River Crossings

Volume 21 **April/May/June 2012** **Number 2**

Chairman's Comments

As the floods of 2011 are now a year in the past, we need to seriously consider how such costly flooding can be prevented in the future. MICRA is of course a fishery organization. But healthy fisheries need healthy rivers and healthy rivers need healthy floodplains. We must modernize and improve the way we manage floodplains. That is not to say that we should replace our existing flood management infrastructure, but we should consider and implement a better mix of what is called grey and green infrastructure to further reduce human risk from flooding, and improve water quality and river habitat. The floodplains of the Mississippi River and its tributaries have enormous values for our cities, agriculture, and unique riverine habitats like bottomland hardwood forests, Cane breaks, and wetlands. Floodplains provide habitat for numerous life stages of fish, resident and migratory birds, and assimilate excessive nutrients from the water.

Reconnecting floodplains can be an effective and low-cost way to reduce flooding. By allowing floodwaters to spread out onto floodplains, we can lower flood heights and risk to nearby towns. Historically, the Nile River spilled over its banks and replaced the nutrients that made the Nile valley productive farm land for 1000's of years. These nutrients tied up on the floodplain were the basis for their agriculture and helped to retain fertile fields even after regular use. While I don't think floodplain management is simple in our world, we should always look for better, more efficient ways to do business that are environmentally sustainable.

2012 Asian Carp Control Strategy

The Obama Administration's 2012 Asian Carp Control Strategy Framework calls for spending $50 million and identifies the following eleven priority actions which are planned or under way to address the threat of a Great Lakes Asian carp invasion.

Grass (left), Silver (middle) and Bighead carp (right) taken from commercial nets in early March from the Mississippi River near Winona, MN, marking the northernmost range extension for the silver carp. (Nicholas Schlesser, MN DNR photo)

1. Continuing the Great Lakes and Mississippi River Interbasin Study (GLMRIS) to identify the most cost-effective and efficient ways to prevent the transfer of aquatic nuisance species (ANS) between the Great Lakes and Mississippi River basins.
2. Improving the evaluation of electric barrier effectiveness through fish tagging and utilization of sonar equipment.
3. Beginning the construction of the permanent barrier to replace electrical Barrier 1, the original electrical barrier built in 2002.
4. Deploying an enhanced, more efficient system to monitor, sample, and capture Asian carp if present above the electric dispersal barriers.
5. Increasing collaboration with stakeholder groups, commercial fishermen, industry, and recreational boaters.
6. Increasing investment in research and development of long-term fish management

Inside This Issue

strategies for Asian carp, environmental DNA (eDNA) sampling, and habitat assessments.
7. Field testing new technologies, such as water guns, to herd or eradicate aquatic invasive species.
8. Continuing development and field testing of biological methods to reduce Asian carp breeding.
9. Developing alternate traps and technologies to enhance capture rates.
10. Conducting research and testing to reduce the uncertainty of eDNA results.
11. Stopping the illegal transport of Asian carp and other ANS across State lines.

The Framework is designed to be flexible, to ensure the ability to tailor actions to changing conditions. "This strategy builds on the unprecedented and effective plan we are implementing to keep Asian carp out of the Great Lakes while we determine the best long-term solution," said John Goss, director of the Asian carp program for the White House *Council on Environmental Quality*. Over the past two years, the federal government has budgeted more than $100 million for the fight against bighead and silver carp.

Unfortunately, an electric barrier near Chicago designed to prevent Asian carp and other species from migrating between Lake Michigan and the Mississippi River system had a 13-minute power outage on May 2nd according to U.S. Army, Corps of Engineers (Corps) officials who operate the barrier. Federal officials consider the barriers a crucial part of their strategy to prevent bighead and silver carp from invading the Great Lakes. The outage happened at about 1 p.m. CDT , U.S. Sen. Debbie Stabenow (D/MI) and Rep. David Camp (R/MI) said. Two of three barriers were operating at the time and both failed. Backup generators were activated, but a power surge prevented them from immediately working. Personnel at the site had to manually reset a circuit breaker to get the generators working. The barriers emit rapid pulses to scare away fish and jolt those that don't turn back.

The Corps and experts with the Asian Carp Regional Coordinating Committee are investigating the cause of the failures to determine whether any fish were nearby at the time, the lawmakers said. "These barriers are the only thing standing between the Asian carp and our Great Lakes," Stabenow and Camp said in a statement. "If carp had been able to get through while the barriers were down, it could have been absolutely devastating to our economy and our way of life." Stabenow and Camp, are co-sponsoring bills that would order the Corps to speed up development of a plan to prevent migrations between the Mississippi and Great Lakes watersheds. The Corps' plan is not scheduled for completion until late 2015, and the Corps and other agencies have identified 39 species that could slip from one drainage basin to the other and disrupt native ecosystems.

The May power outage was the second in which the barrier network inadvertently lost power, said Lt. Col. James Schreiner, deputy commander of the Corps' Chicago district. The other was in 2010 and lasted four minutes. He said that outage was weather-related but didn't have additional details. "Right now we just don't have enough data to say" if weather played a role this week, he said. Also, in 2009 officials shut down the system for maintenance. During that time they put a fish toxicant (rotenone) in the water to prevent Asian carp from getting through.

Camp and Stabenow are among critics who contend the electric barrier network is inadequate. They favor erecting solid obstacles to permanently separate the Great Lakes and Mississippi watersheds, which a study this year said would cost billions. "While the Corps was fortunately able to respond quickly to the barrier losing power, this glitch illustrates what we already know — electric barriers and chain-link fences will not hold back Asian carp forever," Camp said.

Less than a week after the power outage, White House officials announced that the Corps plans to release a short list of possible fixes next year to speed up completion of their scheduled 2015 study. White House officials said that a handful of options will be proposed leaving it to Congress and the public to decide the proper course. "This new step will result in a more focused path forward that could mean faster implementation of a permanent solution for protecting our Great Lakes from Asian carp," Goss said. Whether the new approach results in a faster solution will depend on Congress, which must choose a path and pay for it. It also means the Corps won't spend the next few years developing a single plan that Congress could end up rejecting anyway.

River Crossings

Published by

Mississippi Interstate Cooperative Resource Association
(MICRA)
9053 Route 148, Suite A
Marion, IL 62959

River Crossings is a mechanism for communication, information transfer, and coordination between agencies, groups and persons responsible for and/or interested in preserving and protecting the aquatic resources of the Mississippi River Drainage Basin through improved communication and management. Information provided by the newsletter, or opinions expressed in it by contributing authors are provided in the spirit of "open communication", and do not necessarily reflect the position of MICRA or any of its member States or Entities. Any comments related to "River Crossings" should be directed to the MICRA Chairman.

Sources: *AP/Washington Post*, 2/23/12; *www.asiancarp.us* ; *AP/Chicago Tribune*, 5/4/12; *AP/Twin Cities Pioneer Press*, 5/4/12; John Flesher, *AP/Detroit News*, 5/8/12; and *Greenwire*, 2/23, 3/27, 3/28, 5/8/12

Bio-bullet for Asian Carp

U.S. Geological Survey (USGS) biologist Jon Amberg has spent the last two years working to develop a poison pill that would kill Asian carp and leave other fish unscathed. Such engineered poisons, often called "bio-bullets," have become increasingly popular among scientists trying to create solutions to unyielding problems, from malignant pests in rivers and fields to tumors in human bodies. "If you look at Asian carp as being kind of like a cancer, we're in essence developing a drug to be able to target it without killing the 'cells' around it," said Amberg, who works at the USGS lab in La Crosse, WI.

Akin to chemotherapy, attempts to chemically control Asian carp would require dumping thousands of gallons of pesticide into waterways, possibly harming other aquatic life. By contrast, an Asian carp bio-bullet would theoretically deliver toxins specifically to silver and bighead carp in a digestible microsize particle, about the width of a human hair. Built to mimic food, the pill would then break apart in the carp's intestine, releasing its lethal load and killing the fish. If it works, Amberg and his colleagues foresee an arsenal of similarly elegant weapons designed to control the many invasive species that have wreaked havoc in the Great Lakes and Mississippi River basins. Preliminary work has already begun on zebra mussels as well as on fish eggs, which they think may be susceptible to electricity and nano-size silver that would be about a thousand times smaller than the Asian carp microparticle.

Some experts, however, have questioned whether the targeted strategies will really work. Environmental groups that have lobbied for physical separation of the Great Lakes from the Mississippi River see it as a red herring, a distraction from a permanent solution to the invasive species problem. Other scientists have wondered if the reconfigured toxins might result in unintended environmental consequences. Nano-size silver particles, for instance, have been shown to harm a range of species in laboratory experiments, according to Andrew Maynard, director of the *Risk Science Center* at the University of Michigan. "From a technology perspective, this is very inspiring," Maynard said. "But if you are releasing new particles into the environment, there are certain questions that you need to ask: What do they do? Where do they end up? How long do they last?"

Amberg's colleague Mark Gaikowski got the idea for an Asian carp poison pill in 2009 after watching a presentation by *Advanced BioNutrition Corp*. about a particle it had created to carry vaccines into salmon. Perhaps, Gaikowski thought, instead of aiding fish, that same technology could be used to kill Asian carp. "They (Asian carp) are, by far, the most interesting species I have ever worked with," Amberg said. "Their resilience is incredible." Yet Amberg saw promise in a deadly pill that could work as a kind of miniature Trojan horse, allowing scientists to sneak a toxin into more Asian carp than they had ever been able to reach.

In 2010, Amberg and his colleagues began working with *Advanced BioNutrition* to develop a strategy using the fish's own digestive system. They wanted to build a particle that would break apart inside Asian carp, but would remain intact if eaten by other fish. To do that, they had to first find something unique in the bowels of the invasive species that could trigger the poison's release. Amberg pondered whether the carp's stomach acid might work, but after slicing into dozens of different species of fish he realized most were too similar. He then focused solely on digestive enzymes, which are proteins that process food, wondering whether those could be used to dismantle the pill. Two years and hundreds of tests later, Amberg said he and his colleagues have finally found a couple of carp enzymes they think might work. But they must first pursue a host of outstanding questions, including whether those key enzymes will change based on the carp's diet.

But some scientists remain skeptical of the entire enterprise. Jennifer Sass, a scientist with the *Natural Resources Defense Council*, said she is not convinced that the pill would target only carp because of the similarities in animal digestive systems. "(It) seems like a lot of scientific arrogance," she said. Rebecca Klaper, a scientist at the University of Wisconsin at Milwaukee who studies the impact of contaminants on freshwater species, also questioned how the particle might behave differently when moved from lab to river. She wondered, for example, whether microorganisms in the environment could tear apart the pill's coating, dispersing the toxin into the water. "Once you start putting stuff into the environment, it is sort of a black box where you don't know what is going to happen," Klaper said.

Amberg and his team hope to answer some of those questions in the coming months when they start testing the particle in river water. Subsequent studies may include analyzing the impact on birds that eat the dead carp and whether bottom-feeding fish could be affected if the microparticles settle in riverbeds. Still, they acknowledged that once in the environment, it is possible the pill may affect other fish. The goal, they said, is for it to kill far fewer species than would currently be affected by a standard poison dump.

In the meantime, they are continuing work on similar particles for invasive mussels as well as for Asian carp eggs, which would ideally allow them to attack the problem before it hatches. For the first time, Amberg said, there is a feeling that the scientists may finally be on the offensive in the fight against Asian carp. But he described their position as somewhat delicate. "It is like you are walking on thin ice," Amberg said. "You want to make sure that next step is going to be on something really solid before you start to put your foot on it."

Sources: Cynthia Dizikes, *Chicago Tribune*, 3/27/12; and *Greenwire*, 3/28/12

Illegal Shipments of Asian Carp

As the debate over how to handle Asian carp spreading in the Great Lakes and elsewhere proceeds, the species continues to makes its way northward through illegal truck shipments. In February, Canadian border patrol agents confiscated 14,000 pounds of live Asian carp in what was the third bust in less than two months at the border and the fifth in the past year. In January, inspectors nabbed a combined 9,400 pounds of live carp on two additional busts.

In each case, the carp were brought north from fish farms in the southern U.S. to be sold in Toronto, where the fish is popular in Asian cuisine. There are questions over how well the U.S. and Canadian governments are working together to stop the invasive species from entering new waters. To reach the Canadian border, trucks carrying Asian carp are crossing state lines — often from as far away as Arkansas. Penalties for violation of the U.S. Lacey Act range from $10,000 and a year in jail for misdemeanors up to $250,000 for individuals and $500,000 for organizations that commit felonies.

"Curbing interstate transport of live bighead carp promotes the federal government's goal of preventing the carp's spread into new lakes and rivers in the United States," U.S. Fish and Wildlife Service (FWS) officials said last year. Despite that sentiment, it is unclear if the U.S. is following up on the cases identified by Canadian border officials. When asked what communication between Canadian officials and their U.S. counterparts on those busts has occurred, a spokesman for the Ontario Ministry of Natural Resources (OMNR) said, "very little."

"The formal route for communicating is through the *Great Lakes Fisheries Commission* (GLC) by reports at the regular meetings," said John Cooper, a spokesman for the OMNR. "But usually, if we get a truck stopped at the border or a successful (court prosecution), our U.S. counterparts usually find out about it by reading the newspaper." FWS officials are coy about any follow-up work they are doing on this year's cases, or last year's. "I would like to stress the importance of the good work that our special agents do across the country," wrote Tina Shaw, a FWS spokeswoman, in response to written questions from *The Detroit News*. "Unfortunately, aside from the specifics of the federal laws we are charged to uphold," she added, "I cannot give you any information regarding ongoing investigations."

