River Crossings

Volume 18 **January/February/March 2009** **Number 1**

New *River Crossings* Format

With this issue we are pleased to resume publication and circulation of *River Crossings*. We apologize for the break in publication and any inconvenience it may have caused. Over the past year we have been going through a few adjustments after the retirement of our long-time Coordinator, Jerry Rasmussen. As part of those changes we have decided to reduce the publication of *River Crossings* from a bimonthly to a quarterly publication. We hope to continue providing the quality publication that *River Crossings* has provided in the past, and we hope that you continue to enjoy reading it.

New Carp Barrier to be Activated

In early December, the U.S. Coast Guard finally gave approval to activate the electric Asian carp barrier built in 2006 in the Cal Sag and Chicago Sanitary and Ship Canal. The approval came less than a week after a group of 29 U.S. senators and representatives wrote a letter demanding answers as to why the barrier, designed to keep the carp from invading the Great Lakes, had not been turned on.

Despite their approval, Coast Guard officials want the barrier operated at only one volt per inch, or one-quarter of its capacity, which biologists say is not strong enough to repel all sizes of fish. The Coast Guard, which has been studying the barrier for two years, cited safety concerns in operating the underwater electric fence at full strength. Unfortunately, operating the barrier at this reduced capacity may do little to prevent interbasin exchange of small invasive fishes between the Great Lakes and the Mississippi River Basin.

The U.S. Army Corps of Engineers (Corps), which is in charge of barrier operation, has delayed turning it on, saying that they needed Coast Guard approval. But the Coast Guard stated in a December letter to the Corps, "After legal review, the Coast Guard's position is that no statute or legislative language exists which authorizes us to 'approve' operation of the barrier."

Scene from the Red Neck (Asian Carp) Fishing Tournament on the Illinois River near Bath IL showing jumping silver carp. Hundreds of jumping carp are dipnetted annually in this one hour event.

Coast Guard Capt. Bruce Jones stated, "I remain very concerned about the potential for personal injury or death to any person who may be immersed in the water in the vicinity of either the initial demonstration barrier or the new barrier ... as well as the potential for sparking between vessels, particularly those carrying highly volatile cargoes such as gasoline. However, I am satisfied the many safety measures that have been implemented to date reduce these risks to acceptable levels at currents of one volt per inch."

In an interview with the *Milwaukee Journal Sentinel* Jones said further, "I don't have an authority to approve or not approve operation of the barrier. What we do is express our safety concerns." But Lynn Muench, vice president of the American Waterways

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Operators (AWO) said, "That's absolutely not true." For years AWO officials have expressed their concerns about the barrier to the Coast Guard. Muench said the State of Illinois' permit to allow construction of the barrier requires Coast Guard approval prior to its activation. Jones did not dispute that but said this doesn't mean the Coast Guard has final say on the matter.

The confusion over jurisdiction is adding to the frustration of barrier advocates. "If there is some discrepancy about who has the authority here, work it out," said Marc Gaden, spokesman for the *Great Lakes Fishery Commission*. "That is the worst of all excuses, to say you're waiting for someone else to give the go-ahead." But Chuck Shea, the Corps' project manager for the barrier said, "Regardless of any legal details, the fact is we want to make sure the project can be run safely and the Coast Guard is an expert in safety on the waterways. Therefore, we want to coordinate with the Coast Guard and determine what their opinion is on safety issues."

Jones said that if the Corps decided to operate the barrier against the Coast Guard's wishes, the only recourse the Coast Guard would have is to shut the waterway down to navigation. Although such an action is unlikely, the Coast Guard did say earlier this fall that closing the waterway to navigation is a possibility if it's determined that dangerously high voltages are needed at some points of the year to repel juvenile fish. "It may be that during those times you energize it to higher voltages (and) you just have to stop people from transitting through there. That may be the ultimate answer," Rear Adm. Peter V. Neffenger told the *Milwaukee Journal Sentinel* in November. "There may have to be compromises on industry's part." The canal is estimated to carry 17.7 million tons of cargo annually.

The problem with all this is that it is very difficult to determine if fingerling or juvenile fish are present in the canal's murky waters that carry Chicago's treated sewage. And, biologists say these small fish likely could be present any time of the year.

At the January *Dispersal Barrier Advisory Panel* meeting Coast Guard officials agreed that if and when an imminent threat exists (i.e., Asian carp threatening to cross the barrier) they will close the waterway and the Corps agreed that they would operate the barrier at a higher voltage. In the instance of closure, the Corps said they will need to define the trigger and determine whether the voltage could be turned down at a later date. For that a contingency plan is needed which will likely require an expanded monitoring plan to identify differential risk zones as the fish move upstream.

The $9 million barrier, operated at only a quarter of its strength, will now be the primary defense against Asian carp migrating up the canal and into Lake Michigan. It will be backed up by an existing "demonstration" electric barrier that is both smaller and weaker than the new one. The Corps said it will foot the bill for powering the two barriers, which is estimated at between $500,000 and $1 million per year.

In late January the Corps announced yet another delay in activating the new barrier so that a set of defective cooling pipes could be replaced. Installing the new pipes is expected to take a couple of months, and the hope is now that the $9 million device will be turned on sometime in mid to late March.

As for the carp, Greg Sass, Illinois Natural History Survey, said that the Illinois River's LaGrange Pool hosts the most abundant Asian carp population in the world. Current estimates, according to Sass, place Asian carp abundance at 4,100 carp per river mile. He also estimates that the silver carp population doubles each year, and are showing an 83% rate of population growth. This year, he noted that, silver carp comprised 55% of the sample catch (>80,000 fish) at the *Long Term Monitoring Station* on the Illinois River in Havana. In 2007, he noted that the carp had three spawns and were able to overwinter at only 29 mm (1.14 in.) in length. The carp had at least one spawn in 2008. Age at maturity, he said, is about 2 years for males and 3 years for females. Maximum length is around 25 inches, but he noted that they do get bigger. He also noted that Asian carp eggs can hatch in 1 day at 70°F and on average the young fish grow to 14-19 inches in length after one year of life.

Different alternatives to stopping the exchange of invasive organisms between Lake Michigan and the Mississippi River Basin

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have been proposed. The most effective action is likely the creation of a physical barrier (levee) between the canal and Lake Michigan to permanently separate the two watersheds. Barges could be off-loaded across such a barrier and a boat lift could transit recreational crafts between the two waterways. With a physical barrier between the two ecosystems in place, the electric barrier could then be shut down, saving up to $1 million per year in electricity; safety concerns could be eliminated; and best of all, aquatic organisms could be prevented from passing between to the two watersheds.

Source: Dan Egan, *Milwaukee Journal Sentinel*, 12/16/08 and 1/29/09; *Dispersal Barrier Advisory Panel Meeting Notes*, 1/8/09 and *Greenwire*, 12/17/08 and 1/29/09

Species Screening Bill Introduced

Conservation groups are applauding new legislation (H.R. 669, the *Nonnative Wildlife Invasion Prevention Act*) introduced by Congresswoman Madeleine Bordallo (D/Guam) to limit risky and invasive animals and diseases they might carry from being imported to the U.S. in commerce. "Screening species for invasiveness is long overdue," said Peter Jenkins, Director of International Conservation for *Defenders of Wildlife*. "For far too long the pet, aquarium and other industries have imported live animals to the U.S. without regard to their harm. As a leading import market, the U.S. receives hundreds of millions of these animals each year."

Inevitably, some imported animals, from the Burmese python, the snakehead fish, to several species of Asian carp, end up on our lands and in our waters. Too often, they escape from captivity; are dumped by those who no longer want them; are released by floods; or spread diseases like salmonella, monkeypox, and avian influenza to native species. "Species like Asian carp would have been banned from the U.S. if this bill were in place earlier," said Jennifer Nalbone, Campaign Director from *Great Lakes United*. "If we put the new approach in place now, we can stop the next invader."

The U.S. does not currently require that animal species being imported first be evaluated (or "screened") for invasiveness, for diseases they might carry, or for the risks they pose to human or wildlife health. The current federal law, the Lacey Act, merely list species as "injurious," usually after they have been imported to the U.S. and mostly after the damage has been done. "For a century we have relied on an antiquated approach to the trade of live animals," said Mike Daulton, *National Audubon Society*. "Finally Congress is embracing the adage, an ounce of prevention is worth a pound of cure." "We urgently need this bill," said Phyllis Windle, Senior Scientist and Director of Invasive Species for the *Union of Concerned Scientists*. "Every major scientific report on invasive species in the last 15 years has recommended the approach this bill takes. With it, Congress has a critical chance to protect the natural habitats we know and love."

H.R. 669 would modernize existing law. The Lacey Act is old (enacted in 1900); slow (listing a damaging species averages about 4 years); reactive; and incomplete (only about 20 taxa of live organisms are listed). H.R. 669 would fix all of these problems. "In our globalized world, animals are traded across continents every day," said Corry Westbrook Legislative Director from the *National Wildlife Federation*. "Enacting this bill would be one of the most significant policy advances we can make to prevent harmful invasions in the U.S. and to prepare for changing climates."

Source: *National Environmental Coalition on Invasive Species Media Release*, 1/28/09; Contact: (202) 772-0293

Better laws and species screening are needed to keep invasive species from impacting the United States.

Lawsuits and New Ballast Water Regulations

U.S. EPA's new ballast water treatment requirements allow cargo ships to dump invasive species into U.S. waterways, a coalition of environmental groups charged in a lawsuit filed in mid January in federal court. The *Stanford Environmental Law Clinic* (SELC) filed the suit in the 9th U.S. Circuit Court of Appeals in San Francisco on behalf of the *Center for Biological Diversity*, *Northwest Environmental Advocates* (NEA) and *People for Puget Sound*. The groups say EPA's new permitting rules, issued in December, are not stringent enough to meet the requirements of the Clean Water Act (CWA).

The *Natural Resources Defense Council* (NRDC) plans a similar suit in the U.S. District Court for the Southern District of New York. "We are very much aligned with what the NEA filed yesterday," said Henry Henderson, NRDC's director of Midwest programs.

EPA's permit system reflects current U.S. Coast Guard requirements for ballast water, which ships use to stay upright in rough waters. The regulations require oceangoing vessels to conduct mid-ocean ballast water exchange before entering U.S. waters or to retain their ballast water while sailing through the nation's waterways. Alternatively, ships can use a Coast Guard-approved, environmentally sound method to manage their ballast water.

EPA also is requiring mandatory saltwater flushing for all vessels carrying unpumpable ballast water and residual sediment that leave U.S. waters and travel more than 200 nautical miles from any shore. The agency is mandating flushing for any vessels engaged in Pacific near-shore voyages that travel through more than one port zone and also journey at least 50 miles from shore. The measures are aimed at preventing the spread of invasive species, but the environmental groups say the agency did not go far enough and should implement stricter regulations.

"The Clean Water Act requires a technology-based approach and a water quality-based approach, and EPA's permit seems to avoid doing either one," said Nina Bell, NEA executive director. The agency also "leaves out ships that never get to the ocean," Bell said. "We're particularly concerned with what are called the 'lakers' that operate in the Great Lakes. They don't bring in new species, but they do distribute existing invasive species

around the Great Lakes."

But Benjamin Grumbles, EPA's assistant administrator for water described the permit system as a "practical and protective step forward for preventing pollution from ships and keeping our waters and coasts clean and healthy." "We look forward to working with states and citizens to ensure progress continues as treatment technologies improve," he said in a statement.

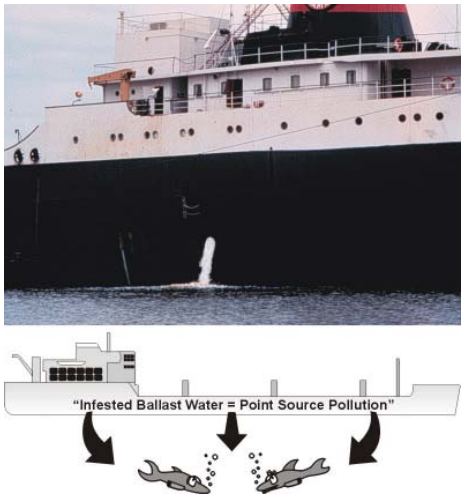
EPA was forced to issue the requirements after the U.S. District Court for the Northern District of California in 2006 revoked a 1973 permit exemption for commercial and recreational vessels. A three-judge panel for the 9th U.S. Circuit Court of Appeals later upheld the district court decision. Although the court's decision originally required a permit for recreational boats, as well, Congress exempted those vessels in 2008 legislation. S. 3298, from Sen. Lisa Murkowski (R/AK), established a two-year moratorium on discharge permit requirements for fishing and recreational boats.

The current permit requirement affects commercial vessels 79 feet in length or longer. It establishes pollution limits for discharges, including deck runoff, ballast water and graywater from showers, sinks and laundry machines. Altogether, EPA estimates, about 61,000 U.S.-flagged and 8,000 foreign-flagged vessels will need to comply with the CWA permit. They will have to undergo specific corrective actions and inspections and follow record-keeping and reporting requirements.

