

## Glacier-protection bill to become law in Argentina

Buenos Aires, Argentina

**N**early two years after Argentine President Cristina Kirchner vetoed glacier-protection legislation, her country's Congress has approved a similar bill. This time, though, Kirchner says she'll sign the measure, which is aimed at curbing mineral and oil operations on glaciers and in so-called periglacial areas.

News of the Sept. 30 vote and Kirchner's pledge cheered environmental groups. Green advocates argue that the proliferation of projects sponsored here in recent years by international mining companies are posing a threat to Argentine water sources, thereby jeopardizing the environment and human health.

The view is not shared by Argentine provincial governors keen on attracting mining invest-

ment. Three of these governors, who head western provinces that include Andean glacial areas, appeared before Congress the week before the vote to argue against the legislation.

Kirchner's announcement that she'd sign the bill came hours after the legislation cleared the Senate in a tight, 35-33 vote in which lawmakers from every political party had split into 'for' and 'against' camps. When she vetoed the 2008 version of the bill, she said she was doing so because lawmakers had appeared to have passed it in haste, adding that she would sign it if it were weighed again and approved.

Indeed, this year's close and contentious vote came in stark contrast to the legislation's

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## Concern for health of D.R. tourism's silent partner

Punta Cana, Dominican Republic

**T**he emergence of the Dominican Republic as one of the Caribbean's top tourist destination has a lot to do with mega-developments like Punta Cana, which features sprawling resorts, golf courses and a marina.

From humble beginnings more than 40 years ago, Punta Cana has grown into a powerful tourist magnet that now attracts millions of visitors a year. Facing Puerto Rico on the

country's eastern tip, this tourism center has the Caribbean's third busiest airport, and offers more than 28,000 hotel rooms.

But not far seaward of Punta Cana's golden sands, one of the area's most important silent partners suffers. The roughly 30-kilometer (19-mile) coral barrier reef that protects the coast, harbors marine life and attracts snorkelers and divers seeking brilliant underwater seascapes is

dying. Severe overfishing, the effects of pollution from nearby towns and resorts and the lack of a national reef-protection plan have conspired against the reef, the second largest off the island of Hispaniola.

When the developers of Punta Cana commissioned a study of the reef's health from the University of Miami in 2006, it found algae had overtaken the coral in a process known as a phase shift. "The reef was fished out, and without [fish], there was nothing to keep the algae down," says Jake Kheel of Puntacana Ecological Foundation, an environmental



Deterioration of reefs create unwelcome ripple effects

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## Surprise showing for Silva in Brazil's presidential race

Ahead of Brazil's Oct. 31 presidential runoff the buzz was less about who'd win—pollsters favored Dilma Rousseff, President Luiz Inácio Lula da Silva's choice—than about the strong, third-place finish of Green Party candidate Marina Silva in the first-round vote.

Silva's strong showing in the Oct. 3 first round left political pundits wondering whether she would stay neutral in the runoff or back runner-up José Serra and tighten the race. Amid intense speculation, she ultimately announced she would not.

Silva, who pollsters had thought would finish far behind Rousseff and Serra in the first round with 9% to 10% of the vote, wound up receiving a hefty 19.3%. Though she was knocked out of contention by virtue of winding up third, the former environment minister attracted enough votes to deny a first-round victory for Rousseff, who received 46.9%. (Serra, São Paulo's governor, won the other spot in the runoff with 32.6%.)

Her finish makes her the most successful third-place candidate in any of the six presidential elections since Brazil ended its dictatorship in 1985.

There is no single explanation for Silva's strong finish, political pundits say. Yes, the Green Party is growing in strength, but only minimally, electing 15 of its members to Congress, as opposed to 13 in the 2006 general election. Yes, the evangelical block in Congress, to which Silva belongs, is also growing, electing 63 members to the Chamber of Deputies, the 513-member lower house of Congress—a

46% increase over 2006—and claiming three of 81 senators.

