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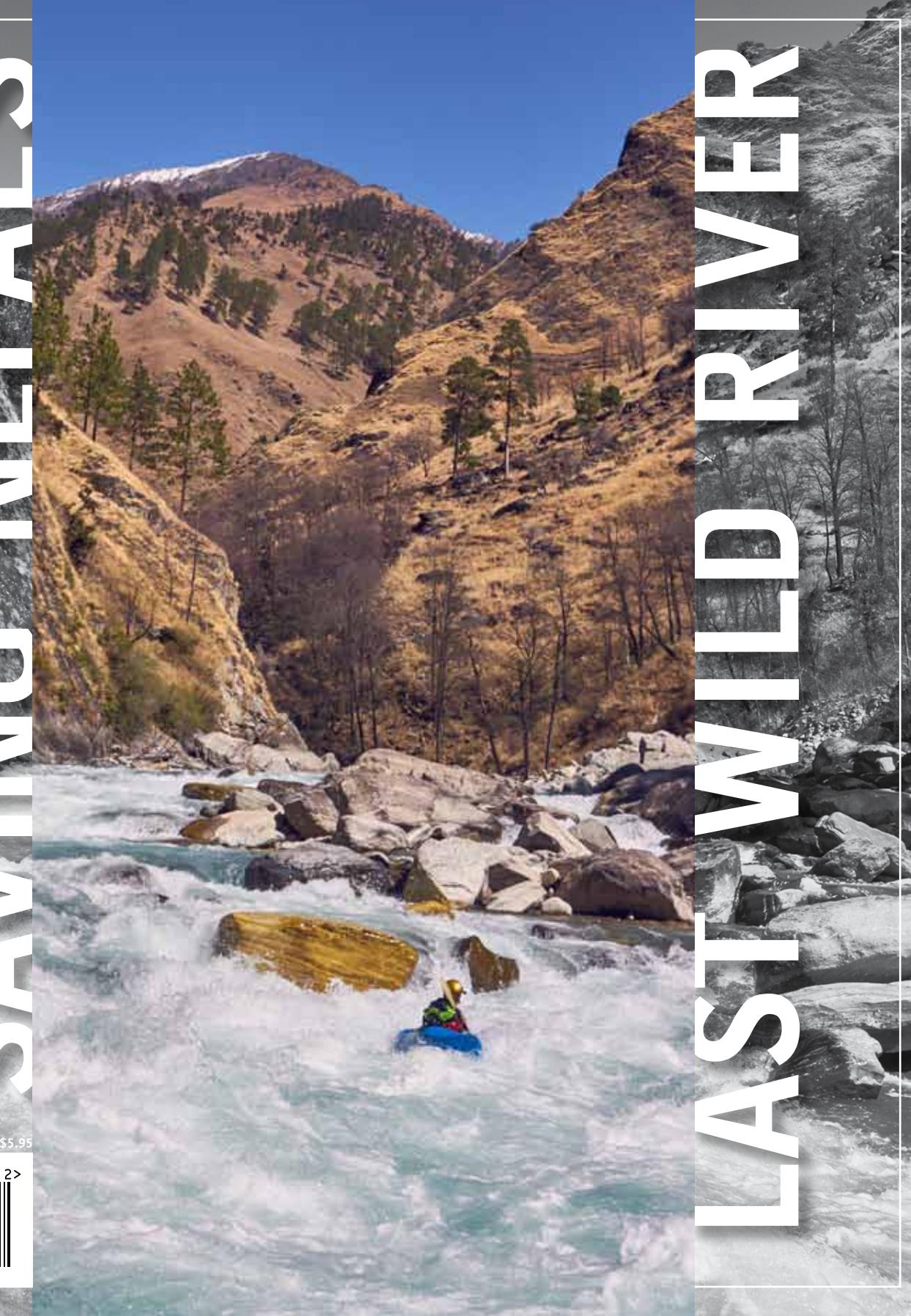
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The signature of John Paul DeJoria, written in a cursive script.

John Paul DeJoria,  
Co-founder and Chairman of the Board  
Photographed with his son (and Joe)

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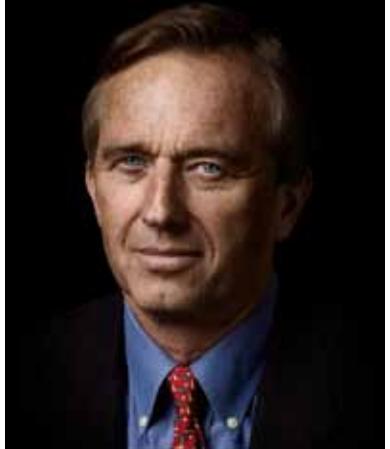
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LETTER FROM THE PRESIDENT,  
ROBERT F. KENNEDY, JR.

# HORSEMEN OF THE APOCALYPSE

Not long ago, the legendary economist Amory Lovins showed me two photos, taken 10 years apart, of the New York City Easter Parade. A 1903 shot looking north from midtown showed Fifth Avenue crowded with a hundred horse-and-buggies and a solitary automobile. The second, taken in 1913 from a similar vantage on the same street, depicted a traffic-jam of automobiles and a single horse and buggy.

That momentous shift occurred because, over a 13-year period, Henry Ford had dropped the nominal price of the Model-T by 62 percent. Wealthy New Yorkers led the transition, and the remainder of America quickly followed.

Between 1918 and 1929, according to Stanford University lecturer Tony Seba, American car ownership rocketed from eight percent of Americans to 80 percent – because DuPont and General Motors had devised a financial innovation called “car loans,” which soon accounted for three quarters of auto purchases. The buggy manufacturers never saw it coming.

Compare that platform for disruption to marketing in today’s solar industry. Over the past five years, photovoltaic-module prices have dropped 80 percent, and analogous home-solar-financing innovations have spread like wildfire. Three quarters of California’s rooftop solar installations – including the system atop my own home – have been innovatively financed, with no money down. NRG Solar leased me a rooftop array with zero cost to myself and guaranteed a 60 percent drop in my energy bills for 20 years. Who wouldn’t take that deal?

And the costs continue to drop every day. The price of utility-scale solar plants has also plummeted dramatically, to around a billion dollars a gigawatt (compared to three-to-five billion per gigawatt to construct a new coal or gas plant, and six-to-nine billion for a nuclear plant.) We can make energy by burning prime ribs if we choose to, but any rational utility seeking the cheapest, safest form of energy is going to choose wind or solar. That’s

why, according to the Federal Energy Regulatory Commission, in the first eleven months of 2016 renewable energy supplied more than 50 percent of newly installed electrical-generation capacity—surpassing natural gas, nuclear power, coal and oil combined.

Let’s face facts. The carbon incumbents are looking at their own imminent apocalypse. And the real savings for solar and wind comes at the back end – zero fuel costs. Unlimited

photons rain down on the earth every day for free. Transitioning to clean fuel only requires that we build the infrastructure to harvest and distribute the photons, and that infrastructure will bless America with a magical promised era of free fuel forever.

The internal-combustion engine is racing toward the same kind of seismic disruption as the horse and buggy. According to calculations by John Walker of the Rocky Mountain Institute, the current operating cost of an electric car is about one-tenth that of an internal-combustion engine. And the range and performance of EVs now exceed those of traditional gasoline-powered cars. That’s why the world’s 15 top auto companies all launched new EV models in 2015.

If you believe in free markets, then the day of the internal combustion engine is over. The markets have already seen the future. The top 50 coal companies are now either in Chapter 11 bankruptcy or on the brink of it. The largest three—Arch, CONSOL and Peabody—have lost 80 percent of their value over the last two years. Observing this landscape, Lovins remarked to me, “The meteor has hit. The dinosaurs are doomed. It’s just that some of them are still walking around causing trouble.”

Amid these rich indices of imminent change, America, prior to the 2016 election, was on the verge of leading the global transformation away from destructive reliance on the filthy, poisonous, addictive, warmongering fuels from hell to a sunny new age of innovation and entrepreneurship, of abundant and dignified jobs, of a democratized energy system and widespread wealth-creation, powered by the clean, green, healthy, wholesome and patriotic fuels from heaven. But the present administration is doing all it can to pull us back from that position.

Renewable energy sources like wind and solar create high-paying jobs, promote small businesses, give us local, resilient power and reduce dependence on foreign carbon fuels. They are good for our economy, our national security and for democracy.

And every American will eventually benefit from the cornucopia of economic, political and health-giving bounties that will accompany a decarbonized nation. There will be no more poisoned air and water, but instead clean rivers and bountiful oceans, with fish that are safe to eat. No more exploded mountain ranges. No more crippling oil spills in the Gulf of Mexico, or Alaska or Santa Barbara. We will no longer worry about acid rain deforesting our purple mountains majesty and sterilizing our blue lakes. No more fretting about acidified oceans destroying our coral reefs, and causing the collapse of global food chains and fisheries. Ozone- and particulate-pollution won’t sicken and kill millions of our citizens, damage crops and corrode buildings. Tyrannical petro-states will no longer be able to subjugate their peoples and victimize their neighbors. And there will be an end to oil wars.

While this portrait of the future is enticing to most Americans and consistent with the historical idealism of an exemplary nation, it is a fearful nightmare for a certain segment of our population, which is willing to sacrifice the planet and to mount all-out war to prevent the realization of that new world. We are engaged, as Abraham Lincoln declared, “in a great civil war,” a successor to the cataclysm of the 1860s that our country endured to end an archaic and immoral energy-system dependent on enslaved human labor. The entrenched interests who profited from that system were willing to sacrifice our country and more than half-a-million lives to maintain their power and profits.

Now, instead of a slave-holding gentry, the entrenched defenders of the system are the carbon tycoons cited in a book I recently co-wrote with Dick Russell titled *Horsemen of the Apocalypse*.



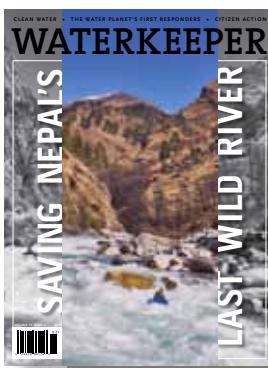
THE TWO PHOTOS ABOVE, OF THE NEW YORK CITY EASTER PARADE, WERE TAKEN 10 YEARS APART. A 1903 SHOT LOOKING NORTH FROM MIDTOWN SHOWED FIFTH AVENUE CROWDED WITH A HUNDRED HORSE-AND-BUGGIES AND A SOLITARY AUTOMOBILE. THE SECOND, TAKEN IN 1913 FROM A SIMILAR VANTAGE ON THE SAME STREET, DEPICTED A TRAFFIC-JAM OF AUTOMOBILES AND A SINGLE HORSE AND BUGGY. LIKE THE BUGGY MAKERS OF THAT EARLIER AGE, THE CARBON-BASED INDUSTRIES OF TODAY ARE LOOKING AT THEIR OWN IMMINENT COLLAPSE.

NATIONAL ARCHIVES AND RECORDS ADMINISTRATION, RECORDS OF THE BUREAU OF PUBLIC ROADS

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These are forces of ignorance and greed that are determined to liquidate the natural riches of our planet for cash. Russell makes no bones about the fact that their moral compass is pointed straight at hell. Like the Horsemen in the Book of Revelation, their actions are propelling humanity toward a dystopian nightmare. Leading the charge are David and Charles Koch, whose industries are a template of “disaster capitalism,” whose corporate headquarters are the command-center of an organized scheme to undermine democracy and impose a corporate kleptocracy that will allow billionaires to profit from mass extinction in our biosphere and the end of civilization.

But in the revolution of renewable energy they will meet their personal apocalypse.



## ON THE COVER:

Karnal River Waterkeeper Megh Ale is leading the fight to save the Karnali, Nepal's last free-flowing river, from a proposal for a massive dam.

Photo by Anup Gurung

Design by BoyBurnsBarn/John Turner

# WATERKEEPER

M A G A Z I N E



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The official magazine of Waterkeeper Alliance

Globally, the paper industry is the single largest industrial consumer of water and the third greatest emitter of greenhouse gases.

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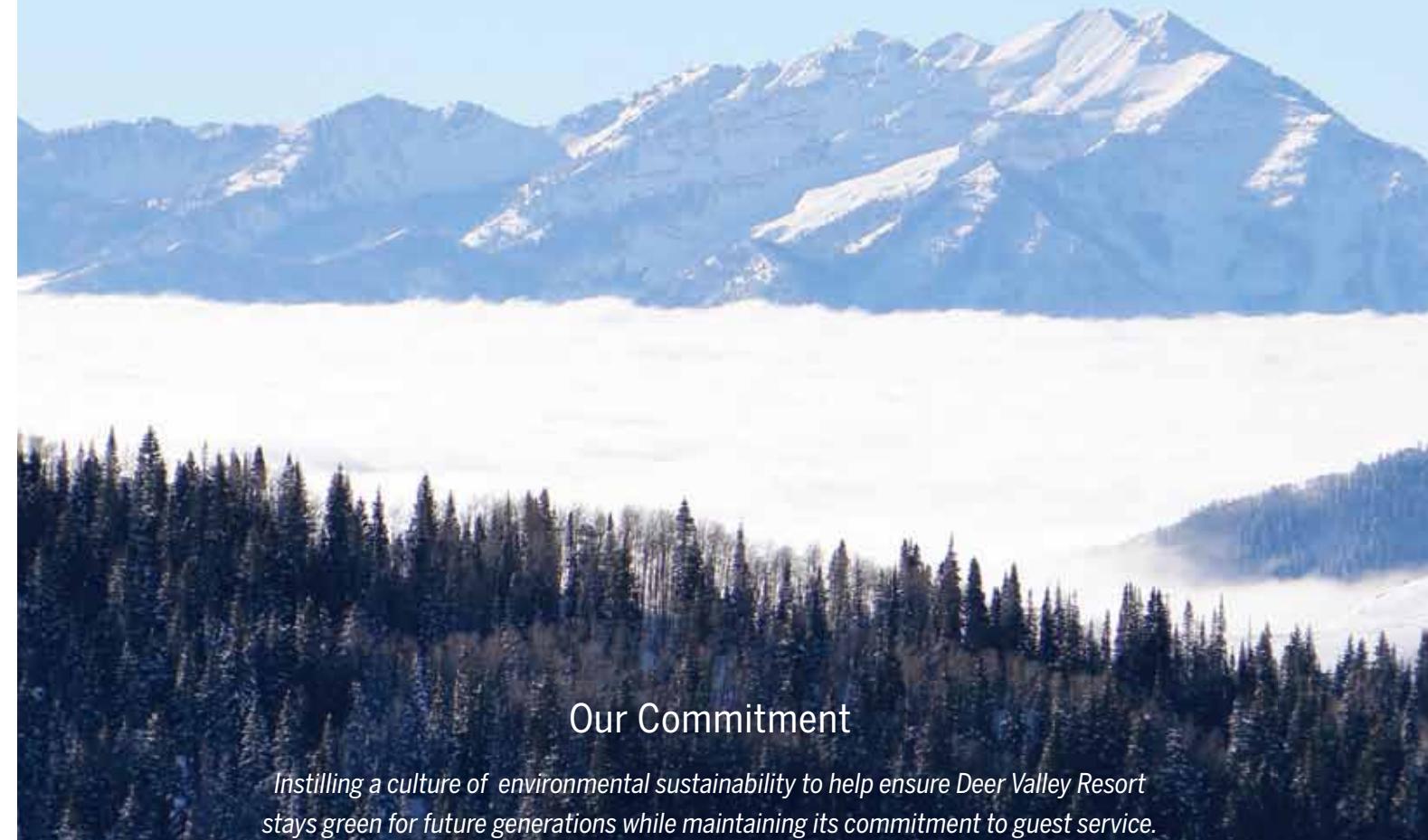
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# Who Is Waterkeeper Alliance?