But it's unclear if there is an ongoing investigation. Mark Eikenberry, owner of *Sweetwater Springs Fish Farm* in Peru, IN, paid a $20,000 fine last year when his truck was stopped at the border with live Asian carp in its holding tanks. He said the fish, which had been packed in ice, were thought to be dead before they left the state. Eikenberry said *Sweetwater* has since changed its procedures to make sure the problem doesn't occur again. "Obviously, you stop short of the border to make sure they're dead," he said. "Also, once you've iced the fish heavily on top, you spray down or wet the top layer of ice so it melts together and seals off the flow of air." Since that incident, more than a year ago, Eikenberry said he has not been interviewed or contacted by the FWS.

"It's hard for me to believe that there is no attention being paid to these busts on the U.S. side," said Joel Brammeier, president of the *Alliance for the Great Lakes*. "I think it's clear there needs to be an effort to lock this down because there's clearly a trend of (illegal) transporting happening. I think it's time to get on the road and shut it down because it's right there staring at us." Marc Gaden, communications director and legislative liaison for the GLC said he also hoped making transportation of live carp across state lines illegal would send a message. "We worked, the *Great Lakes Fisheries Commission* and law enforcement community, to support the listing of Asian carp as injurious under the Lacey Act," he said. "With that came the understanding that prohibiting the movement of these fish across states and border would be a deterrent … that enforcement would occur."

The possession of live Asian carp has been illegal in Ontario since 2005. Those caught with the live fish have to pay fines amounting to tens of thousands of dollars. While it is legal to possess live Asian carp in the U.S., it is illegal to transport the live fish across state lines.

Sources: Jim Lynch, *Detroit News*, 3/27/12; and , 3/27/12

New Cooperative Invasive Species Risk Assessment Proposal

The U.S. Fish and Wildlife Service (FWS) is working with the *Pet Industry Joint Advisory Council* (PIJAC) , a major trade association, in an effort to try to keep new invasive animals out of the U.S. The goal is to create voluntary trade bans for foreign fish and animals that have prime potential to cause economic or environmental harm if brought into the country. The effort represents a "new era of policymaking" for invasive species, according to Jeff Underwood, deputy assistant director for fisheries and habitat conservation for the agency.

The move is also an attempt to speed up the current process for banning problem species, which falls to the century-old Lacey Act that governs international trade of wildlife. The law gives the government latitude to list a species as "injurious" and bar its import, but in practice that usually does not happen until after a species has already become a nuisance. "By the time we have done the listing process, a species could already be established somewhere," Underwood said. With the new voluntary bans, the FWS is trying to "get progressive and find a nonregulatory solution that accomplishes nearly the same thing a lot faster," he said.

Part of the new effort involves federal biologists working with the PIJAC to create risk assessments aimed at flagging potentially harmful species that should be kept out of the U.S. and give a green light to species that pose little risk of establishing themselves in the U.S. There currently are no requirements to assess species for risks before allowing them into the country. So FWS biologists are currently working on a draft memorandum of understanding with the PIJAC and hope to include sportfishing groups, the *Association of Zoos and Aquariums* and other federal, state and industry partners. The FWS would provide technical expertise through risk screening and make those reports available on a public website. The partners would use that information to agree to trade bans for risky species and recommend low-risk species for trade. The assessment addresses species that are not currently in trade in the U.S., but that have the potential for trade as pets, aquaculture or live food. The agency has already evaluated some 1,500 species for the new risk assessment.

The assessment gives the following three rankings: red for potentially invasive species that could merit a trade ban, a yellow "caution" ranking for species whose impact risk is uncertain, and a green "go" ranking for species that do not pose a threat. The red rankings would go to species that have a history of invasiveness in other places with similar climate or habitat to the U.S. For instance, the FWS's draft assessment gives a "red" no-trade ranking to the Nile perch, a fish that was introduced into Lake Victoria and caused extinction of some species there.

The partnership builds on a recent "habitattitude" public awareness campaign that the FWS and the pet industry developed to warn consumers not to release fish or aquatic plants into streams and rivers. After that campaign, the pet industry came to the FWS and asked to work together on a registry to flag potential future invaders, according to Marshall Meyers, a senior adviser for the PIJAC. Meyers said the industry wants to avoid bringing in species that could be harmful. He said the industry looks forward to working with the FWS and nonprofit groups on "a nonregulatory approach to stop clearly invasive species that are not good for trade and not good for the environment." "It is going to become interesting," he added. "We will all have to learn how to work together and not be adversaries."

But advocates for better screening of invasive species are not convinced a voluntary agreement will do the trick. "Where are the teeth here?" said Bentley Johnson, who tracks invasive species issues for the *National Wildlife Federation*. His group and dozens of other national and state environmental organizations have been pushing the

administration and Congress to overhaul their approach to the Lacey Act and take up mandatory screening and risk analysis. "Anytime we can work collaboratively with the pet trade industry and the administration towards the goal of preventing the introduction of potentially harmful animal invasive species is a positive step," Johnson said. "But from a perspective of already having trouble using the slow-moving Lacey Act ... it would seem that a voluntary approach might be signaling a retreat."

FWS officials have said the voluntary trade ban would not preempt the Lacey Act. They could still list a species as injurious, if needed, but the voluntary agreement would give them a quicker way to flag it before they complete the Lacey Act process. "There is nothing to stop us from an 'injurious species' listing that would codify it in law," said Craig Martin, who works on aquatic invasive species for the Fish and Wildlife Service. But advocacy groups still would prefer to see a mandatory risk assessment process. The *National Environmental Coalition on Invasive Species*, which includes major national environmental organizations and dozens of state groups, has been pushing for a screening program.

But mandatory screening has been a tough sell in Congress. Proposals have stalled in the face of arguments that restricting more species would unduly harm trade or impinge on personal freedoms. The U.S. currently imports thousands of different wildlife species, totaling hundreds of millions of nonnative animals. Experts agree that the Lacey Act is too clunky and slow to deal with the challenges of a modern, global marketplace. "It is remarkable that with something so dangerous and so irreversible, we don't assess risks before allowing entry [of new species]," said David Lodge, director of the *Notre Dame Environmental Change Initiative* and a leading expert on invasive species.

It takes more than four years on average for the FWS to decide whether to list a species. More than half the species that have been listed were already well on their way to becoming established as harmful pests, according to research Lodge published in 2007. "Given the intensely slow pace of Fish and Wildlife Service action on petitions, any step that provides more effective protections for the country from the damages of invasive species is a good step," Lodge said.

The FWS has flagged fewer than two dozen species as "injurious." Until that happens, species are open for trade. Lodge and other experts have said the government should instead require risk assessments similar to food safety screenings or approvals for new pharmaceuticals. "In almost any other area the public expects to be protected from substantial risks, but in this area we have a practice, which we have had forever, that is completely open," Lodge added. "We say, 'let it in,' and only after it does something horrible to us do we list it as injurious, but at that time it is irreversible."

Researchers say the science has evolved in recent years so there are now tools available for rapid, reliable scientific risk assessment. Australia and other nations have instituted mandatory risk assessments for new species. Research published last year in the journal *Ecological Economics* found there could be "substantial returns" for a screening program in the U.S., compared to the current open-door policy. Researchers from the University of California, Auburn University and the University of Chicago estimate the long-term net benefits of implementing a risk screening system range from roughly $54,000 to $150,000 per species assessed.

Once a species is in the U.S., it is difficult and costly to try to stem the ecological damage. Altogether, invasive animals and associated animal diseases cost the country as much as $35 billion per year, according to an estimate from Cornell University economists.

Source: Allison Winter, Greenwire, 3/28/12

Two MRB Mussels Listed as Endangered

The sheepnose and spectaclecase mussels will be protected under the federal Endangered Species Act (ESA) following an agreement reached last summer between the U.S. Fish and Wildlife Service (FWS) and the Washington, D.C.-based *Center for Biological Diversity* (CBD). The two freshwater mussel species, were once common in the eastern U.S. but are now found in only a handful of rivers. Under that legal settlement, the FWS agreed to expedite listing decisions on 757 imperiled species by 2017.

"These mussels have funny names, but their situation is serious — and so are the water quality problems facing our country's rivers," said Tierra Curry, a conservation biologist with the CBD. With the listing, both "have a real shot at survival and recovery." The spectaclecase has been eliminated from 20 of the 44 streams where it historically lived. Those habitats include parts of the upper Mississippi, Ohio, Cumberland and Tennessee rivers. The sheepnose has been eliminated from 25 of the 77 waterways where it historically lived. Its former habitat included thousands of miles of the Mississippi, Wisconsin, Illinois, Ohio, Cumberland and Tennessee rivers.

Freshwater mussels, which filter-feed on small particles in the water, are considered key indicator species. Because they need clean water to survive, their health reflects the health of the waterway. "By protecting these two species, we're protecting the quality of the water we drink, fish in and swim in," Curry said. "And the Fish and Wildlife Service needs to designate critical habitat for these mussels, because protecting their habitat will protect ours, too."

Sheepnose (top) and Spectaclecase (bottom) mussels (Kristen Lundh - USFWS and Nick Rowse - USFWS photos, respectively)

The final rule doesn't cite any particular waterways as "critical habitat" because the FWS lacks the resources to fully study the biological and physical requirements that would justify that designation. The sheepnose, once commercially harvested for jewelry and buttons, is oval and 5 inches long. It is now found in AL, IL, IN, IA, KY, MN, MS, MO, OH, PA, TN, VA, WV and WI. The spectaclecase is about 7 inches long and is found now in AL, AR, IL, IA, KY, MN, MO, TN, VA, WV and WI. Both species are threatened by pollution, dams and mining, but Curry said protection through the ESA listing has a 99 percent success rate. More than 50 mollusk species in the eastern U.S. have already become extinct.

Sources: *AP/Columbia Missourian*, 3/12/12; and *Greenwire*, 3/14/12

Ohio and Mississippi Rivers - the Most Polluted

The Ohio and Mississippi rivers top the list of the nation's most polluted waterways in a report released in late March by *Environment America* (EA), an environmental group. Citing a U.S. EPA discharge inventory, the EA report says industrial facilities dumped 226 million pounds of chemicals into waterways in 2010. The Ohio River received the most discharges, 32.1 million pounds, while the Mississippi River came in second, at 12.7 million. Third, fourth and fifth, respectively, were the New River in VA and NC; the Savannah River in GA and SC; and the Delaware River in NY, NJ, PA and DE.

The report also ranks the top 10 states by the amount of toxic pollution released in 2010. Topping the list is IN, with 27.4 million pounds, followed by VA, with 18.1 million pounds, and NE, with 14.7 million pounds. Pollution from just five states — IN, VA, NE, TX and GA — accounted for nearly 40 percent of the total dumped into U.S. waterways in 2010, the report says.

The most-polluting industries, it says, are food and beverage manufacturing, primary metals manufacturing, chemical plants and petroleum refineries. The top industrial discharger was West Chester, OH-based *AK Steel*, with 30 million pounds released into waterways in 2010. Nitrates accounted for nearly 90 percent of the total volume of discharges to waterways reported in 2010.

Source: Paul Quinlan, *Greenwire*, 3/23/12

MRB Nutrient Lawsuits

Two new lawsuits filed by the *Natural Resources Defense Council* (NRDC), on behalf of a group of concerned organizations, aim to reduce the size of the Gulf of Mexico's 'dead zone' by setting limits on nutrient pollution in the Mississippi River Basin through development of quantifiable regulations for nutrient pollution. The dead zone, which occurs annually from June through August, is an oxygen-depleted, or hypoxic, area that forms at the mouth of the Mississippi River when excessive levels of nutrients like nitrogen and phosphorous generate massive algal blooms. When these blooms die and sink to the bottom of the Gulf, decomposition sucks up so much oxygen that other organisms cannot survive there.

The dead zone in the Gulf of Mexico stretches west toward Texas from the delta and is roughly the size of Massachusetts, Louisiana State University Professor Eugene Turner said. The largest hypoxic zone was recorded in 2002 and covered 22,000 km^2 (8,481 mi^2). While the size varies from year to year, data compiled since 1985 by the *Louisiana Universities Marine Consortium* show that the dead zone has been growing over time, due in large part to runoff from agricultural land and discharge from urban wastewater-treatment plants. The NRDC feels that the U.S. Environmental Protection Agency (EPA) has not used its authority under the Clean Water Act to solve the problem, despite acknowledging the issue for more than two decades, according to Ann Alexander, a Senior NRDC Attorney who is working on the case. "The EPA has recognized that nutrients are a problem and that we need to develop numeric regulations to control them," she said.

But the agency has not set numeric standards regulating the amount of nitrates and phosphates in the water, instead leaving it up to the states to implement narrative standards that describe the quality of water needed for a body of water to be used for a designated purpose, such as recreation. But the states, for the most part, have also failed to adequately enforce these standards, which prompted the NRDC to file a petition in 2008 asking the EPA to step in, Alexander said. Last year, the agency denied the petition, and now the NRDC is challenging this response in one of their lawsuits. "This response doesn't address that the states aren't doing anything; that, with a few exceptions, they have failed spectacularly," Alexander said. "The law says that, when there is a problem [with implementation], the EPA needs to step in and do what needs to be done."

The second lawsuit filed in late March seeks a response to a separate petition, filed in 2007, regarding sewage treatment, which remains unanswered. The petition asked the EPA to reevaluate its regulations for secondary — or biological — sewage treatment, taking into account technological changes and new capabilities developed since 1985, which was the last time the regulations were updated, Alexander said. She added that the biggest hurdle to improving water quality in the region is jump-starting government systems into action. "The states and the EPA are under substantial pressure not to do anything about the problem, but the law requires that they do."