And perhaps most relevant of all, support for Rousseff suffered after Erenice Guerra—who replaced Rousseff as Lula's chief of staff in March and who had served as Rousseff's number-two—was accused of influence peddling. The accusations forced Guerra to resign two weeks before the first-round vote, and rubbed off on Rousseff, according to polls.

In addition to those factors, many here say, Silva's performance as a candidate also played a role in her strong showing.

"What also helped Silva was how, during presidential debates and TV ads, she projected an image of integrity that both of her opponents failed to project," says José Goldemberg, a professor at the University of São Paulo's Energy Institute who served briefly as Brazil's environment minister in 1992 and worked as the environmental secretary of São Paulo state during 2002-07.

Adriana Ramos, deputy executive secretary of the Socio-Environmental Institute, a green group here, agrees adding: "Many Brazilians began to feel that Lula, a highly popular leader, didn't bolster Brazilian democracy by hand-picking his successor, a candidate who had never run for any office. So they voted for Silva, not just because she was by far, the most respected and likeable of all three candidates, but to force a runoff between Rousseff and Serra, and strengthen the democratic process."

Silva resigned as environment minister in May 2008 after a series of high-profile clashes with Lula's inner circle—in particular with Rousseff, when Rousseff was Lula's chief of staff and, before that, his Mines and Energy Minister. Silva crossed swords with Rousseff by opposing the construction of large Amazon dams and

the country's third nuclear plant, and by criticizing legislation allowing the planting and sale of transgenic crops.

Silva has called Rousseff and others "developmentalists," while characterizing herself as a "sustainable developmentalist."

Before she decided against making an endorsement in the runoff, Silva released a list of positions a candidate would have to take in order to gain her support. These included support for tax, election-law and educational reform; for climate change initiatives; and for protection of Brazilian biomes and biodiversity.

She also sought a commitment to kill legislation pending in Congress that would revise the Forest Code so landowners can legally clear more of their land and that would grant amnesty to many of those who have cut in excess of government limits.

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## Costa Rica and U.S. sign new debt-for-nature swap

The United States, Costa Rica and the Nature Conservancy environmental group have agreed to cooperate in a 15-year, US\$27 million debt-for-nature swap aimed at helping the Central American country create a "complete and integrated" protected-areas system.

In return for the debt reduction, Costa Rica has committed to steer the freed-up funds to the private-public conservation initiative Forever Costa Rica to assess conservation needs in three areas. The areas are man-

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# Brazilian clean-up accord marks progress

Rio de Janeiro, Brazil

**W**hen Brazilian companies are called to task for industrial pollution, they typically lodge repeated appeals to stymie regulators. That's what makes the case of Brazil's National Steel Company (CSN), the country's second-largest steel maker, unusual.

CSN, whose mill in southeastern Rio de Janeiro state churns out 5.6 million metric tons of steel annually, has failed for years to make the investments needed to comply with state and federal environmental laws.

But this month the Rio de Janeiro state Environmental Secretariat and the company reached a clean-up agreement which, while not a first, is seen as a significant step forward in Brazilian environmental regulation. The steel maker pledged to spend R\$200 million (US\$119 million) on 90 environmental upgrades over the next three years after documenting that it had already spent R\$50 million (US\$31 million) on such work since early this year.

"The CSN agreement is one of the few instances in which a large industrial polluter in this state has agreed to invest substantial amounts to undertake a broad-based environmental cleanup of its activities," says state Environmental Secretary Marilene Ramos.

## Encouraging sign

Carlos Bocuhy of the nonprofit Brazilian Environmental Protection Institute (Proam), differentiates CSN's cleanup with one the state oil company Petrobras undertook after a pipeline to an island terminal ruptured in 2000. That accident sent 340,000 gallons fuel oil into Guanabara Bay and resulted in a US\$27.7 million fine against Petrobras—one of the highest pollution fines ever levied in Brazil.

"Petrobras partially cleaned up the oil spill in Guanabara Bay and invested in measures to prevent future accidents because it was easily provable the company caused the spill," says Bocuhy. "The CSN agreement was more noteworthy because it involved a polluter agreeing to invest in cleaning up less easily provable pollution it caused over a long period of time."