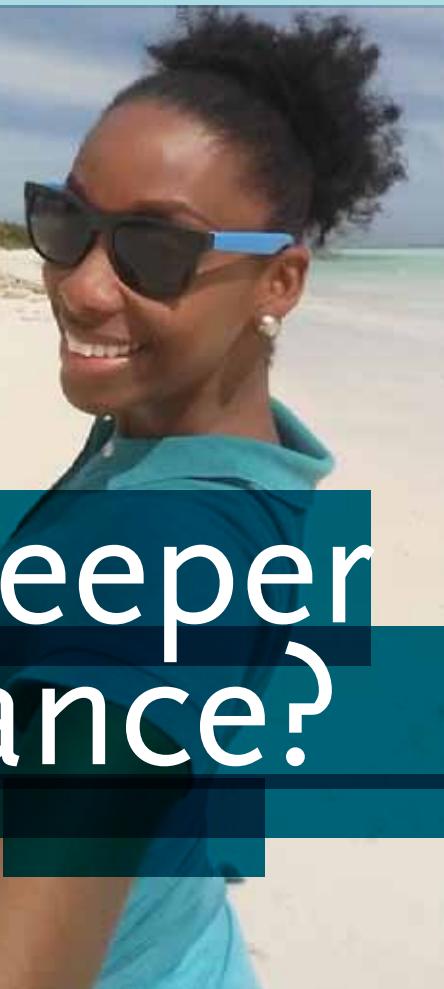
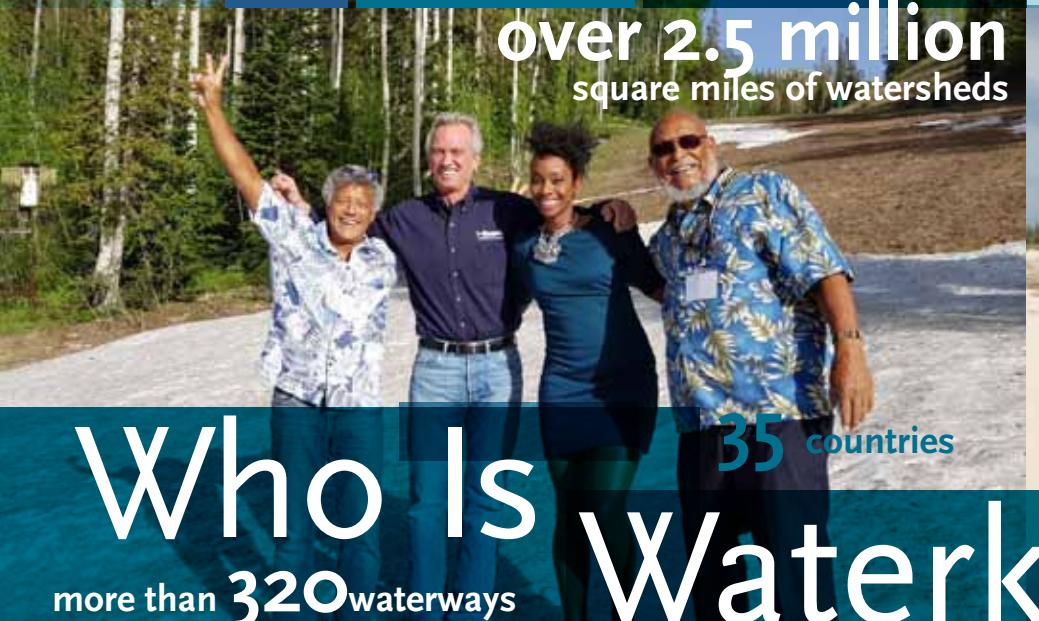
Waterkeepers Bahamas is committed to preserve and protect the Bahamian environment through proactive policy change, education, legal action and advocacy.

It all started with a commitment to preserving and protecting Clifton Bay and other common marine environments surrounding New Providence Island. From a maritime cargo facility proposed in the early 1990s to sprawling residential development proposed in the late 1990s, the Bahamas' environment is facing a number of critical threats including overfishing, unregulated development, and pollution. There are few environmental regulations and little enforcement of existing laws in The Bahamas due to the size of the nation and the limited resources of law enforcement.

Rashema T. Ingraham serves as the Executive Director of Waterkeepers Bahamas where she focuses on education and citizen action for clean water use, making frequent presentations to schools, church and youth groups. It was her late grandfather who opened her eyes to the waterworld, taking her into his self-made canoes when she was much younger to catch fish and conch for the night's enjoyment. She finds peace and tranquility in or near the water, so she spends most of her weekends at the beach with her two children.

Follow Waterkeepers Bahamas on Facebook, and learn more about Waterkeeper Bahamas' work – and how you can help – at [www.savethebays.bs](http://www.savethebays.bs).

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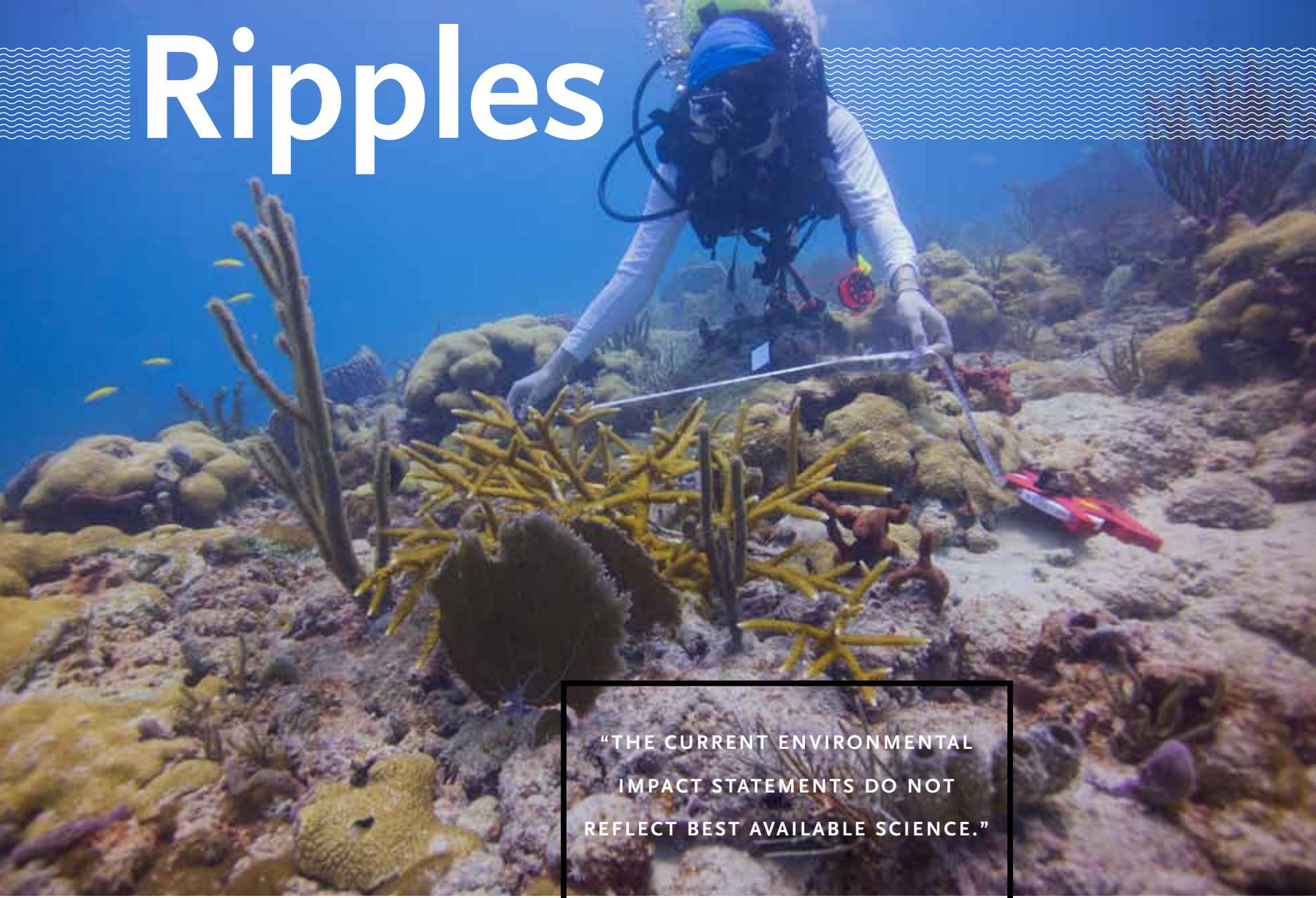


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# Ripples



“THE CURRENT ENVIRONMENTAL  
IMPACT STATEMENTS DO NOT  
REFLECT BEST AVAILABLE SCIENCE.”

MIAMI WATERKEEPER RACHEL SILVERSTEIN



PHOTOS BY EVAN DALESSANDRO

## AFTER MIAMI DISASTER, ARMY CORPS WILL RE-EVALUATE PORT EVERGLADES DREDGING

Miami Waterkeeper has agreed to put a temporary hold on its lawsuit against the U.S. Army Corps of Engineers' project to expand Port Everglades and make way for larger, "post-Panamax" ships, so that the Corps can conduct new environmental studies before starting its dredging. The Waterkeeper and its partners in the suit, including the Center for Biological Diversity, the Florida Wildlife Federation and America's largest trade organization for recreational divers, claim that the Corps' dredging plan fails to account for damage to fragile coral reefs.

The Corps has agreed to re-assess its analysis because of new information available about the widespread and unanticipated damage caused during a similar dredging project at nearby PortMiami, and the addition of more coral species to the federal Endangered Species Act's list. Dredging in Miami proved disastrous to coral reefs in the area when, contrary to the Corps' assumptions, fine-grained sediment from the project harmed tens of thousands of coral colonies and over 250 acres of reef designated by ESA as "critical habitat" for staghorn corals. The

ABOVE LEFT, MIAMI WATERKEEPER RACHEL SILVERSTEIN SURVEYS FOR STAGHORN CORALS, WHICH ARE ON THE ENDANGERED SPECIES LIST, NEAR THE PORT OF MIAMI DREDGING PROJECT. TOP, SILVERSTEIN DEMONSTRATING HOW TO TAKE TISSUE SAMPLES OF CORALS WITH A SYRINGE FOR GENETIC ANALYSIS OF THE REEFS NEAR KEY BISCAYNE. ABOVE; A TRUMPETFISH SHARES THE OCEAN FLOOR WITH SILVERSTEIN.

National Marine Fisheries Service (NMFS) has determined that 95 percent of the surveyed reef is no longer suitable habitat for corals, and that some of the damaged reef will never recover naturally.

"The Corps' and NMFS's prior environmental analyses simply ignored evidence from PortMiami that showed estimated impacts from dredging near corals are significantly more harmful and widespread than expected," said Miami Waterkeeper Rachel Silverstein. "The current environmental impact statements do not reflect best available science."

"Under the law, a proper analysis must be done before further taxpayer dollars are spent on this potentially devastating project," added Brettny Hardy, an attorney at Earthjustice, which

represents Miami Waterkeeper and its partners in the suit.

Each year, snorkeling and scuba diving in Florida account for almost 30,000 full-time equivalent tourism-related jobs, and contribute hundreds of millions of dollars to the Florida economy.

"The reefs provide huge environmental and economic benefits to South Florida," said Tom Ingram, President of the trade organization for recreational divers. "We're determined to help protect the natural reef from destruction so that generations to come can continue to enjoy the opportunity to see, first-hand, this unique and precious natural resource."

The Port Everglades dredging, which was planned to begin in 2017, is now expected to be on hold until at least 2019.

**“WE'RE DETERMINED TO HELP PROTECT THE NATURAL REEF FROM DESTRUCTION SO THAT GENERATIONS TO COME CAN CONTINUE TO ENJOY THE OPPORTUNITY TO SEE, FIRST-HAND, THIS UNIQUE AND PRECIOUS NATURAL RESOURCE.”**



"PEOPLE ARE WORRIED ABOUT HOW BAD ENFORCEMENT IS GOING TO BE UNDER THE NEW [PRESIDENTIAL] ADMINISTRATION, BUT FOR LOUISIANA IT CAN'T GET ANY WORSE, BECAUSE THERE IS NO NUMBER BELOW ZERO."

## LOUISIANA PIPELINE OVERSIGHT GETS GRADE OF ZERO

A Waterkeeper fighting a pipeline in their watershed, and urging the Army Corps to deny a permit, is a story we've heard many times before. But what happens when the Corps isn't even really on the ground? Atchafalaya Basinkeeper (ABK) is finding out.

Since last year, Atchafalaya Basinkeeper has been collaborating with local citizens and NGOs in opposition to the proposed Bayou Bridge Pipeline, which would run 163 miles between Calcasieu and St. James parishes in Louisiana and traverse a portion of the Atchafalaya Basin, the vast wetland formed where the Atchafalaya River meets the Gulf of Mexico. ABK has submitted comments to the Army Corps of Engineers and the Louisiana Departments of Environmental Quality and Natural Resources. In January and February 2017, it addressed permitting and water-quality-criteria applications at public hearings before the agencies.

ABK argues that the proposed permit lacks evidence of sufficient consideration of environmental impacts on the wetlands and that the proposal by the applicant, an arm of Energy Transfer Partners, to use an existing right-of-way that is currently out of compliance, is unacceptable. Energy Transfer Partners is the Dallas-based company building the controversial 1,172-mile Dakota Access oil pipeline, a \$3.7 billion project that will stretch across four states.

The Basinkeeper has also raised the issue of Energy Transfer Partners' history of safety violations and pipeline incidents,

including those involving existing pipelines in the basin. It called upon all of the agencies to deny

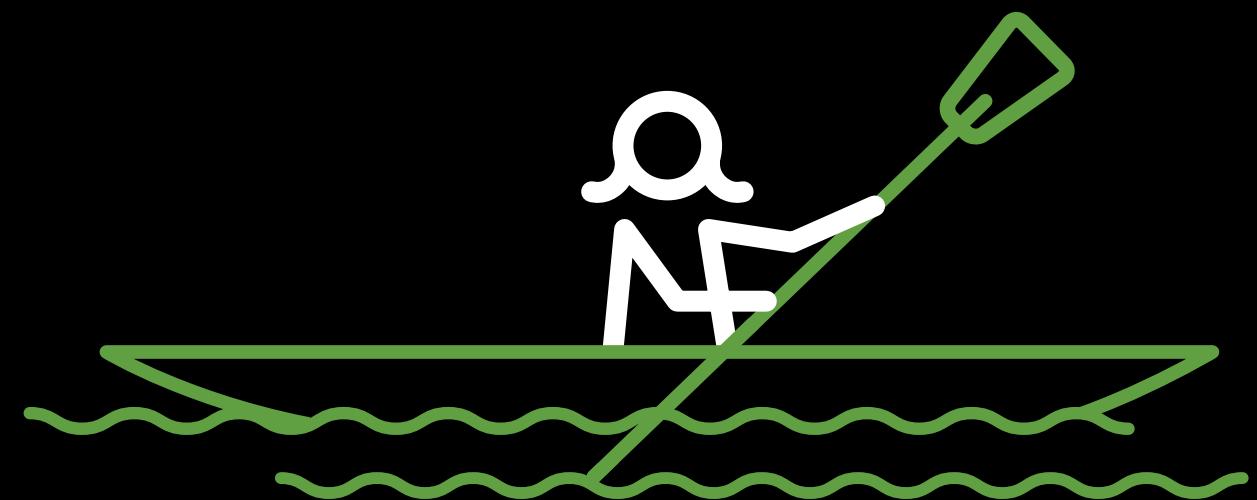
the permits until a proper investigation into the applicant's existing projects has been conducted, including analyses of its compliance with state and federal law, the total impact of existing and proposed projects in the Atchafalaya Basin, and the ability of the Army Corps to enforce permits without proper funding and the existence of necessary infrastructure. ABK also has contacted Region 6 EPA to request that it call for an environmental impact statement before making any decisions regarding the proposed pipeline.

"People are worried about how bad enforcement is going to be under the new [presidential] administration, but for Louisiana it can't get any worse, because there is no number below zero," said Dean Wilson, executive director and Basinkeeper. "We have zero people at the Corps reviewing permits for compliance, zero" regulatory enforcement for activities in the basin. Although the Corps' New Orleans District now has one enforcer, for years we had zero and they have zero boats, making it impossible for them to inspect the sites. It is because of this lack of enforcement that Energy Transfer Partners has existing pipelines in the basin that are out of compliance with their permits and are devastating our wetlands."

To date, the permit applications are pending before the respective agencies.

*– Bart Mihailovich, Organizer, Eastern U.S.*

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## ALABAMANS NOW FREE TO CHALLENGE COALMINE OWNERS

SMCRA grants American citizens broad rights when a mining permit is considered or issued, including rights to examine the mining site, to initiate a formal hearing on the merits of the decision, and to have that decision judicially reviewed. A citizen may participate in inspections of mine property if there is believed to be imminent harm to the environment or the public, may file a complaint about blasting, challenge an agency's failure to take proper enforcement action, and appeal any adverse decision to the courts.

Before this settlement, the Mining Commission's regulations authorized itself or a coal-mining operator to recover attorneys' fees and costs from a citizen challenging a regulatory decision, even when the challenge was meritorious and in good faith. This punitive regulation violated federal law and for the past 40 years discouraged citizens from challenging the commission's regulatory decisions. Although the commission had not previously required such payments, citizens were inhibited by the possibility that it could do

Alabama citizens can now challenge decisions by the Alabama Surface Mining Commission without risking financial ruin. Thanks to the settlement of a lawsuit filed by Black Warrior Riverkeeper, Alabamans will no longer risk the imposition of attorneys' fees and costs when exercising their rights under the federal Surface Mining Control and Reclamation Act of 1977 (SMCRA).

so, in the face of such cases as Shepherd Bend, LLC's seeking compensation for \$250,000 in attorneys' fees and costs from the Birmingham Water Works Board when it challenged a permit that authorized coal-mining adjacent to and upstream of one of Birmingham's primary drinking-water intakes. Rights provided by Congress for citizens to play a vital role in the implementation of the nation's mining laws mean little when a fear of fees prevents their exercise.

