S. 387. Hagel (R/NE) and 3 Co-Sponsors. Amends the Internal Revenue Code of 1986 to provide tax incentives for the investment in GHG intensity reduction projects, and for other purposes.

S. 388. Hagel (R/NE) and 3 Co-Sponsors. Amends the Energy Policy Act of 1992 to direct the Secretary of Energy to carry out activities that promote the adoption of technologies that reduce GHG intensity and provides credit-based financial assistance and investment protection for projects that employ advanced climate technologies or systems, provides for the establishment of a national GHG registry, and for other purposes.

S. 887. Hagel (R/NE) and 6 Co-Sponsors. Amends the Energy Policy Act of 1992 to direct the Secretary of Energy to carry out activities that promote the adoption of technologies that reduce GHG intensity and to provide credit-based financial assistance and investment protection for projects that employ advanced climate technologies or systems, and for other purposes.

S. 1151. McCain (R/AZ) and Lieberman (D/CT). Provides for a program to accelerate the reduction of GHG emissions in the U.S. by establishing a market-driven system of GHG tradeable allowances.

S. 3698: Jeffords (I/VT) and 9 Co-Sponsors. Amends the Clean Air Act to

reduce emissions of carbon dioxide, and for other purposes.

H. R. 955. Olver (D/MA) and Gilchrest (R/MD). Amends the Clean Air Act to establish an inventory, registry, and information system of U.S. GHG emissions, and for other purposes.

H. R. 2828. Inslee (D/WA) and 14 Co-Sponsors. Ensures that the U.S. leads the world in developing and manufacturing next generation energy technologies, to grow the economy, create new highly trained, highly skilled American jobs, eliminate American over-dependence on foreign oil, and address the threat of global warming.

H. R. 5642: Waxman (D/CA) and 14 Co-Sponsors. Reduces greenhouse gas emissions and protect the climate.

Conservation

S. 260. Inhofe (R/OK) and **H. R. 2018.** Sullivan (R/OK). Authorizes the Secretary of the Interior to provide technical and financial assistance to private landowners to restore, enhance, and manage private land to improve fish and wildlife habitats through the Partners for Fish and Wildlife Program.

S. 339. Reid (D/NV) and 4 Co-Sponsors and **H. R. 731.** Udall (D/CO) and Otter (R/ID). Reaffirms the authority of States to regulate certain hunting and fishing activities.

S. 421. Lott (R/MS) and Kohl (D/WI). Reauthorizes programs relating to sport fishing and recreational boating safety, and for other purposes.

S. 964. Alexander (R/TN) and 3 Co-Sponsors. The "American Outdoors Act of 2005" provides a conservation royalty from Outer Continental Shelf revenues to establish the Coastal Impact Assistance Program, to provide assistance to States under the Land and Water Conservation Fund Act of 1965, to ensure adequate funding for conserving and restoring wildlife, to assist local governments in improving local park and recreation systems, and for other purposes.

H. R. 524. Berkley (D/NV). Amends the Internal Revenue Code of 1986 to provide incentives for the conservation of water.

H. R. 5539. Pombo (R/CA) and 6 Co-Sponsors. Reauthorizes the North American Wetlands Conservation Reauthorization Act.

Endangered Species Act (ESA)

S. 2110. Crapo (R/ID) and 3 Co-Sponsors. Amends the ESA to enhance the role of States in the recovery of endangered and threatened species, to implement a species conservation recovery system, to establish certain recovery programs, to provide Federal financial assistance and a system of incentives to promote the recovery of species, and for other purposes.

H. R. 93. Gilchrest (R/MD). Assists in the conservation of flagship species throughout the world.

H. R. 1299. Cardoza (D/CA) and 16 Co-Sponsors. Amends the ESA to reform the process for designating critical habitat under that Act.

H. R. 1837. Flake (R/AZ) and 4 Co-Sponsors. Amends the ESA to establish limitations on the designation of critical habitat, and for other purposes.

H. R. 2779. Herger (R/CA). Amends the ESA to enable Federal agencies responsible for the preservation of threatened and endangered species to rescue and relocate members of any of those species that would be taken in the course of certain reconstruction, maintenance, or repair of Federal or non-Federal man-made flood control levees.

H. R. 3300. Graves (R/MO) and 2 Co-Sponsors. Amends the ESA to authorize species recovery agreements under which the Federal Government is obligated to make annual payments or provide other compensation for activities that improve the recovery of one or more species listed under that Act, and for other purposes.

H. R. 3824. Pombo (R/CA) and 13 Co-Sponsors. Amends and reauthorize the ESA to provide greater results in conserving and recovering listed species, and for other purposes.