Adds Bocuhy: "National Steel Company is taking the rare step of assuming responsibility for having polluted the environment heavily, especially the nearby Paraíba do Sul River. This is something companies in Brazil almost never do. What normally happens is that industrial polluters in Brazil appeal court decisions requiring them to invest in an environmental cleanup, the result being that the cleanup is delayed ad-infinitum or simply not done."

The initial R\$50 million in work CSN has completed includes setting up water-quality monitoring of the Paraíba do Sul, the state's main source of drinking water; dredging heavy-

metal- and oil-tainted sediment from the river bottom; and trucking contaminated sediment to an industrial landfill, Ramos says.

With the R\$200 million in new funds specified in the agreement, CSN pledges to upgrade every stage of the steelmaking process to cut air pollution; reduce water consumption; improve treatment of wastewater; and boost solid- and hazardous-waste management.

"The agreement is the result of our requiring the steel mill to comply with state and federal environmental laws, which it had for many years ignored by not making the investments needed to do so," Ramos says. "CSN's failure to spend the funds by the three-year deadline will result in suspension of the company's operating license, one we plan to renew if we see that CSN is honoring its agreement."

## Fine, insurance addressed

In its accord with the secretariat, CSN also agreed to pay R\$16 million (US\$9.53 million) in environmental compensation, mainly for air and water pollution that occurred during the five-year period of its last operating license, Ramos says. Part of this money will cover an outstanding R\$6 million (\$3.56 million) fine Rio de Janeiro state regulators levied on the company in December, 2009 for leaking oil-tainted waste into the Paraíba do Sul River.

The agreement also requires the steel maker to buy insurance so that, if it does not honor its cleanup agreement, the insurer will fund the work.

"[The secretariat] needed this clause in the agreement as a guarantee that either National Steel Company or its insurer would pay for those upgrades," Ramos says.

Fernando Tabet, a São Paulo environmental lawyer, says the cleanup-insurance requirement is unusual, but not unprecedented, in Brazil. Some city and state governments require such insurance, and legislation pending in Congress would require industrial operations that pose a significant risk of pollution to take out environmental-cleanup insurance.

Proam's Bocuhy agrees. "In Brazil, it is rare, but becoming more common, for companies to take out insurance as a financial guarantee that they will reverse the environmental impact they cause," he says. "This is especially true of sanitary landfill developers whom some city governments are now requiring to get insurance coverage."

Adds Bocuhy: "The question, however, remains as to whether [CSN's] R\$216 million will be enough to reverse its decades of environmental damage."

—Michael Kepp

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# Bid in Belize to prohibit offshore oil drilling

Belize City, Belize

**C**ontending that British Petroleum's massive oil spill in the Gulf of Mexico has "opened Belizeans' eyes," opponents of oil exploration in Belize are seeking a referendum to block oil exploration and production off the country's coast, home to the world's second-largest barrier reef.

A group of environmental and tourism leaders formed recently launched a referendum to ban offshore exploration, says attorney and offshore-oil opposition leader Audrey Matura-Shepherd, who is vice president of the marine conservation group Oceana's Belize office.

Government officials, however, appear determined to continue onshore and offshore oil-exploration efforts, the latter of which have yet to yield a producing well. They view oil revenues as a potential boost to the country's economy. And they downplay the opposition campaign, which Andre Cho, the government's oil director, described in an interview with EcoAméricas as "making a lot of noise." Said Cho: "I don't think a moratorium is possible."

Belize has granted oil-exploration concessions to 18 companies, six of which have offshore exploration contracts, according to Cho. Privately held Belize Natural Energy currently is producing 4,000 barrels of crude oil a day at the Spanish Lookout field in central Belize—the only oil-producing site in the country thus far.

## Supporters cite economy

The country could generate up to US\$900 million a year from offshore oil, Belizean officials say. That, they argue, could help bolster a national economy that shrank 1.1% last year as tourism revenues fell amid the global slump. Cho argues it also would help close Belize's fiscal gap, thanks to royalties of 7.5% and other oil-related revenues.

