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VOLUME 7 NUMBER 1

WINTER 2011

# Global Warming

Waterkeepers Around the World  
Face Up to Climate Change



WINTER 2011 \$5.95



*plus*  
**Big Victory vs. CAFOs pg. 12**  
**Update on the Gulf pg. 18**



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TERRY TAMMINEN

Intro:

# Facing Up to Climate Change

By Terry Tamminen

Stories of climate calamities are ubiquitous this year – such as the extreme and deadly heat waves boiling Russia and the flood that has devastated Pakistan and taken more than 2,000 lives. Here in the United States, the summer of 2010 turned out to be the hottest on record in New York City. Climate change is a natural subject for Waterkeeper magazine, because, as the planet gets warmer, we easily can see the damaging effects of climate change through our relationship with water:

As our oceans absorb more carbon dioxide, they become more acidic, destroying coral, plankton, and shellfish, which are major drivers of our coastal economies and are critical to our marine ecosystems.

Our warming oceans have threatened to change gray-whale migration patterns as they head to Baja, Mexico.

Sea-level rises are increasing beach erosion and threatening our coasts.

Today, worldwide, there are between 25 and 50 million environmental refugees, most fleeing areas of drought or flooding.

Australia has been suffering from record drought lasting for more than a decade, drying up rivers, jeopardizing drinking-water supplies, and ravaging food supplies and prices.

The Czech Republic has faced epic flooding that has shut down train-lines, disrupted power-supplies, and caused hundreds of millions of dollars in damage.

The Inupiat Eskimo village of Kivalina, Alaska is seeking up to \$400 million from oil companies for damages to its coastal real estate, where the sea ice that has protected the villagers is now eroding, jeopardizing the community's existence.

In the pages that follow, are the stories of everyday heroes who are on the front lines protecting their communities. Waterkeepers' activities in the realm of climate change range from temperature-monitoring to citizen awareness to litigation against carbon-spewing industries.



CONSEQUENCES OF CLIMATE CHANGE: DEAD CORAL REEF WITH SKELETAL REMNANTS OF REEF-BUILDING CORALS.

PHOTOGRAPHER: DAVID BURDICK

## SOME EXAMPLES INCLUDE:

Martha Moctezuma, the Los Cabos Coastkeeper in Baja, California Sur, Mexico, has significantly increased her organization's efforts to defend coastal dunes and wetlands over the last year, seeking an official decree of protection for these resources, and organizing massive citizen-awareness campaigns.

John Weisheit, the Colorado Riverkeeper, is fighting a proposal to begin strip-mining tar sands in the Uinta Basin of the Colorado Plateau in Utah – the second driest state in the United States.

California Coastkeeper Alliance has begun a comprehensive "Taking Action in the Face of Climate Change" program, through which it has urged the U.S. Environmental Protection Agency (EPA) to take immediate action on ocean acidification, called for funding for sea-level-rise adaptation, and worked with key agencies to implement specific adaptation strategies.

In these pages, we highlight these local advocates' efforts to spur our elected leaders to act, fully aware that the U.S. Congress waved the white flag on addressing carbon this summer, and expecting very little, if any, progress to be made at the Cancun Conference of Parties in December. Nonetheless, we hold out hope that the regional leaders at the R20 conference – a new sub-national initiative – in Davis, California, in November, will have the vision and courage to take decisive action and help lead us to a clean-energy future. These leaders – like Governor Arnold Schwarzenegger, whose "Million Solar Roofs Initiative" is spurring rooftop solar-installations in California, replacing the output of about one large power plant every six months – have seized the initiative to show governments around the world that aggressive measures can lead us to the creation of green economies that will clean the environment, create green jobs, and address climate change. It is these visionaries who are setting the bar that the world's leaders must reach for.

Waterkeepers and other grassroots activists across the world are making herculean efforts every day as they tackle some of the greatest threats our communities have ever faced. Can we count on our elected leaders to do the same?

*Terry Tamminen is the former Secretary of California's Environmental Protection Agency and founder of the nonprofit organization Seventh Generation Advisors. Terry founded Santa Monica Baykeeper in 1993, and is a member of Waterkeeper Alliance's Board of Trustees.*

## Up to the minute: A Showdown with Big Coal in Kentucky

On Thursday, October 7, 2010, Waterkeeper Alliance, Appalachian Voices, Kentucky Riverkeeper and Kentuckians for the Commonwealth filed a 60-day notice of intent to sue against several Kentucky coal companies. According to the letter, ICG Knott County, ICG Hazard and Fasure Creek Mining (a subsidiary of Trinity Coal) routinely failed to conduct proper water-quality testing and often submitted false testing data to state agencies. All three companies, which maintain operations in the eastern part of Kentucky, work under state-issued permits that allow them to release limited amounts of pollution into nearby rivers and streams. Those permits require the mining firms to monitor their pollution and report it back to state officials. Once turned over to the state, the reports become public documents.

At a press teleconference announcing the filing, representatives of the groups, including Waterkeeper Alliance President Robert F. Kennedy, Jr., and Upper Watauga Riverkeeper Donna Lisenby, spoke about the development of this case and the importance of holding this industry accountable under the Clean Water Act. Lisenby described how she and others from Appalachian Voices visited the offices of the Kentucky Division of Mine Reclamation and Enforcement and found dust-covered stacks of un-reviewed Discharge Monitoring Reports (DMRs) dating back several years. A review of these reports uncovered over 20,000 reporting violations by these three companies alone. During the teleconference, Kennedy spoke of the blatant criminal acts of these companies, where in some cases old monitoring reports were submitted with the date simply scratched out and a new date written in.

Under the Clean Water Act, the companies named have 60 days to respond to the allegations. If, at the end of that period, all violations have not been corrected, Waterkeeper Alliance and its partners plan to file a complaint in federal court for the Eastern District of Kentucky.



**ON THE COVER:**  
Midnight sun, melting Arctic ice, open leads, and cirrus clouds. Arctic Ocean, Canada Basin.

Photographer: Jeremy Potter  
National Oceanic and Atmospheric Administration (NOAA), NOAA  
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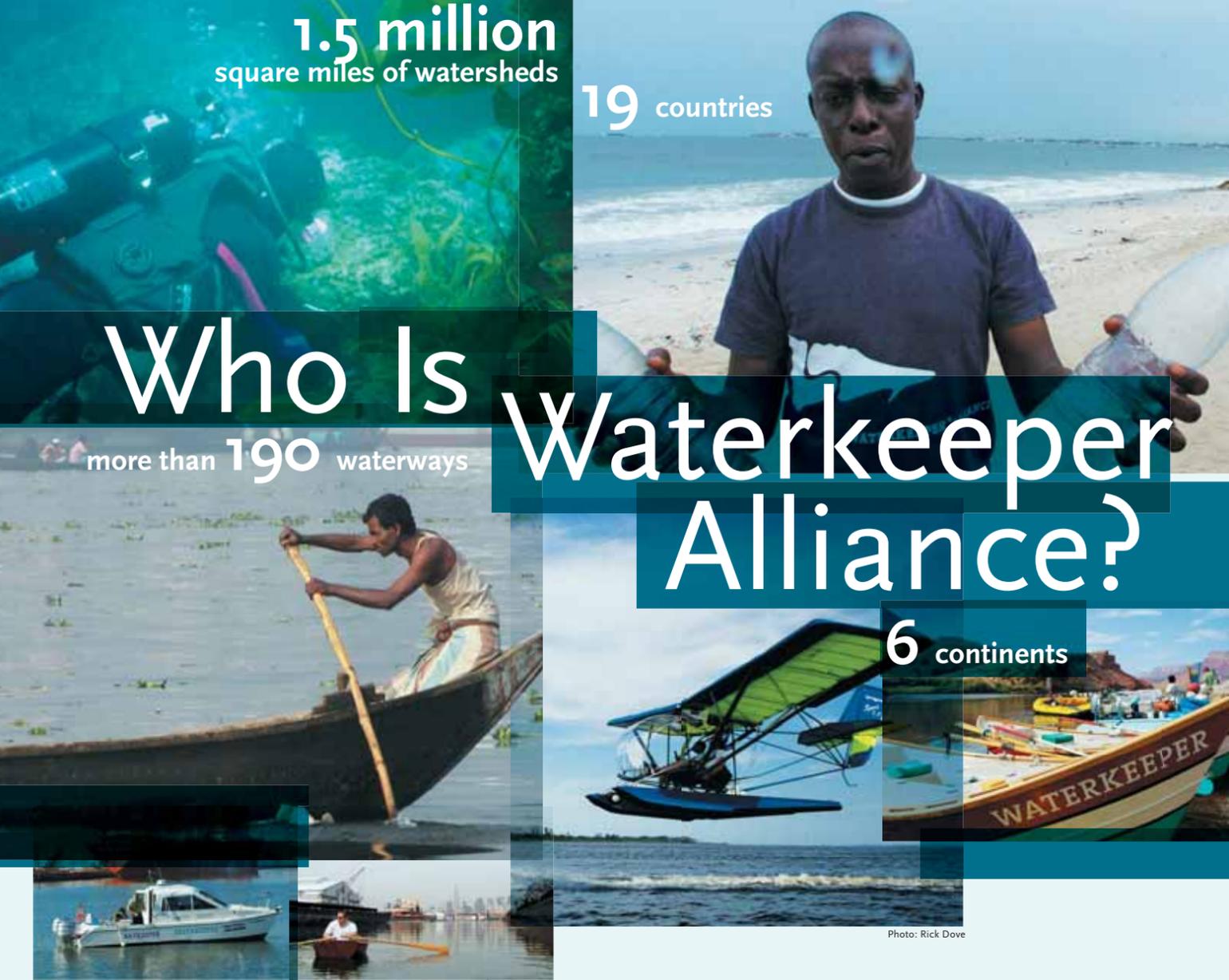
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19 countries

# Who Is Waterkeeper Alliance?

more than 190 waterways

6 continents



In virtually every part of the world, climate change is affecting the quality and quantity of water resources. As the effects intensify in the coming years, the impacts on farms and forests, coastlines and floodplains, water supplies, and human populations will become more and more severe.

Waterkeeper Alliance is uniquely positioned to confront the effects of climate change and other environmental threats by engaging its grassroots network on local, regional and global levels. We are the voice for rivers, streams, wetlands and coastlines in the Americas, Europe, Australia, Asia and Africa.

We are a powerful worldwide coalition of nearly 200 local Waterkeeper groups—Riverkeeper, Baykeeper, Coastkeeper and other grassroots Waterkeeper organizations—connected as a unified international force to defend the world's waters during this period of unprecedented crisis.

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# { Ripples }



LEFT: ANIMAL WASTE FROM FACTORY FARMS OFTEN SPILLS INTO NEARBY WATERWAY WHERE IT CAUSE MANY WATER PROBLEMS, INCLUDING MASSIVE FISH KILLS LIKE THIS ONE ON THE NEUSE RIVER IN NORTH CAROLINA.

ABOVE: CHICKEN MANURE PILES LIKE THIS ONE ON MARYLAND'S EASTERN SHORE POLLUTE NEARBY WATERWAYS WITH DANGEROUS CONTAMINANTS THAT KILL FISH, SPREAD DISEASE AND TAINT DRINKING WATER.

PHOTO BY RICK DOVE

## Waterkeeper Alliance and Partners Reach Settlement with EPA on Factory Farm Pollution Lawsuit

The U.S. Environmental Protection Agency will launch a regulatory initiative to identify and investigate thousands of factory farms that have been avoiding government regulation for animal waste pollution, according to a settlement reached in May on a lawsuit filed by Waterkeeper Alliance, NRDC and the Sierra Club over a Bush administration water pollution regulation.

Factory farms, also known as concentrated animal feeding operations (CAFOs), confine animals on an industrial scale and produce massive amounts of manure and other waste that pollute waterways with dangerous contaminants. These large-scale operations routinely over-apply liquid animal waste on land, which runs off into waterways, killing fish, spreading disease, and contaminating drinking water. EPA estimates that pathogens, such as E. coli, are responsible for 35 percent of the nation's impaired river and stream miles, and factory farms are one of the most common pathogen sources.