Black Warrior Riverkeeper requested that the federal Office of Surface Mining, Reclamation and Enforcement (OSMRE) require the Alabama Surface Mining Commission to amend its regulation to comply with federal law, as OSMRE had done in Utah, Alaska and New Mexico. When OSMRE did not, Black Warrior Riverkeeper filed a suit against OSMRE and the state's Surface Mining Commission in July 2015. As a result of the suit, the commission amended their regulation to state explicitly that challenging citizens could be liable for attorneys' fees and costs only if their challenge is in bad faith. That regulation was approved by OSMRE on October 26, 2016.

Attorney Clay Ragsdale, who represents private individuals in such challenges, worked with Black Warrior Riverkeeper's staff attorney, Eva Dillard, on the suit.

"Coalfield citizens in Alabama," said Dillard, "can now exercise the full-participation rights and oversight responsibilities that Congress provided them in the Surface Mining Control and Reclamation Act, without the chilling effect of a fee award."

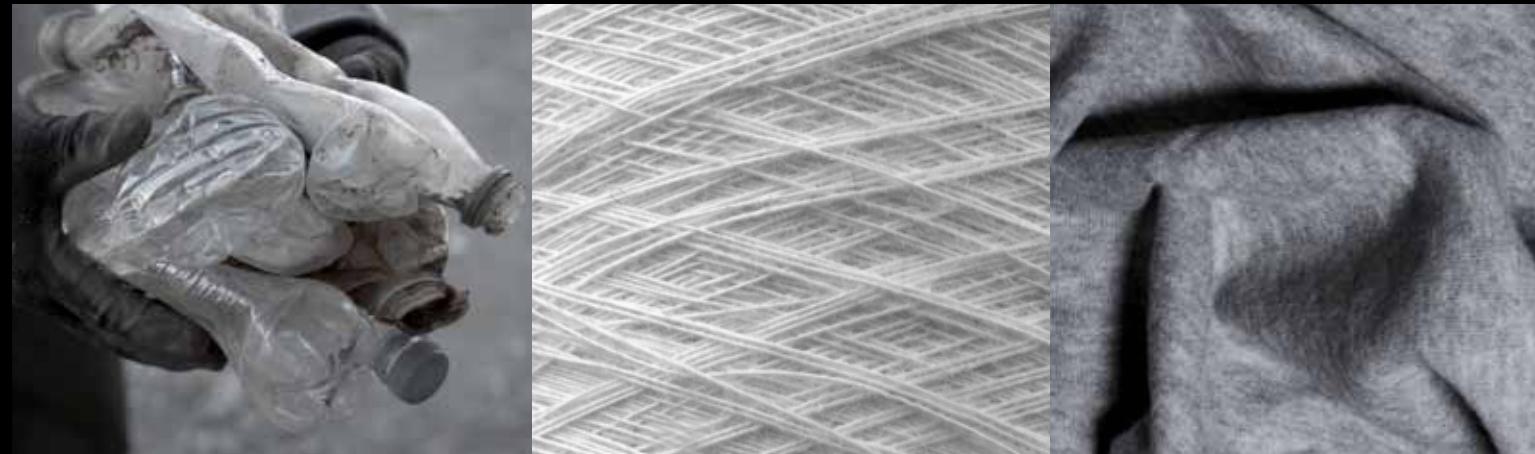


PHOTO BY JOHN WATHEN

PHOTO BY NELSON BROOKE FLIGHT PROVIDED BY SOUTHWINGS.ORG

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WATERKEEPER ALLIANCE

PHOTO BY LIND SMIGER  
THE LEADERSHIP OF COOK INLETKEEPER HAS DISCOURAGED SEVERAL RECKLESS FOSSIL-FUEL ENERGY PROJECTS IN COOK INLET.

## TEXAS BILLIONAIRES ABANDON ALASKAN COAL-MINE PROJECT

ECONOMIC AND ENVIRONMENTAL DAMAGES TO FISHERIES, ECOSYSTEMS, AIR, CLIMATE AND WATER QUALITY COULD COST ALASKA \$2 BILLION IN ECONOMIC LOSSES.



Alaska is blessed with wild and spectacular natural amenities, but logging, mining and other extractive industries have long taken a toll on its landscape and waterways. It's a state where the fossil-fuel industry exercises a lot of power and control. In south-central Alaska, however, Cook Inletkeeper is pushing back hard, and often winning.

In a big blow to fossil fuels, PacRim Coal announced on April 3rd that it is packing up its plans to mine through 14 miles of wild salmon stream on Alaska's Chuitna River to create the largest strip-mine in Alaska. The company, which is owned by Texas billionaires and incorporated in Delaware, sent a letter to the U.S. Army Corps of Engineers saying that it had "decided to suspend pursuit of permitting efforts on the Chuitna Coal Project."

Since the company began pursuing permits in 2006, Cook Inletkeeper and partners have tenaciously opposed the Chuitna Coal Project and warned of the precedent it would set as the first such project to mine directly

through a wild salmon stream -- trading away a renewable resource for a non-renewable one. Wild salmon are a vital part of Alaska's culture and economy, providing families and communities with sustainable jobs and healthy food.

Coal from the Chuitna project would have been exported to Pacific Rim coal-fired power plants, which release toxic mercury that travels through atmospheric and oceanic currents to Alaska, elevating levels of mercury found in its ocean fish.

As part of their decade-long battle against the Chuitna mine, Cook Inletkeeper released a report in 2011 on the potential economic costs and benefits of the Chuitna coal mine. That report found that economic and environmental damages to fisheries, ecosystems, air, climate and water quality could cost Alaska \$2 billion in economic losses during the life of the project.

"We hope [they] will finally recognize that coal is a resource of the 19th century, and not something to invest in for the future," said Carly Wier, executive director of Cook Inletkeeper. "PacRim seems to be making calculations that coal companies all over the world are making: times are changing and coal is no longer a profitable commodity."

*--Lesley Adams, Senior Organizer, Western U.S.*

## WE'RE USING LESS WATER. BECAUSE LESS IS MORE.

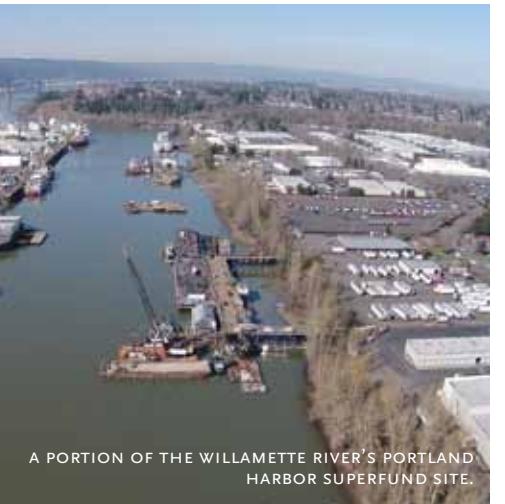
SO FAR, WE'VE SAVED OVER 1 BILLION LITERS OF WATER, INCLUDING OVER 30 MILLION LITERS OF RECYCLED WATER, CRAFTING MORE THAN 90 MILLION WATERLESS™ PRODUCTS.



### MADE OF PROGRESS



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A PORTION OF THE WILLAMETTE RIVER'S PORTLAND HARBOR SUPERFUND SITE.

PHOTO BY TRAVIS WILLIAMS

## AT LAST, EPA OUTLINES PLAN FOR WILLAMETTE RIVER SUPERFUND SITE

On January 6th, the U.S. EPA released its "record of decision" for the Willamette River's Portland Harbor Superfund site, 16 years after its initial listing. The cleanup plan outlined in the decision, while not as strong as Willamette Riverkeeper had sought, is a significant improvement over what had been put forward in a draft plan in June 2016. After that draft was revealed, the Riverkeeper and its partners helped to gather over 5300 public comments, 90 percent of which supported a more robust cleanup.

The site extends nearly 11 miles downstream from downtown Portland. The entire river meanders nearly 200 miles through Oregon's Willamette Valley, from Eugene in the south to Portland in the north.

Over the decades a significant amount of industrial and municipal pollution has

contaminated the river in the harbor, and hundreds of acres of sediment containing PCBs, dioxin, PAH and DDE, and many other pollutants are found in the river-bottom and pose an ongoing risk to human and ecological health.

Willamette Riverkeeper has worked on this site since 2000, and, with its partners, has pushed for a plan that calls for significant dredging and engineered capping. It has also sought to limit the process of monitored "natural recovery," by which the river's natural sediments would cover up contaminated sediment. The City of Portland and the State of Oregon were early proponents of a cleanup plan.

The EPA has listened to the community, and is requiring more removal of pollution, engineered caps and more openness during the remediation. More than three million cubic yards of sediment will be removed, and over 123,000 lineal feet of contaminated riverbank excavated. The Riverkeeper will press for the implementation of this plan over the next 10 years, but it will be a complicated process because more than 150 parties hold some measure of liability for the cleanup, and their financial liabilities and responsibilities for particular actions must be determined.

During the next year much will be decided regarding priorities for the cleanup. And, at Willamette Riverkeeper's urging, the State of Oregon and U.S. EPA have established the Willamette Toxics Reduction Taskforce, which will work to identify sources of contamination that are far upstream.

-- Travis Williams, Willamette Riverkeeper

## IN MONTANA, WATERKEEPER ACTS AGAINST THAT BLOOMING ALGAE

Upper Missouri Waterkeeper settled a lawsuit in March that will provide more information on and further study of the growing problem of toxic algae in Montana's Upper Beaverhead watershed.

Severe unnatural algae blooms and turbidity on the Upper Beaverhead River have degraded the fish population over the last few years, hurting the local outdoor economy. The state estimates that in one year this pollution cost the local Dillon, Montana economy around \$5 million.

Upper Missouri Waterkeeper saw an opportunity to intervene when a proposal to retrofit Clark Canyon Dam on the Beaverhead required relicensing that involved state and federal officials. When the state issued a permit for the dam without accounting for the connection between the dam's ongoing operations and the growing pollution

problem, the Waterkeeper took legal action. That led to a settlement requiring the state and the dam's owners to work with local stakeholders to better assess the Beaverhead pollution issue, identify its scientific causes, and create solutions to stop the ballooning growth of toxic algae.

"It's not enough for our decision-makers and government agencies to know and talk about pollution problems," said Upper Missouri Waterkeeper Guy Alsentzer. "We need guaranteed action to identify and implement solutions. That type of tangible commitment is exactly what our settlement provides: a path forward that prevents future pollution events and protects local citizens' and businesses' right to clean, fishable water. Sometimes we can only vindicate the public's right to clean water through legal action."

UNNATURAL ALGAE BLOOMS AND TURBIDITY FROM POLLUTION ON THE UPPER BEAVERHEAD RIVER HAVE DEGRADED THE FISH POPULATION IN RECENT YEARS.

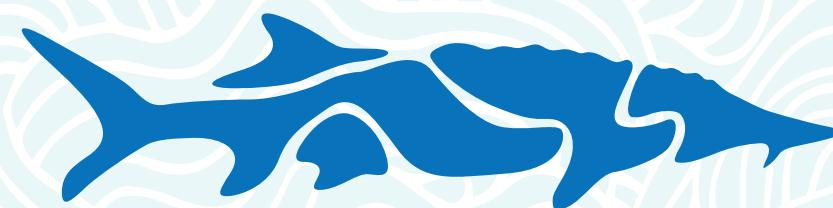
PHOTO BY WADE FELLIN

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PARKING LOTS,  
AND OTHER  
PAVED SURFACES"



VOLUNTEERS BUILD A RAIN GARDEN TO COMBAT STORMWATER POLLUTION NEAR THE TOWN OF HAGUE IN WARREN COUNTY, NEW YORK.

## AT LAKE GEORGE, PUTTING A "LID" ON "LARGEST WATER- QUALITY PROBLEM"

banks, stirring up sediments that deplete dissolved oxygen necessary for marine life. Mounting pressure on waterways from stormwater runoff is responsible for contaminant loading of chemicals, road salt, fertilizers, and more. And water that doesn't enter the ground can cause a groundwater system to run on empty. The cooling springs that feed our neighborhood streams in summer run dry.

Nationwide, according to a report by the Natural Resources Defense Council, "an estimated 10 trillion gallons of untreated stormwater per year runs off roofs, roads, parking lots, and other paved surfaces, often through the sewage systems, into rivers and waterways that serve as drinking-water supplies, and flows to our beaches, increasing health risks, degrading ecosystems, and damaging tourist economies." Because the exact origin of diffuse pollution from stormwater and snowmelt cannot easily be identified, it is exceedingly difficult to solve the problem through conventional regulation and controls.

In sum, stormwater is a major clean-water issue. In fact, the U.S. EPA has declared it "the nation's largest source of water-quality problems." Remediation calls for responsive innovation that, much like the problem

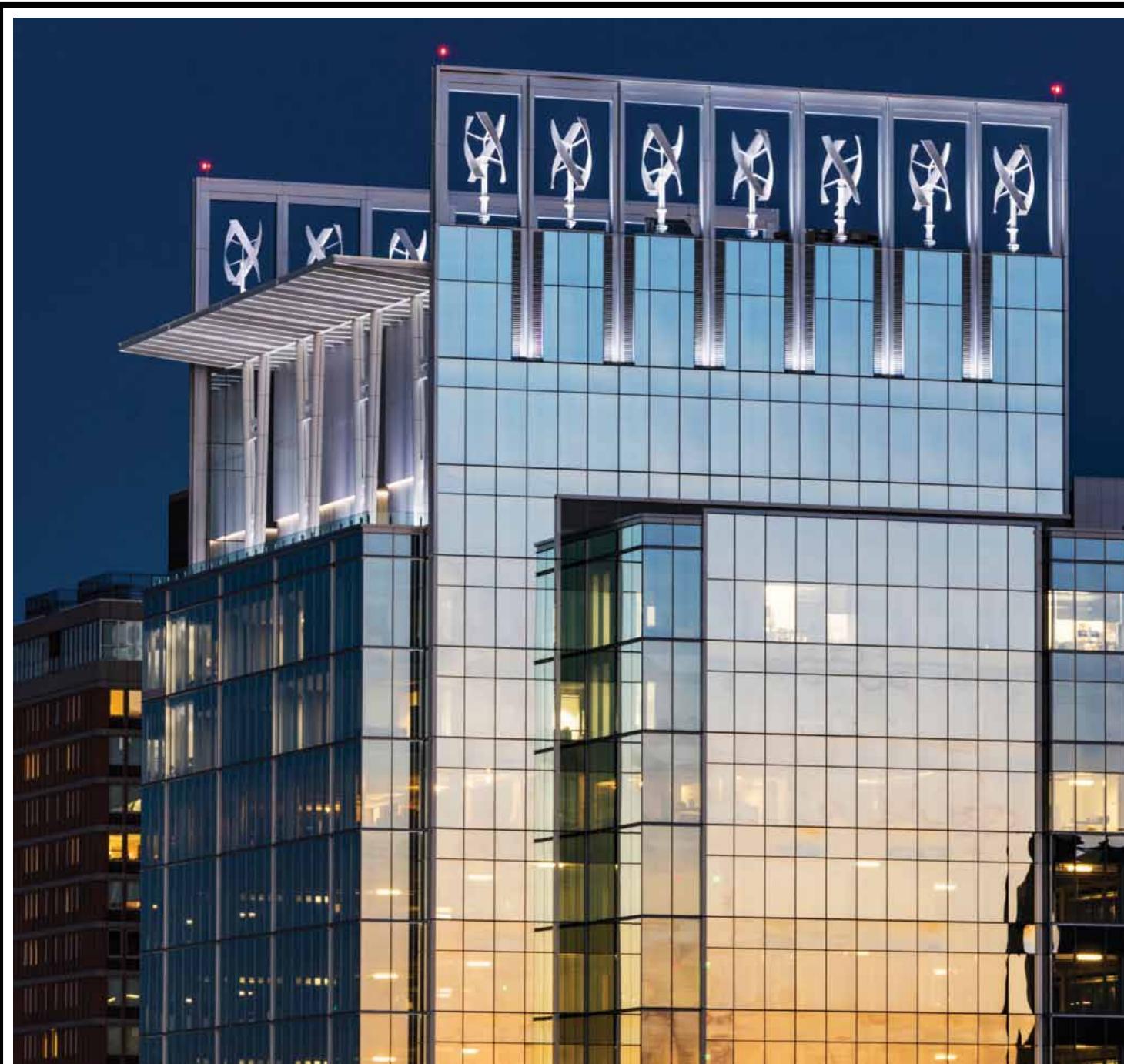
itself, is distributed widely, and with the necessary consistency and coherent standards capable of controlling stormwater runoff at its many and varied sources.

Now Lake George Waterkeeper is onto an exciting solution. The Low Impact Development Certification System (LID), created by The FUND for Lake George, sponsor organization for Lake George Waterkeeper, is developing a powerful tool for managing stormwater runoff. Similar to LEED Certification for green buildings, LID rewards public and private property owners for taking prescribed steps to protect, build, restore, and maintain a property in ways that support lake health, applying proven methods of stopping runoff as close to its source as possible. Harnessing the momentum achieved in solving other threats to watershed health, including aquatic invasive species and road-salt migration, LID's full implementation at Lake George will provide a working model for green-infrastructure planning and effective implementation throughout the Lake Champlain Basin and beyond.