EPA also allows for individual states to impose additional restrictions on ships through their own certification process. But Anne Burns, spokeswoman for the *American Waterways Operators* (AWO), a national trade association which represents tugboat, towboat and barge owners, said this could pose problems. "Maritime commerce serves 38 different states," Burns said. "One company could have to deal with a number of regulations in a few days."

Debbie Sivas, director of the SELC, said a number of states felt EPA did not give them enough time to devise additional state-based regulations. But despite the environmentalists' concerns, Sivas said she was gratified that EPA finally issued the permit after years of litigation. "In that sense, it's a good start," Sivas said. "We need to get these sources into the permitting process. There's no question you can't jump whole hog into it when these sources have never been regulated before." But Sivas said she was disappointed that the agency had not done more to protect water quality, and hopes EPA will strengthen standards in the permit over time.

Michigan was the first state to require a ballast water permit, but its permit only applies to ocean-going vessels. Minnesota, the second state to establish a ballast water permit system went a step further requiring both ocean-going and "lakers" to obtain permits. Minnesota has also set treatment standards, as opposed to Michigan's requirements for specific technology.



The Minnesota permit system applies to all vessels transitting the Minnesota state waters of Lake Superior that are (1) designed, constructed, or adapted to carry a minimum ballast water capacity of 8 cubic meters or more and (2) 50 meters in length or more. Vessels that carry ballast water in permanently sealed tanks, discharge ballast water directly to an on-shore treatment facility or another vessel, or implement flow-through or flush ballast water management techniques approved by the Minnesota Pollution Control Agency do not need to obtain permit coverage. Vessels of the Armed Forces and vessels operating within the Duluth Captain of the Port Zone are also exempt.

To qualify for coverage under the general permit, vessels must maintain a *Ballast Water and Sediment Management Plan* and a ballast water log book, employ best management practices to minimize the discharge of aquatic invasive species, submit annual discharge monitoring reports, and install treatment technology capable of meeting certain biological performance standards. Those standards are identical to the standards mandated by the *International Convention for the Control and Management of Ships' Ballast Water and Sediments*, although Minnesota chose not to set a standard for *vibrio cholera*.

Meanwhile, Wisconsin is proposing new regulations, beginning in 2012. that would require existing ships to meet standards that are 100 times more stringent than the U.N. regulations. New ships launched after 2012 would have to meet standards that are 1,000 times more stringent. If the technology is not available by 2012, the ship owners will have to comply with only the U.N. standards. The proposed U.N. standards require on-board systems that purify water to the point that only a certain amount of organisms of a certain size are allowed per cubic meter of water. But those regulations have yet to be adopted by the world's maritime community.

"We want to prevent new introductions, and we feel that the current (U.N.) standards aren't enough to do the job," says Wisconsin Department of Natural Resourses' (DNR) Susan Sylvester. But Wisconsin will likely be sued by shipping advocates who fear the regulations are unworkable. New York, which has passed essentially the same rules for oceangoing vessels as proposed by Wisconsin, has already been sued by the shipping industry.

It is widely agreed that the best solution is for the federal government to step in and lay down a single standard for the whole country, and that could happen. In late February, new EPA administrator Lisa Jackson said she would reconsider the Bush administration's decision to essentially do nothing new to protect the Great Lakes, even though the federal government last year was ordered by the courts to start treating ballast water like any other pollutant under the CWA. "A federal solution makes a whole lot more sense than doing this on a state-by-state basis," says Todd Ambs, administrator for the Wisconsin DNR's water division. "But we didn't feel like we could wait."

Anne Burns, on the other hand said, "AWO is still deeply concerned that the National Pollutant Discharge Elimination System permit program, which was developed to control water pollution from fixed, land-based facilities, is a very poor fit to regulate discharges from mobile sources, like vessels." "It doesn't provide for uniformity and consistency critical to interstate maritime commerce," she said. "One of our highest priorities is for the 111th Congress to seek support for a more suitable framework for

the regulation of discharges."

But some conservationists have altogether lost their tolerance for the overseas shipping industry. "I'm for shutting them down," says Dan Thomas, president of the *Great Lakes Sport Fishing Council*. He points to a 2005 *Joyce Foundation* study that estimated the overseas shipping industry is a $55 million enterprise annually to the Great Lakes region. That's the amount the study said the region saves by bringing cargo into the lakes aboard oceangoing vessels instead of by other means, such as rails, trucks, Mississippi River barges or a fleet of freighters shuttling between the East Coast and Great Lakes. And the volume of cargo entering the Great Lakes has continued to drop since that study. Last year, an average of fewer than two oceangoing ships per day entered the Great Lakes.

"We've lost a superb fishery because of the direct connection of invasive species introduced by the foreign shipping industry," Thomas says, pointing to fish population crashes on Lakes Huron and Michigan that many scientists have tied to a surge in quagga mussels. "I hate to say this," he says, "but they (the shipping industry) really deserve what they get."

Sources: *SandBar* 7:4, January, 2009; Dan Egan, *Milwaukee Journal Sentinel*, 3/1/09; Katherine Boyle, *Greenwire*, 12/22 and 1/13/09; and *Greenwire*, 3/2/09

Economic Stimulus to Jump-Start Water Projects

The economic stimulus bill that President Obama signed in mid February will send $4.6 billion to the U.S. Army Corps of Engineers (Corps) for water projects. The legislation directs the Corps to spend $2.1 billion on operations and maintenance of ongoing projects; $2 billion on construction, including $200 million for work on environmental infrastructure; and $375 million for work on the Mississippi River and its tributaries. The Corps must submit quarterly reports on its work to congressional appropriators.

The stimulus includes a provision requiring swift National Environmental Policy Act (NEPA) reviews and reports by the Obama administration to the Senate Environment and Public Works Committee on the status and progress of stimulus projects subject to NEPA. But environmentalists say it is crucial that the Corps adhere to the environmental impact review process required by NEPA. Environmental groups are also concerned with news that states such as Montana, Idaho, Kansas, and California are all considering waving environmental regulations for stimulus projects such as power plants, electric transmission lines, septic fields, road projects and construction equipment. Utah is even considering accepting nuclear waste for cash to solve their economic problems.

Some environmental groups also remain concerned that stimulus package funds could be used to sponsor what they consider unnecessary projects. For example, Jennifer Nalbone of the advocacy group *Great Lakes United* said a plan to build a third lock at the Upper Peninsula town of Sault Ste. Marie, MI, would be a waste of money. That project is backed by Rep. Bart Stupak (D/MI), who said it could generate $500 million a year. Similar concerns exist for such locks on the Upper Mississippi River.

"*Great Lakes United* was founded as a critic of navigation issues," Nalbone said in an interview. "We felt our responsibility was just to be very frank about this lock and say this is an unnecessary lock. At best, it's a make-work project, but the traffic does not demand it." Nalbone said her group is more interested in seeing money go toward projects like upgrading antiquated sewage-treatment infrastructure. "This project is not anywhere close to that kind of caliber," she added.

Corps projects also could receive an infusion of cash from a new water resources bill funding transportation and infrastructure initiatives. The Senate Environment and Public Works Committee and the House Transportation and Infrastructure Committee have vowed to pass a new Water Resources and Development Act this year. In 2007, Congress overrode President Bush's veto to pass the first water development measure since 2000. That legislation authorized more than $23 billion in water projects.

Source: Matt Gouras, *Associated Press*, 3/2/09; Katherine Boyle. *Greenwire*, 2/17/09; and *Greenwire*, 3/2/09

New River Dam Needs Major Work

West Virginia's Bluestone Dam on the New River needs a lot of work and during the repair period it will not be able to hold back as much water as it does now, according to the U.S. Army Corps of Engineers (Corps). But if dam operators have to release more water from the dam during periods of heavy rainfall, places such as downtown Charleston could flood.

When the dam was built in 1949, engineers believed the structure that drains about 4,500 square miles was adequate. But when Hurricane Katrina devastated New Orleans in 2005, Corps officials decided to re-evaluate the dam. Doing so led the Corps to decide that the volume of water behind the dam when full could potentially build up enough force to push the structure downstream and cause a failure. "We're going much more conservative at this point," Col. Dana Hurst, Corps Huntington District Engineer said. He said the dam "is in urgent need of repair."

They also discovered that the boulders placed on the downstream side of the dam to slow water coming from the structure are not large enough to stay in place, which could lead to erosion at the bottom of the dam. So construction crews are now adding 600 anchors inside the dam to secure it to the bedrock below. They are also redesigning areas below the dam to slow down water and adding additional pathways to release water from the dam. They will also build a wall along the bank to lessen erosion at the base of the dam. And, they will eventually add 8 feet to the top of the dam to allow for more capacity. But construction will not be complete until 2020.

Meanwhile, the Corps is reducing the amount of water behind the dam, and under emergency conditions, the agency will release more water from the dam earlier, even if it means flooding areas downstream, said Col. Hurst. "I will not allow that dam to fail," he said. Hurst said that in a worst-case scenario where the dam fails, water would be about 15 feet deep in Charleston. In Belle, the first town in Kanawha County that would be affected by a dam break, the effects would be catastrophic. But such an event is extremely unlikely Hurst said. That much water behind the dam can be expected once every 10,000 years. But Corps officials urged local planners to make plans based on such a contingency.

Kanawha County Commission President Kent Carper urged Corps officials to have more than one public hearing in Kanawha County, in communities that would be affected by possible flooding. "Their concerns would be different," Carper said. "In Charleston, they're going to worry about rowing a boat around the Capitol. In Belle, they'll be dead if you have a catastrophic [dam] failure."

Corps officials can't predict exactly how different levels of rainfall might affect flooding downstream from the Bluestone Dam, because the communities downstream might also be affected by drainage from the Summersville Dam on the Gauley River, Sutton Dam on the Elk River and the Greenbrier River, which has no dam. But local officials need to start planning now, just in case, Hurst said.

Sources: Rusty Marks, *Charleston Gazette*, 1/19/09; and *Greenwire*, 1/21/09

New Initiative Needed to Better Monitor MRB Nutrients

The U.S. Environmental Protection Agency (EPA) and U.S. Department of Agriculture (USDA) should jointly establish a *Nutrient Control Implementation Initiative* (NCII) for the Mississippi River Basin (MRB) and an *MRB Water Quality Center* to administer the facility and to conduct monitoring and research the *National Research Council* (NRC) says in a new report. The NCII would be established to learn more about the effectiveness of actions meant to improve water quality throughout the MRB and into the northern Gulf of Mexico, says the report. The report also advises how to move forward on the larger process of allocating nutrient loading caps — which entails delegating responsibilities for reducing nutrient pollutants such as nitrogen and phosphorus — across the basin.

"A NCII would represent an important step toward EPA developing water-quality criteria and states setting water-quality standards," said David Moreau, chair of the committee that wrote the report and professor in the Departments of City and Regional Planning and Environmental Sciences and Engineering at the University of North Carolina, Chapel Hill. "However, efforts to reduce nutrients in the northern Gulf of Mexico will face significant management, economic, and public policy challenges, as well as a time lag — a decade at minimum — between reducing pollutants across the river basin and identifying water-quality improvements downstream in the Gulf."

The Gulf of Mexico's oxygen-depleted "dead zone" derives from excess nutrients, such as nitrogen and phosphorus from fertilizers and other sources, flowing into the Gulf from the Mississippi and Atchafalaya rivers. Numerous federal and state regulatory agencies and water-quality standards govern conditions across the 31-state river basin. To better meet nutrient and sediment reduction objectives in the Clean Water Act — and in turn help improve water quality in the Mississippi River Basin and into the northern Gulf of Mexico — EPA asked the NRC for advice on how to (1) initiate nutrient pollutant control programs, (2) identify alternatives for allocating reductions of nutrient discharges into bodies of water, and (3) document the effectiveness of these strategies.

The committee recommended that the NCII implement a network of pollution-control pilot projects to evaluate local and downstream water-quality improvements, and to compare results and enhance the outcomes of best management practices. The NCII should start with approximately 40 projects, which would be targeted to priority watersheds with high levels of nutrient pollutants. The NCII would represent a systematic approach to better understanding and managing nutrient inputs across the basin, and provide opportunities to strengthen interagency, interstate, and state and local coordination and cooperation. The NRC noted that the collective reduction of discharged pollutants from the NCII projects would have little effect on the Gulf's dead zone because the projects would cover only a small portion of the sources in the river basin. Therefore, other nutrient control actions and programs across the river basin should not pause or slow their progress to wait for NCII project development and implementation.

Also the NRC recommended that EPA gather additional data regarding the relative nutrient contributions of "point sources" such as water treatment plants and industries that have permits to release nutrients. EPA should require major point sources to monitor the nutrient concentrations of their discharges as a condition of their permits. Although the estimated current flux of nitrogen and phosphorus being delivered to the Gulf of Mexico from these point sources is roughly 10% of the total, the relative importance and actual percentages are still debated. Requiring monitoring and reporting as conditions for discharge permits could substantially reduce uncertainties in the estimates of point source nutrient discharges, the NRC said.