Now dominating animal production nationwide, confined livestock operations generate more than three times the waste that people do, according to EPA estimates, yet factory farms lack waste treatment facilities comparable to those that treat human sewage.

Many of these massive facilities have been operating without the EPA even knowing of their existence. This lawsuit guarantees that EPA starts gathering the missing information required to clean up the country's waterways.

Waterkeeper Alliance, NRDC and the Sierra Club filed the lawsuit over a rule that effectively exempted thousands of factory farms from taking steps to minimize water pollution from the animal waste they generate. More than 30 years ago, Congress identified factory farms as water pollution sources to be regulated under the Clean Water Act's permit program. But under this rule, massive facilities were able to escape

government regulation by claiming—without government verification—that they do not discharge into waterways protected by the Clean Water Act.

Under the settlement, EPA will initiate a new national effort to track down factory farms operating without permits and determine for itself if they must be regulated. The specific information that EPA will ultimately require from individual facilities will be determined after a period of public comment. But the results of that investigation will enable the agency and the public to create stronger pollution controls in the future and make sure facilities are complying with current rules.

"The record is clear: large CAFO operations – and many medium and small operations – commonly discharge pollutants into the surrounding environment," said Waterkeeper Alliance attorney Hannah Connor. "What is also clear is that if we want to continue to drink, fish and enjoy water that is not contaminated with raw animal excrement, these discharges must be stopped. The terms of this settlement will help reverse this industry's history of bad behavior by improving enforcement of the law."

Waterkeeper Alliance has a long history of fighting to clean up water pollution from factory farms. Litigation brought by these groups has forced EPA to revise its CAFO rules twice within the past decade to tighten the pollution control requirements on these facilities.

**More than 30 years ago, Congress identified factory farms as water pollution sources to be regulated under the Clean Water Act's permit program.**



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# Global Warming

*Sometimes climate change can seem like a far-off abstraction. That is, until you see it in the mountains of China and India, where the glaciers are melting at an unprecedented rate, in the terrible flooding in Pakistan, in the greater frequency of hurricanes in Baja California, and in the increasingly parched American West.*

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**02**  
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**04**  
LOS CABOS, MEXICO

**05**  
OAXACA, MEXICO

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# In This Dry Country The Rivers Are Dying

*An Australian Riverkeeper educates a city about climatic threats to its water source – and long-term solutions.*

BY IAN PENROSE, YARRA RIVERKEEPER



01



02



03

01 YARRA RIVERKEEPER IAN PENROSE PATROLS THE ESTUARY OF THE YARRA WITH THE CITY OF MELBOURNE IN THE BACKGROUND.

02 PENROSE CHECKS THE RIVER LEVEL GAUGE, WHICH SHOWS THE DEPLETED STATE OF THE YARRA.

03 PENROSE ADDRESSING THE GATHERING OF KAYAKERS IN THE CENTRAL BUSINESS DISTRICT PROTESTING FOR IMPROVED FLOWS IN THE YARRA RIVER.

**A**ustralia is the driest inhabited continent on the planet, and is particularly vulnerable to the changing climate. Weather-patterns across the country are renowned for their variability, and the frequency and impact of severe natural events, such as bushfires, droughts and floods are predicted to increase. This is particularly evident in my hometown, Melbourne, the capital of and major city in the southern state of Victoria.

In February 2009 the temperature in Melbourne rose to 46.4° C (115° F), marking the hottest day on record. In the soaring heat the tinder-dry bush ignited and spread into a massive bushfire fanned by gale-force winds. The inferno on this “Black Saturday” claimed the lives of 173 people, destroyed almost 2000 homes and killed several million native animals. It was Australia’s worst natural disaster. The fire-front came within 20 kilometers of my home in bush-land beside the Yarra River, but luckily the wind changed just in time to spare us any loss.

Was climate change to blame? No one can say. But we do know that around Melbourne the climate has become drier, and that there is much less water run-off. The Yarra River, the city’s main water-source, has been experiencing a never-ending summer. Its catchment (watershed) has been in drought for more than a decade, and, as a result, Melburnians are drawing out a far-greater portion of its water. During 2007, 2008 and 2009, over 70 percent of the river’s water was extracted for Melbourne’s consumption, the most ever for a three-year period.

And its future looks bleak. Droughts are expected to become more frequent as rainfall declines markedly. But that’s not the only problem. Melbourne’s population passed four million in mid-2009 and is growing by roughly 100,000 a year, the fastest pace ever experienced by an Australian city. At this rate Melbourne will soon surpass Sydney’s 4.5 million population to become the nation’s largest city. The fight for water is escalating, and the Yarra River is on the front line.

In light of this, the Yarra Riverkeeper Association has been campaigning for improved river-flows since our formation in 2004, formally representing our community’s interest in the government’s major scientific study of river-flows. As assertive contributors to the

study, we pressed for recommendations to restore and protect the river’s health. But in 2007 the government failed to implement the study’s recommendations, and our organization became its most vocal and persistent critic – a role we have carried on consistently for over three years.

Our campaign for restoring flows to the Yarra has involved over 100 speeches, a similar number of media placements, a widespread community petition and several public protests. The most successful protest was our “Yarra Flow-tilla,” a colorful and noisy gathering of kayakers on the river in the city center, which was reported on the evening news of all four Melbourne TV stations.

Have these speeches, protests and media stories worked? In one sense, no. River-flows have remained depressingly low because priority is still been given to water extraction. Although extraction has decreased, as average per-capita consumption has dropped by 35 percent, the river’s flows have fallen much more sharply.

But, in another sense, we have made a difference. In earlier years, river-flows were not on people’s radar. When asked about the state of the Yarra, most Melburnians would comment on the river’s brown color or pollution. Nowadays, many are aware of the dangerously low river-flows, and that they are a consequence of the drier climate and over-extraction. Among the general population and public officials, the Yarra Riverkeeper Association is acknowledged to be the dominant advocate for the river and its flows. (One senior government representative commented that we “punched well above our weight.”) This growing recognition reached a personally gratifying high point this year when, for my role as Riverkeeper, I was awarded the 2010 Melbourne Award for contribution to the environment.

The climate-change issue has lately caused much turmoil in Australian federal politics. First, the opposition conservative party (strangely called the Liberal Party) replaced its leader because his support for reducing carbon-emissions was at odds with many global-warming deniers in his party. The governing Labor Party then put on hold its long-standing commitment to a much heralded carbon-trading plan. In the federal election in August, the Labor Party, with its own new leader, was nearly defeated, as many former Labor

supporters voted for the Greens Party, an emerging third political force, because Labor had delayed the carbon-trading scheme. So public attitudes about carbon-emissions and the political will to reduce them remain uncertain.

In contrast, the impact of climate change on rainfall and water-supply (especially for Melbourne) is spurring action. But it is not necessarily the right action. And this is where we are taking a new tack.

When water-storage levels dropped to an unprecedented 26 percent of capacity in 2006, the Victorian state government focused on (some would say panicked into) short-term solutions. It invested heavily in a desalination plant, the largest in the southern hemisphere, ignoring the irony that this would be a major energy user and thus contribute to climate change. They also built a large pipeline to import water from across the mountains, ignoring the fact that this would drain another river-system -- a case of “robbing Peter to pay Paul.” Rather than being delighted that these additional water sources would reduce extraction from the disappearing Yarra, we were and remain critical of such shortsighted thinking.

We argue that, in this part of the world, we must quickly change the attitude that our water-supply must be taken from rivers. In this dry country, our rivers are intrinsically precious, and they are dying from over-extraction. The most ecologically sustainable processes for maintaining supply are water-recycling and storm-water capture. Some steps are being taken in these areas, but they are far too small, too slow and too low in priority and investment. So we are taking our views directly to the politicians, who are listening to us right

*Nowadays, many are aware of the dangerously low river-flows, and that they are a consequence of the drier climate and over-extraction.*

now because Victorian state elections will be held this November. Our members, who are spread across many electoral districts, are engaged in a campaign to meet as many members of Parliament and their opposition candidates as possible and press the messages about our disappearing river and the need for better long-term water-management.

There are hurdles in the way. One is the appalling ignorance about the river and its health. A senior politician admitted to me that he was unaware that the Yarra River was Melbourne’s primary water-source. Another problem is the false sense of security caused by good rainfall and healthy river-flows during August and September. One wet season does not mean an end to long-term drought.

A significant achievement has been our gaining access to the ultimate decision-maker on water-supply and river-flows, the minister for water. Taking note of our assertiveness at a public event, he acceded to our request for a lengthy discussion and accepted an invitation to join us for a half-day kayaking excursion on the Yarra. As we negotiated gentle rapids through a pristine watery landscape, the minister witnessed the special beauty of the Yarra and spoke of appreciating better the wonders and importance of the river. Shortly afterwards he announced a small return of river-flows. Was our advocacy a factor? We don’t know. But we do believe we are making a difference. **W**

# Climate Change at the Third Pole

*The glaciers of the Himalaya are the Third Pole. They feed the giant rivers of Asia, and support half of humanity. What will happen if they disappear?*

BY DR. VANDANA SHIVA, FOUNDER, WATERKEEPERS INDIA



**C**limate change is not a future threat. It is already killing people in the Indian subcontinent, which the Intergovernmental Panel on Climate Change has identified as the region with the highest level of climate instability.

In 2010, the extreme and tragic impacts of climate change were made dramatically clear. The floods in the Indus basin were the worst in history. Two thousand people have already died in Pakistan. In the



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high-altitude desert of Ladakh, intense rain and floods washed away homes and villages and killed 200 people. And, while deserts received too much rain, the monsoon failed in eastern India. The States of Bihar, Jharkhand, Orissa and Bengal were declared drought-affected.

The melting of snow in the Arctic and Antarctic due to global warming is reported frequently, but the melting of the Himalayan glaciers goes largely unreported, even though far more people are impacted. At present, 10 percent of the earth's land-mass is covered with snow. Of this total area, 84.16 percent is in the Antarctic, 13.9 percent in Greenland, 0.77 percent in the Himalaya, 0.51 percent in North America, 0.37 percent in Africa, 0.15 percent in South America, and 0.06 percent in Europe. Outside the Polar Regions, the Himalaya has the maximum concentration of glaciers – 9.04 percent of its area. An additional 30-to-40 percent is covered with snow.

The glaciers of the Himalaya are the Third Pole. They feed the giant rivers of Asia, and support half of humanity.

For two years, Navdanya/Research Foundation for Science, Technology and Ecology has conducted a participatory research process for communities in the Himalaya to monitor the impact of climate change and develop systems of adaptation. Ladakh is one of the regions in which this community-based climate study has been undertaken.

In Ladakh, the northernmost region of India, all life depends on snow. It is a high-altitude desert with only 50 millimeters of annual rainfall. Ladakh's water comes from the snow-melt – the snow that falls on the land and provides the moisture for farming and pastures, and the snow of the glaciers that gently melts and feeds the streams that are the lifeline of the tiny settlements. It has been this way for centuries.

Climate change is transforming this. Less snow is falling, so there is less moisture for growing crops. In village after village, we are witnessing the end of farming where snow melt on the fields was the only source of moisture. Not only does less snowfall mean less stream-flow, but the shorter period of snowfall also prevents the snow from accumulating in the glacial formations as hard ice crystals. Therefore, more of the glacier is liable to melt when the summer comes.

Climate change has also led to rain falling, rather than snow, even at higher altitudes. This also accelerates the melting of glaciers. Meantime, heavy rainfall, previously unknown in the high-altitude desert, has become more frequent, causing flash-floods, washing away homes, fields, trees and livestock. Residents of Himalayan villages such as Rongjuk have already become climate refugees. "When we see the black clouds, we feel afraid," said one displaced woman.

The arrival of black clouds and disappearance of white snow in the cold desert is how climate change is entering the life of the



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01 ONE OF EIGHT SMALL VILLAGES IN LADAKH'S HIGH-ALTITUDE LINSHE VALLEY.

02 SITUATED NEAR A JEEP ROAD AT 14,000 FT., THIS HIMALAYAN GLACIER MELTS QUICKLY AND SHOWS SIGNS OF POLLUTION.

03 GOMUKH, AT THE TERMINUS OF THE GANGOTRI GLACIER, GOT ITS NAME BECAUSE IT IS SAID TO RESEMBLE A COW'S MOUTH. GLACIAL MELTING HERE IS THE SOURCE OF INDIA'S GANGA RIVER.