"LID Certification incentivizes the restoration and maintenance of ecosystem services by promoting smart growth," explains Lake George Waterkeeper Chris Navitsky, a licensed engineer. "We are not anti-development, we are anti-pollution. Low Impact Development balances growth and redevelopment with the protection and efficient use of resources, all for the benefit of our communities."

Unlike ecological threats that are beyond individual or local control, stormwater runoff and pollution from built environments can be effectively managed within watersheds by LID because it mimics and, as much as possible, maintains natural drainage-patterns, site features, and hydrology to absorb, cleanse and filter stormwater. Properly applied, LID enables buildings, roads, and landscapes to "work more like a forest" when it rains, protecting watersheds and water quality. Leading by example, the LID Certification awards points for avoiding very steep slopes, maintaining shoreline buffers, protecting native trees of certain size and value, limiting impervious surfaces and lawn areas, providing natural stormwater treatment, and other techniques that naturally and effectively manage runoff.

"Such environmentally sound engineering practices and established techniques," says Navitsky, "provide cost-effective means for property owners, developers, designers, engineers, public agencies, maintenance staff and others to readily mitigate stormwater runoff."



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## THE CURSE OF PLASTIC OCEAN WASTE NOW PART OF THE CURE

was discovered in the 2000s by adventure-seekers attracted to its white-sand beaches, consistent surf-break and world-class nature reserves within walking distance. Today, this piece of paradise is experiencing growing pains. As tourism has increased, so has the volume of trash, and the community is struggling to keep plastic waste from winding its way onto Santa Teresa's pristine beaches.

Carolina Chavarría, the Nicoya Peninsula Waterkeeper, is addressing these discomforts head-on. A native Costa Rican, she worked for many years in Africa and South America, designing and managing environmental and social-development projects. She returned home in 2010, and moved to Santa Teresa, a town she had long been in love with. When residents there decided to put in place a concerted effort to safeguard and protect their town's beaches, they formed Nicoya Peninsula Waterkeeper, and Chavarría jumped at the opportunity to lead it.

For the past couple of years, Nicoya Peninsula Waterkeeper has organized monthly cleanups and recycling-events. In 2016



NICOYA PENINSULA WATERKEEPER CAROLINA CHAVARRÍA, ABOVE AND LEFT, HAS LED THE CAMPAIGN AGAINST MAINLY PLASTIC MARINE DEBRIS ALONG HER AREA'S BEAUTIFUL BEACHES, AND IS NOW BEING HELPED BY BIONIC.

Much of the natural beauty around it remains intact but the town of Santa Teresa is no longer the undiscovered surfer's paradise. Located near the southern tip of Costa Rica's Nicoya Peninsula, Santa Teresa was once a sleepy village but alone, Chavarría and a small band of volunteers collected 17 tons of recyclable metal, glass, and cardboard. But without a way to recycle plastics, bottles and other plastic waste have been a growing problem. To confront it, Chavarría partnered with BIONIC, a New York-based startup company that turns coastal and marine plastic debris into yarns and fabrics for clothing. Since its founding in 2009, BIONIC has worked with several apparel brands to incorporate its yarn into products varying from denim jeans to snowboarding jackets.

In late 2015 one of BIONIC's founders, vacationing in Santa Teresa, asked locals about plastic waste and recycling efforts, and was connected with Chavarría. Their dialogue blossomed into a project to set up a system to collect plastic waste washing up ashore. This summer Nicoya Peninsula Waterkeeper and BIONIC will begin to collect plastic in six coastal communities and five inland towns.

The Waterkeeper will operate a plastic-recycling facility where it will consolidate, sort, and bale the plastic it collects, which will be sold to BIONIC for processing into yarn and fabrics. Proceeds from the sales will support the Waterkeeper's projects.

"I am very heartened by this collaboration," says Chavarría, "not only because it'll impact positively the coastal waters of Santa Teresa and nearby towns but also because it shines a light into how purpose and profit can overlap to make a difference. People in the community are aware and educated, they are ready to recycle, and now they have the means to do so."



PHOTOS BY CAROLINA MOLINA

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ZHENG DONG OF QIANTANG RIVER WATERKEEPER STANDS OVER POOLS OF HOG WASTE WHILE INSPECTING THE FACILITY ON RADISH HILL.

## IN ZHEJIANG PROVINCE, IT'S THE YEAR OF NO PIG-WASTE

A MOBILE APP CALLED "SMART-RIVER," DESIGNED TO ADDRESS RIVER ISSUES, HAS LED TO THE RESOLUTION OF 91 POLLUTION CASES

Zheng Dong, a staffer at Qiantang River Waterkeeper, typically works long hours patrolling the waterways of Quzhou City in Zhejiang Province, China. May 1st of 2016, however, was not a typical day for him. He was patrolling the river with two volunteer water-quality monitors, YunLong Yang and Shiliang Li, when they passed a hillside dubbed "Radish Hill" on which there were 26 pig-houses belonging to Xixi Farm. To the right of these structures was a pool for pig-waste, from which a foul-smelling stream of muddy wastewater flowed down the hill into an irrigation canal, saturating adjacent farmland with pig-waste and, ultimately, draining into a nearby waterway.

Mr. Dong inquired of local villagers about the pollution, and they told him that Xixi Farm's draining of animal sewage into nearby farmland had been a common practice for nearly two years. He immediately contacted Qiantang River Waterkeeper's longtime ally, "Focus Today," a Zhejiang television program, to bring awareness to the issue. Within the week the program scheduled a film-crew to investigate the site, and on May 17 the program aired their report. The news of the pollution soon reached the secretary of Zhejiang Provincial party, Mr. Baolong Xia. Within two days Mr. Xia had investigated the farm himself and condemned the pollution. He emphasized the need for a proper environmental impact assessment and called for a rapid upgrade of livestock operations.

The owner of Xixi Farm acknowledged that

substandard sewage management caused pollution, and that proper treatment of sewage would benefit him, neighboring farms and the nation. And, under the guidance of various governmental departments, Xixi became a model ecological farm within a month, a development that earned the praise of Mr. Xia and brought pride to Mr. Dong.

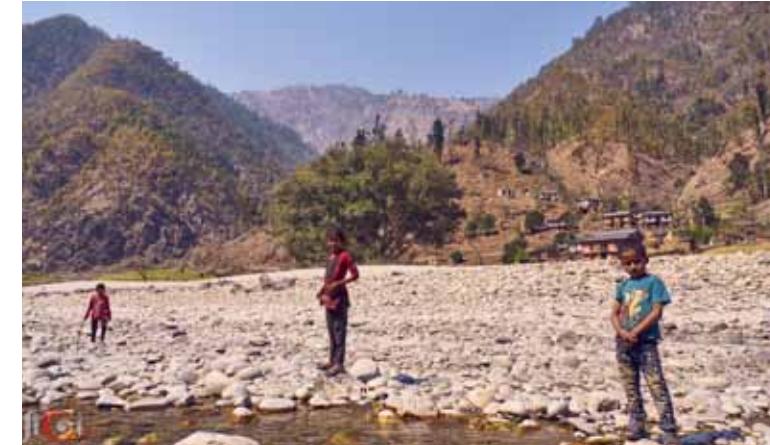
In Zhejiang Province there are many stories like that of Radish Hill, which are becoming known thanks largely to Qiantang River Waterkeeper's training citizens in environmental protection and water safety. The Xixi cleanup brought renewed support for Qiantang River Waterkeeper and the Zhejiang Environmental Observation program's "Clean Source Action" project from the Alibaba Public Welfare Foundation, an environmental-protection fund established by China's e-commerce giant, Alibaba Group.

The Clean Source Action project hosts roundtable meetings with partners to explore solutions to local water-pollution issues, and invites members of environmental protection departments and civil society organizations to train the public, especially young people, in environmental inspection skills. There are now over 170 volunteer water-quality monitors who have joined Qiantang River Waterkeeper in its efforts to achieve clean water. A mobile app called "smart-river," designed to address river issues, has led to the resolution of 91 pollution cases, including Xinnan Lake's acid-water problem, illegal discharge of wastewater by an industrial park, and dumping of waste near coastlines.

Environmental observers have provided provincial and municipal news media with nearly 100 pieces of evidence of the effectiveness of this grassroots movement, which has now drawn government's attention and spurred many regional leaders to support Qiantang River Waterkeeper.



PHOTOS BY ANUP GURUNG  
THE VILLAGE WHERE THESE INDIGENOUS NEPALESE CHILDREN LIVE IS BEING THREATENED BY A MASSIVE DAM PROJECT. NEPAL NOW HAS FIVE WATERKEEPER ORGANIZATIONS AND TWO WATERKEEPER AFFILIATES SPEAKING UP FOR ITS PEOPLE.



## A SUMMIT AMID THE HIMALAYAN SUMMITS, WHERE MORE WATERKEEPERS ARISE

When a devastating earthquake shook Nepal in April 2015 and took more than 8,000 lives, Bagmati River Waterkeeper Mausam Khanal, Megh Ale (now the Karnali River Waterkeeper) and their entire team of river guides and conservationists took unprecedented action to help rescue remote communities and rebuild the country. Because of their actions, the Waterkeeper family in Nepal has grown bigger, stronger and more determined to save Nepal's Himalayan Rivers.

This past March, I spent 10 days in Nepal, along with Columbia Riverkeeper Brett VandenHeuvel, Waccamaw Riverkeeper Deputy Director Christine Ellis and Waterkeeper Alliance's Asia Regional Coordinator Min Zheng, to help train and organize our growing network of Himalayan Waterkeepers, affiliates and partners. Included in that network are over 200 "Kung Fu nuns" from the Buddhist Drukpa lineage, who practice martial arts to promote female empowerment.

We also participated in the 2nd Nepal River Summit 2017, where over 250 local stakeholders and youths gathered to develop their knowledge of the conservation and management of Nepal's rivers.

"Nepal is a place of contrasts: striking beauty and terrible pollution," Brett VandenHeuvel observed. "Raw sewage pours into rivers, plastic is burned on the streets, and formerly clear rivers run brown. The rivers of Nepal need a voice to speak for them, and the Nepali Waterkeepers serve that role. In a place where environmental laws are rarely enforced, Waterkeepers will step up."

There are now five Waterkeeper organizations in Nepal, on the Bagmati, Karnali, Outdoor enthusiasts from around the world

experience the Trishuli when they travel from Kathmandu to explore Nepal, and Trishuli River Waterkeeper is currently advocating for their waterway to be designated a Heritage River.

Megh and the summit organizers made sure that participants experienced the power of the river and its rapids, arranging a two-hour rafting trip for more than 200 of us.

"Rafting on the Trishuli afforded our diverse group the opportunity to bond over water at the beginning of the summit," Christine Ellis commented. "The Trishuli could serve as a metaphor for the issues we face as river advocates: times of calmness and agreement, then times of discord and rough waters."

Nepal's first official national rafting team joined us at the summit to show us the gorgeous landscapes that are threatened by a proposal for a mega-dam project on the Karnali, which is Nepal's last free-flowing river and its most pristine. Descending from Mount Kailash and flowing to the Indian border, it is sacred to both Hindus and Buddhists. The rafting team ran the first Nepali-only expedition to descend the river, and was the first to engage the indigenous people that live along it. Their traditional way of life would be criminally destroyed by the dam project, and Karnali River Waterkeeper is committed to keeping the river flowing free.

Just as impressive as the rafting team and guides were the young Nepalese we met. They clearly appreciate the value of their country's natural resources, and even fill their social-media feeds with images of its wonders. This generation of young environmentalists is eager to become advocates for Nepal's rivers and help their country prosper. They recognize that land-and river-conservation, along with eco-tourism, have tremendous potential to provide for their people. And Waterkeeper Alliance's growing network is helping them achieve their vision for a sustainable Nepal.

- Sharon Khan, Recruiting Director

# COASTAL ALABAMA ON THEIR MINDS

FOUNDED BY PERSONS OF PROPERTY, EXPANDED  
BY DISASTER, MOBILE BAYKEEPER IS AN  
IMPROBABLE SUCCESS STORY.

BY HANLON WALSH

The founding story of Mobile Baykeeper bears a stark contrast to that of many other Waterkeepers throughout the world. It wasn't founded by commercial fishermen trying to reclaim their river and restore their livelihoods (as was the case with the first Waterkeeper Organization, Hudson Riverkeeper) or by fierce environmental advocates who had years of experience fighting for clean water. Or by persons who considered themselves environmentalists at all.

"I think the thing that sets us apart from most other environmental organizations is that we were founded by a group of politically conservative waterfront property owners who cared about their health, their kids being able to swim in Mobile Bay, the quality of their seafood, and their property values," says Baykeeper and Executive Director Casi Callaway, who has led the organization and its predecessor for 19 years.

Leading the charge in the mid-1990s was Jack V. Greer, a prominent, well-respected businessman with a home on a peaceful stretch of the western shore of Mobile Bay, far removed from more tourist-ridden destinations of Coastal Alabama such as Gulf Shores and Orange Beach. Now 90, he still resides there with his wife Janice, and can vividly recall the early days of what was then known as West Bay Watch. Greer and a small group of other concerned residents mobilized when plans were announced for the construction of a chemical plant near his family's home.

"The 'powers that be' announced they were going to take over the entire western shore of Mobile Bay for industrial development, primarily for chemical companies," says Greer. "They

wanted the eastern side of the bay to be residential, and this side of the bay to be solely industrial."

Plans were laid for the construction of a sewage-outfall pipe, 80-feet long and 40-feet wide, to be built two miles from the mouth of Fowl River, a 14.4-mile-long brackish river that discharges into Mobile Bay and is lined with both full-time and vacation homes.

"Some folks on Fowl River got word of this announcement and began to call each other up to spread the news," says Greer.

This grassroots group, known as the Fowl River Protective Association, began holding regular meetings at a nearby church and formed into West Bay Watch in 1997. As they investigated the environmental implications of those chemical plants, they discovered that Mobile County's economic policy had encouraged industry for decades, and that the Environmental Defense Fund ranked Mobile County first in the nation for the presence of chemicals linked to reproductive and developmental disorders, and fifth in those known to be cancerous hazards.

Logan Gwin, another founding member of West Bay Watch, who later succeeded Greer as president, remembers driving near the one industrial site on the western shore where chemical plants had already been built, and "seeing all of those smoke stacks in the air; and wanting to know if it was safe to breathe. At the time it was a few decision-makers who were trying to decide the future of this area. One day, we agreed that it was time to draw the line and tell them we didn't want any more of these chemical plants coming here."

In 1998, the growing organization changed its name to Mobile Bay Watch, and expanded its mission to address air- and water-quality

# "YOUR JOB ISN'T TO FIGHT FOR JOBS. YOUR JOB IS TO FIGHT FOR MOBILE BAY. IF YOU DON'T STEP UP AND DO SOMETHING, THEN WHO'S GOING TO?"

PHOTO NEAR RIGHT, HUNDREDS OF VOLUNTEERS GATHER TO HELP BUILD A QUARTER-MILE ARTIFICIAL OYSTER REEF DURING A COASTAL RESTORATION PROJECT ON MOBILE BAY. FAR RIGHT, CASI CALLAWAY AND ROBERT F. KENNEDY, JR., AT THE OFFICIAL LAUNCH OF MOBILE BAYKEEPER IN 2001, THE \$20 CRAB TRAP WAS AUCTIONED FOR \$250.

issues on both the east and west sides of the bay. But demands were such that many of the volunteers couldn't keep up with the workload, as they juggled their commitment with those to families and full-time careers. Jean Downing, a founding member who worked tirelessly alongside Gewin to establish credibility for the organization in the first few years, remembers the moment she realized they needed to hire a staff person: "I came to the point and thought – I can't do this anymore," she said. "There were too many things that came up that were slipping through the cracks, and we knew it was time for someone who could take this job on full-time."

