River Crossings

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National Grass Carp Policy Needed

In an effort to prevent the illegal or unintentional release of Grass Carp into the Great Lakes, the U.S. Fish and Wildlife Service (USFWS) funded MICRA to examine commercial Grass Carp use in the United States. MICRA's final report contains eight recommendations on how to potentially improve Grass Carp production, certification, shipping, stocking and regulation. These include the following:

- All states prohibit the production, sale, live shipment, stocking, import, and export of diploid (fertile) Grass Carp except for permitted diploid brood stock at appropriately licensed production facilities.
- States that allow triploid (sterile) Grass Carp production should develop a consistent set of minimum standards (SOPs and BMPs), permit requirements, and record keeping for diploid Grass Carp broodstock.
- States that allow the legal importation of triploid Grass Carp should adopt consistent, uniform regulations that allow only USFWS certified triploid Grass Carp (or an equivalent state approved certification program – e.g., South Carolina and Louisiana).

Forty inch, 40 lb. Grass carp taken from the lower Wisconsin River - John Lyons, Wisconsin Department of Natural Resources Photo.

- Increase random inspections and enforcement of relevant regulations in states that allow the importation of certified triploid Grass Carp.
- Improve state regulation of the live fish shipping industry and develop standards for Grass Carp distributors.
- Modify the scope and standards of the USFWS *National Triploid Grass Carp Inspection and Certification Program* (NTGCICP), including direct participation of states and Grass Carp distributors.
- The USFWS should work with states, triploid Grass Carp producers, and other partners to develop defensible ploidy testing procedures for quality control and law enforcement purposes in support of state random inspection programs.
- Develop and provide information about NTGCICP, Grass Carp regulations, and best management practices for natural resource managers, aquacultur-

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ists, and the general public.

Grass Carps, an invasive species of Asian carp, were imported into the U.S. in 1963 for their ability to consume nuisance aquatic vegetation. Eventually escaping into the wild, Grass Carp populations were first reported in the Mississippi River Basin as early as 1970. Today, Grass Carps are widely distributed throughout the country's waterways including the Great Lakes, with the exception of Lake Superior. To date, the Grass Carps found in the Great Lakes are not believed to be part of a self-sustaining population.

MICRA's report, funded through the federal Great Lakes Restoration Initiative, concludes that state Grass Carp regulations are varied and inconsistent, and a national policy strategy is needed to effectively minimize the risks of additional fertile and sterile Grass Carp introductions into the Great Lakes. The views and conclusions contained in the report are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government or of MICRA's individual state agency members. MICRA will be discussing the report's recommendations and considering the next steps in the coming months.

Source: *USFWS News Release*, 2/25/15 BACK TO TOP

Bioinvasions in a Changing World

A new federally sponsored report on the interactions and impacts of climate change on the introduction and spread of invasive species was released in late December. The report entitled, *Bioinvasions in a Changing World: A Resource on Invasive Species - Climate Change Interactions for Conservation and Natural Resource Management* was prepared for the *Aquatic Nuisance Species Task Force* and the *National Invasive Species Council* (NISC) by the *Ad Hoc Working Group on Invasive Species and Climate Change*. The working group chaired by Stanley W. Burgiel (NISC) and Thomas Hall (USDA Animal and Plant Health Inspection Service) included 37 additional members representing various state and federal agencies, tribal groups, colleges and universities and private groups. The document is intended to be a guide to the methods, resources and assistance available for dealing effectively with invasive species and their interface with climate change at the site level, and to inform policy-making and planning at larger geographic scales.

The report is targeted at a broad audience of people interested in invasive species, climate change and natural resource management. It provides a brief overview of the connections between invasive species and climate change and addresses the broader framework of invasive species management and climate change adaptation as tools to enhance and protect ecosystems and their natural resources in the face of these drivers of change. It also delves into the tools available to assess and manage the risks associated with invasive species under changing climatic conditions. It concludes with a review of existing institutions and networks relevant to these management questions, as well as a discussion of available resources and recommended next steps.

Comments and/or questions related to the document should be directed to Stan-

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North American Invasive Species Network

There is no one lead federal agency in Canada, Mexico, or the United States that prevents, manages, researches, and educates the public about invasive species on public conservation lands and waterways within each of these countries. Because of this leadership void, of a number of invasive species centers, institutes, labs, and networks were established over the years in North America to help meet the needs of public conservation land and waterway resource managers. In 2009, scientists and resource managers recognized the need to unite and form a national center/network as an umbrella organization that would help coordinate the regional invasive species centers and institutes, or hubs that exist in North America, as well as the 143 U.S. data systems that contain information on invasive species.

The *North American Invasive Species Network* (NAISN) was formed in 2010 to meet this need as an American 501(c)3 non-profit organization by university and government scientists from across North America. The countries of Mexico and Canada participate as NAISN members through a Memorandum of Understanding. Membership is targeted toward regional university centers and institutes, government institutions, non-profit organizations, research labs, and/or other groups and individuals with invasive species interests and qualifications that are valuable to the NAISN mission. Because invasive species cross governmental jurisdictional boundaries, NAISN aims to unify and connect existing regional invasive species efforts into a single network to improve communication, collaboration, and overall coordination to help current invasive species management and prevention efforts across the continent.

Map showing location (yellow dots) of NAISN hubs and nodes in North America.

NAISN membership is comprised of three categories:

- Hubs are regionally- or internationally-based organizations and agencies that address invasive species issues through research, coordination, or management missions/efforts.
- Nodes are government agencies, networks, and other organizational entities that are thematically focused and play a recognized role in invasive species research, management, public outreach, or policy.
- Affiliates are individuals with invasive species interests and qualifications that align with the NAISN mission.

It is envisioned, as NAISN grows and expands, that the Network will work to enhance information exchange among scientists, government agencies, and private landowners through the use of a comprehensive website similar to the U.S. Centers for Disease Control and Prevention (CDC) website and the aggregation of the more than 250 databases that contain information on invasive species currently in use worldwide. When funding is available, NAISN will begin to track invasive species expenditures through annual surveys of federal, provincial, state, municipal and tribal governments and oversee a comprehensive analysis of the economic impacts of invasive species. Such information could readily be used by policy-makers and elected officials. Finally, NAISN aims to provide a "one stop source" for the news media and develop and implement national public awareness campaigns about invasive species in North America utilizing successful education and outreach techniques.

NAISN has identified the ten most important invasive species or invasive species assemblages in North America based on their ability to invade a wide geographic area on public conservation lands and waterways, their ecological and/or economic impacts and/or their human health impacts. They are listed below in alphabetical order:

Asian Carp Assemblage:
- Grass Carp (*Ctenopharyngodon idella*)
- Common carp (*Cyprinus carpio*)
- Silver carp (*Hypophthalmichthys molotrix*)
- Bighead carp (*Hypophthalmichthys nobilis*)
- Black carp (*Mylopharyngodon piceus*)

Asian gypsy moth (*Lymantria dispar*)
Burmese python (*Python bivittatus*)
Emerald Ash borer (*Agrilus planipennis*)
Eurasian wild pig (*Sus scrofa*)
Lionfish (*Pterois spp.*)
Hydrilla (*Hydrilla verticillata*)
Mussel Assemblage:
- Quagga Mussels (*Dreissena bugensis*)
- Zebra mussels (*Dreissena polymorpha*)

Orange Hankweed (*Hieracium aurantiacum*)
Salt cedar (*Tamarix spp.*)

NAISN also recognizes that many other invasive species are locally or regionally important.

Source: NAISN Web Site; and *NAISN Newsletter*, Vol. 1, No. 1, December 2014 BACK TO TOP

Smartphone Invasive Species Apps

The *Center for Invasive Species & Ecosystem Health* (Bugwood) is headquartered at the University of Georgia (Athens). Bugwood is an official hub of the *North American Invasive Species Network* and has pioneered the development of a series of invasive species *Smartphone Apps*. Bugwood currently offers 25 such Apps for various platforms and has received more than 62,168 iPhone downloads and 13,443 android downloads. The apps currently offered by Bugwood and available for download include the following:

iPhone/iPad and Android Apps

- EDDMapS West
- Outsmart Invasive Species
- Squeal on Pigs
- What's Invasive
- Southeast Early Detection Network
- Stink Bug Scout
- Forest Insect Pests
- New Jersey Invasive Species Strike Team
- Georgia Cotton Insect Advisor
- Great Lakes Vegetables
- IPCConnect
- IPM Toolkit
- Mid-Atlantic Early Detection Network
- Great Lakes Early Detection Network
- EDDMapS Ontario
- Invasive Plant Atlas of New England
- National Wildlife Refuge Early Detection Network for New England
- Texas Invaders
- iBiocontrol - Noxious Weeds and their Biocontrol Agents
- Southeast Agricultural Stink Bug ID
- VegDr
- Invasive Plants in Southern Forests: Identification and Management
- IPAlert
- IveGot1 - Identify and Report Invasive Animals and Plants in Florida

iPhone/iPad, Android and Kindle App

- Landscape Alternatives for Invasive Plants of the Midwest

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Pallid Sturgeon Lawsuit and Research on the Missouri and Yellowstone Rivers

The federally endangered pallid sturgeon faces localized extinction in the upper Missouri River Basin because dam operations prevent the species from accessing spawning grounds, according to a new lawsuit filed by the *Defenders of Wildlife* (DOW) and the *Natural Resources Defense Council* (NRDC). The conservation groups filed the lawsuit in early February against the U.S. Bureau of Reclamation, U.S. Army Corps of Engineers (Corps), and U.S. Fish and Wildlife Service (USFWS). Among other things, the groups accuse the agencies of violating the Endangered Species Act by not adequately changing the operations of two dams - the Intake Diversion Dam on the Yellowstone River, a tributary to the Missouri River, and the Fort Peck Dam on the Missouri River. In particular, the groups take aim at a Corps plan that would increase the size of the Intake Diversion Dam. That dam blocks pallid sturgeon from moving upstream in the Yellowstone River, so the Corps also plans to add a 3-mile channel around the dam that slows flows enough to allow the fish to swim around the dam.

