2017 National Wetlands Awards

Honoring Excellence in Wetlands Conservation

ENVIRONMENTAL LAW • INSTITUTE®

Environmental Law Institute National Wetlands Awards

May 18, 2017

U.S. Botanic Garden
Washington, D.C.

ENVIRONMENTAL
LAW • INSTITUTE®

Ceremony Program

Reception 6:00 PM

Ceremony 6:30 PM

Welcome & Introduction
John Pendergrass
Environmental Law Institute

Keynote Speaker
Luke Frazza
Trout Headwaters, Inc.

Presentation of 2017 National Wetlands Awards

Conservation and Restoration Award: Gregory Kearns
Presented by
U.S. Forest Service

Education and Outreach Award: Dana Pounds
Presented by
Federal Highway Administration

Science Research Award: Dr. Robert R. Twilley
Presented by
U.S. Fish and Wildlife Service

State, Tribal, and Local Program Development Award: Collis G. Adams
Presented by
U.S. Environmental Protection Agency

Wetland Community Leader Award: Alicia M. Mozian
Presented by
Natural Resources Conservation Service

Celebrating 28 Years of Protecting and Restoring Our Nation's Wetlands

Of all the questions which can come before this nation . . . there is none which compares in importance with the great central task of leaving this land even a better land for our descendants than it is for us.

—Theodore Roosevelt

The five recipients of the 2017 National Wetlands Awards have truly made a difference in protecting and restoring our nation's wetlands. These vital natural resources filter pollutants from our waterways, recharge our aquifers, provide essential habitat to wildlife, buffer coastal storms, reduce the threat of floods, and protect biodiversity. The accomplishments of this year's award recipients will help ensure that future generations understand and benefit from the many services that wetlands provide.

Since 1989, the National Wetlands Awards program has honored more than 200 individuals who have demonstrated extraordinary commitment to our nation's wetlands. The recipients provide inspirational examples of how individual citizens across the country can—and do—make a difference in wetlands conservation, education, and restoration efforts.

2017 Award Recipients

Conservation and Restoration

Gregory Kearns

Maryland-National Capital Park and Planning Commission
Upper Marlboro, Maryland

Education and Outreach

Dana Pounds

Nature's Academy
Bradenton, Florida

Science Research

Dr. Robert R. Twilley

Louisiana State University
Baton Rouge, Louisiana

State, Tribal, and Local Program Development

Collis G. Adams

New Hampshire Department of Environmental Services
Concord, New Hampshire

Wetland Community Leader

Alicia M. Mozian

Sasco Brook Pollution Abatement Committee
Westport, Connecticut

Photo Credit: *'Alae'Ula (Hawaiian Gallinules)*, Randal T. Bartlett

Conservation & Restoration

Gregory Kearns is a Naturalist for the Maryland-National Capital Park and Planning Commission. For over 34 years, he has worked for the Patuxent River Park and Jug Bay Natural Area where he has made a recognized impact in habitat restoration and avian research. Beginning in the 1980s, he spearheaded an intensive study of the Sora rail, a migratory marsh bird, and connected the decline of the Sora to the loss of the wild rice and it's link to the exponential population growth of resident Canada geese that decimated the rice. In 2000, he launched a restoration project in Jug Bay that led to the full recovery of wild rice wetlands in the area and has benefitted the Sora as well as many other species. Apart from this, he has worked tirelessly as an educator, incorporating citizen science into his programs and advocating wetland conservation through presentations at schools, senior centers, and environmental organizations throughout the Chesapeake Bay Watershed.

Wild rice is one of the most valuable wetland plants, both in nutrient absorption and as a high-energy seed source for migrating birds at Jug Bay on the Patuxent, which I like to refer to as one of nature's gas stations. I feel very fortunate to live and work on the beautiful Patuxent River.

—Gregory Kearns

Photo Credit: Jon Mcray

Education & Outreach

Dana Pounds is the Executive Director and Founder of Nature's Academy, an outdoor educational organization that enhances science literacy and fosters environmental stewardship. She has developed a suite of experiential learning programs that integrate STEM (Science, Technology, Engineering, Math), Common Core, and Florida Sunshine State Standards. By offering "Edventures" at no cost, Pounds has successfully extended these programs to local low-income, minority students from underserved schools in Manatee County. Now, nearly every fifth grader in the county has access to Nature Academy's outdoor science education. Through her decade of work with Nature's Academy, she has engaged over 55,000 students, teachers, and chaperones from 41 states and five countries. With plans to expand the program to neighboring counties, and eventually the entire Tampa Bay region, she continues to work toward inspiring new generations to become guardians of the wetlands.

Science education isn't just my life's work. Science education literally saved my life. So, I feel compelled to inspire youth to fall in love with science in the hope that someday they may use science to save the lives of other people and the planet itself.

—Dana Pounds

Photo Credit: Nature's Academy

Science Research

Dr. Robert R. Twilley is the Executive Director of the Louisiana Sea Grant College Program and a Professor in the Department of Oceanography and Coastal Sciences at Louisiana State University. As an internationally renowned researcher, he has produced 148 highly cited, peer review publications, including the first global carbon budget of mangroves and work on the blue carbon value of mangroves. As a leader in wetland science, he has pioneered a variety of research partnerships, collaborations, and outreach projects. In addition to his work in the Mississippi River Delta, he has also researched mangroves in Florida, Columbia, and Ecuador. He has testified in several U.S. House and Senate subcommittee hearings and delivered briefings to a variety of other arms of the U.S. government. During his more than 30-year career, he has brought in over $13 million in grant funding and supervised 31 graduate students.

I have always felt a strong commitment to not only teach and train the next generation of wetland scientists, but to also dedicate my time in communicating how science can improve society. It has been one of the most challenging, but rewarding, parts of my career. It is great to see so much commitment by young scientists to make a difference in society by communicating the value of new discoveries in solving some really complex problems.

—Dr. Robert R. Twilley

Photo Credit: Baton Rouge Area Foundation

State, Tribal, & Local Program Development

Collis G. Adams is the Administrator of the New Hampshire Department of Environmental Services (NH DES) Wetlands Bureau. Since 2000, he has been responsible for streamlining the state's wetland permit application review process and improving the state's enforcement response processes. He also served as chair of the Association of State Wetland Managers, during which he helped create several capacity-building projects serving states and tribes in wetland regulation, restoration, monitoring and assessment, and development of wetland water quality standards. He is an active member of the NH DES "Silver Jackets," an incident and recovery response team that works to increase awareness, reduce flood risk, and facilitate partnerships related to mitigating and recovering from flooding events. He also served on his municipal conservation commission, during which time he was instrumental in designating prime wetlands and writing local regulations to establish wetland and surface water buffers.

Developing a wetlands program cannot be accomplished through the efforts of one person. It takes a team of dedicated and passionate professionals, and I am fortunate enough to be team captain.