Agriculture in the country's Midwestern bread-basket contributes significantly to water quality issues in the Mississippi River Basin and, subsequently, the Gulf of Mexico. Some estimates suggest that 43 percent of the nitrogen and 27 percent of the phosphorous flowing to the Gulf originate in the Upper Mississippi River Basin (UMRB), an area encompassing parts of MN, WI, IL, IA, and MO. Agriculture occupies 67 percent of this area, and runoff packs a lot of nutrients into the water, though sewage from cities like Chicago also plays a major role.

"The Mississippi River and the entire Gulf of Mexico has long been treated as the nation's sewer," said Matt Rota, director of science and water policy for the *Gulf Restoration Network*. "Current efforts by the EPA and the Mississippi River states just simply are not enough," Rota said, describing the dead zone as "one of the many ongoing insults to the Gulf ecosystem." Glynnis Collins, executive director of the Illinois-based *Prairie Rivers Network*, said setting a target was critical. Only MN and WI have adopted EPA steps to limit pollution that were recommended in 2000, she said. Illinois is the largest source of nitrogen and phosphorous in the basin through runoff from industrial scale corn and soybean production and the massive wastewater treatment programs from the Chicago Metropolitan Water Reclamation District. The pollution causes extensive damage well before the water reaches the Gulf, forcing some Illinois communities for example to install expensive treatment equipment or even pipe water from neighbors, Collins said.

"The water quality in this region is pretty bad. There is a lot of soil erosion, lots of nutrients in the water," Catherine Kling, a professor in Iowa State University's Department of Economics said. In 2010, Kling and other researchers developed a model to assess the economic costs and tradeoffs of different conservation methods that would reduce nutrient pollution in the UMRB. "There is no requirement for agriculture, no limits on fertilizers or requirements for conservation practices," she said. "The hope is that they will voluntarily adopt conservations methods, but these are costly."

The 2010 study found that reducing nitrogen and phosphorous pollution could cost between $370 million and $1.4 billion each year, depending on the methods used. The cost necessitates careful planning when implementing conservation measures, Kling said. "Because it would be very expensive to put conservation measures in place every-

where, it is important to target places where they would be most effective."

Sources: Codi Yeager, *Circle of Blue*, 3/26/12; David Bailey, *Reuters*, 3/14/12; and *Greenwire*, 3/15/12

Five Ways to Cut Farming Nitrate Losses

Matt Helmers, Iowa State University associate professor of agricultural and biosystems engineering lists five in-field management measures, each suited to different conditions, which show promise for reducing nitrate (N) loss from farm fields. Helmers says following Best Management Practices advisories on N application is only the beginning of reducing field N losses. Research advances also offer the following toolkit of options:

1. Cover crops can reduce N losses by 25-30% "for sure," Helmers says. He calls them an emerging technology for N control. They are suited to all kinds of land, do not take any acres out of production and can be applied in any size operation. But they add another layer of overall farm management to get the right crop seeded at the right time in the fall. Cover crops takes up N during their growing season and release it for the next year's crop after the cover crop is burned down in the spring. Weed burndown timing is especially critical to reduce yield loss when corn is the next crop in the rotation. Helmers estimates cost of cover crops at about $30/acre.

2. Controlled drainage management uses gates on drainage tiles to reduce N delivery to streams as well as reduce water loss in dry years. For example, gates can be set higher after harvest to allow water to flow down through of the top layer of soil while retaining water at lower levels. The tile outlet can be opened a few weeks before planting to allow a wet field to drain more fully. Then the gates are raised post-planting to store water. And if needed, the gates can be opened again pre-harvest on wet fields. Controlled drainage takes added management but costs relatively little once installed. And it has a long lifespan, Helmers says. It can reduce N losses by 30%, but is not suited to all terrains, performing best on land with a slope of 0.5% or less. Leonard Binstock, *Agricultural Drainage Management Coalition* drainage consultant, Hot Springs Village, AR says some newer technologies allow for going up to 1.0% or greater by using water gates to step up the percentage of slope.

3. Shallow drainage is similar to controlled-drainage management, and is an option when new tile systems are installed. "Shallow is 2½-3 ft.," Helmers says. It's more applicable to places like Iowa where drainage tiles are commonly put in at 4 ft. deep. Shallow drainage is more expensive, since the closer placement of lines to create enough draw-down to drive flow requires more linear feet of tile. Benefits from shallow drainage are similar to those of controlled-drainage management.

4. Bioreactors are an emerging technology best suited for fields of 50 acres or less. In this technology typically a pit is placed at the field edge and filled with wood chips that denitrify water flowing through from the field. These pits require less than 0.1% of the land being treated and can reduce N by 40%. "This technology has great potential," says Helmers, "but we have to move with caution on key questions like how we size and manage them for maximum performance and to avoid unintended consequences like sulfate reduction or methyl mercury." On-farm studies are under way in IL, IA, MN and OH. Scientists in Illinois are working on a database and performance research to provide guidance on the interaction between specific soils, weather, bioreactor size and levels of N removal. Officials of the Natural Resource Conservation Service (NRCS) are developing national design standards that should be available within the next year. Once they are developed, there will be opportunities for farmers to work with NRCS to install systems. Iowa's research indicates a bioreactor cost of about $150 per treatment acre, with a lifespan of 15 years, after which the wood chips must be replenished.

5. Targeted wetland restorations are also under research but "probably more proven than bioreactors," says Helmers. "I think they are one of the most promising technologies, not only for providing water quality benefits but also because of habitat benefits." Properly sited and designed, wetlands can serve multiple farms, since they treat watersheds from 500 to 4,000 acres. Depending on size, they reduce N losses by 40-70% at a cost of $0.23/lb. N removed over their nominal 150-year lifetime, says Shawn Richmond, program coordinator for Iowa's Conservation Reserve Enhancement Program (CREP). "For a 1,000-acre watershed, you might need a 5-20-acre wetland, so it's not a big land buyout program." Most of these wetland restorations involve only one or two landowners, who get CRP payments for 15 years at cropland rates, an additional payment from Iowa to extend the land use with a 30-year or a permanent easement, and a 100% cost share on the restoration. Landowners also retain ownership of the land enrolled in CREP and control access to it. "Our focus is on N removal, but we also make it a high quality habitat," Richmond says. "Within a couple of weeks, a new wetland begins attracting wildlife." He adds that neighboring states are expressing interest in the Iowa program.

Source: Edith Munro, *Corn and Soybean Digest*, 3/1/12

USDA Shifts to Landscape Initiatives

The U.S. Department of Agriculture (USDA) is promoting the development of landscape-scale initiatives and targeting so-called ecological hot spots. The $33 million "*Working Lands for Wildlife*" program that USDA introduced in early March showcases the new approach. That program targets seven at-risk species and encourages landowners to voluntarily undertake conservation efforts such as modifying fences to promote wildlife movements, halting the advance of invasive species and changing grazing patterns. The approach differs from USDA's traditional approach to conservation, which lets farmers enroll for benefits without regard to how their properties and projects fit into the overall picture.

USDA's Natural Resources Conservation Service (NRCS) has begun 15 landscape initiatives, spending $324 million in fiscal 2011 and $243.5 million to date in the current fiscal year, NRCS chief Dave White said. The first program, the *Migratory Bird Habitat Initiative*, was begun in response to the Deepwater Horizon oil spill in 2010. It brought in funding from three farm bill conservation programs and, with the help of nonprofit groups, focused on alleviating effects from oil pollution in migratory bird breeding grounds along the Gulf Coast.

The initiatives also target the Chesapeake Bay, the Mississippi River Basin, the Great Lakes, longleaf pine habitat in the Southeast and forests in the Northeast. "Rather than applying one kind of conservation measure here and one conservation measure there, instead we are talking about a suite of conservation measures," Harris Sherman, USDA's Undersecretary for Natural Resources said. "And we work hard to get as comprehensive a sign-up of landowners as possible. So instead of getting just one landowner here, or two landowners there, we try to get 100

percent of the landowners in this area." By coupling a targeted approach with broader ecological context, "the return on our investment is greater," Sherman said.

While the conservation service's focus on landscape and targeting is relatively new, the idea is not. But NRCS programs have historically been spread across the 50 states and open to farmers in general sign-ups. The approach has received bipartisan support but does not focus resources on the worst water pollution areas or critical habitat for threatened species. Marty Matlock, an ecological engineer at the University of Arkansas, said he sees the recent policy focus on the landscape coming at the same time as a "consensus across all folks" that habitats have to be preserved in order to preserve species, combined with a recognition that habitat boundaries do not line up with state and county lines and farm fences. "We can't preserve every habitat, so we have to prioritize," Matlock said.

The programs have proved popular with farmers — more than 400 producers have signed up for the sage grouse initiative, according to the USDA. "USDA's landscape-scale approach to conservation is exactly what's needed to ensure federal conservation dollars are spent as efficiently as possible to achieve specific conservation objectives in particular regions, like cleaner water and improved habitat for wildlife in the Upper Mississippi River Basin," said Terry Noto, an environmental lawyer and federal policy consultant for the *Environmental Defense Fund*. Steve Kline, director of the *Center for Agricultural Lands* at the *Theodore Roosevelt Conservation Partnership*, also said he sees a heightened need for landscape-scale and targeted approaches. "With limited budgets, limited staff, we have to make sure these programs are as cost-efficient as possible through targeting," Kline said. Sixty-six percent of the funding appropriated for the habitat program will go toward the new *Working Lands for Wildlife* initiative.

The Farm Service Agency's Conservation Reserve Program, which pays farmers to idle their lands to preserve habitats, is also increasingly relying on a targeted approach. Earlier this year, USDA announced it was focusing 1 million Conservation Reserve Program acres on wetlands and grasslands, while another initiative announced that it is focused on the most highly erodible land. Such approaches are benefiting not only at-risk species but also the water, air and soil, Kline said. He stressed, though, that there must also still be a vehicle to spread out conservation dollars across the country. "There's always going to be value to a farmer who wants to put in a riparian buffer," even if it is not in sage grouse habitat or the Chesapeake Bay region, he said. "There's always going to be value to a farmer who wants to keep cattle out of a stream."

Source: Amanda Peterka, *Greenwire*, 5/15/12

Grazing Blamed as Leading Cause of Rangeland Degradation

A new federal study suggests that commercial livestock grazing is a leading reason why more than one-third of public rangelands are failing to meet health standards. The Bureau of Land Management (BLM) study, published in mid-May by the group *Public Employees for Environmental Responsibility* (PEER), found that of the 42 million acres of lands with failing health grades, livestock grazing is identified as the primary cause on nearly 80 percent of them.

PEER, which was notified of the assessment by an agency employee, said the report shows that livestock grazing, which occurs on nearly two-thirds of BLM's 245 million acres, continues to play a significant role in the degradation of public lands. "Livestock's huge toll inflicted on our public lands is a hidden subsidy which industry is never asked to repay," said Kirsten Stade, PEER's advocacy director. "The more we learn about actual conditions, the longer is the ecological casualty list."

But a ranching group dismissed PEER's assessment of the study as "fiction" that unfairly portrays the livestock industry in a negative light. "Livestock grazing remains one of the most efficient and effective mechanisms to manage vast areas of the West," said Dustin Van Liew, executive director of the *Public Lands Council* and director of federal lands for the *National Cattlemen's Beef Association*. "America's federal lands ranchers have worked hand in hand with the federal government to responsibly manage the land and its resources for the American people and continuously make efforts to improve their land and resource management practices," he said.

The fiscal 2011 report, which covers allotments in more than a dozen Western states, found that an area larger than Alabama fails to meet rangeland health standards for water quality, watershed functionality and wildlife habitat, among other measures, PEER said. Although factors such as drought, fire, invasive species and sprawl are significant factors impairing public lands, livestock grazing is most often the leading cause of wildlife and watershed impacts and desertification, the group concluded in its analysis of the BLM report.

BLM spokesman Tom Gorey said the agency is reviewing PEER's findings. PEER's assessment came nearly six months after the group filed a scientific integrity complaint alleging that BLM had bowed to political pressure when it chose not to include livestock grazing in a $40 million ecological assessment in Western states. PEER said its complaint is still pending. Environmental groups have long complained that low grazing fees create a perverse incentive to graze cattle on public lands, where the animals can trample native vegetation, accelerate erosion and pollute streams.

President Obama's 2013 budget would increase fees to graze livestock on Interior Department lands by roughly 75 percent, though the proposal has angered ranching advocates and some Western lawmakers. Van Liew said the new fee would significantly increase the cost of grazing cattle on public lands, on top of the costs for range improvements, fencing and compliance with other regulations. The fee would help agencies recover part of a shortfall that the *Government Accountability Office* estimated was more than $100 million in 2004 to administer grazing programs.

Sources: *E&ENews PM*, 2/15/12; Phil Taylor, *Greenwire*, 5/15/12; and *Greenwire*, 12/1/12

Planted vs Unplanted Wetland Development

Two experimental wetlands were developed by Dr. William Mitsch (Ohio State University) in 1994 to document the differences over time between one that was planted with marsh plants and a second which was allowed to develop naturally. Researchers planted 13 common wetland species in one marsh and left the other to develop naturally, to see how the two would fare over the long term. The accompanying aerial photos show the results at year 2 and year 15. The planted wetland is on the left and the unplanted one is on the right in each of the two panels.