Oceana's Matura-Shepherd and others who oppose offshore drilling argue that the government is putting oil production above environmental protection. She suggests authorities are also taking international-relations risks, pointing out that the government granted an offshore concession to Island Oil, of which Guatemala's Petdegua state oil company is the main shareholder, even though the territory is in dispute with the Guatemalan government.

The BP spill, she says, heightened such concerns: "It really opened Belizeans' eyes when the BP oil spill occurred."

Opposition to offshore drilling was bolstered recently when the country's tourism board joined the Belize Coalition to Save our Natural Heritage, she says. A prime focus of the coalition's referendum campaign is Belize's status as steward of the northern hemisphere's largest barrier-reef system, declared a natural

World Heritage site by the U.N. Educational, Scientific and Cultural Organization in 1996, as well as of offshore atolls, sand cays, mangrove forests, coastal lagoons and estuaries.

The Belize Barrier Reef Reserve System illustrates the evolutionary history of reef development and provides significant habitat for threatened species, including sea turtles, manatees and the American marine crocodile.

Melanie McField, researcher for the Smithsonian Institution in Belize, says the reef already is under pressure from climate change, overfishing and coastal development. Smithsonian researchers have documented at least five coral bleaching events, caused by rising water temperatures, in which coral rejects algae that lives in its tissue, causing the coral to starve. Toxic chemicals released into the water during oil drilling could do more damage, she says.

## Inevitable impacts seen

"The big threat in the back of the public's mind, even if it is a slight probability, is a major accident like the one in the Gulf [of Mexico]," she says. "But even without that, it's a dirty business. There's no way of doing it clean."

Cho insists Belizean law protects against the risk of environmental disasters such as the BP disaster. "If you have reefs, you have to apply the safeguards that are being developed to guard the reefs," he says. "There are environmental laws and processes to get permits."

Two offshore exploratory wells drilled last year bore no fruit, Cho says. Houston-headquartered Treaty Energy, partnering with a subsidiary of the Belizean casino consortium Princess Group International, is surveying its concession and plans to start its first well, onshore, in the coming weeks. Its concession covers 2,000,000 acres in three separate tracts; one offshore and two onshore.

"We just have to keep on drilling wells so we can make a big discovery," Cho says. "Offshore discovery would be even better, because there may be several big fields."

Prime Minister Dean Barrow told the weekly *Amandala* recently that Belize should not let fear about a repeat of the BP spill prompt a ban on Belizean offshore oil exploration.

"We have to proceed cautiously but I do not agree with any suggestion that we simply cut and run, that we say that there can never be offshore oil exploration in this country," the Prime Minister said. "You don't stop flying because there is a risk that the plane will crash. You don't run off half-cocked and, because of what is admittedly a disaster in the States, foreclose on all your options."

—Blake Schmidt

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# President surprises coal-plant foes in Chile

Copiapó, Chile

**T**he relief and joy that has reigned here since the rescue of 33 trapped miners makes it difficult to remember that not long ago, this northern Chilean city was the focus of angry protests.

Prompting the demonstrations, which took place in Copiapó and in the Chilean capital of Santiago, were plans for a complex of six coal-fired power plants and a diesel-fueled plant 80 kilometers (50 miles) southeast of here. Experts say the US\$4.4 billion, 2,350-megawatt Castilla complex, sponsored by Brazil's MPX Energia, could supply up to one-seventh of Chile's electricity as early as 2016.

Nearly a dozen coal power-plant projects are planned or under discussion in Chile. A second one that sparked equally intense protests, a plant to be called Barrancones, was slated for the Coquimbo Region near the city of La Serena, 20 kilometers (12 miles) from the north-central coast's Punta de Choros marine reserve.

In late August, when the Coquimbo Regional Environmental Commission approved the \$1.1 billion, 540-megawatt Barrancones project, marches and protests spontaneously broke out in 10 Chilean cities. From Antofagasta in the north to Coyhaique in Chilean Patagonia, social networks like Facebook and Twitter were overflowing with anti-thermoelectric-plant declarations and calls to join street protests.