H. R. 4857. McMorris (R/WA) and 5 Co-Sponsors. Better informs consumers regarding costs associated with

compliance for protecting endangered and threatened species under the ESA.

H. R. 5381. Saxton (R/NJ) and Kind (D/WI). Establishes a volunteer program and promotes community partnerships for the benefit of national fish hatcheries and fisheries program offices.

Energy

S. 1860. Domenici (R/NM) and 5 Co-sponsors. Amends the Energy Policy Act of 2005 to improve energy production and reduce energy demand through improved use of reclaimed waters, and for other purposes.

H. R. 140. McHugh (R/NY). Promotes use of anaerobic digesters by agricultural producers and rural small businesses to produce renewable energy and improve environmental quality.

H. R. 174. Millender-McDonald (D/CA). Encourages greater use of geothermal energy resources.

H. R. 2064. Udall (D/CO). Assures that development of certain Federal oil and gas resources will occur in ways that protect water resources and respect the rights of the surface owners, and for other purposes.

H. R. 3263. Wamp (R/TN) and 10 Co-Sponsors. Reduces the growth of energy use in the U.S., limits the impact of growing energy use on the economy, environment, and national security of the U.S. through reductions in energy demand and for other purposes.

Federal Water Pollution Control Act (FWPCA) Amendments:

S. 912. Feingold (D/WI) and 8 Co-Sponsors and **H. R. 1356.** Oberstar (D/MN) and 125 Co-Sponsors. Amends the FWPCA to clarify the jurisdiction of the U.S. over waters of the U.S.

S. 1400. Chafee (R/RI) and 3 Co-Sponsors. Amends the FWPCA and the Safe Drinking Water Act to improve water and wastewater infrastructure in the U.S. .

H. R. 74. Davis (R/VA). Amends the FWPCA to impose limitations on wetlands mitigation activities carried out through the condemnation of private property.

Invasive Species

S. 363. Inouye (D/HI) and 3 Co-Sponsors and **H. R. 5030.** Miller (R/MI). Amends the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 to establish vessel ballast water management requirements, and for other purposes.

S. 507. De Wine (R/OH) and 4 Co-Sponsors and **H. R. 1593.** Ehlers (R/MI). Establishes the National Invasive Species Council, and for other purposes.

S. 770. Levin (D/MI) and 12 Co-Sponsors and **H.R. 1591.** Gilchrest (R/MD) and 4 Co-Sponsors. Amends the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 to reauthorize and improve that Act.

S. 1402. DeWine (R/OH) and 7 Co-Sponsors and **H. R. 3049.** Green (R/WI). *Asian Carp Prevention and Control Act* amends the Lacey Act, to add certain species of carp to the federal list of injurious species that are prohibited from being imported or shipped.

S. 1541. Akaka (D/HI) and 3 Co-Sponsors and Kind (/WI) **H.R. 5900.** Protects, conserves, and restores public land administered by the Department of the Interior or the Forest Service and adjacent land through cooperative cost-shared grants to control and mitigate the spread of invasive species, and for other purposes.

H. R. 489. Pearce (R/NM). Provides for an assessment of the extent of the invasion of Salt Cedar and Russian Olive on lands in the Western U.S. and efforts to date to control such invasion on public and private lands, including tribal lands, to establish a demonstration program to address the invasion of Salt Cedar and Russian Olive, and for other purposes.

H. R. 1592. Ehlers (R/MI) and 5 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.

Mining

S. 961. Rockefeller (D/WV) and **H. R. 1600.** Cubin (R/WY) and 4 Co-Sponsors. Amends the Surface Mining Control and Reclamation Act of 1977 to reauthorize and

reform the Abandoned Mine Reclamation Program, and for other purposes.

S. 1701. Thomas (R/WY) and Enzi (R/WY). Amends the Surface Mining Control and Reclamation Act of 1977 to improve the reclamation of abandoned mines.

S. 2616. Santorum (R/PA) and Specter (R/PA). Amends the Surface Mining Control and Reclamation Act of 1977 and the Mineral Leasing Act to improve surface mining control and reclamation, and for other purposes.

H. R. 905. Cubin (R/WY). Amends the Mineral Leasing Act to provide for the development of Federal coal resources.

H. R. 1165. Kanjorski (D/PA) and 6 Co-Sponsors. Amends the Internal Revenue Code of 1986 to allow a credit against income tax to holders of bonds issued to finance land and water reclamation of abandoned mine land areas.

H. R. 1265. Udall (D/CO). Provides a source of funding for the reclamation of abandoned hardrock mines, and for other purposes.