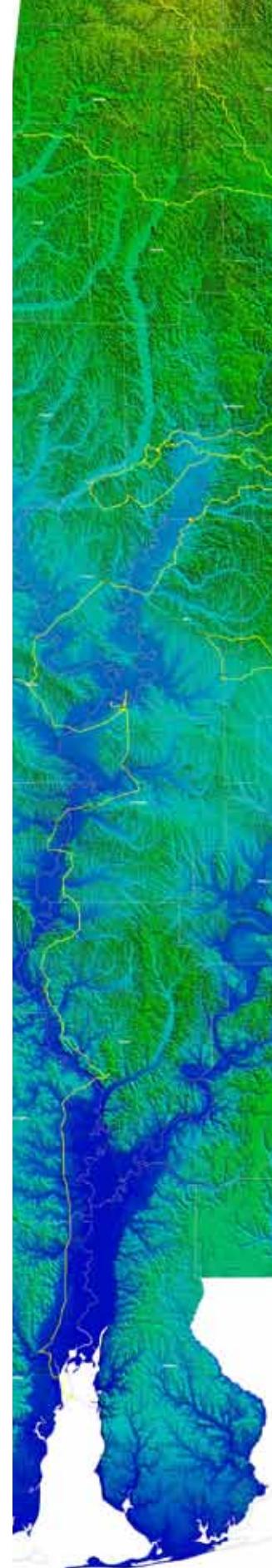
They hired Casi Callaway as the first full-time director of West Bay Watch, and shortly thereafter applied for and received nonprofit status. Callaway, who today also serves as the chair of Waterkeeper Alliance's Waterkeeper Council, had recently moved back to the Mobile area after working for Clean Water Action in Washington, D.C. for eight years. She knew that she faced a different kind of battle in her politically conservative, industry-minded hometown, where most residents viewed environmentalists as left-wing extremists.

"People down here didn't like the word 'environmentalist,'" she recalls, "but many of them were proud conservationists who were hunters and fishermen with families who spent their summers on Mobile Bay. It was just a matter of showing people that we were all on the same team, whether or not they realized it at the time."

In September 1999, Mobile Bay Watch affiliated with Waterkeeper Alliance, and then changed its name to Mobile Baykeeper.

"When we joined Waterkeeper Alliance," says Callaway, "I realized I had a larger family and they gave me the tools I needed to better understand our issues and translate them for our politically conservative climate."

Shortly afterward, Rick Dove, the founding Neuse Riverkeeper, traveled down from North Carolina to conduct



a site-visit. Mobile Baykeeper at the time was in a fierce battle with a chemical company, and Callaway was being sharply criticized and accused of being opposed to job creation. She will always remember advice that she received from Dove.

"Rick said, 'Casi, your job isn't to fight for jobs. Your job is to fight for Mobile Bay. If you don't step up and do something, then who's going to?'" Nearly 17 years later, Callaway evokes these words as a mantra whenever she encounters opposition.

Such inspiration and encouragement helped carry Mobile Baykeeper through some significant milestones. In 1999, it filed its first lawsuit, against the Mobile Area Water and Sewer System (MAWSS) for violations under the Clean Water Act, after it discovered that MAWSS had been spilling 2.5 million gallons of raw sewage into the bay annually.

"One of the very first things we knew we were going to have to deal with was sewage," says Callaway. "Sewage spills kept occurring because MAWSS was putting Band-Aids on the system and not making the types of upgrades that were critical to prevent more spills."

After nearly two years of negotiations, the parties reached a settlement that markedly improved

the way MAWSS would operate. Under its terms, the agency was required to make a significant investment to upgrade infrastructure, an amount that has now reached nearly \$200 million. And remarkably, what had started as a lawsuit eventually turned into a partnership.

Shortly after the settlement, the two organizations joined in a fight against the Alabama Department of Transportation (ALDOT), which in 2004 had proposed construction of a new highway that would cross nine streams within the Big Creek Lake Reservoir, Mobile's primary source of drinking water.

"The whole situation was a giant mess," says Callaway. "They hadn't even conducted an environmental impact statement and were allowing massive amounts of red clay to be dumped in our drinking-water supply."

After years of litigation, the partnership settled with ALDOT in 2007, exacting tightened rules regarding the amount of dirt that could be uncovered while building new roads, as well as more stringent statewide stormwater regulations.

"Collaboration has been behind every successful campaign we have won," Callaway says. "This was such a unique scenario, that despite being in a previous lawsuit with MAWSS, we were able to work together and win a huge battle that saved the drinking-water supply for hundreds of thousands of our citizens."

Notable as these victories were, arguably the most significant event in Mobile Baykeeper's history occurred after the explosion aboard a BP Deepwater Horizon oil-drilling rig on April 20, 2010, which killed 11 workers. Immediately after the spill, Callaway was unsure how it would affect Alabama's Gulf Coast until she heard disturbing news from other Waterkeeper groups who had experience dealing with oil spills, including Casco Baykeeper in Maine, San Francisco Baykeeper and Cook Inletkeeper in Alaska.

"We learned that because they waited seven days to burn the oil, it was going to be a massive spill," says Callaway. In fact, it became the worst environmental disaster in U.S. history. "One day it was leaking 5,000 gallons a day, then the next day it would be 25,000 gallons a day, and so on."

This would continue for 87 days, until the well was finally capped on July 15th. By then, more than 200 million gallons of oil had been

released. During those months, Mobile Baykeeper's tireless response and restoration plan drew national attention, as well as financial support that allowed it to double its budget and staff.

Though the BP disaster occurred more than seven years ago, Baykeeper is still very much engaged in restoration efforts throughout coastal Alabama. "We have a lot of money coming to the Gulf Coast that needs to be spent wisely on projects that restore and enhance what was lost," says Callaway. "We're working hard to make sure that the majority of funds go toward projects that will make us resilient enough to withstand the next disaster, manmade or natural."

With a full-time staff of eight, a 19-member board of directors, more than 4,500 members and an annual operating budget of nearly \$700,000, Baykeeper, once viewed by many as a radical clique, is now considered a trusted environmental watchdog and informed voice of reason.

"Twenty years ago, we were way behind the rest of the country," says Logan Gewin. "What Casi and Mobile Baykeeper have done over the years is bring the issues of clean water and protection of our natural resources to the forefront of our community."

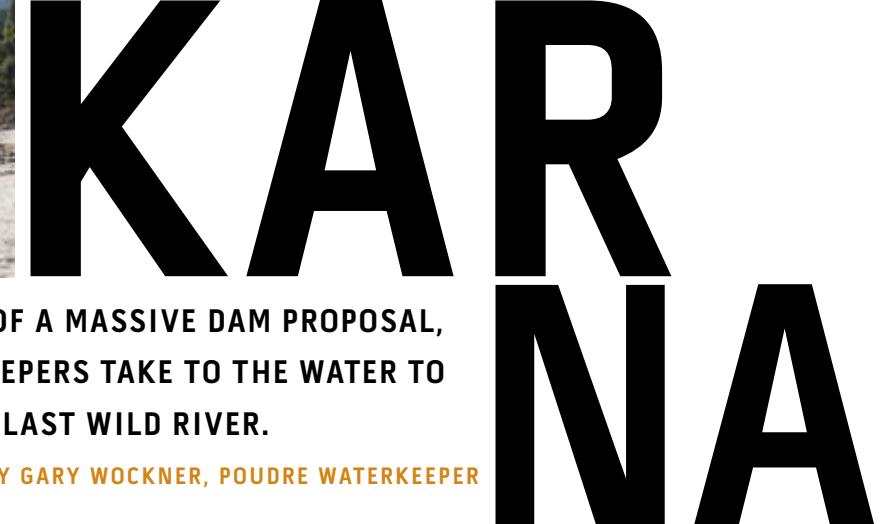
Jean Downing, who still monitors industrial projects near her home on the western shore and regularly communicates with the Baykeeper staff, couldn't agree more. "Today," she adds, "when there are environmental questions that come up in our community, people know they have a trusted resource to call on – and that's Mobile Baykeeper."

As it has developed, however, Mobile Baykeeper's mission has remained the same—to protect the beauty, health, and heritage of its watershed and Alabama's coastal communities. Given the recent shift in political administrations, Callaway knows that she and her staff will have to walk a thin line amid politically conservative supporters in a "red" state. But this is a challenge she is all too familiar with.

"Our members know that our waterways are integral to our economic vitality, our community strength, and our success," she concludes. "We must continue emphasizing that clean water is a non-partisan issue and remind them that we need their support now, more than ever." **W**

*Hanlon Walsh is the communications coordinator at Mobile Baykeeper.*

# SAVING THE WILD KARNA



Megh Ale (pronounced "Ah-lay") is a patient man. His eyes twinkle, the corners of his mouth almost always turned up into a soft smile. He was a monk before he started his rafting, adventure travel, and river conservation endeavors. Patience is a virtue in Nepal if you are a river conservationist. But a sense of alarm is also there in Ale's face and voice. Nepal has about 6,000 rivers and streams, and every single river is dammed, except one. That's right — one.

Now, that final free-flowing river, the Karnali, is also threatened, and Ale is trying to save it.

The Karnali River begins in the Himalaya Mountains in Nepal near the Tibet border and Mt. Kailish, the spiritual center for four eastern religions – Hinduism, Buddhism, Jainism, and Bon. The mountain is believed to be where the Hindu Lord Shiva sits in a state of perpetual meditation. In bold contrast, the Karnali is never still. It rages down the canyons of western Nepal, its glacier-fed blue-green waters glistening in the sun.

In the first week of last November, which is the dry season in Nepal, Ale and his team from the rafting company he owns, Ultimate Descents, led 21 international adventurers from 10 different countries on an eight-day trip on the Karnali. Our expedition was the inaugural "Karnali River

Waterkeeper Expedition," and wasn't only about rafting. Organized in cooperation with the Nepal River Conservation Trust, which Ale co-founded in 1995, and Waterkeeper Alliance, which Ale joined in 2016 as the Karnali River Waterkeeper, this journey was dedicated to protecting the Karnali.

On our first day at the put-in (the starting point for the rafting trip), five of us awoke early and drove 18 miles upstream to the proposed site of the Upper Karnali River Dam in the village of Daab. GMR, a private Indian engineering firm that is named for its founder, G. M. Rao, plans to build the 520-foot-tall hydroelectric facility there. The company has built a small headquarters in Daab, their six modern buildings contrasting dramatically with the traditional mud and slash-roofed homes of the villagers.

The GMR project is just one of several proposals to dam the Karnali, including a competing Nepal-government plan for a 1,345-foot dam that would be the world's tallest. These proposals have ignited a massive controversy in Nepal and have increasingly drawn international attention from activists and media.

We quickly eased into the water, and left the village and the bus behind us. As our armada of three large rafts and three kayaks

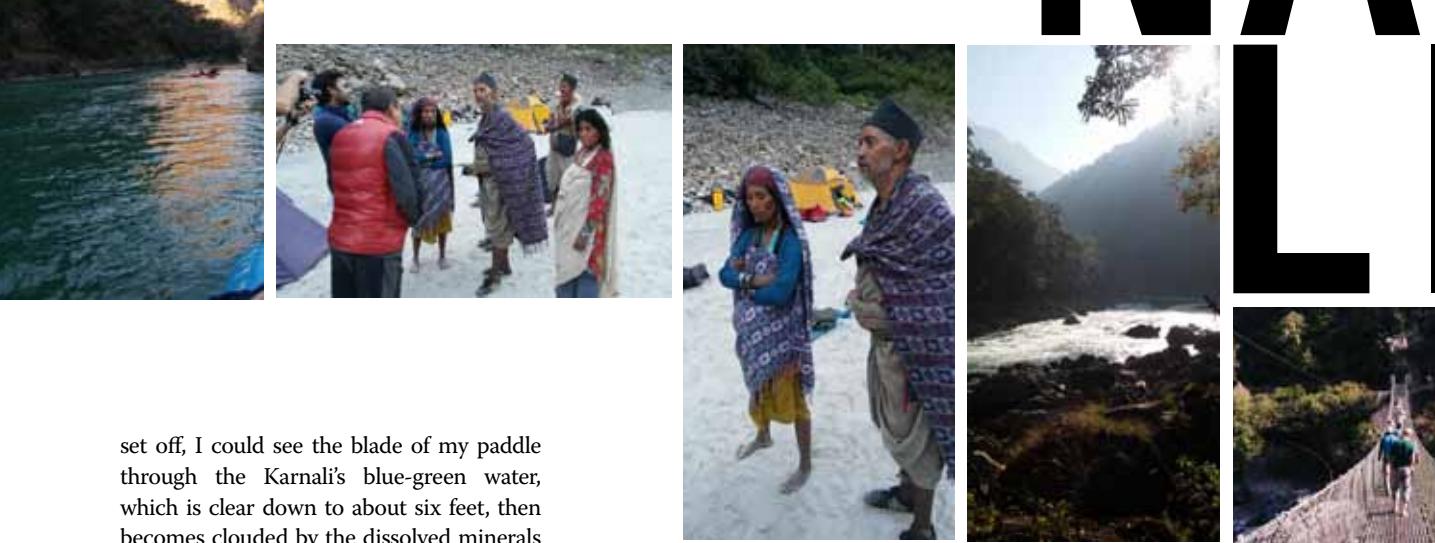
Quickly after arriving, four of us snuck down through the village to the bank of the river and unveiled a "SAVE THE KARNALI" banner that proclaimed, "The last best place in Nepal and only free flowing river in the country." We photographed the event and returned to our trip's starting-point at the village of Sauli, which would be the last large settlement we'd see for eight days – and the street where we parked our bus would be the last road. Most of the canyon downstream from Sauli is dotted with small farming villages accessible only on foot.

set off, I could see the blade of my paddle through the Karnali's blue-green water, which is clear down to about six feet, then becomes clouded by the dissolved minerals running off the Himalayan glaciers.

We estimated the river's flow at this point to be 20,000 cubic feet per second, which is probably one-fifth what it would be during the wet season in June, July, and August, when the monsoons drench the

IN THE SHADOW OF A MASSIVE DAM PROPOSAL, NEPAL'S WATERKEEPERS TAKE TO THE WATER TO PROTECT NEPAL'S LAST WILD RIVER.

STORY AND PHOTOS BY GARY WOCKNER, POUDRE WATERKEEPER



THE KARNALI RIVER EXPEDITION BEGAN AT THE SITE OF THE PROPOSED UPPER KARNALI DAM, WHERE MEGH ALE (OPPOSITE PAGE), FAR LEFT, AND GARY WOCKNER, FAR RIGHT, UNVEILED A "SAVE THE KARNALI" BANNER. IT CONTINUED THROUGH VILLAGES WHERE EXPEDITION MEMBERS MET MEMBERS OF THE RAUTE PEOPLE, NEPAL'S ONLY NOMADIC TRIBE.



# THE RIVER

IS NOT  
ONLY  
A PRICELESS  
ECOLOGICAL TREASURE  
BUT IS HOME TO UNIQUE



AND ENDANGERED  
INDIGENOUS  
COMMUNITIES  
AS WELL.

OPPOSITE PAGE, LEFT TO RIGHT, CLOCKWISE, A RAUTE ENCAMPMENT, EXPEDITION LEADER AND KARNALI RIVER WATERKEEPER MEGH ALE, ONE OF THE EXPEDITION'S RAFTS, ONE OF THE KARNALI'S BEAUTIFUL SANDY BEACHES, AND AN EXPEDITION MEMBER WITH PART OF A JUST-SLAUGHTERED GOAT THAT SHE HAD BARTERED TRIBAL MEMBERS FOR.

dry. Because the Karnali makes a long circling switchback in the proposed area of the dam, the project would maximize the power created by the fall in the river, while minimizing the length of the tunnel, thereby creating a relatively cheap source of electricity.

All of the dam proposals for the Karnali have been delayed for two decades due to politics and competition among the proposals, including the Nepal government's proposal to build the world's largest dam and to maintain ownership of the project and the electricity. The GMR proposal took a step forward in 2014 when the company reached an agreement with the government. The proposal calls for shipping 75 percent of the electricity to India. But the project has stalled for lack of both funding and political support. Facing a projected cost of nearly a billion dollars, the project's backers have sought financing from the World Bank and other international lending agencies, which

has not yet materialized.

A countering proposal is to keep the Karnali free-flowing as the only protected river in Nepal and a source of conservation, pride, and eco-tourism for its people. The country's nascent river-protection movement, led in part by Megh Ale and his colleagues, has the strongest voice in this controversy, and has brought together members of the country's many religious and ethnic groups. Ale is working to build a national campaign to produce legislation similar to the U.S.'s National Wild and Scenic Rivers Act, to protect the Karnali River and its corridor that extends from the Chinese border, through Nepal and down into India.

It was this proposal that was on our minds as we paddled and floated past several small villages during the first few days of

entire country. The following three months are the year's driest and sunniest, and now the high watermark of the river could be seen 10 feet above us, below which the banks had been scoured clean of vegetation and most debris. It is water at that top level that the dam companies are hoping to divert and harness to generate electricity.

Although the financial, political, and ecological details have yet to be worked out, GMR plans to build what's called a "run of the river" hydroelectric project, which would divert almost all of the water out of the river, bore a massive two-kilometer-long tunnel down through a mountain, place a powerhouse at the tunnel's bottom, then run the water back into the river 44 miles downstream, with the result that those 44 miles of river would be virtually drained

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MANY THANKS FOR YOUR HELP  
TO PROMOTE SAVE THE KARNALI  
EXPEDITION. PROCEEDS WILL GO  
TO KARNALI RIVER WATERKEEPER  
TO KEEP THE CAMPAIGN GOING.  
THE EXPEDITION WILL BE LED BY  
MEGH ALE, FOUNDER PRESIDENT  
OF NEPAL RIVER CONSERVATION  
TRUST/ KARNALI RIVER  
WATERKEEPER AND ULTIMATE  
DESCENTS NEPAL.