—Collis G. Adams

Photo Credit: Laura Collis

Wetland Community Leader

Alicia M. Mozian is the leader of the Sasco Brook Pollution Abatement Committee in the town of Westport. Following the closure of shellfish beds at the mouth of the brook due to poor water quality, the committee was formed in 1991 to promote collaboration and best management practices for water quality improvement. Under her purview, the Committee has helped design and guide a number of initiatives, including public outreach, infrastructure improvements, dam repair planning, and amending Westport's water-related policy. In addition, she has dedicated her life to education, policy reform, enforcement, and funding for water quality improvement by working with the local health district, universities, and nonprofits. She serves as a Board of Director representing Fairfield County for the Connecticut Association of Conservation and Inland Wetland Commissions. She is also a board member of the Southwest Conservation District, a town representative on the Long Island Sound Assembly, and serves on the Aquarion Water Company Citizen Advisory Board.

I feel that there is a significant disconnect between property owners and the environment. However, I have found that many care and want to do the right thing, but they don't know what that is. I believe part of my job is to educate our residents on how what they do on their property has an impact on our wetlands, and then to give them advice on stewardship practices that protect these resources.

—Alicia M. Mozian

Photo Credit: Westport Now

2017 Selection Committee

Allison Aldous
The Nature Conservancy
Portland, OR

Mark Biddle
DE Dept. of Natural Resources
Dover, DE

Greg DeYound
The Westervelt Company
Tuscaloosa, AL

Michael Eberle
U.S. Forest Service
Washington, DC

Royal Gardner
Stetson University College of Law
Gulfport, FL

Richard D. Gitar
Fond du Lac Reservation
Cloquet, MN

Janine Harris
NOAA Fisheries
Silver Spring, MD

Dwane Jones
University of the District of Columbia
Washington, DC

Maka'ala Ka'aumoana
Hanalei Watershed Hui
Hanalei, HI

Kathleen Kutschenreuter
U.S. Environmental Protection Agency
Washington, DC

Caroline Oswald
National Fish and Wildlife Foundation
Bloomington, MN

Jonathan Phinney
U.S. Fish and Wildlife Service
Falls Church, VA

John Rissler
Natural Resources Conservation Service
Washington, DC

Michael Ruth
Federal Highway Administration
Washington, DC

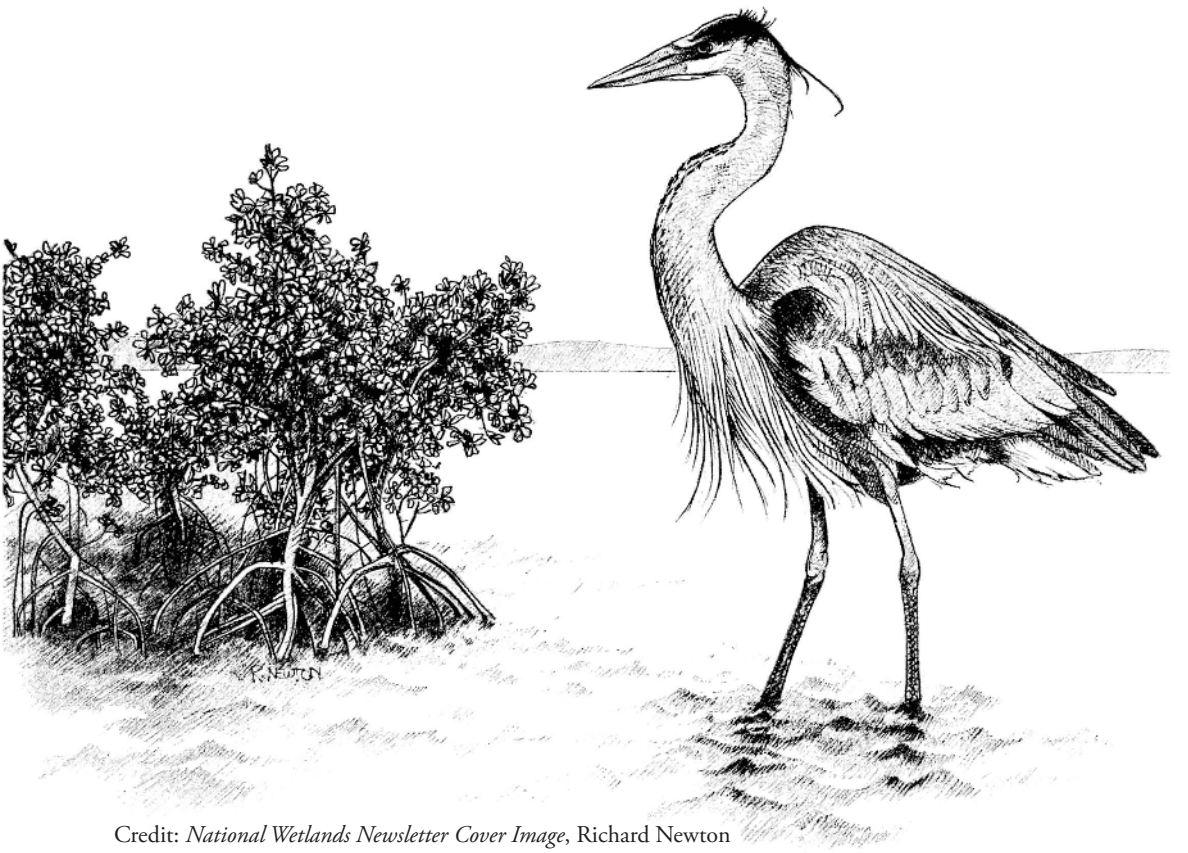
Michael Sprague
Trout Headwaters, Inc.
Livingston, MT

Jeff Trulick
U.S. Army Corps of Engineers
Washington, DC

Photo Credit: *'Alae 'Ula (Hawaiian Gallinules)*, Randal T. Bartlett

Wetlands News

For nearly 38 years, ELI's *National Wetlands Newsletter* provided readers with the latest wetlands news, cases, and insights from experts in the field. In commemoration of the former *Newsletter*, this year's National Wetlands Awards program features a variety of experts providing updates and unique perspectives on wetlands. Topics cover mitigation, recent developments on the Clean Water Rule, an overview of the restoration of China's coastal wetlands, and financing coastal resilience. We have also launched the *Wetlands and Waters* e-mail list to provide a new way to share the latest research, resources, events, and more from ELI. Please contact wetlands@eli.org to join.



Credit: *National Wetlands Newsletter Cover Image*, Richard Newton

Contributors

Donna Collier is Manager and founder of Valencia Wetlands Trust and Chairwoman of the National Environmental Banking Association. She purchased then restored the degraded Louisiana Pacific sawmill property in Priest River, Idaho, into the first and largest wetland bank in Idaho.

Baoshan Cui is the Dean and a Professor at the School of Environment, Beijing Normal University, and the Chief Scientist for a project concerning the impact of reclamation activities on coastal wetlands and ecological restoration. His expertise covers ecology, ecohydrology, and ecological network for coastal wetlands.

Shannon Cunniff is the Director of Coastal Resilience at Environmental Defense Fund in Washington, D.C., leading strategies to improve coastal community resilience that involve natural infrastructure. She has over 35 years of experience in coastal zone and water resources science and policy.