The report also recommends that EPA, USDA, and Mississippi River Basin states should allocate nutrient loading caps by:
- selecting an interim goal for the amount of nutrients that can enter the basin;
- identifying priority watersheds for nutrient control actions;
- adopting an allocation formula for distributing interim reductions;
- allowing credit for past progress; and
- encouraging the use of market-based approaches to allow jurisdictional flexibility.

In moving forward on this front, the NRC recommended looking at experiences gained in the Chesapeake Bay watershed, as it provides an example of how these processes have been developed in a large, multistate watershed with some similar water quality challenges. Information gained from the NCII would also be an important part of the process for determining loading reduction caps.

The NRC further recommended that the proposed *MRB Water Quality Center* be located in the upper basin, where most nutrients enter the river system. Participation from other organizations that play important roles in water-quality monitoring — such as the U.S. Geological Survey, the U.S. Army Corps of Engineers, and state natural resources and water-quality agencies — would be vital to its success.

Some of the Center's responsibilities should include:
- coordinating NCII projects;
- conducting basinwide water-quality and land-use monitoring and relevant analysis and research;
- developing a land use and cover database for the basin;
- identifying additional watersheds for future NCII projects;
- providing advice on water-quality variables and statistical approaches; and
- producing periodic reports on basinwide water-quality assessments and project implementations.

Lastly, the NRC stressed that the new *MRB Water Quality Center*, EPA, USGS, National Oceanic and Atmospheric Administration, and basin states should strengthen their commitment to systematic water-quality monitoring for the northern Gulf of Mexico in order to complement data gathered upstream and document the effectiveness of upstream nutrient-control actions.

Copies of the NRC report entitled, *"Nutrient Control Actions for Improving Water Quality in the Mississippi River Basin and Northern Gulf of Mexico"* are available on line at: http://www.nap.edu/catalog.php?record_id=12544
Source: *National Academies News Release*, 12/11/08

CAFOs Under New Manure Wastewater Rule

EPA has finalized a rule to help protect the nation's water quality by requiring concentrated animal feeding operations (CAFOs) to more safely manage manure. This is the first time the U.S. EPA has required a nutrient management plan (NMP) for manure to be submitted as part of a CAFO's Clean Water Act permit application.

EPA estimates CAFO regulations will prevent 56 million pounds of phosphorus, 110 million pounds of nitrogen and two billion pounds of sediment from entering streams, lakes and other waters annually. Previous rules required CAFO operators to use NMPs for controlling manure, but the regulation builds on that by requiring NMPs to be submitted with permit applications.

Each NMP will be reviewed by the permitting authority and conditions based on it will be incorporated as enforceable terms of each operator's permit. Each proposed NMP and permit will be available for public review and comment before going final. The deadline for newly defined facilities to apply for permits was February 27, 2009. More CAFO information is available at www.epa.gov/npdes/caforule.

Source: *Non-Point Source News Notes*, February 2009, Number 86

New EPA/Corps Wetland Guidance

Environmentalists and industry stakeholders alike are blasting the wetlands guidance memorandum issued in December by the U.S. EPA and the U.S. Army Corps of Engineers (Corps). The revised guidance defines protected waters as those that:
- are determined to be navigable-in-fact by the courts,
- are currently being used for commercial navigation,
- have historically been used for commercial navigation, or
- could realistically be used for commercial navigation in the future.

The document also clarifies what constitutes a protected, adjacent wetland, noting that a wetland must:
- have an unbroken hydrologic connection to jurisdictional waters,
- be separated from those waters by a berm or similar barrier or
- be reasonably close to a jurisdictional water.

Neither environmental groups like the *National Wildlife Federation* (NWF) nor industry stakeholders like the *National Association of Home Builders* (NAHB) are happy with the guidance. The NWF slammed it as less protective and more confusing than the June 2007 memo it replaces. Both memos were meant to clarify the Supreme Court's muddled 2006 *Rapanos-Carabell* decision.

The guidance "is another lose-lose document that will have the effect of making it harder to protect waters, and more time-intensive and costly to administer permit applications," NWF attorney Jim Murphy said in a statement. "It will result in more pollution, more administrative delays, and more head scratching." Environmentalists warn that the revised guidance undermines Clean Water Act (CWA) protections for a number of wetlands and streams by requiring waters to be commercially navigable to qualify. That means fewer bodies of water will fall under the significant nexus test, which measures the relationship between upstream waters and the closest traditionally navigable water, devised by Justice Anthony Kennedy in the Rapanos decision, the NWF said.

The NAHB, on the other hand, said the guidance's definition of protected waters is too broad. Susan Asmus, NAHB vice president for regulatory policy, said including waters that are potentially navigable contradicts the intent of the CWA. She said the law is meant to cover waters that are currently being used for navigation rather than those that are "susceptible" to use.

Despite the criticism, Benjamin Grumbles, EPA's assistant administrator for water, praised the guidance, which he said ensures that the traditional navigable waters test encompasses requirements the agency has looked at over the years. "We're looking at all the prongs for jurisdiction under the CWA," Grumbles said. "That includes if it was navigable in the past or is susceptible to commercial navigation in the future." That definition ensures that officials will not solely rely upon the *1899 Rivers and Harbors Act* when applying Kennedy's significant nexus test. The *Rapanos* guidance is able to cover waters that may not have been covered in the past after the Supreme Court decision, Grumbles added.

But environmentalists and industry officials agree that much of the language in the new guidance is still unclear. Asmus said EPA and the Corps still need to better clarify which wetlands and streams will qualify as protected. "I'm not sure that [EPA and the Corps] changed it enough to make it workable in the field," Asmus said. "There are still a lot of uncertainties." Asmus pointed to EPA's new definition of protected, adjacent wetlands as an example. "They talk about adjacency, and they talk about 'reasonable, close proximity,'" she said. "I don't know what that means." The NWF also panned the terminology as vague and confusing, calling the adjacency standard "ill-defined."

Yet Grumbles said, "The guidance makes clear that an ecological connection is the basis for asserting the CWA safeguard, and we're proud of that," he said. "We think it's an additional and important clarification." The guidance also notes that decisions on protected waters do not have to be made on a case-by-case basis, Grumbles said. "We will infer an ecological connection for those wetlands that are sufficiently close by looking at the movement of amphibians or fish," he said. "We think that type of ecological connection is an important one ... and we think it will lead to additional protections for wetlands."

Meanwhile, the NWF and three other advocacy groups — *American Rivers*, *Environmental Defense* (ED) and *Ducks Unlimited* — are calling on Congress to pass legislation that would override the memo and the split *Rapanos* decision. "The *Rapanos* decision has caused a bureaucratic nightmare, but it is a Supreme Court decision and EPA has no choice but to obey it, " Jim Tripp, general counsel for ED, said in a statement. "Congress, however, can — and should — step in to fix the problem."

House Transportation and Infrastructure Chairman James Oberstar (D/MN) and Sen. Russ Feingold (D/WI) may do just that. Both lawmakers argue that prior to the court's *Rapanos* decision and the 2001 *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* decision, the phrase "navigable waters" had been broadly defined as "waters of the United States, including the territorial seas." They have indicated that during the 111th Congress

they will reintroduce legislation aimed at restoring that definition. But opponents of their legislation say the bill would expand wetland protections beyond the intent of the CWA and could lead to a spate of lawsuits.

While environmentalists call for a legislative fix, the homebuilders indicated they would like to see EPA promulgate a rule on the issue. "Part of the challenge here is, you've got a Supreme Court who's ruled on something [and] a couple of agencies who don't quite know how to interpret that or are a little afraid to interpret that," Asmus said. "So they interpret it one way, and then everybody comes out of the woodwork and says, 'Hey, wait a minute, I disagree. You didn't interpret this right.' And you're off on a bad foot to begin with."

Source: Katherine Boyle, *Greenwire*, 12/5/08

Water Footprinting

It takes roughly 20 gallons of water to make a pint of beer, 132 gallons to make a 2-liter bottle of soda, 35 gallons to make a cup of coffee, 700 gallons to make a cotton T-shirt, 630 gallons to make a typical hamburger, and about 500 gallons, including water used to grow, dye and process the cotton, to make a pair of *Levi's* stonewashed jeans. Tallying these "water footprints" for manufactured goods can be tenuous since there are no clear standards for what a water footprint should measure. Some companies measure just water used in factory operations; others count the gallons used to grow ingredients in their supply chains, and still others take stock of water that consumers use to wash clothes or dishes with their products.

Though much of that water is replenished through natural cycles, a handful of companies have started tracking such "water footprints" as the growing threat of freshwater shortages looms. And with the interest in water footprinting continuing to grow, a coalition of scientists, companies and development agencies in December launched the *Water Footprint Network*, an international nonprofit that helps corporations and governments measure and manage their water footprints. In late February representatives from about 100 companies, including *Nike Inc.*, *PepsiCo Inc.*, *Levi Strauss & Co.* and *Starbucks Corp.*, gathered in Miami for a summit on calculating and shrinking their corporate water footprints.

The water-footprint concept was coined in 2002 by Arjen Hoekstra, a professor of water management at University of Twente in the Netherlands. Using data from the U.N.'s Food and Agricultural Organization, Mr. Hoekstra and other researchers gauged the water content that went into the making of various products and applied those statistics to people's consumption patterns to get a rough water footprint for average individuals and nations as a whole.

But a large water footprint isn't necessarily bad if the product is made in an area where water is plentiful and well managed. Almost all of the water that goes into crops and food production is returned to the water cycle, either as evaporated water or in the form of polluted runoff. But it is temporarily unavailable for other uses, and may not be restored to the same aquifer, lake or river if it comes back as rainfall in another region. The latter is what poses problems for water-scarce areas.

Some experts doubt the accuracy and usefulness of water footprints, which vary depending on where and how products are made. For example, oranges grown in Brazil might have a higher water footprint than oranges from Spain, but the Brazilian orange might be a better choice because of the country's rainy climate. "It's a hard thing to calculate," says Peter Gleick, president of the *Pacific Institute*, an Oakland, CA, environmental group. "Beef grown in the Eastern U.S. has different water use than beef grown in Illinois."

But a *Coca-Cola* spokeswoman said the water-footprint figure is preliminary and may change as the methodology improves. "When you try to reduce a complex subject into a single number, the methodology is so inconsistent and unreliable that it's fraught with the possibility of manipulation and misinformation," says Wayne Balta, vice president of corporate environmental affairs and product safety for *IBM Corp.*

Also, for many food and beverage companies, calculating water use isn't just an attempt at an eco-friendly makeover. It's a matter of self-interest. For instance, *SABMiller PLC* — whose brands include *Miller Lite*, *Peroni* and *Pilsner Urquell* — started to worry about the company's water footprint in August 2007. The *World Business Council for Sustainable Development* had just released its online "global water tool," which allows companies to enter the GPS coordinates of their factory sites in order to identify hot spots where water scarcity overlaps with factory operations or agricultural supply chains. The results were alarming. About 30 of the company's sites, including factories in South Africa, India and Peru, were shown to be vulnerable to future water shortages, says Andy Wales, *SABMiller's* director of sustainable development. Water-management experts have also started to build models for "water offset" projects so that beverage companies and other heavy water users can soften their impact by funding water sanitation and conservation projects. *PepsiCo* recently piloted a program to help rice farmers cultivating 4,000 acres in India switch from flood irrigation to direct seeding, a planting method that requires less water and makes crops more resilient to drought.

But conservationists are divided over whether water footprinting will translate into meaningful conservation efforts. "Footprinting has its place, but it's not a panacea," says Nick Hepworth, director of *Water Witness International*, a nonprofit advocacy organization. Companies may feel better by calculating their water footprints, says Mr. Hepworth, "but at the end of the day there's still a need for an objective audit."

But despite the challenges involved, water footprinting is poised to grow. Two-thirds of the world's population is projected to face water scarcity by 2025, according to the U.N. In the U.S., water managers in 36 states anticipate shortages by 2013, a General Accounting Office report shows. Last year, for example, Georgia lawmakers tried, unsuccessfully, to move the state's border north so that Georgia could claim part of the Tennessee River.

"Three billion more people are going to be on this planet [by 2050]," says Stuart Orr, manager of the *Freshwater Footprint Project* for the *World Wildlife Fund*. "Somehow, we're going to have to use the same amount of water we use today."

Sources: Alexandra Alter, *Wall Street Journal*, 2/17/09; and *Greenwire*, 2/17/09

Engineers Struggle to Adapt to Sinking Missouri River

The *Kansas City Star* recently raised concerns that parts of the Missouri River are losing elevation, threatening to damage billions of dollars in property, weakening levees and bridges, and exposing navigation hazards such as sunken piers and underwater pipelines. What most people fail to recognize, however, is that these problems are, in

fact, the result of the way man has altered the river ecosystem to serve the purposes of flood control and navigation. Managing the river for these two purposes has cost the taxpayer hundreds of millions of dollars and has critically altered the form and function of the natural riverine ecosystem.