SEE YOU DOWNSTREAM....

FALL SEASON:  
OCTOBER 24 TO  
NOVEMBER 4, 2017  
(12 DAYS)

SPRING SEASON:  
MARCH 24 TO  
APRIL 4, 2018  
(12 DAYS)

the expedition, becoming increasingly aware that the river is not only a priceless ecological treasure, but is home to unique and endangered indigenous communities as well. One memorable scene developed as we approached a moderate-sized rapid around a large bend in the river. A funeral pyre burned brightly on the bank, surrounded by about 50 people holding candles.

Ale had told us when we started out that we might see Raute people, Nepal's last nomadic tribe. Small bands of the tribe live as hunter-gatherers in the forest surrounding the Karnali. On the fourth day of our expedition, as we set up our tents at a place called Scorpion Beach, two Raute walked out of the forest to visit us. Their dialect overlaps with the Nepali language, so Ale and the Nepali guides and rafters who were with us were able to talk with them.

Over the next 24 hours, a few dozen Raute members came into our camp; then we accompanied them to their makeshift village where they were living in huts made of branches covered with tarpaulin. They subsist by harvesting large tuni trees, whose rich dark wood they carve into bowls, boxes and stools that they trade to Nepali villagers and occasional tourists. The Nepal government has granted the Raute privileges to cut down these big, beautiful trees, which are otherwise protected. Our cultural exchange included buying some

bowls and taking the Raute chief for his first-ever ride in a raft.

As we continued down the river, we regularly came across villages carved out of the forest every few miles. Their inhabitants have been thriving there for hundreds of years by fishing, farming rice and vegetables, and selling and trading other goods when they hiked out of the canyon. The villages' residents sold us fish and vegetables, and, at one point, a goat, which we slaughtered and ate over the next two days. We often encountered villagers in long dugout canoes, paddling along the edges of the river and ferrying themselves and products from bank to bank across its calmer stretches. We occasionally saw people slipping through the forest above us, sometimes walking down to the beach to say hello, sometimes not.

While the human culture along the Karnali may be several hundred years old, the geology of the river and the canyon has been forming for millions of years. For an unforgettable two-day stretch, we ran through a steep-walled canyon of hard rock that created fabulous rapids. We scouted then raced through "class III" and "class IV" rapids named "Sweetness and Light," "Jailhouse Rock," "God's House," "Juicer," and "Flip and Strip." Although GMR's proposed dam, tunnel and powerhouse are upstream of this wild section of the river, the



LEFT, A PLACID STRETCH  
OF THE KARNALI. BELOW,  
CLOCKWISE, A VILLAGER IN  
HER HOME, A STRETCH OF  
RAPIDS, AND SOME OF THE  
EXPEDITION'S MEMBERS IN  
THEIR KAYAKS.



rapids would nonetheless be diminished by the hydropower project. And the wonderful beaches that line the river banks would be even more diminished – the dam would trap all of the sand and sediment upriver and over time would rob the beaches in the lower river of their sand, just as dams do all over the planet. The dam also would block the passage of endangered migrating fish, including the mahseer, which can grow five feet long and weigh over 100 pounds, and the giant catfish, which can be even bigger. And it would further endanger these fish, the human culture that survives on the fish, as well as the river's burgeoning eco-tourist economy.

Three raft companies currently run a few multi-day expeditions on the river each year. One of our crewmates, Ramesh Bhusal, a journalist who also works with Waterkeeper Alliance along another Nepali river, stated his belief that the eco-tourist economy has great potential to expand and provide more sustainable jobs than the hydropower project.

Megh Ale takes this idea a step further; he foresees a "Karnali River National Park" that would protect not only the river, but also a

mile-wide corridor all the way along its route from Mt. Kailish on the Tibetan border, down into Bardia National Park in Nepal, and through Nepal into India to the headwaters of the Ganges. Although the country contains many national parks and spends vast amounts of money to protect them and their wildlife, it has no protected rivers.

As our expedition ended on the eighth day, we floated out into the plains at the town of Chisapani, where the river widens before braiding downstream, and where large diversion structures already suck out water to supply the massive rice farms on the plains. So the Karnali River remains undammed, but not untouched.

Amid massive mountains and glaciers that fascinate the world, the beautiful Karnali still runs free and begs to be saved, and Ale and his team are digging in for the adventure of doing so. **W**

*An earlier version of this article previously appeared in the online Earth Island Journal.*

Gary Wockner, PhD, is the Poudre Waterkeeper in Fort Collins, Colorado, and a member of Waterkeeper Alliance's board of directors. He is also an award-winning international environmental activist, writer, and consultant who focuses on water-and-river protection. He is author of the 2016 book, *River Warrior: Fighting to Protect the World's Rivers*.

# FROM DROUGHT HIT



## LESSONS FROM CALIFORNIA FOR A RESILIENT WATER FUTURE

CALIFORNIA'S WATERKEEPERS LEAD THE EFFORT TO MAKE WATER CONSERVATION A WAY OF LIFE IN THAT STATE.

BY SARA AMINZADEH,  
EXECUTIVE DIRECTOR, CALIFORNIA COASTKEEPER ALLIANCE

**D**uring the dry years, the people forgot about the rich years, and when the wet years returned, they lost all memory of the dry years. It was always that way.” John Steinbeck’s comment on California’s climatic cycles in his 1952 novel *East of Eden*, which lives on in the electronic signature of Russian Riverkeeper Don McEnhill, reminds us that these extremes have always punctuated life in California. But the recent historic drought that parched the state broke the mold. The four years between fall 2011 and fall 2015 were the driest since we started keeping records in 1895. Blistering heat in 2014 and 2015 also reached all-time-high temperatures. The wet years returned suddenly and forcefully this past winter, with weeks of record-setting rain that caused general flooding and overflowing reservoirs and threatened the integrity of the

Oroville Dam, the tallest in the United States.

Our reservoirs and snowpack have quickly been replenished, but other effects of that longstanding drought are still being felt. The years of scorching temperatures and low flows hammered our rivers and their Chinook salmon runs, which already were on the brink of extinction because of pumping and diversions that left streams too shallow and warm to support them. Communities that already lacked access to safe, affordable drinking water had to make do with bottled water doled out by the state, and many are still not connected to reliable water systems. The drought revealed how vulnerable California’s water supply is to increasingly severe extremes associated with climate change.

In 2014, Governor Jerry Brown declared a state of drought emergency, and subsequently required a 25 percent reduction in

water use, as well as prohibiting water-wasting practices such as spraying sidewalks with drinking water. Many communities and businesses stepped up immediately to comply, but some affluent areas, including Palm Springs and North San Diego, blatantly disregarded state mandates, pledging to pay whatever rates and fines came their way so that they could keep their lawns, hobby farms, polo fields and golf courses green.

Media across the country began to pay attention to issues we had struggled to address for years, and, as a result, so did the public and decision-makers. *The New York Times* and *Washington Post* regularly covered California’s water news, and outlets everywhere tuned in to watch State Water Board meetings. Waterkeepers shone a spotlight on “water hogs” in press releases and other contacts with the media, and testified every month before the Water Board. We



PHOTO COURTESY OF ELUZION PHOTOGRAPHY

emphasized the injustice of allowing wasteful uses when more than a million people in our state did not have access to safe and affordable drinking water.

California had to stop taking water for granted and start using it more wisely, and Waterkeepers urgently advocated sustainable practices they had championed for years, beginning with individual households. Russian Riverkeeper Don McEnhill made public his own water bill each month to demonstrate how a family of four could achieve 20 percent conservation. His organization, in the state's northwest, produced a water-conservation video entitled #Saveit. Orange County Coastkeeper, located in a region with some of the state's highest per-capita residential water use, utilized its 2.5 acre Coastkeeper Garden, which showcases six different low-water, California-friendly alternative gardens, and ramped up their "Smartscape" program for designing water-saving, drought-tolerant landscapes.

Santa Barbara Channelkeeper

partnered with several wineries and one brewery to convert their brewing barrels into beautiful oak rain-capture barrels (an idea imported from Milwaukee Riverkeeper—who else?).

In its car-centric locale, Los Angeles Waterkeeper launched the "Dirty for the Drought" campaign, encouraging residents to take a "Dirty Car Pledge" to not wash their cars for 60 days, and broadcast the "Dirty for the Drought" slogan on eight billboards. Over 10,000 Angelenos took the pledge, saving over 3 million gallons of water and warranting national-media attention.

But while some water users focused on conservation, others saw an opportunity to leverage drought fears to build large, expensive water supply projects. We saw a rush of projects that promised short-term relief, despite high financial and/or environmental costs. Proponents of ocean desalination, an expensive and energy-intensive process that has long been considered an option of last resort, sought to expedite approval of proposed facilities, applying political pressure on government agencies. A previously mothballed plant in Santa Barbara was scheduled to restart this summer, at an estimated cost of \$70 million.

Southern California Waterkeepers have worked tirelessly to fend off this aggressive push, organizing local

hearings, producing technical reports to demonstrate impacts, and, of course, using the law. Orange County Coastkeeper filed several suits to challenge and stop construction of a recklessly planned facility in their region, and San Diego Coastkeeper filed suit to require San Diego to recognize and account for the greenhouse-gas emissions caused by their newly built facility – the largest in the Western Hemisphere.

Amid widespread concerns about water shortages, the policies and practices that protect our environment fell by the wayside. Farmers and ranchers drilled and drew groundwater from aquifers in unmeasured and unregulated quantities. We also saw environmental laws violated under the guise of emergency measures.

California Coastkeeper Alliance worked with local Waterkeepers to track, watchdog and halt all attempts to undermine the state's environmental protections and push through bad proposals, which became a four-year game of whack-a-mole in the legislature and state agencies. Our work led to the adoption of California's first comprehensive policy to regulate ocean desalination, establishing environmental safeguards such as a requirement that all new facilities include intake pipes beneath the ocean floor to reduce harm to marine life.

## WE WORKED WITH MORE THAN 30 SCIENTISTS TO PEN A LETTER TO THE GOVERNOR URGING PERMANENT CONSERVATION REFORMS, NOTING: "BUSINESS AS USUAL IS NOT AN OPTION; CALIFORNIA SIMPLY DOES NOT HAVE ENOUGH WATER TO SUPPORT OUR OLD WAYS."

PHOTO BY CALIFORNIA DEPARTMENT OF WATER RESOURCES

# ARE WE STILL



PHOTO BY KIRA REDMOND



PHOTO BY MIKE WONDOLOWSKI



# IN A DROUGHT?

LEFT, SHASTA LAKE DURING THE HISTORIC DROUGHT WHEN ITS WATERS WERE AT AN ALL-TIME LOW. RIGHT, SINCE THE DROUGHT RAIN BARRELS HAVE BECOME A FIXTURE THROUGHOUT CALIFORNIA.

Coastkeeper Alliance also advocated for water-supply strategies that are less costly than desalination. When the rains returned last fall, the urgent need to conserve water faded, and residents began asking, "Are we still in a drought? Can we start watering our lawns again?" In May 2016, Governor Brown issued an executive order directing state agencies to "make conservation a California way of life." It was a promising sign of leadership, but we knew from our daily battle over emergency regulations that some water suppliers would be lobbying against a new permanent framework, arguing for exceptions, credits and adjustments in the name of "local control." It was clear that advocates had to come up with ideas to transform permanently the way our state used water.

We ramped up our efforts to rally support for efficiency and conservation, not only in times of emergency, but also as a full-time strategy for a state challenged by increasingly extreme conditions as a result of climate change. Studies suggest that California's droughts are becoming longer and drier, and that precipitation is falling increasingly as rain instead of snow.

Climate change will severely reduce water-supply reliability throughout the West. We worked with more than 30 scientists to pen a letter to the governor urging permanent conservation reforms, noting: "business as usual is not an option; California simply does not have enough water to support our old ways." We joined with the building industry and businesses in Silicon Valley to demonstrate the potential for California to meet water needs through homegrown innovation and technology.

On April 7th the governor declared the California drought was over in all but four Central Valley communities. Importantly, Governor Brown reaffirmed his commitment to make conservation a way of life with new water-conservation targets, drought-planning and prohibition of water-wasting practices.

California Coastkeeper Alliance, the Natural Resources

Defense Council and other partners hope to pass a package of bills this year that commits California to a permanent framework of conservation measures, including providing planning guidance for rural, urban and agricultural users to reflect permanent conservation regulations, and directing state agencies to develop common standards for efficient indoor and outdoor water use and for losses from leaks.

These standards would be used to create a water-use target for each urban water supplier based on local conditions such as population and climate. Each supplier would be able to choose projects that provided the most bang for their buck, such as repairing leaks or promoting more water-efficient landscapes.

Some worry that too much focus on urban water conservation distracts from larger, systemic water-supply issues, such as inordinate usage by Big Agriculture. Are we encouraging token actions when wholesale reforms are needed? Perhaps. California's water system is still structured in such a manner that conserved water doesn't reach the ecosystems and people that need it most. But our policymakers and the public are engaged in water issues like never before, and I believe something has shifted in the way that our state thinks about and values water. It's a palpable cultural change that can spark further and deeper reforms.

We know that, as our climate changes, our droughts and deluges will continue to break records. This is our new normal. Or rather, there is no more "normal." Yet during the devastating drought we have just endured, Californians, supported by their Waterkeepers, have proven that we can rally, and even thrive, in extraordinary circumstances. **W**

# RIVER WARRIOR



**R**ecently I met with China's Qiantang River Waterkeeper Hao Xin at the Massachusetts Institute of Technology in Cambridge to discuss his work restoring and protecting Zhejiang Province's environment and its principal river, the Qiantang. Hao Xin is also the vice-president and executive director of Qiantang River Waterkeeper's parent organization, Green Zhejiang, an NGO that has become one of the most influential water-advocacy groups in China.

If it were a country, China's Zhejiang Province, home to 55 million people, would rank 24th on the world's population list. The metropolitan area of its largest city, Hangzhou, alone houses 21 million people. Prior to Hao Xin's involvement, it suffered from some of the worst water pollution in the country.

Hao Xin's journey as an environmental activist began 17 years ago when he was a first-year environmental-science undergraduate at Zhejiang University. He was 18 years old, and had the idea to rally a few fellow students to bicycle with him around the province for a month to promote environmental

awareness and assess the level of water-pollution in the region. They called their 36-day, 2,000-plus-kilometers ride "Millennium Environmental Protection Cycling" and adopted the motto "I dream; I do." They found many places where pollution had reached staggering levels. Hao recalls many rivers "with piles of garbage visibly floating in black, foul-smelling water." He was shocked, and, joined by one of his university instructors, Professor Junhua Ruan, who received the seventh National Earth Award in 2003, is currently the president of what has become the largest

establish an environmental organization immediately upon his return to university.

Connecting to a growing network of civilian and professional allies, the organization was established in 2002, and grew steadily thereafter. It was first registered as a municipal-level civil-society group, the Hangzhou Eco-Culture Association. In 2013 it received provincial-level status as Green Zhejiang (GZJ). Professor Ruan, who received the seventh National Earth Award in 2003, is currently the president of what has become the largest



HAO XIN  
DEMONSTRATES  
WATER-QUALITY  
TESTING TO  
STUDENT  
VOLUNTEERS  
AT YINZHOU  
MIDDLE SCHOOL.

## A CONVERSATION WITH HAO XIN, QIANTANG RIVER WATERKEEPER

BY NATHAN SENGE

environmental NGO in the province.

Over the past decade, Green Zhejiang has set up an impressive reach of programs, including ones for environmental monitoring and promotion, ecological community-development, nature education, and environmental and climate-change research, and it has been honored with a wide array of environmental accolades and awards. That's a lot of success, but when Hao and his colleagues first became involved in water advocacy as university undergraduates, they faced a daunting lack of funding. They were, however, far from short of ideas, and they realized that their greatest challenge would be to achieve deep, long-term systemic change in the region's environmental practices. Xin remembered those early days and contrasted them to the present.

**Hao Xin:** "We knew that, if we could not clean the river and make villages more beautiful, all of our efforts would be wasted.

"Today Green Zhejiang is in a state of tremendous growth as an organization.

Our network is extensive in the social sector, and we have pushed successfully forward on such key issues as the sorting of waste. The changes we have made already have fused one voice out of the more than 50 million people in Zhejiang Province."

Like many provinces in China, Zhejiang has seen tremendous economic growth in recent years, and this has helped spread awareness of the need for ecological restoration.

**H. X.:** "It is interesting to note the relationship between one's income and the degree of environmental pollution. The more income you have, the more stuff you have, and the more you tend to waste. But then a point is reached where the relationship inverts. That is, as income rises past a certain point, one has enough income to take measures to lower one's environmental impact.

"Moreover, expectations for environmental protection also have increased. Twenty years ago, people literally would ask, 'What does it mean to protect the environment?' Now it's a topic they discuss over dinner.