Craig Denisoff is owner of Craig Denisoff Consulting, a habitat mitigation consulting company focusing on wetland and species mitigation and ecosystem trading programs. He has consulted to international governments, U.S. regulatory agencies, and California on the establishment of mitigation and habitat trading programs.

Diego Herrera is a Natural Infrastructure Economist at Environmental Defense Fund in Washington, D.C., developing financing mechanisms to support private investments in nature-based coastal resilience. He has a Ph.D. in Environmental Economics and Policy from Duke University.

Patrick Parenteau is a Professor of Law and Senior Counsel Environmental and Natural Resources Law Clinic at the Vermont Law School. He is well-recognized for his expertise regarding water quality and wetlands, environmental policy and litigation, and land use and property rights.

Michael Sprague is President and founder of Trout Headwaters, Inc. (THI), an aquatic resource restoration design/build firm headquartered in the Paradise Valley of Montana. For more than 20 years at THI, Sprague has helped advance sustainable river, wetland, and habitat restoration projects and technologies.

Universal Principals of Mitigation

By Michael Sprague, Donna Collier, and Craig Denisoff

The National Environmental Banking Association (NEBA) has recently released a white paper that highlights the universal principles of compensatory mitigation.[1] Drawing upon hundreds of years of collective mitigation banking experience, NEBA recommends that these principles be applied to all mitigation projects, including wetlands, irrespective of the regulatory agency or the particular impact. These principles were compiled from the best management practices of well-respected mitigation bankers in the United States, and NEBA considers these policies to be the bedrock of effective mitigation banking.

Compensatory mitigation is environmental improvement specifically undertaken to offset unavoidable impacts created after all reasonable avoidance and minimization have been achieved. Project impacts range widely not only from different resource types, but to different impact types ranging from cultural to biological to physical. Wetlands are the resource that impactors are most commonly required to offset.

The need for compensatory mitigation arises from many different government programs, including some that are nonregulatory. Wetland compensatory mitigation is sometimes a requirement for agriculture-related programs, while the mitigation of scenic views sometimes is a required land management goal. The vast majority of mitigation, however, is regulation-driven. As a condition of receiving a project permit, applicants are required to offset any ecological damage the project will cause. Where regulations require offsets, the compensatory mitigation must be reasonably proportionate to the impact. The cost of mitigation can significantly impact the economic feasibility of a project.

Consistent, high-compensatory mitigation standards are necessary to ensure that like other offset projects, wetland mitigation banks fully achieve their necessary ecological functions in perpetuity. Constraints on both regulatory agencies and project applicants can cause permitting delays. Statistics show that these delays could be significantly shortened by quality, uniform mitigation standards applied to advance mitigation projects. Lengthy and expensive project-specific offset deliberations could also be avoided.

Studies have shown that advance compensation projects, most commonly mitigation and conservation banks, are consistently the most efficient means for enabling compliance. Unfortunately, history has shown that inconsistent quality standards for different forms of mitigation offsets has allowed significantly ecologically inferior projects, often the cheapest option, to be used as offsets. It is no surprise then that those lower quality projects simply add to cumulative losses instead of offsetting them with genuine, high-quality restoration.

The following compensatory mitigation principles endorsed by NEBA are considered universal. They apply regardless of which regulatory authority is requiring mitigation or what form of mitigation is being applied.

Equivalency: All compensatory mitigation, whether on private or public lands, should adhere to equivalent standards. Project proponents responsible for environmental impacts are usually in highly competitive markets forcing them to seek the least expensive

1. National Environmental Banking Association, Universal Principals of Mitigation (2017), *available at* http://environmentalbanking.org/wp-content/uploads/2017/04/Universal-Principles-of-Compensatory-Mitigation.pdf.

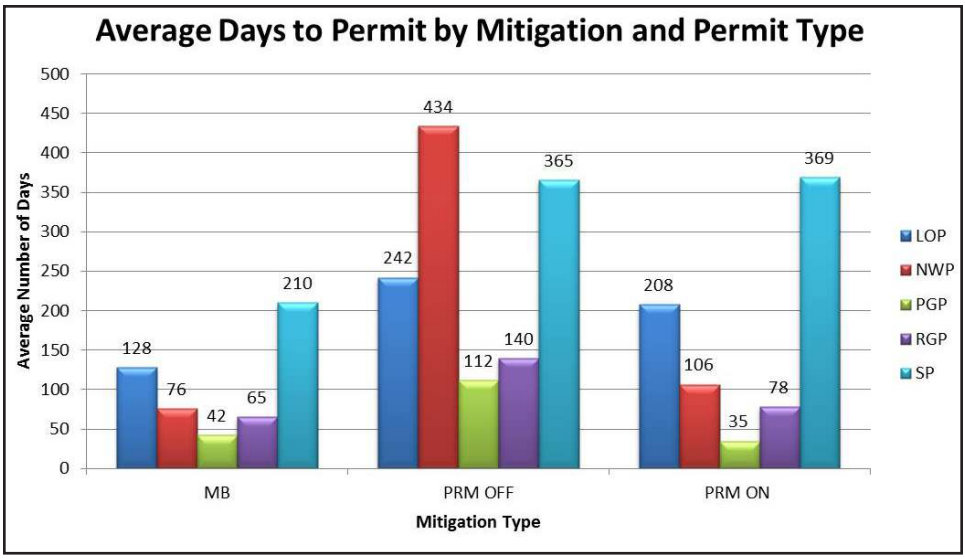


Figure 1: Graph showing the average number of days to permit for different mitigation types: Mitigation bank (MB); Offsite Permittee-Responsible Mitigation (PRM OFF); Onsite Permittee Responsible Mitigation (PRM ON). It also indicates permit type: Letter of Permission (LOP); Nationwide Permit (NWP); Programmatic General Permit (PGP); Regional General Permit (RGP); Standard Permit (SP).

mitigation alternative. Only when regulators insist upon meaningful and uniform mitigation standards can consistent quality and pricing across different mitigation options be achieved. Equivalency eliminates demand for substandard, less expansive offsets options. Regardless of the source, all compensatory mitigation should be held to equivalent standards.

Durability: While common sense would dictate that an offset should have a life span at least equal to that of the impact, making that match can be problematic, particularly for permanent impacts. Permanent mitigation projects require ongoing maintenance and monitoring to be durable. These activities need to be funded by a long-term trust account. A big portion of the cost of mitigation and conservation banks is funding the bank's long-term trust. Mitigation projects not required to maintain a long-term trust fund have a distinct, lower cost advantage over better guaranteed advance mitigation. They also have a much higher failure rate. Compensatory mitigation should be durable for the life of the impact.

Assurance: Financial assurance is a vital prerequisite for all compensatory mitigation. Without it, there is great risk with all mitigation projects. Financial assurances provide a monetary guarantee that the mitigation project will not fail to be completed should the bank sponsor become either unable or unwilling to complete the project. Financial assurances are "risk insurance" for compensatory mitigation and to have true value, they need to be payable immediately upon agency demand. Assurance is so important because mitigation providers with little or no remaining financial risk in their projects have little or no incentive to guarantee the successful completion of their project, or avoid project failure. Financial assurances are recommended to ensure providers do not default on mitigation projects.