The long term effects of the Missouri River flood control and navigation project are now being realized (as noted by the *Kansas City Star*) in additional costs to the taxpayer as cities and municipalities attempt to maintain failing infrastructure. In Kansas City, officials have spent more than $4 million to ensure that drinking-water pumps reach lower river levels, and are considering using a horizontal well to tap underground liquefied sands to ease dependence on the river as a water supply. Downstream in Jefferson City, the water supplier has also applied for a permit to lower its intake pipes. In Parkville, degradation in a creek upstream from the Missouri River caused the stream banks to collapse and threatened baseball fields and two bridges, including one more than a century old. In 2007 the city stabilized the banks and terraced the streambed at a cost of about half the community's budget for parks, streets, public works and sewer systems.

At greatest risk are bridges. When the riverbed erodes, it exposes more of the pylons that hold up bridges. That reduces the support the foundation gets from being buried in the ground. For instance, a bridge designed to have its pylons buried 10 feet in the riverbed might now be buried only 8 feet deep. If not corrected, the erosion can increase the risk for collapse.

Also at risk are levees such as those separating the Missouri River from an estimated $20 billion in developments, including Kansas City's downtown airport, a *General Motors* plant and all of North Kansas City. "Part of the whole problem is, it's not visible," said John Grothaus, chief of planning for the U.S. Army Corps of Engineers (Corps) in Kansas City, where the riverbed has dropped by about 12 feet over the last 50 years.

While this problem may seem like a mystery to some, it is all too familiar to river biologists. The Missouri River was impounded during the middle of the last century across the Dakotas and into Montana by several large flood control, hydropower, water supply and flow augmentation reservoirs. These large reservoirs produce a whole series of impacts on the river and its fisheries which are primarily related to the disruption of sediment transport mechanisms, disrupted river flows or hydrographs, and blockage of fish movements.

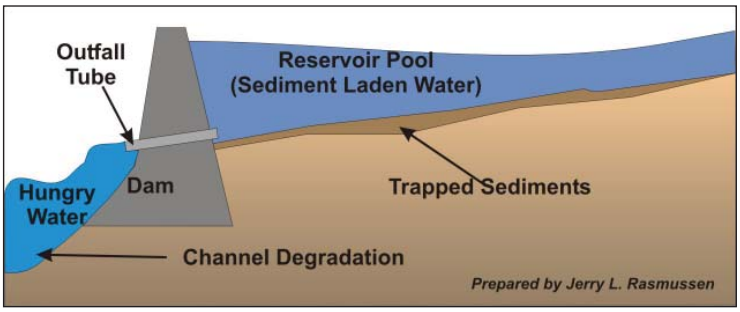


Figure 1. Reservoir outfall waters are relatively sediment free, or "hungry" to pick up and carry sediments. These "hungry waters" cause stream bed erosion or degradation downstream.

Huge amounts of sediments are trapped by these reservoirs in their sediment storage pools, and as a result reservoir outflow waters are relatively clear and sediment free (Figure 1). Hydrologists refer to these as "hungry waters" because they pick up and carry a sediment load. Because of the rock lined channels of the downstream bank stabilization and navigation project, the only place the river's hungry waters can find the sediments they need is in the stream bed or navigation channel (Figure 2). This leads to channel deepening or bed degradation, which in turn lowers water tables and drains floodplain channels and backwaters (Figure 3).

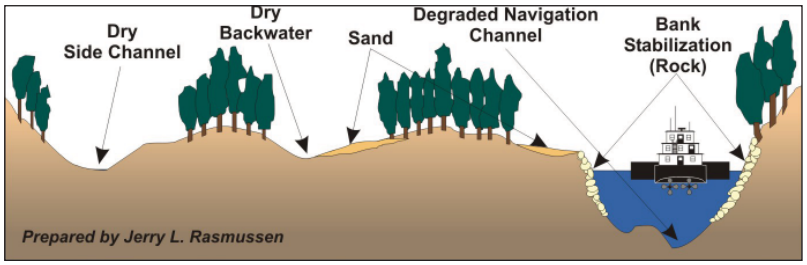


Figure 2. Main channel bank stabilization and bed degradation on channelized rivers dewater floodplain backwaters and side channels, destroying thousands of acres of aquatic habitats.

This same dewatering or draining takes place in tributary mouths and starts an upstream erosion process called "head cutting", which continues upstream in the tributaries until the grades or elevations between the river and the tributary are equalized. But before this happens, "head cutting" can wash out roads and bridges, and the Corps is called in to stop it. They do so by installing concrete grade stabilization structures. These are nothing more than small concrete check dams, which create small waterfalls. But these small waterfalls are large enough to prevent upstream fish movements (Figure 4), thus eliminating fish access to many tributary habitats which are among the last remaining spawning and nursery areas available to large river fish. Fish passage devices installed on these structures have been largely unsuccessful.

The channel degradation process on the Missouri River has destroyed thousands of acres of floodplain habitats which were formerly used by native riverine species, some of which are now threatened and endangered. So the losses now observed by city officials along the Missouri River are all too familiar to riverine biologists who have observed their own losses since impoundment began.

Figure 3. A side channel as seen during high water stages (top) and during normal or low water stages (bottom). This is caused by degradation of the main channel river bed which dewaters the side channel and destroys aquatic habitat.

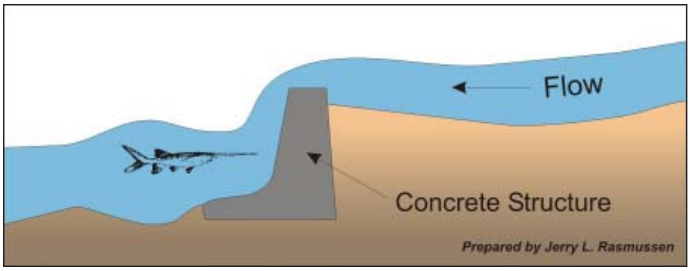


Figure 4. Grade stabilization structures used to stop head cutting block fish from reaching important tributary spawning areas.

Because of these environmental losses taxpayers have been funding major mitigation efforts to restore a small portion of these lost habitats to their former status. Some of these habitats were also restored as part of the 1993 flood recovery effort and have been shown to successfully reduce flood losses, demonstrating the benefits of a restored, naturally functioning ecosystem.

Despite increasing infrastructure problems and taxpayer funded mitigation and restoration efforts, deteriorating environmental conditions continue to be exacerbated by the maintenance of a 9-foot navigation channel. To accomplish the mandated navigation channel, the Corps has engineered the Missouri River to be a "self scouring" channel, which by definition is a channel that is self-eroding. As previously explained, erosion is at the root of the bed degradation problem!

A recent Government Accountability Office report found that tonnage shipped per year on the Missouri River over the 13-year period (1994 and 2006) ranged between 6.9 million and 9.7 million tons. Of this total, the majority of shipments were of sand and gravel, which accounted for 84% of the total tonnage shipped. Of this amount, approximately:
• 54% of the sand and gravel was transported only 1 mile or less by barge,
• 31% between 2 and 9 miles, and
• only 14% was transported 10 miles or more.

According to Corps officials, the short distance traveled is because private companies often mine sand and gravel directly from the Missouri River and then ship the material short distances to a processing facility on shore. When one considers that 84% of the total on-river shipment is over only a short distance, one has to question the economic and environmental costs of continuing to commit the entire lower Missouri river to a 9-foot draft channel at the expense of other more environmentally friendly (and less costly) uses. Beyond that, the act of dredging the channel to mine sand and gravel in itself contributes to bed degradation!

Meanwhile, city and federal officials in Kansas City are restoring a section of the south bank of the Missouri River to how it would have appeared to early settlers. The Corps is overseeing the $1.2 million project, which will remove concrete and other debris from a 5.5-acre site and create a wetland with native trees and grasses. An existing system of riverside walkways and bike paths also will be extended through the site. The project is part of an overall effort to improve the city's riverfront and help revitalize the city's River Market area and all of downtown. "You won't recognize it," said Vincent Gauthier, executive director of the *Port Authority of Kansas City*. "We're reintroducing people to where the city started. This will be the coolest trail in town, no question."

Hopefully, as part of that project the city will provide for public education as to:
• why the river looks the way it does now,
• what will continue to happen to it under current management procedures, and
• what the river could look like and provide for if managed in a more environmentally friendly manner.

Sources: *Associated Press*, 1/2/09; Chris Blank, *AP/Kansas City Star*, 2/7/09; *Greenwire*, 1/8 and 2/9/09; *Reservoirs and Channelization Projects*, MICRA Web Page http://wwwaux.cerc.cr.usgs.gov/MICRA/; and *GAO-09-224R Missouri River Navigation*, Report to Senator Byron L. Dorgan, Senator Kent Conrad, and Congressman Earl Pomeroy January 15, 2009, U.S. Government Accountability Office, Washington, DC 20548

Montana Group Wants Walleye Declared Native

Walleyes Unlimited of Montana (WUM), a sportfishers group, wants the Montana Legislature to declare walleye a native species despite widespread opposition from scientists. WUM claim the fish, which are distributed across the Mississippi and Missouri River watersheds, have also always been in Montana's streams. They contend that early European explorers in the area mistook walleye for trout, creating faulty records. But scientists say the species' presence is the result of illegal stocking, and *Trout Unlimited of Montana* (TUM) says declaring walleye native would codify bad science. "I don't think there are very many serious scientists who think it could have been native to Montana," said Duane Chapman, president of the Introduced Fish Section of the *American Fisheries Society*.

But Bob Gilbert, executive director and lobbyist for WUM says, "We firmly believe that walleye were here all the time". WUM members played a major role in developing a bill declaring the walleye native that was introduced in the Montana legislator in January. "We're baffled that they are trying to suspend natural history," said Bruce Farling, TUM executive. Farling said native fish are "what was indigenous before Europeans showed up, and it wasn't walleye." The harm in passing the bill lies in "legislating erroneous science," he said.

Walleye, which eat trout and the prey of trout, are classified as native in North Dakota, and the Missouri River flows across the North Dakota-Montana line so WUM's Gilbert said he believes the fish traveled here in that water. "The fish don't understand that there's a boundary," he said. Some of the conclusions that walleye are nonnative rely on records indicating the Lewis and Clark expedition of 1804-06 did not find walleye in the territory that would become Montana, Gilbert said. It is possible the expedition caught walleye but mistook them for their cousin the sauger, or that the party was unable to catch walleye, he said.

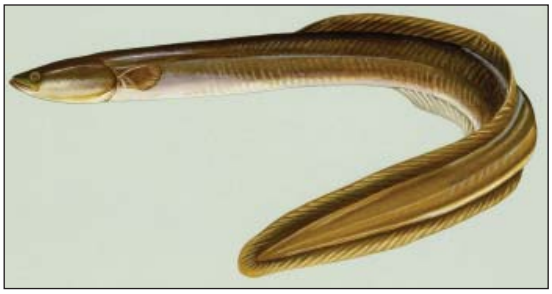
"I'm not going to say trout are dumb, but trout are easy to catch," he said. "Walleye are not easy to catch. It's nothing to go a couple of days without ever getting a bite." Gilbert, a former legislator who fishes for walleye in northeastern Montana's Fort Peck Lake, said passage would help balance "the old Montana mind-set that if it isn't a trout, it isn't anything."
Sources: Susan Gallagher, *AP/Houston Chronicle*, 1/19/09; and *Greenwire*, 1/19/09

New Eelway Constructed in Indian River Delaware

The first choke point for American eels on their 1,000-mile journey from the Sargasso Sea into Delaware's Indian River Inlet and then to fresh water comes at Millsboro Dam — a giant wall of concrete. Some of the tiny elvers — clear, 6-inch-long spaghetti-like strands with big, black eyes — make it over the dam and into Millsboro Pond, using

chinks in the concrete as grab-points in the climb. But as they swim further upstream, there is a second wall of cement — an 8-foot-high dam at Betts Pond.

"We don't know if any are making it or not" there, said Eric Buehl, habitat coordinator with the *Center for the Inland Bays* (CIB). In limited monitoring, CIB scientists found no signs of eels in Betts Pond, he said. So the CIB, working with the federal Natural Resources Conservation Service (NRCS), came up with a plan. They built and installed a custom "eelway" for the 230-year-old dam. The new eelway is made of steel and looks a little like the storm gutters on a house — only more square than round — and it includes little bumpy pegs that eels can use to help them in their climb. A solar panel provides the energy to operate a small pump that keeps the eelway wet. "It keeps them from drying out," Buehl said. "One reason we wanted to get them over the dam is so they can spread out over other water bodies, thus reducing disease, overcrowding and increasing food sources for other species." The NRCS provided a $1,500 grant for construction and installation of the eelway — 75% of the total cost. Sally Kepfer, state resource conservationist with the NRCS, said the agency often provides money to enhance habitat, especially habitat for rare and declining species. The new eelway is the second installed in the chain of manmade ponds along the Indian River — Millsboro, Betts, Ingram — and the headwater streams of the river.