"I'll tell you a funny story. Four years ago, there was a businessman in Zhejiang Province, a private entrepreneur and a member of Green Zhejiang, who went back to his hometown and saw garbage everywhere cluttering the river. So he offered 200,000 renminbi to the head of the Environmental Protection Department to go and take a swim in the river. The man politely declined. People are really starting to care about this issue."

**Nathan Senge:** "What would you say to the people in the environmental movement in the United States, especially given that you conducted your graduate studies in the U.S. at Clark University?"

**H.X.:** "Big issues must be made local. A global concern like climate change must become visible on a human scale, in one's 'own backyard,' where it can be seen, smelled and felt."

This is why he and his group have taken advantage of the extensive training he received at Clark in geographic information systems (GIS), and created the Live Water Systems map for the Qiantang River, which was based on the nationwide China Water Pollution Map. It can be accessed on any smart phone with the corresponding mobile application, providing fast real-time updates on sources of water pollution throughout Zhejiang Province.

**H.X.:** "The idea came to us originally 12 years ago, when I first met Mr. Ma Jun, the director of the Institute of Public and Environmental Affairs (IPE). The goal was to make a map of China's water pollution, and I was put in charge of its technical development.

"Overnight it caught attention all around the world—Mr. Ma Jun was put on the cover of *Time*. It was then I realized people were extremely concerned about the geographical location of these 'pollution spots.' If people knew they were in their backyard, they took to caring about them. They were scared of what was close by—they cared less about what was far away. The map helped them see that these issues are indeed very close by—it renders something lofty and abstract like 'climate change' local and visceral.

"Initially, this map was a one-way thing. It reflected the latest government-fed information, and we published it. But then we realized this would be a much more powerful tool if it became a platform by which everyone could report on nearby instances of pollution themselves. So when I studied GIS at Clark, I learned about the power of open-source geographic information, about updating this map together, as a community, in real time. This technology was successfully piloted in 2010 in Haiti in the midst of the great earthquake. Volunteers poured into Haiti and needed to know where people needed the most help. In response, a GIS-based system called 'Ushahidi' was created and applied."

Xin adopted its design in making the Qiantang River map interactive, allowing citizens to connect to the Environmental Protection Department, which in turn uses the map to find pollution spots and attend to them. The unpredictability of climate change makes such online maps particularly valuable.

**H.X.:** "This kind of dispersed grassroots environmentalist activity is essential in addressing our modern climatic situation, for indeed core issues like river pollution can crop up anywhere, in one of many forms. One cannot underestimate the power of the citizenry. The power inherent in all of us functioning as live and local climate reporters engaged in a collective endeavor of protecting and cleaning the environment we live in is everything. There is capital power in citizens acting on behalf of their local issues. That is how change mounts on a global scale. It does not come from the top. People on the ground need technological platforms by which they can do this. And that is what we provide."

Hao believes that there is a

critical need in the United States for a platform like this.

**H.X.:** "The new head of the EPA is a climate-change denier, so there must be grassroots activity, and it must be dispersed throughout the country to take advantage of all these people working diligently on their own local issue. They must have a way to communicate with one another, and coordinate their efforts."

**N.S.:** "Are there any qualities in yourself that you have noticed have changed throughout the course of your journey?"

**H.X.:** "Seventeen years ago, when I organized the bike ride, it was simply because I loved cycling. But in the 17 years since then, I have realized that I am not just living for myself. I work with a group of people with a unified vision, to make deep change possible for the world. I feel self-actualized through this work. And consciously, or unconsciously, I have become a leader for these people. When you become a leader, you take on the responsibility of helping more and more people. You are not persuading them, but softly leading them, helping them change naturally in the way they wish to change already. For instance, lots of my friends used to be environmental polluters, but I got to know them through reporting them to the Environmental Protection Department, and we have since become partners in supporting environmental protection collectively."

This is a common theme in Hao's journey—transforming polluters into supporters, a process that is facilitated in China when polluters are allowed to shut down their operations without financial penalty. In fact, Hao often works to ensure that they receive government subsidies when they make that choice.

**Hao Xin:** "I'll tell you another story. Three years ago, I went to a small town

**“  
BIG ISSUES  
MUST BE  
MADE LOCAL.  
A GLOBAL  
CONCERN  
LIKE CLIMATE  
CHANGE MUST  
BECOME VISIBLE  
ON A HUMAN  
SCALE, IN  
ONE'S 'OWN  
BACKYARD,'  
WHERE IT  
CAN BE SEEN,  
SMELLED AND  
FELT.”**

near Hangzhou where there was a rubber factory. The village was one of those typical villages where there has been a lot of rapid economic development after the reform and opening up, by which I mean the Chinese movement of 'Socialism with Chinese characteristics' that was initiated in 1978 by Deng Xiaoping. Basically, after this point, many farmers did not cultivate their land anymore and now worked in small businesses. These small factories brought heavy pollution to the village, and the rubber factory was a typical case. When you got close to the village, you could smell its pungent odor. So I reported the operator of the factory to the Environmental Protection Department.

"And I don't know how, but somehow he knew it was me who had done it. So he tracked me down, and we talked, and we actually talked very well. We were both born in the eighties and are of a similar age, and we spoke civilly and had a very nice conversation.

"A year-and-a-half later, I supported him in achieving a 'policy-related shut-down.' In China, a policy-related shut-down is very different from an 'environmental-related shut-down.' The former involves financial compensation; the latter does not. After this happened, this man became one of our key partners, and he is now the vice-director of one of the local environmental-protection organizations we work with to promote rural ecological protection and environmental education around the region.

"I discover more and more that you must get to know the heart of your challenger. So that you may empathize, and you may merge." **W**

**Nathan Senge** is a Systems Story Author for the Academy for Systems Change. He holds a summa cum laude B.A. in Chemistry from Dartmouth College, with a minor in Physics, and a M.A. in Journalism and Media Studies from the University of Colorado, Boulder.

# L O C K O D P E R T I N G F O R N O R T H W E S T C O A L T R A I N S

## WATERKEEPERS IN THE PACIFIC NORTHWEST WIN THE FIGHT AGAINST COAL EXPORT.

BY TYEE BRIDGE

The Cherry Point Aquatic Reserve—Xwe'chieXen in the language of the local Lummi Nation—is home to endangered herring, salmon, orca whales and long-tailed ducks. Bounded by sheer sandy cliffs and cobbled beaches, it covers about seven miles of Washington State's north coast. And it just became bigger. In January, just days before his retirement, Peter Goldmark, Washington's Commissioner of Public Lands, expanded the Cherry Point reserve to include 45 acres of tidelands and aquatic habitat. On the same day he rejected a requested sublease for a loading dock on the Columbia River in Longview.

Goldmark summed up his day's work in a press release: "These decisions are in the best long-term interest of Puget Sound, the Columbia River and the people of Washington. [The decisions] are informed by years of study and consideration, and represent the best way to protect and conserve our state's waterways."

But neither of these decisions sounds all that earth-shaking until you know some background. Those 45 acres at Cherry Point had been set aside for the Gateway Pacific Terminal, a coal-transfer facility projected to ship 48 million metric tons of coal per year out of the aquatic reserve. That would have made it the largest coal-export terminal on the West Coast. In turn, the Longview loading-dock had been requested for another proposed coal terminal, slated to ship out an additional 44 million tons of coal from the Powder River Basin in Wyoming.

To give some perspective: eight million metric tons of coal would pile as high as a 43-story building covering about 19 city blocks.

OPPOSITE PAGE, PROTESTERS AGAINST THE PROPOSED COAL TERMINALS RALLIED THROUGHOUT THE PACIFIC NORTHWEST, INCLUDING DR. PATRICK O'HERRON OF OREGON PHYSICIANS FOR SOCIAL RESPONSIBILITY, BOTTOM RIGHT.

In one day, then, Commissioner Goldmark acted to block the shipment of enough coal to bury an area the size of Manhattan six-feet deep.

### WHACK-A-MOLE RESISTANCE

Perhaps the most notable aspect of the demise of the Cherry Point and Longview proposals was that they were the last two remaining coal-export terminal proposals out of a series of six — all put forward in rapid succession when coal demand in the U.S. plunged after 2008. For Columbia Riverkeeper Brett VandenHeuvel, Goldmark's decision was a culminating victory in a six-year campaign to stop coal trains and terminals from invading the Pacific Northwest.

"It's been a long time," says Brett with a laugh. "Longview was the first proposed terminal. I have emails on that going back to July 2010."

As coal-fired power plants were shuttered and the fracking boom brought natural gas prices down over the past decade, coal companies got into a panic to export to Asia, where demand was surging. Export coal prices climbed for almost two years after 2009, and suddenly, coal-terminal proposals were popping up like mushrooms all over the Northwest: Longview, Cherry Point, Coos Bay, Grays Harbour and others. In 2015, American natural-gas-fired plants produced as much electricity as coal for the first time in history.

"I remember early on," recalls Brett "people were saying to us: 'This is just whack-a-mole, what you're doing opposing these terminals! They'd say, 'Why are you bothering to fight these one at a time? We need some federal energy policy that's going to take care of this.' And our answer all the time was, 'Well, number one, we don't have a federal energy policy. And we probably aren't going to have one any time soon that is going to protect us from coal exports.'

"Our second argument was that if we were able to knock some of these proposals off, it would buy us time. The markets change, the technology changes, to where there are more renewables available. So some of what seem like impossible fights can, maybe two, three years down the line, be won. If you're able to hold it off, it makes room for more good things, like renewables, to become more competitive."

And that was pretty much what happened. Pacific Rim coal prices peaked at about \$142 per metric ton in 2011 then plunged to \$51 per ton by early 2016. Public opposition delayed construction as the market shifted — possibly saving communities and businesses from losing even more money when the market evaporated.



PHOTO BY JAMIE FRANCIS, THE OREGONIAN.



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PHOTOS BY ALEX MILAN TRACY.

The economics of coal-pricing, which thrust major coal producers like Arch and Peabody into Chapter 11 filings, definitely undermined the business case for export, but well-coordinated public opposition also played a major role in keeping terminals out of Washington and Oregon.

What lessons can Waterkeepers and other community leaders take from the Northwest's years of resistance?

## THE THIN GREEN LINE

Columbia Riverkeeper was one of the organizers of the Power Past Coal (PPC) movement in the Northwest, a coalition that engaged the public regarding the dangers and drawbacks of coal exports. PPC was organized by Columbia Riverkeeper and a few other core organizations, including North Sound Baykeeper, Puget Soundkeeper, Climate Solutions, the National Wildlife Federation and Spokane Riverkeeper. The coalition served as a central support to communities opposing coal — providing facts, updates and strategy.

"We created it very early on with the idea that we would be much stronger if we coordinated our efforts," says Brett. "Many, many groups, from the coal mines in Montana and Wyoming to the coast, worked together very closely."

The collaboration was massive. The PPC website notes that 200 regional, community and national organizations were on board, and that "over 55 cities, counties and ports, close to 600 health professionals, 220 faith leaders, 500 local businesses (many from smaller rail-line communities), and over 160 elected officials" had raised concerns about coal exports. The Seattle-based think-tank Sightline Institute has dubbed British Columbia, Washington and Oregon "The Thin Green Line" — a "geographic accident" that placed the traditionally progressive West Coast between North American fossil-fuel deposits (Powder River coal, Bakken shale oil, Alberta tar sands, numerous natural gas fields) and commodity markets in Asia.

Power Past Coal demonstrated that this thin line could get thick fairly quickly. When asked how the coalition grew to include such broad community support, Brett says that the first factor was "just a huge public outcry against coal export. While there was a lot of organizing, much of it happened organically. People stood up to protect what they love. Strip-mines and coal trains were a very visceral threat that people could see, and understand, and didn't like."

## PEOPLE DIDN'T WANT THESE TRAINS ROLLING THROUGH THEIR COMMUNITIES, IT BROUGHT OUT DOCTORS, FAITH LEADERS, BUSINESSES, RANCHERS, FARMERS.

While some environmental threats are invisible, or underwater, coal trains and terminals have hard-to-hide footprints. The westbound trains haul over a hundred cars each and reach as long as a mile. And, despite dampening surfactants applied to the exposed coal, up to 500 pounds of coal-dust can be lost from each train-car in a single trip. Some communities could look forward to 18 open-car coal trains a day passing through their backyards if terminal projects were approved.

"A lot of the strongest concern was for public health. People didn't want these trains rolling through their communities," says Brett. "It brought out doctors, faith leaders, businesses, ranchers, farmers. We set record numbers for public hearings and public testimony."

In the case of the Longview terminal, which was the first of the six to be proposed and the last to be refused, the Washington Department of Ecology received 257,000 public comments.

Legal challenges and engagement with regulators were the second factor that led to success, says Brett. "We had a strong and aggressive legal component to this campaign, where we challenged permits when necessary, and pushed the state and federal agencies to take a hard look at these projects. We evaluated very closely all of the permits and approvals they would need, and we designed the campaigns around those approvals. That combination of community organizing and strategic legal work was really important."

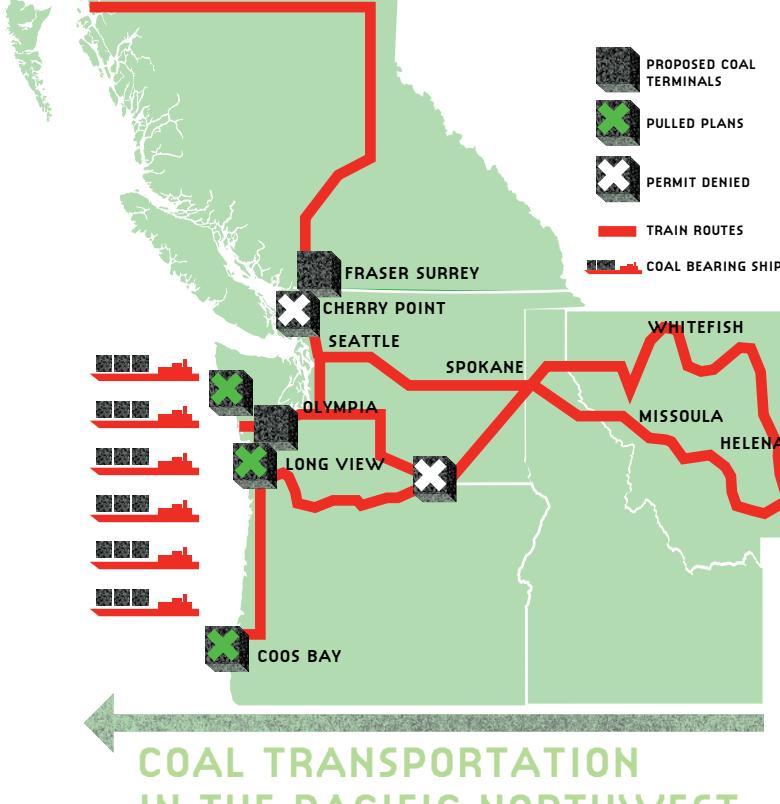
Regional tribes and tribal organizations throughout the Northwest were also crucial in holding the line against the trains and terminals. These included the Yakama Nation, the Nez Perce Tribal Executive Committee, the Columbia River Inter-Tribal Fish Commission and the Lummi Nation.

"They all had unique facts and unique regulatory processes," says Brett. "The tribes played an incredibly important role in standing up for clean water, salmon and treaty rights."

In Oregon, acknowledgement of a traditional tribal fishery was key in the Department of State Lands' refusal in 2014 to permit a coal terminal at the Port of Morrow on the Columbia River. Similarly, the federal treaty that ensures the fishing rights of the Lummi Nation was the basis for the Army Corps of Engineers' rejection of the \$700 million coal terminal at Cherry Point. That decision paved the way for Commissioner Goldmark to return the aquatic acreage to the reserve.

"The Corps may not permit a project that abrogates treaty rights," the commander of its Seattle District, Colonel John Buck, told a local newspaper as the Lummi celebrated the decision.

Lummi Chairman Tim Ballew added, in a written statement: "Treaty rights shape our region and nation. As tribes across the United States face pressures from development and resource



extraction, we'll continue to see tribes lead the fight to defend their treaty rights, and protect and manage their lands and waters for future generations."

## OIL TRAINS AHEAD

Brett VandenHeuvel notes that the oil industry is much stronger than the coal industry, and is "pushing very hard" to move oil trains to West Coast export terminals. "The drilling boom in the West, trying to get that oil to the coast — it's the same situation as coal," he says.

One of the largest new crude-by-rail terminal proposals is the Tesoro Savage facility in Vancouver, Washington on the Columbia River. The 42-acre site would receive up to 360,000 barrels of oil per day to be loaded onto giant tankers. According to the advocacy group Friends of the Columbia Gorge, the terminal would be the largest in the country and would send four more trains down the Columbia Gorge each day, each carrying "millions of gallons of explosive Bakken crude." For Brett and others who have spent six years fighting coal trains, it's a case of déjà vu.

"The good thing is we've built some pretty big, powerful lists, and local leaders and communities are much more aware of what's going on with their ports," VandenHeuvel says. There's a lot more scrutiny on some of these decisions, and they're not happening behind closed doors as easily."