The test wetlands were fed with water pumped from the Olentangy River to mimic natural conditions. The difference was that

one was consciously planted with marsh plants and one was left bare and built up its plant life from seeds floating in the air and water or attached to animals migrating through.

Aerial views of planted and unplanted wetlands developed by Dr. Mitsch at Ohio State University. (Dr. William Mitsch photos)

By Year 2, the planted wetland was forested around its perimeter while the other was not. By Year 15, they are similar. Along the way, the planted marsh exhibited more diversity. But over time, the marshes have come to contain roughly the same 100 species of plant life. And the unplanted marsh had one notable advantage: it sequestered more carbon — 266 gms/m^2/yr.compared with 219 in the planted wetland. Still, both newer marshes sequestered more carbon than mature local marshes, where the rates range from 125 to 160 gms of carbon/m^2/yr., the report said.

Although wetlands creation has been an integral part of American land development policy for decades, there has been scant research on the long-term ecological viability of such human-engineered projects, said Mitsch. Wetlands development has always been a bit of an oxymoron. So perhaps it comes as little surprise that the study found over a 15-year period that both wetlands produced nearly identical plant life. Still, the natural one managed to sequester more carbon. But Dr. Mitsch said he would stop short of advising developers of wetlands not to bother to plant their marshes.

He pointed out that the planted marsh did show more biodiversity in its early years and also sequestered more methane, which like carbon dioxide is a heat-trapping greenhouse gas. Still, he said, the unplanted marsh was less work over time and was "essentially converging" in function with the planted marsh. The analysis appears in the March issue of the journal *BioScience*.

Sources: Leslie Kaufman, *New York Times*, 3/8/12; and *Greenwire*, 3/9/12

Floating Constructed Wetlands

Natural floating wetlands can be found on every continent except Antarctica, across a spectrum of environments from the tropics to boreal forests. Inspired by these wetlands, ecosystem designers have begun to explore the potential of constructed floating wetlands for ecological enhancement and aquatic remediation. A typical floating wetland utilizes a floating media that supports the growth of vegetation. Such wetlands have been shown to remove nutrients and even heavy metals from a water body (plants must be harvested at the end of the growing season) and can provide habitat for land and aquatic animals.

In simple terms, a floating island is constructed and the roots of the plants and the physical matrix of the man-made material provide a surface on which biofilm, a community of microbes, flourish. Found at the base of the food web, biofilm are nature's cleaners, and as such, are often used in water treatment systems. These artificial wetlands thus simulate the water cleansing action of the natural floating peat bogs found in our northern lakes, providing a home for the microorganisms that anchor an aquatic ecosystem.

Floating wetlands can thus bring wetland functions and values to reservoirs, ponds, lagoons, and other surface water bodies where those functions are not present or are inadequate. Reservoirs, especially those with a flood control function, may have widely fluctuating water surface elevations that make establishment of shoreline and shallow water vegetation difficult. Constructed floating wetlands overcome the problem of fluctuating water levels, providing water quality improvement, fish and wildlife habitat, environmental education opportunities, and other benefits.

The earliest uses of floating wetlands and constructed islands were primarily focused on providing wildlife habitat, especially bird nesting platforms. The value of these floating habitats was recognized in reservoirs where large, rapid, or unseasonable (from the point of view of nesting birds) changes in water surface elevation was a constraint to successful reproduction. The roots of floating wetlands grow essentially hydroponically in the water and directly remove suspended solids and nutrients. The roots of mature wetland plants can develop enormous submerged surface area. The bacterial and algal biofilms that develop on surfaces of the submerged roots also process nutrients, reducing the concentration in the water.

Constructed floating wetlands can be expected to undergo succession and community development over time (even during the first summer) as the species best adapted to the conditions provided survive and thrive. Volunteer plant species also begin showing up even within a month of installation.

22,000 ft^2 floating constructed wetland at Summer Lake, OR. (bioxdesign photo)

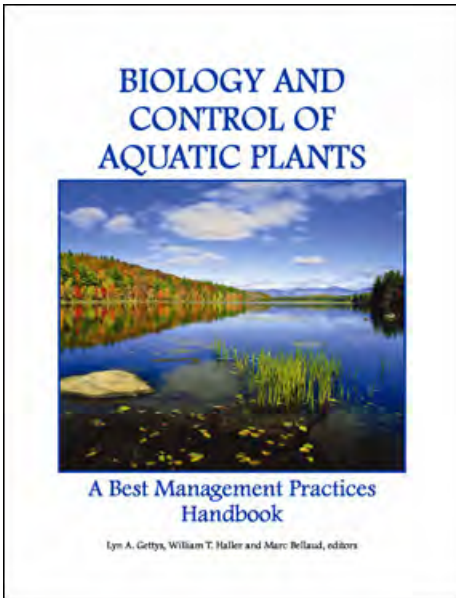
Great egrets have used floating wetlands as fishing platforms, beaver have fed on cattails in the wetlands, humans fished around them, and an interesting invertebrate, the bryozoan (*Pectinatella magnifica*) has made itself at home. Bryozoans are filter feeders, removing algae and other particles from the water.

The potential of constructed floating wetlands to enhance ecological conditions is only beginning to be explored, and they have the potential to become important, long-term components of reservoir and water management. More information on this concept can be obtained at: http://www.bioxdesign.com/wetlands-that-float.

Sources: http://www.bioxdesign.com/wetlands-that-float; and David Casaletto, *Ozark Waters, Vol. VI, Issue 15*, 4/9/12

Biology and Control of Aquatic Plants

A best management practices handbook, entitled *Biology and Control of Aquatic Plants* (2nd edition), edited by Lyn A. Gettys, William T. Haller and Marc Bellaud, is now available online from the *Aquatic Ecosystem Restoration Foundation* (AERF) at http://www.aquatics.org/bmp.htm. The mission of the not for profit AERF is to support research and development which provides strategies and techniques for the environmentally and scientifically sound management, conservation and restoration of aquatic ecosystems. One way the Foundation accomplishes this mission is by producing this handbook to provide information to the public regarding the benefits of aquatic ecosystem conservation and aquatic plant management.



The first edition of the handbook became one of the most widely consulted references in the aquatic plant management community. This second edition has been specifically designed with water resource managers, water management associations, homeowners and customers and operators of aquatic plant management companies and districts in mind. The AERF goal in preparing this handbook is to provide basic, scientifically sound information to assist decision makers with their water management questions.

Hard copies of the handbook may also be obtained by sending a request to Carlton Layne at *clayne@aquatics.org*. Copies are provided free of charge!

Yazoo River Project Ruling

A federal appeals court panel has sided with the U.S. Environmental Protection Agency (EPA) over its 2008 veto of a $220 million flood control project near the Yazoo River in the south Mississippi Delta. The *Board of Mississippi Levee Commissioners* sued the EPA in 2009 after the agency vetoed the Yazoo Backwater Project, which has been in the works for decades. The board said the proposed pumping station would protect wetlands, farms and forests north of Vicksburg from flooding when the Mississippi River is high.

But U.S. District Judge Sharion Aycock sided with the EPA and dismissed the lawsuit last year. A three-judge panel from the 5th U.S. Circuit Court of Appeals in New Orleans upheld that decision in early March. Damien M. Schiff, a *Pacific Legal Foundation* attorney representing the board, said he must talk to levee commissioners before deciding whether to appeal. The board's options would be to ask the entire 5th Circuit Court for a rehearing or to ask the U.S. Supreme Court to hear the case. If the ruling stands, "it's unfortunate that the people of the south Mississippi Delta won't get the flood protection that Congress has promised them for 75 years," Schiff said. Congress authorized the Mississippi Delta project in 1941 but didn't fully fund it. The EPA vetoed the Yazoo pump aspect of the project in August 2008, saying it would destroy wetlands, water quality and habitat for threatened species. The lawsuit challenged the agency's authority to stop the project.

The U.S. Army Corps of Engineers has taken steps to control flooding upstream on the Mississippi River, and that has only made flooding worse in the Yazoo River Basin, Schiff has said. The levee board has said the pumps were the last integrated element of the larger flood control system and were needed to pump out water trapped by other flood control measures. The board has said that about 900,000 acres and 1,000 residential structures were affected. The lawsuit also claimed EPA's veto is illegal because the project was approved by Congress before the agency was given veto power under the Clean Water Act in 1977. EPA officials have said in the past that the project doesn't meet all the requirements to proceed under the Clean Water Act, regardless of when it was authorized.

Sources: *AP/New Orleans Times-Picayune*, 3/6/12; and *Greenwire*, 3/7/12

MRGO Flood Ruling

A federal appeals court in early March upheld a judge's landmark ruling that the U.S. Army Corps of Engineers (Corps) is liable for property owners' claims, agreeing the shoddy work on a shipping channel caused billions of dollars in damage from Hurricane Katrina's storm surge. A three-judge panel from the 5th U.S. Circuit Court of Appeals rejected the federal government's argument that it is entitled to immunity from lawsuits blaming Katrina's flood damage on the Corps' operation and maintenance of the Mississippi River-Gulf Outlet (MRGO), a New Orleans navigation channel.

The federal government had asked the 5th Circuit to reverse a 2009 decision by U.S. District Judge Stanwood Duval, who ruled that flooding in St. Bernard Parish and New Orleans' Lower 9th Ward was a man-made disaster created by the Corps' negligence. In his 156-page ruling, Duval said he was "utterly convinced" that the Corps' failure to shore up the channel "doomed the channel to grow to two to three times its design width" and that "created a more forceful frontal wave attack on the levee" that protected St. Bernard and the Lower 9th Ward. The 5th Circuit praised Duval for his "impressive" rulings and lauded his "careful attention to the law and even more cautious scrutiny of complex facts."

Duval awarded a total of nearly $720,000 in damages to five plaintiffs who sued. The Corps also has received roughly 500,000 administrative claims that could become fodder for similar suits. Plaintiffs' attorney Pierce O'Donnell expressed hope that Friday's ruling could stimulate settlement talks with the government to resolve the pending claims.

"This is a landmark victory, not just for the people ravaged by Katrina's flooding but for all Americans," he said. "We must hold our government accountable when it inflicts avoidable harm on its citizens."

Plaintiffs' attorney Joe Bruno said he expects the government to ask the full 5th Circuit to review the case. They could also appeal to the U.S. Supreme Court. "I see no reason for the Supreme Court to take the case," he said. "This is not a big, controversial interpretation of the law." During a hearing last year, O'Donnell told the 5th Circuit judges that the Corps knew for decades that the MRGO channel was a "mounting and looming disaster" in the making and yet did nothing to ease the threat. Justice Department lawyers argued that the Flood Control Act of 1928 shields the federal government from liability.

The 5th Circuit said some of the plaintiffs in the case demonstrated that the Corps' "negligent decisions rested on applications of objective scientific principles and were not susceptible to policy considerations." "At points where it could have mattered, the Corps did not identify MRGO's ability to aggravate the effect of a major hurricane," 5th Circuit Judge Jerry Smith wrote. "This is not a situation in which the Corps recognized a risk and chose not to mitigate it out of concern for some other public policy (e.g., navigation or commerce); it flatly failed to gauge the risk."

The MRGO, which extended for 60 miles southeast from New Orleans to the Gulf of Mexico, partially opened in 1963 and was closed about three years after Katrina struck in August 2005. Over the decades, the Corps' dredging of the channel resulted in the loss of thousands of acres of wetlands that helped protect greater New Orleans from hurricane flood waters.

Sources: Michael Kunzelman, *AP*, 3/4/12; and *Greenwire*, 3/5/12

Yellowstone River Irrigation Project Modified to Aid Sturgeon

The endangered pallid sturgeon in Montana's Yellowstone River now has a better chance of making it to upstream spawning areas thanks to fish-friendly upgrades to a century-old irrigation system that was diverting fish along with water into farm fields. The new intake structure for the irrigation system, completed in early May, features a series of fish screens that will keep the sturgeon and other fish from inadvertently ending up in irrigation canals.

The Lower Yellowstone Project, as the irrigation system is called, was originally built in 1905 —long before the U.S. Fish and Wildlife Service (FWS) listed the sturgeon under the 1973 Endangered Species Act. "The old headworks were still functional, but they did not have any kind of fish protections," said Jerry Leggate, a spokesman for the Bureau of Reclamation (BOR). "The age of the project did not accommodate modern fish screen technology." The screens on the new intake structure are retractable, so they can be cleaned of twigs, trash and other debris that accumulate as water flows into the canal and can damage them, he added.

The upgrades to the project, which irrigates about 54,000 acres, involved several federal and state agencies, including the BOR, the Army Corps of Engineers (Corps), FWS, U.S. EPA, the Montana Department of Environmental Quality and the Montana Department of Natural Resources. The improvements, which began in August 2010, are part of a larger effort by the Corps to help mitigate the effects of dams and diversions in the Missouri River Basin.

But while fish will no longer be swept into sugar beet and corn fields, they still face another problem: the dam that pools water for diversion into the canal. Phase two of the project will be to build a mechanism that allows sturgeon and other fish to clear the 12-foot-high dam, Leggate said. But agency officials haven't yet decided just how to get the fish past the dam. One option is to build a rock staircase of sorts that will allow the fish to move up and over the dam while also creating nooks in which the fish can rest during their ascension. However, such a ramp may not be effective because of occasional high flows on the river. Another possibility may be to create a side channel that allows fish to bypass the dam altogether, although state biologists have questioned the efficacy of that option, as well because of the high spring flows.

Pallid sturgeon recovery efforts on the Upper Missouri and Yellowstone rivers.