04 A DRY MOUNTAIN VALLEY IN LADAKH'S KORZOK RANGE.

Ladakh communities. They did not cause the pollution, but they are its victims. This is the cruel face of climate injustice – as the polluters continue to pollute, they are insulated from the impact of their actions. Others, thousands of miles away, bear the hard burden of greenhouse-gas pollution.

In India there are 5243 glaciers, covering an area of 37,579 square kilometers. The Gangotri glacier, the source of the Ganga, or Ganges, River, is receding at 20-to-23 meters per year. Millam glacier is receding at 30 meters, and Dokrani is retreating at 15-to-20 meters. And the pace has accelerated with global warming. The rate of retreat of the Gangotri glacier has tripled over the last three years. Such quickened glacial meltdown raises the threat of overflowing lakes and the devastating phenomenon of "glacial lake outburst floods."

Climate change thus initially leads to widespread flooding, but over time, as the snow disappears, there will be drought in the summer. In the Ganga, the loss of glacier meltdown would reduce July-through-September flows by two-thirds, causing water shortages for 500 million people and 37 percent of India's irrigated land.

Glacial runoff in the Himalayas is the largest source of fresh water for northern India and provides more than half the water to the Ganga. Glacial runoff is also the source of the Indus, the Brahmaputra, the Mekong, the Irrawaddy, the Yellow and the Yangtze rivers.

According to the Intergovernmental Panel on Climate Change (IPCC), "glaciers in the Himalayas are receding faster than in any other part of the world, and if the present rate continues, the likelihood of them disappearing by the year 2035 and perhaps sooner is very high if the earth keeps getting warmer at the current rate." According to the IPCC report, the total area of glaciers in the Himalaya will shrink from 500,000 square kilometers to 100,000 square kilometers by 2035.

In terms of number of people impacted, climate change at the Third Pole is the most far-reaching in the world. The lives of billions

are at stake. That is why the Navdanya/Research Foundation has begun a participatory process for Himalayan communities to engage in the discussion on climate change, including issues of climate justice, adaptation and disaster-preparedness. No climate-change policy or treaty will be complete without including the Himalayan communities.

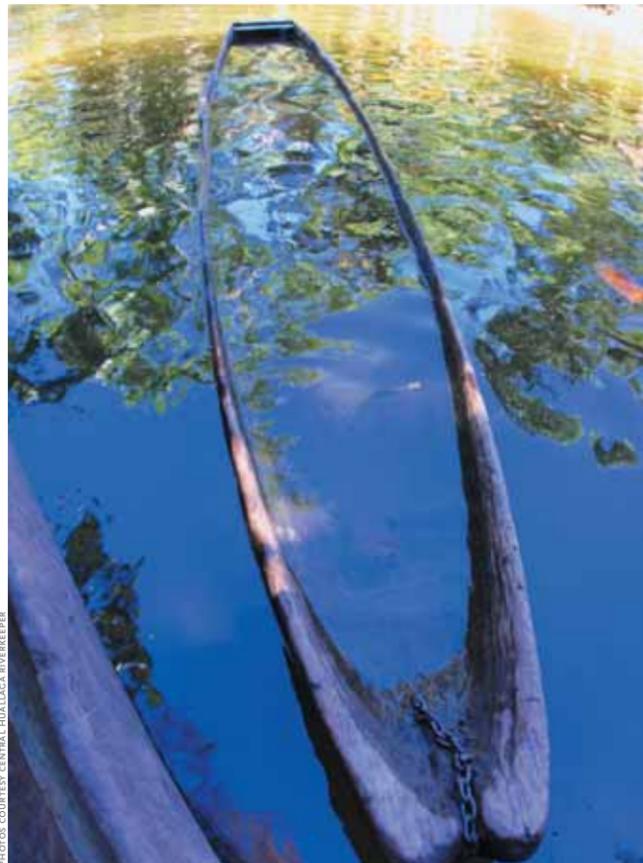
The Government of India has set up a National Climate Action Plan which has eight missions. One of these is to sustain the Himalayan ecosystem. The action plan states, "A mission for sustaining the Himalayan ecosystem will be launched to evolve management measures for sustaining and safeguarding the Himalayan glacier and mountain ecosystem. Himalayas being the source of key perennial rivers, the mission would, inter-alia, seek to understand whether, and the extent to which, the Himalayan glaciers are in recession and how the problem could be addressed. This will require the joint effort of climatologists, glaciologists and other experts." Notably, the Himalayan communities have not been included in the realization of this mission. People are introduced only to protect forests: "Community-based management of these ecosystems will be promoted with incentives to community organizations and panchayats [village leaders] for protection and enhancement of forested lands."

Climate change, however, is about more than forests. It is about flash-floods and drought, and it is about planning for a future which will be very different from today. People need to be partners in monitoring events and planning for new realities. No government machinery, no matter how sophisticated, can know every mountain, every glacier, every stream and every field. Local people are experts on local ecosystems and how a destabilized climate is altering those ecosystems. This expertise needs to be mobilized in order to evolve timely strategies for adaptation. [W](#)

# Fighting For The Lungs of the World

*In the Peruvian Amazon, the struggle for a region's well-being has global implications.*

BY RENA GUENDUEZ, CENTRAL HUALLAGA RIVERKEEPER



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**H**ere in the heartland of the Peruvian Amazon, the Central Huallaga Riverkeeper team and the local communities where we operate have become front-row witnesses to unpredictable weather-patterns in what are considered the "lungs of the world."

Local life in the Amazon may seem far removed from the outside world; yet global activities are changing local rainforests' environmental, cultural, social, and economic landscapes at a rapid rate, as soaring carbon emissions create negative chain-events that modify and even redefine local behavior.

According to leading scientists, one-third of the trees in the Amazon region will be killed by even modest temperature rises, which are already being registered more often every year. If greenhouse gas-emissions are not reduced, 85 percent of the forest could be lost within the next century. But the additional impacts of deforestation could cause this to happen much sooner, altering the face of the Amazon from a green forest to a red savannah.

The global push for increased development, industrialization and consumption, as driven by increasing population, is a mounting threat to the earth's last resource frontiers such as the Amazon. Yet affected rainforest communities are usually not engaged in discussions of what is happening, and often have no clear understanding of the short- or long-term implications.

A fifth of all man-made carbon emissions are absorbed by the Amazon, which is critical to managing global climate change. The Amazon is also one of the most bio-diverse and fragile areas on the planet, containing nearly half the world's species of plants, animals and microorganisms. It is also host to one-fifth of the world's fresh-water supply, making it one of the planet's most important water resources. These characteristics define the region's critical role in managing global climate change, and the Central Huallaga Riverkeeper team is continuously battling on this front.

Our hub is at eco-pueblo Bougainvillea in the heart of the Peruvian rainforest of San Martin on the Huallaga River, a source of the Amazon, where we recently had our own experience of serious



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01 AN OLD DUGOUT CANOE SURRENDERS ITSELF TO PERU'S HUALLAGA RIVER, A TRIBUTARY OF THE MARAËUN RIVER IN THE AMAZON BASIN.

02 & 03 WATER LEVELS RECEDE ON PERU'S HUALLAGA RIVER.

04 THE HULL OF AN OLD BOAT ROT'S AWAY ON THE BANKS OF THE HUALLAGA RIVER.

05 A YOUNG PERUVIAN GIRL HOLDS A CLUSTER OF FLOWERS.



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flooding this past February. Forested areas were badly damaged and some 1500 newly planted trees were destroyed. Tree-planting has been an integral part of the Central Huallaga Riverkeeper program to combat deforestation and climate change, in a region, the Department of San Martin, where nearly 28 percent of the land has been deforested. It is estimated that some 40 to 80 hectares are being destroyed daily in our region. To counter this, we have made it a priority to work with the local schools and community members in planting trees and raising awareness of the significant effects of deforestation on the water cycle.

Extreme and unpredictable weather has wreaked havoc on local communities and economies and left lasting impacts on our environment. In fact, there has been a steady annual increase in the regional government's issuing of warnings in regard to environmental emergencies, including ones related to water shortages, increased deforestation, and land-water use conflicts. Poor agricultural practices, moreover, have harmed air quality.

This year a host of warnings were issued, as temperatures ranged from an unprecedented low of 14 degrees centigrade in June to highs in the 40s during a scorching dry summer. It has also been a year of extreme precipitation and flooding, as the Huallaga's banks breached from its source in the Andean highlands to its central and lower watershed. Thousands of hectares of crops and corresponding infrastructure were damaged, severely affecting hundreds of communities. Yet the damage to human lives, local communities, livelihoods and natural habitats are only a few of the countless impacts Central Huallaga Riverkeeper and its constituents face in a region where there are so many poor.

We have now entered into another long dry spell, with water levels receding to all-time lows and temperatures increasing rapidly. If we on this planet do not do our part and face up to the urgent need to manage climate change, what will the future hold for us? The Amazon is more than "the lungs of the world" but the beating pulse of our human future. **W**

# Tarnation!

*Utah ignores climate change and water depletion as it plans the country's first large tar-sands project.*

BY JOHN WEISHEIT, COLORADO RIVERKEEPER



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**T**he Colorado River basin will be impacted by climate change more than any other in North America. In fact, in the last decade alone, the effects of drought and climate change have reduced the basin's annual average water supply by 31 percent. A more ominous statistic is the record of consumption, which now exceeds the supply. The combined storage capacity of water in Lakes Mead and Powell, which are the two largest reservoirs in the United States, now stands at 50 percent.

This combination of no surplus water and excessive consumption makes rebuilding the storage capacity of these two reservoirs a formidable challenge. If the reservoirs empty, which is statistically possible, then the basin returns to the exact situation that existed before Hoover Dam was built: There will be an undependable water supply for supporting agriculture for a robust population.

The main water-purveyors of the Colorado River basin – or “water buffalos,” as they are called out west – are the Metropolitan Water District of Southern California (17 million customers) and the Imperial Irrigation District (IID), which consumes three million acre-feet annually. An acre-foot is the size of a football field, one foot deep (325,851 gallons.) The delivery system for the IID, the All American Canal in southeast California, had more Colorado River water in it last August than the Colorado River near Moab, Utah, where I live.

Last December, at a conference of these buffalos, Interior Secretary Salazar told the audience that reductions in supply may become permanent, and he encouraged them to work cooperatively to seek solutions by making management adjustments now, and to find ways of producing energy without further increasing global temperatures. Unfortunately, this message is not being embraced by one partner of the Colorado River basin, the state of Utah, which recently approved a tar-sands strip-mining project that will simultaneously increase water consumption and global temperatures.

If the nation is to adapt to climate change by reducing greenhouse gases in the atmosphere, then strip-mining of low-grade hydrocarbons in the second driest state in the union is hardly an appropriate way to demonstrate one's commitment to this goal. But that is what is now on the drawing boards.

On May 20, 2009, the Utah Division of Oil, Gas and Mining (UDOGM) approved a plan of operations drafted by an Alberta, Canada, mining company, Earth Energy Resources (EER), to begin the strip-mining of tar sands in the Uinta Basin of the Colorado Plateau. The plan is to blast and chew into the slopes of canyon headwaters at depths of 500 feet. The waste-rock (sand, clay, and rubble) will then be placed back into the empty cavity, sprinkled with top soil, mulch, seeds and prayer, because there is no assurance that the infamous winds and



PHOTOS COURTESY COLORADO RIVERKEEPER AND LIVING RIVERS



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01 SEEP RIDGE ROAD (IN OURAY, UINTAH COUNTY, UTAH) WHERE THE DUSCHESNE AND WHITE RIVERS MEET WITH THE GREEN RIVER. THE PROPOSED MINE AT PR SPRINGS STRADDLES THE LINE BETWEEN UINTAH & GRAND COUNTIES.

02 LOOKING SOUTH OVER FOREST CANOPY FROM THE TOP OF THE EXPLORATORY PIT AT PR SPRINGS ON TAVAPUTS PLATEAU. NOTE THE RICH NATURAL HABITAT SURROUNDING THE MINE SITE.

