River Crossings

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Chairman's Comments

Beginning with this issue, MICRA has changed River Crossings from a 3-column news print format to a single column format to simplify reading of the electronic newsletter. We have also added a few navigation features to assist those reading the electronic document. Let us know what other improvements we can make to improve your experience reading River Crossings!

It has been a busy start to 2013 with MICRA's third annual trip to Washington, DC, in early March to raise awareness about fisheries and aquatic resource issues in the Mississippi River Basin. Aquatic invasive species, particularly Asian carp, were a key topic of discussion. MICRA delegates from Arkansas, Kansas, Kentucky, Missouri, Pennsylvania, and West Virginia joined me to meet with several Federal agencies and 30 congressional offices. MICRA also helped to organize and present an Asian Carp Informational Symposium and co-hosted a National Invasive Species Awareness Week evening reception at the National Aquarium that featured Asian carp and other "Invasives on the Menu". I'm happy to report that MICRA's efforts were a great success!

Many thanks to the MICRA delegates that participated in this year's visit to DC - this important effort would not succeed without MICRA delegates making time to participate. I'm also very grateful to the Northeast-Midwest Institute and Representative Mike Kelly's (R-PA) office for their efforts in planning the Asian Carp Informational Symposium.

Asian Carp Issues

A federal judge, in early December, dismissed a lawsuit that sought to have barriers placed in Chicago-area waterways to prevent Asian carp from entering the Great Lakes. In the suit, the states of MI, WI, MN, OH and PA said the U.S. Army Corps of Engineers (Corps) and Chicago's Metropolitan Water Reclamation District had failed to separate a network of rivers and canals from Lake Michigan, resulting in a public nuisance.

U.S. District Judge John Tharp noted in his ruling that he was "mindful of, and alarmed by, the potentially devastating ecological, environmental and economic consequences that may result from the establishment of an Asian carp population in the Great Lakes." But under federal law, he noted, that the Corps must keep shipping channels open between Lake Michigan and Chicago's Des Plaines River. The agency also cannot construct dams in any waterway without a congressional

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act, so the states should seek change through Congress, he said. But he left the case open so it could be considered again if the states file new arguments. "There may be room in which the [states] can still maneuver," he wrote.

Dr. Brian Roth at Michigan State University said that although the entire Great Lakes region is within the temperature range of the Asian carp, they won't end up everywhere. "There are a limited number of places that fit (their) spawning habitat needs but there are some in the Great Lakes," he said. "I think where we're really worried about Asian carp is western Lake Erie, Saginaw Bay, where productive bays are fed by long productive rivers". Roth also looked at commercial fishing as a potential control measure where Asian carp are already established. He said that targeting both adult and juvenile fish will reduce populations, but unfortunately, it won't reduce Silver carp populations. "Bigheads make up 90 percent of commercial catch but silvers make up 74 percent of the population," Roth said. In the end the researchers determined that commercial fishing, as it currently exists, would not be effective in reducing carp numbers in areas where they are established.

A new government study conducted by the Corps, the U.S. Fish and Wildlife Service and the U.S. Geological Survey has found that live Asian carp aren't necessarily present where their environmental DNA (eDNA) is found. Although DNA usually is found in excrement, slime and scales of live fish, the report reveals that carp eDNA could come from other sources. Researchers found that fish-eating birds "have the capacity" to transmit carp DNA in their droppings, which could contaminate barges and other vessels. Asian carp DNA was found in the feces of birds that were fed Asian carp. The study also found "considerable amounts" of eDNA stuck to boat hulls, which can remain for days "and does not appear to be completely or quickly washed off of boats moving through the water." Asian carp eDNA was also found in Chicago's storm sewers. The study said boats, nets and other gear used by commercial fishermen and natural resource agencies could spread the genetic markers. "The purpose (of the three year study) ... is to improve the understanding and interpretation of Asian carp environmental DNA results, so we can refine and make this relatively young monitoring tool the most effective to detect live Asian carp presence," said Kelly Baerwaldt, a Corps fisheries biologist and Asian carp program manager. Additional reports are planned as the study continues.

Chris Jerde of the University of Notre Dame, who's among the scientists who have detected Asian carp eDNA in recent years, said they never claimed that all the positive hits came from live fish. But alternatives suggested in the report don't explain the persistent eDNA findings in the same general locations, he said. Jerde said he and colleagues have tested more than 1,700 water samples from the Chicago waterways, Lakes Michigan and Erie, and many rivers in the region. The positive results have been concentrated in areas relatively close to where a live Asian carp was landed in Chicago in 2010 and where a bighead was caught in Lake Erie around 2000, he said. "These patterns ... would seem to indicate that there's at least some live carp present in the system, although we don't know how many," Jerde said.

Meanwhile, Minnesota legislators are expected this year to discuss actions to stop the advance of Asian carp up the Mississippi River. The Minnesota Department of Natural Resources wants to build an $8-15 million sound bubble and light barrier in the Twin Cities to keep the carp from advancing upstream. "When people talk about the prospective costs of keeping Asian carp out of our lakes, you have to think not just in terms of what it's going to be to do that, but what are the costs of not doing that, and those costs are enormous," said Jean

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Wagenius, of Minneapolis, chairwoman of the Minnesota House Environment, Natural Resources and Agriculture Finance Division. In order to pay for the barrier and other programs, the Legislature may consider doubling or tripling the state's $5 surcharge on boat registrations.

Sources: *AP/Washington Post*, 12/3/12; Brian Mulherin, *Ludington (MI) Daily News*, 1/14/13; John Flesher, *AP/Sacramento Bee*, 2/20/13; Steve Karnowski, *AP/Fargo Forum*, 1/13/13; and *Greenwire*, 12/4/12 and 1/14 and 2/21/13

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Drought and Chicago Waterway Issues

Lake Michigan's water levels have plunged in recent months as the nation continues to experience record drought conditions. This has created a scenario that could allow the Chicago River (which often carries as much as 80% treated water) to flow backward into Lake Michigan. More than a century ago, the U.S. Army, Corps of Engineers (Corps) reversed the direction of the river in order for it to carry the city's wastes away from the lake. Since that time the river has acted almost as a sewage pipe carrying treated and untreated sewage away from Lake Michigan and into the Des Plaines and Illinois rivers, and thus into the Mississippi River Basin.

The Corps manages navigation locks along the Chicago River and the agency typically tries to keep water levels in the river about 6 inches below that of the lake. But with dropping lake levels that management scenario is becoming increasingly more difficult. Corps officials say that the locks will help to mitigate how much water would seep back into the lake. They also say that lockages could be limited to designated times rather than provided on an on-demand basis.

"What we don't want to do is have significant amounts of canal water going into Lake Michigan because it's not as clean as Lake Michigan," said Gary Meden, the Corps' Rock Island district deputy for programs and project management. But some people fear that dropping water levels could cause the Chicago River to stop flowing completely, changing parts of it into a lifeless, de-oxygenated canal. If you live around a lot of water, you don't think of it as a precious resource," said David St. Pierre, executive director of the Metropolitan Water Reclamation District (MWRD) of Greater Chicago, the city's sewage utility. "Conservation is a conversation that's just started to happen in the Chicago region," he said. Great Lakes water levels typically increase by about a foot after snowmelt and runoff during the spring. However, Lake Michigan rose only 4 inches last year, and in December the lake was 28 inches below the long-term average. The Corps and the MWRD, which is responsible for the waterways, may find it necessary to minimize backflow without affecting the locks by pumping lake water instead of river water into the locks.

Almost 59 percent of the contiguous U.S. is experiencing drought, according to the latest *U.S. Drought Monitor update*, with the worst conditions concentrated in the Great Plains and Western states. That is not expected to change much over the next three months, the National Oceanic and Atmospheric Administration (NOAA) said in mid-January in its three-month outlook for February, March and April. "Most of the central and southern Plains look like they will continue to have significant drought-related problems," said Anthony Artusa, a meteorologist at NOAA's Climate Prediction Center. "The best chance for some relief, at least during the early months of the growing season, is in the Northern Plains and the upper, and perhaps middle, portions of the Mississippi Valley," he said.

Sources: Michelle Merlin, *E&Enews PM*, 1/11/13; Peter S. Green, *Bloomberg*, 1/31/13; Elizabeth Campbell, *Bloomberg*, 2/6/13; Lauren Morello, *ClimateWire*, 1/18/13; *Greenwire*, 2/1 and 2/8/13

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Ohio River States Crack Down on Illegal Paddlefish Fishing

IN, KY, OH, and IL conservation officers stepped up efforts to monitor their portions of the Ohio River in December as more commercial fishermen moved in to pursue collection of paddlefish roe in the wake of damage to East Coast caviar sources caused by Hurricane Sandy. Tom Stefanavage, who leads the Indiana Department of Natural Resources (IDNR) Big Rivers Fisheries Program said, "We're working with our neighbors – Kentucky, Ohio, Illinois – to enforce regulations. Caviar is a very lucrative product and a very lucrative industry. It's a small industry, but just the Indiana portion is worth several million dollars a year," he said.

Large paddlefish taken from a reservoir in South Dakota.

With regard to paddlefish fishing, Steve Kinne, an IDNR conservation officer said, "We are observing violations such as fishing in restricted areas, setting more nets than they are licensed for and not checking

their nets within 24 hours." Violations can range from misdemeanor to felony charges, according to an IDNR news release. Most violations are a misdemeanor resulting in a fine. One fish caught illegally costs $20, with each fish after that costing $35. People are charged with a felony if the number of fish they sell surpasses the value of $500. But that doesn't take many fish because this season's caviar prices, IDNR conservation officer Corey Norrod said, are projected to reach $85 to $120 per pound. "One large female paddlefish can produce as much as 10 pounds of finished caviar," he said. "Two Indiana commercial fishermen reported harvests of 5,000 to 8,000 pounds of caviar last fishing season," he said. Paddlefish roe is consumed as a substitute for sturgeon roe which is more desirable and is commonly used to produce caviar.

Even before the hurricane, officials said the decline of "top-of-the-line" sturgeon species such as Beluga, Russian and Stellate had increased the demand for paddlefish eggs. Before the collapse of the Soviet Union, the Caspian Sea provided the bulk of the world's caviar, Stefanavage noted. After that nation's dissolution, however, fishermen freed from strict Soviet oversight quickly overharvested sturgeon and depleted the populations. "The added pressure (in the U.S.) has caused paddlefish to be listed as endangered, threatened or as a species of special concern in 10 of 22 states within the species remaining range," said Norrod. "There has been a noticeable decline in size and populations."

To the average consumer, the paddlefish are much more financially than physically attractive. They are sometimes described as spatula-snouted. Paddlefish are one of the largest U.S. freshwater fish and can grow to lengths of more than 5 feet and weights of up to 100 pounds. The paddlefish is an ancient species that predates even dinosaurs. Along with overharvesting, pollution and destruction of aquatic habitat have also contributed to the species decline. Paddlefish are native to the large rivers of the entire Mississippi River Basin, but their numbers have been significantly reduced in many areas. The paddlefish demise was a primary factor which led to the formation of MICRA in the late 1980's.