"It all hinges right now on cost and how the engineering works out," Leggate said. Figuring out how to get the fish past the dam is particularly important, he added, because it's a bigger impediment to the sturgeon's making it to the upper reaches of the river than the irrigation diversions. "They can't swim up past that to spawn," he said. "By working on this intake structure and modifying the dam, it'll provide additional habitat for the surgeon."

When the dam mitigation project is completed, about 100 miles of river upstream from the dam will be open to the fish for the first time in a century. The improvement project is a beneficiary of the 2007 Water Resources Development Act, which authorized the Corps to use funding from the Missouri River Recovery and Mitigation program to help with BOR projects.

Source: April Reese, *Greenwire*, 5/2/12

Gunnison and Colorado River Flows Altered to Aid Native Fish

Almost 10 years after federal biologists urged the Bureau of Reclamation (BOR) to tweak releases from three dams on Colorado's Gunnison River to help endangered fish, the agency has issued a plan for doing just that. BOR's plan calls for letting more water spill downstream to aid the Colorado pikeminnow, razorback sucker, bonytail and humpback chub. The pikeminnow and the sucker inhabit a section of river about 60 miles downstream from the dams, close to the city of Grand Junction near the Utah border. The other two species, whose habitat is on the river's main stem, also will benefit, since the Gunnison's higher flows will merge with the Colorado River near the Colorado-Utah line.

Reclamation says modifying dam operations will create "more natural" flows in spring, when snowpack runoff from the Rocky Mountains swells the river, and "moderate" base flows for the rest of the year. "This avoids jeopardizing the continued existence of fish listed under the Endangered Species Act and does not result in the destruction or adverse modification of critical habitat in the Gunnison and Colorado rivers," the agency

decision says. The modifications are based on recommendations made in 2003 by the Fish and Wildlife Service's Upper Colorado River Endangered Fish Recovery Program.

"This record of decision is a culmination of an extraordinary effort by a diverse group of interests and a major step in ongoing efforts to recover the Colorado River endangered fish," said Anne Castle, the Interior Department's Assistant Secretary for Water and Science, in a statement. "This is going to make it look a lot more like a real river," added Bart Miller, water program director for *Western Resource Advocates*, a Boulder-based environmental group that weighed in on the plan during stakeholder meetings held by BOR over the past few years.

The Aspinall Storage Unit — as the three dams are collectively called — comprises the Blue Mesa, Morrow Point and Crystal dams; the reservoirs that pool water behind them; and hydropower plants that generate enough electricity from the dams to supply about 240,000 people. The dams also regulate flows to provide irrigation water for downstream farms and control flooding. Changes in dam operations, the EIS says, will result in a 1.3 percent reduction in hydropower generation and a 1.5 percent reduction in hydropower revenues. The benefits of the new flow regime will ripple far beyond the lower Gunnison River, Miller said. The higher releases will be felt as far as Lake Powell on the Utah-Arizona border, he said. "It's a really good example of getting lots of people in the room, making slow but steady progress on changing how dams are operated and bringing the river back into balance," he said.

Source: April Reese, *Greenwire*, 5/9/12

MT Riverbed Ownership Debate

In a unanimous decision, the U.S. Supreme Court in late February reversed a Montana court ruling that required a hydroelectric dam operator to pay rent for the use of the state's riverbeds. *PPL Montana* — backed by the Obama administration — had objected to the Montana Supreme Court's conclusion, arguing that the court had incorrectly tackled the key question of whether the rivers were navigable at the time Montana was admitted to the union in 1889. The U.S. Supreme Court agreed, with Justice Anthony Kennedy writing that the Montana court had failed to correctly interpret the test for determining navigability.

The Montana court ruled in March 2010 that three rivers in Montana — the Clark Fork, Missouri and Madison — are navigable. It based its ruling in part on an 1845 U.S. Supreme Court case that said states hold title to riverbeds if the river was navigable at the time the state was admitted to the Union. If the state ruling had been upheld, *PPL Montana*, which owns 10 dams on the three rivers, faced the prospect of paying $40 million in rent for its use of the riverbeds since the company acquired them in 1999. In his opinion, Kennedy wrote that the principle problem with the state court's finding was that it failed to conduct the necessary segment-by-segment analysis for establishing navigability.

"The segment-by-segment approach to navigability for title is well settled, and it should not be disregarded," Kennedy wrote. He noted that various sections of the Montana rivers are easily divided up, especially the segment of the Missouri River that includes the Great Falls, "which is 17 miles long and has distinct drops including five waterfalls and continuous rapids in between." Kennedy's opinion includes numerous references to explorers Meriwether Lewis and William Clark, who traveled along Montana's rivers. They had to portage around the most difficult sections, including the Great Falls. That took at least 11 days, Kennedy noted, which undermined the state's argument that any section that could be portaged should be considered navigable.

The case will now return to Montana courts. Making it clear that they need to do a better job next time, Kennedy wrote that "the relevant evidence should be assessed in light of the principles discussed in this opinion." David Hoffman, a spokesman for *PPL Montana*, said the company was "very pleased that the Supreme Court has overturned the Montana court rulings and has agreed with our position." The decision should help lead to a resolution of what has become an eight-year legal battle, he added. In a statement, Montana Attorney General Steve Bullock (D) vowed to continue the fight in state court. "From the beginning, this case has been about whether *PPL* pays its fair share for use of our rivers for hydroelectric power — just like Montana farmers using agricultural trust lands, ranchers using grazing trust lands, loggers using timber trust lands, and others who benefit from state trust lands already do," he said.

Source: Lawrence Hurley, *Greenwire*, 2/22/12

New Ballast Water Cleaning Regs

Oceangoing cargo ships will be required to treat their ballast water with ultraviolet light, chemicals or other treatments before dumping it in U.S. waters under a regulation the Coast Guard announced in mid March to prevent species invasions that damage the environment and cause billions in economic losses. The long-awaited rule comes more than two decades after environmental groups began pushing for a crackdown on ballast water, which provides stability in rough seas but often harbors stowaway species from abroad. When the soupy mixtures of water and sediment are discharged in U.S. ports, the newcomers like the zebra and quagga mussels can spread rapidly, starve out native competitors and spread diseases.

"Once fully implemented, this ballast water discharge standard will significantly reduce the risk of an introduction of aquatic nuisance species into the Great Lakes," said Rear Adm. Michael Parks, commander of the Coast Guard's Cleveland district. Under existing rules, shippers must exchange ballast at sea or flush the tanks with salt water if empty. But the Coast Guard acknowledged some organisms could survive in puddles of water and mud left in the ships. For the first time, the new policy requires onboard treatment of ballast water to kill as many fish, mussels and even tiny microbes as possible.

"It's a major milestone and a starting point, but it's not nearly as strong as it should be," said Jennifer Nalbone of *Great Lakes United*, a U.S.-Canadian advocacy group. The rule limits numbers of living organisms in particular volumes of water. Ships would have to install equipment to meet standards developed by the *International Maritime Organization*, an arm of the United Nations. Environmental groups contend the limits should be 100 or even 1,000 times tougher, but industry groups say no existing technology can do that.

A tentative version of the Coast Guard rule issued in 2009 called for starting with the international standard, then making it 1,000 times stronger by 2016. But the final regulation drops the second level in favor of more research. The Coast Guard said it made the change after a U.S. EPA study questioned the reliability of more stringent standards. EPA has proposed a separate ship discharge policy based on the international limits. In a written statement, the Coast Guard said it "fully intends to issue a later rule that will establish a more stringent phase-two discharge standard."

Thom Cmar, an attorney with the *Natural Resources Defense Council*, said the delay was a step backward. "For them to say they'll get back in a couple of years with an analysis of whether a stronger standard is achievable is cold comfort after it's taken so long to finish this round of rulemaking," he said. Cmar also criticized a decision to exempt ships that remain within the Great Lakes from the ballast standards. Environmentalists contend those ships carry invasive species around the lakes even if they weren't responsible for bringing them to the U.S. The Coast Guard said research is needed into whether existing ballast technology would work on vessels that never travel the oceans.

Shipping interests were unhappy the Coast Guard dropped an earlier provision exempting vessels fitted with ballast treatment systems from having to modify them if standards are toughened in the future. But completion of the rule is mostly good news for ship owners who have delayed installing equipment until they knew what would be required, said Steve Fisher, executive director of the *American Great Lakes Ports Association*.

Sources: John Flesher, *AP/Seattle Post-Intelligencer*, 3/16/12; *Great Lakes United Press Release*, 3/21/12; and *Greenwire*, 3/19/12

Young Adults Less Interested in Environmental Issues

Today's young Americans are less interested in the environment and in conserving resources than other generations, according to an academic analysis of surveys. The findings go against the belief that environmental issues are a top concern among young adults, known as *Millennials*, who have grown up with climate change discussions and learning to "reduce, reuse, recycle."

Based on two long-standing national surveys of high school seniors and college freshmen, the study looked at the life goals, concern for others and civic orientation of three generations — baby boomers, Generation Xers and Millennials. It found that over the last four decades, there has been a decline in young people's trust in others, their interest in government and the time they said they spend thinking about social problems. The steepest decline of all was concern about the environment and taking personal action to save it.

Twenty-one percent of Millennials think it is important to become involved in programs to clean up the environment, compared with about a quarter of Generation Xers and a third of baby boomers. Millennials were also more likely to say they made no effort to help the environment and were least likely to make efforts to conserve electricity and fuel used to heat their homes.

"I was shocked," said Jean Twenge, a psychology professor at San Diego State University and one of the study's authors. "We have the perception that we're getting through to people. But at least compared to previous eras, we're not". The study was published online in March in the *Journal of Personality and Social Psychology*.

Sources: Martha Irvine, *AP/Billings Gazette*, 3/15/12; and *Greenwire*, 3/15/12

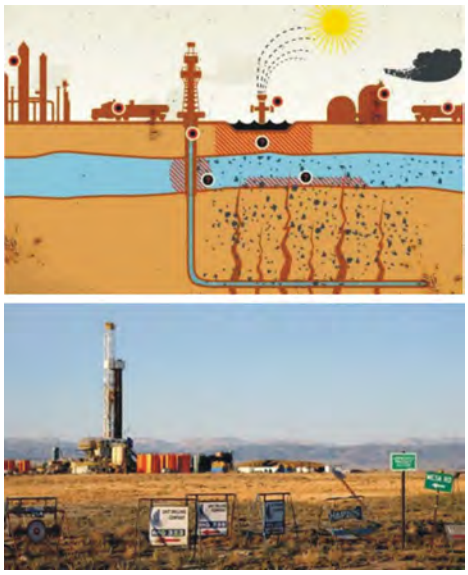
Fracking Issues

A series of earthquakes (one at magnitude 4.0) near Youngstown, OH, were most likely caused by the underground injection of shale drilling wastewater, Ohio officials have concluded. "After investigating all available geological formation and well activity data, Ohio Department of Natural Resources (ODNR) regulators and geologists found a number of co-occurring circumstances strongly indicating the Youngstown-area earthquakes were "induced". "Specifically, evidence gathered by state officials suggests fluid from the *Northstar 1* disposal well intersected an unmapped fault in a near-failure state of stress causing movement along that fault." The state's report found the well connected to the earthquakes was positioned improperly because of a lack of regulator access to adequate geological data. New rules emphasized by state officials require the driller to submit to the state a complete roll of geophysical logs. "These logs were not available to inform regulators of the possible issues in geologic formations prior to well operation," the state's report said.

The issue in the Youngstown quake is not the drilling itself — or the hydraulic fracturing production process — but underground injection of brine. Fracturing shale requires the use of millions of gallons of water, and subsequently creates millions of gallons of salty wastewater more toxic than what was initially fired down the hole, and drillers must figure out how to dispose of it. Some reuse part of it in the next "frack job," but they often inject it back underground in a deep disposal well as at Youngstown. Similar "underground injection" of brine from shale is believed to have caused earthquakes in Arkansas earlier this year. Oil and gas production itself has also caused earthquakes, most famously in Wilmington, CA, where oil extraction caused earthquakes that stretched from 1947 to 1961.

A *National Academy of Sciences* (NAS) panel is presently studying how oil and gas production and other types of energy production can lead to man-made earthquakes, and NAS officials are hoping to release their report this summer. Nationally, U.S. EPA records show there are 150,851 "Class II" injection wells associated with oil and gas. Underground injection is also used to dispose of radioactive waste, hazardous waste, mining fluids and carbon dioxide. There are about 500,000 other types of injection wells that dispose of nonhazardous waste. In a recent U.S. Geological Survey study, researchers said that an increase in drilling wastewater injected into the ground might have spurred a sixfold increase in the number of earthquakes that have hit the central U.S. from 2000 to 2011.

ODNR officials called Ohio's new rules (developed in recent months) "among the nation's toughest." The rules will require well operators to submit more comprehensive geological data when requesting a permit to drill, and the chemical makeup of all drilling wastewater must be tracked electronically. Future injection into Ohio's Precambrian rock will be banned, and existing wells penetrating the formation will be plugged. State-of-the-art pressure and volume monitoring will be required, including automatic shut-off systems. Tracking systems that identify the makeup of all drilling wastewater fluids entering the state will also be required.



Graphic and Photo of Fracking Operation (Ozark Water Watch graphic and photo)

Across the *Marcellus Shale* formation drillers are now recycling more of their briny, chemical-laced wastewater, but bromide levels in Pennsylvania rivers are not showing the expected declines, according to an analysis of state data. Pennsylvania officials requested that drillers keep shale wastewater out of rivers that supply drinking water. And data show that about 97 percent of the shale wastewater generated in the second half of 2011 was either recycled, sent to deep-injection wells or taken to treatment plants that do not discharge into waterways. But with salty bromide levels still high, experts are wondering if a loophole in disposal regulations is still letting significant quantities flow into rivers and streams.