Advance Mitigation: A thorough examination of the 2001 National Research Council (NRC) report Compensating for Wetland Losses Under the Clean Water Act shows that incentive-based wetland mitigation banking performed better than both permittee-responsible mitigation and in-lieu fee banking. The reasons are obvious: wetland banks not

only performed their function in advance of impacts, they also had the added security of financial assurance mechanisms attached to ensure that project sponsors were motivated to see the projects succeed. Mitigation projects that demonstrate success before being allowed to offset impacts are much less likely to fail. Compensatory mitigation performs best when created in advance of impacts.

Additionality: Because compensatory mitigation was designed to offset actual resource loss, it is imperative that the compensatory offsets perform functions that would not have naturally occurred. This additionality standard prevents mitigation from being used to replace a natural function that would have occurred anyway. Additionality measures are most often easy to recognize on private land projects, but can be much harder to identify on public land projects. Mitigation should demonstrate additionality: restoration activities above those normally expected.

Scientific: Mitigation projects should be designed, assessed, and managed with a thorough scientific foundation. This process starts with collection of baseline data and analysis to establish site conditions. Only then can an adaptive management, restoration, and financial assurance plan be created. This method allows probable unknowns to be identified, accounted for, and shown transparently to any interested parties. Advance mitigation projects are best-suited to demonstrate the scientific foundation of ecological improvement from baseline to present-day conditions. Compensatory mitigation should be based on scientific data with successful monitoring and transparent reporting.

Adaptive: Because of the complexity of many biological and physical systems, accurately predicting outcomes is difficult. This is why an adaptive management plan is so important. It allows project sponsors to adjust and respond to the specific project needs as the project matures. This adaptive plan should be included in the initial mitigation plan and should detail how the plan and parties will react when new information dictates a change in the plan. Compensatory mitigation plans should include adaptive management to anticipate likely unknowns.

The concept is simple. Shortcuts and least expensive options have been shown to lead to failed or even abandoned projects. Conversely, projects that adhere to these basic universal principles have been proven to not only lead to shorter and more consistent permitting times, they most importantly give environmental impact offset projects the greatest chance to perform their prescribed function—in perpetuity. ■

Repealing and Replacing the Clean Water Rule Is Harder Than It Looks

By Patrick Parenteau

On February 28, 2017, as one of his very first acts after taking office, President Donald J. Trump issued an Executive Order[1] directing the Administrator of the U.S. Environmental Protection Agency (EPA) and the Assistant Secretary of the Army to review the Barack Obama Administration's Clean Water Rule[2] and "publish for notice and comment a proposed rule rescinding or revising the rule." The Executive Order further directed that, in carrying out this review, the agencies "shall consider interpreting the term 'navigable waters'. . . in a manner consistent with the opinion of Justice Antonin Scalia in *Rapanos v. United States*."[3]

In his plurality opinion, Justice Scalia said that "waters of the United States" includes only "relatively permanent, standing or continuously flowing bodies of water" and "does not include channels through which water flows intermittently or ephemerally." He further stated that the term includes "only those wetlands with a continuous surface connection to bodies that are 'waters of the United States' in their own right, so that there is no clear demarcation between the two."

On March 6, EPA and the U.S. Army Corps of Engineers (the Corps) published a notice of intent to "review and rescind or revise" the Clean Water Rule.[4] In the notice, the agencies noted their "inherent authority to reconsider past decisions and to revise, replace or repeal a decision to the extent permitted by law and supported by a reasoned explanation." In a clear signal of their intentions, the agencies further asserted that "such a revised decision need not be based upon a change of facts or circumstances." Rather, said the agencies, "a change in administration brought about by the people casting their votes is a perfectly reasonable basis for an executive agency's reappraisal of the costs and benefits of its programs and regulations."

On April 10, EPA Administrator E. Scott Pruitt followed up with a letter[5] to a select list of state and local officials announcing his intent to follow a two-step process (starting with an initial rulemaking to rescind the 2015 rule and followed by promulgation at some unspecified future date) of a revised definition of waters of the United States, consistent with President Trump's Executive Order. Pruitt stated that he was "very much looking forward to the opportunity to sit at the table with our state and local partners across the country to discuss the rule and develop an approach to address this significant issue while keeping the states at the forefront of our mission." Conspicuously absent from the guest list were any Tribes or environmental organizations.

1. Exec. Order No. 13778 (Feb. 28, 2017), *available at* https://www.whitehouse.gov/the-press-office/2017/02/28/presidential-executive-order-restoring-rule-law-federalism-and-economic.
2. Clean Water Rule: Definition of "Waters of the United States," 80 Fed. Reg. 37054 (June 29, 2015).
3. Rapanos v. United States, 547 U.S. 715 (2006).
4. Intention to Review or Rescind or Revise the Clean Water Rule, 82 Fed. Reg. 12532 (Mar. 6, 2017), *available at* https://www.epa.gov/sites/production/files/2017-02/documents/cwr_fr_notice_prepublication_version.pdf.
5. Letter from E. Scott Pruitt, to Intergovernmental Association on the Waters of the United States Rule (Apr. 10, 2017), *available at* https://www.eenews.net/assets/2017/04/12/document_pm_04.pdf.

A leaked internal EPA document titled, *2017 WOTUS2 Draft Proposed Rule Text*, revealed that Pruitt seems intent on adopting Justice Scalia's test, lock, stock, and barrel. For starters, the draft rule completely eliminates the so-called "(a)(3)" waters—such as intrastate lakes, rivers, streams, and "isolated" wetlands—that are currently covered under the 1986 regulations.[6] Next, it defines "tributary" to mean "a relatively permanent, standing, or continuously flowing body of water that contributes flow" to traditionally navigable waters. It then redefines the term "adjacent" to mean wetlands that have a "continuous surface connection" to covered waters.

If this is, in fact, the rule that Pruitt intends to propose, it would constitute the greatest reduction in the geographic scope of the Clean Water act (CWA)[7] since its passage in 1972. Although it is impossible to precisely quantify the amount of streams, wetlands, lakes, and other water bodies that would no longer be subject to the requirements and protections of the CWA, it is fair to say that the potential impacts on wetlands, water quality, and biodiversity would be substantial. In a 2002 study, the U.S. Fish & Wildlife Service (FWS) documented 19 categories of "geographically isolated wetlands," defined as "wetlands with no apparent surface water connection to perennial rivers and streams, estuaries, or the ocean."[8] The study covered nearly 19,000 square miles, located in all major U.S. watersheds, and in more than 20 ecoregions. FWS concluded that these isolated wetlands perform many of the functions and benefits (e.g., water storage, nutrient retention and cycling, sediment retention, carbon sequestration, and wildlife habitat) ascribed to non-isolated wetlands. All of these wetlands would be at risk of losing federal protection under the Justice Scalia test.