Source: *Indianapolis Star*, Bill McCleery, 1/12/12 BACK TO TOP

Sturgeon Entrainment in Towboat Propwash

A study published in early January in the *Journal of Applied Ichthyology*, estimates the losses of shovelnose sturgeon to entrainment by towboat traffic on the Upper Mississippi River. "Our estimations suggest that at current towboat navigation levels entrainment losses of shovelnose sturgeon may be approaching levels that rival fishery harvest", report L. E. Miranda (U.S. Geological Survey) and K. J. Killgore (U.S. Army, Corps of Engineers), co-authors of the report. Comparison with densities estimated by trawling and mark-recapture also suggested entrainment generally was below ambient densities. Their spawning potential ratio analyses for the sturgeon suggested that depending on current levels of fishing and entrainment mortality (both uncertain), the mature adult population may be dipping to levels where it no longer has the reproductive capacity to replenish itself, at least in some pools and some years they report.

Lake sturgeon collected in Pool 15 of the Upper Mississippi River in the 1980's, the apparent victim of an impact with a large propellor blade.

"Quantifying the impact of entrainment on fish populations is complex as there are many uncertainties involved", they report. These uncertainties are associated with quantifying the level of entrainment, quantifying the fraction of entrained fish actually harmed, quantifying ambient fish densities to gauge the relevance of entrainment, and pinpointing the threshold level of entrainment mortality that would actually threaten a population. Aside from estimation difficulties, population densities can vary greatly among years depending on environmental fluctuations that affect the abundance and distribution of fishes and sampling efficiency. These fluctuations are reflected mainly in numerical densities of juveniles but are often transmitted into older age groups. Accordingly, more precise and representative collection methods may not substantially reduce uncertainties. Considering these limitations, the estimates we derived are exploratory, but are the best available for this system, they report.

Questions about the reliability of data can often delay management action while decision-makers debate whether to take a precautionary stance and initiate conservation activities, or wait until stronger data are available. Uncertainty often results in calls for further studies, which could improve or validate our estimates, they said. "Nevertheless, whether our estimates overestimate or underestimate entrainment mortality, or whether additional estimates are sought, it is clear that entrainment has the potential to impact shovelnose sturgeons." Thus, along with additional estimates, future research may also need to consider development of options for managing entrainment.

Our analysis suggests that for large-bodied, channel-dwelling species such as the shovelnose

sturgeon, entrainment can be an important source of mortality rivaling that of fishing mortality", they report. The link between vulnerability and large-body size is related to the higher probability of propeller impact on large fish as well as life-history characteristics of large-bodied, slow-recovering species that typically include long life-span, maturation late in life, and iteroparous reproductive strategy. "Nevertheless, entrainment is only one of several human-mediated disturbances that may threaten fish populations in river systems." Lack of adequate fish passage, introduced species, habitat degradation in side channels and backwaters, and other disturbances are also likely to negatively impact populations, and exacerbate the effects of entrainment, they said.

Source: L. E. Miranda and K. J. Killgore, Entrainment of Shovelnose sturgeon by towboat navigation in the Upper Mississippi River, *Journal of Applied Ichthyology* (2013), 1–7. BACK TO TOP

Justices Rule That Temporary Flooding Can Constitute a Taking

In the last issue of River Crossings (Vol. 21, No. 4) we reported on the temporary flooding of Arkansas´ Black River Wildlife Management Area by upstream releases of water from the U.S. Army, Corps of Engineers' (Corps) Clearwater Dam on the White River in Missouri. Almost immediately after we went to press, the Supreme Court ruled that such temporary government-induced flooding can give rise to a takings claim under the Fifth Amendment. The 8-0 ruling came in *Arkansas Game and Fish Commission (AGFC) v. United States*, a case in which the AGFC argued that it is owed compensation by the Corps for timber damage caused by the flooding.

The court did not rule whether there was a taking in the Arkansas case. Instead, Justice Ruth Bader Ginsburg wrote in the opinion that there was no blanket exemption for takings claims involving temporary flooding. The question facing the high court was whether temporary flooding of the type that occurred at the Black River site could ever be a taking, which is generally viewed as a permanent loss of property. Although permanent government-caused flooding has been recognized as a taking by courts, temporary flooding has not. Ginsburg wrote that "recurrent floodings, even if of finite duration, are not categorically exempt from takings clause liability." Lower courts will have to make a fact-specific determination about whether there was a taking, she said. "Court must assess the relevant facts and circumstances in each case to determine whether what the government has done amounts to a taking," she explained in remarks from the bench. Courts must consider "the duration of the interference, whether the invasion was foreseeable when the government acted, the severity of the interference, and the degree to which it upsets the property owner's reasonable expectations regarding the land's use," she said.

During the October argument, members of the court were hostile to the federal government's position that no landowners downstream of a government-operated dam can seek compensation in part because they should be aware of the inherent risks of owning land on a floodplain. In a statement, Jim Goodhart, the AGFC's chief legal counsel, said the ruling "sends a strong messages about what our agency has been litigating with the U.S. Army Corps of Engineers over the past seven years."

Source: Lawrence Hurley, *Greenwire*, 12/4/12 BACK TO TOP

Hundreds of Levees in Need of Repair

The first-ever inventory of flood control systems overseen by the federal government has found hundreds of structures in 37 states at risk of failing and endangering people and property. The U.S. Army, Corps of Engineers (Corps) has yet to issue ratings for a little more than 40 percent of the 2,487 structures, which protect about 10 million people. Of those it has rated, 326 levees covering more than 2,000 miles were found in urgent need of repair. The problems are myriad: earthen walls weakened by trees, shrubs and burrowing animal holes; houses built dangerously close to or even on top of levees; and decayed pipes and pumping stations.

The *Associated Press* (AP) requested, under the Freedom of Information Act, details on why certain levees were judged unacceptable and how many people would be affected in a flood. But the Corps declined on grounds that such information could heighten risks of terrorism and sabotage. The AP did find specifics about the condition of some levees from federal and state records and in interviews with more than a dozen officials in various cities and towns. The number of people who might be affected by a breach could not be determined because there are many different factors in a flood, such as terrain and obstacles.

Local governments are responsible for upgrading unacceptable levees. But some local officials say that the Corps is exaggerating the dangers, that some deficiencies were approved or not objected to by the federal government, and that any repairs could cost them hundreds of thousands, if not millions, of dollars. "It's just not right to tell a little town like this to spend millions of dollars that we can't raise," said Judy Askew, mayor of Brookport, IL, a town of about 1,000 on the banks of the Ohio River.

Compared with other types of infrastructure, the nation's levees, within and outside of federal jurisdiction, don't fare well with the American Society of Civil Engineers (ASCE). Levees earned a D-minus for overall condition from the ASCE in its latest report card

in 2009, ranking behind dams, bridges, rails and eight other categories. The condition of flood control systems came into dramatic focus in August 2005 when Hurricane Katrina storm surges toppled levees in New Orleans and tore up the Gulf Coast. Afterward, Congress told the Corps to catalog federally overseen levees, many of which it built and handed over to municipalities to run and maintain. The Corps spent more than $140 million on inspections and developing the inventory. As of mid-January, the agency had rated 58 percent of the levees (1451), 326 of which were unacceptable, 1,004 were minimally acceptable with deficiencies that need correcting, and 121 were acceptable.

According to the AP the most widespread issues were:
• Design or construction flaws: Some levees had inadequate "freeboard" (extra height to prevent overflow) which can weaken the landward slope of the levee.
• Inadequate or crumbling infrastructure: Many pipes built into levees to drain storm water were made of metal that has rusted, and pumping systems are giving out.
• Failure to control vegetation and invasive animals: Corps specifications require that levee slopes be kept clear of plants and burrowing critters such as ground squirrels and gophers. Animal burrows can weaken levee walls by providing pathways for water, and thick vegetation can conceal cracks, holes and unstable slopes.
• Building encroachment: The Corps requires a 15-foot buffer between levees and man-made structures such as houses, fences and parking lots. But some structures abut levees or rest on top of them.

The Corps doesn't expect local officials to tear down neighborhoods or hotels, but has orders from Congress to tell them about levee problems and risks. In many cases, additional walls or other steps around buildings can improve safety. In interviews, some local managers disputed their "unacceptable" ratings, saying their levees were sound, if not perfect. Bill Sheppard, assistant chief engineer for the Yazoo-Mississippi Delta Levee Board, noted that none of its levees failed during severe flooding in spring of 2011. "Our system works," he said. "Does it have components that need to be fixed after this flood? Absolutely. But if you look at the levee evaluation reports, you'd think, `Oh Lord, run for the hills.'"

The Corps' Eric Halpin, special assistant for dam and levee safety, agreed that levees covered by the agency's safety program mostly held their own during some of the heaviest flooding on record in 2011, which caused an estimated $9 billion in damage. But that doesn't mean inspectors are overstating the system's flaws, he said, noting that some communities escaped catastrophe only after heroic efforts to shore up levees more than half a century old. "That is not acceptable performance," he said. A number of local officials said they would happily upgrade their levees - if they could afford it. "There is no money available. There's no way we could raise even a 25 percent match if they covered the rest of it," said Brookport Mayor Askew. A concrete floodwall about 10 feet high tops the section nearest the town's business district. Askew said the levee proved itself during the 2011 flood, when the town was mostly spared. The mayor figures the government should pay for about $2 million in upgrades.

In 2009, a congressional advisory panel recommended that Congress invest in levees, create national levee programs and enact policies to increase awareness about the risks of flooding. But Congress has yet to adopt the group's report. In the meantime, experts are warning that aging and weak flood-control systems will likely face stiffer tests as climate change makes severe storms more common in the coming years. "This is going to be a national problem and it just hasn't dawned on people how big it's going to be," said Jeffrey Mount, a levee management specialist and founder of the *Center for Watershed Sciences* at the University of California, Davis. "We're in a never-ending cycle of flood and rebuild."

Meanwhile along the Mississippi, the Corps is set to release its latest analysis of a 60-year-old plan to plug a quarter-mile gap in a large levee, part of a $165 million project that would put in two pump stations to ameliorate flooding in southeastern Missouri. The plan would have workers drain 55,000 acres of wetlands that offer habitat for fish and waterfowl. Farmers in the area, which suffers from floods every three to five years, said they stand to benefit from the plan. Corps officials estimate that stop-gapping the flooding will bring $15.5 million in yearly benefits to the area. Some scientists, taxpayer advocates and environmentalists, however, say the plan cuts off one of the river's remaining natural flows. It could wreck important fish-spawning and birding habitat and intensify farming. Missouri Sens. Roy Blunt (R) and Claire McCaskill (D) are slated to meet with officials to push for the release of the latest analysis – and a final decision.