American eel

The CIB, with the help of the *FishAmerica Foundation* and the National Oceanic and Atmospheric Administration, installed a different style eelway at Millsboro Pond in 2005. That one was a low-tech assembly of PVC pipes lined with nylon. The trouble, though, was that it depended on consistent water levels in the pond. In other words, the pipe had to be in the water to allow the eels to climb through. Buehl said that when water levels were low, the eels couldn't reach the pipe and when they were high, it was submerged too far under the water. Still, he said, they believe it did help some eels cross the dam.

Eels don't need all that much help getting over dams, Buehl said. In the past, state fisheries officials have draped fish-trawling nets at other eel hot spots such as Moores Lake in Dover and Garrisons Lake near Smyrna to help the fish climb over. Eels can't use traditional fish ladders because they aren't strong swimmers.

This latest effort comes at a time when there is growing attention to American eels. The *Atlantic States Marine Fisheries Commission* is requiring state-by-state population monitoring as part of a fisheries management plan. And Millsboro Pond is considered a hot spot in the migration of eels. In 2005, state fisheries biologists counted as many as 60,000 young eels — called glass eels or elvers — at the Delaware dam and spillway at Millsboro Pond.

The scaleless fish are catadromous, meaning they are born in the ocean, mature in fresh water and return to the ocean to spawn — a life-cycle that can take more than a decade. They are found from Greenland to Brazil and are believed to make their way to fresh water on ocean currents.

John Clark, a state fisheries scientist who has been monitoring Delaware's eel population, said the latest work is changing what scientists thought they knew about eels. Eel biologists used to think that "all glass eels were hell-bent to get to fresh water," he said. But it turns out, some may do just fine in brackish and estuarine water. "Only a certain percentage are really keyed to fresh water," Clark said. Biologists from Maine to Florida who are participating in the monitoring are looking for population trends, but so far, "There really hasn't been a trend," he said.

Eels are an important fishery in Delaware — the second largest after blue crabs, Clark said. "Delaware is one of the leading states in landing eels," he said. Some eels are sold as bait while others are live-shipped to Europe and Asia for human consumption, he said.

Source: Molly Murray, *The Wilmington, Delaware News Journal*, 12/15/08

Mosquito Poison Contributing to Frogs' Decline

A common insecticide is weakening frogs' immune systems and contributing to declining populations, according to a new peer-reviewed study by researchers at the Virginia Polytechnic Institute and State University. Runoff tainted with malathion — an organophosphate pesticide used to poison mosquitoes — does not kill tadpoles outright, but inhibits their immune system development, making them more susceptible to infections from lethal parasites.

The researchers found a nearly 20% drop in survival rates when they exposed pickerel frog tadpoles to concentrations of malathion that they say mimic those found in frogs' habitats. Additionally, 11% of tadpoles exposed to malathion developed deformities — more than 10 times the usual rate.

Climate change and fertilizer runoff are increasing parasite populations in frog habitats worldwide, making healthy immune systems all the more critical, wrote researchers Sarah Budischak, Lisa Belden and William Hopkins. The researchers said more study should be conducted to confirm the link between pesticide exposure and underdeveloped immune systems.

Malathion is produced by Denmark-based chemicals company *Cheminova*. Diane Allemang, a spokeswoman for *Cheminova's* U.S. subsidiary, said she had not seen the study and could not comment. Jay Feldman, executive director of the nonprofit advocacy group *Beyond Pesticides*, said the findings should prompt U.S. EPA to review and strengthen regulations on malathion and other organophosphates. "Malathion being a widely used chemical, this type of conclusion should give EPA pause that suggests regulatory process has not adequately restricted uses — that means EPA is currently not doing an adequate job," Feldman said.

The research was published in the December issue of the journal *Environmental Toxicology and Chemistry* and funded by Virginia Tech through a grant from the *National Science Foundation*.

Source: Patrick Reis, *Greenwire*, 1/7/09

Curbs in Usage/Research Needed for Hormone-Altering Pollutants

The *Chemicals, Health and Environment Monitoring Trust* (CHEM) has called for curbs on usage and more research on hormone-altering pollutants in a recent report. CHEM examined more than 250 scientific studies of the reproductive impacts of such compounds on fish, amphibians, reptiles, birds and mammals and found reasons for alarm.

"Urgent action is needed to control gender bending chemicals, and more resources are needed for monitoring wildlife," said Gwynne Lyons, CHEM's director. "Man-made chemicals are clearly damaging the basic male tool-kit. If wildlife populations crash, it will be too late. Unless enough males contribute to the next generation, there is a real threat to animal populations in the long term." The report says chemicals are altering hormone levels, reducing sperm counts and causing genital deformities. It says such findings are significant because all vertebrates have similar hormone receptors. Most of the data the group assessed were drawn from studies of polluted waters.

There has been growing attention to chemicals that mimic the action of estrogen, and scientists have identified many that have the ability to bind to the estrogen receptor, said Gerald LeBlanc, head of North Carolina State University's Department of Environmental and Molecular Toxicology, who was not involved in the study. But he cautioned that not enough is known about exposure levels and effects to make a direct causal connection between the chemicals and wildlife problems.

"We know that chemicals can cause these effects, and we see those effects in wildlife populations, but the links made to causation must be further explored," LeBlanc said. "This reflects the status of science. It's a big void that exists now." LeBlanc said scientists do not fully understand what is "normal" in the environment. For example, scientists expect to see some percentage of organisms that have problems highlighted in the report because of natural imbalances. "What's lagging behind is an understanding of what exposure levels are, and how much of a burden of chemicals these animals are carrying," LeBlanc said. The report calls for more research into how long-term exposure to low levels of contaminants affects animals and their offspring.

Source: Sara Goodman, *Greenwire*, 12/12/08

Deicing Salt Concerns

A University of Minnesota study estimates that 70% of the deicing salt used on Twin Cities metro-area roadways does not travel far before it drains off the pavement and into area wetlands, lakes and groundwater, making them saltier with each successive year. About 30% drains into the Mississippi River. The study found that salinity in 39 metro-area lakes has increased steadily over the past 22 years, following a similar increase in road salt purchases by the state of Minnesota. The researchers also analyzed salinity in three major rivers, 10 tributaries and numerous wells near roadsides.

"This is a wake-up call," said Heinz Stefan, a civil engineering professor at the University of Minnesota's *St. Anthony Falls Laboratory*. "Fortunately we don't have an acute problem right now, but we may have a significant problem in 50 years with groundwater if we keep on doing this." Snowplow drivers apply nearly 350,000 tons of road salt onto pavements in the greater Twin Cities metro area each winter, said Eric Novotny, one of the researchers.
He found that the salt solution that enters lakes is more dense than water in the lakes, forming a layer just above the bottom that can potentially change the water chemistry and kill aquatic insects and affect plant growth. The Twin Cities seem to have a much higher salt-retention rate than Chicago or Toronto, where similar studies have been done, a finding that could be attributed to the numerous wetlands and lakes in the area, Stefan said.

Glenn Skuta, manager of the watershed section for the Minnesota Pollution Control Agency, said that chloride is an emerging issue in the metro area. "Yeah, this is a problem," he said. The agency worked with city, county, and state officials years ago to cover salt piles and prevent erosion, and more recently on ways to use less salt.

Skuta said that five metro-area creeks are listed as impaired because their salt levels are too high: Minnehaha Creek, Nine Mile Creek, Bevens Creek, Shingle Creek and Battle Creek. The creeks have chronic levels above the state standard of 230 parts per million — equivalent to 1 teaspoon of salt in 5 gallons of water. Many streams and lakes in other areas of the Midwest may experience similar issues with road salt.

Sources: Tom Meersman, *Minneapolis Star Tribune*, 2/10/09; and *Greenwire*, 02/11/2009

Scathing IG Report and Other Challenges to Bush ESA Changes

The Bush Administration's Endangered Species Act (ESA) policies are facing attacks on all sides, as the Inspector General (IG), Democrats, environmentalists and the incoming Interior Secretary make moves to overturn or review decisions and regulations made during the Bush era. Political meddling in endangered species decisions at the Interior Department was more widespread than previously thought, according to a new federal IG investigation that says policy changes to the ESA may be needed to fully fix the problem. IG Earl Devaney revisited the political interference of Julie MacDonald, the former deputy assistant secretary for Fish and Wildlife and Parks, in a report delivered to Congress in mid December.

Lawmakers requested a review of 20 different species decisions, and Devaney found that MacDonald may have exerted undue influence in at least 13 of them. "In the end, the cloud of MacDonald's overreaching, and the actions of those who enabled and assisted her, have caused the unnecessary expenditure of hundreds of thousands of dollars to reissue decisions and litigation costs to defend decisions that, in at least two instances, the courts found to be arbitrary and capricious," Devaney wrote.

Tainted decisions include those involving the spotted owl and the marbled murrelet and one reducing the number of streams that would be designated as critical habitat for the endangered bull trout. The rules are already the subject of lawsuits by environmentalists.

MacDonald resigned last year after a previ-

ous scathing IG report found she had:
• violated ethics rules,
• put pressure on employees to change their findings,
• edited scientific decisions on endangered species issues and
• passed internal agency information to outside parties.

The new report found that MacDonald had help from others at the agency, at least one of whom is still a career-level employee at Interior, who "enabled her behavior" and "aided and abetted her." "The results of this investigation paint a picture of something akin to a secret society residing within the Interior Department that was colluding to undermine the protection of endangered wildlife and covering for one another's misdeeds," said Natural Resources Chairman Nick Rahall (D/WV), who requested some of the species reviews. A spokesman for the Interior Department said agency officials are still reviewing the more than 1,000 page report and would not comment until they had more time to review it.

Devaney blames "an enormous policy void" in the ESA that allowed MacDonald to exploit the law. The ESA gives the Interior Secretary discretion to exclude habitat protections and make other changes but does not lay out specific policy for when those changes should be allowed. MacDonald used that discretion to create a process with a "wholesale lack of consistency, a process based on guess-work and decisions that could not pass legal muster," according to the report. Policies changed from one listing decision to another, causing one employee to remark that each morning he would awaken and wonder, "O.K., what's the agency doing today?"

New regulations or agency policy is needed to give more clarity to the process, which is now largely driven by lawsuits, according to the report. Devaney recommends that Congress be a part of the process to provide oversight and "bolster legitimacy."

Regulations, finalized by the Bush Administration in December, would scale back some long-standing safeguards for endangered species. The new regulations make it optional for federal agencies to consult with U.S. Fish and Wildlife Service (FWS) biologists on actions that might threaten species. The new regulations also allow agencies to skip that process in cases where they think there would be little harm to a species.

As a result of these last minute regulation changes, the Interior Department and the FWS now face mounting legal challenges, from the *Center for Biological Diversity* (CBD). CBD made a last rush at the Bush administration's climate change and endangered species policies in mid-January with a spate of wide-ranging lawsuits. The group filed seven separate lawsuits in federal court challenging political interference in a half-dozen endangered species decisions. It also filed a wide-ranging lawsuit in Washington, D.C., demanding that six federal agencies take action to protect threatened and endangered species from global climate change.

Congressman Rahall introduced a resolution in mid-January that would overturn the controversial ESA regulations. The resolution would employ the little-used Congressional Review Act, which gives lawmakers some of the fastest and most aggressive options to roll back rules. Under the act, Congress can throw back recent regulations with a simple majority vote. "The Bush administration has had a long — though one could hardly say proud — history of trying to undermine the ESA and the protection it provides to America's most imperiled species," Rahall said in a statement introducing the bill. "Today, I introduce legislation ... to overturn a rule that served as the Bush Administration's final assault on, and insult to, one of the nation's landmark conservation laws." "While I look forward to working with a new administration with a much greater respect for the law, Congress needs to take immediate steps to make sure that Julie MacDonald's legacy can never be repeated," said Sen. Ron Wyden (D/OR).

But some of the officials who helped MacDonald could potentially remain at the Interior Department during the Obama Administration. MacDonald was "ably abetted" by special assistant Randal Bowman, a career employee who had the authority to help her advance the unwritten policy of working to exclude as much as possible from critical habitat designations. Bowman is still working at the agency. And Devaney charges Thomas Graf, a career-level attorney in the solicitor's office, with a "remarkable lack of recollection that leaves one to speculate whether he was doing MacDonald's bidding or was simply a rogue actor emulating her policy style." MacDonald also had "seemingly blind support" from former assistant secretary for Fish, Wildlife and Parks, Judge Craig Manson. Manson directed an error caused by MacDonald's calculations to be published in the Federal Register, even after the problem was pointed out to him.