Whether the states could or would pick up the slack is likewise problematic. According to the Association of State Wetland Managers, 23 states have a wetland permitting program.[9] Only two states—Michigan and New Jersey—have assumed the §404 permit program. Thirty-five states have their own definition of wetlands. In significant parts of the country, there is strong reliance on §401 water quality certification processes to condition federal permits and licenses rather than state dredge and fill permitting. As the jurisdiction of the CWA shrinks, these states will lose some of their §401 authority. State budgets are also tight and there is no reason to think that money for wetland regulation will be increasing. Plus, the 2018 budget submitted by President Trump calls for a drastic cut (31%) in EPA's budget (including grants that support many state water quality programs), a sharp reduction in staff levels (over 3,000 full-time employees), and a consolidation of the regional offices. Even if the U.S. Congress restores some of the cuts President Trump wants, it is clear that at least for the foreseeable future the states will be called upon to shoulder more of the load of implementing environmental programs under several federal laws.

Further, according to a study by the Environmental Law Institute, "Over two-thirds of states, 36 in all, have laws that could restrict the authority of state agencies or localities to regulate waters left unprotected by the federal Clean Water Act."[10] Twenty-eight states have laws that could operate to either prohibit state agencies from regulating waters more stringently than the CWA or limit their authority to do so. Thirteen states have laws providing that their water quality regulations can be "no more stringent than" federal law,

6. 33 C.F.R. §328.3
7. 33 U.S.C. §§1251-1387.
8. U.S. Fish & Wildlife Service, Geographically Isolated Wetlands (2002), *available at* https://www.fws.gov/wetlands/Documents/Geographically-Isolated-Wetlands-A-Preliminary-Assessment-of-Their-Characteristics-and-Status-in-Selected-Areas-of-the-United-States-NI.pdf.
9. *State Wetlands Programs*, Association of State Wetlands Managers, https://www.aswm.org/wetland-programs/state-wetland-programs.
10. Bruce Myers et al., State Constraints: State-Imposed Limitation on the Authority of Agencies to Regulate Waters Beyond the Scope of the Federal Clean Water Act (2013), *available at* http://www.eli.org/sites/default/files/eli-pubs/d23-04.pdf.

meaning that federal standards become the "ceiling" rather than the "floor" of protection. Twenty three states have a "qualified" stringency requirement that makes it more difficult for states to regulate more stringently than EPA.

So, where do we go from here? Pruitt has said his first step will be to repeal the Clean Water Rule, forthwith. That will require a rulemaking with public notice and comment as required by the Administrative Procedure Act (APA).[11] Once the repeal is final, it will immediately be subject to challenge in court. But which court? That issue is currently pending before the U.S. Supreme Court in the cases that have challenged the Clean Water Rule. The question presented is whether challenges to rules such as the Clean Water Rule (and presumably its successor) must be brought in the courts of appeal under CWA §509 or in district courts under APA §706. The Court rebuffed a request by the Trump Administration that it hold off deciding that question and will hear arguments in fall 2017, which means we probably will not have an answer until the end of the year at the earliest.

Once the jurisdictional question is settled, the substantive issue will be whether the decision to abruptly repeal the Clean Water Rule—a rule 10 years in the making—is lawful. Agencies are free to change course provided they have good reasons for doing so. As the Supreme Court said in the seminal *State Farm* case, "[A]n agency changing its course by rescinding a rule is obligated to supply a reasoned analysis for the change beyond that which may be required when an agency does not act in the first instance."[12] Recently, the Court reinforced this principle in *Encino Motorcars, LLC v. Navarro*, emphasizing that an agency must "show that there are good reasons for the new policy."[13] Absent such a carefully "reasoned analysis," Pruitt's *volte face* would be arbitrary and capricious.

So, that brings us to the question of what exactly are the reasons for repealing and replacing the Clean Water Rule with something more to the liking of the late Justice Scalia and the president? It is no secret that Pruitt considers the Rule to be an illegal "overreach" that trenches on state sovereignty. In fact, he led the charge of state attorneys general challenging the Rule. Does he have a point? Not really. The Rule was carefully crafted by the Obama Administration to meet the "significant nexus" test articulated by Justice Anthony Kennedy in his concurring opinion in *Rapanos*. Justice Kennedy's lengthy opinion was a point-by-point rebuttal of Justice Scalia's interpretation limiting the jurisdiction of the CWA to "relatively permanent" water bodies and wetlands with a "continuous surface connection." Indeed, Justice Kennedy said, "these limitations are without support in the language and purposes of the Act or in our cases interpreting it." At another point, he said "the plurality reads nonexistent requirements into the Act."

EPA and the Corps were on firm legal ground basing the Rule on Justice Kennedy's significant nexus test. Thus far, there have been 10 circuit court decisions that have parsed the fractured decision in *Rapanos.* Four said that Justice Kennedy's test is controlling in most situations.[14] Three said waters meeting either Justice Kennedy's or Justice Scalia's tests are jurisdictional.[15] Two said it was not necessary to decide since the waters met both.[16] One

11. 5 U.S.C. §§500 et seq.
12. Motor Vehicle Mfrs. Ass'n v. State Farm Ins., 463 U.S. 29 (1983).
13. 136 S. Ct. 2117 (2016).
14. Northern California River Watch v. City of Healdsburg, 496 F.3d 993 (9th Cir. 2007) (superseding the original opinion published at 457 F.3d 1023 (9th Cir. 2006)), *cert. denied*, 552 U.S. 1180 (2008); United States v. Gerke Excavating, Inc., 464 F.3d 723 (7th Cir. 2006), *cert. denied*, 552 U.S. 810 (2007); Precon Dev. Corp. v. U.S. Army Corps of Eng'rs, 633 F.3d 278 (4th Cir. 2011); Cordiano v. Metacon Gun Club, Inc., 575 F.3d 199 (2d Cir. 2009).
15. United States v. Johnson, 467 F.3d 56 (1st Cir. 2006), *cert. denied*, 552 U.S. 948 (2007); United States v. Donovan, 661 F.3d 174 (3d Cir. 2011), *cert. denied*, 132 S. Ct. 2409 (2012); United States v. Bailey, 571 F.3d 791 (8th Cir. 2009).
16. United States v. Cundiff, 555 F.3d 200 (6th Cir.), *cert. denied*, 130 S. Ct. 74 (2009); United States v. Lucas, 516 F.3d 316 (5th Cir.), *cert. denied*, 555 U.S. 822 (2008).

said Justice Kennedy was the exclusive test. None said Justice Scalia is controlling.[17] In short, Justice Kennedy's test comes closest to being the law of the land at this point. There is, of course, much speculation on how the current Supreme Court might view a new rule based on Justice Scalia's test.