This seems to be the case. In 2016 the State of Washington received over 289,000 comments regarding the proposed crude-by-rail site.

"I think the coal export issue has actually made the oil fights — well, 'easier' is probably not the right word — but, you know, easier," Brett concludes. "These kinds of proposals aren't going away. We're definitely still fighting them." W

## WATERKEEPERS COMMENT

Bart Mihailovich, former Spokane Riverkeeper, is now Organizer, Eastern U.S. for Waterkeeper Alliance and a veteran of the Northwest coal battle:

I hope at some point Brett and his staff at Columbia Riverkeeper write a book about some of the tactics they used. What they pulled off — and not just them, but a whole lot of people — in terms of effective strategies, with communication and group action — has just been incredible.

In 2010 the coal train issue in Spokane wasn't on anyone's radar. Yet it was very visible, and it affected many places all along the route — cities like Missoula, Sandpoint, Spokane, where train traffic is a fact of life. So it was relatively easy to build up non-conventional allies, like local emergency response people, who were willing to say, "We're simply not ready for this increase in train traffic. It's very dangerous, and lives could be lost if people are stuck behind a track waiting for an emergency response."

Then there were allies from the passenger-rail companies and from agriculture — grain growers and apple shippers — saying "We don't want our tracks clogged with coal trains. This is a commodity that's not helping anyone in the U.S.; it's going to be shipped to China and India. We're the local economic drivers, who are putting money and revenue back into this economy."

So it wasn't just this hippy green thing. It was a lot of people saying "Let's look at our region in a more realistic way. What kind of community do we want? Do we want train traffic shipping grain or apples or aerospace industry parts, or do we want to put everything behind coal?"

Puget Soundkeeper Chris Wilke and his organization won a legal battle in 2016 to get coal-by-rail shipper BNSF to pay for clean-up of waterways contaminated by coal, and to study the possibility of covering their train cars. Puget Soundkeeper also achieved tightened restrictions of oil-refinery effluent. Here Chris talks about the looming threat of oil trains:

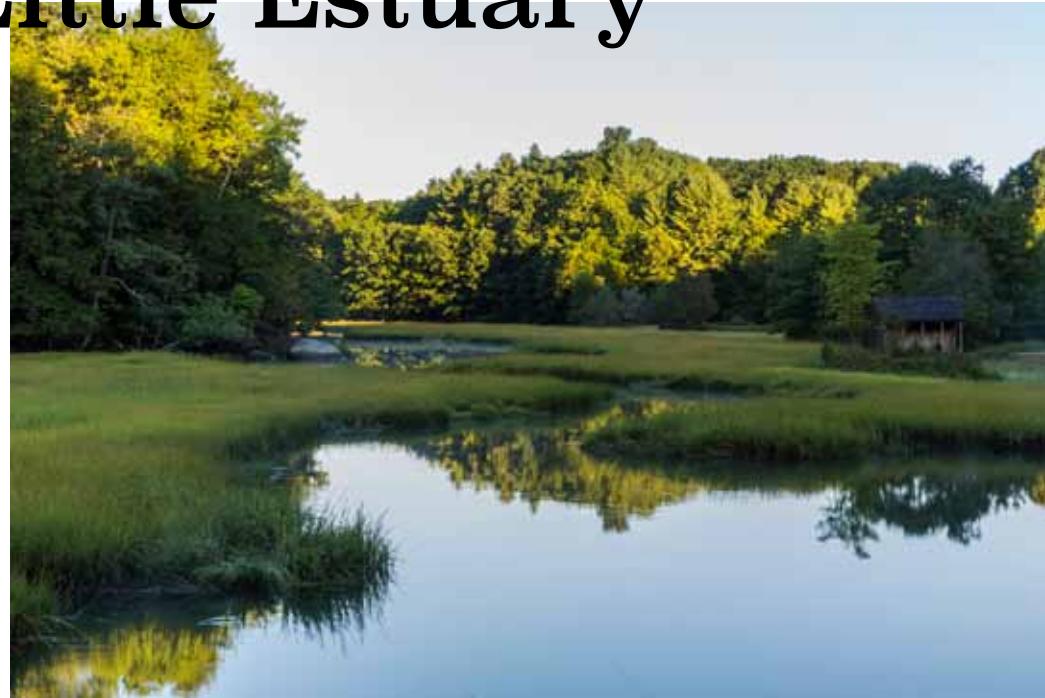
In the coal case with BNSF we were arguing that every car of every train discharged coal into every waterway that it crossed. That doesn't happen with oil trains. What we have with them is high risk and a very high consequence from any disaster. Derailments happen, and oil explodes and flames jump three stories high. It burns for days and spills into waterways, and in some cases people lose their lives.

We participated with Waterkeeper Organizations and Affiliates across the country in documenting aging rail infrastructure for Waterkeeper Alliance's 2015 "Deadly Crossing" report. About 40 percent of 250 rail crossings that Waterkeepers examined showed obvious signs of disrepair and possible instability. We saw 25 crossings on Puget Sound where the footings were severely eroded. And the federal government has a limited ability to order repairs on some of these crossings because they are privately owned and railroads are the primary agency in charge of maintaining them.

Last fall the U.S. lifted a 40-year ban on export of crude oil. Right now the market is poor because of the glut of oil, but if gas goes up to \$4 or \$5 a gallon, you better believe they'll be wanting to export more and more of it, and you'll have more trains, more impact on communities, and higher risks.

Tyee Bridge is the former Fraser Riverkeeper in British Columbia. His writings have received four National Magazine Awards and seven Western Magazine Awards. He is the co-author, with Joel Solomon, of the 2017 book "The Clean Money Revolution."

# A Little Estuary



PHOTOS BY ECO PHOTOGRAPHY.



THE GREAT BAY ESTUARY IS RICHLY ENDOWED WITH WETLANDS AND WOODS.

and New

# with Big Problems

BY LAURIE O'REILLY

With its breathtaking panoramas and diverse habitats of salt marsh, mudflats, rocky shores and eelgrass meadows, the Great Bay estuary is a vital part of the landscape of New Hampshire's seacoast region and southern Maine. Extending inland from the mouth of the Piscataqua River – and including Little Bay, Great Bay, and numerous rivers and tidal creeks – the 13,000-acre estuary is a critical resource for fish, birds and other wildlife. It is also a beautiful destination for boating, fishing, and hiking and, for many who live here, a place for contemplation,

The Great Bay estuary's economic and cultural histories have been as impactful on the region as its natural endowments. Its waters – once plied by the famous wind-driven Gundalow barges – powered sawmills and tanneries, and its salt hay was once harvested for food and bedding for farm animals. While the shores of Great Bay and Little Bay remain largely undeveloped (in no small part due to the successful effort in the 1970s to stop Aristotle Onassis from constructing a massive refinery there), portions of the Piscataqua River are lined with power plants, oil terminals, and other industrial sites.

More than 400,000 people now live in the 52 cities and towns within the watershed, and as the population has grown and the region become more developed, the pressures on this remarkable resource have intensified. Today Great Bay is in jeopardy, its

future uncertain. Pollution is pushing its waters toward a tipping point, degrading its health and its habitats. But prodding and persistence from the Great Bay-Piscataqua Waterkeeper have raised local awareness of the bay's troubles and roused action to resolve them – offering hope for this small but mighty estuary.

For centuries, Great Bay was New Hampshire's most bountiful source of oysters, until, in 1993, its oyster population was virtually wiped out almost overnight by two parasites. A thousand acres of oysters was reduced to just 50, and while it once took the oyster population two-to-three days to filter the entire volume of water in the bay, it now took the remnant population a year and a half. Though several dedicated local groups have undertaken efforts to bring oysters back, the continued presence of parasites, coupled with the fact that the historic beds are covered in sediment, make it unlikely that the population will ever fully recover.

Then the eelgrass, the cornerstone of the estuary's ecosystem, began to decline, as it has in estuaries across the world over the last two decades. When healthy, this sub-tidal plant grows in thick meadows, providing essential habitat for fish and crustaceans, producing oxygen, anchoring sediments, improving water-quality, and sequestering carbon even more effectively than the trees in our forests.

# Hopes

In Great Bay, according to Dr. Fred Short, world-renowned seagrass expert and professor at the University of New Hampshire's Jackson Estuarine Laboratory, 2,900 acres of fairly healthy eelgrass in Great Bay have shrunk over the past two decades to 1,500 acres. This dramatic drop seems to have stabilized in the last three years, but acreage is not the whole story. The eelgrass has also lost biomass, and what has been thinned out has been replaced by macroalgae, such as "sea lettuce," which do not provide the same important habitat and other benefits to the local ecosystem. Using 1996 as a baseline, Dr. Short estimates that nearly four-fifths of the eelgrass biomass in Great Bay that forms its natural habitat has been reduced from 1,630 metric tons to 348.

#### BARNUM'S MISSION WAS THREE-FOLD:

### 1. safeguard the long-term health of the estuary by finding ways to reduce pollution,

In 2007, realizing that increasing pollution was coinciding with this devastating loss of eelgrass, the Conservation Law Foundation (CLF), a New-England-wide environmental advocacy organization, used the Clean Water Act to leverage regulation of nitrogen in the estuary. The U.S. Environmental Protection Agency began to focus sharply on reducing nitrogen pollution from sewage-treatment plants, while heading off strong pushback from a small group of municipal officials about the costs of upgrading plants, and about whether nitrogen was causing harm in the estuary at all.

"We've all heard of climate denial. Here, addressing a pollutant that has had oxygen-depleting effects in estuaries across the globe, we were dealing with nitrogen denial," says Tom Irwin, director of CLF's New Hampshire office. "That's when we realized we needed a Waterkeeper. We had been successful getting the regulators to take action, but we also needed local citizens to speak up for clean water and the investments that would get us there."

CLF was well aware of the Waterkeeper model, having established the Lake Champlain Lakekeeper program in Vermont in 2002. By combining its legal and policy expertise with the proven effectiveness of the worldwide Waterkeeper model, CLF realized it could help build a local movement committed to Great Bay's protection, and it launched the Great Bay-Piscataqua Waterkeeper program in 2012.

Jeff Barnum was a natural fit for the role of Waterkeeper. As a recreational fisherman along Great Bay and the Piscataqua River, Barnum had witnessed firsthand the effects of pollution, including the dramatic loss of eelgrass habitat, and, during his time as president of the Coastal Conservation Association of New Hampshire, he had focused on the health of the state's estuarine ecosystems. One of his key accomplishments was the establishment of an oyster-shell-recycling program, in which shells from area homes and restaurants were used to establish new oyster beds in Great Bay, benefiting its water-quality and habitat.

Barnum's mission as Great Bay-Piscataqua Waterkeeper was

three-fold: to safeguard the long-term health of the estuary by finding ways to reduce pollution, to keep a watchful eye and guard against illegal and harmful activities, and, most importantly, to build a stronger voice for the estuary by educating and mobilizing local citizens to protect it.

In any given week, Barnum could be found tabling at a local event, attending a community supper, or giving a presentation at a library or civic-group meeting. He conferred regularly with town leaders, planning boards and partner organizations. During the summer he took local officials, reporters and volunteers out on the water so that they could experience Great Bay's beauty and better understand its fragile health. And he contributed op-ed pieces and a bi-monthly column about current issues in the

bay to local newspapers. In short, he aimed to help people see Great Bay the way he does: as an extraordinary, vibrant and vital place that urgently needed their advocacy before it was too late.

And people listened. Barnum convened a group of more than 30 local volunteers – "Clean Water Advocates for Great Bay" – who help to keep the public's attention focused on

Great Bay by turning out to town meetings and hearings where issues affecting the bay's health are on the table. In 2015, he worked with Timberland and Seven Rivers Paddling to organize annual cleanups. Since then, more than two dozen volunteers have taken to their kayaks and removed enough debris from the bay to fill more than three dumpsters. These residents learn about this remarkable resource and serve it at the same time.

"The estuary is right in our backyard," says Barnum, "yet many people haven't gotten out on the water, and don't understand it needs help. My job is to help people connect with our local waters. It's the best way to engage them and keep them involved."

Perhaps Barnum is most dedicated to raising awareness about the damage caused by nitrogen pollution – and how the solution to that problem lies very much in the hands of the people and communities surrounding Great Bay. Sewage-treatment plants are the watershed's largest controllable source of nitrogen

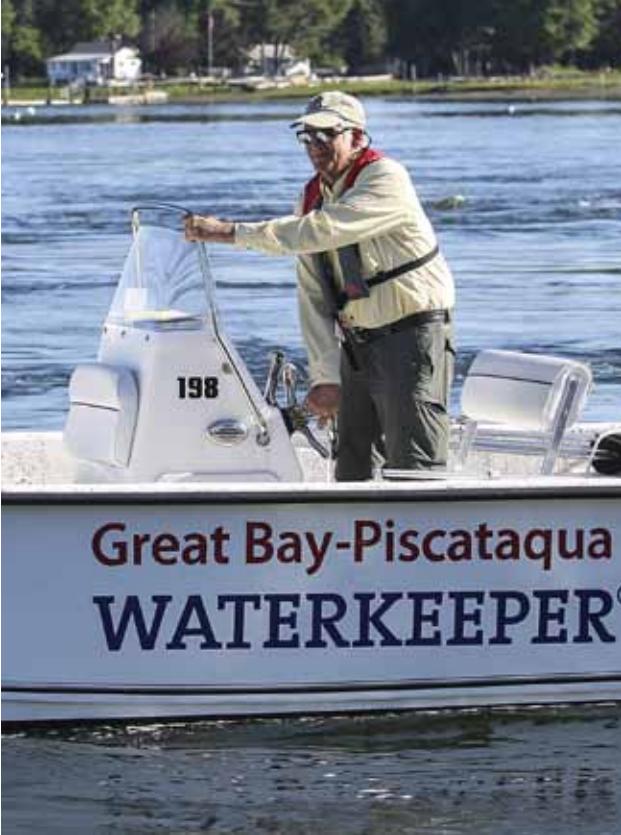


PHOTO BY CHERYL SENTER COURTESY OF NHCF



LEFT, WATERKEEPER JEFF BARNUM IN THE WATERKEEPER PATROL BOAT. AND, ABOVE, BARNUM REVIEWS PLANS FOR THE 2016 GREAT BAY KAYAK CLEANUP WITH TEAM LEADERS FROM SEVEN RIVERS PADDLING, WHO HELPED TO ORGANIZE THE ANNUAL EVENT.

times. He has set out to educate them as well as managers of local garden and hardware stores about the right ways to fertilize and the harm that can result when the stuff is misused. He has also worked closely with community activists and the program's Clean Water Advocates to support local fertilizer ordinances.

"It's all about educating people to become part of the solution," says Barnum. "The job of cleaning up our waters

### 3. and, most importantly, to build a stronger voice for the estuary by educating and mobilizing local citizens to protect it.

belongs to us all, and once people understand the challenges, most are happy to do their part."

This is progress, to be sure, but Barnum knows that the fight to curb this bay-killing pollution is far from over and that the keys to recovery will be persistence and a continuing willingness in communities to invest in clean water. And new threats to the health of our waters and the public are emerging.

The Great Bay estuary wraps around three sides of the redeveloped Pease Air Force Base, which closed in 1991. Research has recently tied perfluorinated chemicals, or PFCs, which were used at the base for fire-fighting, to soft-tissue cancers. PFCs at Pease have contaminated three wells that supply drinking water to the coastal city of Portsmouth. One of these is closed and the other two have been retrofitted with activated carbon filters. The chemicals also have been found migrating from the site of a former landfill nearby that received waste from Pease. Barnum has conducted two rounds of water-sampling that show high levels of PFCs in a brook near the landfill.

While the EPA recently lowered its health-advisory for

lifetime drinking-water exposure to PFCs from 600 parts per trillion to 70, Barnum, CLF and others are concerned that even this much lower standard does not sufficiently protect public health

Stormwater magnifies the problem, carrying PFCs, nitrogen and other pollutants from the property into three creeks that flow into the estuary. In January, CLF filed a lawsuit against the Pease Development Authority for its failure to comply with the Clean Water Act's municipal stormwater-management program.

Elected officials and local citizens also have organized to introduce legislation, push regulators to act, and encourage responsible parties to actually be responsible.

Ultimately, that is what the Great Bay-Piscataqua Waterkeeper is all about – working with and mobilizing community members and partners to protect and restore the estuary. Barnum knows that no single voice will ever be enough to save Great Bay, and that success thus far has come through listening, convening, guiding, and being guided by the volunteers, partner organizations, legislators, and town officials whose energy and dedication are preserving and restoring Great Bay for the present – and for tomorrow. **W**

*Laurie O'Reilly is the chief content officer at the Constitution Law Foundation, and is based in Boston, Mass. Jeff Barnum retired as Great Bay-Piscataqua Waterkeeper in May. Melissa Paley was named the new Baykeeper in that same month. She brings extensive environmental and communication expertise to the job along with longstanding connections to the watershed.*

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ROBERT H. BOYLE

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