But new Interior Secretary Ken Salazar has pledged to take the agency in a new direction. Salazar told members of the Senate Energy and Natural Resources Committee that his "first priority" would be open decision-making and "respect for scientific integrity." He pledged to revisit species decisions that may have been tainted by undue political interference. "We will review what decisions have been made ... and make sure they are in compliance with the law and with the science — there is not a substitute for good science," Salazar said.

Lawmakers told Salazar that major changes are in order to remedy the problem. "You have to go in there and drain the swamp," said Sen. Wyden He asked for Salazar to create a timetable for correcting the decisions upon coming into office. The lawsuits from the CBD — filed in courts in Texas, California and Washington, D.C. — challenge critical habitat designations for 18 different species, including plants, fish and invertebrates. The group wants half a million acres protected for the plants, fish, mammals and invertebrates in nine different states. Interior Department officials drastically reduced protected habitat for the species because of some of the politically tainted policies in the department, according to the suit. The group also filed a notice of intent to sue over the listing decision of the Colorado River cutthroat trout.

"Eight years of the Bush Administration has been a disaster for the nation's endangered species," said Noah Greenwald, biodiversity program director at the CBD. "Reconsidering protection for these 19 species will add to a growing workload in the endangered species program for the Obama Administration."

Source: Allison Winter, *Greenwire*, 12/16 and 1/15/09

Other Last Minute Bush Rulemaking Challenges

"The Bush administration rushed out a host of problematic regulations in its final months," *OMB Watch* and the *Center for American Progress* say in a report released in mid-January. "Many of these 'midnight' regulations actually represent deregulatory actions that weaken or eliminate safeguards protecting health, safety, the environment and the public's general welfare."

But Bush officials have disputed claims that they issued more last-minute rules than their predecessors. According to Jerry Brito, a

senior research fellow at the *Mercatus Center* at George Mason University, the Bush White House reviewed fewer economically significant regulations — those costing the economy $100 million or more — during its final months than Presidents Bill Clinton and George H.W. Bush. But most of the controversial environmental rules, including the overhaul of endangered species regulations, were not classified as economically significant, even though environmental groups said they could have a major effect on wildlife and environmental quality.

During the "midnight" period of President George W. Bush's administration — November and December of 2008 — the Office of Information and Regulatory Affairs (OIRA) reviewed 42 significant rules, Brito said, compared with 48 reviewed under Clinton and 54 reviewed under President George H.W. Bush over the same time during their administrations. But the Bush administration was more effective than its predecessors at finalizing significant rules before the "midnight" period began, Brito said.

The administration's strategy was laid out in a memo from White House chief of staff Joshua Bolten, who called in May for final rules to be issued by November 1. That memo put pressure on agencies to get regulations done earlier, Brito said, resulting in more Bush Administration rules from June to November than from Clinton and George H.W. Bush during the same period during their presidencies. So the Obama Administration and Congress will face more obstacles to overturning those regulations.

With a simple majority in both the House and Senate and the president's signature, lawmakers can vote down regulations that took effect after May 15, 2008, under the Congressional Review Act. Congress can also deny funding for the implementation or enforcement of controversial Bush regulations. Major rules that Congress could attempt to roll back include standards addressing mountaintop mining, an exemption for factory farms from Superfund reporting requirements and rules that would scale back some long-standing safeguards for endangered species (see previous article).

A controversial rule to exempt large animal-feeding operations from some air pollution reporting requirements made it in under the wire. The Bush Administration published the rule before the 30-day deadline. The hotly contested regulations are facing lawsuits on both sides, from environmental groups and the pork industry.

The new Bush rule for mountain-top removal mining would extend the current 100-foot buffer around streams to include all waters (i.e, lakes, ponds and wetlands). But it would also exempt certain activities, including permanent spoil fills and coal-waste disposal facilities, and allow mining that changes a waterway's flow, provided the mining company repairs the damage later. Companies also could receive a permit to dump waste within the 100-foot buffer if they explain why an alternative is not reasonably possible and identify a range of possible waste amounts and locations. The rule does say that the companies must choose the alternative with the least overall adverse environmental impact.

A controversial air pollution rule for aggregating power plant emissions was published in mid January in the Federal Register and was scheduled to take effect on February 17. EPA said the rule would streamline permitting for power plants, but environmental groups argue that it would help industries avoid regulation.

The Obama Administration is moving to review the Bush rules, and in one of the administration's first official acts, White House chief of staff Rahm Emanuel froze all pending federal rules until the Obama team reviews them. Peter Orszag, director of the Office of Management and Budget (OMB) in a memo to federal agency heads in late January offered guidance about extending the regulations' effective date and conducting reviews.

Matt Madia, a regulatory policy analyst at *OMB Watch*, said the Emanuel memo could freeze hundreds of unfinished environmental rules. "The regulatory process isn't really transparent, so we don't really know what EPA or the Department of Interior is working on all day, every day. There could be dozens or hundreds of regulations that are in some stage of development. All the regulations that have been getting a lot of attention aren't impacted by the Emanuel memo. They are already in effect and already doing damage."

Source: Eric Bontrager, *Greenwire*, 12/12/08; Robin Bravender and Allison Winter, *Greenwire*, 1/22/09

Climate Change Update

The three greenhouse gases (GHGs) that have potentially catastrophic effects on the Earth's climate patterns rose to record highs in 2007, according to the U.N. weather agency. The U.N. *Intergovernmental Panel on Climate Change* (IPCC) has warned that if the level of GHGs continues to increase, there will be destructive consequences like severe droughts and floods. Carbon dioxide (CO_2) was up the most, 0.5%, with methane and nitrous oxide rising by lesser amounts, said Geir Braathen of the *World Meteorological Organization* (WMO). He also said it was the first time in 10 years that the concentration of methane increased, but it was too soon to tell what caused the increases.

But according to a new Danish study, much more methane, several times more potent than CO_2, is escaping from Greenland's tundra faster than previously understood. Methane was previously thought to escape most rapidly from the tundra during warm seasons, but Danish and Swedish researchers contend that methane releases actually increased during the fall months. "…it was fantastic and quite surprising to monitor how methane emissions from the tundra suddenly increased drastically in connection with the onset of freezing," said University of Copenhagen researcher Charlotte Sigsgaard. Scientists previously believed the layer of snow and ice covering the tundra would prevent methane from escaping.

Meanwhile, Swiss scientists said in January that the world's glaciers thinned by an average of almost 29 inches in 2007, leading scientists to believe they are melting twice as fast this decade as during the 1980s and 1990s. The *World Glacier Monitoring Service* in Zurich, which regularly measures 80 glaciers around the globe, found that some Alpine glaciers lost as much as 10 feet of ice cover. But coastal glaciers in Norway actually thickened in 2007, the monitoring service said. The rate of decline was less than in 2006, said Michael Zemp, one of the scientists involved. But 2007 was the sixth year this decade that glaciers lost more than 20 inches thickness on average. Glacial thickness is directly influenced by the weather during the previous year. Glacier length is considered to be an indication of long-term climate trends by scientists.

According to new NASA satellite data more than 2 trillion tons of land ice have melted from Greenland, Antarctica and Alaska since 2003. More than half the loss of land-locked ice during the past five years occurred in Greenland, based on measurements of ice weight by NASA's *GRACE* satellite. The water melting off Greenland is enough to fill up about 11 Chesapeake Bays, said NASA geophysicist Scott Luthcke. And the Green-

land melt appears to be accelerating.

Luthcke said the Greenland figures for this past summer are not complete yet, but this year's ice loss — while significant — will not be as severe as 2007. Land ice melting increases sea levels only slightly, unlike sea ice. Between Greenland, Antarctica and Alaska, melting land ice has raised global sea levels about one-fifth of an inch during the past five years, Luthcke said. Sea level can also rise as warming water expands.

Researchers for the *International Polar Year* (IPY) effort, spearheaded by WMO and the *International Council for Science* also say they now have conclusive proof that the ice mass found on Antarctica and Greenland is diminishing. They also say that Arctic permafrost is melting and that the average temperature of permafrost found in northern Russia has increased by 1 to 2 °C over the past 35 years. The findings match an earlier study of Alaskan permafrost that discovered a temperature rise of about 0.5 to 2 °C. The vast swath of permafrost covering the Arctic Circle is known to hold massive quantities of organic material trapped beneath the permanently frozen ground. Scientists suspect that thawing permafrost will lead to much of this material decaying, releasing an enormous amount of CO_2 into the atmosphere and exacerbating the greenhouse effect.

Officials say the two-year polar research and awareness effort has helped to improve scientific understanding of global weather patterns, as well. Researchers have learned that the Arctic and Antarctic get much of their heat and moisture from storms originating in the North Atlantic. Tracking where and how this heat pump operates should help meteorologists and climatologists improve their weather forecasts.

Perhaps the biggest finding to come out of the IPY initiative is the discovery that changes to Earth's climate and environment are happening much more rapidly than scientists working on the groundbreaking studies of the IPCC initially suspected, officials say. "IPY has provided a critical boost to polar research during a time in which the global environment is changing faster than ever in human history," WMO said. "Warming in the Antarctic is much more widespread than it was thought prior to IPY, and it now appears that the rate of ice loss from Greenland is increasing."

Melting Arctic ice is also beginning to open up Arctic sea routes which will pose a threat to delicate relations between countries with competing claims to Arctic territory — particularly as once-inaccessible areas become ripe for oil and gas exploration. Russia, Canada and the U.S. are among the countries attempting to claim jurisdiction over Arctic territory alongside Nordic nations. Analysts say China is also likely to join a rush to capture oil and gas trapped under the region's ice. Some scientists have estimated that Arctic waters could be ice-free in summers by 2013. De Hoop Scheffer said trans-Arctic routes are likely to become an alternative to passage through the Suez or Panama canals for commercial shipping.

Meanwhile, University of California Berkeley researchers have found that average winter temperatures outside the tropics have risen 3.2 °F during the past 50 years, nearly double the 1.7 °F rise in average summer temperatures during the same period. The researchers also identified a shift in the seasons, with the hottest day of the year coming an average of two days earlier now than it did a half-century ago, according to lead author Alexander Stine, a graduate student at Berkeley's Department of Earth and Planetary Science. The study was published in late January in the journal *Nature*.

These changes "have huge economic and other societal implications," said climate expert Gretchen Daily, director of the *Center for Conservation Biology* at Stanford University. "In California, the changes are likely to reduce snowpack and water storage and supply, increase wildfires and lengthen and intensify heat waves". The researchers hypothesize that shifting wind patterns, particularly the *Northern Annular Mode*, or *Arctic Oscillation*, are contributing to the timing of the debut of the year's hottest day. Such winds tend to circulate west to east around the globe, mostly influencing whether a winter is cold from year to year in the Northern Hemisphere. The wind stirs up the atmosphere and moves from one part of Earth to another, bringing heat and moisture. Its strength year to year might be affected by the difference between the pressure in the high Arctic and the tropics, Stine said. One explanation for earlier seasons is the drying of the soils as warmer temperatures cause evaporation. With smaller snowpacks, there is less to melt to supply water in the spring. An earlier spring could warn of a dryer summer, said University of California, Berkeley Professor Inez Fung, co-director of the *Berkeley Institute of the Environment*, who is studying moisture in relation to climate.

Along those lines, U.S. Energy Secretary Steven Chu, a Nobel laureate physicist, warned of water shortages plaguing the West and Upper Midwest and especially bleak consequences for California, the nation's leading agricultural producer. California's farms and vineyards could vanish by the end of the century and its major cities could be threatened if Americans do not act now to deal with global warming, Chu said. Up to 90% of the Sierra snowpack could disappear, all but eliminating a natural storage system for water that is critical to agriculture.

According to a new study in *Science Daily*, snowy owls, the Arctic world's avian equivalent of the polar bear, may also depend on sea ice for their winter habitat, . Owls were traditionally thought to stay on solid ground during the winter months, but six of the adult females tracked in a satellite study spent most of last winter far out on the Arctic sea ice, according to French researchers. The researchers speculate that the owls, whose wingspans can reach up to 5 feet, take to the ice to prey on seabirds.

Also, according to a new study published in the journal *Proceedings of the National Academy of Science*, emperor penguins could go extinct within 100 years if the warming trend of the past 50 years continues. Climate change is altering the timing of Antarctic events such as breaking sea ice or fish migrations, and in order to survive, the penguins will have to change as well, according to the paper. Climate change is reducing the amount of sea ice, which creates conditions for the large populations of krill and fish that penguins depend on. The researchers said a 10% drop in sea ice would reduce penguin populations by 50%. Using IPCC projections, the researchers calculated there was a 36% chance the penguins would lose 95% of their population by 2100. "To avoid extinction, emperor penguins will have to adapt, migrate or change the timing of their growth stages," the paper says. "However, given the future projected increases in [GHGs] and its effect on Antarctic climate, evolution or migration seem unlikely for such long-lived species at the remote southern end of the Earth." Some species are better able to adapt to a new climate than others. Species that breed more frequently evolve more quickly, and some species have shown a greater ability to adjust the timing of their behaviors to meet new conditions. For example, some species of Antarctic birds are laying eggs earlier to be ready for the earlier break up of sea ice, but emperor penguins do not appear capable of doing so.