Some have pointed to Justice Kennedy's cryptic comments in the recent *Hawkes* case, in which he said "the reach and systemic consequences of the CWA remain a cause for concern."[18] That comment should not be read as a repudiation of the robust, ecologically based analysis he brought to bear in *Rapanos*. It may well reflect Justice Kennedy's frustration with the fact that 10 years after his call for a rule clarifying the scope of waters of the United States there is still no rule. He certainly will not be happy to see a rule repudiating his test for Justice Scalia's. Nor can Justice Neil Gorsuch be counted on to accord much deference to a crabbed statutory interpretation given his outspoken criticism of the *Chevron* doctrine.[19]

Thus, it could be hard to find five votes to uphold a rule that dramatically reduces protection for the nation's waters. Additionally, a case cannot be made that the existing rule is not based on sound science, let alone that a Justice Scalia-based rule would be any better. In fact, it would be a good deal worse. The "Connectivity Report" that EPA commissioned represents the state-of-the-science on the connectivity and isolation of waters in the United States.[20] It was peer-reviewed by a select group of independent experts assembled by the National Academy of Sciences. It was further peer-reviewed by the Science Advisory Board (SAB), which concluded that the study "provides an adequate scientific and technical basis for the proposed rule."[21] The SAB noted that watershed science would support an even stronger definition of "waters of the United States" than what EPA was proposing. Nothing has changed in the meantime; the science is on the side of the existing rule.

Finally, there is no policy justification for repealing and replacing the existing rule with a Justice Scalia rule. The oft-stated objective of the CWA is to "restore and maintain the chemical, physical and biological integrity of the nation's waters." Pollution, as we know, does not respect political boundaries. Watersheds, as we also know, are interconnected. To be effective, pollution control must go to the sources wherever they may be located within the watersheds. The planning, permitting, funding, research, technical assistance, and public education programs of the CWA all depend on the scope of the waters it covers. Drawing artificial lines limiting that scope—based more on ideology than law or science—will surely defeat the noble aims of the nation's premier water quality law. As Massachusetts Attorney General Maura Healey said:

> Rescinding the Clean Water Rule would allow uncontrolled pollution of these critical water resources, and could also harm the competitiveness of our state economies by forcing us to spend more to clean up the pollution of deregulated waters coming from upstream states that refuse to control such pollution in order to benefit their economies.[22] ■

17. United States v. Robison, 505 F.3d 1208 (11th Cir. 2007), *cert. denied sub nom.* McWane v. United States, 555 U.S. 1045 (2008).
18. Hawkes Co. v. U.S. Army Corps of Eng'rs, 136 S. Ct. 1807 (2016).
19. *See* Gutierrez-Brizuela v. Lynch, 834 F.3d 1142 (10th Cir. 2016).
20. U.S. EPA, Connectivity of Streams and Wetlands to Downstream Waters: A Review & Synthesis of the Scientific Evidence (2015).
21. Letter from the EPA Science Advisory Board, to EPA Administrator Gina McCarthy (Sept. 20, 204), *available at* https://yosemite.epa.gov/sab/sabproduct.nsf/36a1ca3f683ae57a85256ce9006a32d0/518D4909D94CB6E585257D6300767DD6/$File/EPA-SAB-14-007+unsigned.pdf.
22. Press Release, AG Healey Joins Coalition of Attorneys General Opposing President Trump's Executive Order That Guts Clean Water Protections (Feb. 28, 2017), *available at* http://www.mass.gov/ago/news-and-updates/press-releases/2017/opposing-trump-rescinding-clean-water-rule.html.

China's Coastal Wetlands: Reclamation Impacts and Ecological Restoration

By Baoshan Cui

In China, coastal wetlands have been increasingly lost due to land reclamation activities that have been widely adopted to meet the growing demand of land under rapid economic development and population growth. In this article, we will discuss the relationship between these activities and economic development, damaged components of coastal wetlands, prominent problems in the restoration projects, and solutions of restoration and ecological compensation.

There are many different types of land reclamation activities for different utilization, mainly including salt pans, mariculture (e.g., sea cucumber and mollusk farms), industrial production, agriculture, oil fields, coastal defense structures, ports, and tourism. Since the founding of the People's Republic of China, the development of land reclamation in the country has progressed in four distinctive phases: land adapted for (1)salt pans (at early stages of the founding of the People's Republic of China); (2) agriculture (1960s-1970s); (3) mariculture (1980s-1990s); and (4) infrastructure (since the 21st century). Temporal and spatial developments of these reclamation activities are significantly characterized by their large scales, rapid growth, broad scope, and multiple types.

Reclamation of wetlands is closely related to economic development. In particular, wetlands reclaimed to develop salt pans and mariculture are closely tied to China's gross domestic product (GDP). The relationship is well-illustrated by an inverted U-shape curve. As shown in Figure 1, the growth of salt pans has passed the peak of the inverted U-shape curve, while the peak of the inverted U-shape curve for mariculture is predicted to be reached when the size of mariculture becomes compatible with per capita GDP $5,000 to 7,000. This may help to explain why coastal mariculture has been growing rapidly, while the salt pans are declining in recent years.

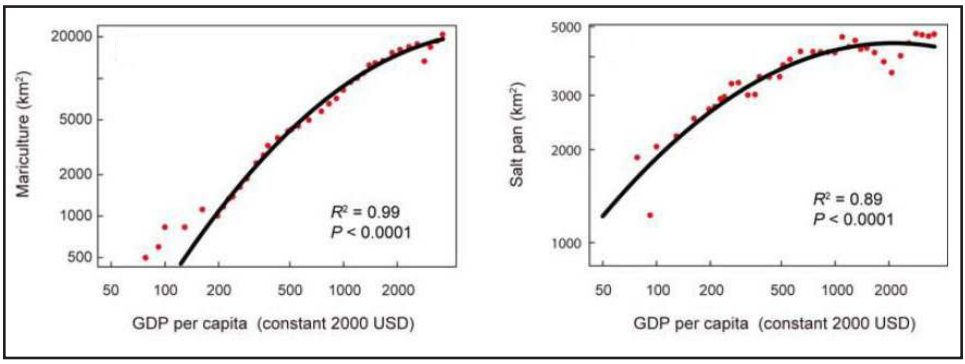


Figure 1: The relationship between GDP per capita and land reclaimed in kilometers squared (km^2) for two selected reclamation activities (mariculture and salt pans).

While land reclamation brings in considerable economic benefits, these practices have exerted huge impacts on the ecosystem of coastal wetlands in China. Our research shows that biodiversity and annual average change of macrozoobenthos biomass in coastal wetlands are significantly correlated with the intensity of reclamation. However, some species seem to respond to the intensity differently. For example, with the increasing coastal reclamation intensity, the total biodiversity, species richness, and biomass of Polychaeta and Echinodermata, decrease linearly, whereas the richness and biomass of mollusks and crustaceans first increase and then decrease.

To combat the extensive loss of coastal wetlands, a total of 1,011 coastal wetlands restoration projects have been implemented in China, covering tidal marshes, sandy beaches, mangroves, seagrass beds, coral reefs, coastal waters, and others (e.g., oyster reefs). China's history of restoration efforts can be roughly split into three phases. In Phase 1 (1950s-1980s), the restoration projects focused only on small-scale transplantation and restoration of mangroves. No projects concerning other types of wetlands were conducted during this period. In Phase 2 (1980s-2000), the government started several small-scale restoration projects that focused on mangrove restoration and recovery of fisheries in coastal waters. In Phase 3 (2001-present), the government increased the amount of funding on ecosystem restoration for coastal wetlands. During this period, the restoration projects for various coastal ecosystems (e.g., salt marshes, mangroves, seagrass beds, coral reefs, and coastal waters) have all increased steadily. However, the effects of these restoration projects are not all up to expectations. Possible reasons contributing to the ineffectiveness include the lack of systematic planning, support of solid research, long-term monitoring and adaptive management, and participation of nongovernmental organizations and local communities.