## Push-back effective

Leading Chilean celebrities and opposition politicians strongly criticized the center-right Sebastian Piñera government for allowing the plant to be sited so close to Punta de Choros, which is home to, among other species, 85% of the world's remaining Humboldt penguins.

Causing surprise across the Chilean political spectrum, Piñera personally reached an agreement with the GDF Suez, persuading the French company to look for an alternate location. Still further, Piñera shortly afterward visited Punta de Choros to announce a new environmental initiative to "perfect" Chile's environmental law because he stated "it does not consider the impacts of the siting of large projects, such as thermoelectric plants."

Said Piñera: "We will create a Biodiversity and Protected Areas Service that will be under the command of the Environment Ministry, which will be in charge of balancing protection of unique, beautiful places of exceptional value, like Punta de Choros, with the development that our country needs."

Piñera added that Chile needs to double its energy sources this decade. He said he has asked the leaders of the United States, France and Spain for their help in promoting renewable energy through pilot projects for solar,

wind, tidal, and geothermal energies. Nuclear-energy research and training will also be boosted, the president said. Yet he vowed he'd still back hydroelectric and thermoelectric plants: "Our government is going to support the development of these types of projects through the framework of our environmental institutions."

Originally, three coal plants were proposed near Punta de Choros. One, however, was withdrawn by sponsor Codelco, the state mining company, earlier this year. Piñera's decision on Barrancones appears to cast a cloud over the third, a \$460 million, 300-megawatt plant slated to be built a few kilometers south.

Reaction to Piñera's decision has been mixed. While politicians with environmental leanings welcomed the move, others, from the political left and right, criticized Piñera for circumventing Chile's environmental institutions. The president of the Chilean Senate, Christian Democrat Senator Jorge Pizarro, complained that Piñera's relocation effort is "full of dangerous consequences for institutions."

## Story not over

Others worry where Barrancones may ultimately be sited. Environmental groups charge that there could not be a dirtier, more polluting energy source. "The Castilla plant would throw all its contaminants into the atmosphere, generating all kinds of illnesses to people living near the plant, with direct impacts on the local economy as well," says Sara Larrain of Santiago-based Sustainable Chile.

The regional environmental authority (Corema) for the Atacama region had been slated to vote on Castilla in July, but an appeals court suspended the vote until the courts decide a lawsuit local residents filed against the regional health service. That suit challenges the ethics and rationale of the decision by the local branch of the regional health service (Seremi) to reclassify the project from "polluting" to "bothersome." Citizens and green groups argue that by making the change, health authorities effectively gave a green light for the project.

One Chilean senator called the Seremi decision indefensible. "There is no more contaminating source of energy in the world than a coal-fired plant," said Chilean Senator Guido Girardi at a press conference. "This plant will cause cancers to the local population. It will also contaminate the coastline and local seafood products. But as happens in Chile, this area had a land-use plan that does not allow industries categorized as 'contaminating.' So what does the government do? It changes the category of the company."

—James Langman

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## Centerpiece

# Kuna, citing warming, set to leave island life

Panama City, Panama

In the mid-19th century, most of the Kuna people migrated to the San Blas islands off current-day Panama to escape flooding rivers and disease. Today, they're planning a move back to the mainland, threatened by sea-level rise from global warming—and, some experts assert, by reef destruction the Kuna themselves have caused.

For Kuna such as Kinyapiler Johnson, their low-lying island communities in recent years have become alarmingly exposed to the sea.

Flooding used to be a rare occurrence in Johnson's coral-island community of Ustu, one of 49 villages scattered over the 300 islands of the "Kuna-Yala," a 924 square-mile (2393-sq-km) swath of islands and coastal mainland that forms the indigenous nation's autonomous territory on Panama's Caribbean shore. But recently the ocean has risen to frightening new levels, threatening to wash the over-crowded island communities away, he says.

"The hot season months of January and February coincide with the winds from the north, a time when the sea normally rises," Johnson says. "But two years ago, the sea rose to an alarming level. Many communities flooded. Many families couldn't cook because their kitchens flooded."