But many bird species have radically changed migration patterns to adjust to

global warming and could be pushed to the brink by further changes, the *Audubon Society* said in a report released in mid February. Drawing from data gathered in more than 40 years of annual Christmas bird counts, *Audubon* researchers concluded that 58% of the 305 species that winter in North America have since 1968 been traveling farther north — some by hundreds of miles — in search of colder winters. The link between shifting migrations and climate change is "undeniable," the group's scientists say.

More than 70% of forest and feeder birds such as woodpeckers, cardinals, jays and finches — species that are generally considered highly adaptable — are moving north. One such bird, the fox sparrow, is vanishing from its traditional range in Louisiana and Georgia and is now seen frequently in Alaska, Nebraska and Wisconsin, a northward shift of approximately 288 miles. But there are limits to how far north the birds can travel since a powerful cold snap in their new northern ranges could devastate populations, warned Greg Butcher, *Audubon's* bird-conservation director and co-author of the report.

The most imperiled are birds that cannot extend their range, the report says. Nearly two-thirds of grassland species were unable to find new habitat as climate change and agriculture degraded their existing range. Unless immediate action is taken to stem habitat decline, the report says, populations of grassland species such as the eastern meadowlark and burrowing owl will continue to rapidly decline. "Experts predict that global warming will mean dire consequences, even extinction, for many bird species, and this analysis suggests that the process leading down that path is already well under way," *Audubon* President John Flicker said in a statement. "We're witnessing an uncontrolled experiment on the birds and the world we share with them."

Climate change could also push more than 1,000 species of commercial fish and shellfish away from tropical waters and toward polar oceans, according to a new study published in mid February in the journal *Fish and Fisheries*. Researchers predicted that by 2050, marine species will migrate toward cooler waters at an average rate of 40-45 kilometers (25-28 miles) per decade. "These are major impacts that we are going to see within our lifetime and our children's lifetime," said William Cheung, a marine biologist at the University of East Anglia in the United Kingdom and lead author of the study. The migrations could cause massive food shortages and make fish move away from developing equatorial countries where millions depend on them as their primary source of protein.

Also, gray whales along the West Coast are lingering longer in the north before making their swim to tropical waters for the summer, scientists and whale watchers say. Every year, grays make a 12,000-mile round-trip migration from warm waters off Baja California to Arctic seas between Alaska and Russia, where they gorge themselves on enough crustaceans to keep them nourished for the rest of the year. But as the Arctic seas warm because of climate change, competition from new species may be forcing whales to spend more time gathering nourishment and delaying their return to the tropics by an average of 10 days per year, according to Wayne Perryman, a researcher at the *Southwest Fisheries Science Center* in La Jolla, CA, where scientists have watched whales for 20 years.

Climate change has also already created a class of human "ecomigrants" who are moving from their homes in search of more hospitable living spaces. There were roughly 25 million ecomigrants a little more than 10 years ago, and the number now is a good deal higher, said Norman Myers, an environmental researcher at Oxford University. And not all of them come from impoverished countries. In the U.S., most are moving away from hurricane zones, but some are moving for fear of how climate change will affect the planet a century from now.

Adam Fier, a former NASA computer security professional, for example, recently moved his family from Montgomery County, MD, to New Zealand. Fier determined that New Zealand's variety of bioenvironments — the islands' climate ranges from tropical to arctic — make it resilient to climate change and that its geographic isolation shield it from international resource struggles. "I am not going to predict how the climate might change and how it might affect New Zealand," Fier said. "But quite honestly, I feel in 100 years, one of my daughters is still going to be alive and this planet is going to be a mess. If I didn't have two daughters, I would not be doing this," he said.

Unfortunately, the pace of global warming could accelerate when oil and gas supplies dwindle, according to new research by Pushker Kharecha and James Hansen of NASA's *Goddard Institute for Space Studies* at Columbia University. As oil and natural gas reserves dry up, the world may turn to cheap and dirty coal to fill the gap they said. Unless the carbon it emits is captured and stored underground, burning more coal could accelerate global warming. Burning oil pumps 274 grams of CO_2 into the atmosphere for each kilowatt hour, and natural gas produces 202 grams of CO_2. But coal is by far the worst polluter, dumping 331 grams of CO_2 into the air. The researchers concluded that continuing to produce oil and gas until reserves peter out would still allow the world to avoid major climate change. But coal has the potential to keep the planet in the danger zone well past the year 2150, they said. The planet's atmospheric CO_2 concentration is currently 385 parts per million, which Kharecha said is already "undesirably high".

On January 16 the U.S. Climate Change Science Program (CCSP) posted the final five of 21 climate change *Synthesis and Assessment Products,* the final business day for the end of the Bush Administration. The reports cover topics including the effects of climate change on sea-level rise in the Arctic and at high latitudes, and the thresholds of global warming in ecosystems. Critics blasted the Bush Administration for the reports' delayed release, saying President George W. Bush's White House deliberately tried to minimize the role the reports would play in climate policy by slowing their release and minimizing media scrutiny. Rick Piltz, director of the watchdog group *Climate Science Watch* and a former CCSP official, said the delay, "…really undermined the credibility of the federal climate change science program under the Bush Administration."

Meanwhile, speaking at the *World Economic Forum* in Davos, Switzerland, Nobel Peace Prize winner Al Gore called President Barack Obama "the greenest person in the room" for making environmental funding a big chunk of the $819 billion economic stimulus bill passed by the House of Representatives. "I think it's important for the world leaders gathered here to fully appreciate the magnitude of the change in U.S. leadership," Gore said, referring to the frustration in many countries at the Bush Administration's refusal to sign international pacts on reducing planet-warming carbon emissions.

Meanwhile, NASA's James Hansen and his wife, Anniek, sent an open letter to President Barack and Michelle Obama, warning of the "profound disconnect between actions that policy circles are considering and what the science demands for preservation of the planet." The Hansens propose the following three-pronged approach to tackling the

climate crisis:
1) A moratorium on all new coal-fired power plants that do not effectively employ carbon capture and storage technology.
2) A straightforward, revenue-neutral carbon tax, as opposed to cap-and-trade mechanisms supported by Obama and much of the political establishment. Their tax would apply to all oil, gas and coal at the well-head or at the point of entry, affecting all goods that rely on fossil fuels. All the revenue from the tax would be redistributed equally, with monthly deposits in citizen's bank accounts. The tax would penalize those with high carbon footprints and reward those with low ones.
3) Greatly increasing research and development for so-called fourth-generation nuclear power technology, which is designed to improve safety and minimize nuclear waste. Most scientists think such technology will not be commercially available until 2030, but the Hansens say stepped-up government support could make it a reality sooner.

According to a new report from Rice University's *Baker Institute of Public Policy* NASA should shift its focus from moon missions to energy, environment and climate change research. The space agency has an opportunity to prove "its relevance in the post-Cold War world," researchers said, urging President Obama's Administration to place the space agency on the front lines of efforts to harness electricity from alternative energy sources. NASA also should join with other federal agencies to tackle climate change by launching satellites that study the Earth and using the agency's supercomputers to evaluate the future consequences of global warming.

NASA launched the last in a series of National Oceanic and Atmospheric Administration (NOAA) satellites on February 6 from an Air Force base in California. The $564 million *NOAA-N Prime* joins other polar-orbiting satellites that have been monitoring planetary weather since 1960. Its data is intended for use in long-range weather and climate forecasts.

Energy Secretary Chu warned at his Senate confirmation hearing that, "It is now clear that if we continue on our current path, we run the risk of dramatic, disruptive changes to our climate system in the lifetimes of our children and grandchildren." Chu also welcomed President Obama's decision to create a new White House post to oversee and coordinate the administration's work on energy and climate issues, saying the new position underscores the importance of those issues to Obama. The post will be filled by former EPA Administrator Carol Browner.

In mid February Chu further said that scientists would have to achieve Nobel-level breakthroughs in electric batteries, solar power and the development of new crops for fuel to solve the world's energy and environmental problems. A science and technology "revolution" is necessary for the world to reduce its dependence on fossil fuels and curb GHG emissions, Chu said. Solar technology will have to improve fivefold and scientists must identify new types of plants that use little energy to grow and can be turned into cheap alternatives to fossil fuels, he said. The U.S. must also forge a path for cleanly burning coal because other countries with big coal reserves, such as India and China, will not turn away from the resource, Chu said.

U.N. Secretary-General Ban Ki-moon in mid January told reporters that climate change should be the overriding concern of governments. "The coming year will be challenging in the extreme. This is the year of climate change. We have only 11 months to the summit in Copenhagen," he said. Ban said further that he hopes to work with government officials and negotiators on the "crunch issues" surrounding the international climate change talks. He also hopes to have an audience with President Obama as early as possible.

As for President Obama, he has pledged to cut U.S. emissions to 1990 levels by 2020 and to 80% below that level by 2050. But those targets are not as ambitious as the one European and developing nations have proposed for industrialized nations, and they are waiting to see whether the U.S. will enact a hard-line climate bill before the Copenhagen meeting. A State Department official familiar with the issue said top Obama officials recognize the challenge ahead. "We are committed to getting a deal done in Copenhagen, and it obviously has to be a deal that the United States can join in," the official said. "The domestic legislation is going to be enormously important in telling us how far we're going to be able to go." But to adopt climate targets that will satisfy other countries, the administration will have to persuade Democrats and Republicans from the middle of the nation — where fossil fuels, manufacturing and automobiles are key for the economy — to approve legislation that will inflate short-term energy prices.

Meanwhile, partisan battle lines have emerged in the House Energy and Environment Subcommittee as the new panel holds hearings on sweeping energy and climate legislation slated for markup before Memorial Day. Democratic committee leaders and the panel's rank-and-file majority warned of the economic, public health and national security threats from global warming if the U.S. fails to take an international leadership role by curbing its GHG emissions. "Doing nothing is not an option that anybody should look at without feeling a sense of alarm," said Rep. Henry Waxman (D/CA), chairman of the full Energy and Commerce Committee. Republicans, meanwhile, countered with their own concerns about an accelerated economic meltdown if Waxman and the Democrats move as expected on a climate bill that seeks to reduce mid-century emissions by roughly 80%. Rep. Joe Barton (R/TX), the full committee's ranking member, cited economic studies from last year's Senate global warming debate showing that cap-and-trade legislation would slow the projected growth of U.S. gross domestic product. "You want to talk about launching another Great Depression, let's do some of the things that will require that kind of contraction," said Barton, who also is a skeptic on the science linking man-made emissions to climate change.

But eighteen states and the top legal brass from New York and Baltimore in early February urged the Obama Administration to quickly get started on global warming regulations from cars and other industrial sources of heat-trapping GHG emissions. In a letter to U.S. EPA Administrator Lisa Jackson, lawyers for the states and cities said the agency's new leader should move "without further delay" on a long-sought document that makes the connection between GHG emissions and threats to public health or welfare. By issuing an "endangerment finding," EPA then would be prompted to write a series of rulemakings that address everything from motor vehicles to power plants and airplanes. "The science is clear and the need for action at the federal level immediate," the state and city attorneys wrote. "Issuance of the endangerment determination is a decisive step that can and should be taken now."

State attorneys signing the letter include Martha Coakley of Massachusetts ,Terry Goddard of Arizona, Jerry Brown of California, Richard Blumenthal of Connecticut, Richard Gebelein of Delaware, Lisa Madigan of Illinois, Tom Miller of Iowa, Janet Mills of Maine, Douglas Gansler of Maryland, Lori Swanson of Minnesota, Anne Milgram of New Jersey, Gary King of New Mexico, Andrew Cuomo of New York, John Kroger of Oregon, Susan Shinkman of Pennsylvania, Patrick Lynch of Rhode Island, William Sorrell of Vermont and Rob

McKenna of Washington.

Despite offering $8 billion for energy research, the economic stimulus package passed by Congress can only go so far in advancing the use of clean and renewable energy, according to leading experts. Technological breakthroughs are needed to ramp up the efficiency of solar cells, expand the storage capacity of batteries, capture and store CO_2 and revolutionize coal and nuclear power plants, but it has been 30 years since significant progress has been made in any of these fields. Scientists and energy officials are hoping for a revolutionary technology akin to what the transistor brought to radios, telephones and other electronics once dependent on fragile light bulb-sized vacuum tubes. A similar achievement is needed in the areas of wind, solar and biofuel technology to make those sources as cheap and efficient as fossil fuels like coal and oil.

Meanwhile, utility owners say that U.S. EPA and state regulators should consider the carbon impact of treatment technologies before deciding the maximum daily load (TMDL) for pollutants in wastewater discharges. Further they say pollution cleanup efforts should focus on stopping dirty water where it starts — on farms, lawns and streets — with low-tech pollution controls instead of relying on energy-hungry technologies at water treatment plants. Controls for wastewater treatment plants are "very energy-intensive," said Fred Andes, a lawyer representing utilities in Chicago and Idaho.