But conservationists say that is not sufficient to save the aging wild sturgeon population comprised of only 125 fish. "We are simply not going to stand by while the federal agencies charged with ensuring that ancient sturgeon don't go extinct spend scarce taxpayer dollars on a plan that has no reasonable expectation of success," said Steve Forrest, senior representative for the DOW *Rockies and Plains Program*. "We know the agencies can do better, and we're challenging them to go back to the drawing board and come up with a plan that creates actual fish passage for this endangered fish on the Yellowstone River." The USFWS listed the pallid sturgeon as endangered in 1990. According to the agency fewer than 175 wild-spawned pallid sturgeon – all adults – live in the free-flowing Missouri River above Lake Sakakawea in North Dakota. Since 1990, not a single wild-spawned pallid sturgeon is known to have survived to the juvenile stage, despite intensive searching. It takes 20 years for the fish to mature and individuals of the species can live for 50 years. The Intake Diversion Dam and the Fort Peck Dam have prevented the fish from reproducing in the two rivers for decades. While the former prevents fish passage, the latter destroys nursery habitat due to the timing, magnitude and temperature of the water released, according to a recent study published in the journal *Fisheries*.

That study conducted by scientists at Montana State University (MSU) is the first to directly link dam-induced changes in sediment transport to reduced oxygen levels and the survival of the pallid sturgeon. "This research shows that the transition zone between the freely flowing river and reservoirs is an ecological sink – a dead zone – for pallid sturgeon," said Christopher Guy, the MSU professor who was the lead author on the paper. "Essentially, hatched sturgeon embryos die in the oxygen-depleted sediments in the transition

zones," he said. Guy said further that fisheries biologists have long suspected that the Missouri River's massive reservoirs were preventing hatched embryonic pallid sturgeon from surviving to the juvenile stage. But early attempts to tie the problem to low levels of dissolved oxygen were unsuccessful. "The reason for that is we hadn't sampled deep enough," Guy said. "It wasn't until we sampled water down at the bottom, where those sediments are being deposited, that we found there was no dissolved oxygen. Because hatched pallid sturgeon embryos are negatively buoyant, they tend to sink into that hostile environment," he said.

"The lack of oxygen is a function of high microbial activity in the sediment laden area," said Eric Scholl, an MSU Ph.D. student and a co-author of the study. Hilary Treanor, an MSU research associate working with Guy, said they were able to show just how hostile these transition zones between riverine environment and reservoir could be to hatched sturgeon embryos. In experiments at the USFWS *Fish Technology Center* in Bozeman, MT with coauthors Molly Webb, Kevin Kappenman, and Jason Ilgen, Treanor said different aged hatched embryos were treated with water of varying levels of dissolved oxygen. The lowest level of dissolved oxygen they could recreate (1.5 mg/l) was still higher than samples pulled from the bottom at the upper end of Fort Peck Reservoir. At those depleted levels, the hatched sturgeon embryos suffered almost immediately. "We saw changes in their behavior fairly quickly. They became disoriented and weren't able to move the way they should have," Treanor said. "Within an hour we started to see mortality. By the end of the experiment they were all dead."

Adult Missouri River pallid sturgeon - Photo by Steve Krentz, USFWS, Bismarck, ND

Guy said this study built on research conducted by USGS fisheries biologist Patrick Braaten, which demonstrated that not enough available drift distance exists between the reservoirs for hatched pallid sturgeon embryos before entering the reservoirs in the upper Missouri River. Before dams, hatched pallid sturgeon embryos would drift for hundreds of miles, eventually settling out of the river's current in areas with low flow where they matured enough to negotiate the river's flow. Given what the new research shows about how no oxygen is available to hatched pallid sturgeon embryos, the authors of the paper propose that officials will need to consider innovative approaches to managing Missouri River reservoirs for pallid sturgeon conservation to have a chance. It also could provide some guiding principles for the construction of new dams around the world, Guy said. The result of the MSU research should also weigh heavily in the aforementioned DOW and NRDC lawsuit.

Meanwhile, pallid sturgeon recovery efforts below the Missouri River dams is showing some signs of success. Genetic testing has confirmed that two larval pallid sturgeon were found in the Missouri River near St. Louis, offering much-needed insight into the recovery of the endangered fish, Corps officials said. The tiny fish are the first to have been found during samplings from an 811-mile stretch of the Missouri between the Gavins Point Dam on the Nebraska-South Dakota border and St. Louis, leading researchers to cautiously conclude at least some natural reproduction is occurring. Restoration efforts have introduced thousands of sturgeon raised in hatcheries, but the wild offspring of those fish have difficulty surviving much longer than a year. "The good news here is this is the first indication that, to some degree, the pallid sturgeons are reproducing on their own in this section of the Missouri River," Missouri Department of Conservation spokesman Joe Jerek said. "It's just added hope – that first indication that it's possible."

Source: *USGS News Release*, 1/23/15; Jim Suhr, *AP*, 1/20/15; Brett French, *Billings Gazette*, 2/12/15; Emily Yehle, *Greenwire*, 2/3/15; and *Greenwire*, 1/21 and 2/12/15

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Waterkeeper Alliance Launches Rapid-response Program for Disasters

The watchdog group *Waterkeeper Alliance* is beefing up its rapid-response program to deploy staffers and local advocates to the scene of disasters affecting waterways like oil spills and hurricanes. In the past year, the group has sent teams to the Dan River in North Carolina, where a coal ash spill sent more than 30,000 tons of waste into the waterway, and to Lynchburg, VA, where a train carrying Bakken crude oil derailed. The teams conducted water quality testing, documented impacts by camera, and raised the issue to the public and in the media.

Now, the group is raising money to train more people with its rapid-response protocol. Marc Yaggi, *Waterkeeper Alliance's* executive director, said the increase in the number of oil train incidents was part of what persuaded the group to expand the program. "We've been building this team as a response to what we see as more and more fossil-fuel-related disasters," he said. "We have a team that has

been undergoing training and has been responding to fossil fuel disasters, and so this will give them a greater ability to respond and also help train other advocates." He said the group is raising money to be able to send teams to the scene of accidents, conduct boat and aerial patrols, purchase sampling equipment, and pay to get testing done in labs. The group is also planning to train its more than 200 riverkeepers across the world.

Source: Annie Snider, *Greenwire*, 11/24/14 BACK TO TOP

Rash of Train Derailments

An increase in train derailments across North America have led to calls for updates to operating procedures and tank car standards. The worst derailment occurred in July 2013 when a 72-car train loaded with oil from North Dakota's Bakken Shale fields derailed and exploded in Lac-Mégantic, Quebec, killing 47 people and spilling more than a million gallons of crude into a nearby river. That train was operated by the now-defunct *Montreal, Maine & Atlantic Railway Ltd.* At least two derailments have occurred in the Mississippi River Basin already this year.

Scene of Mississippi River train derailment 2/4/15 - Dave Kettering, AP Photo

On February 4, 2015, a *Canadian Pacific Railway Ltd* (CPRL) train derailed in a steep, remote area along the Mississippi River about 10 miles north of Dubuque, IA. Eleven of the train's 81 cars derailed and ten of the derailed cars were carrying ethanol. Three of those plunged into the Mississippi River. The impacts on the river's ecosystem are unknown, but the primary concern associated with the spill is that ethanol in the water depletes oxygen. Mussel beds in the area were especially at risk because mussels do not have the ability to easily move away when oxygen levels begin to sag. Also, the reach of river impacted was within the *Upper Mississippi River National Fish and Wildlife Refuge*. The 81-car train originated in northwest Iowa and was headed to New Jersey. Each tank car can carry up to 30,000 gallons. The derailed cars were *DOT-111* models, which the *National Transportation Safety Board* (NTSB) has been urging the industry to replace or retrofit since 1991.

Then on February 16, 2015, a mile-long, 109-car *CSX Corp.* train carrying crude oil derailed and caught fire near Montgomery, WV spilling an unknown amount of oil into the Kanawha River. Teresa White, director of the Fayette County Office of Emergency Services, said at least 10 cars on the eastbound train exploded. CSX reported that all tank cars involved in the derailment were built to the tougher, type *CPC-1232* standard that the rail supply industry has used since 2011. NTSB has criticized older-model type *DOT-111* tank cars as unfit to carry flammable liquids such as crude oil and ethanol. The Department of Transportation (DOT) has proposed updating oil tank car requirements beyond even the *CPC-1232* standard to include thicker steel shells and other protections. Environmental groups have criticized DOT actions as insufficient, calling instead for an immediate ban on the oldest, most puncture-prone types of crude tank cars.

The first draft of DOT's oil-by-rail safety rule proposed a two-year deadline for upgrading or scrapping the type *DOT-111* cars hauling the most flammable varieties of crude. The final oil tank car rule, now under review at the White House, is not yet publicly available. "Waiting another two, three or five years for marginal improvements in oil train safety is not acceptable when these bomb trains keep derailing and setting towns and rivers on fire," said Mollie Matteson, a senior scientist with the *Center for Biological Diversity*, in a statement responding to the WV derailment. Crude-by-rail shipments have shot up from next to nothing in 2007 to more than 1.1 million barrels per day last year.

Sources: David Pitt, *AP*, 2/4/15; *Iowa Department of Natural Resources Press Release*, 2/5/15; Blake Sobczak, *EnergyWire*, 2/17/15 and *Greenwire*, 2/5 and 2/6/15

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Cloud Seeding to Boost Western Water Supplies

After 15 straight years of drought, desperate Colorado River water managers are welcoming a new cloud-seeding study. The concept of cloud seeding – using aircraft or ground-based generators to inject microscopic particles of silver iodide into clouds around which ice crystals can form and fall as snow – dates back to the 1940's. Today, ski resorts, water districts and farmers across the West swear

by the practice to produce both snow and water, spending millions of dollars a year on machines and flights. But proving that it is money well-spent has been tricky. Because, while it might snow or rain after a cloud has been seeded, it's hard to know whether the seeding actually caused the precipitation. The *National Research Council* (NRC) concluded in a 2003 report that there was "no convincing scientific proof" that cloud seeding and other forms of weather modification worked. There had simply been too little robust research on the topic, the NRC said.

In response, Wyoming's Legislature took the NRC challenge and, buoyed by coffers filled from oil and gas severance taxes, poured $14 million into a major study over the past 10 years that employed the latest scientific techniques recommended by the NRC panel, as well as an independent evaluation team. Major findings of that study, recently unveiled to the Wyoming Legislature, say that seeding the right storms the right way can produce 5 to 15 percent more precipitation. That could increase streamflows by as much as 3.7 percent, the researchers' initial findings indicate. The study also found seeding to have next to no downwind impact, suggesting seeding storms to get precipitation in one place is not decreasing precipitation elsewhere – a major concern of cloud seeding. Roy Rasmussen, a senior scientist with the *National Center for Atmospheric Research* who led the study's outside evaluation team said, "We know that silver iodide produces ice crystals, so really it ends up being an engineering problem: Can the ice crystals get into the right cloud at the right place and can we do all this?" "That's what the Wyoming program demonstrated: That, yes, they can do it," he said. "With modern technologies – through satellite-controlled silver iodide generators, and with good forecasting, with good real-time modeling – we can figure out when the storms are right for seeding and apply the seeding, and there is a measurable effect."