03 THE MACHINERY TO CONVERT TAR SANDS INTO LIQUID OIL. WATER AND A CITRUS-BASED SOLVENT ARE USED TO SEPARATE OIL FROM SAND AND CLAY BEFORE FINAL REFINING INTO DIESEL AND JET FUEL.

cloudbursts of this high plateau won't wash and blow it all away. The pretty pictures on the EER website give viewers the impression that the landscape will actually be improved by their industry. Never mind the weed crop that will actually replace this landscape of sage, Gambel oak, pinyon pine, aspen and Douglas fir—a habitat ideal for wildlife populations such as elk, deer, bear, bison, nightjars, grouse and owls.

The Uinta Basin covers the northeast corner of Utah and the northwest corner of Colorado. In Utah it is known to some as the Tavaputs Plateau or the Book Cliffs, in Colorado as Piceance Creek Basin or the Roan Cliffs. This geophysical sub-province is loaded with kerogen and bitumen embedded in sandstones and shales of the Green River Formation. Various documents claim there are more hydrocarbons in the Green River Formation, which also extends into Wyoming, than in Saudi Arabia. Oil-bearing rocks have never before been extracted here, however, because of the high cost of production and the general lack of water for processing.

The EER plan, which is the first serious application for large-scale extraction of tar sands in the United States, will affect the watershed of the Green River, the major tributary of the Colorado. The Utah counties to be affected are Grand and Uintah. The national parks in the vicinity are Canyonlands, Arches, Dinosaur and Colorado National Monument, near Grand Junction. The permit is for an area of 213 acres at PR Springs, but EER has leased a total of 5,930 acres of state land. Unless the mining operations extend to federal lands managed by the Bureau of Land Management, which is not a certainty, the project may not warrant a full Environmental Impact Statement. In the absence of Congressional climate-change legislation, federal oversight is limited to an Interior Department Secretarial Order for federal agencies to adjust to climate change and reduce greenhouse gases.

The seven-year, 24-hour-a-day project will involve blasting, ripping, and hauling extracted material by tanker-trucks over dusty roads to waiting refineries in air-impaired urban areas like Salt Lake City. The blaring lights and noise of midnight shifts will be seen and heard from

Dinosaur National Monument, a federal reserve that has captured the most stunning canyon scenery in North America. And when it is completed, the tar sands project will add a total of six additional hours to U.S. energy consumption.

In return, the Colorado River watershed, sole source of water for seven states and northern Mexico, will get a mauled landscape, increased carbon-emissions (three times more than from conventional oil-production) and fugitive dust that will pollute the snowpacks of the Rocky Mountains and foul the reservoir system of the Colorado River.

EER is reported to be searching for \$35 million for start-up expenses and reclamation-bonding, so mining operations have yet to occur. Although Uintah County has granted a Conditional Use Permit for the project, Grand County has not yet done so. Meanwhile, an informal administrative hearing held by Utah-based environmental groups last winter resulted in a settlement to extend the public-comment period. But when the Colorado River advocates Living Rivers and the climate-change activists Peaceful Uprising recently protested this disaster-in-the-making at an informal hearing before UDOGM administrators, it became very clear that nothing will stop this mine from proceeding because the state of Utah blatantly refuses to adjust to climate change by implementing renewable energy alternatives. They only provide lip-service to these policies to answer critiques such as mine. The activists were advised by UDOGM to take the matter up with the governor and the legislators. But this is the legislative body that recently filed a lawsuit against the federal government with the hope that the court will hand the public domain over to the loving husbandry of Utah.

Utah has assumed the position as the ultimate denier of climate change while its surface-water yield declines, despite a fully funded cloud-seeding program. Utah has one of the highest consumption rates for water in the country. But because of the way water use is regulated in the West, the more water Utah uses, the more it's entitled to. It's a system that virtually guarantees that water conservation will never be a priority. That arrangement has to be changed.

The Utahans that do drink water from the Colorado River basin, for example the folks of Salt Lake City and Provo, do not utilize surface water from the Uinta Basin. Their water comes from the slopes of the Uinta Mountains and the Wasatch Plateau, which is of excellent quality. The biggest threat to their water supplies is from the air pollution and greenhouse gases these cities themselves generate. Salt Lake is ranked as the sixth-worst city in the nation for short-term particle pollution. Among the polluters are four oil-refineries.

Corporations and government agencies must abandon traditional petroleum-based energy programs and invest their time and resources in developing energy products that do not conflict with the water supplies of the Colorado River basin, or with national and international goals and programs to reduce greenhouse gas emissions that contribute to global warming and regional climate change. **W**

# The Wet & Dry Of It

*Warming has contradictory effects on Czech rivers and watersheds, and none of them is good.*

BY HELENA KRALOVA, MORAVA RIVERKEEPER



**L**ike countries in all parts of the world, the Czech Republic is facing the grave consequences of climate change. During recent decades, global warming has resulted in hydrometeorological extremes -- threats to Czech rivers that are in fact contradictory.

Temperatures have been increasing over 30 years, and the climate is drier. Total rainfall has declined, and episodes of drought have become more frequent, especially during the summer.

Longer periods of drought decrease flow in the rivers, which Czech law requires to be kept above minimum levels to preserve the rivers' health. About 97 percent of the population depends on central drinking-water sources, most of which are rivers and reservoirs. Mild winters with very little or no snow in the last decade, followed by dry summers, have worsened the water deficit in ground-water sources. On the other hand, some regions have experienced the opposite extreme -- periods of extensive rainfall, causing floods where landscapes altered by human activities are more vulnerable than they used to be. The flooding in the Morava River basin in July 1997 is considered to have been the biggest natural disaster in Moravia in the last 500 years.

Even more dangerous are the torrential rains that often bring local flash-floods. Such floods can arise after just three hours of intensive rain. They are difficult to predict and arrive very fast, leaving very little time for warning residents.

Extensive rainfalls in many localities also cause landslides, rock-falls and intense water-erosion of arable land, where valuable soil is washed down and often carried away by a river. The resulting



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01 A NIGHT OF RAIN CAUSED THIS FLOODING ON THE LUZNICE RIVER IN AUGUST 2002. THE STORM CREATED AN EVENT MEASURED AT THE 5-YEAR FLOOD INTENSITY MARK.

02 THE RECONSTRUCTION AND RAISING OF A LEVEE ON THE CANALIZED STRETCH OF THE MORAVA RIVER BRANCH FOLLOWING A FLOOD.

03 MASSIVE AMOUNTS OF WOOD AND DEBRIS ACCUMULATE ALONG THE BRAIDED RIVER BED OF THE MORAVKA RIVER THREE MONTHS AFTER FLOODING IN MAY 2010.

sediment in the rivers has impacts on their water chemistry and consequently biology. The material damage is much greater nowadays than it was in the past.

Why do the floods occur more often? There are several reasons connected to the development of various human activities in potentially threatened areas that have contributed to the frequency and severity of floods, including vast new areas of impervious surfaces (concrete, asphalt), channeled rivers and increased arable land exposed on steep slopes of fields. Historically, settlements were situated at high locations, but in our time many buildings have been built in the narrow floodplains of the rivers, where the level of flood risk is very high. River floodplains used to be covered by grassland and floodplain forests, where the floods were slowed down and reduced -- these have almost disappeared from our river landscapes.

Are we becoming more sensitive to the impact of these extremes? That is still an open question in most of the Czech Republic. But what is without question is the urgent need to minimize the consequences of climate change. We need to develop natural water-storage systems to accumulate water for dry periods -- such as wetlands, wet meadows, ponds, floodplain forests and restored rivers. We may need to build new river-dam reservoirs. We must make builders and settlers aware of increased flood hazards in planning new housing-developments, and encourage changes that will limit the danger.

We have to give rivers their space. We must restore the balance between human practices and the natural world. And in this new age of climate change, we have to get used to living with natural extremes. **W**

# The China Syndrome

*Vanishing glaciers and lakes, shrinking rivers -- but gradually rising awareness.*

BY WANG YONGCHEN, BEIYUN WATERKEEPER



**I**n the summer of 2010, Green Earth Volunteers, the parent organization of Beiyun Waterkeeper, started out on a 10-year journey along the Yellow River. Their goal: to spend a decade talking to people all along the river, documenting the impact of climate change from the river's source to its mouth -- in particular, the effects of ecological change on human populations.

In July 2009, I learned through interviews at the source of the river that over the past 50 years the average temperature there has risen 0.88°C, and that over the past 30 years the glacier-covered area of that region has shrunk by 17 percent, reducing water resources by 2.39 billion metric tons. This represents an annual rate of glacial shrinkage ten times faster than over the previous 300 years. Climate change has also caused a significant decrease in the volume of the lakes around the source of the river. Experts have found that, between 1986 and 2000, of the 4077 lakes in Ma Duo County in Qinghai Province, 3,000 have dried up completely. River-water volume has decreased by 9 percent, and marshland by 13.4 percent. Climate change, glacial shrinkage, the deterioration of tundra, the drying up of lakes: all these phenomena are compounding one another and have significantly diminished the Yellow River's capacity.

In 2007 some colleagues and I began searching near the source of the river for a major lake called Xingxu Hai, which means "Sea where Stars Rest." We did not find it until 2010 -- but in a sense we did not find it at all, for it was so sadly depleted that it was no longer a lake. And all that remains of the marshlands surrounding the source of the Yellow River is bleak grassland. The once lush marshlands of the Yuegu Zonglie Basin have become a scattering of puddles, and, similarly, other marshlands throughout the region have been drying up.

In July 2009, when I interviewed residents near the source of the Yangtze River, I learned that in May of that year there had been more than ten consecutive days of snow, which killed 10,820 head of livestock in the township of Zhiduo (Gang Ni County, Yu Shu Region, Qinghai Province). The people there generally knew little of what climate change is all about, but the increasing frequency of snow disasters, the melting of glaciers, and a decrease in the river table have



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PHOTO COURTESY BEIJING NORTH CANAL WATERKEEPER

01 GAQIADIRU GLACIER AT THE HEADWATERS OF THE YANGTZE RIVER.

02 CERACK CAMP AT THE SOURCE OF THE YANGTZE RIVER IN 1998.

03 SUNSET AT YUEGUZONGLIE, AT THE HEADWATERS OF CHINA'S YELLOW RIVER.

begun to heighten their awareness.

In 1998, when I joined the first all-female expedition to the source of the Yangtze River, I learned from historical records that between 185 B.C. and 1911 A.D. there were a total of 214 major flood disasters, an average of one every ten years. From the 1920s to the 1970s, there were 11 flood disasters, one every six years. Since the 1980s, the frequency of floods has increased to one small flood disaster per year and one major disaster every two years. During the major flood of 1998, in a span of two months, the water table repeatedly reached historically high levels. Although a million soldiers and civilians did their best to fight the flood, it still caused significant loss of life and property damage.

Not many years ago I took photos of the majestic white glaciers at the source of the Yangtze River. Even then they were melting. When I returned in 2009 they had almost completely disappeared.

Luo Yong, the vice-director of the National Climate Center, has warned that global warming will change precipitation patterns in China, and has called the country's attention to the impact of climate change on water resources. Evidence we have gathered shows that over the past 50 years the flow of six major rivers in China has been in decline. Tang Qiangli, the leader of an expedition team studying the sources of the three major Chinese rivers -- the Yangtze, the Yellow and the Pearl -- has stated: "There are 756 glaciers at the source of the Yangtze River, and the majority are receding, with two minor ones having already completely disappeared. The snowline has been receding from north to south, and from east to west." Tang believes that apart from the factors of geological locations and terrains, the melting of glaciers is closely related to climate change.