Focusing on damaged coastal wetlands, we have proposed two modes of ecological restoration. One emphasizses individual wetland patch and the other targets restoration of connectivity among wetland patches (also known as wetland network). For the individual wetland patch, we focus on the key ecological processes of coastal wetlands, including interspecific facilitation and competition, herbivory, physical stress, nutrient inputs, microtopography, recolonization, and life cycle of plants. The network restoration strategy is based on the restoration of hydrological and biological connectivity (e.g., trophic cascade and genetic flow) among wetland patches. Also, we have proposed ecological compensation for damaged coastal wetlands. A model based on no net loss of biodiversity has been developed to determine the minimum compensation rate when the investigated coastal wetlands are to be reclaimed. The ecological compensation can be implemented through on-site compensation, off-site compensation, and economic compensation.

In conclusion, land reclamation has stimulated economic development at the expense of coastal wetland ecological value. To support sustainable economic growth, appropriate regulations based on solid scientific research on the interconnection of "economy-reclamation-wetland degradation" should be imposed on land reclamation, and continuous efforts on conservation and restoration of coastal wetlands from all parties involved throughout the world are demanded. ■

Financing Wetland Restoration to Build Real Coastal Resilience

By Diego Herrera and Shannon Cunniff

Sea-level rise and the increase in the frequency of extreme weather events will continue to affect coastal cities throughout the 21st century.[1] Communities across the globe will need additional resources to adapt to new conditions and maintain the qualities that attracted them to the shore—jobs, esthetics, and recreation—in a cost-effective manner aligned with their values and interests. Therefore, interest is growing in flood risk-reduction measures that include wetlands and other natural infrastructure and nature-based defenses that simultaneously support ecosystems and associated benefits to human populations.[2] Environmental Defense Fund (EDF) and other conservation-minded organizations are exploring ways to tap the financial sector's emerging interest in funding conservation and coastal resilience and determine what is necessary to ensure commensurate support for restoration and protection of coastal habitats.

It is well established that riparian floodplains and wetlands reduce flood heights and reduce exposure to flooding on humans. Cities across the globe have successfully installed "green infrastructure" to recreate the absorptive capacity of lost wetlands and open natural spaces, to lessen the impacts of storm runoff on urban streams and storm drain systems. Coastal cities facing threats from extreme weather can further lower their risk by restoring and maintaining salt marshes, coral reefs, mangroves and other wetland forests, and wide beaches. These restored environments provide ecosystem services such as reducing erosion, absorbing floodwaters, lowering wind speed, attenuating waves, and in some cases slowing and absorbing storm surges. We know where and how we can *confidently* deploy natural defense solutions,[3] and we are learning more from modeling and implemented projects to better define their operating parameters or functional limits. Natural infrastructure offers several advantages over traditionally engineered, hardened solutions and may, in some circumstances, perform better and cost less than these solutions.[4] For example: installations of living shorelines cost $50 to $100 per foot less than bulkheads and riprap solutions, which cost approximately $500 to $1,200 per foot[5]; coral reefs reduced wave heights as much as or more than constructed low-crested detached breakwaters and did so at a lower median cost[6]; an oyster reef breakwater cost approximately $1 million per mile, while standard rock

1. Ning Lin et al., *Hurricane Sandy's Flood Frequency Increasing From 1800 to 2100*, 113(43) Proceedings of the National Academy of Sciences 12071-75 (2016).
2. So-Min Cheong et al., *Coastal Adaptation With Ecological Engineering*, 3 Nature Climate Change 787-91 (2013).
3. Shannon Cunniff & Aaron Schwartz, *Performance of Natural Infrastructure and Nature-Based Measures as Coastal Risk Reduction Features*, Environmental Defense Fund (2015).
4. Mark D. Spalding et al., *Coastal Ecosystems: A Critical Element of Risk Reduction*, 7(3) Conservation Letters 293-301 (2013); Mark D. Spalding, *The Role of Ecosystems in Coastal Protection: Adapting to Climate Change and Coastal Hazards*, 90 Ocean & Coastal Management 50-57 (2014); Antonio B. Rodriguez et al., *Oyster Reefs Can Outpace Sea-Level Rise*, 4 Nature Climate Change 493-7 (2014); B.G. Reguero et al., *Coastal Risks, Nature-Based Defenses and the Economics of Adaptation: An Application in the Gulf of Mexico, USA*, 1(34) Coastal Engineering Proceedings 25 (2014).
5. Chesapeake Bay Foundation, *Living Shorelines for the Chesapeake Bay Watershed* (2007).
6. Filippo Ferrario et al., *The Effectiveness of Coral Reefs for Coastal Hazard Risk Reduction and Adaptation*, 5 Nature Communications (2013).

breakwater would cost $1.5 to $3 million per mile for the equivalent amount of storm protection[7]; and soft shore options can be 30% to 70% less costly than a traditional seawall approach.[8] Nevertheless, much depends on site-specific conditions and needs.

Increasingly, we are seeing "hybrid" designs, where a mix of nature-based and traditional hardened storm-hazard reduction features are integrated to take advantage of the best both have to offer. One example is the "horizontal levee" proposed for the San Francisco Bay, where recreation of tidal flats, salt marsh, and coastal grasslands form a grassy dike with a seawall embedded inside. Another is Louisiana's 2017 Coastal Master Plan, a 50-year landscape-scale plan for coastal restoration and hurricane storm surge protection that includes marsh creation, sediment diversions, hydrologic restoration and other natural features, along with structural risk-reduction measures such as levee systems and non-structural measures like elevating and acquiring residential properties.

It is worth noting that a recent study by RMS, one of the leading companies providing risk analytics to the insurance industry, quantified the economic benefits of coastal wetlands in reducing property damage from storms and flooding in the northeastern United States. It found that coastal wetlands saved more than $625 million in avoided flood damages from Hurricane Sandy across the northeastern United States.[9] This study also examined the benefits of wetlands for 200 storm events in Ocean County, N.J., and found that areas behind existing marshes would have an average of 20% less property losses than areas where marshes have been lost and that damage reduction benefits from salt marshes would be much higher for properties at lower elevations.

> "... coastal wetlands saved more than $625 million in avoided flood damages from Hurricane Sandy across the northeastern United States."

The scale of adaptation needed to cope with the effects of rising seas and coastal storms is daunting. Even with an infusion of diverse sources of government funds, additional means of financing projects will likely be essential to building more resilient coastal communities. In fact, conservation and adaptation projects already face a shortage of funds globally.[10] Public and philanthropic funding alone cannot finance investments needed to address climate change mitigation and adaptation.