But the results didn't look so good at first. When researchers initially sat down to analyze the data collected from seeding storms over six winters, they saw little difference between the storms that were seeded and those that weren't. Scientists had designed the experiment to answer the question of whether snow would have fallen anyway by randomly seeding one of two mountain ranges: the Medicine Bow and the Sierra Madre. The two ranges are often affected by the same storms, so the range that was not randomly selected for seeding served as the "control." But, in practice, sometimes the cloud seeding material from the target range was slipping over into the control range. "When you were seeding on the west side, it was also seeding on the east side, and then they both got about equal amounts of additional precipitation, so when you took the difference – the signal – it was zero," Rasmussen said. "So when we eliminated those cases, we started seeing the signal pop out of the noise." Rasmussen's team also eliminated data from times when equipment didn't operate properly. Separately, the team also used high-resolution modeling to estimate the impacts of seeding. All of these data, together, led researchers to the 5 to 15 percent increase conclusion. "The idea is that you're accumulating information," Rasmussen said, "but you're also understanding the physics of what's going into that information."

Example of a ground based cloud nucleating generator. A propane flame is used to vaporize the seeding solution, which is composed of silver iodide mixed in acetone. The vaporized silver iodide then re-crystallizes in the cold air, forming millions of tiny particles which are intended to serve as ice nuclei. The generators are positioned to maximize the number of silver iodide crystals that reach the critical regions of passing storms. North American Weather Consultants, Inc. Photo.

Western water managers have had a close eye on the Wyoming study. Extended drought on a fully allocated system has left the Colorado River's main reservoirs – Lake Mead and Lake Powell – at less than half capacity. Water levels are on a path to head threateningly near elevations that could begin triggering curtailments to Arizona, Nevada and eventually California, cut off hydropower, and potentially leave the city of Las Vegas without access to water. In short, managers are desperate for water, and there are three ways to get more water: (1) increase supply, (2) decrease demand and (3) make the system more efficient. Experts generally agree all three will be necessary, and cloud seeding appears to be one of the cheaper options in the first category. A major study of the basin released by the U.S. Bureau of Reclamation in 2012 estimated that weather modification could increase water supply at a cost of $30 to $60 per acre foot each year. Other approaches to augmenting water supplies – like desalination or importing water from other basins – run orders of magnitude higher. "The fact that cloud seeding could be part of our tool box going forward is a significant finding," said Chuck Cullom, Colorado River programs manager for the *Central Arizona Project* (CAP), a 336-mile canal network that delivers water to Phoenix and Tucson, as well as agricultural users. CAP kicked in some additional funding for the Wyoming study. "It's not a drought-busting technology, but it can increase a bad year and make a normal year better," he said.

From the water rights perspective, weather modification projects are currently premised on the tenant that precipitation created through the programs is treated just like any other precipitation. "There's no such thing as an atmospheric water right; there is water rights when it hits the ground," Joe Busto, a researcher with the *Colorado Water Conservation Board* who runs permitting for the state's weather modification program said. "We just said, 'We'll make more, and it falls where it falls, but then the water rights system takes over." That means water produced from cloud seeding in Wyoming's headwater ranges might never make it to Lake Powell, the upper reservoir, if someone with an upstream water right exercises it. Even if a downstream entity helps pay for the seeding, they have no right to it. But proponents say that water rights probably would have been exercised anyway, and without more water introduced into the system, it would only have caused reservoir levels to drop further. "Our view, and it's a long-held view, is that projects where it's

difficult to effectively measure the yield should always be viewed as system water, meaning that it's subject to the law of the river," Cullom said. "It supports all the uses, from the top of the system to the bottom of the system, because frankly there are tremendous benefits to both parts of the system by treating it that way."

As stakeholders grapple with how to fill the gap between supply and demand along the Colorado River, which is only expected to grow as populations boom and temperatures rise, larger-scale cloud seeding efforts promise to be a hot topic. The new Wyoming study is likely to serve as a starting gun for those conversations, experts say. "We're positioning ourselves," said Barry Lawrence, a project manager with the Wyoming Water Development Office who shepherded the study. "Should discussions in this area continue and should something larger for the entire Colorado basin come about, we want to be a player in that. We're willing to partner and go forward."

Similar cloud seeding studies in Colorado were scrapped in the early 1970's after a drastic flood occurred in the Rapid City, SD area. As then, the question will undoubtedly arise again as to whether all of this cloud seeding in the West could ultimately effect rainfall amounts that might otherwise occur either positively or negatively in the more middle western parts of Mississippi River Basin.

Source: Annie Snider, *Greenwire*, 12/23/14 BACK TO TOP

EPA Releases Clean Water Rule Scientific Report

The U.S. EPA in mid-January released the final version of the scientific report supporting the Obama administration's proposal to increase the number of streams and wetlands getting automatic Clean Water Act protection. The report is a stepping stone to the planned unveiling of a final water rule this summer. Opponents had criticized the Obama administration for beginning the rulemaking process before the scientific process was completed, but EPA had said it wouldn't issue a final rule until the scientific report was complete. "Now final, this scientific report can be used to inform future policy and regulatory decisions, including the proposed Clean Water Rule being developed by EPA's Office of Water and the U.S. Army Corps of Engineers," EPA says in a fact sheet accompanying the scientific report. The 408-page technical report synthesizes the findings of more than 1,200 peer-reviewed scientific studies examining the connections between streams and wetlands and larger downstream water bodies. The Obama administration is using those connections to justify extending federal regulatory jurisdiction beyond navigable waters that are clearly addressed by the Clean Water Act. Federal wetlands regulations have been mired in legal quicksand since Supreme Court decisions in 2001 and 2006 raised questions about which streams and wetlands deserve Clean Water Act protection.

The administration's proposed rule – fiercely opposed by congressional Republicans and a range of industries – would automatically regulate all tributaries that connect to a downstream water body and all streams and wetlands in floodplains or riparian areas of regulated water bodies. The science report draws a direct line between those two categories of waters and larger downstream rivers – "The scientific literature clearly shows that wetlands and open waters in riparian areas and floodplains are physically, chemically, and biologically integrated with rivers via functions that improve downstream water quality."

The technical report, however, makes changes to its earlier draft conclusions about wetlands and streams that are outside the floodplain. This category roughly overlaps with the category of "isolated" that was at issue in the Supreme Court's 2001 S*olid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*. Since then, regulators have had to make case-by-case calls about whether a wetland is significantly connected to downstream waters in order to decide whether it falls under federal jurisdiction. The administration's proposed rule would continue this case-by-case analysis. In the draft version of the EPA science report, released in 2013, the agency concluded there wasn't enough information to reach a conclusion about the connectivity of these types of waters. But an independent *Science Advisory Board* (SAB) that reviewed the report for EPA disagreed with this conclusion, stating, "To the contrary, the SAB finds that the scientific literature provides ample information to support a more definitive statement".

In the final report, EPA revised the conclusion to say this type of wetlands generally occurs along a gradient. "At one end of this gradient, the functions of non-floodplain wetlands clearly affect the condition of downstream waters if a visible (e.g., channelized) surface-water or a regular shallow subsurface-water connection to the river network is present," the report states. But on the other end of the gradient – where there is no clear hydrologic connection – the agency said generalizations are difficult. Moreover, the report says there's inadequate scientific literature on drawing conclusions about connections among specific groups or classes of wetlands.

A High Country, Possibly Isolated Wetland - USEPA Photo

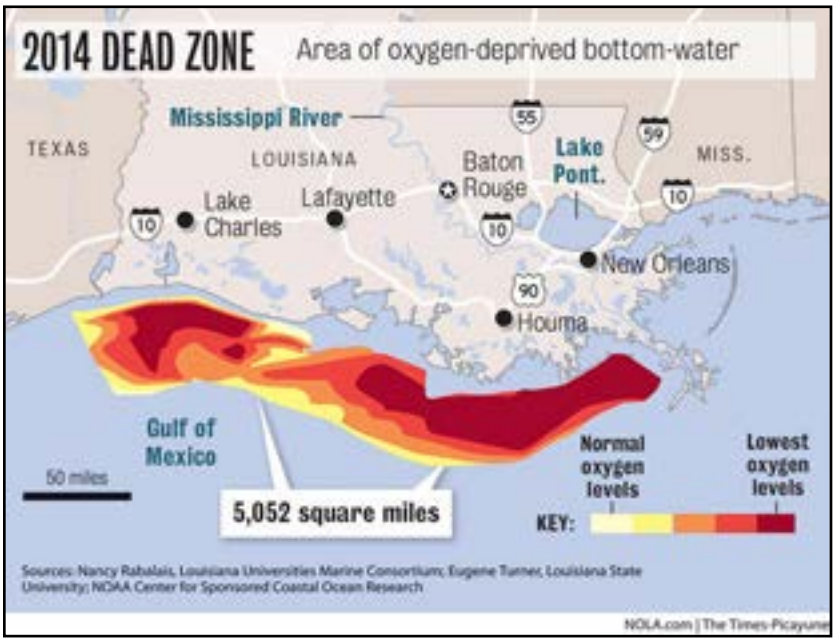
In the Supreme Court's 2006 ruling on *Rapanos v. United States*, Justice Anthony Kennedy wrote that the case had opened the door to evaluating classes of wetlands – the Dakotas' prairie potholes, for example – as a group rather than requiring individual determinations. Environmental and sportsmen's groups have been pushing for such classifications, and the administration asked for comment on the issue in its proposed rule. The scientific report also notes that an isolated wetland can be as important to the river network as a connected wetland. A far-flung wetland can help soak up floodwaters or trap pollutants that would otherwise make their way downstream, the report notes. But again, the report states that making generalizations about classes of wetlands is not supported by the literature. The report also bolsters the administration's approach to looking at the cumulative effects of groups of similar waters in determining whether an individual stream or wetland is important to the system.

Environmental and sportsmen's groups that back the administration's proposed rule welcomed the final scientific report. "Today's release of the final report on the chemical, physical and biological connections between water bodies is an important step in the nearly 15-year-long effort to resolve the confusion over which waters are – and are not – covered by the Clean Water Act," Jimmy Hague, director of the *Theodore Roosevelt Conservation Partnership's Center for Water Resources*, said in a statement. "By finalizing this report, EPA is guaranteeing that the final rules will reflect the best available science." EPA and the Corps of Engineers are currently reviewing the nearly 900,000 comments they received on the proposed rule with a goal of finalizing the rule this summer. EPA's Science Advisory Board has already backed the overall rule as scientifically supported.