The severity of climate change has attracted the world's attention, and glacial melting at the North and South Poles has been widely publicized. But the Tibetan plateau, the world's "third pole," although it is the area most affected by climate change, has not received the same degree of attention. For this reason we urgently appeal to scientists and environmentalists to join us in fully recognizing the ecological impact of climate change on the sources of major rivers in China. **W**

# The Battle of Los Cabos

*In Baja California, climate change is compounding a Coastkeeper's fight against unchecked development.*

BY MARTHA MOCTEZUMA, LOS CABOS COASTKEEPER WITH FRANCISCO OLLERVIDES, WATERKEEPER ALLIANCE SENIOR FIELD COORDINATOR



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**B**etween the popular resort towns of Cabo San Lucas and San Jose del Cabo at the southern end of the Baja California peninsula stretch 19 miles of sparkling beaches and jagged cliffs. Gray and humpback whales, as well as whale sharks and five of the world's seven species of sea turtles visit the coastal waters regularly.

Most of Cabo San Lucas Bay became Mexico's first marine protected zone in 1973, when it was declared a "Natural Protected Area" by the federal government. But today tourist-related development is threatening to destroy the natural environment.

For over a decade, Los Cabos Coastkeeper Martha Moctezuma has been the most energetic and vocal defender of this splendid bay and seaside. And her ultimate ambition is to create and implement an integrated coastal and beach-management plan for the entire municipality of Los Cabos.

"I became a Coastkeeper," says Moctezuma, "because I realized the need to do something about the pollution of our arroyos and our bays. Someone has to fight the corrupt authorities who grant permits to hotel-owners and developers who limit access to our beaches and discharge untreated sewage."

Moctezuma was victorious in her first battle. Los Cabos Coastkeeper won the certification of Chileno Beach Park as the first protected beach under Mexico's National Clean Beach Program. Once a hotel beach, Chileno was opened to the public in the 1970s. "We feel the beaches are sacred," says Moctezuma, "not for commercial uses that reduce beach quantity and quality."

But now Moctezuma faces another mounting threat—climate change has compounded the problem of uncontrolled urban development, rampant tourism projects, and other man-made pressures. For one thing, it is raising water levels and increasing beach erosion. It is also a factor in the rising incidence and strength of hurricanes, already a common occurrence in Baja California. Traditionally, their energy has been absorbed by the coastal elements, such as shallow submerged dunes. In a healthy sand-system, unaffected by climate change, the arroyos and coastal dunes eventually heal coastal erosion. But the growing number and force of hurricanes is having a much greater effect on the fauna and flora in coastal areas. An increase of 20 miles per hour in wind speeds can increase a storm's power exponentially, causing far more devastating



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01 FIRE RAGES IN ESTERO SAN JOSE.

02 COASTAL DUNES IN LOS CABOS, MEXICO.

03 ESTERO SAN JOSE WAS DESIGNATED AS A RAMSAR SITE BY THE RAMSAR CONVENTION ON WETLANDS.

04 LOS CABOS COASTKEEPER MAKES THE OFFICIAL CLEAN BEACH CERTIFICATION ANNOUNCEMENT AT EL CHILENO.

damage to wetlands and dunes and permanently changing the shape of beaches and coastlines.

Another battle, fought over several years, has been to protect the Estero San Jose, a tropical estuary in the heart of San Jose del Cabo. In the Estero San Jose, the fresh waters of Rio San Jose, descending from the sides of 6,000-to-7,000-foot granite peaks, meet the salt waters of the sea. The mountain tops catch the scarce rain clouds, and the water washes into the arroyos and canyons that eventually become the Rio San Jose, which flows about 30 miles before emptying into the Sea of Cortez in San Jose del Cabo. The entire year's rainfall often occurs in four or five days, usually in September, yet the river is the largest and one of the few reliable sources of fresh water in southern Baja.

*The growing number and force of hurricanes is having a much greater effect on the fauna and flora in coastal areas.*



Because of population increases and lack of sanitation services, the water in the arroyo is heavily polluted and flows directly into the estuary. Los Cabos Coastkeeper has been implementing an environmental education program to highlight knowledge about the estuary's critical role as a refuge for coastal species, a buffer against pollution, and an invaluable source of fresh water. Lack of understanding of these key roles has been a main obstacle to obtaining community involvement in conservation efforts.

The estuary also provides a critical stopover point for many migrating birds, being the last resting stop for aquatic species migrating to the south of Mexico, and Central and South America. Among its year-round residents are osprey, egrets, herons, cormorants, gulls, pelicans, turkey-vultures and frigate birds.

Thanks in large part to the efforts of Los Cabos Coastkeeper to create greater awareness of the estuary's hydrological and biological importance, it was designated for protection in 2009 under the Ramsar Convention, an international treaty that seeks to preserve

critically important wetlands by asking participating nations to fully protect them. A Ramsar designation encourages territorial planning, with the active participation of the local people, and opens greater access to public funding.

In recent years, the single greatest threat to the site has been a large-scale tourist project adjacent to the water-body. Now a related threat has emerged. The estuary is ringed by Tlaco palms, a rare species endemic to this and a few other wetlands of southern Baja. In recent months, fields of these massive trees have caught fire. Climate change is certainly a factor in these fires, but Moctezuma believes that the majority of the fires were willfully set. "The fires," she contends, "aid the intentions of certain developers to use this precious area for tourist development." Los Cabos Coastkeeper has presented a citizen complaint in regard to this burning.

The protection of this site has faced many complications and legal constraints. The limits of this reserved area are defined in blueprints and documents, but there is no signage to indicate to the public the zone's boundaries and restrictions. And economic resources are insufficient to provide for proper care and management of the area.

With the effects of climate change a wildcard, and adding new levels of complexity, Moctezuma and her group are committed now more than ever to developing legal tools that can help guarantee the conservation of this and other critical natural areas.

Over the past year, it has been organizing a conference that should lead to the declaration of an official Mexican norm to protect coastal dunes and wetlands. The effort has the support of the National Commission of Natural Protected Areas, and particularly, of biologist Benito Bermudez Almada, regional director for the Baja California peninsula and Northern Pacific area. The outpouring of interest and support for this workshop, both nationally and internationally, so exceeded expectations that the Ministry of Natural Resources rescheduled this workshop to accommodate additional legal experts. The conference took place Sept 2-4, 2010. Its effectiveness is yet to be determined, but meanwhile, Moctezuma and other local activists are confident that they will soon have stronger tools to defend and protect their precious piece of paradise from the various human and natural forces that threaten it. **W**

# Sea-Level Rise: A Golden State Opportunity

*Along the California Coast, a chance to apply natural alternatives to contend with the rising sea.*

BY SARA AMINZADEH, CALIFORNIA COASTKEEPER ALLIANCE



**J**ust one day of building sandcastles at the beach will teach you much of what you need to know about coastal planning. The ocean is unpredictable and can demolish your best-laid plans. Don't build too close to the shoreline. Be mindful of the tides and weather.

Our desire to be close to the ocean in California often conflicts with these common-sense truths. In many places, the shoreline is heavily developed with structures ranging from power plants to private estates. However, those who have built right up to the edge will need to come to terms with an increasingly unrelenting and unforgiving sea. A recent state report on climate adaptation forecasts an average rise in sea-level of more than one foot over the next 40 years, and nearly five feet by the turn of the century. And scientists warn that tides will not just rise gently and gradually. Unprecedented flooding will menace shoreline infrastructures and ecosystems as higher sea-levels, high tides and storm surges coincide.

In the Humboldt Bay area of Northern California, much of the region's infrastructure lies close to the shoreline, at or near sea level: portions of Highway 101, local wastewater-treatment facilities, industrial plants and even holding-ponds containing nuclear waste. The inundation of any of one of several contaminated industrial sites

at sea-level could release unknown amounts of pollutants into the marine environment, jeopardizing the viability of a community that depends on a healthy bay.

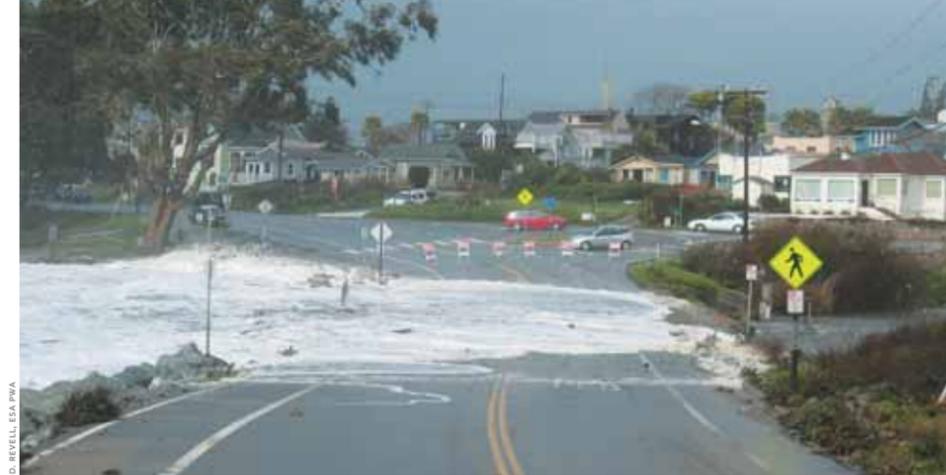
Along San Francisco Bay, no less than 21 wastewater-treatment plants face potential inundation. The release of even a fraction of these plants' combined 530 million gallons per day of incoming raw sewage would be an enormous public-health and environmental disaster, and in the blink of an eye would undo decades of progress achieved under the Clean Water Act.

As the ocean moves inland, coastal ecosystems will undergo changes of enormous magnitude. Salt water will intrude into estuaries and groundwater basins, impacting ecosystem health and freshwater supplies. Moreover, 350,000 acres of California's dwindling and critically important coastal wetlands face flooding from sea-level rise. A recent study by scientists at San Diego State University found that 25 percent of San Diego's inland fresh-water marshes could be lost to a rising sea. [See the sidebar on page 37 to find out more about how San Diego Coastkeeper is using these findings to make the case for local climate-change-adaptation planning.]

Yet sea-level rise is just one of several fundamental climate change-driven impacts to coastal and marine ecosystem processes. Warmer air and water temperatures, shifting precipitation patterns and ocean acidification will profoundly change the biology and chemistry of our ocean and coasts.

The fact that coastal ecosystems and communities are facing environmental changes of an unprecedented magnitude and scale has not gone unnoticed. The Obama administration's Ocean Policy Task Force has pledged to make adaptation to climate change a priority, as has the California Natural Resources Agency. And California Coastkeeper Alliance and California Waterkeepers, which have unparalleled knowledge of coastal issues and solid networks of local support, intend to ensure that all levels of government keep their promises.

"Sea level rise has a nexus with so much of the work we do," says Bruce Reznik, the San Diego Coastkeeper. "We are working to ensure



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01 A SANTA CRUZ HIGHWAY FLOODS DURING A FEBRUARY 2008 STORM. FLOODS ARE EXPECTED TO INCREASE AS SEA LEVEL RISE AND LARGE WAVE EVENTS COINCIDE. THESE EVENTS ARE ALSO EXPECTED TO ACCELERATE COASTAL EROSION.

02 A FUEL STORAGE FACILITY SITS ON THE SHORELINE OF HUMBOLDT BAY. THIS IS ONE OF NUMEROUS INDUSTRIAL SITES IN THE HUMBOLDT AREA VULNERABLE TO SEA LEVEL RISE.

that local decision makers take the necessary steps to plan for climate change."

Many of the simplest and smartest sea-level-rise adaptation measures are policies that the California Coastkeeper Alliance and California's Waterkeepers have long championed to address other environmental issues. For example, dam-removal is necessary to restore water-flow and fish-migration routes on numerous California rivers. Sea level rise creates an added impetus for dam removal because the unobstructed delivery of sediment could allow tidal wetlands to keep pace with sea-level rise.

There are numerous other strategies that have been central to Waterkeeper efforts to protect and enhance coastal ecosystems, but are becoming absolutely necessary as we face sea level rise. Low-impact development techniques such as permeable pavement and vegetated buffers will slow and sink storm-water runoff, mitigating flooding from storm-surges and rises in sea-level. Restoring tidal wetlands, eelgrass beds, oyster beds and other natural coastal ecosystems both creates aquatic habitats for threatened species and establishes a natural buffer against extreme weather. Creating buffers of open space around beaches and wetland areas similarly increases the amount and diversity of coastal habitats and allows beaches and wetlands to migrate inland as the ocean advances.