H. R. 1266. Udall (D/CO) and Salazar (D/CO). Facilitates the reclamation of abandoned hardrock mines, and for other purposes.

H. R. 2721. Peterson (R/PA) and 16 Co-Sponsors. Amends the Surface Mining Control and Reclamation Act of 1977 to reauthorize collection of reclamation fees, revise the abandoned mine reclamation program and for other purposes.

Public Lands

S. 1897. Corzine (D/NJ) and Dodd (D/CT). Amends the Forest and Rangeland Renewable Resources Planning Act of 1974 and related laws to strengthen the protection of native biodiversity and ban clear-cutting on Federal land, and for other purposes.

H. R. 599. Udall (D/CO) and Tancredo (R/CO). Provides a source of funds to carry out restoration activities on Federal lands under the jurisdiction of the Secretary of the Interior or the Secretary of Agriculture, and for other purposes.

H. R. 975. Tancredo (R/CO) and 5 Co-Sponsors. Provides consistent enforce-

ment authority to BLM, NPS, FWS, and FS to respond to violations of regulations regarding the management, use, and protection of public lands under the jurisdiction of these agencies, and for other purposes.

H. R. 1796. McCollum (D/MN) and 7 Co-Sponsors. Amends the National Trails System Act to designate the route of the Mississippi River from its headwaters in the State of Minnesota to the Gulf of Mexico for study for potential addition to the National Trails System.

H. R. 3166. Grijalva (D/AZ). Provides compensation to livestock operators who voluntarily relinquish a grazing permit or lease on Federal lands where conflicts with other multiple uses render livestock grazing impractical, and for other purposes.

Water Resources

S. 232. Smith (R/OR). Authorizes the Secretary of the Interior, acting through the Bureau of Reclamation, to assist in the implementation of fish passage and screening facilities at non-Federal water projects, and for other purposes.

S. 353. Conrad (D/ND) and Dorgan (D/ND). Amends the Water Resources Development Act of 1999 to direct the Secretary of the Army to provide assistance to design and construct a project to provide a continued safe and

reliable municipal water supply system for Devils Lake, ND.

S. 728. Bond (R/MO) and 17 Co-Sponsors and **H.R. 2864** (Passed by the House and Senate). Provides for the consideration and development of water and related resources, to authorize the Secretary of the Army to construct various projects for improvements to rivers and harbors of the U.S., and for other purposes.

S. 753. Feingold (D/WI) and McCain (R/AZ). Provides for modernization and improvement of the Corps of Engineers, and for other purposes.

S. 802. Domenici (R/NM) and 10 Co-Sponsors and **H. R. 1386.** Hastings (D/FL) and 24 Co-Sponsors. Establishes a National Drought Council within the Department of Agriculture, to improve national drought preparedness, mitigation, and response efforts, and for other purposes.

S. 1017. Chaffee (R/RI) and 10 Co-Sponsors. Reauthorizes grants for the water resources research and technology institutes established under the Water Resources Research Act of 1984.

S. 2288. Feingold (D/WI) and McCain (R/AZ). Modernizes water resources planning, and for other purposes.

H. R. 109. Herseth (D/SD). Provides compensation to the Lower Brule and Crow Creek Sioux Tribes of South Dakota for

damage to tribal land caused by Pick-Sloan Projects along the Missouri River.

H. R. 135. Linder (R/GA) and 8 Co-Sponsors. Establishes the "Twenty-First Century Water Commission" to study and develop recommendations for a comprehensive water strategy to address future water needs.

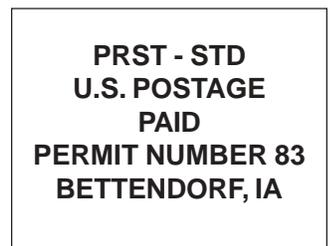
H. R. 391. Leach (R/IA). Directs the Secretary of the Army to convey the remaining water supply storage allocation in Rathbun Lake, IA, to the Rathbun Regional Water Association.

H. R. 487. Pearce (R/NM). Imposes limitations on the authority of the Secretary of the Interior to claim title or other rights to water absent specific direction of law or to abrogate, injure, or otherwise impair any right to the use of any quantity of water.

H. R. 1368. Burgess (R/TX) and 2 Co-Sponsors. Provides the Secretary of the Army with additional and enhanced authority with respect to water resources projects, and for other purposes.

H. R. 4588. Doolittle (R/CA). Reauthorizes grants for and requires applied water supply research regarding the water resources research and technology institutes established under the Water Resources Research Act of 1984.

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