Sources: John Flesher and Cain Burdeau, *AP*, 1/17/13; Juliet Eilperin, *Washington Post*, 2/10/13; and *Greenwire*, 1/17 and 2/11/13

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Pipeline Crossing Concerns

Pipeline spills caused by flooding and riverbed erosion dumped 2.4 million gallons of crude oil and other hazardous liquids into U.S. waterways over the past two decades, according to a new report from the U.S. Department of Transportation (DOT). The DOT report to Congress was conducted in response to a 2011 spill into Montana's Yellowstone River. In that spill the rupturing of an *Exxon Mobil Corp*. pipeline resulted in 1,000 barrels of crude being spilled. Scouring was also behind the bursting of an *Enterprise Products*

Partners LLP pipeline in Iowa last year. In that instance a total of 818 barrels of gasoline additive spilled into the Missouri River floodplain. These spills highlighted concerns about federal pipeline rules that require lines to be buried just 4 feet below riverbeds – scant cover that can quickly be scoured away by floodwaters.

Congress in January ordered the review of pipeline incidents at river crossings to determine whether the depths at which the pipelines were buried were a factor. Many river engineers say the standards are inadequate. Richard Opper, director of the Montana Department of Environmental Quality, said after the *Exxon* spill, studies found that about one-fourth of the 90 pipelines inspected were close to exposure. "We're vulnerable. But not just in Montana," he said. "The whole pipeline system across the country is vulnerable." Regulators found flood-related pipeline spills since 1993 in CA, TX, IA, LA, MT, NE, SD and KY. Of the 2.4 million gallons of oil, gasoline, propane and other hazardous liquids released, less than 300,000 gallons was recovered. Although those accidents account for less than 1 percent of the total number of pipeline accidents, the consequences of a release in water can be much more severe because of the threats to drinking water supplies and the heightened potential for environmental damage.

U.S. Sen. Max Baucus (MT/D), who requested the report with fellow Montana Sen. Jon Tester (D), said the results reveal "some pretty clear holes in pipeline oversight when it comes to flooding." But Baucus said the report leaves unanswered basic questions about what steps can be taken to prevent future accidents. DOT officials will next evaluate whether pipeline crossing rules such as the 4-foot depth requirement are sufficient, said Jeannie Layson, communications director for the agency's Pipeline and Hazardous Materials Safety Administration. The agency must deliver another report to Congress within the next year to update lawmakers on its plans.

Pipeline companies are required to inspect crossings under navigable waterways at least once every five years. An industry representative cautioned against imposing stringent new regulations. Those could force companies to divert money from other safety initiatives such as reducing accidents caused by corrosion or excavation damage, said John Stoody, of the *Association of Oil Pipe Lines*. The water crossings report showed riverbed scouring around pipelines caused by flooding "is a real but rare occurrence," Stoody said. "It's our hope the focus remains on efforts that will provide the most public safety and protection for the environment," he said, adding that companies spent at least $1.1 billion on evaluations, inspections and maintenance geared toward safety in 2011.

In recent years, some pipeline companies have voluntarily buried their lines deeper than federal rules require. Using a technique called horizontal directional drilling, pipelines can be installed dozens of feet beneath riverbeds, minimizing the chances they could be exposed to damaging floodwaters and debris. The technique can cost millions of dollars for a single water crossing. But that can save money in the long run: *Exxon's* 2011 spill into the Yellowstone cost the company an estimated $135 million.

Sources: Jack Nicas, *Wall Street Journal*, 12/3/12; Matthew Brown, *AP/Denver Post*, 1/3/13; and *Greenwire*, 12/4/12 and 1/4/13

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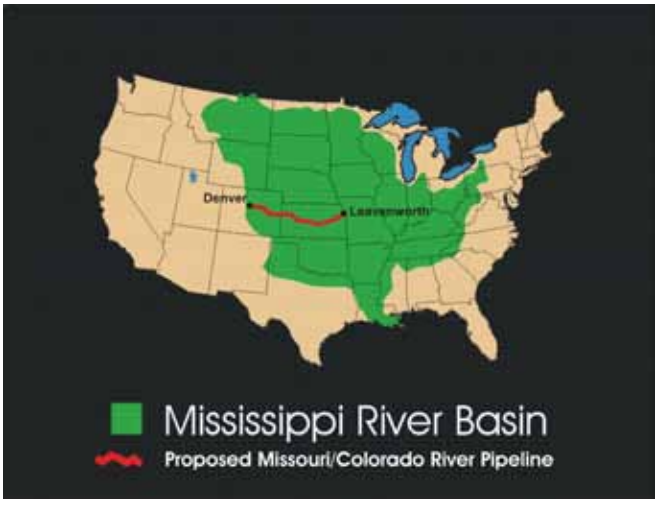
Proposed Missouri River/Colorado River Pipeline

Most Colorado River water is currently used for agriculture, but that is changing as the cities of the Southwest continue to grow. The federal government has come up with dozens of ways to enhance the river's diminishing flow which has long struggled to keep seven states and roughly 25 million people hydrated. Now, among the proposals in a report by the Bureau of Reclamation (BOR), and expected to remain in the final draft of the report, is a more extreme and contentious approach. It calls for building a pipeline from the Missouri River to Denver, nearly 600 miles to the west. Water would be doled out as needed along the route in Kansas, with the rest ultimately stored in reservoirs in the Denver area.



Experts say the plan is reminiscent of those proposed in the middle of the last century, when grand and exorbitant federal water projects were commonplace – and not, with the benefit of hindsight, always advisable. The fact that the Missouri River pipeline idea made the final draft, water experts say, shows how serious the problem has become for the states of the Colorado River basin. "I pooh-poohed this kind of stuff back in the 1960s," said Chuck Howe, a water policy expert and emeritus professor of economics at the University of Colorado, Boulder. "But it's no longer totally unrealistic. Currently, one can say 'It's worth a careful look.' "

The pipeline would provide the Colorado River basin with 600,000 acre-feet of water annually (currently being pumped to Denver), which could serve roughly a million single-family homes. But the loss of so much water from the Missouri and Mississippi River systems, which require flows high enough to sustain towboat navigation, would most likely face strong political opposition. "If this gets any traction at all, people in the flyover states of the Missouri River basin probably will scream," said Burke W. Griggs, with the counsel for the Kansas

Agriculture Department's division of water resources. But, he added, the proposal "shows you the degree to which water-short entities in the Colorado River basin are willing to go to get water" from elsewhere, rather than fight each other over dwindling supplies, as they have intermittently for about a century.

The new report addresses the adequacy of water supplies over the next 50 years in the Colorado River basin, which includes the central and southern Rocky Mountains, the deserts of the Southwest and Southern California. The study, the officials said, will serve as a road map for future federal action in collaboration with the Colorado River basin states. As far as future water supplies go, the outlook is not good. The effects of climate change could result in less precipitation over the Rockies, further stressing the supply. Existing agreements among the states that depend on the river oblige those in the upper basin (including CO, UT and WY) to provide a specified amount of flow downstream. The fear, Professor Howe said, is that there will not be enough Colorado River water for all, and that downstream states like AZ and CA will nonetheless call for their usual deliveries from the upstream states, renewing old water wars. To avert that, new sources of supply or a sharp reduction in demand would be required.

Rose Davis, a BOR spokeswoman, said that during the course of the study, the analysis done on climate change and historical data led the agency "to an acknowledged gap" between future demand and future supply as early as the middle of this century. That is when they put out a call for broader thinking to solve the water problem. "When we did have that wake-up call, we threw open the doors and said, 'Bring it on,' " she said. "Nothing is too silly." Jason Bane of *Western Resource Advocates*, a conservation organization based in Boulder, CO, described the Missouri pipeline option as "fundamentally 20th-century water-policy thinking that doesn't work in the 21st century." He added, "We clearly need to conserve and be more efficient with the water we have."

It is unclear how much such a pipeline project would cost, though estimates run into the billions of dollars. That does not include the cost of the new electric power that would be needed (along with the construction of new generating capacity) to pump the water uphill from Leavenworth, KS, to the front range reservoirs serving Denver, about a mile above sea level, according to Sharlene Leurig, an expert on water-project financing at *Ceres*, a nonprofit group based in Boston that works with investors to promote sustainability.

If the Denver area had this new source of water to draw on, it could reduce the supplies that come from the Colorado River basin on the other side of the Continental Divide. But Griggs and some federal officials said that the approval of such a huge water project remained highly unlikely. Leurig noted that local taxpayers and utility customers would be shouldering most of the expense of such a venture through their tax and water bills, which would make conservation a more palatable alternative.

Sources: Felicity Barringer, *New York Times*, 12/9/12; and *Greenwire*, 12/10/12 BACK TO TOP

Mississippi River Caucus

After organizing lawmakers to promote Mississippi River interests when last year's drought lowered water levels, Sens. Tom Harken (D/IA) and Roy Blunt (R/MO) launched a bipartisan Mississippi River caucus in early February aimed at keeping the world's largest navigable inland waterway in front of Congress. The caucus will focus on flood mitigation, the promotion of commerce and addressing other concerns of river communities, the lawmakers said in a statement. "The Mississippi River is a vital artery of commerce for hundreds of millions of tons of agriculture goods and other products that are important to our national economy," Blunt said.

Mississippi River water levels dipped to near record lows for months last year, threatening to halt shipping and causing an uproar in the barge industry and among farmers and coal companies that rely on it. The situation sparked a small water war, as shippers called for the U.S. Army Corps of Engineers (Corps) to release water from reservoirs along the upper Missouri River, while Montana Sens. Max Baucus (D) and Jon Tester (D) staunchly opposed such a move, arguing that it put agricultural and recreational interests in their state at risk. Ultimately, the Corps decided against such a release. The immediate crisis on the Mississippi appears to have now passed, as a result of fast-tracked rock-blasting operations which added 2 feet of water depth near Thebes, IL, a key chokepoint. But at an Environment and Public Works Committee hearing in early February, Baucus said he will continue to fight for his state. "I spent years on this committee fighting attempts to drain Montana's economy to float barges downstream," Baucus said.

Source: Annie Snider, *E&E Daily*, 2/8/13 BACK TO TOP

French Broad River Dairy Waste Spill

A Fletcher, NC, dairy farm with a history of environmental violations was found to be dumping raw animal waste into a popular section of the French Broad River in what was termed a major spill. State Division of Water Quality (DWQ) inspectors found waste entering the river from the *Taproot Dairy Farm* waste pond at a rate of about 11,000 gallons an hour. *French Broad Riverkeeper* Hartwell Carson said he informed state inspectors after learning of the spill from fishermen. That affected section of the river is

popular among fishermen and boaters, he said.

The waste resulted in high fecal coliform bacteria levels in the river nearby, said DWQ regional supervisor Landon Davidson. It was difficult to judge the impact on fish and other aquatic life near the spill, but the level of bacteria in the water was high enough to cause illness in humans if ingested, he said. "That's a pretty high volume for a one-hour period," Davidson said. "We don't know the duration. It's unusual to have a direct discharge of this amount. It's the worst one I've seen, and I've been here since 2000," he said.

Inspectors, working with the farm's owner, Billy Johnston, were able to quickly stop the spill, Davidson said. Workers at the farm added soil to the bank of the pond where waste was running over, and workers drained some of the liquid from the pond. From the storage pond, the waste drained into a nearby dry creek bed, then flowed about 300 yards to the river, Davidson said. He said his office "likely would recommend penalties" against *Taproot* that could include fines and require the owner to take corrective measures. Davidson said he could not be any more specific about potential penalties until the investigation is completed.