Source: Annie Snider, *Greenwire*, 1/15 and 2/11/15 BACK TO TOP

Voluntary Fertilizer Reductions Won't Fix the Gulf Dead Zone

Voluntary strategies being used in the Midwest won't do enough to remove nutrients from fertilizers that fuel the "dead zone" in the Gulf of Mexico, according to a new study. The research, published in the *Journal of the American Water Resources Association*, found that combining the existing strategies with new techniques, like strategically restoring wetlands, could cut nitrogen runoff by 45 percent. That's the goal U.S. EPA has set to reduce the dead zone to less than 1,930 square miles. Last year the dead zone was estimated to cover about 5,052 square miles.



The recent study, conducted by a team of scientists with the U.S. Geological Survey, U.S. Department of Agriculture and the *Environmental Defense Fund* (EDF), used modeling to measure the effects of several nitrogen reduction methods on land segments in the watersheds of the Upper Mississippi and Ohio rivers. Those watersheds contain much of the nation's intense "farm belt" and soybean agricultural land that have been shown to be the source of the nutrients causing the dead zone. The study found that continuing with only voluntary efforts would reduce nitrogen pollution by 12 percent and adding more cover crops would result in a 30 percent cut. Those reductions would achieve only about two-thirds of the goal set in the 2008 action plan of the consortium of states and federal agencies that make up the *Mississippi River Gulf of Mexico Watershed Nutrient Task Force*.

Adding the other methods recommended by the recent study, however, resulted in significant improvements in the nitrogen reduction numbers. Focusing those methods at areas where they would provide the greatest effects, resulted in both the best reduction results and the least amount of existing farmland taken out of production for wetlands and other reduction strategies, the study found. "The good news is that adopting soil health and fertilizer efficiency measures across the Corn Belt can get us two-thirds of the way to the tipping point," said the study's lead author and *Environmental Defense Fund* (EDF) senior scientist, Eileen McLellan. "But by strategically placing wetlands on less than 1 percent of the region's croplands, we'll be able to reverse the trend of significant losses in aquatic life, and improve flood resiliency for downstream communities with minimal impact to crop production," she added. The additional nitrogen removal practices the scientists recommended also include enhancing drainage ditches to help them hold and remove nutrients. Restoring stream channels and reconnecting floodplains would turn those areas into wetland filters that use marginal land with low crop yields, thus minimizing impacts to crop production, the study said.

"The results show that we need to start thinking about conservation not just at the scale of an individual farm but also at the watershed scale," said Dale Robertson, research hydrologist at the U.S. Geological Survey's *Wisconsin Water Science Center* and co-author of

the paper. "Improving water quality is a community-wide effort that will save money, clean up local streams, and benefit the Gulf," he said. The authors of the study also point out that there are more than 400 similar low-oxygen water areas around the world that would benefit from following similar nutrient reduction strategies.

In mid-February the EPA and the *Mississippi River Gulf of Mexico Watershed Nutrient Task Force* seemed to support the study's findings when they announced that it will take another two decades until 2035 to shrink the Gulf of Mexico's annual "dead zone" to the size they had hoped to reach this year. They also announced that they had set an interim goal of cutting nutrient pollution by 20 percent by 2025. "It's going to take time to vastly improve water quality in very large bodies of water like the Mississippi River and Gulf of Mexico," Ellen Gilinsky, a senior adviser in EPA's water office, said in a statement. "Federal agencies and states are committing to comprehensive actions and increased resources to spur progress on the ground and in the water."

But Ann Alexander, a senior attorney for the *Natural Resources Defense Council* (NRDC), said "EPA appears hell bent on living out the maxim that insanity is doing the same thing over and over and expecting a different result." "For more than a decade, it has been recognizing goals to reduce the Dead Zone are not met," she said. Earlier, NRDC and the *Gulf Restoration Network* (GRN) took EPA to court in a bid to force the agency to set numeric limits for nutrients on rivers, streams and other water bodies within the basin. "I'm not saying that the idea of nutrient reduction strategies is bad; I think there could be some good things that come out of them, but ... there's no accountability in these plans," said Matt Rota, senior policy director for the GRN. "If you don't have a goal, like a numeric nutrient criteria, then what are you measuring against?," Rota said.

Sources: Mark Schleifstein, *New Orleans Times-Picayune*, 2/3/15; Annie Snider, *E&ENews PM*, 2/12/15; and *Greenwire*, 2/4/15

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Iowa Utility Sues Farmers Over Nutrient Runoff

Rather than undertake a $100 million upgrade to the Des Moines (Iowa) Water Works (DMWW) facility, Bill Stowe, CEO and general manager and the DMWW board of trustees in early January sent a notice of intent to sue to three heavily agricultural upstream counties. This potentially precedent-setting lawsuit is opening up a huge debate over how best to stem the flow of nutrients from America's farms and animal operations into the country's rivers and streams. The DMWW has long faced unsafe nitrate levels in its water supply – the Raccoon and Des Moines rivers. The two rivers regularly exceed the Safe Drinking Water Act nitrate limit (10 mg/l), and those levels have been particularly high over the past two years, the utility says. Last year, the Raccoon River saw a record 24 mg/l, the agency says. Normal water treatment can't remove nitrates (a by-product of agricultural fertilizer), so the high concentrations have forced the utility to run its expensive and aging denitrification plant. In 2013, DMWW said it had to run the facility for 74 days for at a total cost of $900,000. Last year, after an especially rainy fall, the utility had to begin operating the plant in the winter – a highly unusual occurrence.

The notice of intent to sue drew swift opposition from Iowa's agricultural community and state officials, including the governor, the state agriculture commissioner and new Iowa Republican Sen. Joni Ernst. They argue that such regulation not only isn't allowed under the Clean Water Act, but simply won't work when nutrient problems and solutions can vary widely depending on location, hydrology and other factors. "Des Moines has declared war on rural Iowa," Gov. Terry Branstad (R) told *The Des Moines Register*. "I think instead of filing a lawsuit, Des Moines should sit down with the farmers and people who want to do something about it." But city leaders responded that they have tried this approach for years, to little avail. "They want to go down this path of voluntarily trying to find ways to reduce those pollutants and test them out and see how it works," Des Moines Mayor Franklin Cownie said. "Well, we're seeing that it's not working."

The lawsuit specifically targets the extensive system of field drainage tiles used by farmers to remove excess water from farm fields. Large swaths of the Dakotas, Minnesota, Iowa, Illinois, Indiana and Ohio were left as soggy wetlands when glaciers from the last ice age retreated over 12,000 years ago. That process left particularly rich soils but also made farming them nearly impossible. So farmers, often with government encouragement, installed artificial drainage systems. Today these systems use strong plastic piping ranging in size from a few inches to 3-4 ft. in diameter. Such drainage tiles are typically placed about 4 feet below the surface and efficiently drain water away from row crops' roots. But no one tracks the extent of these vast tile drain systems (essentially farm field sewers), said Keith Schilling, a hydrologist at the University of Iowa. "I don't think there's any way to underestimate how many tile drains there are, and we don't know where they are," he said. Nor are the systems' impacts on water quality well understood.

Lori Sprague, a hydrologist with the U.S. Geological Survey who studies water quality trends, said tile drainage systems essentially short-circuit the natural filtration system that would normally allow some nitrogen to be taken up by plants or turned into harmless gas. It's hard to know how much of that nitrogen could still make its way into a stream through the normal path of groundwater. "But we have observed when there are more tile drains, if you hold everything else constant, there tends to be higher nitrate levels in streams," Sprague said. Nitrogen, phosphorus and sediment washing from Midwest farm fields into the Mississippi River and its tributaries feed

a massive dead zone each year in the Gulf of Mexico. USGS attributes 41 percent of that problem to farm fertilizer. The role of tile drains in this problem is simply unknown, scientists say.

To deal specifically with the nutrients in tile drained water, there are three main options: (1) building artificial wetlands that the drains' water can flow into and be cleansed by, (2) installing bioreactors to treat the water, and (3) designing saturated buffers that allow the drained water to spread out and filter through buffers with grasses and trees that can take up excess nitrogen. All three have been tried in Iowa, but they are not prevalent. One major hurdle: The cost-share funding available for such projects is limited, and the price can be high for items like artificial wetlands that would require prime farmland to be taken out of production. "Three and four million [dollars] here and there sounds like a lot of money, but that's not enough money to even come close to addressing the problem," Schilling said. "It's going to take $1 billion to make a dent in the problem."

Under the federal Clean Water Act, factories, wastewater treatment plants and other industrial facilities deemed to be "point sources" must get permits to discharge pollutants like nitrogen into rivers and streams, but most forms of agricultural flows are exempted under the 1972 law. The law explicitly provides two exemptions for agricultural water: (1) for rainwater washing over farm fields, called agricultural stormwater, and (2) for excess irrigation water that flows off fields, called irrigation return flows. For years, environmental lawyers have been batting around the idea among themselves that tile drainage systems could be argued to be point sources, not qualifying for either of the two exemptions. Until now, though, the concept has been tried in court only once, in a case brought by a California fishermen's association and a slate of environmental groups. That case was dismissed by a federal judge.

Vermont Law School professor Patrick Parenteau said, however, that the DMWW case laid out in the letter sent to county supervisors appears to be much stronger. "Their theory of why this meets the definition of a point source discharge and is not subject to the agricultural runoff exemption – which was the reason that the California case got dismissed – was intriguing," he said. DMWW's' argument hinges on the idea that rainwater that has infiltrated into the ground to become groundwater and is then artificially drained is something fundamentally different, from the Clean Water Act's perspective, from rainwater that washes over the surface of a farm field. The utility argues that stormwater flowing across fields and into ditches or streams could not pick up nearly as much nitrate pollution as water infiltrated through Iowa's nutrient-rich soils. Parenteau said there is precedent for a judge requiring natural groundwater discharges to be permitted – a 9th Circuit decision on groundwater pumping from coalbed methane formations.

But Gary Baise, who served as chief of staff to the first U.S. EPA administrator and now represents agricultural interests at the law firm *Olsson Frank Weeda Terman Matz PC*, said courts have been reluctant to poke holes in the law's farm exemptions. "Agricultural stormwater runoff has been pretty sacrosanct because Congress said so," he said. "We know nonpoint runoff has nutrients in it, we know it's there, and Congress has spoken and until Congress speaks again, this strikes me as an oddball lawsuit." Putting aside the question of exemptions, Baise said that permitting tile drain systems would pose an enormous administrative burden. On his farm in Illinois, there are 25 to 30 tiling systems just on his property, he said. "Do you realize how many farms there are in this country?" Baise asked. "Do you realize how many discharge points there are on a farm? There's no way in hell you can permit that as a point source." Sean McMahon, executive director of the nonprofit *Iowa Agriculture Water Alliance* said, "The agricultural sector would definitely be the first to say that we have water quality problems in Iowa and we're actually working very hard to address them." McMahon, a former *Nature Conservancy* staffer, whose new group is funded by farm industry groups with the goal of increasing adoption of voluntary agricultural conservation practices said further, "I would say that there's very strong buy-in to the (voluntary) strategy." The question now is what the Des Moines lawsuit does to that momentum. Even supporters of the lawsuit acknowledge that the only real pollution solutions can come from willing agricultural partners.