So serious was the flooding in 2008, he says, that one of the more populated islands submerged completely under several inches of ocean water. Indigenous elders say this had never happened before in the Kuna's over 150-year history inhabiting the San Blas islands.

That's why many of the Kuna leaders have decided it's time to go. Since last year, the Kuna General Congress, the central politi-

cal authority of the Kuna nation, has been promoting the idea of a massive relocation of island communities to the mainland. But according to the Kuna's political structure, the local leadership of each island community will have the final word on whether or not to make the move.

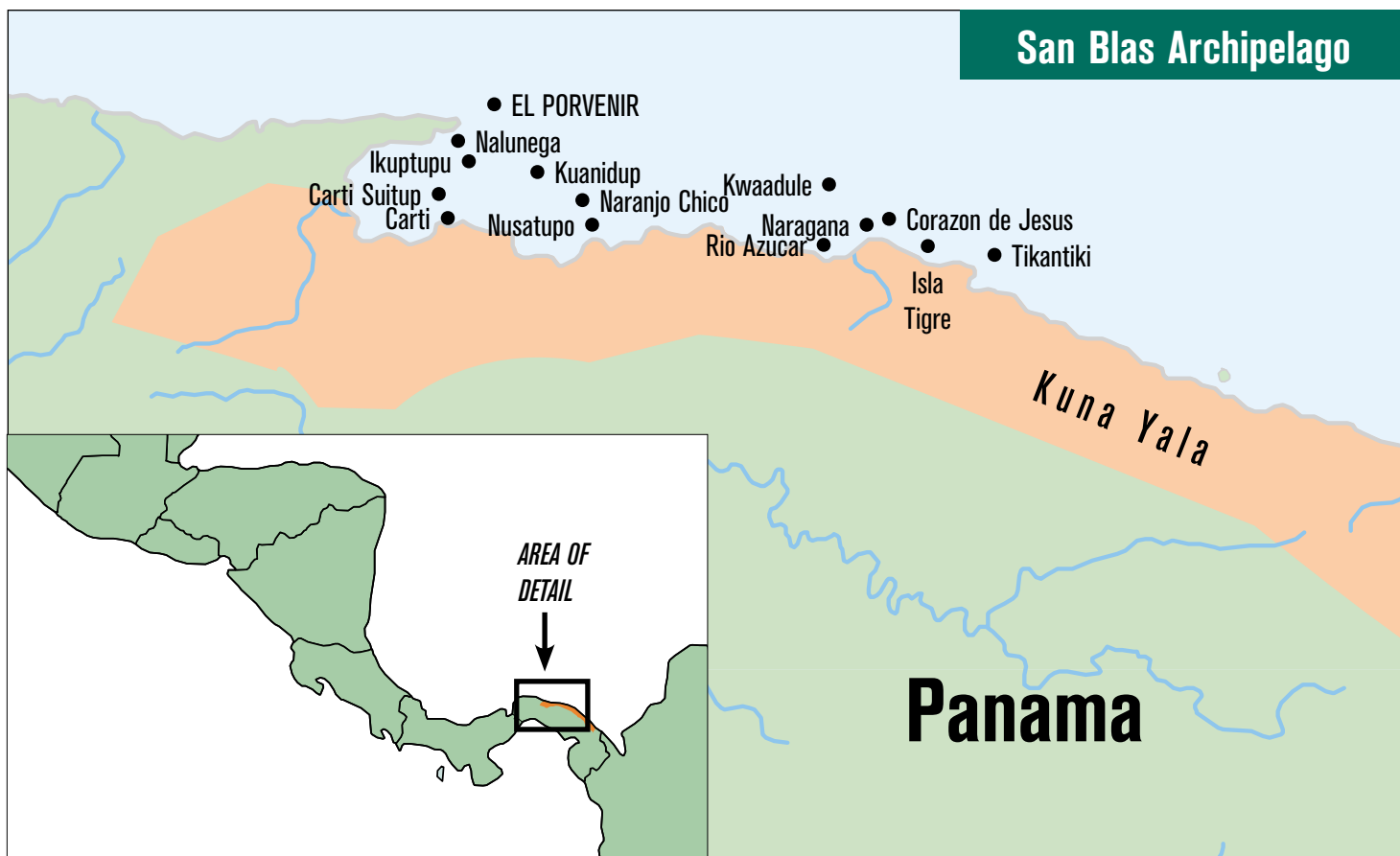
The idea of relocating to the mainland is not a new one; a similar plan was promoted unsuccessfully in the 1970s by several Kuna leaders who argued that the communities should occupy the mainland to better defend that portion of their tribal territory from encroachment by Panamanian farmers.