To date, implementation of strategies such as these that make use of natural ecosystem processes have been used sparingly compared with the practice of "armoring" the coast with hard structures, such as sea walls. The general perception is that sea-walls protect shoreline properties, but, in fact, they frequently fail, and they require costly maintenance, erode adjacent beaches and coastal areas, and decrease the natural adaptive capacity of coastal ecosystems. Sea-walls, like parking-lots, roads, and rails, also

prevent the natural migration of wetlands and beaches and reduce the amount of sandy beach, salt marsh, and other habitats. Ten percent of California's coast has already been armored, or "hardened," including more than a third of coastal areas in the four southernmost counties. And the pressure on coastal agencies to approve permits for sea-walls and levees will increase exponentially as sea-levels rise and extreme weather and coastal erosion accelerate over the next 50 years.

Before these walls go up, California Waterkeepers are seizing a small window of opportunity to introduce environmentally and technically sound alternatives to inadequate short-term fixes. State coastal managers have enlisted Pete Nichols, the Humboldt Baykeeper, to spearhead sea-level-rise adaptation initiatives that protect local coastal resources. He has taken on the assignment with optimism: "Our community has always been highly engaged in decisions about our coastal watershed," he says. "Tackling sea-level rise will be no different."

In Orange County, where high-value shoreline development continues despite coastal erosion, the coast is heavily armored in some areas. Orange County Coastkeeper Garry Brown warns that, "without intervention, sea-level rise could result in many more sea-walls being built to greater heights along the Orange County coastline over the next 20 years. Coastkeeper is exploring the use of non-structural alternatives in already built-out areas, so that we can put effective options on the table that work for our community and preserve our beaches."

Whether such options are chosen or rejected over the next five years to deal with rising sea-levels, coastal inundation, storm-surges and their associated impacts will profoundly influence the future of the California coast. **W**

## In San Diego, Cause for Alarm

As rising seas put many of San Diego's most valuable coastal habitats at risk, local decision-makers need current, region-specific information in order to create adaptation plans that truly protect local ecosystems and communities. To help address this information gap, San Diego Coastkeeper joined with Dr. Richard Gersberg of San Diego State University, who has developed a computer model showing how San Diego's coastal habitats might change as the sea rises. The results are alarming. For example, the San Diego coast may lose approximately 25 percent of its inland fresh marsh and 20 percent of its swamp (wetland dominated by trees or shrubs) in foreseeable climate scenarios. San Diego Coastkeeper is presenting these results in discussions with stakeholders about potential adaptation strategies that can protect San Diego's coastal watersheds in an uncertain future. To follow this project, visit San Diego Coastkeeper's wiki at [www.sdwatersheds.org/wiki/](http://www.sdwatersheds.org/wiki/).



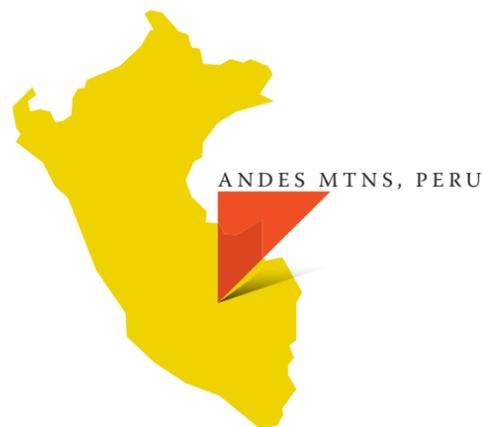
PHOTOS COURTESY RAMIS RIVERKEEPER

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# Looking To The Past

*Ramis Riverkeeper looks to the past to counter the effects of climate change in Peru.*

BY HECTOR FLORES, RAMIS RIVERKEEPER



**F**luctuations in climate are hardly a new phenomenon in southern Peru. Throughout history, the Andes region has experienced prolonged cold and dry periods followed by intense humid and wet seasons. These dramatic climate-oscillations have long affected the demographics, economics, social organization and culture of the Andean communities. Now, as climate change becomes more severe and perilous, the recently formed Ramis Riverkeeper, working with the residents and studying displacement patterns in the region, has developed a series of adaptive strategies that focus on soil management, modification of water distribution, crop diversity, and home construction, so that they are able to sustain productivity and cultural and social stability.

Ramis Riverkeeper was created in 2009 as an outgrowth of a nonprofit, Núcleo de Afirmación del Saber Andino, which was launched in 2002 with the goal of improving the living conditions of the Aymara people in southern Peru by recovering traditional farming and agricultural practices. The Riverkeeper is dedicated to protecting the watershed of the Ramis River and the Peruvian side of Lake Titicaca (designated a “Cultural and Natural World Heritage” site by the United Nations). It bases its conservation and preservation efforts on the enforcement of environmental laws and on grassroots defense of the right to clean water in the 15 communities it represents.

In recent decades, these communities have faced climatic imbalances in size and variability that they cannot adapt to fast enough. The most visible changes are the alarming disappearance of the glaciers from the Andean highlands. This retreat has dramatically altered the frequency and intensity of rains, freeze events and hail storms. In some ways these changes have been beneficial. Because of the increased precipitation, dominant crops such as potatoes and grains (maize) have expanded into areas formerly covered by natural grasses, and the glacial melting allows for more extensive irrigation systems. In less than two decades, the once rigid crop seasons have been substantially extended, so more food is available throughout the year. And farmers can sell more produce in the region’s cities.

But there are also significant ill effects. The loss of natural-grass pastures diminishes the numbers of cattle that each family can sustain. As wildlife is displaced and new vegetation introduced, erosion increases. Overall water availability for the entire watershed is reduced (and in many places polluted). Ultimately, the way of life and natural stewardship of these communities is out of balance. Subsistence farming and small-scale ranching are no longer compatible, and some communities have been displaced because their lands are no longer productive.



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01 HECTOR FLORES, RAMIS RIVERKEEPER (CENTER), READYING HIMSELF TO SURVEY FLOODED COMMUNITIES.

02 FLORES (FAR RIGHT) MEETING WITH COMMUNITY LEADERS AND HIS TEAM TO DISCUSS THE NEED FOR FRESH DRINKING WATER.

03 THE RAMIS RIVER FLOODED SEVERAL COMMUNITIES CAUSING SERIOUS DAMAGE TO HOMES.

04 EXTENSIVE DAMAGE FROM THE LATEST FLOODS IN RAMIS RIVER WATERSHED.

05 A VIEW OF FIELDS FLOODED AFTER THE RAMIS RIVER OVERFLOWED ITS BANKS.



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The disarray of these natural rhythms is particularly disturbing in a culture that places great value on humans maintaining harmony with natural forces. To adjust to the new rain patterns, some families are taking measures to better anticipate weather-changes, including conserve water and establishing an alert system to warn and prepare others against deadly freeze periods. Meanwhile, the climate-change problems are compounded by new threats: mining-operations, an increased demand for the production of bio-fuels, and transgenic, or genetically modified, crops.

When we talk about the weather nowadays, we must bear in mind what each of us is doing to affect it, as it no longer is the same as when we were young. Our sources of water, our natural-grass fields on the sides of mountains and high plains are disappearing from lack of regular rain-periods. We no longer know when to plant our crops. For example we used to plant barley and quinine in October, but because rain has been scarce, our crops are not growing.

Ramis Riverkeeper is searching for ways to strengthen the efforts of farmers and help them adapt to climate change. One of the things it is doing is re-evaluating ancient Andean farming practices, collecting and systematizing data and passing it on to the communities whose legacy it is. Through regular visits, it is promoting exchanges of experiences, practices and adaptive strategies among these communities, especially as they relate to climate change. It manages a fund, called “PROCLIMA,” to support microenterprises that develop ways to adapt to climate change. The fund advocates water-conservation techniques, small-scale irrigation-systems and infrastructure, construction and maintenance of very small dams to store water, and “agrobiodiversity.” The Riverkeeper is collecting the knowledge it gains in videos and printed materials, which it distributes to community members and institutions involved in these projects. As we share this knowledge our hope is that this ancient and beautiful agricultural region can adjust in time. **W**

# A Lesson on Conservation And Climate Change

*In Bahia de los Angeles, Mexico, protecting land and sea has helped guard against warming.*

BY KRISTIAN BEADLE



**H**ow did a remote fishing village in Baja California become a hub of conservation – and become uniquely ready for the challenges of climate change?

First, try to imagine a flat ice-sculpture of stunning blue colors broken up by the dunes of the Sahara. That is how the azure Sea of Cortez and its layers of islands look from the road to the small town of Bahia de los Angeles in Baja California. The illusion may evaporate with the heat, but the water does not: this is the home to big fish and whales, and great masses of plankton.

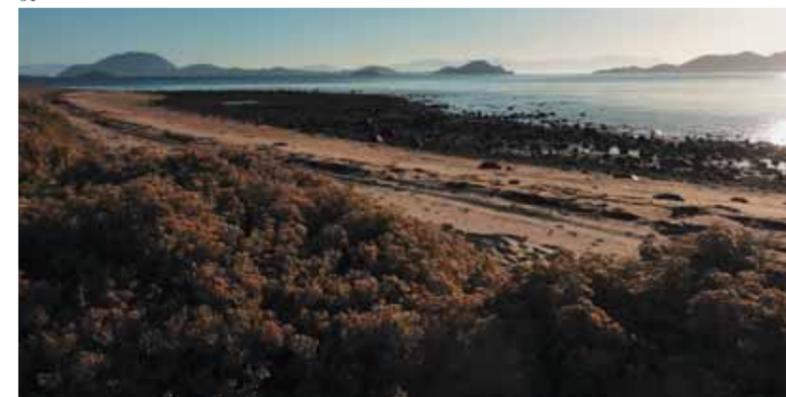
Jacques Costeau called it the “World’s Aquarium,” and one look underwater tells you why. The world’s largest creatures come to feed in the Sea of Cortéz (a.k.a. “Gulf of California”), including the blue whale, finback whale, and whale-shark. Like frosting on a cake, this underwater kaleidoscope is dotted by sea sponges, anemones, and urchins –and sea lions gather in a nearby rookery as if it were an amusement park.

Still, it was the land that first captured peoples’ attention, and the birds on the tiny Isla Rasa, which is home to 95 percent of the global population of Heerman’s seagulls. In the 1950s there was growing awareness of these birds’ vulnerability to threats from exotic species and egg-harvesting, and the rising concern spurred a chain of conservation efforts. By the 1980s, both the archipelagos of the Gulf of California and the terrestrial Valle de los Cirios – a desert of phenomenal biodiversity that lies adjacent to Bahia de los Angeles – had been designated protected areas. Nonetheless, the waters of the “Aquarium” were still being overfished, and this was the greatest threat of all.

A shift of emphasis to marine protection was led by Gustavo Danemann, executive director of Pronatura Noroeste, the parent organization of Bahia de los Angeles Coastkeeper. After spending 10 years as a dive-master and guide, Dr. Danemann wrote an award-winning dissertation on resource-management in the Sea of Cortéz, including Bahia de los Angeles, and began an intensive process of community engagement. Although fishermen were initially skeptical, the benefits of protected waters became apparent to them when the Upper Gulf of California Biosphere Reserve and the Loreto National Park were established in the 1990s, and reports were issued about the danger of overfishing. With the approval of the local ejido – through which land is communally owned – a ten-year process led to



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01 THE CARDON CACTUS, SIMILAR TO THE SAGUARO OF ARIZONA, CAN GROW UP TO 40 FEET TALL. LARGE STANDS OF THE CARDON AND THE ENDEMIC CIRIO, A SPINDLY TREE-LIKE PLANT, ARE SAFE GUARDED BY THE VALLE DE LOS CIRIOS PROTECTED AREA. THIS CARDON CACTUS OVERLOOKS THE TOWN OF BAHIA DE LOS ANGELES.

02 SUNRISE AT THE BEACH IN BAHIA DE LOS ANGELES.

03 A DECAYING FORD BECOMES AN ARTISTIC INSTALLATION NEXT TO THE MUSEUM AT BAHIA DE LOS ANGELES.

the creation of the Bahia de los Angeles Biosphere Reserve, completed in 2007. Along the way, the southern archipelago of San Lorenzo was also designated a National Park, and multiple wetlands of international importance were recognized by the Ramsar Convention.