Parenteau said that even if the DMWW lawsuit moves forward and wins, state and federal regulators could create a general permitting system that essentially perpetuates the status quo for farmers. "I'd be the first to say that the Clean Water Act is probably not the best way to address this," he said. "You never litigate your way to water quality; you use litigation as leverage. You need a political solution to these problems." McMahon said the DMWW lawsuit has "…..the potential to create an environment where farmers don't want to implement conservation practices because they fear that regulation is coming." But Suzy Friedman, director of agricultural sustainability at the *Environmental Defense Fund* (EDF), said she has seen some indications that the lawsuit could advance the conversation. Friedman says there is a role for regulation in some cases but ultimately argues that market forces are the most effective driver for conservation efforts. She has worked with *Wal-Mart* to set environmental requirements, including fertilizer efficiency, for its suppliers like *Smithfield*, the world's largest pork producer, and *General Mills*. And EDF is working with agribusinesses to help farmers respond to the demand signal with things like precision fertilizer techniques.

On a recent trip to Iowa to talk with farmers and agribusiness leaders about these efforts, Friedman said the Des Moines legal action was a hot topic. "There was some pretty passionate talk about the lawsuit, but not in terms of, 'All right, we need to fight this thing,' or 'We need to slam the door shut and we don't talk to anybody,'" she said. "It was, 'We need to get going, we need to go faster, we need to roll this program out sooner because this is our opportunity to get ahead of this and show that we can make a difference and show that lawsuits and what comes from them isn't the way it needs to happen.'"

Source: Annie Snider, *Greenwire*, 1/29/15 BACK TO TOP

Middle Mississippi River Levee Controversy Resurfaces

Environmental groups and a slate of local officials are urging President Obama to have U.S. EPA Administrator Gina McCarthy prepare to veto a contentious 60 year old levee project as it nears approval stages. Southeast Missouri farmers and communities – and their elected officials in Washington, D.C. – have for decades been trying to close a quarter-mile gap in a massive Mississippi River levee near New Madrid, MO. Proponents argue that extending the 60-foot-high levee would be an economic boon, not only protecting homes and current crops but also allowing more diverse ones to be grown in the rich floodplain. But the levee would cut off the last remaining connection in the state between the Mississippi River and its backwater floodplain, an ecologically rich area abundant in fish and wildlife species. About 90 environmental groups in mid-December sent a letter to President Obama asking that EPA use its power to veto the Clean Water Act 404 dredge-and-fill permit that the U.S. Army Corps of Engineers (Corps) would need in order to build the project. The groups point out that EPA's regional office has itself said that the project would "cause the greatest loss of wetlands function in EPA Region 7's history." By some estimates, nearly 55,000 acres of wetlands would be drained. The U.S. Fish and Wildlife Service has said that the project "would cause substantial, irretrievable losses of nationally significant fish and wildlife resources, and greatly diminish rare and unique habitats found in southeast Missouri."

The Corps has proposed various iterations of the project over the years and even began construction before a federal judge ruled in 2007 that the agency had erred in its environmental analysis and forced it to restore the site. But the Corps, prodded by lawmakers, took another stab at reconfiguring the project and put out a new draft environmental impact statement last summer for a $165 million engineering effort. Now, the agency is finishing up work on a final EIS for the project that environmentalists argue will be no better than previous ones. "The levee is the same levee that they had looked at in 2007," said Melissa Samet, senior water resources counsel for the *National Wildlife Federation*, one of the groups signing the letter. "Even though they are updating and redoing evaluations, they are still horrible. At this point, it's time to just stop it."

While EPA's veto authority is premised on wetlands impacts, the project has also drawn an outcry from upstream communities concerned that the project would increase their flood risk. The gap in the levee exists because it is meant to serve as an outflow for the New Madrid floodway. During high flows on the Mississippi River, the Corps can blast a hole in the levee upstream and allow floodwaters to spread out in the river's natural floodplain. Landowners were paid to allow this to happen – by 1942, the Corps had purchased flood easements on 106,858 acres within the floodway at an average price of $17 an acre, according to a Corps fact sheet. But the floodway has only been used twice – once in 1937 and again in 2011 – both times amid intense political pressure from floodway landowners trying to prevent it. Under the Corps' 1928 operations plan, the agency was to "activate" the floodway when water levels reached 55 feet just upstream at Cairo, IL. But in 1937, the Corps waited until the river was a few feet higher than that. Over the years, the operations plan was rewritten to raise the "trigger" to 61.5 feet. But in 2011 the Corps waited until just beyond that – 61.72 feet – to blow the levee. By that time, flood waters had already overtopped the levees near the community of Olive Branch, and the town of Cairo was in immediate danger. When the floodway was activated, water levels at Cairo fell swiftly, dropping 2.7 feet in 48 hours.

Political leaders in nearby communities worry that building the new levee would only increase the political pressure not to use the floodway. "The St. Johns Bayou-New Madrid Floodway project will put our communities at even greater risk of catastrophic flooding by creating more obstacles and opposition to the Floodway's use," two dozen local mayors, council members, state legislators and other local leaders from Illinois, Missouri and Kentucky wrote in their own mid-December letter to President Obama. "We are at a loss to understand how the Corps of Engineers could determine that this is in the national interest. We certainly know that it is not in the interest of our communities."

In November, the Corps sent its working draft of a final environmental impact statement to an external review panel, project manager Danny Ward said. That review is scheduled to be completed in late March. After that, the Corps will make any necessary changes and put out a final EIS for public comment, he said.

Source: Annie Snider, *Greenwire*, 12/16/14

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Downstream Impacts of Mines Can Harm Fish

Mining operations can affect waterways and fish habitats on a regional basis, according to a new federally funded study led by Michigan State University researchers. The research, published in November in the journal *Ecological Indicators*, said mining can affect fish populations miles downstream, even in waterways not directly tied to coal or mineral extraction operations. "We've been surprised that even a single mine in headwaters might influence larger rivers miles downstream," said Wesley Daniel, MSU research associate, in a statement. "Mines have a much stronger influence on fishes than has been assumed. It's important, when considering the location of a new mine, to not just look local, but look way downstream."

The study could have policy implications as environmental groups press for areawide reviews of projects like mountaintop-removal coal extraction. "Our study is one of the first to consider fish responses to both coal and mineral mine disturbances, independently and combined, in many streams over multiple large regions," the paper said. Daniel, working with MSU Department of Fisheries and Wildlife researcher Dana Infante, plus the U.S. Geological Survey and *Great Lakes International Joint Commission*, used an algorithm to crunch mine location and stream health data in three eastern U.S. regions. "We found consistent, wedge-shaped declines in multiple fish metrics with increasing levels of mining in catchments," said the study, "suggesting mines are a regional source of disturbance." Researchers also looked at the impact of agriculture and development on streams but said mining can have particular effects, including chemical and sediment releases. "The quality of headwater streams will determine quality of rivers," Daniel said. "The condition of small streams that flow into larger rivers will affect downstream fish communities."

But *National Mining Association* spokesman Luke Popovich said mining discharges must meet federal and state water quality standards. So if the standards are protective of fish near the mine, he said, "it would be bizarre if the same standards are failing to protect downstream waters." Mine advocates also have often criticized such studies by saying the researchers did not prove a direct connection between specific mine pollution and problems downstream. "We acknowledge that our analyses were based on a landscape approach associating relationships between stream fishes and mines in catchments over broad spatial extents," said the paper, "however, repeatability in the trends detected with multiple fish metrics and for multiple classes of mines lend credence to our conclusions."

Source: Manuel Quiñones, *Greenwire*, 12/3//14 BACK TO TOP

Coal Mining Conductivity Litigation

Alpha Natural Resources Inc. has promised to address water pollution concerns from two subsidiaries operating four mountaintop-removal coal mines in West Virginia in a proposed consent decree announced in mid December by environmental groups. At issue are elevated levels of conductivity, a measurement of a waterway's ability to carry an electric charge because of its load of dissolved solids, which U.S. EPA regards as a barometer of aquatic health. The agreement released by the groups requires *Alpha* to come into compliance with EPA-approved state "narrative" water quality standards and help improve stream quality. If the company fails to meet those standards, the agreement calls for the company to install potentially expensive treatment technology and comply with conductivity limits suggested by EPA, which the company has opposed.

"We are confident that this agreement will ultimately force the company to treat its conductivity pollution with the best available technology," said Cindy Rank of the *West Virginia Highlands Conservancy* (WVHC). Earlier this year, U.S. District Judge Robert Chambers for the Southern District of West Virginia faulted *Alpha* for elevated conductivity levels near its operations. The judge blamed conductivity for impaired streams in what environmental groups called a landmark ruling. *Alpha* had expressed its intention to appeal the ruling before the December settlement agreement, which must still go through Justice Department and court review. The litigation comes as the broader coal mining industry and regulators in West Virginia resist the use of conductivity in environmental compliance.

In another conductivity case, Chambers said in late January that a subsidiary of *Consol Energy Inc.* is also liable for elevated levels of conductivity in a regulated waterway. In response to a 2013 lawsuit by several environmental groups, including the *Ohio Valley Environmental Coalition*, *Sierra Club* and WVHC, Chambers cited a "preponderance of the evidence" to hold *Fola Coal Company LLC* liable. Following a trial last year, Chambers ruled that the company "has committed at least one violation of its permits by discharging high levels of ionic pollution, as measured by conductivity, into Stillhouse Branch." Chambers said those releases "have caused or materially contributed to a significant adverse impact to the chemical and biological components of the applicable stream's aquatic ecosystem, in violation of the narrative water quality standards that are incorporated into those permits." Chambers said further, "Even without affording deference to EPA's Benchmark," there was an "extant collection of peer-reviewed scientific publications" on the issue.