Unfortunately, Pennsylvania's highly publicized plan for voluntary compliance by *Marcellus* drillers did not apply to the thousands of other oil and gas projects in the state. The new state data show that about 1.86 million barrels of drilling wastewater from non-*Marcellus* wells was still sent to treatment plants and discharged into waterways in the second half of last year. "They ought to get all of that out of the water. It's obviously hazardous; it presents a public health hazard. What's good for the *Marcellus* wells should be applied to the other wells, too," said Jan Jarrett, who leads the environmental group *PennFuture*. Kathryn Klaber, president of the *Marcellus Shale Coalition*, an industry group, said it was never accurate to blame the whole bromide problem on shale gas drillers. "We know there are quite a few other sources going into Pennsylvania waterways," she said. "You have to start looking at other places."

Coal-fired power plants and other industries also produce bromides. Bromides themselves are not considered pollutants, but they combine with chlorine used in water treatment to create trihalomethanes, which can cause cancer if ingested over a long period of time. Handling the wastewater produced by hydraulic fracturing of natural gas wells has also become an issue in New York where some of the wastewater is used to de-ice roads or to tamp down dust. U.S. EPA warned New York officials that using the water to brine roads could allow chemicals to seep into aquifers and waterways.

Meanwhile on public lands, the Obama administration lacks the authority to deter oil and gas operators from committing major drilling violations said Bob Abbey, Bureau of Land Management Director. Abbey said he hopes that Congress will at least consider raising fines for drilling violations on federal lands where warranted. A report issued by House Natural Resources Committee Democrats found that the Interior Department collected less than $300,000 in fines from oil and gas drillers on public lands over the past decade, despite issuing more than 2,000 safety and drilling violations. Cases were cited where operators had begun drilling without an approved permit and others where operators failed to report a blowout to regulators. Oil and gas fines over the past decade amounted to about $135 per violation, a paltry sum for global energy firms that earned more than $100 billion last year said Rep. Ed Markey (D/MA), the Natural Resources Committee's ranking member.

According to a new national *Bloomberg News* poll, a majority of Americans favor greater regulation of hydraulic fracturing. Sixty-five percent of those surveyed said there should be more regulation, while 18 percent said there should be less and 17 percent said they were uncertain. The poll included 1,002 adults age 18 and older, and had a margin of error of plus or minus 3.1 percentage points. The results are in line with separate polls that indicate there are more people who believe hydraulic fracturing will cause environmental damage than those who think it is safe.

President Obama has announced that the White House is setting up a new interagency working group to promote the safe development of domestic natural gas. Chaired by the director of the *Domestic Policy Council* the group will focus on development of so-called unconventional gas, which typically employs hydraulic fracturing. The working group, which will comprise more than a dozen agencies, including the departments of the Interior and Energy and U.S. EPA, is designed to "facilitate coordinated administration policy efforts to support safe and responsible unconventional domestic natural gas development." The working group will be charged with:

- Ensuring agency policies are coordinated, efficient and effective.
- Sharing scientific, environmental and related technical and economic information.
- Engaging in long-term planning and ensuring coordinated research, natural resource assessment and infrastructure development.
- Promoting interagency communication with stakeholders.
- Consulting with other agencies and offices as appropriate.

John Engler, president of *Business Roundtable*, called this a "solid first step" toward improving federal oversight of hydraulic fracturing. "*Business Roundtable* CEOs recently discussed with the president how federal handling of this technology threatened to become burdensome with overlapping authorities and unnecessary and duplicative rules," he said. "We hope this working group can cut through these complications and ultimately encourage further investment in the energy sector." The Obama administration in its fiscal 2013 budget request released in February also proposed spending $45 million on a three-agency study of how to increase the safety of shale gas drilling, particularly the process known as hydraulic fracturing.

Meanwhile, Vermont became the first state to formally ban hydraulic fracturing after Gov. Peter Shumlin (D) signed legislation in mid-May. Shumlin said the law may help set an example for other states. But the action is mostly viewed as symbolic, since there is likely little or no natural gas in the state's grounds. "I hope other states will follow us," he said. "The science on fracking is uncertain at best. Let the other states be the guinea pigs. Let the Green Mountain State preserve its clean water, its lakes, its rivers and its quality of life."

Sources: *Bloomberg/Fuel Fix*, 4/23/12; Kevin Begos, *AP/San Francisco Chronicle*, 2/17/12; Jim Efstathiou Jr., *Bloomberg*, 3/15/12; Mireya Navarro, *New York Times*, 5/3/12; *AP/Fuel Fix*, 5/17/12; *E&ENews PM*, 2/13/12; Mike Soraghan, *Greenwire*, 3/9/12; Phil Taylor, *Greenwire*, 4/13 and 3/20/12; and *Greenwire*, 2/20, 3/16,4/23, 5/4 and 5/17/12

Climate Change Update

The warmest year in modern history was most likely 2010, not 1998, British scientists from the Met Office and the University of East Anglia said in late March while updating their influential synthesis of global temperature records. The record maintained by the group, called *HadCRUT*, had maintained that 1998 was the warmest year, even as similar records from U.S. scientists found that both 2005 and 2010 matched or bested 1998 in their heat. The longevity of the 1998 record, which was bolstered by an epic El Niño, has long been a talking point for those skeptical of human-induced global warming. But now that talking point has been significantly weakened. From a scientific standpoint most researchers advise against focusing on single-year highs, favoring instead focusing on the overall warming trend. So by any temperature record the past

decade is the warmest in modern history.

A new report by the *National Wildlife Federation* (NWF) entitled, "*On Thin Ice: Warmer Winters Put America's Hunting and Fishing Heritage at Risk*," showcases the effects of climate change on several key species as observed by people who are presented as "America's first conservationists": anglers and hunters. "We work with a lot of sportsmen and -women across the nation, and we constantly hear back from them that they're seeing the effects of climate change on the ground," said Joe Mendelson, policy director for NWF's *Climate and Energy* program. "The changes might seem subtle to some, but they see them in their outdoor pursuits maybe more readily than others."

Since the 1970s, says the report, average winter temps have gone up 1-2 °F in the Pacific Northwest and as much as 4 degrees in the Northeast. The season is as much as two weeks shorter than it used to be, and there's less snow on average. The effects on ice fishing are pretty obvious but less so elsewhere. For example, moose in ME, NH and MN are dying in record numbers, and the culprit is winter ticks. A moose might ordinarily carry 30,000 ticks, but normally, cold weather kills off or controls the parasites. A study cited in the report says that warm winters might increase that number to 160,000 ticks — enough to kill even a moose. The report also highlights effects on other species: trout are scrambling to find cooler water — or enough water — as river temps rise and snowpacks diminish; waterfowl such as geese and ducks are shortening their migrations, or sometimes not migrating at all; and snowshoe hare populations have plummeted.

Mendelson says the response from sportsmen's groups, including one called *Sportmen for Responsible Energy Development*, has been heartening. "This winter, we've seen basically the fourth warmest winter on record, they're seeing the effects double-time. They want to have a voice, and say that cutting carbon pollution is something that needs to be done for the hunting and angling community," he adds. Fishermen came out in large numbers last year to lobby Congress and the EPA to regulate mercury emissions from power plants, as coal-fired plants disgorge a form of the poison that settles in rivers and affects fish eaten out of those rivers. The solution to global climate change is certainly more daunting, but those quoted in the report are making the connection to regulating the emissions of carbon dioxide (CO_2) and other global warming gases from multiple sources.

According to a study released in late February in the journal *Nature Climate Change*, alpine chipmunks are on the decline, and climate change is the culprit. A team from the University of California, Berkeley conducted the study in Yosemite National Park where the chipmunk is native. Researchers believe the chipmunk, as well as other small mammals in the area, moved to higher, cooler elevations because Yosemite's overall temperature had risen by 5.4 °F in the past century. But as the alpine chipmunk has moved higher into the mountains, its numbers and genetic diversity have declined, researchers found. That lack of diversity could eventually threaten the species' survival, said Emily Rubidge, lead author of the study. "Because of climate change, the alpine chipmunk had nowhere to move but up," she said. "And that movement has resulted in chipmunks dying off, leading to a smaller genetic pool and making them more vulnerable." The research was based on the work of Joseph Grinnell, a zoologist in the early 20th century, who did a survey of Yosemite's birds, mammals, reptiles and amphibians from 1914 to 1920. Originally, the alpine chipmunk could be found at altitudes of up to 7,800 feet. Now the researchers found that the chipmunk had moved 1,640 feet upslope.

Meanwhile, more than 50 coral species in U.S. waters are likely to go extinct by 2100 if climate change policy and technology remain the same, according to a new report from federal scientists. Ocean warming, disease and ocean acidification are the most significant threats posing extinction risks, the experts conclude in a new "status review" of 82 coral species the government is considering for protection under the Endangered Species Act. The scientists put human-driven climate change squarely at the center citing anthropogenic releases of CO_2 as a key driver of oceans warming and absorbing more CO_2, which makes waters more acidic. "The combined direct and indirect effects of rising temperature, including increased incidence of disease and ocean acidification, both resulting primarily from anthropogenic increases in atmospheric CO_2, are likely to represent the greatest risks of extinction to all or most of the candidate coral species over the next century," the report from the National Marine Fisheries Service says. Seven federal scientists from the National Oceanic and Atmospheric Administration, National Park Service and U.S. Geological Survey worked on the report, which also underwent independent peer review.

Sudden oak death, canker and other forest diseases could spread more quickly in the West as climate change warms the region's forests, according to a new report from the Forest Service's Pacific Southwest Research Station. The report, which synthesizes information from more than 200 individual studies, examines the effects of eight tree diseases under two different climate-change scenarios — one involving warmer and drier conditions, the other involving warmer and wetter conditions. Climate change models from the Forest Service and other entities suggest the West will see slightly wetter winters and significantly warmer summers throughout the 21st century. Under the warmer and wetter climate scenario, sudden oak death and other potentially fatal fungal diseases are expected to spread more rapidly, according to the report. Furthermore, the range of some diseases could shift as increasing temperatures allow them to colonize areas that were inhospitable before. "Many pathogens currently are limited by winter temperature, and seasonal increases in temperature are expected to be greatest during winter," the report says. "Therefore, both overwintering survival of pathogens and disease severity are likely to increase." And while climate change is expected to allow some diseases to spread, it is also likely to make trees more susceptible to disease, according to the analysis. Disease can also leave forests more vulnerable to wildfires. For instance, hundreds of thousands of oaks killed by sudden oak death fueled fires that swept through Big Sur National Forest and other areas along California's central and northern coasts in 2008.

Meanwhile, experiments designed to help ecologists assess how plants will react to rising temperatures are underestimating potential impacts, according to a study published in the journal *Nature* in early May. The experiments — in which scientists subject small plots of plants to increasing warmth — have been a hallmark of ecological research for more than 20 years, providing insight into how plants advance when they flower and leaf out as temperatures rise. "That's the beauty of them," said Elizabeth Wolkovich, an ecologist with the University of British Columbia, Vancouver. "After a couple years of heating the air or soil, you can see how a plant changes." Researchers have long assumed plants will respond the same way to warming in the experiments as they do in nature, making them a reasonable predictor for what might happen as the atmospheric temperatures increase.

But a comprehensive analysis conducted by

Wolkovich, climate scientist Benjamin Cook and a large team of collaborators revealed warming experiments are not doing a good job mimicking real-world conditions. For the past three years, the group gathered 50 data sets of both warming experiments and observations of real-world changes documenting the flowering and leafing out of 1,634 plant species. The timing of such seasonal events in nature is called phenology. "Oftentimes, events for plants are tied to climate, so by studying phenological events like first flowering and leafing, we get insight into ecosystem responses to climate change," said Cook, who is a modeler for the NASA *Goddard Institute for Space Studies*. Generally, plants are expected to flower and leaf out earlier when temperatures are higher. And that was a clear and consistent pattern in the observational data sets, even though they were from a wide variety of sources, including a meteorological society, universities and individuals who had kept 70-year records on when their flowers bloomed and migratory birds arrived. On average, plants were observed to flower and leaf out five to six days earlier per degree Celsius rise. However, predictions based on warming experiments anticipated only a half-day to two-day advancement — underpredicting the impact by 4 to 8.5 times per degree change for leafing and flowering, respectively.

"We didn't expect the differences to be quite so large," Cook said. When just comparing plant species that were in both data sets, the discrepancy was even more profound, with some warming experiments predicting delays in plant response. An accurate understanding of how plants are going to respond to temperature increases is important for planning conservation protocols, as well as understanding other potential impacts such as how much carbon will be stored or released into the atmosphere; how much water plants will use and how much will be left for people; and impacts on pollinators, which will have a cascading impact on crops, Wolkovich said. "Right now, if you are using experimental data to make predictions about how ecosystem services are going to change, it's most likely an underestimate," Wolkovich said.