Taproot Dairy Farm waste pond overflowing into the French Broad River, NC - Asheville Citizen-Times Photo.

The DWQ has cited *Taproot Dairy* for a range of violations each year from 2006 through 2010, but the farm so far has not been assessed any penalties, Davidson said. Some of the violations included failure by the owner to maintain required operator certification, failure to provide records, failure to renew required permits and failure to collect soil and waste analyses. The farm also was cited in 2007 and 2008 for allowing silage leachate to leak into a wetland area beside the river. Such runoff can rob water of dissolved oxygen, which can harm aquatic life.

"We're really disappointed in the dairy," Davidson said. "Their permit requires them to actively manage the ponds and measure the amount of waste. This overtopping was very easy to see. People were actively working there," he said. Carson, of the *Western North Carolina Alliance*, said the recent dry weather makes the farm's owner more culpable. Typically, waste spills happen after heavy rain causes storage ponds to overflow their banks. "It wasn't after a big rain storm or anything," Carson said. He said his group has been searching for several months for a major source of pollution in an 8-mile stretch of the river that the DWQ added to its list of impaired waters in August because of persistently high levels of fecal coliform. *Taproot Dairy* is on that stretch of water. "We're hoping this is one of the main sources of that impairment," Carson said, noting that identification of the source can lead to improvements.

"The French Broad is such a highly recreated and fished river," Carson said. "I've heard of people getting sick in that section of the river, getting stomach bugs and that kind of thing." He lauded the fishermen who told him of the *Taproot* spill and urged other recreational users to keep their eyes peeled for sources of pollution. The French Broad lies on the very eastern edge of the Mississippi River Basin, flowing from North Carolina into Tennessee and becoming part of the Tennessee River sub basin.

Sources: Sabian Warren, *Asheville Citizen-Times*, 12/6/12; and *Greenwire*, 12/7/12 BACK TO TOP

Agricultural Runoff Reduction Efforts Fail to Improve Iowa's Lakes

Iowa's lakes continue to fill up with sediment from nearby farm fields, despite millions of dollars spent on programs to decrease nutrient and sediment runoff from agricultural land, a new study from Iowa State University researchers has found. The study, published in early January in the online scientific journal PLOS ONE, examined 32 lakes in Iowa and found that sediment accumulation rates have "increased exponentially" since the region's agriculture intensified in the 1950s. Cleaning up the lakes, the authors say, will require more than the conservation voluntary programs that have been pushed by both the U.S. Department of Agriculture (USDA) and the state of Iowa.

The results suggest "the need for new approaches to permit the coexistence of productive agriculture and healthy water," says the study, which was published the same day U.S. EPA called on Iowa to put in place a stricter regulatory regime to reduce nutrient and sediment pollution. In their study, the Iowa State researchers found that erosion was responsible for up to 75 percent of the sediment found deposited in the 32 lakes, and that the largest increases in accumulated sediment came after 1950. Eroded sediment reaching the lakes was filled with particulates and phosphorus, a common nutrient in agriculture, which has stimulated algae growth in many of the lakes, the researchers said. As algae decompose, they suck oxygen from the water, creating what are known as "dead zones" in which fish cannot survive.

Iowa is the nation's top corn- and soybean-producing state. According to the study, the land around all of the studied lakes was used primarily for agriculture. Some form of conservation practice was present in all of the watersheds. Since federal soil erosion

mitigation programs began in the 1930s, the government, through USDA's Natural Resources Conservation Service (NRCS), has spent $53 million on conservation programs in Iowa. Nationwide, the United States spends $5 billion a year to limit the runoff of soil and nutrients from farm fields, according to the study. Common erosion management practices include lining waterways with greenery and building terraces. "Soil erosion mitigation programs were created in response to excessive losses of soil from farmers' fields and water quality concerns," the study says. "Despite these efforts, however, sediment deposition downstream has not decelerated in one of the most intensive agricultural regions."

The Iowa State researchers' conclusions are similar to that of a report released in December by the *Environmental Working Group* (EWG), which found that 60 percent of monitored streams in Iowa had "poor" or "very poor" water quality between 2008 and 2012. The EWG's report found no evidence that water quality has improved at all since 1999 and called on Iowa to put in place a set of regulations targeted toward the state's 90,000 farmers. "I think the main message of the report is that we simply will not stem the tide of this nutrient pollution unless we begin to put a regulatory foundation in place," Craig Cox, EWG's senior vice president for agriculture and natural resources, said at the time. "That foundation ought to be smart and tailored in ways that work in an agricultural setting."

In November, the state of Iowa released a draft plan to combat nutrient pollution from both industrial facilities and agricultural lands that focuses on voluntary conservation efforts. Environmental groups have been critical of the plan, saying it would fall short of significantly improving the state's water quality. In a comment letter submitted in early January, EPA said it thought the plan was a "great start" but urged the state to put in place a stricter regulatory regime, including placing numeric limits on nutrient runoff. The agency has taken such action recently in the Chesapeake Bay region, setting a series of total maximum daily loads (TMDLs) for bay-area states.

Agricultural runoff in Iowa - Agriculture.com photo

Iowa's plan "does not reflect the EPA's current thinking about numeric criteria development and implementation," EPA Region 7 Administrator Karl Brooks wrote. "It is the EPA's point of view that numeric criteria are important tools for effective water quality management of nutrient pollution." EPA also said that Iowa should better target programs toward problem watersheds and address phosphorus that enters water bodies through erosion. The state's plan also lacks an effective way to measure nutrient reductions and a way to monitor progress, EPA wrote.

In a comment letter on the Iowa plan, *Iowa Farm Bureau Federation* President Craig Hill praised the voluntary nature of the plan. He blasted regulatory approaches like numeric limits, calling them "arbitrary" and the science behind them "flawed." Regulatory approaches like the limits, Hill said, "have not been effective at reducing nutrient impairments but have merely redefined the definition of pollution and labeled partners as 'polluters.'" Speaking in December about the plan, Adam Schneiders, supervisor of the Clean Water Act permitting program at the Iowa Department of Natural Resources, also panned EPA's TMDLs, saying that Iowa's plan was an attempt to take a "different approach" to cleaning up water quality. Numeric limits, Schneiders said during a webcast presentation, "can be very difficult to comply with and very costly to do."

On February 15, the USDA said it would provide $59 million for projects aimed at improving water quality in the Mississippi River Basin. USDA NRCS will administer funding through the *Mississippi River Basin Healthy Watersheds Initiative*, a program in its fourth year that seeks to strengthen the water quality in 640 small watersheds in 13 states. NRCS works with farmers and ranchers on voluntary conservation measures, including managing nutrients, rotating crops, planting cover crops and managing agricultural residues. "The Mississippi River basin is an example of how voluntary conservation practices in small watersheds can help improve a larger system," USDA Secretary (and former Iowa Governor) Tom Vilsack said in a statement. "This initiative provides an opportunity for farmers and ranchers to voluntarily do their part and get recognized for it," he said.

Meanwhile, the *Soil and Water Conservation Society* (SWCS) and the Iowa Chapter of SWCS are among 14 co-sponsors of a new, online educational video series that shows how conservation practices remove nitrates from water. The *Missouri & Mississippi Divide Resource Conservation & Development, Inc*., based in west central Iowa, produced the four new water conservation videos in a series titled "*Nabbing Nitrates–Before Water Leaves the Farm*." Offered in both English and Spanish, the short videos entitled, (1) *Water Conservation Drainage*, (2) *Riparian Forest Buffers*, (3) *Working Wetlands* and (4) *Bioreactors*; include animations showing how wetlands and conservation practices remove nitrates from surface and groundwater: The series was produced with a Conservation Innovation Grant awarded by the USDA NRCS.

Sources: *Nonpoint Source News Notes*, January 2013, #93; *www.mmdividercd.org/projects.asp*; Amanda Peterka, *Greenwire*, 1/11/13; Amanda Peterka, *E&ENews PM*, 2/15/13 and *Greenwire*, 12/11/12 BACK TO TOP

Planting Corn Acres With Biofuel Crops Reduces Runoff

Planting biofuel crops such as switchgrass and miscanthus can greatly reduce the amount of nitrogen that escapes the soil in fields otherwise planted with traditional row crops like corn and soybeans, according to a new study. The study, a four-year undertaking led by researchers at the University of Illinois at Urbana-Champaign, implies that biofuel crops could help lessen the dead zone in the Gulf of Mexico that forms each year due to runoff of excess nutrients in the Mississippi River watershed. "Intensive corn production with large fertilizer inputs leads to large losses of nitrogen into the environment, both through gas emissions of nitrous oxide and leaching of nitrate to surface waters through tile drainage systems," Mark David, one of the study's authors and a biochemist at the University of Illinois, said in a statement. "The hypoxic zone that forms each summer in the Gulf of Mexico is a result of nitrate leaching from the tile-drained Corn Belt of the Midwestern U.S. – a likely location for biofuel production," he said.
In 2008, the authors planted research plots of miscanthus, switchgrass and restored mixed prairie at the University of Illinois Energy Farm and compared them to a plot with a traditional corn-corn-soybean rotation. The plots were managed to replicate the practices at a typical farm in central Illinois, an area of extensive row-crop agriculture. Throughout the following four years, the authors measured several indicators of nitrogen use and runoff, including soil nitrogen mineralization, nitrate leaching, drainage flow and nitrate concentrations. Emissions of nitrous oxide, a greenhouse gas (GHG) that is released into the air through the use of nitrogen fertilizer, were also measured.

"Our results clearly demonstrate that environmental [nitrogen losses] from row-crop agriculture can be greatly reduced after establishment of perennial biofuel crops," the authors wrote. "Nitrate leaching and [nitrous oxide] emissions were much less in miscanthus, switchgrass or prairie compared with corn and soybeans. ... Perennial grasses efficiently recycle nutrients by removing them from the above ground biomass," the report says. Further, the yields of the biofuel crops, which have longer growing seasons than row crops, greatly surpassed those of the corn-corn-soybean rotation. The overall amount of nitrogen in the soil increased for the corn-soybean and switchgrass plots, which were all given fertilizer, but not for the plots of prairie grass and miscanthus.

The study thus shows that planting advanced biofuel feedstocks can help alleviate some of the concerns raised about corn ethanol, including GHG and sustainability issues arising from land-use changes, the authors wrote. The biofuel crops can also help mitigate the dead zone in the Gulf of Mexico, an area where excessive nitrogen and phosphorus have caused algae blooms to grow. "Incentivizing the reduction of agricultural nitrogen losses through the use of perennial grasses as biofuel feedstocks could have major environmental benefits for water and air quality," the authors conclude. More research is needed, though, because of the variation among species of biofuel crops and the geographies in which they are planted, the study says.