Also in late January a federal judge in Tennessee ruled in favor of allowing environmental groups – including the *Sierra Club* and *Defenders of Wildlife* – to pursue a 2013 case accusing the U.S. Fish and Wildlife Service and the federal Office of Surface Mining, Reclamation and Enforcement (OSMRE) of failing to protect the endangered Cumberland darter and the threatened blackside dace from increased conductivity pollution. The groups say the agencies should have considered the potential for increased conductivity from

the Zeb Mountain and Davis Creek areas. The Obama administration tried to argue that the groups didn't have standing to pursue their case because they could have contested the OSMRE mining permits. Plus, administration attorneys said, mining has ceased in the area. But while U.S. District Court Judge Pamela Reeves in Knoxville dismissed some counts based on standing, she agreed that OSMRE still had jurisdiction over area mining during the reclamation process. She also agreed with the environmental groups' ability to contest agency permits didn't preclude them from pursuing other cases. Environmental groups say that this is the first conductivity case focused on the Endangered Species Act and OSMRE mining permits.

Source: Manuel Quiñones, *E&ENews PM*, 12/15/14; and 1/28 and 1/30/15 BACK TO TOP

Duke Scientists Identify New Oil and Gas Wastewater Contaminants

Oil and gas wastewater that is flowing into Appalachian waterways contains high levels of potentially hazardous pollutants, a team of Duke University scientists found. Two contaminants, ammonium and iodide, were present in discharges from both conventional and hydraulically fractured fossil fuel wells, their study showed. "This discovery raises new concerns about the environmental and human health impacts of oil and gas wastewater in areas where it is discharged or leaked directly into the environment," said Avner Vengosh, professor of geochemistry and water quality at Duke's *Nicholas School of the Environment*. "Our data clearly show that the current brine treatment practice in Pennsylvania is not sufficient to remove these contaminants."

When combined with water, ammonium and iodide can be highly toxic. Dissolved ammonium can convert into ammonia, which is poisonous to aquatic life. The Duke team measured ammonium levels as high as 100 mg/l in water samples collected near waste discharge sites. That's more than 50 times U.S. EPA's recommended threshold for protecting water quality. Iodide, in combination with the chlorine used to disinfect drinking water at downstream treatment plants, can catalyze the formation of highly toxic by-products that are not monitored by state or federal regulators.

The finding that these compounds are carried in wastewater from both conventional and unconventional operations is significant because public concern over water contamination has been largely focused on hydraulic fracturing. "Wastewater from both conventional and unconventional oil and gas operations is exempted from the Clean Water Act, which allows their disposal to the environment," Vengosh said. "This practice is clearly damaging the environment and increases the health risks of people living in these areas, and thus should be stopped." The research was published in mid-January in the journal *Environmental Science & Technology.*

Source: Pamela King, *EnergyWire*, 1/14/15 BACK TO TOP

Chemical From WV Spill Traveled Far Downriver

The massive spill of a coal-cleaning chemical into the Elk River near Charleston, WV, a year ago traveled farther downstream than first thought, according to researchers at the U.S. Geological Survey. The researchers said tests showed the chemical – 4-methylcyclohexane methanol, or 4-MCHM – remained in the river for six days after the spill and also was present at low concentrations in area tap water more than six weeks after the spill. Meanwhile, the chemical plume traveled at least 390 miles downstream from *Freedom Industries'* chemical storage facility through Huntington, WV and Cincinnati, OH to Louisville, KY, which could have exposed additional populations to the chemical at low levels, the study said. Nine readings collected in Louisville days after the spill consistently indicated that the 4-MCHM "was well mixed throughout the river by the time it reached these locations," the study said. A similar chemical, methyl 4-methylcyclohexanecarboxylate, was also present in the water, and some residents may have observed its characteristic fruit-like smell in addition to MCHM's licorice-like odor, the researchers said.

"This spill represented a huge challenge for all of the entities who responded to it, as the behavior of these specific components in water environments was largely unknown before the spill," Bill Foreman, a USGS research chemist and the study's lead author, said in a statement. "Researchers had little information on how the spilled chemicals moved through water, their stability or toxicity, or even how to measure them, as published information was either limited or non-existent." No mention was made of potential impacts on the aquatic organisms affected. The findings were published in the journal *Chemosphere*. Coverage of the original spill was included in the January/February/March 2014 issue (Vol. 23, No. 1) of *River Crossings*.

Source: Sam Pearson, *E&ENews PM*, 1/9/15 BACK TO TOP

Diabetes Drug and other Chemical Concerns

The diabetes drug metformin was the most common personal care product found in water tests from Lake Michigan, and researchers are trying to figure out whether it's disrupting the endocrine systems of fish. Scientists at the *School of Freshwater Sciences* at the

University of Wisconsin, Milwaukee (UWM), found the diabetes drug in water samples taken 2 miles off the shore in Lake Michigan. "It was not even on our radar screen," Rebecca Klaper, a professor of freshwater science at UWM, said of the diabetes drug's presence. Klaper said the findings show that contrary to what many once believed, the Great Lakes are not so large that they cannot be disrupted by modern chemicals. Other chemicals the researchers found include caffeine; sulfamethoxazole, an antibiotic; and triclosan, an antibacterial and antifungal chemical used in soap and other products.

Metformin is a first-line treatment for type 2 diabetes and is the most commonly prescribed medicine for the condition. In 2013, about 70 million prescriptions were dispensed, according to *IMS Health*, a drug market research firm. The drug is present in the lake because it is not broken down completely by sewage treatment plants. Recent research by Klaper suggests that metformin in lake water is not just a curious artifact of everyday life. The study looked at the effect of metformin on fathead minnows in the lab that were exposed to the drug at levels found in the lake for four weeks. It found gene expression suggesting disruption of the endocrine system of male fish, but not females. In essence, the males were producing biochemicals that are associated with female minnows. The biochemicals are precursors to the production of eggs. Klaper said that because the minnows are a stand-in for other fish, the changes also could be affecting other species such as perch, walleye and northern pike.

The UWM research confirms what others have found regarding prescription drugs showing up in America's lakes, rivers and streams, said Melissa Lenczewski, an associate professor of geology and environmental geosciences at Northern Illinois University. For years, it was assumed that the volume of water in the Great Lakes was so enormous that any drugs that got through treatment facilities would be diluted to the point that they would not pose a problem, said Lenczewski, who was not a part of the UWM study. That theory itself now is being diluted. Even more concerning are the much higher levels of antibiotics that are being put into rivers and streams near pig farms where the drugs are used to produce larger animals, she said. In addition, strains of antibiotic-resistant bacteria also have been found in water near those farms, she said. "It is very alarming how much we are putting drugs out there in the environment," she said.

Sources: John Fauber, *Milwaukee Journal Sentinel*, 12/31/14; and *Greenwire*, 1/5/15 BACK TO TOP

Algae Blooms Could Spread in Freshwater Lakes

When a massive algae bloom occurred in Lake Erie last summer experts pointed to nutrient runoff from farmland and residential lawns as the driving force behind the blue-green algae's toxic spread. Now a new study, published in the journal *Ecosphere*, has found another driver, the algae themselves. The study's authors say the microorganisms can spread in lakes with low levels of nutrients, suggesting they have a greater capacity to affect a wide range of freshwater lake ecosystems. Blue-green algae, or cyanobacteria, can lead to nitrogen and phosphorus cycling and seem to be able to push a freshwater system toward a high nutrient state, according to Kathryn Cottingham, the study's lead author and a professor of biological sciences at Dartmouth College. "What most people think about them is that cyanobacteria are responders to their environment," said Cottingham. She used the analogy of humans driving the "eutrophication train," with cyanobacteria riding along, benefiting from the increased nutrients. "This study may mean that they are in the driver's seat of the train's engine car with us," she said, adding that controlling nutrient flow into waterways was still critical. "I don't want this to shift the conversation from issues of runoff – cyanobacteria just amplifies [the effect]. We need to get ahold of these drivers first," Cottingham said.

2011 Lake Erie algae bloom - Cleveland.com Photo

Extensive research had previously shown that nitrogen-fixing cyanobacteria can transform dissolved nitrogen from the atmosphere into forms it can use to fuel growth, effectively getting around limited nitrogen availability in the lake. In fact, most of the types of cyanobacteria found in freshwater lakes have this capability, according to the study. Yet most researchers, other than phycologists and limnologists, were unaware of cyanobacteria's ability to use pools of phosphorus found in the lake's sediment, Cottingham said. "Cyanobacteria have an overwintering seed, and when they come out of that, they spend some time in the sediment and can use the phosphorus there," she said. Some types of cyanobacteria are able to regulate their buoyancy, which allows them to travel from nutrient-poor to nutrient-rich parts of the water column. In shallow lakes, the microorganisms can sink all the way down into the sediment to access otherwise inaccessible nutrients.

The researchers used simple models of nitrogen and phosphorus cycling to simulate how cyanobacteria could facilitate the shift from

nutrient-poor to more nutrient-rich lakes. The models were meant as a rough guide for how the process could work and can't be used to describe any specific body of water. Factors like how much nutrients are stratified within the water column and the size of the lake would alter how much nutrient-cycling from cyanobacteria would have an impact, according to the study. "I think this is a very nice synthesis of very complicated literature," said Stephen Carpenter, director of the *Center of Limnology* at the University of Wisconsin, Madison, who was not involved in the study. "It suggests that lakes will have a long memory for nutrient enrichment." Even though countries are investing a lot of money in reducing the flow of nutrients into lakes and reservoirs, freshwater systems could still have problems if nutrients settle into the sediment, Carpenter said. The findings do not bode well for freshwater lakes, which are predicted to experience more algae blooms, at least partly because of climate change. As overall temperatures increase, warmer surface water temperatures will create more favorable conditions for harmful cyanobacteria. Rising levels of dissolved CO_2 will also favor certain kinds of algae growth, and more extreme rainfall will lead to more nutrient runoff into bodies of water, according to the U.S. EPA.

Source: Niina Heikkinen, *ClimateWire*, 1/20/15 BACK TO TOP

2014 – Warmest Year on Record

Last year was the Earth's warmest year on record (since the late 1800's when record keeping began) for both land and ocean surfaces, according to scientists at both NASA and the National Oceanic and Atmospheric Administration (NOAA). Japan's Meteorological Agency also confirmed the finding. NOAA's data show that the average temperature across land and ocean surfaces in 2014 was 1.24 ^{o}F above the 20th-century average, surpassing the previous records in 2005 and 2010. The announcement from NOAA and NASA is particularly notable because last year did not feature an El Niño. Gavin Schmidt, deputy director of NASA's *Goddard Institute for Space Studies* said that the previous three warmest years also featured an El Niño, in which higher temperatures occur in the tropical western Pacific Ocean. Schmidt said further it "would not surprise me at all" if the next El Niño produces another record-breaking year". But Schmidt and other federal scientists also clarified that the link between record warm years and El Niños is a correlation. "Certainly, El Niños add additional heat that makes it more likely" for record temperature, said Tom Karl, director of NOAA's *National Climatic Data Center*. "But we shouldn't be misled that just because it's an El Niño year doesn't mean it's going to be a record year."