Meanwhile, even though air temperature has increased over the past decade across the U.S., the amount of water flowing out of many headwater basins has not changed as expected, according to research published in early April in the journal *BioScience*. Mark Williams, a hydrologist at the University of Colorado, Boulder is part of a large team that analyzed temperature, precipitation and stream flow data from 35 headwater basins throughout North America. Most of the sites are a part of the *Long Term Ecological Research* (LTER) network, which was started in 1980 and is funded by the *National Science Foundation*. As temperatures increase with climate change, more water is generally expected to be lost to the atmosphere through evaporation and transpiration — "evapotranspiration" for short — decreasing the amount of water stored in the ground and flowing through rivers and streams. But that's not happening, according to data collected over the past 30 years at most of these LTER sites and others, Williams said. "The amount of water coming out of the basin depends on a lot of other factors besides air temperature," Williams said. He added that climate effects are being masked by past and present human disturbances and management of ecosystems. "Human interaction is the dominant player in water availability," Williams said. "It's a bigger factor than climate change." However, the masking effect of any climate impacts is "worrisome," Williams said.

As the climate changes, human activities could inadvertently push ecosystems toward an unknown tipping point, which could result in a sharp change in water flows in a short time period. The trend was found across many different types of ecosystems, from grasslands and deserts to arctic tundra and forests, with one exception. Ecosystems dominated by snow and ice showed a stronger climate signal than human influence. On the nation's snow-capped mountains, or "water towers," as Williams called them, snowmelt is occurring earlier in the spring, rather than in summer. This seasonal variation means climate is the most dominant factor in water availability in these areas, more so than human changes to the landscape. While human influence is less in this environment, the strong influence of human activities in other ecosystems suggests that smart management of land and resources can make a difference in water availability, even as the climate changes, Williams said. The study found another unexpected pattern — drier ecosystems retain more water than predicted with the corresponding rise in temperature. "Ecosystems themselves have ability to regulate, or respond to climate changes," Williams said. "One way they do it is to change the amount of water loss due to evapotranspiration. That's pretty cool." Ecosystems flush with water, like wetlands and wet forests, lost more water to the atmosphere than models predicted, though researchers are not exactly sure why. He said long term data sets like those collected by the LTER are needed to explain these differences.

Declines in thick, perennial Arctic sea ice may cause deposits of toxic mercury to form, according to a NASA-led research team. The team found that thinner and saltier ice was replacing thicker slabs of ice. When thinner ice interacts with sunlight and cold, the group said, it releases bromine into the air, causing a chemical reaction called a "bromine explosion." In this explosion, the bromine creates gaseous mercury, a toxic pollutant, that then falls on snow, land and ice and can build up in fish, researchers said. The bromine also can strip ozone from the troposphere, which is the lowest layer of the atmosphere. Son Nghiem, a NASA researcher at the Jet Propulsion Laboratory in Pasadena, CA was the lead author of the study. The research will be published soon in the *Journal of Geophysical Research-Atmosphere*.

A nonprofit environmental group has found that 29 states are under prepared to deal with increased threats to water resources as temperatures rise and precipitation patterns change. The findings are part of a state-by-state analysis by the *Natural Resources Defense Council* (NRDC) that looks at how state governments are planning for the water-related impacts of climate change. "If government officials have a greater appreciation of the impacts they're facing now and in the pipeline for the future, that will cause them to think again about more support for curbing the pollution and thus slowing the train that's rushing at them," said David Doniger, NRDC's climate and clean air policy director. The group found that nine states -- particularly CA, NY and MD — were among the most prepared. NM, AZ and TX were among those states that have done little. NRDC researchers conceded that some low-ranked states, like TX, do have water policies that promote conservation. But those programs do not address how climate change may affect water supplies.

The state of Tennessee enacted a law in mid April that critics say would give cover to public school teachers who challenge climate change and evolution in their classrooms. Even though Republican Gov. Bill Haslam expressed misgivings about the legislation, he allowed the controversial measure to become law — albeit without his signature. "The bill received strong bipartisan support, passing the House and Senate by a 3-to-1 margin," Haslam said in a statement to *The Tennessean* newspaper. "But good legislation should bring clarity and not confusion.

My concern is that this bill has not met this objective," he said. The law does not require educators to teach alternatives to scientific theories of evolution, climate change and the chemical origins of life." Instead, it attempts to block school administrators from preventing teachers from presenting alternative hypotheses to those topics. The *Tennessee Science Teachers Association* and the state chapter of the *American Civil Liberties Union* do not support the legislation. Also, Scientific organizations, like the *American Association for the Advancement of Science* and the *National Center for Science Education*, are condemning the move. And some bloggers following the news compared it to the 1920s Scopes monkey trial, when a Tennessee public school teacher was convicted and fined for teaching evolution. The move from the Tennessee Legislature comes as Texas and Louisiana have introduced education standards that mandate teachers characterize climate change denial as a legitimate scientific position. "The idea behind this bill is that students should be encouraged to challenge current scientific thought and theory," said Bo Watson, a Republican state senator and the Tennessee bill's sponsor. But according to the *National Association of Biology Teachers*, the legislation would encourage nonscientific thinking -- not promote critical analysis.

Meanwhile, a survey conducted by Yale University and Georg Mason University and released in late April found that 3 out of 4 voters favor regulating CO_2 as a greenhouse gas pollutant. Also, 72 percent of those surveyed believe global warming should be a priority for the Obama administration and Congress. The survey also found that 61 percent would vote for a candidate who raised taxes on fossil fuels while cutting income taxes. The maneuver would not add to federal revenues but would change their source, a move advocated by former Vice President Al Gore and former Republican Rep. Bob Inglis (SC). Twenty percent said they would be less likely to vote for someone who favored such a swap. The nationally representative survey had 1,008 adult participants, with a margin error of plus or minus 3 percent.

Sources: Dean Kuipers, *Los Angeles Times*, 3/28/12; Dan Whitcomb, *Reuters/Yahoo News*, 3/1/12; Susan Montoya Bryan, *AP/ Wall Street Journal*, 4/5/12; Neela Banerjee, *Miami Herald*, 4/11/12; Suzanne Goldenberg, *London Guardian*, 3/21/12; Deborah Zabarenko, *Reuters*, 4/26/11; and *Greenwire*, 2/20, 3/2, 3/20, 3/22, 3/29, 4/6, 4/10, 4/11, 4/16, 4/27 and 5/2/12

Meetings of Interest

Jul. 15-19: 10th International Congress on the Biology of Fishes, University of Wisconsin, Madison, WI. See: http://conferencing.uwex.edu/conferences/icbf2012/

Jul. 22-25: 67th International Annual Conference of the Soil and Water Conservation Society – "Choosing Conservation: Considering Ecology, Economics and Ethics". Ft. Worth, TX. See: www.swcs.org/12AC

Aug. 5-10: ESA 97th ANNUAL MEETING Life on Earth: Preserving, Utilizing and Sustaining our Ecosytems, Portland, OR. See: http://www.esa.org/portland/

Aug. 19-23: 142nd Annual Meeting of the American Fisheries Society, Minneapolis/St. Paul, MN. See: http://www.afs2012.org

Sep. 26-27: The America's Great Watershed Initiative Summit, Hilton St. Louis at the Ballpark, St. Louis, MO. See: www.AGWI.org

Sep. 26-28: 4 th Annual Upper Mississippi River Conference, "Make Room for the River: In Your Life – In Your Architecture – In the Floodplain", Moline, IL. Contact: Karen Wilke at kwilke@riveraction.org

Sep. 30-Oct. 5: 4th International EcoSummit - Ecological Sustainability - Restoring the Planet's Ecosystem Services, Columbus, OH. See: http://www.ecosummit2012.org/index.htm

Oct. 29-30: Upper Midwest Invasive Species Conference, La Crosse, WI. See: www.umisc2012.org

Dec. 10-14: ACES 2012 and Ecosystem Markets Joint Conference, Marriott Harbor Beach, Ft. Lauderdale, FL. See: www.conference.ifas.ufl.edu/aces or Contact Jhanna Gilbert, jhanna@ufl.edu, 352-392-5930

Jul. 21-25, 2013: 7th International Symposium on Sturgeons, co-hosted by Vancouver Island University (VIU) and the City of Nanaimo, Canada, See: http://iss7.viu.ca/call-for-papers-abstracts

Congressional Action Pertinent to the Mississippi River Basin

Climate Change

S. 116. Vitter (R/LA) and Barrasso (R/WY). Provides for the establishment, on-going validation, and utilization of an official set of data on the historical temperature record, and for other purposes.

S. 228. Barrasso (R/WY) and 22 Co-sponsors and **H. R. 750.** Walberg (R/MI) and 99 Co-sponsors. Preempts regulation of action relating to, or consideration of greenhouse gases (GHGs) under Federal and common law on enactment of a Federal policy to mitigate climate change.

S. 482. Inhofe (R/OK) and 44 Co-sponsors and **H. R. 910.** Upton (R/MI) and 95 Co-sponsors. Amends the Clean Air Act to prohibit the Administrator of the EPA from promulgating any regulation concerning, taking action relating to, or taking into consideration the emission of a GHG to address climate change, and for other purposes.

S. 1393. Barrasso (R/WY) and **H. R. 2603**. Posey (R/FL) and 8 Co-sponsors.. Prohibits the enforcement of a climate change interpretive guidance issued by the Securities and Exchange Commission, and for other purposes.

H. R. 97. Blackburn (R/TN) and 125 Co-sponsors and **H. R. 1292.** Cuellar (D/TX). Amends the Clean Air Act to provide that GHGs are not subject to the Act, and for other purposes.

H. R. 153. Poe (R/TX) and 61 Co-sponsors. Prohibits funding for the U.S. EPA to be used to implement or enforce a cap-and-trade program for GHGs, and for other purposes.

H. R. 680. Luetkemeyer (R/MO) and 49 Co-sponsors. Prohibits U.S. contributions to the Intergovernmental Panel on Climate Change.

H. R. 1149. Bilbray (R/CA) and 12 Co-sponsors. Amends the Clean Air Act to include algae-based biofuel in the renewable fuel program and amends the Internal Revenue Code of 1986 (IRC) to include

algae-based biofuel in the cellulosic biofuel producer credit.

H. R. 3242. Stark (D/CA) and 15 Co-sponsors. Amends the IRC to reduce emissions of carbon dioxide by imposing a tax on primary fossil fuels based on their carbon content.

H. R. 3323. Huelskamp (/KS) and 6 Co-sponsors. Freeing Agriculture to Reap More Act.

Conservation

S. 339. Baucus (D/MT) and 19 Co-sponsors and **H. R. 481.** Connolly (D/VA) and 14 Co-sponsors. Amends the IRC to allow a credit against income tax for qualified conservation contributions which include National Scenic Trails.

S. 901. Tester (D/MT) and 2 Co-sponsors. Amends the Land and Water Conservation Fund Act of 1965 to ensure that amounts are made available for projects to provide recreational public access, and for other purposes.

S. 1105 (Murray (D/WA) and 4 Co-sponsors and **H. R. 1982.** Reichert (R/WA) and 3 Co-sponsors. Provides a Federal tax exemption for forest conservation bonds, and for other purposes.

S. 1201. Lieberman (ID/CT) and 9 Co-sponsors. Conserves fish and aquatic communities in the U.S. through partnerships that foster fish habitat conservation, to improve the quality of life for the people of the U.S., and for other purposes.

S. 1265. Bingaman (D/NM) and 28 Co-sponsors. Amends the Land and Water Conservation Fund Act of 1965 to provide consistent and reliable authority and funding to maximize the effectiveness of the fund for future generations, and for other purposes.

S. 1774. Baucus (D/MT) and Tester (D/MT) Establishes the Rocky Mountain Front Conservation Management Area, to designate certain Federal land as wilderness, and improves the management of noxious weeds in the Lewis and Clark National Forest, and for other purposes.

S. 2066. Mukowski (R/AK) and 9 Co-sponsors and **H. R.2834**. Benishek (R/MI) and 58 Co-sponsors. Requires federal public land management officials, in cooperation with the respective state and fish and wildlife agency, to facilitate the use of, and access to, federal public lands and waters for fishing, sport hunting, and recreational shooting, except as described in this Act.

H. R. 390. Thompson (D/CA) and 2 Co-sponsors. Amends the IRC to provide an exclusion from the gross estate for certain farmlands and lands subject to qualified conservation easements, and for other purposes.

H. R. 1443. Broun (R/GA) and 13 Co-sponsors. Prohibits the EPA from prohibiting or otherwise restricting, the manufacture, importation, sale, or use of any traditional hunting and fishing implement based on material content.

H. R. 1444. Broun (R/GA) and 13 Co-sponsors. Requires that hunting activities be a land use in all management plans for Federal land under the jurisdiction of the Secretaries of the Interior or Agriculture as long as it is compatible with the purposes for which the Federal land is managed.

H. R. 1593. Bishop (D/NY) and Hanna (R/NY). Amends the IRC to allow an unlimited exclusion from transfer taxes for certain farmland and land of conservation value, and for other purposes.

H. R. 1917. Kind (D/WI) and 3 Co-sponsors. Authorizes USFWS, to conduct a Joint Venture Program to protect, restore, enhance, and manage migratory bird populations, their habitats, and the ecosystems they rely on, through voluntary actions on public and private lands, and for other purposes.

H. R. 1964. Gerlach (R/PA) and 306 Co-sponsors. Amends the IRC to make permanent the tax deduction for charitable contributions by individuals and corporations of real property interests for conservation purposes.

H. R. 3496. Kind (D/WI) and 4 Co-sponsors. Sets forth requirements concerning the maintenance of viable populations of existing native and desired non-native species within each planning area in the National Forest System's or BLM public lands

H. R. 4089. Miller (R/FL) and 27 Co-sponsors. Requires federal public land management officials to facilitate the use of, and access to, federal public lands, including wilderness areas for fishing, sport hunting, and recreational shooting.