Source: Amanda Peterka, *Greenwire*, 1/14/13 BACK TO TOP

Small Trees Are Important to Keeping Waterways Healthy

Nitrate concentrations in waterways can soar by as much as 400 percent when the nitrogen cycle is disrupted by logging and the nitrate once tied up in organic matter washes into streams. Algal blooms and fish die-offs almost always follow this sort of nitrogen fertilization event. Scientists studying the mountain pine beetle epidemic in the West, which now stretches from Mexico to Canada, have worried for a long time that all of those dead trees would mean serious trouble for local water quality as well. But a team of researchers led by William Lewis, University of Colorado at Boulder, found that despite the ravaged appearance of forests in Colorado, where 80 to 90 percent of the canopy in many watersheds is gone, streams and lakes are remarkably healthy. The small trees and understory vegetation that the pine beetles mostly leave alone appear to be compensating for the loss of mature trees by drastically increasing their uptake of nitrate. The results were published online in late January in the *Proceedings of the National Academy of Sciences*.

Pine beetles prefer to infest the largest trees in the forest, seeking out a bigger living space and also greater insulation during the winter, when their population can plummet with the temperature. Dr. Lewis explained that "in an intact forest, smaller trees aren't taking up nitrate nearly as fast as they can." "They have to compete with the larger trees for this nutrient. But when the big trees are gone, the little trees are sort of released from certain growth restraints imposed by the older trees," he said. "With so much nitrate available in the forest they start growing faster. What's shocking is that the understory can completely compensate, at least in Colorado, for the loss of the big trees."

Dr. Lewis and his team are still in the process of analyzing data for organic carbon, phosphorus and major dissolved solids like calcium and magnesium. Dr. Lewis suggests that their research carries lessons for tree harvesting and forestry management. "It shows just how important it is to protect the understory," he said. "Even a heavily logged area can serve a really vital ecological function if about half of the understory vegetation can be left intact," he said.

Sources: Joanna Foster, *New York Time*s, 1/18/13; and *Greenwire*, 1/21/13 BACK TO TOP

Causes, Prevention and Mitigation of Harmful Algal Blooms

Harmful algal blooms (HABs) have historically been strongly correlated with excessive levels of nutrients in water bodies with low turbidity. Point sources, such as discharges from sewage treatment plants and confined animal feeding operations, and non-point sources such as diffuse runoff from agricultural fields, roads and stormwater may be high in nitrogen and phosphorus and can promote or cause excessive fertilization (eutrophication) of both flowing and non-flowing waters. In addition, climatic changes, including variation in rainfall patterns, flood and drought frequencies, dust storms, tropical storms, and the intensity of hurricanes, have impacted nutrient cycling in freshwater bodies and may support cyanobacterial and algal communities which can lead to HAB development.
Cyanobacteria are generally present, but not necessarily dominant, in freshwater bodies in the U.S. However, there is widespread agreement within the scientific community that the incidence of cyanobacterial Harmful Algal Blooms (CyanoHABs) is increasing both in the U.S. and worldwide. According to a new EPA web page, "*Cyanobacterial Harmful Algal Blooms*" this increase is attributed to increasing anthropogenic activities and their interaction with a suite of physical, chemical and biological factors such as competition and grazing. Some physical factors include the availability of light, meteorological conditions, alteration of water flow, vertical mixing and temperature. Chemical factors include pH changes, nutrient loading (principally in various forms of nitrogen and phosphorus) and trace metals.

As a result of the interplay of these factors, there may be large temporal fluctuations in the levels of cyanobacteria and their toxins in predominating species. The ratio of nitrogen to phosphorus, organic matter availability, temperature, and light attenuation among others, likely play an interactive role in determining corresponding HAB composition and toxin production. Fresh waters that are high in phosphorus but low in nitrogen are typically dominated by toxic nitrogen fixing genera (e.g., *Anabaena*, *Aphanizomenon*, *Nodularia* and *Cylindrospermopsis*). Such "biological nitrogen fixation" results in the production of ammonia, an important process in the global nitrogen cycle. On the other hand, surface waters that are high in nitrogen are dominated by toxic blooms of non-nitrogen fixing genera (*Microcystis*, *Lyngbya*, and *Planktothrix*).

Preventative measures are the preferred approach to managing the occurrence of cyanoHABs. The most effective preventative measures are those that seek to control the anthropogenic influences that promote blooms such as the leaching and runoff of excess nutrients. Management practices for nutrients, specifically nitrogen and phosphorus, should have the goal of reducing loadings from both point and nonpoint sources. Devices that result in the mixing of lakes (for example, by air bubbling), enhance vertical mixing of the phytoplankton, which minimizes the formation of surface blooms of buoyant cyanobacteria. Also, increasing the water flow through lakes or estuaries reduces water residence time and inhibits cyanobacteria blooms. However, these efforts can be expensive and are best suited to small affected water bodies.

Another effective but expensive management practice for small watersheds is the application of compounds to chemically-precipitate phosphorus, followed by removal of the sediment by dredging. Adding alum, ferric salts or clay products effectively settles the phosphorus to the sediment layer reducing concentrations and the potential for bloom formation. Suction dredging of the top half meter of sediments removes nutrients and prevents bloom formation. Repeated dredging at intervals of several years may be necessary to prevent the re-release of phosphorus. Monitoring phosphorus concentrations is recommended to evaluate if dredging is needed. Effective treatment requires careful design and understanding of the sediment chemistry and hydrology of the water to be treated.

Mitigation (or remedial) measures can be employed once blooms have already occurred to control the phytoplankton blooming rate and to remove blooms. Remedial measures include the physical removal of surface scums and the application of algaecides and other chemicals (e.g. copper sulfate and lime) to control blooms. The precipitation of algal blooms with lime does not appear to cause cell lysis and toxin release into the water. However, application rates are high and, therefore, are recommended only for small lakes. Treatment of algal blooms with copper sulfate leads to cell breaking and a substantial release of cyanotoxins into the water, greatly increasing the risk of toxin contamination and treatment costs. Copper may also be toxic to other aquatic wildlife in the lake. Algaecides also lead to cell breaking and should be applied when cell numbers are low to avoid excessive toxin contamination following rupture of the cells. Algaecides application in drinking water reservoirs may require monitoring since conventional drinking water treatment processes are not very effective in removing toxins released in water after cell breaking.

Biological mitigation measures include different approaches to change the aquatic food web to increase grazing pressure on cyanobacteria by introduction of functionally competitive species (e.g., diatoms). Competition and grazing can affect the net growth rates of algae in water but the effectiveness in reducing harmful algae depends on the population density of the harmful algae and nutrients concentrations. In some cases, grazing may increase nutrient regeneration affecting the availability of some nutrient forms for the algae to consume. For many HAB species, the toxicity increases when they are grown under nutrient-unbalanced conditions. Although competition and grazing have been studied for a long time, there are still important gaps, in particular, understanding the grazing of phytoplankton with different nutritional status.

All the technologies have their own advantages and limitations. Choosing the most efficient, safest, and cost-effective approach

should be done on case-by-case basis. EPA's Office of Water recently posted a short video, available on EPA's YouTube channel at: www.youtube.com/watch?v=WaIrLFq3DGI, that highlights how an algal bloom can impact the public's recreational use of a water body. A second video, at: www.youtube.com/ watch?v=vCicSNnKUvM, provides a general overview of nutrient pollution and its many sources.

Sources: *Nonpoint Source News Notes*, January 2013, #93; and http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/cyanohabs.cfm

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New Technology Could Reduce Cost of Treating Mine, Municipal and Farm Waste

The U.S. Geological Survey (USGS) has discovered novel water treatment technology that could help reduce the cost and difficulty of cleaning up several problem wastes. Researchers were successful in using leftover sludge from treating acidic water coming out of abandoned mines – known as acid mine drainage or AMD – to remove phosphorous from agricultural and municipal wastes. The findings could have significant implications for resolving a series of persistent environmental issues. "As environmental scientists, we kind of hesitate to use this analogy, but it really is like killing two birds with one stone," said USGS researcher Philip Sibrell, lead author of the study published in 2012 in the journal *Water, Air and Soil Pollution*. Sibrell called the water treatment system a "win-win situation." USGS Director Marcia McNutt, speaking about the success of tests, said, "This wonderful result shows the inventive application of some very sophisticated environmental chemistry to create a new life cycle for what otherwise would have been some problematic waste products."

Dry AMD sludge used for phosphorous removal from wastewater - Philip Sibrell, USGS Photo.

AMD pollutes thousands of streams, particularly in coal-producing Appalachian states. Phosphorous-rich municipal and farm wastewater contributes to aquatic "dead zones." The problem is compounded for vulnerable bodies of water like the Chesapeake Bay, which is affected by both phosphorous and AMD. Current phosphorous removal methods using aluminum or iron salts can be expensive. Also costly is getting rid of iron-rich sludge from treated AMD. The new system can reduce the price of both, and the output can be sold for use as a fertilizer. "With our system you can really recover and recycle the phosphorous," Sibrell said in an interview, noting that other methods don't recover the material as well if at all. "So that stuff can be recycled into a fertilizer," he added. The phosphorous issue is important in itself. Not only is it in increasingly short supply and high demand, but litigation and environmental concerns have made domestic mining more difficult, especially in phosphate-rich Florida.

Sibrell said he started working on the issue in 1998 with research into acid mine drainage treatment alternatives. "One of my tasks during that was trying to figure out what to do with the sludge," he said. Over the years, studies showed that dried AMD sludge wouldn't turn back into mud when helping treat phosphorous-rich water. Sibrell said, "It wasn't until a few years later that we found out it could retain its shape." Not only does it retain its shape, but the dried AMD can be used through several cycles of wastewater phosphorous removal. And when no longer effective, it could be "loaded up" with phosphorous and used as a soil additive. "Tests have shown that plants can access that phosphorous," Sibrell said.

Using AMD for phosphorous removal is not yet ready for large-scale operations. "We're not ready to treat New York City's effluent," Sibrell said. But having used sludge from the *Blue Valley Mine Drainage Treatment and Fish Culture Station* in Brady Camp, PA, to remove phosphorous from different waters, USGS knows it can process about 10,000 gallons per day. "These results indicate that fixed bed sorption of [phosphorous] would be a feasible option for the utilization of AMD residues, thus helping to decrease AMD treatment costs while at the same time ameliorating the impacts of [phosphorous] contamination," the paper said.

Source: Manuel Quinones, *Greenwire*, 12/21/12

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Antibiotic Used in Soaps and Cosmetics Tainting MN Lakes/Rivers

An antibacterial widely used in soaps and cosmetics that mostly goes down the drain is slowly converting to toxins at the bottom of many of Minnesota's lakes and rivers a new study shows. The research, posted online in mid-January in the journal *Environmental Science and Technology*, was conducted by scientists at the University of Minnesota and the Science Museum of Minnesota. Researchers analyzed sediments in eight Minnesota lakes and rivers used by municipal wastewater treatment plants. Findings revealed that amounts of the antibacterial *triclosan* and the toxins it forms have been steadily increasing in the sediments since the material was first used in *Dial* soap in the 1960s. This is the first study to show how pervasive the contaminant has become in tiny lakes and giant rivers, and that the same is likely true across the country. "This really shows the magnitude of change," said Bill Arnold, a University

of Minnesota civil engineering professor, and the study's leading author. Researchers found that while other types of dioxins have declined, the four created by *triclosan* are rising and are now a primary source. "We know that, since 1965, *triclosan* is the major source of dioxins in all these lakes," he said. Water treatment removes most of the *triclosan*, but when the little that remains is exposed to chlorine and sunlight, it can become a toxin.