The news was quickly heralded by activists as further proof that climate change is a growing problem – particularly since two federal agencies independently came to the same conclusion. Sen. Barbara Boxer (CA), the top Democrat on the Environment and Public Works Committee said, "The data from NASA and NOAA is the latest scientific evidence that climate change is real, and we must act now to protect our families and future generations." "Deniers must stop ignoring these alarms if we are to avoid the worst impacts of climate change," she said.

But global warming skeptics accused NASA and NOAA scientists of making exaggerated claims, and blasted assertions that the change was minuscule and instead merely proved that temperatures were "paused." Last year's temperatures, they said, beat out former record-setting years by too small an amount to prove anything. Marc Morano of *Climate Depot* called it an "immeasurable difference." "The claim of the 'hottest year' is simply a political statement not based on temperature facts," he said in a statement. "'Hottest year' claims are based on minute fractions of a degree while ignoring satellite data showing Earth is continuing the 18 plus year 'pause' or 'standstill.'" David Whitehouse of the *Global Warming Policy Foundation* – a group that is "deeply concerned" about global warming policies – said the rise in temperature is "statistically meaningless." In other words, 2014 was close enough to 2005 and 2010 that it falls within the margin of error. "It is clear beyond doubt by now that there is a growing discrepancy between computer climate projections and real-world data that questions their ability to produce meaningful projections about future climatic conditions," Whitehouse said.

But such skeptics were in the minority. While federal scientists admit that data are constantly being fine-tuned, they say 2014 is undoubtedly the warmest year since records began. The bottom line, according to the federal scientists is: "The Earth is warming".

Sources: Emily Yehle, *Greenwire*, 1/16/15 BACK TO TOP

Humans Pushing Earth Past 'Planetary Boundaries'

At the rate things are going, the Earth in the coming decades could cease to be a "safe operating space" for human beings. That is the conclusion of a paper published in mid-January in the journal *Science* by 18 researchers trying to gauge the breaking points in the natural world. The paper contends that we have already crossed four of nine "planetary boundaries." Those include: (1) the extinction rate; (2) deforestation; (3) the level of CO_2 in the atmosphere; and (4) the flow of nitrogen and phosphorous (used on land as fertilizer) into the ocean. "What the science has shown is that human activities – economic growth, technology, consumption – are destabilizing the global environment," said Will Steffen, lead author of the paper who holds appointments at the Australian National University and the S*tockholm Resilience Center*. These are not future problems, but rather urgent matters, according to Steffen, who said that the

economic boom since 1950 and the globalized economy have accelerated the transgression of the boundaries. No one knows exactly when push will come to shove, but he said the possible destabilization of the "Earth System" as a whole could occur in a time frame of "decades out to a century."

The researchers focused on nine separate planetary boundaries first identified by scientists in a 2009 paper. These boundaries set theoretical limits on changes to the environment, and include ozone depletion, freshwater use, ocean acidification, atmospheric aerosol pollution and the introduction of exotic chemicals and modified organisms. Beyond each planetary boundary is a "zone of uncertainty." This zone is meant to acknowledge the inherent uncertainties in the calculations, and to offer decision-makers a bit of a buffer, so that they can potentially take action before it's too late to make a difference. Beyond that zone of uncertainty is the unknown – planetary conditions unfamiliar to us. "The boundary is not like the edge of the cliff," said Ray Pierrehumbert, an expert on Earth systems at the University of Chicago. "They're a little bit more like danger warnings, like high-temperature gauges on your car." Pierrehumbert, who was not involved in the paper published in *Science*, added that a planetary boundary "is like an avalanche warning tape on a ski slope." The scientists say there is no certainty that catastrophe will follow the transgression of these boundaries. Rather, the scientists cite the precautionary principle: We know that human civilization has risen and flourished in the past 10,000 years – an epoch known as the Holocene – under relatively stable environmental conditions.

No one knows what will happen to civilization if planetary conditions continue to change. But the authors of the *Science* paper write that the planet "is likely to be much less hospitable to the development of human societies." The authors make clear that their goal is not to offer solutions, but simply to provide information. This is a kind of report card, exploiting new data from the past five years. But it's not just a list of Fs. The ozone boundary is the best example of world leaders responding swiftly to a looming environmental disaster. After the discovery of an expanding ozone hole caused by man-made chemicals, chlorofluorocarbons (CFCs), the nations of the world banned CFCs in the 1980's.

This young field of research draws from such disciplines as ecology, geology, chemistry, atmospheric science, marine biology and economics. It's known generally as *Earth Systems Science*. The researchers acknowledge the uncertainties inherent in what they're doing, and point out that technology can potentially provide solutions to many of the environmental problems we face today. But technological innovations often come with unforeseen consequences. Pierrehumbert said we should be wary of becoming too dependent on technological fixes for global challenges. "The trends are toward layering on more and more technology so that we are more and more dependent on our technological systems to live outside these boundaries," he said. "It becomes more and more like living on a spaceship than living on a planet."

Sources: Joel Achenbach, *The Washington Post*, 1/15/15; and Emily Yehle, *E&ENews PM*, 1/15/15 BACK TO TOP

Obama Administration Releases New Data Sets on Ecosystems and Water

The White House in early December released new data sets on water and ecosystems in the hopes that the private sector will be able to use the information to respond to the impact of climate change. Interior Secretary Sally Jewell announced the newly available data at the ACES (*A Community on Ecosystem Services*) conference in Arlington, VA. "The administration is saying these are times of constrained resources, so the President is calling on innovators to leverage the data in ways that can make the nation's communities more resilient to climate change," Jewell said.

The information released is part of the White House Climate Data Initiative launched last March and includes information about stream flow, soil, land cover and biodiversity. It also includes tools to overlay the different data sets on maps to help researchers visualize ecosystems. Previously, the administration has published data sets on sea-level rise, flood risk and agriculture. Jewell said the data would aid conservation efforts by depicting the changes affecting different ecosystems so that environmentalists can identify what steps to take. "We can look at how big a wildlife refuge or a park needs to be to support bird migrations," she said. Jewell noted how the U.S. Geological Survey was able to monitor the impact of Superstorm Sandy to discover the importance of "naturally resilient ecosystems" like marshes in absorbing the force of the storms and said she hoped the data will help scientists and communities be better prepared before future catastrophic events. She also said some of the data sets would help confirm and quantify anecdotal evidence of climate and ecosystem changes.

The release of climate data is meant to enable a new wave of smart conservation that has its roots in Theodore Roosevelt's presidency, she said. While previous conservation efforts have protected specific "special places," Jewell said the data will allow conservation to "move beyond the old way of random acts of kindness and give us a strategic focus." "We can't protect the ecosystem in Yellowstone if we don't look beyond Yellowstone National Park," she said. For example, she said the ongoing debate about whether to list the sage grouse as an endangered species is not just about protecting a specific bird but "about the greater ecosystem that defines the American West."

Source: Ariel Wittenberg, *Greenwire*, 12/9/14 BACK TO TOP

Corps Looks to Private Funding Sources

The nation is falling behind in maintaining its aging levees, dams, ports and harbors and needs to get creative as it seeks ways to pay for the critical projects, U.S. Army Corps of Engineers' (Corps) commander Lt. Gen. Thomas Bostick said in mid-December. Bostick said that finishing all the projects that have been authorized would cost about $23.5 billion but the Corps' annual budget for the work usually hovers around $1.5 billion. He said that figure doesn't include addressing a maintenance backlog as projects – many of them decades old – exceed their design life. "It is going to take you decades to finish the work and then you are going to have new projects here and there," Bostick said, speaking during a *Society of American Military Engineers* conference. "The reality is Congress cannot do this alone. The federal government cannot do this. And the message to local towns and communities and business is we cannot rely on the federal government to solve this fiscal challenge." Bostick said the Corps is looking at alternative means of financing projects, including through public-private partnerships. The question, he said, is how to "monetize the project in such a way that investors would come in and over a number of years get a return on their investment?"

The Corps said that 16 percent of the dams it operates are categorized as extremely or very high risk. Since 2009, delays and interruptions have more than doubled on the nation's inland waterways' locks and dams. There also has been a 50 percent increase in hydropower facility downtime since 2000, the Corps said. Bostick highlighted the findings of the *American Society of Civil Engineers* (ASCE), which has given America's overall infrastructure a D+ grade, its dams a D, its inland waterways a D-, its levees a D- and its ports a C. The group has called for Congress and the Obama administration to come up with a way to pay for infrastructure maintenance and updates to help manage floods. The ASCE noted in its report that the *Association of State Dam Safety Officials* estimates that it will require an investment of $21 billion to repair aging high-hazard dams, while the *National Committee on Levee Safety* said the cost to repair or rehabilitate levees is estimated at $100 billion. "I wouldn't be concerned at this point from a safety perspective. But there are projects, individual projects that are at high risk," Bostick said.

Sources: Heather Hollingsworth, *AP*, 12/10/14; and *Greenwire*, 12/11/14 BACK TO TOP

Interior Department Overhauls Scientific Integrity Policies

The Interior Department in mid-December announced a new scientific integrity policy that officials say will better protect the agency against misconduct. The new policy updates and "strengthens" its 2011 scientific integrity policy by providing more clarity on the complaint and appeals process, creating an ombudsman role and expanding employee training. "Science is at the heart of Interior's mission, so it's important that we continue to lead federal efforts to ensure robust scientific integrity," Interior Secretary Sally Jewell said in a statement. Like other agencies, Interior first issued a scientific integrity policy in response to a 2009 directive from President Obama. The department lists its closed scientific integrity cases on its website and has tasked officials throughout its various agencies with overseeing scientific integrity.

Interior's scientific integrity procedures were put to the test in a recent case where two U.S. Fish and Wildlife Service (USFWS) employees were found to have repeatedly committed misconduct. Internal documents released in February 2014 showed that two supervisors at the agency had purposely ignored staff concerns in order to shrink the habitat of the endangered American burying beetle. Interior's inspector general publicly criticized USFWS Director Dan Ashe in 2013 for not reprimanding the two supervisors – Dixie Porter and Luke Bell – for retaliating against the biologists who uncovered their misconduct. At the time, Ashe told *Greenwire* that his agency had reprimanded Porter and Bell for the misconduct finding but was working to determine the extent of the retaliation.