Endangered Species Act of 1973 (ESA)

S. 826. Feinstein (D/CA) and **H. R. 1907.** Calvert (R/CA) and 2 Co-sponsors. Requires the Secretary of the Treasury to establish a program to provide loans and loan guarantees to enable eligible public entities to acquire interests in real property that are in compliance with habitat conservation plans approved by the Secretary of the Interior under the ESA, and for other purposes.

H. R. 39 Young (R/AK). Delists the polar bear as a threatened species under the ESA.

H. R. 1042. Baca (D/CA) and 16 Co-sponsors. Amends the ESA to require that certain species be treated as extinct for purposes of that Act if there is not a substantial increase in the population of a species during the 15-year period beginning on the date the species is determined to be an endangered species, and for other purposes.

H. R. 1719. McMorris-Rodgers (R/WA) and 10 Co-sponsors. Better informs consumers regarding costs associated with compliance for protecting endangered and threatened species under the ESA.

Energy

S. 629. Murkowski (R/AK) and 8 Co-sponsors. **H. R.3680.** McMorris Rodgers (R/WA) and 2 Co-sponsors. Amends the Public Utility Regulatory Policies Act of 1978 (PURPA) to increase from 5,000 to 10,000 KW the size of small hydroelectric power projects which the FERC may exempt from its license requirements. Improves hydropower, and for other purposes.

S. 892. Burr (R/NC) and 17 Co-sponsors. Establishes the Department of Energy and the Environment, and for other purposes.

S. 1343. Bingaman (D/NM). Provides for the conduct of an analysis of the impact of energy development and production on the water resources of the U.S., and for other purposes.

H. R. 795. Smith, (R/NE) and 16 Co-sponsors. Exempts from certain Federal Power Act licensing requirements a hydroelectric project that uses only a non-federally owned conduit to generate electric power under 1.5 megawatts.

H. R. 1861. Murphy (R/PA) and 20 Co-sponsors. Greatly enhances America's path toward energy independence and economic and national security, to conserve energy use, to promote innovation, to achieve lower emissions, cleaner air, cleaner water, and cleaner land, to rebuild our Nation's aging roads, bridges, locks, and dams, and for

other purposes.

Federal Water Pollution Control Act (FWPCA)

S. 272. Manchin (D/WV) and 8 Co-sponsors. Amends the FWPCA to clarify and confirm the authority of the U.S EPA to deny or restrict the use of defined areas as disposal sites for the discharge of dredged or fill material.

S. 468. McConnel (R/KY) and 11 Co-sponsors and **H. R. 960.** Rogers (R/KY) and 8 Co-sponsors. Amend the FWPCA to clarify the authority of the Administrator to disapprove specifications of disposal sites for the discharge of, dredged or fill material.

S. 661. Lautenberg (D/NJ). Amends the FWPCA to ensure the safe and proper use of dispersants in the event of an oil spill or release of hazardous substances, and for other purposes.

S. 711 Lautenberg (D/NJ). Amends the Safe Drinking Water Act and the FWPCA to authorize the Administrator of the EPA to reduce or eliminate the risk of releases of hazardous chemicals from public water systems and wastewater treatment works, and for other purposes.

S. 1313. Whitehouse (D/RI) and 5 Co-sponsors. Amends the FWPCA to reauthorize the National Estuary Program, and for other purposes.

S. 1582. Lautenberg (D/NJ) and 3 Co-sponsors. Amends the FWPCA to modify provisions relating to beach monitoring, and for other purposes.

H. R. 395. McNerney (D/CA). Amends the FWPCA to extend the pilot program for alternative water source projects.

H. R. 457. McKinley (R/WV) and 15 Co-sponsors. Amends the FWPCA to remove the Administrator of the U.S. EPA's authority to disapprove after a permit has been issued by the Corps under section 404 of such Act.

H. R. 517. Young (R/AK) and 12 Co-sponsors. Amends the FWPCA to eliminate the authority of the Administrator of the U.S. EPA to deny or restrict the use of a defined area as a dredged or fill material disposal site, and for other purposes.

H. R. 872. Gibbs (R/OH) and 137 Co-sponsors. Amends the Federal Insecticide, Fungicide, and Rodenticide Act and the FWPCA to clarify Congressional intent regarding the regulation of the use of pesticides in or near navigable waters, and for other purposes.

H. R. 1375. Pallone (D/NJ) and 120 Co-sponsors. Amends the FWPCA to define "fill material" to mean any pollutant that replaces portions of waters of the U.S. with dry land or that changes the bottom elevation of a water body for any purpose and to exclude any pollutant discharged into the water primarily to dispose of waste.

H. R. 2018. Mica (R/FL) and 39 Co-sponsors. Amends the FWPCA to preserve the authority of each State to make determinations relating to the State's water quality standards, and for other purposes.

H. R. 2427. Miller (R/CA) and 8 Co-sponsors. Amends the FWPCA to: (1) include the removal of sediment, debris, and vegetation as "maintenance" of a currently serviceable structure for which the discharge of dredged or fill material into the navigable waters at specified disposal sites is not prohibited; and (2) include a channel or basin as such a structure.

H. R. 2840. LoBiondo (R/NJ) and 7 Co-sponsors. Amends the FWPCA to regulate discharges from commercial vessels, and for other purposes.

H. R. 3145. Bishop (D/NY) and 35 Co-sponsors. Amends the FWPCA to authorize appropriations for State water pollution control revolving funds, and for other purposes.

Grazing

S. 1129. Barrasso (R/WY) and 8 Co-sponsors and **H. R.4234.** Labrador (R/ID) and 14 Co-sponsors. Amends the Federal Land Policy and Management Act of 1976 to double from 10 to 20 years the period of a term for grazing permits and leases for domestic livestock grazing on public lands or lands within national forests in 16 contiguous western states.

Invasive Species

S. 471. Stabenow (D/MI) and 8 Co-sponsors and **H. R. 892.** Camp (R/MI) and 36 Co-sponsors. Requires the Corps to study the feasibility of the hydrological separation of the Great Lakes and Mississippi River basins.

S. 1324. Boxer (D/CA) and 5 Co-sponsors. 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.

S. 2317. Stabenow (D/MI) and 9 Co-sponsors and **H. R. 4406.** Camp (R/MI) and 13 Co-sponsors. Compels the Corps to complete the Great Lakes Mississippi River Interbasin Study within 18 months and to focus particular attention on the permanent prevention of the spread of aquatic nuisance species between the Great Lakes and the Mississippi River basins.

Mining

S. 897. Bingaman (D/NM) and 4 Co-sponsors and **H. R. 1365.** Rahal (D/WV). Amends the Surface Mining Control and Reclamation Act (SMCRA) of 1977 to clarify that uncertified States and Indian tribes have the authority to use certain payments for certain non coal reclamation projects and acid mine remediation programs.

S. 1003. Tester (D/MT). Amends the SMCRA of 1977 to limit the liability of a State performing reclamation work under an approved State abandoned mine reclamation plan.

S. 1455. Tester (D/MT). Amends the SMCRA of 1977 to authorize certified States and tribes to use amounts made available from the Abandoned Mine Reclamation Fund for hard rock and coal mining reclamation projects and to extend liability protection to certified States and Indian tribes carrying out approved abandoned mine reclamation programs.

H. R. 785. Pearce (R/NM) and 3 Co-sponsors. Amends the SMCRA of 1977 to clarify that uncertified States and Indian tribes have the authority to use certain payments for certain non coal reclamation projects.

National Environmental Policy Act (NEPA)

H. R. 332. Filner (D/CA) and 6 Co-sponsors. Amends Title 10, U.S. Code, to require the Department of Defense and all other defense-related agencies of the U.S. to fully comply with Federal and State environmental laws, including certain laws relating to public health and worker safety, etc.

Public Service

S. 896. Bingaman (D/NM) and 5 Co-sponsors and **H. R. 587.** Grijalva (D/AZ) and

9 Co-sponsors. Amends the Public Lands Corps Act of 1993 to expand the authorization of various departments to provide service opportunities for young Americans; help restore the Nation's natural, cultural, historic, archaeological, recreational and scenic resources; train a new generation of public land managers and enthusiasts; and promote the value of public service.

H. R. 494. Kaptur (D/OH) and 30 Co-sponsors. Authorizes the President to reestablish the Civilian Conservation Corps as a means of providing gainful employment to unemployed and underemployed citizens of the U.S. through the performance of useful public work, and for other purposes.

Water Quality

S. 1502. Baucus (D/MT) and Testor (D/MT). Directs the Administrator of the Pipeline and Hazardous Materials Safety Administration (PHMSA) to review the adequacy of PHMSA regulations with respect to PHMSA-regulated pipelines that cross rivers with a width of at least 100 feet from high water mark to high water mark.

S. 1669. Cardin (D/MD) and 2 Co-sponsors and **H. R. 2738.** Capps (D/CA) and 22 Co-sponsors. Authorizes the Administrator of the USEPA to establish a program of awarding grants to owners or operators of water systems to increase the resiliency or adaptability of the systems to any ongoing or forecasted changes to the hydrologic conditions of a region of the U.S.

S. 1701. Snowe (R/ME) and 12 Co-sponsors and **H. R.2484.** Harris (R/MD) and 9 Co-sponsors. Amends the Harmful Algal Bloom and Hypoxia Research and Control Act of 1998 to require the President to establish an Inter-Agency Task Force on Harmful Algal Blooms and Hypoxia.

H. R. 553. Markey (D/MA) and 8 Co-sponsors. Amends the Safe Drinking Water Act regarding an endocrine disrupter screening program.

H. R. 4458. Kind (D/WI). Promotes Department of the Interior efforts to provide a scientific basis for the management of sediment and nutrients in the Upper Mississippi River Basin, and for other purposes.

H. R. 4965. Mica (R/FL) and 52 Co-sponsors. Preserves existing rights and responsibilities with respect to waters of the U.S., and for other purposes.

Water Resources

S. 399. Baucus (D/MT) and Tester (D/MT). Modifies the purposes and operation of certain facilities of the BOR to implement the water rights compact among the State of Montana, the Blackfeet Tribe of the Blackfeet Indian Reservation of Montana, and the U.S., and for other purposes.

S. 573. DeMint (R/SC) and Graham (R/SC). Establishes a harbor maintenance block grant program to provide maximum flexibility to each State to carry out harbor maintenance and deepening projects in the State, to require transparency for water resources development projects carried out by the Corps, and for other purposes.

S. 1197. Coats (R/IN) and 2 Co-sponsors and **H. R. 2432.** Visclosky (D/IN) and 18 Co-sponsors. Directs the Corps, prior to any major federal action to prevent the introduction or establishment of a population of aquatic nuisance species between the Great Lakes and the Mississippi River Basins that would impact the flow of commerce or commercial activity within the Chicago Area Water [sic] System, to prepare an economic impact statement.

S. 1377. Roberts (R/KS) and Johanns (R/NE) and **H. R.2579.** Jenkins (/KS) and 4 Co-sponsors. Requires the Corps to take into account all available hydrologic data in conducting Missouri River basin operations.

S. 1795. Grassley (R/IA) and Johanns (R/NE) and **H. R.2942.** King (/IA) and 13 Co-sponsors. Directs the Corps to revise the Missouri River Mainstem Reservoir System Master Water Control Manual to ensure greater storage capacity to prevent serious downstream flooding.

S. 2039. Hoeven (R/ND) and Conrad (D/ND). Allows for a State or local government to construct levees on certain properties otherwise designated as open space lands

S. 2104. Cardin (D/MD) and 4 Co-sponsors. Amends the Water Resources Research Act of 1984 to reauthorize grants for and require applied water supply research regarding the water resources research and technology institutes established under that Act.

S. 2245. Barrasso (R/WY) and 38 Co-sponsors. Preserves the Waters of the U.S. Act.

H. R. 700. Walberg (R/MI) and 16 Co-sponsors. Provides a moratorium on the issuance of flood insurance rate maps, to assist property owners in adapting to flood insurance rate map changes, and for other purposes.

H. R. 1026. Waters (D/CA) and 7 Co-sponsors. Extends the authorization for the national flood insurance program, to identify priorities essential to reform and ongoing stable functioning of the program, and for other purposes.

H. R. 1421. Boren (D/OK) and 3 Co-sponsors. Amends the Water Resources Development Act of 1986 to clarify the role of the Cherokee Nation of Oklahoma with regard to the maintenance of the W.D. Mayo Lock and Dam in Oklahoma

H. R. 1865. Gibbs (R/OH) and 100 Co-sponsors. Protects the right of individuals to bear arms at water resources development projects administered by the Secretary of the Army, and for other purposes.

H. R. 2330. Loebsack (D/IA) and Kucinich (D/OH). Establishes within NOAA an Office of Flood Research and Policy, headed by a Director.

H. R. 2993. Graves (R/MO) and 5 Co-sponsors. Directs the Corps to revise the Missouri Mainstem Reservoir System Master Water Control Manual and any related regulations to delete fish and wildlife as an authorized purpose of the Corps and elevate flood control as the highest priority of authorized purposes of the Corps at all times.

H. R. 3223. Foxx (R/NC). Directs the Corps to allow certain entities to use a portion of collected recreational user fees for administrative expenses and for the operations, maintenance, development of recreational facilities or management of natural resources.

H. R. 3719. King (R/IA) and 8 Co-sponsors. Provides that funds made available to the Corps for certain Missouri River fish and wildlife purposes be used for the reconstruction of flood control structures, and for other purposes.

H. R. 4342. Withfield (R/KY) and 14 Co-sponsors. Provides funding for construction and major rehabilitation for projects located on inland and intracoastal waterways of the U.S., and for other purposes.

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