Currently, about $52 billion per year flows to conservation projects, the bulk of it in public and philanthropic funds. The best estimates suggest that $300 to $400 billion per year is needed to preserve healthy ecosystems on land and in the oceans.[11] With respect to climate adaptation, cost estimates range from $70 to $100 billion per year globally by 2050.[12] Currently, less than 20% of climate finance is focused on adaptation, and almost none of that is coming from the private sector.[13]

7. The Nature Conservancy. *Green Infrastructure Case Studies* (2013).
8. G. Lamont et al., *Greening Shorelines to Enhance Resilience: An Evaluation of Approaches for Adaptation to Sea Level Rise* (2014).
9. Siddharth Narayan et al., *Coastal Wetlands and Flood Damage Reduction: Using Risk Industry-Based Models to Assess Natural Defenses in the Northeastern USA* (2016).
10. Credit Suisse AG et al., *Conservation Finance: Moving Beyond Donor Funding Towards an Investor-Driven Approach* (2014).
11. Credit Suisse Group AG & McKinsey Center for Business and Environment, *Conservation Finance: From Niche to Mainstream: The Building of an Institutional Asset Class* (2016).
12. Global Adaptation & Resilience Investment Working Group, *Bridging the Adaptation Gap: Approaches to Measurement of Physical Climate Risk and Examples of Investment in Climate Adaptation and Resilience* (2016); World Bank, *The Economics of Adaptation to Climate Change* (2010).
13. Jay Koh & Siguler Guff, *Global Adaptation & Resilience Fund (GARF): First Fund to Invest in Climate Adaptation and Resilience Tools and Solutions* (2016).

However, private investors could help close more than half the gap between the funding that is needed and what is available for conservation by profitably financing projects in areas such as sustainable agriculture, habitat protection, water quality, and forest and marine conservation.[14] The number of investors seeking projects that generate market-rate financial returns as well as environmental and social benefits, i.e., *impact investors*, is increasing.[15] While still representing less than 1% of global investment assets, the impact investing sector is expected to grow from $77 billion to about $700 billion by 2020.[16]

Notably, the conservation subsector is growing faster than the broader impact market.[17] These trends suggest that there could be an opportunity for more participation from private investors in projects that generate both conservation and adaptation benefits given adequate mechanisms and project design. The fast development of the *green bonds* market could also support the design of financing tools for investing in nature-based coastal resilience. The issuance of green bonds went from $2.6 billion in 2012 to $41.8 billion in 2015, and was estimated to reach $100 billion in 2016.[18]

The evidence base for the risk-reduction benefits from natural infrastructure is growing,[19] and there is a potential for these benefits to be effectively measured and valued in a way that financial markets can understand and incorporate into their products.[20] Nevertheless, investors also have certain expectations tied to their investments, in particular, precise quantification of the risk-return characteristics of the investment vehicles they are using. Proper risk-adjustment on investment returns and measureable conservation impacts will be key to fully develop and scale-up such tools. To these ends, the Marine Resources group within the Climate Bonds Initiative is developing eligibility criteria for marine-related investments under the Climate Bonds Standard, which could incorporate elements of resilience. The recently launched Coalition for Private Investments in Conservation (CPIC) has also created a working group to develop a blueprint for coastal resilience investments.

In January 2017, EDF hosted a workshop to advance efforts to define new sustainable approaches for financing coastal resilience that recognize the value of natural infrastructure. World-class experts, representing a balanced subset of interests and knowledge, evaluated the potential for innovative financing mechanisms such as green bonds, resilience bonds, pay-for-success models, blended finance approaches, as well as established mechanisms such as federal and state programs to support nature-based coastal resilience projects. As a result, EDF and its partners are now designing an environmental impact bond with a pay-for-success component that would allow the state of Louisiana to attract private capital through bonding to support the Coastal Master Plan restoration projects,[21] and help close a known funding gap.[22] The potential savings from early investments in restoration[23] would allow the state to pay back investors once the natural infrastructure has achieved a satisfactory performance. This model could serve as a blueprint that other regions across the United States and the globe could use to accelerate investments in nature-based resilience.

14. Jeffery Schub et al., *Green and Resilience Banks: How the Green Investment Bank Model Can Play a Role in Scaling Up Climate Finance in Emerging Markets*, Natural Resources Dendense Council (2016).
15. *Id.* at 12.
16. J.P. Morgan, *Spotlight on the Market: The Impact Investor Survey* (2014); Abhilash Mudalair et al., *2016 Annual Impact Investor Survey* (6th ed. 2016).
17. NatureVest & EKO, *Investing in Conservation: A Landscape Assessment of an Emerging Market* (2014).
18. Climate Bonds Initiative, *Bonds and Climate Change: The State of the Market in 2016* (2016).
19. *Id.* at 10.
20. RE:bound, *Leveraging Catastrophe Bonds: As a Mechanism for Resilient Infrastructure Project Finance* (2015).
21. Coastal Protection and Restoration Authority, *Louisiana's Comprehensive Master Plan for a Sustainable Coast* (2012).
22. Mark Davis et al., *Financing the Future: Turning Coastal Restoration and Protection Plans Into Realities: How Much Is Currently Funded?*, Tulane Institute on Water Resources Law & Policy (2015).
23. The Water Institute of the Gulf, *Future Costs of Marsh Creation Projects in Coastal Louisiana: Summary of Methodology* (2016).

Mangroves provide important wind and wave attenuation for coastal communities. Photo Credit: Shannon Cunniff

In general, there exists a real potential to integrate mature financing mechanisms with innovative concepts to attract new private investors in coastal resilience. Linking a well-established municipal bonds market to developments in the green bonds market by adding pay-for-success elements that shift the restoration projects' risks from public entities to private investors appears especially promising. Sophisticated financing structures may work well for big coastal cities with technical capacity, but less so for rural areas with fewer resources. Moreover, the use of specific innovative tools will depend largely on the actual scale of the resilience projects, policy drivers, market conditions, and known revenue streams for restoration.

EDF aims to ensure that restoration of coastal habitats is included in financed coastal resilience projects by identifying and addressing knowledge gaps, pursuing proof-of-concept projects, and defining metrics of success that increase private investors' confidence in nature-based solutions and their multiple dividends. ■

Sponsors

ELI would like to thank the sponsors of the 2017 National Wetlands Awards for their help in making this year's awards possible. Their support was crucial in raising awareness on the importance of wetlands protection and in recognizing the work of this year's five award recipients.

THI TROUT HEADWATERS, INC.

Experience *EcoBlu*™

PRINCE GEORGE'S AUDUBON SOCIETY

The National Wetlands Awards program is administered by the Environmental Law Institute and supported by the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, Natural Resources Conservation Service, U.S. Forest Service, NOAA Fisheries, and the Federal Highway Administration. ELI coordinates the awards program, while our federal agency partners provide financial support, serve on the selection committee, or participate in the ceremony. For more information about the National Wetlands Awards program, visit our website at www.nationalwetlandsawards.org.

The Environmental Law Institute makes law work for people, places, and the planet. With its non-partisan, independent approach, ELI promotes solutions to tough environmental problems. The Institute's unparalleled research and highly respected publications inform the public debate and build the institutions needed to advance sustainable development.

ENVIRONMENTAL LAW • INSTITUTE®

Front/Back Photo Credit: *Bayou De View,* Larry Smith (1997 National Wetlands Awardee)