Michael Halpern, program manager at the *Union of Concerned Scientists' Center for Science & Democracy*, credited Interior's scientific integrity policies with helping to bring those problems to light. "[W]e might not know about these cases, and probably wouldn't have any resolution to them, without a scientific integrity policy in place," he wrote in a December blog post. Still, he added, he sees room for improvement. "Whistleblower protection statements continue to be modest," he said, and questions remain regarding the definition of conflict of interest. The "most glaring flaw," he said, is that although the department has been posting details about scientific integrity cases on its website, it isn't required to do so. "Should the DOI stop publishing closed cases, we'd just have to take their word that the policy is well-implemented."

But the advocacy group, *Public Employees for Environmental Responsibility* (PEER) blasted the new revisions to Interior's scientific integrity policy. The new rules "for protecting scientific integrity actually substantially weaken them," PEER said in a statement. The changes "narrow the scope of the rules, erect barriers against holding miscreant managers accountable and enshroud scientific integrity reviews in secrecy, preventing independent analysis of the facts." Among PEER's complaints is that Interior "blurred" the definition of scientific misconduct in its new policy. According to the watchdog group, several key elements were removed from the definition, including the statement that misconduct includes "intentionally circumventing policy that ensures the integrity of science and scholarship" and "actions that compromise scientific and scholarly integrity." Instead, PEER said the agency cut that definition back by defining scientific misconduct as the "fabrication, falsification or plagiarism in proposing, performing or reviewing scientific activities, or in the products or reporting of the results of these activities." The new policy defines the "loss of scientific integrity" as a "signifi-

cant departure from the accepted standards, professional values and practices of the relevant scientific community."

PEER also accused Interior of blocking scientific integrity reviewers from suggesting any specific personnel actions or other corrective measures and of removing language from the new version stating that employees are responsible for reporting scientific misconduct. "These changes threaten to make a sham out of an already tattered scientific integrity process," PEER Executive Director Jeff Ruch said in a statement. He said that of the 27 scientific integrity complaints processed at Interior since 2011, most were dismissed without any investigation and only two were upheld. Ruch called it "inexplicable" that Interior released the changes to its scientific integrity policy without first taking public comment.

But Interior Department spokeswoman Jessica Kershaw defended the agency's new policy. "The Department of the Interior was the first federal agency to institute a Scientific Integrity policy in the U.S. government and the policy was always meant to be a living document," she said in a statement. Improvements to the revised policy, she added, "include ensuring a positive culture of scientific integrity, encouraging and maintaining an environment of rigorous and honest investigation, open discussion, and constructive peer review, free of political influence that is needed for good science to thrive."

Source: Robin Bravender, *Greenwire*, 12/18 and 12/23/14

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Meetings of Interest

Mar. 22-26: *Upper Mississippi River Conservation Committee and Freshwater Mollusk Conservation Society Joint Meeting*, St. Charles, MO.

Apr. 22-24: *47th Annual Meeting of the Mississippi River Research Consortium*, La Crosse, WI.

Apr. 28-30: *Flow 2015 - Protecting Rivers and Lakes in the Face of Uncertainty*, Insteam Flow Council, Portland, OR.

May 18-22: *2015 Water Microbiology Conference*, Chapel Hill, NC.

Jun. 14-19: *Catchment Science: Interactions of Hydrology, Biology, and Geochemistry 2015*, Andover, NH.

Jul. 26-29: *70th Annual Soil and Water Conservation Society Conference*, Greensboro, NC.

Aug. 23-28: *4th Biennial Symposium of the International Society for River Science (ISRS)*, La Crosse, WI.

Nov. 16-19: *National Working Waterfronts and Waterways Symposium*, Tampa, FL

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Congressional Action Pertinent to the Mississippi River Basin

Climate Change

S. 66. Vitter (R/LA). Prohibits any regulation regarding CO_2 or other GHG emissions reduction in the U.S. until China, India, and Russia implement similar reductions.

H.R. 383. Luetkemeyer, (R/MO) and 17 Co-sponsors. Prohibits U.S. contributions to the *Intergovernmental Panel on Climate Change*, the *U.N. Framework Convention on Climate Change*, and the *Green Climate Fund*.

Conservation

S. 330. Heller (R/NV) and Stabenow (D/MI) and **H.R. 641.** Kelly (R/PA) and 54 Co-sponsors.. Amends the IRS Code of 1986 to make permanent the special rule for contributions of qualified conservation contributions, and for other purposes.

S. 338. Burr (R/NC) and 7 Co-sponsors. Permanently reauthorizes the Land and Water Conservation Fund.

S. 384. Crapo (R/ID) and 3 Co-sponsors. Amends the IRS Code of 1986 to facilitate water leasing and water transfers to promote conservation and efficiency.

H.R. 338. Young (R/AK). Amends the IRS Code of 1986 to encourage charitable contributions of real property for conservation purposes by Native corporations.

H.R. 781. Connolly (D/VA) and 11 Co-sponsors. Amends the IRS Code of 1986 to allow a credit against income tax for qualified conservation contributions which include National Scenic Trails.

Endangered Species

S. 112. Heller (R/NV). Amend the ESA to require the Interior Secretary to publish and make available for public comment a draft economic analysis at the time a proposed rule to designate critical habitat is published.

S. 292. Cornyn (R/TX) and 13 Co-sponsors. Amends the ESA to require publication on the Internet of the basis for determinations that species are endangered or threatened, and for other purposes.

S. 293. Cornyn (R/TX) and 15 Co-sponsors and **H.R. 585**, Flores (R/TX) and 7 Co-sponsors. Amends the ESA to establish a procedure for approval of certain settlements.

Energy

S. 1. Hoeven (R/ND) and 59 Co-sponsors and **H.R. 3,** Cramer (R/ND) and 30 Co-sponsors. Keystone XL Pipeline Act.

Fish Culture

H.R. 393. Young (R/AK) and 6 Co-sponsors. Amends the Federal Food, Drug, and Cosmetic Act to require the labeling of genetically-engineered fish.

FWPCA and Water Quality

S. 234. Vitter (R/LA) and 9 Co-sponsors. Amends the FWPCA to confirm the scope of the authority of the EPA to deny or restrict the use of defined areas as disposal sites.

S. 371. Murkowski (R/AK) and 6 Co-sponsors. Removes a limitation on a prohibition relating to permits for discharges incidental to normal operation of vessels.

H.R. 349. Latta (R/OH) and 12 Co-sponsors. Requires the NOAA Administrator to create an electronic database of research and information on the causes of, and corrective actions being taken with regard to algal blooms in the Great Lakes, their tributaries, and other surface fresh waters, and for other purposes.

H.R. 896. Gibbs (R/OH). Amends the FWPCA to clarify when the EPA has the authority to prohibit the specification of a defined area, or deny or restrict the use of a defined area for specification, as a disposal site under section 404 of such Act, and for other purposes.

H.R. 897: Gibbs (R/OH). Amends the Federal Insecticide, Fungicide, and Rodenticide Act and the FWPCA to clarify Congressional intent regarding regulation of the use of pesticides in or near navigable waters, and for other purposes.

Invasive Species

S. 373. Rubio (R/FL) and 19 Co-sponsors. Provides for establishment of nationally uniform standards governing discharges incidental to the normal operation of a vessels, rolling back water protections against the spread of invasive species through ballast water disposal.

S. 589. Stabenow (D/MI) and 7 Co-sponsors. Prevents the interbasin transfer of aquatic nuisance species between the Mississippi River and Great Lakes watersheds at a lock and dam choke point downstream from Chicago through measures such as electric barriers, carbon dioxide bubble screens, underwater sound cannons and pheromones.

Public Lands

S. 146. Flake (R/AZ) and 4 Co-sponsors. Authorizes funding for national parks, federal refuges and units of national forests during any period in which the Secretaries of Interior or Agriculture are unable to maintain normal levels of operations at the units due to a lapse in appropriations, and for other purposes.

S. 361. Lee (R/UT) and McCain (R/AZ) and **H.R. 435.** Chaffetz (R/UT). Directs the Interior Secretary to sell certain Federal lands in AZ, CO, ID, MT, NE, NV, NM, OR, UT, and WY, previously identified as suitable for disposal, and for other purposes.

H.R. 792. Griffith (R/VA). Provides for no net increase in the total acreage of certain Federal land under the jurisdiction of the BLM, NPS, USFWS, or FS, and for other purposes.

Recreation

S. 225. Thune (R/SD) and Klobuchar (D/MN). Amends the Toxic Substances Control Act to clarify EPA jurisdiction with respect to certain sporting good articles related to hunting and fishing (i.e., lead based materials), and to exempt those articles from a definition under that Act.

S. 263. Crapo (R/ID) and 2 Co-sponsors and **H.R. 578**, Gibbs (R/OH) and 54 Co-sponsors. Protects the right of individuals to bear arms at water resources development projects.

S. 390. Tester (D/MT). Ensures that amounts in the land and water conservation fund are made available for projects to provide recreational public access, and for other purposes.

S. 405. Murkowski (R/AK) and 5 Co-sponsors. Protects and enhances opportunities for recreational hunting, fishing, and shooting, and for other purposes.

H.R. 176. Womack (R/AR) and Westerman (R/AR). Amends WRDA of 1992 to permit the collection of user fees by non-Federal entities in connection with the challenge cost-sharing program for management of recreation facilities, and for other purposes.

H.R. 528. Benishek (R/MI) and 35 Co. sponsors. Facilitates use of and access to Federal public lands for fishing, sport hunting, and recreational shooting, and for other purposes.

H.R. 974. Lummis (R/WY). Directs the Interior Secretary to promulgate regulations to allow the use of hand-propelled vessels on certain rivers and streams that flow in and through certain Federal lands in Yellowstone National Park, Grand Teton National Park, and the John D. Rockefeller, Jr. Memorial Parkway, and for other purposes.

Regulations

S. 226. Paul (R/KY) and 34 Co-sponsors and **H. 427**, Young (R/IN) and 148 Co-sponsors. Requires Congress to approve all new major federal regulations.

S. 280. Portman (R/OH) and 6 Co-sponsors. Improves the efficiency, management, and interagency coordination of the Federal permitting process through reforms overseen by the OMB Director, and for other purposes.

Water Resources

S. 176. Boxer (D/CA) and 2 Co-sponsors and **H.R. 291,** Napolitano (D/CA) and 28 Co-sponsors. Establishes within the EPA a *WaterSense* program to identify, label, and promote water efficient products, buildings, landscapes, facilities, processes, and services.

H.R. 594. Gosar (R/AZ) and 172 Co-sponsors. Preserves existing rights and responsibilities with respect to waters of the U.S., and for other purposes.

H.R. 813. Huffman (D/CA) and 11 Co-sponsors. Supplements the Corps of Engineers; existing authorities to review the operations of reservoirs to encompass climatic and atmospheric trends.

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