Local fishermen have gained in two ways. A management-plan now oversees their fishing resources and limits illegal fishing. And ecotourism has added to their income: for example, fishermen can get permits to lead tours of the area where whale-sharks feed in the bay beside the town of Bahia de Los Angeles. Conservation activities, such as setting up marker-buoys for vessel traffic, are supported by an innovative social program. Park-revenues fund sustainable development-projects proposed by the community – if a person or group can cover 20 percent of a project’s budget, the park finances the rest. Among the initiatives that have been subsidized so far are workshops that teach shell handicraft for women and a sea-turtle rehabilitation-project.

Readiness for climate change is one of the unplanned benefits of this array of protected areas now enveloping Bahia de los Angeles. It is well known that the temperature variations caused by the El Niño phenomenon affect whale migration and fish-stocks. Global climate change raises the potential for even greater variations in temperature, acidity, and food-supplies. Gustavo Danemann explains the increasing

importance of the Bahia de los Angeles Biosphere Reserve:

“It shows a unique oceanographic pattern that involves the vertical mix of cold, nutrient-rich waters.... Our projections of water temperature along the Gulf of California indicate that Bahia de los Angeles will maintain its cold temperatures and high productivity even when the surrounding areas experience dramatic changes in temperature, acting as a reservoir and refuge for marine flora and fauna that may not be able to adapt to warmer waters. This includes fishing resources [i.e. marine life with commercial value, for example yellowtail for sportfishing and shrimp for commercial fishing], as well as whales, whale-sharks and seabirds.”

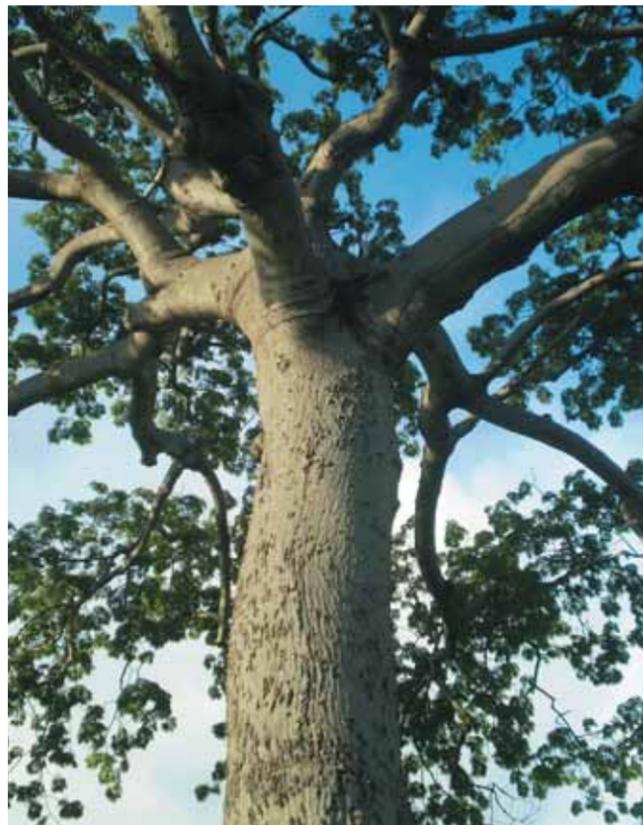
Although the protected areas were planned without the specifics of climate change in mind, the region’s special characteristics ensure they will play a key role in climate adaptation. Local communities will be able to maintain their economic activities and the exceptional flora and fauna will have a safe refuge. This benefit may be accidental, but it offers an important environmental lesson for the 21st century: in a world of shifting temperatures, protected areas are critical for biodiversity and community well-being.

More information on the Bahia de los Angeles Coastkeeper can be found at [www.pronatura-noroeste.org](http://www.pronatura-noroeste.org). [W](#)

# When Ecology Makes Strange Bedfellows

*In Oaxaca, Mexico, farmers are learning to marry conservation and development.*

BY KRISTIAN BEADLE



PHOTOS COURTESY KRISTIAN BEADLE

**I**n one of Oaxaca's many anonymous small towns, Heladio Reyes, a peasant's son, received a university scholarship to study agronomy. He grew up near Lagunas de Chacahua National Park, a wetland-lagoon system that lies adjacent to one of the Mexican state's largest rivers, the Rio Verde.

The peasant's son studied soil science, and learned about the ecological role of forests, and how watersheds are vital to farming. When he returned, he met with his neighbors, explained what he had learned, and they understood. As a result, in 1993 a group of 17 people established the first micro-reserves – small areas for protecting rare, threatened or endangered species – on their land, and from this initiative sprouted the organization Ecosta Yutu Cuii (which means 'green tree' in the regional language of Mixteco) and, eventually, the Rio Verde Waterkeeper.

Today, many farmers participate in the micro-reserve program. Remarkably, more than 800 landowners are managing reserves that range from 1/2 hectare to 300 hectares – voluntarily preserving chunks of forest on their land, and bypassing the short-term economic gains of transforming those forests into cornfields. Ecosta accomplished this small miracle with just (until recently) one full-time staff-member, assisted by part-time staff and volunteers.

How can poor people be expected to preserve nature when they're struggling to survive? How can environmental conservation be justified when economic development is needed? Economists speak of the "Kuznets Curve": once people are wealthy enough, they begin to care about the environment. It is a familiar argument in countries with developing economies, particularly when greenhouse-gas emissions are discussed. But Ecosta's work reveals an opposite possibility. Conservation and development can be strange bedfellows, lying hand-in-hand. It is just a matter of scale.

Ecosta used three keys to open the way to this new relationship: education, food-sufficiency and micro-loans. They first taught the campesinos why the normal approach of clear-cutting for agriculture is mistaken. Typically, corn plantations become unproductive after two-to-three years of usage, due to excessive fertilizer use and the depletion of soil nutrients such as nitrogen. Cattle are often introduced to graze on the fallow land, but this causes soil-compaction and erosion. So



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01 ECOSTA YUTU CUII TAUGHT LOCAL CAMPESINOS TO MAINTAIN THE TREE CANOPY RATHER THAN CLEAR-CUT IT TO MAKE WAY FOR AGRICULTURE.

02 THE OCHO VENADO (EIGHT DEER) ECOTOURISM CORRIDOR PROVIDES A VENUE FOR SUSTAINABLE ECOTOURISM IN OAXACA, MEXICO.

03 TOURISTS MAY VISIT AN IGUANA FARM AND ENGAGE IN SEVERAL OTHER ECOLOGICALLY SUSTAINABLE ACTIVITIES AT OCHO VERDE.

04 CHANGES IN OAXACA'S NORMAL WEATHER PATTERNS MAKE IT MUCH MORE DIFFICULT TO PREDICT WHEN THE RAINY SEASON AND FLOODING LIKE THIS WILL OCCUR.

additional forest has to be cut down for corn plantations, and the vicious cycle continues.

In order to avert this, Ecosta reintroduced organic-farming techniques and crop-rotation with nitrogen-fixing plants. They also explained the many benefits of keeping a reserve: less soil-erosion and heat-damage from the dry season, and healthier watersheds to disperse nutrients and diffuse toxins. On a personal level, the campesinos also realized they could continue to harvest wood for fuel and construction, and have access to traditional medicinal and edible plants.

To ensure that farmers keep their reserves through bad years of production, when the temptation to clear new cropland is greatest, Ecosta began a food-sufficiency program. This is essentially a tutorial on how to create food gardens and keep small livestock. Currently, Ecosta works with 15 villages, which are growing vegetables and fruits, and raising chickens. The organization also connects the families in a loose network for selling and trading surplus food.

As Ecosta grew, they were able to offer micro-loans as financial incentives to those participating in their projects. They now manage two micro-loan funds: one for agricultural assistance (tools, machinery, pest-management) and another for sustainable business (ecotourism, fair-trade products). Showing remarkable vision, Ecosta brought together their micro-loan recipients and created an ecotourism corridor called Ocho Venado (Eight Deer). Tourists can now visit an iguana nursery, purchase locally made pineapple-and-mango jam, stay at a lodge that raises deer and jabalí (boar), or spend the night in a cabaña in Chacahua, whose owner is spearheading a recycling program. Under the banner of Ocho Venado, the area may be on the brink of losing some of its anonymity -- but in a very positive way.

Now Reyes and Ecosta are taking on a new challenge: in solidarity with local communities, they are fighting the construction of a mega-hydroelectric dam on the Rio Verde, which would inundate villages and displace thousands of residents. Even if hydroelectric dams were indeed a "carbon-free" energy source (untrue, because flooding of plant matter can release huge amounts of methane), they still would have the perverse consequence of irreversibly altering hydrological cycles. Many concerns of climate change, such as droughts, floods, and storm-damage, are,

after all, related to water and hydrology, and a mega-dam that produces "clean electricity" can seriously aggravate those concerns.

Even if the Rio Verde dam isn't built, and 17 years of Ecosta's work creating micro-reserves and conserving the watershed doesn't "go down the drain," they face a growing challenge in helping their communities adapt to climatic change. In Oaxaca, as on the rest of Mexico's Pacific coast, the dry and wet seasons used to be very predictable. But they no longer are. Heladio Reyes explained:

"Before, the farmers knew the 15th of April was the day to start preparing their lands. That way, between the 2nd and 6th of June they could plant the corn and know it would survive a sensitive initial period. Now, they no longer know. There are extremely dry years followed by extremely wet years, rains occurring in April or November that are outside the usual range. The grandfathers say that in the past, if the calandria bird was nesting in very tall trees, they knew it was likely a year with little wind; or conversely, if the calandria was nesting in low trees, they'd plant the corn only in areas protected from wind. All the signals are now changing so quickly the communities are struggling to re-orient themselves."

With these rapid disruptions, said Reyes, the effort to create micro-reserves and protect the watershed is even more critical for maintaining stability in the area's hydrology for the peasant farmers. As I write this, amid Mexico's most intense rainy season on record, a huge landslide has been reported in an Oaxacan mountain town. Reyes is helping people to re-learn what they must know to respond to such extreme events and to secure their long-term wellbeing. He and his colleagues are de-constructing the last few decades of mistaken knowledge about agriculture and development, which no longer serves rural communities, while creating a strong web of human-ecological relationships.

Thanks to such path-breaking work, this anonymous town may soon have a place on the map.

For his efforts, Heladio Reyes was recognized with an Ashoka Fellowship for social entrepreneurship. More information about the Rio Verde Waterkeeper can be found at [www.ecosta.org](http://www.ecosta.org). **W**

*Kristian Beadle is a Rotary Ambassadorial Scholar and is writing a book about the effects of climate change in coastal Mexico based on a recent trip, the Voyage of Kiri. For more information, see [www.voyageofkiri.com](http://www.voyageofkiri.com).*

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# CALL TO ACTION ON CLIMATE CHANGE

Janelle Robbins, Associate Director of Waterkeeper Support

From our coasts to our inland rivers and streams, climate change is already affecting water availability and quality around the world. One in five people now live without enough water to meet their basic needs, and two-thirds of the global population could experience similar stress in the next 15 years. You can begin to reverse this alarming trend today by conserving and using renewable sources of energy.

## U.S. AND INTERNATIONAL ACTION

Three decades after former U.S. President Ronald Reagan famously removed solar panels from the White House, we're far past due to install solar technology on the government buildings of every nation. Log on to [www.putsolaron.it](http://www.putsolaron.it) and tell your leaders to follow that directive.

Let your elected officials know that you need them to support legislation that increases renewable energy standards and conservation standards, allocates money for renewable-energy research and cuts carbon emissions. Visit [www.waterkeeper.org/ElectedOfficials](http://www.waterkeeper.org/ElectedOfficials) to get advice on how to write to your legislators.

## LOCAL MOTION

Get involved with your municipal planning, zoning and action boards to advocate for energy-conservation incentives and sustainable sources of power for your community.

## INDIVIDUAL RESPONSIBILITY

Conserve electricity. Check out [www.energystar.gov](http://www.energystar.gov) for a list of certified energy-saving (and money-saving) products such as appliances and electronics, heating-and-cooling equipment and insulation and other housing materials. You can also calculate your carbon footprint and track your progress toward reducing it at [www.climateculture.com](http://www.climateculture.com).