"By requiring those controls, you've increased the carbon footprint of those facilities," said Susan Bruninga, spokeswoman for the *National Association of Clean Water Agencies* "You really need to find a balance." Bruninga noted that the Clean Water Act puts pressure on utilities to clean up so-called non-point source pollution, which washes into storm sewers from diffuse areas, before discharging it into rivers and other waters. "Because we're not getting the reduction we need from these other sources of pollution, [regulators] turn to us, the point sources," she said. Andes is urging regulators to take carbon emissions into account and focus on stopping pollution before it reaches treatment plants — by requiring farmers to account for discharges in nutrient-management plans, for example.

The U.S. Department of Agriculture's (USDA) Office of Ecosystem Services and Markets, initiated last October, also seeks to engage farmers, ranchers and forest managers in efforts to maximize agricultural lands' ability to soak up more atmospheric CO_2. Scientists have long noted that large agricultural tracts — whether planted in trees, crops or grasses — can soak up millions of tons of CO_2 from the atmosphere as part of photosynthesis. "Private lands could be a real engine for the better in the fight against climate change," said Steve Moyer, vice president of government affairs for *Trout Unlimited*. "We're hopeful this is another sign the federal agencies, including ones that have not been at the forefront of resource conservation and dealing with global warming in the past, including the USDA, are now really committed to doing their part on climate change."

Also on the agricultural front, researchers now believe livestock industries are responsible for more GHG emissions than cars, according to the United Nations. Ruminants such as sheep, deer, cows and other livestock use a unique digestive process to digest grasses which also produces high concentrations of methane. In New Zealand — where 35 million sheep outnumber people 10-1 — researchers are changing sheep's diets, giving them chemical treatments and experimenting with selective breeding in an effort to make sheep less gassy. "We're at a very theoretical stage," said Simone Hoskin, a livestock expert from Massey University. "A lot of people think we are insane."

In 2003, New Zealand politicians proposed a livestock tax to compensate for emissions, but industry opposition labeled the measure a "fart tax" and succeeded in tabling the measure. Many in the industry dispute that livestock are contributing to climate change. Nevertheless, the industry is hoping to avoid being labeled a climate polluter, as many environmental groups are already encouraging people to avoid meat to reduce their contribution to global warming.
Meanwhile, the religious organization, *Interfaith Center on Corporate Responsibility* (ICCR), an alliance of about 300 faith-based groups controlling more than $100 billion in investments launched a Web site in early February profiling the effects of more than 150 corporations on climate change and comparing those companies to their industry peers. ICCR said it has compiled "climate risk profiles" of well-known companies such as *Google Inc.*, *Dow Chemical Co*. and *Intel Corp*. Using information provided by *Trucost*, an environmental data company claiming to have the world's largest accounting of GHG emissions, ICCR's site notes whether companies have publicly disclosed their emissions. Investors can also compare companies' performance on climate mitigation.

James Salo, vice president of strategy and research at *Trucost* called the database a "credible and totally independent assessment" that does not rely solely on disclosure from the businesses themselves. The corporate climate-risk profiles should also "clear away confusion about corporate greenwashing on the GHG issue," said Leslie Lowe, director of the energy and environment program at ICCR. "Now we are squarely faced with the urgent necessity for business to become engaged in reducing GHG emissions," Lowe said. "All sectors of the economy must be engaged in this struggle."

On a more personal level for us computer users, a typical *Google* search produces 7 grams of CO_2, the equivalent of boiling a kettle of water, according to a Harvard University physicist Alex Wissner-Gross. The emissions come from electricity used by *Google's* data centers. "*Google* isn't any worse than any other data center operator," he said. "If you want to supply really great and fast results, then that's going to take extra energy to do so." But *Google* disputes Wissner-Gross' figures, pegging carbon emissions from a typical search at 0.2 grams. Overall, a recent study by American research firm *Gartner* suggested information technology is responsible for 2% of global carbon emissions.

Sources: *AP*, 11/25/08 and 1/30/09; *Science Daily*, 12/10 and 12/11/08; *AP/Anchorage Daily News*, 1/29/09; *AP/MSNBC.com*, 12/10 and 12/16/08; David Stringer, *AP*, 1/29/09; Jane Kay, *San Francisco Chronicle*, 1/22/09; Jim Tankersley, *Los Angeles Times*, 2/4 and 2/23/09; Azadeh Ansari, *CNN.com*, 2/12/09; Michael Torrice, *Miami Herald*, 2/12/09; Shankar Vedantam, *Washington Post*, 2/23/09; Alexis Madrigal, *Wired*, 1/26/09; ; Eoin O'Carroll, *Christian Science Monitor*, 1/5/09; Mark Carreau, *Houston Chronicle*, 2/3/09; *AP/Houston Chronicle*, 2/6/09; Broder/Wald, *New York Times*, 2/12/09; *BBC News*, 1/12/09; Juliet Eilperin, *Washington Post*, 2/20/09; Patrick Barta, *Wall Street Journal*, 2/26/09 Katherine Ling and Ben Geman, *Greenwire*, 1/13/09; Patrick Reis, *Greenwire*, 2/10/09; Robin Bravender, *Greenwire*, 1/29/09; Katherine Boyle, *Greenwire*, 12/16/09; Nathanial Gronewold, *Greenwire*, 1/13 2/5 and 2/25/09; Darren Samuelsohn, *Greenwire*, 2/5 and 212/09; and *Greenwire*, 11/25, 12/2, 12/11, and 12/16/08; and 1/6, 1/12, 1/22, 1/27, 1/29, 1/30, and 2/3, 2/4, 2/6, 2/12, 2/13, 2/20, 2/23, 2/25 and 2/26/09

Meetings of Interest

May 4–6: Managing Water Resources and Development in a Changing Climate, Anchorage, AK. See: www.awra.org/meetings/Anchorage2009.

May 5–8: 12th National Mitigation and Ecosystem Banking Conference, Salt Lake City, UT. See: www.mitigationbankingconference.com.

May 12–13: Professional Development Workshop: Assessment and Identification of Riparian Vegetation, Pittsboro, NC. See: www.ncsu.edu/srp/veg_workshop.html.

May 17-20: National Watershed Conference, Wichita, KS. See: www. watershedcoalition.org.

May 17–21: World Environmental and Water Resources Congress 2009, Kansas City, MO. See: http://content.asce.org/conferences/ewri2009.

May 19–21: Professional Development Workshop: Stream Morphology Assessment, Raleigh, NC. See www.ncsu.edu/srp/rc_100.html.

May 29 – June 1: 2009 National River Rally, Baltimore, MD. See www.rivernetwork.org/rn/rally.

July 12-17: International Society for River Science (ISRS), St. Petersburg, FL. http://www.stpt.usf.edu/coas/espg/riverconference/schedule.asp

Jul. 20-24: 3rd National Conference on Ecosystem Restoration, Westin Bonaventur, Los Angeles, CA. See: www.conference.ifas.ufl.edu

Aug. 10-13: Visions of a Sustainable Mississippi River, Collinsville, IL. Contact: ngrrec@lc.edu

Aug. 30 - Sept. 3: 139th Annual Meeting of the American Fisheries Society, Nashville, TN, www.fisheries.org.

Aug. 30 - Sept. 3: Monitoring, Characterizing and Managing Big River Fish Communities Symposium, 139th Annual AFS Meeting. Contact: ddixon@epri.com

Congressional Action Pertinent to the Mississippi River Basin

Climate Change

S. 137. Brown (D/OH). Creates jobs and reduces the dependence of the U.S. on foreign and unsustainable energy sources by promoting the production of green energy, and for other purposes.

H. R. 232. Baldwin (D/WI) and 3 Co-Sponsors. Provides for creation of a Federal greenhouse gas registry, and for other purposes.

H. R. 594. Stark (D/CA) and McDermott (D/WA) Amends the Internal Revenue Code of 1986 to reduce emissions of carbon dioxide by imposing a tax on primary fossil fuels based on their carbon content.

H. R. 585. Lee (D/CA) and 5 Co-Sponsors. Directs the President to enter into an arrangement with the National Academy of Sciences (NAS) to evaluate certain Federal rules and regulations for potentially harmful impacts on public health, air quality, water quality, plant and animal wildlife, global climate, or the environment; and to direct Federal departments and agencies to create plans to reverse those impacts that are determined to be harmful by the NAS.

Conservation

H. R. 404. Grijalva (D/AZ) and 23 Co-Sponsors. Establishes the National Landscape Conservation System, and for other purposes.

H. R. 1080. Bordallo (D/GU). Strengthens enforcement mechanisms to stop illegal, unreported, and unregulated fishing, and for other purposes.

Endangered Species Act (ESA)

H. J. RES. 18. Rahall (D/WV) and 12 Co-Sponsors. Provides for Congressional disapproval of the rule submitted by the Department of the Interior and the Department of Commerce under chapter 8 of title 5, United States Code, relating to interagency cooperation under the ESA of 1973.

Federal Water Pollution Control Act

H. R. 700. McNerney (D/CA) and Tauscher (D/CA). Amends the Federal Water Pollution Control Act to extend the pilot program for alternative water source projects.

Invasive Species

S. 237. Levin (D/MI) and 4 Co-Sponsors and **H. R. 500.** Ehlers (R/MI) and 20 Co-Sponsors. Establishes a collaborative program to protect the Great Lakes, and for other purposes.

S. 462. Boxer (D/CA) and Vitter (R/LA). Amends the Lacey Act Amendments of 1981 to prohibit the importation, exportation, transportation, and sale, receipt, acquisition, or purchase in interstate or foreign commerce, of any live animal of any prohibited wildlife species, and for other purposes.

H. R. 48. Biggert (R/IL). Amends section 42 of title 18, United States Code, popularly known as the Lacey Act, to add certain species of carp to the list of injurious species that are prohibited from being imported or shipped.

H. R. 51. Kirk (R/IL). Directs the Director of the USFWS to conduct a study of the feasibility of a variety of approaches to eradicating Asian carp from the Great Lakes and their tributary and connecting waters.

H. R. 669. Bordallo (D/GU) and 9 Co-Sponsors. Prevents the introduction and establishment of nonnative wildlife species that negatively impact the economy, environment, or other animal species or human health, and for other purposes.

Mining

S. 140. Feinstein (D/CA). Modifies the requirements applicable to locatable minerals on public domain lands, consistent with the principles of self-initiation of mining claims, and for other purposes.

S. 409. Kyl (R/AZ) and McCain (R/AZ). Secures Federal ownership and management of significant natural, scenic, and recreational resources, to provide for the protection of cultural resources, to facilitate the efficient extraction of mineral resources by authorizing and directing an exchange of Federal and non-Federal land, and for other purposes.

H. R. 493. Rahall (D/WV). Directs the Secretary of the Interior to promulgate regulations concerning the storage and disposal of matter referred to as ``other wastes'' in the Surface Mining Control and Reclamation Act of 1977, and for other purposes.

National Environmental Policy Act (NEPA)

H. R. 996. Nunes (R/CA) and McCarthy (R/CA). Temporarily exempts certain public and private development projects from any requirement for a review, statement, or analysis under the NEPA of 1969 (42 U.S.C. 4321 et seq.), and for other purposes.

Public Lands

S. 22. Bingaman (D/NM). Designates certain land as components of the National Wilderness Preservation System, to authorize certain programs and activities in the Department of the Interior and the Department of Agriculture, and for other purposes.

S. 32. Spector (R/PA) and Casey (D/PA). Requires FERC to hold at least one public hearing before issuance of a permit affecting public or private land use in a locality.

H. R. 1041. Melancon (D/LA). Directs the Secretary of the Interior to study the suitability and feasibility of designating sites in the Lower Mississippi River Area in the State of Louisiana as a unit of the National Park System, and for other purposes.

Water Quality

H. R. 135. Linder (R/GA) and 3 Co-Sponsors. Establishes the 21st Century Water Commission to study and develop recommendations for a comprehensive water strategy to address future water needs.

H. R. 276. Miller (R/MI). Directs the Administrator of the USEPA to convene a task force to develop recommendations on the proper disposal of unused pharmaceuticals, and for other purposes.

H. R. 631. Matheson (D/UT). Increases research, development, education, and technology transfer activities related to water use efficiency and conservation technologies and practices at the USEPA.

H. R. 1145. Gordon (D/TN). Implements a National Water Research and Development Initiative, and for other purposes.

Water Resources

H. R. 172. Salazar (D/CO) and Markey (D/CO). Provides for the construction of the Arkansas Valley Conduit in CO.

Sources: http://www.gpoaccess.gov/bills/index.html; and http://thomas.loc.gov/cgi-bin/thomas

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River Crossings

Mississippi Interstate Cooperative Resource Association
9053 Route 148
Marion, IL 62959