Arnold and Dan Engstrom, director of the Science Museum's St. Croix Watershed Research Station and a co-author of the study, analyzed layers of sediment, building a toxic timeline for each lake and river going back decades. An eighth lake, in northern Minnesota, with no connection to wastewater treatment or industry was used as a comparison. No *triclosan* or its toxins were found there. The other seven water bodies all had some of the toxins, even 9 miles from shore in Lake Superior, Arnold said. The small lakes, such as Lake Winona in Alexandria, had concentrations of *triclosan* toxins that rose steadily over time and now make up 60 percent of all the dioxins in the sediment. In larger bodies, such as the Mississippi River's Lake Pepin and the Duluth Harbor, concentrations were lower, but also increased over time. In Lake Pepin, for example, there were no *triclosan* toxins in 1960, but now they account for 25 percent of the lake's contaminants.

Engstrom said the findings indicate that the same is likely true for most of the rivers and lakes that receive chlorine-treated wastewater nationwide. "Seventy-five percent of wastewater treatment facilities use chlorination," he said. "It's really quite effective, but it does have some unintended consequences." What's less clear at this point, the researchers said, is the effect on aquatic life. Some studies have shown that *triclosan* can interfere with the ability of algae to use light. It's also been shown to disrupt the thyroid hormone in frogs and rats, and studies have shown that it alters sex hormones in animals. The industry, however, disputes those findings. Companies that use it in consumer products, including everything from soft soap to deodorant, say that it has a long track record of safe, effective use. Millions of people rely on it as part of their daily hygiene, and there is no evidence of harm in the environment, the *American Cleaning Institute* says. Still, some companies, including *Johnson & Johnson*, are phasing it out, and the Minnesota Department of Health recommends consumers avoid it. Most products that contain *triclosan* say so on the ingredient list.

In recent years, concerns about *triclosan*'s potential effects on human health, the rise of antibacterial-resistant germs, and its toxic effect on the environment have prompted new federal regulatory scrutiny that is now underway. The Food and Drug Administration (FDA) said that there is not enough evidence to recommend limiting its use, but that it is studying its health effects. The U.S. EPA is also investigating whether exposure to chlorine in the wastewater treatment process transforms *triclosan* into compounds called dioxins that can accumulate in the natural food chain, causing cancer, deformities and other problems in fish, frogs and other animals. The Canadian government last year announced its intent to ban *triclosan* from consumer products because, while safe for human use, it's potentially harmful in the environment. Environmental and consumer safety groups are pressuring the federal government to outlaw it's use in the U.S., if only because the FDA has found that the material provides little benefit. Other than in toothpaste as a deterrent for gingivitis, it's no better than plain soap and water in combatting germs, the agency found. "The point is, this is one of those things we don't need," said Engstrom. "We have a substance that, by and large, was a marketing ploy."

Sources: Josephine Marcotty, *Minneapolis Star Tribune*, 1/21/13; and *Greenwire*, 1/22/13 BACK TO TOP

Traces of Pharmaceuticals in Water Change Fish Behavior

Fish living in waters tainted by traces of drugs intended for human use exhibit unusual behaviors according to a study published in mid-February online in the journal *Science*. The findings add to the mounting evidence that minuscule amounts of medicines in rivers and streams can alter the biology and behavior of fish and other aquatic organisms. "I think people are starting to understand that pharmaceuticals are environmental contaminants," said Dana Kolpin, a researcher for the U.S. Geological Survey who is familiar with the study.

The Swedish researchers who conducted the study suspect that smaller drugged fish could become easier targets for bigger fish because they are more likely to venture alone into unfamiliar places. The research team at Umea University used minute concentrations – 2 parts per billion (ppb) of the antianxiety drug *oxazepam*, similar to concentrations found in real waters. The drug belongs to a widely used class of medicines known as *benzodiazepines* that includes *Valium* and *Librium*. The team put young wild European perch into an aquarium, exposed them to these highly diluted drugs and then carefully measured feeding, schooling, movement and hiding behavior. They found that drug-exposed fish moved more, fed more aggressively, hid less and tended to school less than unexposed fish.

"We know that in a predator-prey relation, increased boldness and activity combined with decreased sociality ... means you're going to be somebody's lunch quite soon," said Gregory Moller, a toxicologist at the University of Idaho and Washington State University. Researchers around the world have been taking a close look at the effects of pharmaceuticals in extremely low concentrations, measured in ppb. Such drugs have turned up in waterways in the U.S., Europe and elsewhere over the past decade. They come mostly from humans and farm animals; the drugs pass through their bodies in unmetabolized form. These drug traces are then piped to water treatment plants, which are not designed to remove them from the cleaned water that flows back into streams and rivers. It is not clear

exactly how long-term drug exposure, beyond the seven days in this study, would affect real fish in real rivers and streams.

Sources: *AP/San Francisco Chronicle*, 2/14/13; and *Greenwire*, 2/15/13 BACK TO TOP

Pesticide Raises Parkinson's Risk by 200%

Exposure to a pesticide used in farming berries, nuts and other crops increases a person's risk of developing Parkinson's disease by 200 percent, according to a study published recently in the *Proceedings of the National Academy of Sciences*. Researchers at UCLA linked the chemical *Benomyl* to the degenerative neurological disorder, which is second only to Alzheimer's disease in its prevalence. The study found the pesticide kills brain dopamine cells. Loss of that neurotransmitter is believed to cause changes in motor skills and other symptoms seen in Parkinson's disease. *Benomyl* maker *Dupont* pulled the pesticide from the market in 2001 amid toxicology concerns, U.S. EPA said.

The UCLA research looked at *Benomyl* at three levels. It studied how the chemical affected neuron cells in a petri dish and how it affected zebrafish. Scientists also looked at rates of Parkinson's disease in 360 people who lived within 50 meters of where the pesticide was used and 754 people without any known contact. There was a twofold increase in risk for those living where *Benomyl* was sprayed, the research found. The study relied on a database for chemical use kept by the California Department of Pesticide Regulation. Since 1974, it has mandated that companies applying chemicals in the state submit information on where, when and how much pesticide was distributed. Researchers evaluated the more than 1,000 people in the study by levels of *Benomyl* exposure. For those in the top quartile, the risk of developing the disease jumped 200 percent above those who didn't live near where *Benomyl* was sprayed. For people with pesticide exposure above the median level, the risk increased 67 percent, Arthur Fitzmaurice, a postdoctoral scholar at UCLA who worked on the research said. *Benomyl* was used significantly in California's Central Valley for three decades, he said. Many of the people in UCLA's Parkinson's study group lived in that region.

The UCLA study's findings demonstrate that interaction with chemicals can produce effects years later, Fitzmaurice said. "These have long-lasting effects to the neurology that were just never even considered in the original toxicology screening," he said. When EPA canceled *Benomyl's* registration, Fitzmaurice said, there were worries that the pesticide increased cancer risk. "Even so," he added, "the exposures that had been done were significant enough to result in a higher occurrence of Parkinson's even 10 years after it had been sprayed." UCLA researchers began looking at *Benomyl* as one of six chemicals suspected to interfere with the body's process of breaking down misfolded proteins in the brain before they form clumps. But researchers found that *Benomyl* at lower concentrations was interfering with another brain process. Exposure to the chemical appeared to inhibit the activity of aldehyde dehydrogenase (ALDH), an enzyme that normally acts to break down dihydroxyphenylacetaldehyde (DOPAL), a toxic dopamine metabolite. "When the pesticide comes in and interferes with that, you get a buildup of DOPAL," Fitzmaurice said. Accumulated DOPAL can damage proteins and kill neurons, he said.

In the study, researchers exposed dopamine cells in a petri dish to *Benomyl*. At a level of about 1 micromolar of the chemical, about half the cells were dying. They also saw an accumulation of toxic DOPAL. They then studied zebrafish, which are transparent in embryo form. Researchers labeled neurons with a green fluorescent protein and exposed the fish to 1 micromolar of the pesticide. The amount of the florescent marker dropped, showing a loss of dopamine cells, Fitzmaurice said. They also saw reduced swimming activity. "Two weeks later the fish swims more slowly if it's exposed to *Benomyl*," Fitzmaurice said. It is noteworthy that the same effect was seen in both the petri dish and the zebrafish model, he said. In analyzing risk to people, the study screened for those who had been exposed to Benomyl over a 25-year period ending in 1999, then looked for how many had been diagnosed with Parkinson's after that period. Anyone who had developed the disease before 1999 wasn't included "so that we're certain of the individual's exposure history over a long period of time prior to developing Parkinson's," Fitzmaurice said. "We're as confident as possible that it is a real effect," he said.

UCLA researchers now are examining whether any legal pesticides cause some of the same effects of *Benomyl*. They plan to publish research on those chemicals in the coming months, he said. "This might have implications for pesticides that are currently in use that interfere with the same [brain] process," Fitzmaurice said. The studies are part of an ongoing effort at UCLA to find potential causes of Parkinson's disease. The push already has tied other chemicals to the disorder. In April 2009, the school released research showing that for people exposed to pesticides *Maneb* and *Paraquat*, the chance of developing the condition spiked 75 percent. Earlier research at UCLA and the *Parkinson's Institute* made similar findings. An investigation by the *National Institutes of Health* in 2011 linked the industrial solvent *trichloroethylene* (TCE) and the chemical *perchloroethylene* (PERC) to a higher chance of Parkinson's disease.

However, trade group *Croplife America* said there is no proof pesticides raise the risk for Parkinson's disease. "*CropLife America* (CLA) understands that Parkinson's disease is a devastating illness and encourages research into the disease. CLA agrees with the authors of a new paper ... that a combination of factors may contribute to the occurrence of Parkinson's disease, including genetics and additional environmental factors," said Clare Thorp, the group's senior director of human health policy. "However, there is no consistent evidence of any association between pesticide exposure and Parkinson's disease and no known direct cause of Parkinson's

disease," Thorp said. "As pesticides undergo extensive testing before initial registration, and on a continual basis with every subsequent review, the latest science is used to better understand any potential impact of a product. CLA member companies are proactive in addressing testing requirements," Thorp said.

Sources: Anne C. Mulkern, *Greenwire*, 1/7/13; *Greenwire*, 11/11/11 BACK TO TOP

White River Watershed Designated as National Blueway

The White River watershed, which flows 722 miles from its headwaters in Missouri through Arkansas to the Mississippi River, was named in early January as the nation's second *National Blueway*. Rivers so designated are chosen because they are nationally significant and highly valued for their recreational, economic, cultural and ecological assets. The designation "recognizes that strong, diverse partnerships are the best way to address the modern-day threats to our nation's most important rivers, and the White River is an outstanding example of that approach," Deputy Secretary of the Interior (DOI) David J. Hayes said during a ceremony in Little Rock. "Your watershed sings when it comes to the elements of partnering, the concerted efforts of stakeholders of all kinds," he said.