Find out where your electricity comes from, and if your state allows, choose only clean, renewable sources of energy. Learn more at [www.ucsusa.org/clean\\_energy/what\\_you\\_can\\_do/buy-green-power.html](http://www.ucsusa.org/clean_energy/what_you_can_do/buy-green-power.html).

Make a commitment to walk or bike for trips of less than two miles. Forty percent of urban travel is two miles or less, and 90 percent of those trips are by car. Take the two-mile challenge at [www.2milechallenge.com](http://www.2milechallenge.com).

Join your local Waterkeeper organization at [www.waterkeeper.org](http://www.waterkeeper.org).





# On The Water:

J. Henry Fair

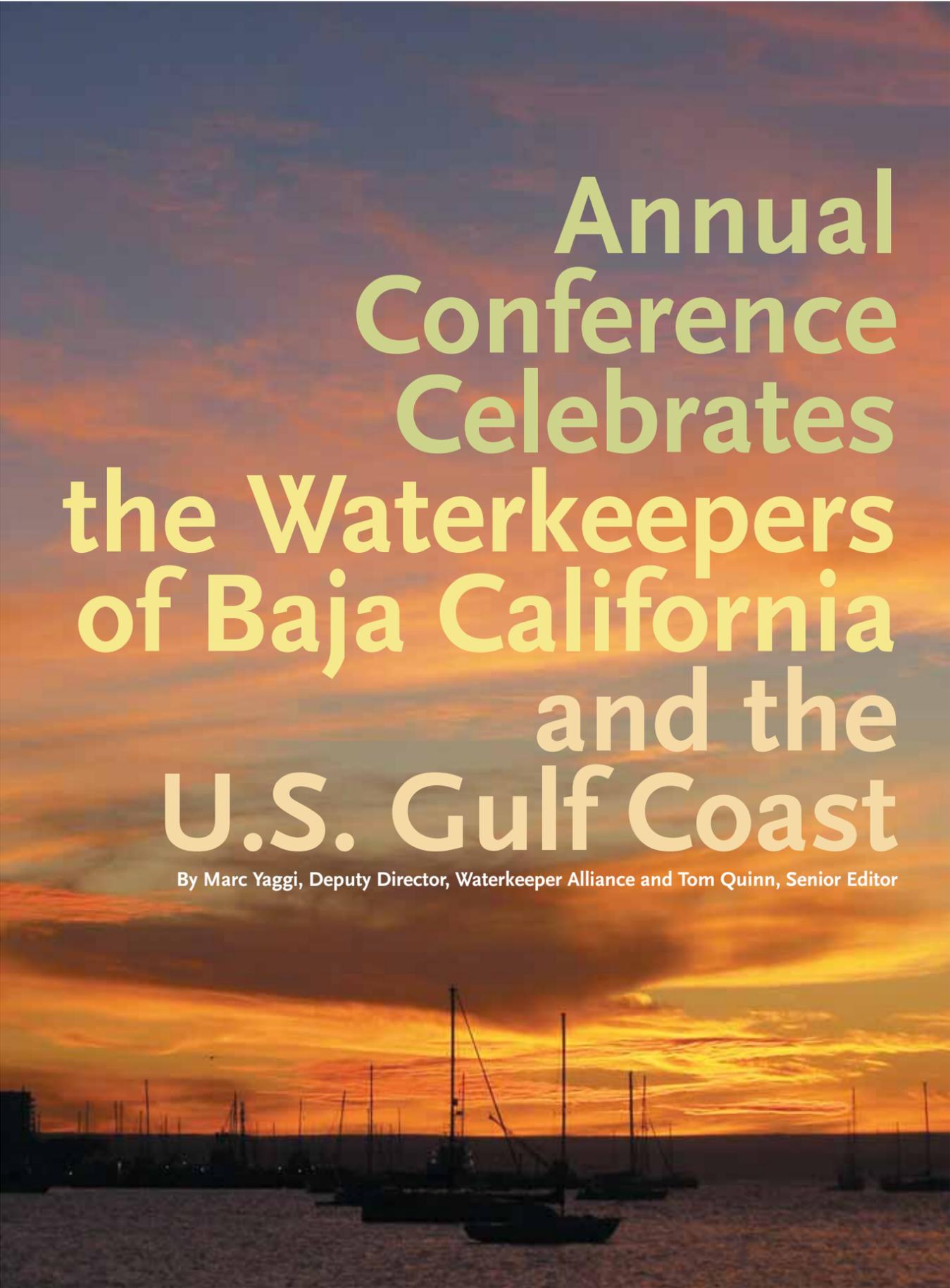
Enacted more than thirty years ago, the Resource Conservation and Recovery Act (RCRA) was crafted to monitor and control the harmful consequences of irresponsible waste disposal on our water, land and air. For many years, the hazardous waste provisions written into the Act have provided for strong oversight of the 150 million tons of extremely toxic coal ash produced in the U.S. each year.

Now, the Obama administration is proposing a new rule under RCRA that will specifically address the handling and disposal of dangerous coal ash waste from the nation's many coal-fired power plants. This new rule offers industry a way to circumvent the hazardous provisions by classifying coal ash a non-hazardous, solid waste akin to what ordinary citizens place in their own household garbage. Under this approach, regulation of coal ash would be left largely to the states, creating an uneven patchwork of inconsistent monitoring and lax control. Were it to become the law of the land, the new RCRA coal ash provisions (officially known by the U.S. Environmental Protection Agency as the Coal Combustion Residuals rule) leaves the U.S. vulnerable to more disasters like the one that took place in Tennessee, in 2008, when a breached coal ash waste pond at the Kingston coal-fired power plant sent more than a billion gallons of toxic coal ash sludge spilling down the Emory River and into nearby communities. Since we can ill-afford another environmental tragedy like this, Waterkeeper Alliance and Waterkeeper Alliance member organizations have been working round-the-clock to make sure that the true dangers of coal ash are understood and officially recognized.

This aerial photo shows a coal ash waste pit at one of the nation's many coal-fired electricity generation stations. The chemical components of this deadly witch's brew include heavy metals like arsenic, chromium, cadmium, lead and selenium, and radioactive elements like uranium and thorium. Exposure to coal ash waste can cause cancer, gastrointestinal illnesses, reproductive problems, birth defects and a host of other problems.

In the images in his "Industrial Scars" series, photographer J. Henry Fair documents the unsustainable consumption of the earth's natural resources. His aim, he says, is to make the photos "beautiful and frightening simultaneously." You can view more of Fair's photographs at [www.industrialscars.com](http://www.industrialscars.com).

*Coal ash waste at electricity generation station.  
Photo by J. Henry Fair.*



# Annual Conference Celebrates the Waterkeepers of Baja California and the U.S. Gulf Coast

By Marc Yaggi, Deputy Director, Waterkeeper Alliance and Tom Quinn, Senior Editor

This past June, over 250 Waterkeepers and other clean-water activists traveled from every part of the globe to La Paz, Baja California Sur, Mexico, to attend Waterkeeper Alliance's 12th annual conference. The exceptional growth and momentum of the Waterkeeper movement has been fueled by the energy and ideas that issue from the conference. It is now a cornerstone event that is rapidly becoming one of the most important annual gatherings of environmental activists in the world. The theme of this year's gathering was the critical need to protect the world's coastal ecosystems—a need dramatized by the BP oil disaster in the Gulf of Mexico, where seven Waterkeeper organizations are on the front lines fighting for the Gulf's waters and for the way of life of millions of people in the Gulf region.

Gathering on the Baja peninsula further underscored the urgency of protecting coastal ecosystems. Today, Baja faces development pressures that threaten to destroy the ecological vibrancy that is the peninsula's greatest asset. The city of La Paz is a prime destination for eco-tourists who come to explore the wonders of the Sea of Cortez, a body of water so rich with life that Jacques Cousteau dubbed it "the world's aquarium." Its waters harbor 31 species of marine mammals (almost 40 percent of the world's marine mammal species) and 891 species of fish.

But because of pollution and unregulated tourism-related development, in less than a decade the Bay of La Paz's mangrove stands, which are critically important nurseries for many of the region's marine species, have lost more than 20 percent of their vegetation. Similar threats to wetlands are now mounting all along the Sea of Cortez.

Baja desperately needs strong environmental advocates to organize threatened communities and demand accountability from developers who would trade the peninsula's natural riches for profits. The peninsula's seven Waterkeeper organizations are

“The conference was an incredibly enriching experience that allowed me to learn and to exchange ideas in a dialogue of equals. Our direct actions at the conference, such as the beach clean-up at Balandra beach, demonstrated to me how powerful we can be when we work together as a team.”

*Betania Cappato, on behalf of Parana Waterkeeper, Argentina*

“Co-hosting the 2010 Annual Waterkeeper Conference in La Paz, Mexico, was one of my best life experiences. It firmly established our organization, strengthened our connections and spread the word in Mexico of the existence of one of the world's best movements - WATERKEEPER ALLIANCE. It's impressive that people from all around the world gather together to work for the same cause. It is, in one word: ¡FANTASTIC! Thanks to everyone of you that helped make this conference a success. ¡Viva Waterkeeper!”

*-Peter Patterson, La Paz Coastkeeper*

working hard to fill that need, in spite of the often dangerous socio-political climate in which they operate—because of the outspoken positions they have taken against unregulated development, their lives and the lives of their families have been threatened more than once. Robert F. Kennedy, Jr., Waterkeeper Alliance's president, summed up the sentiment at the conference when he said, “We were proud to gather in La Paz and make a powerful statement that every one of the Alliance's members stands with our Baja Waterkeepers in their fight for Baja's natural treasures.”

The four-day event featured many inspiring keynote and plenary speakers, including Vicente Fox, former president of Mexico, and David Kirby, author of *Animal Factory*, a ringing indictment of the threats of industrial hog, poultry and dairy farming. The book prominently features Rick Dove, Waterkeeper Alliance board member and former Neuse Riverkeeper in eastern North Carolina. Dove is one of America's most outspoken opponents of factory farming. The conference's highpoint was an evening that featured our Gulf Coast Waterkeepers. Each of them talked about the fight they were waging during what one called their “summer of tears.” And each of them said that what was getting them through was the advice and support that had poured in from their fellow Waterkeepers all over the world. By the end of the night, there wasn't a dry eye in the house.

The training conducted at the conference, which included 28 panel workshops, is crucial to making our nearly 200 Waterkeepers even more effective advocates for their waterways; and the opportunity to network strengthens their ties to each other and re-affirms in them the awareness that, although their struggles may sometimes seem solitary, they are bound together in a global cause that is among the most critical issues of our time.

Each year the conference has grown larger, more educational, and more effective at connecting Waterkeepers at the regional, national and international levels. This year's event set new records, with the largest number of international programs and highest proportion of program representation ever. It was truly inspiring to see Waterkeepers from Bangladesh, Canada, China, Colombia, India, Russia, Senegal, Mexico, the United States and many other countries, come together to exchange information, share their approaches to a broad range of problems, and forge a shared vision for confronting the Global Water Crisis.



Annual Conference Celebrates the Waterkeepers of Baja California and the U.S. Gulf Coast

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The Ocean Foundation  
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 Environment Now  
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 National Endowment for Democracy  
 Norcross Wildlife Foundation

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Jon Ledecky  
 Joan Ricci  
 Christy Walton

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 Magdalena Baykeeper  
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### VOLUNTEERS

Margarita Diaz, Tijuana Waterkeeper  
 Sarah Douglis  
 Alicia Glassco  
 Sharon Kahn  
 Jen Kovecses  
 Alejandro Ollervides  
 And all those volunteers from La Paz Coastkeeper who pitched in at the cleanup at Balandra Beach and made it such a memorable event: Enrique, Alejandro, Jose, Antonio, Carolina, Claudia, Maria, Margarita, Joaquin, Gabriela, Marcela, Juan, Javier, Lucia, Elizabeth, Veronica, Emmanuel, Rodrigo, Edith, Sofia, Juan Carlos, Edgardo, Manuel, Ernesto, Luis and Emilio

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