The watershed, which includes the White River and all of its tributaries in Arkansas and Missouri includes about 18 million acres within 60 counties. About 1.2 million people live in the area, which is an important wintering spot for mallard ducks. Hayes said 26 separate groups, ranging from the *National Wildlife Refuge Association*, the *Arkansas Canoe Club* and *Ducks Unlimited* to the *Arkansas Natural Heritage Commission* and the cities of Augusta and Clarendon, nominated the watershed for the designation. "Scores of communities rely on the economic benefits this river provides," he said. "Tourism, agriculture, recreation – the economic impact and the importance of this system cannot be underestimated."

The *National Blueway* designation does not establish a new protective status with regulations. Hayes said it is simply intended to recognize and support existing local and regional conservation, recreation and restoration efforts by coordinating local, state and federal activities. Ann Mills, deputy undersecretary of U.S. Department of Agriculture announced at the event that her agency would appropriate $22 million to soil and water conservation in counties located within the White River watershed. "These new resources will make a real difference on the ground for the people of Arkansas and Missouri," she said, adding that $13 million will go directly to those hit hard by last year's drought.

Hayes also told the crowd of more than 100 that the U.S. Fish and Wildlife Service (Service) has agreed to expand the land acquisition boundary of the Cache River (a tributary to the White River) National Wildlife Refuge by more than 100,000 acres. "By extending this boundary, the Service will be able to work with more willing landowners to help protect and restore more of the Cache River flood plain and it will establish a wildlife corridor between the Cache River and the White River," he said. Terrence "Rock" Salt, principal deputy assistant secretary of the Army's civil works program, also told the crowd that the U.S. Army Corps of Engineers was moving forward with the Lower Cache River Basin Restoration Project, which will restore flows to areas cut off by flood control work and increase fish and wildlife habitat.

Meanwhile in Congress, the 63-member conservative *Western Caucus*, chaired by Sen. John Barrasso (R/WY) is blasting the *National Blueways* program and demanding withdrawal of Secretarial Order 3321 which created it. In a letter sent to DOI in February, the caucus members said, "Water is the lifeblood of our communities, and it should be managed for the benefit of the community in a transparent fashion. Any designation by a federal agency that directly or indirectly attempts to manage the non-navigable headwaters of many of our nation's rivers, would be a usurpation of state authority." But Jessica Kershaw, a DOI spokeswoman, said the program doesn't set up any new regulations or protective statuses. "It's meant to support local partnerships that are already existing," she said, noting that no funds are funneled through the program.

But Caucus spokeswoman Emily Hytha said, "It's the overall idea of the program and the federal government overtaking state authority and inserting themselves into what should be a state process. If they were navigable waters, that's a federal process, but non-navigable waters is under the state authority. This is a complete overreach. ... States' rights are important and should be respected by the federal government." Barrasso spokeswoman Laura Mengelkamp said, "Senator Barrasso is specifically concerned that the Yellowstone River watershed could be one of the areas designated as a *National Blueway.*" "The senator believes that this will lead to further efforts by the federal government to take control from Wyoming over the water within our state's boundaries," she said. The program came to the Caucus's attention in December 2012 when DOI officials said the Yellowstone River could be a good fit for designation under the program. The *National Blueways System* was established in May 2012. The Connecticut River and its watershed, which flows from Canada to the Atlantic, was designated the first *National Blueway* last year by Interior Secretary Ken Salazar.

Sources: Rob Moritz, *Arkansas News*, 1/9/13; and David Casaletto, *Ozark Waters*, Vol. VII, Issue 2, 1/14/13; and Michelle Merlin, *Greenwire*, 2/15/13 BACK TO TOP

The Value of Public Lands

The West's abundance of public land open to fishing, hiking and skiing is a big part of the region's significant job growth as other areas struggle to attract top employees, according to a study released in late November by an independent research group. The report, "*West Is Best: Protected Lands Promote Jobs and Higher Incomes*," notes a correlation between public lands and job growth. From 1970 to 2010, employment in the West increased by 152 percent, compared with 78 percent for the rest of the country, says the report by *Headwaters Economics* of Bozeman, MT. Almost all that growth was in service industries – health care, real estate, high tech, finance and insurance.

Counties where federal property makes up at least 30 percent of the land base saw the greatest gains, the report found. Those counties – which have national parks, monuments, wilderness areas and other high-value public lands – saw a 345 percent increase in jobs over the past 40 years. In contrast, similar counties with no protected federal lands increased employment by 83 percent, according to the report. "There's something unique happening in the West," *Headwaters Economics* Executive Director Ray Rasker said. "We have a unique competitive advantage when it comes to public lands."

People living in counties with federal lands tend to make more money, too. In 2010, per-capita income in Western non-metropolitan counties with 100,000 acres of protected public lands was $4,360 higher on average than income in similar counties that do not have such lands, according to the report. "A high-quality outdoor environment along with a culture of innovation gives the West a unique competitive advantage that helps explain why the region's economy is the fastest-growing in the country," the report says. "As the structure of the U.S. economy and new growth opportunities have shifted to knowledge-based occupations and industries, the factors that determine the location of companies are shifting."

Also an overwhelming majority of Westerners believe public lands are essential to their state's economy and way of life, according to a public opinion poll released in early February. The "*State of the Rockies Conservation in the West*" poll surveyed 2,400 registered voters in CO, AZ, MT, NM, WY and UT. More than 90 percent of respondents agreed that protected public lands like national parks, forests, monuments and wildlife areas are an essential part of their state's economy. About three-quarters said these public lands help attract jobs to the region, and 71 percent opposed selling off public lands, even to pay down the national debt. A majority supported protecting public lands from oil and gas drilling – either strictly limiting development, or allowing drilling but permanently protecting environmentally sensitive areas important for recreation, wildlife and water resources.

The results were similar across party lines: 54 percent of Democrats and independents and 60 percent of Republicans surveyed supported allowing some drilling while protecting sensitive places. "In the face of 'drill, baby, drill,' the region is holding onto very core values," said Walt Hecox, an economist at Colorado College and director of the *State of the Rockies Project*. Colorado College conducted the bipartisan survey with Republican polling firm *Public Opinion Strategies* and Democratic firm *Fairbank, Maslin, Maullin, Metz & Associates*. The poll had a 2-point margin of error for data on all states and a 4.9-point margin of error for data on individual states. Last year's survey found that nearly two-thirds of respondents label themselves as conservationists regardless of their political affiliation.

The federal government manages 355 million acres in the West, or 46 percent of all land in the region. By contrast, the government manages 15 percent of the land in the rest of the country.

Sources: April Reese, *Greenwire*, 11/30/12; Laura Petersen, *E&E Daily*, 2/8/13; Laura Petersen, *Greenwire*, 2/7/13; and *E&E Daily*, 1/31/12

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Take Me Fishing Ad Campaign Bringing Newcomers to Sport

According to a U.S. Fish and Wildlife Service survey, fishing participation was reported up by 11 percent in 2012. Boating participation was reported up by 10 percent according to the *National Marine Manufacturers Association* (NMMA). Though many factors contribute to this increase, two recent studies published by the *Recreational Boating & Fishing Foundation* (RBFF) may shed some light on the influences.

The first study, which evaluates the *Take Me Fishing* integrated marketing ad campaign, found that the 2012 ad campaign, which invites individuals to get out and enjoy *Mother Nature's Waterpark*, has been maintaining strong brand awareness with current anglers, while also, drawing newcomers to the sport. The ad campaign, which was re-designed in 2012, was developed to specifically target not only

avid anglers, but also broader audiences such as families and individuals who enjoy the outdoors, but may not have tried fishing and boating yet. The latter group is referred to in this article as "family outdoors".

The ad campaign study revealed that the campaign scored a 76.6 out of 100 for its ability to influence readers' decisions to go fishing, an increase from last year. More than one-third (37 percent) of the avid angler and boater responders recalled the phrase "T*ake Me Fishing*," a strong response compared to industry average. More impressively, 31 percent of the family outdoor group also recalled "*Take Me Fishing*," up 13 percent over last year. "We are thrilled to know our marketing is inspiring new participants to get out on the water," said RBFF President and CEO Frank Peterson. "We as a Foundation certainly can't take full credit for the increase in overall fishing participation, but we feel confident our efforts are contributing in a big way."

The second study, *TakeMeFishing.org* web site effectiveness survey, conducted in November, echoed the influence that *Take Me Fishing* is having on bringing new individuals into the fishing and boating world. The study showed that 79 percent of the visitors to *TakeMeFishing.org* are within the family outdoors group. "The majority of newcomers to fishing and boating are women and children 12 and under as revealed in the *2012 Special Report on Boating and Fishing*," adds Peterson. "A typically male-dominated sport, fishing has now become a great way for families to squeeze in quality time with each other whenever and wherever they can."

Source: *News Waves*, RBFF, December 2012 BACK TO TOP

Climate Change Update

Last year was the warmest year ever recorded in the contiguous U.S., according to the National Oceanic and Atmospheric Administration (NOAA). The average temperature in the lower 48 states reached 55.3 ^{o}F, shattering the previous record set in 1998 by a full degree. Government records go back to 1895. It is still hard for scientists to tease out how much of the year's searing heat was caused by natural variability and how much was sparked by man-made climate change, NOAA climate scientist Jake Crouch said. Globally, 2012 appears to be the eighth-warmest year in a record that goes back to 1880, Crouch said. In addition to record warmth in the contiguous U.S., 2012 saw unusual heat blanket the Arctic, where sea ice cover melted to an annual low last summer, shattering the record set in 2007. Canada also experienced record-breaking summer temperatures, severe flooding on its western coast, and historically low river levels according to a new government report. "In addition to higher average temperatures, the year featured a winter that went missing," wrote Environment Canada senior climatologist David Phillips, in an analysis of the country's top weather stories. The Intergovernmental Panel on Climate Change (IPCC) warns that it is 90 percent certain that future heat waves will be longer and more severe.

President Obama prominently featured climate change – calling out skeptics and calling for America to lead a worldwide transition to new energy technologies – in his inaugural address on January 21. "We will respond to the threat of climate change, knowing that the failure to do so would betray our children and future generations," Obama said. "Some may still deny the overwhelming judgment of science, but none can avoid the devastating impact of raging fires, and crippling drought, and more powerful storms," Obama said. Fighting climate change isn't a choice, he said, but an obligation "to all posterity." And the way to fulfill that obligation, he said, is through the development of new, cleaner energy technologies. U.N. Secretary-General Ban Ki-moon also placed the issue among his top priorities for 2013 in an interview with the *Associated Press*. Ban aims to reach a decisive agreement on climate change this year. "I will do my best to mobilize the political will and resources so that the member states can agree to a new legally binding global agreement on climate change," he said.

The heads of five scientific societies in early February added their voices to those calling for President Obama to host a summit at the White House to explore ways to respond to climate change. The science community leaders said in their open letter to Obama that it should investigate "policies and actions that can be taken by each Federal agency and by state and local governments to address the causes and effects of climate change." The letter was signed by the heads of the *Society for Conservation Biology*, *Society for Ecological Restoration*, *American Fisheries Society*, *Wildlife Society*, *Ecological Society of America*, and *American Meteorological Society* (AMS). AMS strengthened its position statement last year to say that humans are the "dominant cause" of climate change. The science groups said that changing weather patterns would cause increasing damage to life and property, and the government must be prepared to respond.

Meanwhile, Norwegian research reveals targets for reducing global warming may be more doable than expected. According to a statement by the *Research Council of Norway*, the planet's average surface temperature rose through the 1990s but stabilized in 2000. Inputting data from the past decade, researchers have projected a rise in temperatures of 1.9 ^{o}C by 2050 if CO_2 levels were to double. The new estimate is below the 3-degree rise predicted by the IPCC. The findings also show the reduction of airborne particulates from burning coal probably has less of an impact – in terms of indirect cooling – than previously thought.

Sources: Damian Carrington, *London Guardian*, 1/8/13; ; *AP/Washington Post*, 1/22/13; Adam Ewing, *Bloomberg*, 1/27/13; Jean Chemnick, *E&E Daily*, 2/8/13; *ClimateWire*, 12/2/12 and 1/9, 1/16, 1/23 and 1/29/13; and *Greenwire*, 1/21/13 BACK TO TOP

Meetings of Interest

Apr. 2-4: 1st National Adaptation Forum (NAF): Action today (climate change) for a better tomorrow. Denver Marriott City Center, Denver CO. See: http://www.nationaladaptationforum.org/

Apr: 7–10: American Water Works Association's Sustainable Water Management Conference, Nashville, TN. See: www.awwa.org

Apr. 14–18: International Association for Landscape Ecology, Landscape Dynamics along Climatic Gradients: Models for a Changing World, Austin, TX. See: http://usiale.org/?id=annualMeetings

Apr. 16–19: 7th International Conference on Irrigation and Drainage, Phoenix, AZ. See: www.uscid.org/13azconf.html

Apr. 21-25: 18th International Conference on Aquatic Invasive Species, Sheraton-on-the-Falls Hotel in Niagara Falls, Ontario, Canada. See: www.icais.org/

Apr. 21-26: Groundwater Quality Conference (GQ13), University of Florida, Gainesville, FL. See: www.conference.ifas.ufl.edu/GQ13

Apr: 24-26: Mississippi River Research Consortium, La Crosse, WI. See: http://mrrc.ngrrec.org/

May 1-3: Steinbeck and the Politics of Crisis: Ethics, Society, and Ecology Conference, San Jose, CA. See: http://tinyurl.com/steinbecksanjose2013

June 11: 2nd Four State Watershed Academy: *MS4 Stormwater-Green Tools for Your Toolbox*, Branson, MO Convention Center. Contact: David Casaletto, contact@ozarkswaterwatch.org

June 14-17: 19th International Interdisciplinary Conference on the Environment, Portland, OR. See: http://ieaonline.org/?page_id=68

Jul. 21-24: Resilient Landscapes – Planning for Flood, Drought & Fire, 68th International Annual Conference, Reno, NV. See: www.swcs.org/13AC

Jul. 21-25: 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

Jul. 29 – Aug. 2 : 5th National Conference on Ecosystem Restoration (NCER), Renaissance Schaumburg Convention Center Hotel, Chicago, IL. See: www.conference.ifas.ufl.edu/NCER2013

Aug. 12-14: 2nd International Conference on Biodiversity & Sustainable Energy Development, Raleigh, NC. See: http://www.omicsgroup.com/conferences/biodiversity-sustainable-energy-development-2013/

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Congressional Action Pertinent to the Mississippi River Basin

Climate Change

S. 7. Reid, H. (D/NV) and 21 Co-sponsors. Promotes (1) investment to ensure resilience to extreme weather and disasters; (2) investment in clean energy infrastructure; and (3) development of clean energy technologies. Also ensures that the federal government is a leader in reducing pollution, promoting the use of clean energy sources, and improving energy efficiency.

S. 107. Vitter, D. (R/LA). Prohibits regulation of CO_2 emissions in the U.S. until China, India, and Russia implement similar reductions.

S. 332. Sanders, B. (I/VT) and 1 Co-sponsor. Addresses climate disruptions, reduces carbon pollution, enhances the use of clean energy, and promotes resilience in the infrastructure of the U.S., and for other purposes.

H.R. 518. Markey, E.J. (D/MA) and 13 Co-sponsors. Amends the *Reclamation States Emergency Drought Relief Act of 1991* to extend authority and appropriations for the drought program through FY2018, and requires cooperative drought contingency plans to address projected long-term climate variability and change.

H.R. 662 : Luetkemeyer, B. (R/MO) and 18 Co-sponsors. Prohibits U.S. contributions to the IPCC and the U.N. Framework Convention on Climate Change.

Conservation

S. 51. Boxer, B. (D/CA) and 10 Co-sponsors and **H.R. 263.** Grimm, M.G. (R/NY) and 1 Co-sponsor. Reauthorizes the National Fish and Wildlife Foundation.

S. 327. Barrasso, J. (R/WY) and 6 Co-sponsors. Authorizes the Secs. Agriculture and Interior to enter into cooperative agreements with States authorizing State foresters to provide certain forest, rangeland, and watershed restoration and protection services.

S. 338. Baucus, M. (D/MT) and 6 Co-sponsors. Amends the *Land and Water Conservation Fund Act of 1965* to provide consistent and reliable authority and funding for it, and for other purposes.

S. 360. Udall, T. (D/NM) and 4 Co-sponsors. Amends the *Public Lands Corps Act of 1993* to provide service opportunities for young Americans to 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.

S. 368. Heinrich, M. (D/NM) and 7 Co-sponsors. *Federal Land Transaction Facilitation Act*, and for other purposes.

H.R. 188. Kaptur, M (D/OH). Creates the 21st Century Civilian Conservation Corps to employ U.S. citizens in public works, such as forestation of federal and state lands, prevention of forest fires, floods, and soil erosion, and construction and repair of National Park System paths and trails.

H.R. 638. Fleming, J. (R/LA) and 11 Co-sponsors. Amends the *National Wildlife Refuge System Administration Act of 1966* to require that any new national wildlife

refuge may not be established except as expressly authorized by statute.

Endangered Species

H.R. 576. Stockman, S. (R/TX). *Save Endangered Species Act of 2013* provides for captive breeding and for other purposes.

Energy

S. 279. Tester, J. (D/MT) and 7 Co-sponsors and **H.R. 596.** Gosar, P.A. (R/AZ) and 15 Co-sponsors. Promotes the development of renewable energy on public lands, and for other purposes.

H.R. 267. McMorris-Rodgers, C. (R/WA) and 9 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.

H.R. 334. Poe, T. (R/TX) and 33 Co-sponsors. Approves a specified permit regarding certain energy-related facilities and land transportation crossings on the international boundaries of the U.S. for the Keystone XL pipeline project.

FWPCA

H.R. 524. McKinley, D.B. (R/WV) and 10 Co-sponsors. Amends the FWPCA to clarify that the EPA doesn't have the authority to disapprove a permit after it has been issued by the Corps under section 404 of such Act.

Grazing

S. 258. Barrasso, J. (R/WY) and 6 Co-sponsors and **H.R. 657.** Labrador, R.R. (R/ID) and 9 Co-sponsors. Amends the *Federal Land Policy and Management Act of 1976* to improve the management of grazing leases and permits, and for other purposes.

Invasive Species

S. 125. Brown, S. (D/OH) and 5 Co-sponsors and **H.R. 358.** McCollum, B. (D/MN) and 10 Co-sponsors. Requires the USFWS, in coordination with the Corps, the NPS, and the USGS, to lead a multiagency effort to slow the spread of Asian Carp in the Upper Mississippi and Ohio River basins and tributaries by providing high-level technical assistance, coordination, best practices, and support to state and local government strategies, to slow, and eventually eliminate, the threat posed by such carp.

S. 365. Klobuchar, A. (D/MN) and 1 Co-sponsor and **H.R. 709.** Ellison, K. (D/MN) and 3 Co-sponsors. Authorizes the Corps to take actions to manage the threat of Asian carp traveling up the Mississippi River in the State of Minnesota, and for other purposes.

H.R. 584. Young, D. (R/AK) and 4 Co-sponsors. Amends the *Federal Food, Drug, and Cosmetic Act* to require labeling of genetically engineered fish.

Mining

S. 222. Udall, T. (D/NM) and 3 Co-sponsors and **H.R. 488.** Pearce, S. (R/NM) and 1 Co-sponsor. Amends the *Surface Mining Control and Reclamation Act of 1977* to clarify that uncertified States and Indian tribes have the authority to use certain payments for certain noncoal reclamation projects and acid mine remediation programs.

H.R. 526. Yarmuth, J.A. (D/KY) and 23 Co-sponsors. Places a moratorium on permitting for mountaintop removal coal mining until health studies are conducted by the Department of Health and Human Services, and for other purposes.

Recreation

S. 170. Murkowski, L. (R/AK) and 2 Co-sponsors. Recognizes the heritage of recreational fishing, hunting, and recreational shooting on Federal public land and ensures continued opportunities for those activities.

S. 311. Landrieu, M. (D/LA). Directs the Secretary of the Interior to study the suitability and feasibility of designating sites in the Lower Mississippi River Area in the State of Louisiana as a unit of the National Park System, and for other purposes.

H.R. 322. Miller, J. (R/FL) and 79 Co-sponsors. Amends the *Toxic Substances Control Act* (TSCA) to exclude from the definition of "chemical substance": (1) any component of any pistol, revolver, firearm, shell, or cartridge, including shot, bullets and other projectiles, propellants, and primers; and (2) any sport fishing equipment the sale of which is subject to federal excise tax and sport fishing equipment components.

Water Quality

H.R. 311. Crawford, E.A. (R/AR) and 48 Co-sponsors. Authorizes the EPA to require certification of large capacity farm storage tanks (> 10,000 gal.) under the Spill Prevention, Control, and Countermeasure rule.

Water Resources

S.4. Reid, H. (D/NV) and 14 Co-sponsors. Updates and enhances dams, ports, water infrastructure, and flood protection infrastructure, and for other purposes.

S. 66. Vitter, D. (R/LA) and 2 Co-sponsors. Directs the Corps to establish a pilot program to evaluate the cost-effectiveness and project delivery efficiency of non-federal sponsors as the lead project delivery team for authorized Corps civil works flood control and navigation construction projects.

H.R. 123. Holt, R. (D/NJ) and 1 Co-sponsor. Establishes a *WaterSense* program to identify and promote water efficient products, buildings and landscapes, and services to reduce water use, conserve energy, and preserve water resources.

H.R. 136. Matsui, D.O. (D/CA). Authorizes the Corps to implement any flood risk management project for which the Secretary has transmitted to Congress, before the date of enactment of this Act, a letter that is technically sound, environmentally acceptable, and economically justified; and consistent with the President's policy and programs.

H.R. 399. Matsui, D.O. (D/CA) and 25 Co-sponsors. Directs the Corps to undertake a comprehensive review of the policy guidelines on vegetation management for levees in order to determine whether current federal policy is appropriate for all regions of the U.S.

Source: http://thomas.loc.gov/home/thomas.php BACK TO TOP