But this time around, the logic behind the relocation is different. The call to move has taken on a new urgency among those who think climate change is an irreversible and worsening condition. Leaders of the Kuna Congress say they must start now to develop a master plan for the exodus of 32,000 people, before it's too late.

The communities on the Carti islands have already started organizing their departure. Other island communities, meanwhile, are in varying stages of discussion or planning.

The process is not easy. In many communities, understanding the case for moving has been frustrated by some members' lack of understanding of climate change, says Jorge Andreve, a Kuna environmentalist and program director at Panama's Foundation for the Promotion of Indigenous Knowledge (FPCI).

"The issue of climate change is very complicated and difficult to explain to indigenous people during a three-day workshop on their islands. It's taken the international community 10 years to discuss this issue, and still not everyone is convinced," says





Andreve, who has a master's degree in environmental studies and is completing a doctorate in climate change and natural risks at the University of Seville, in Spain.

Andreve says the Kuna are witnesses to the symptoms of climate change all around them – they claim the birds are singing out of season, and flowers are blooming in the wrong months. But many Kuna understand such phenomena according to their own personal experiences or perspectives, and not within the context of global climate change.

“Environmental education is still a very new concept among the indigenous communities,” Andreve says.

Yet some of the Kuna have embraced the idea of relocating to the mainland—a move, they claim, that would be a homecoming of sorts.

The Kuna, a fiercely independent people with a history of rebellion, inhabited the tropical forests of Colombia and the Darien jungle for centuries before the Republic of Panama even existed. As traditional hunters and gatherers who lived off the forest, the Kuna started migrating towards the coast centuries ago, pushed by conflicts with other indigenous groups and Spanish colonialists.

They eventually formed communities along the river deltas in the coastal jungle area known today as the Kuna-Yala, or “Kuna Land.” But in the mid-19th century, amid outbreaks of malaria and other health problems caused, by flooding rivers, many Kuna leaders decided to begin migrating to the nearby San Blas islands. Some 38 communities are located on the islands, with 11 remaining on the mainland.

The Kuna who moved began relying more on fishing nets than on bows and arrows. For a people whose identity is intertwined with historical narratives that date back many generations, though, island living is still considered new behavior. So the prospect of returning to the mainland forests is not entirely foreign.

“For me, it will be a return to our natural habitat,” says Johnson, who says he has boyhood memories of his father going over to the mainland to hunt deer. “The [Kuna] youth of today are accustomed to life on the beach and the islands, because they think that’s where we are from. But those of us who know the oral history, know we come from the mountains and the jungle.”

Ariel González, secretary general of the Kuna General Congress, says community leaders have begun a relocation planning process that he estimates will take six or seven years.

“There’s no model for how to do this,” González says. “It’s going to be hard work, but we know it’s time to start. The climate has already become unpredictable; all the community leaders say the ocean has risen and the winds don’t blow the way they used

to.”

The San Blas islands, a series of coral outcroppings, are only about .5 to 1.5 meters above sea level. With sea levels rising an average of 2 millimeters a year, according to measurements taken by the Panama Canal Authority, there’s little time to waste.

González says that for those who know how to read “nature’s body language,” the signs of change abound—and are not encouraging.

“Nature has been altered,” he says. “We see it in the birds. There are specific days when certain birds sing and tell us that the rains are starting, and other birds that sing to tell us when the rains are ending. But now the birds are singing in the wrong seasons.”

The same, he says, is true for certain flowers, whose bloom

used to mark the end of the dry season. “But now the flowers are blooming at the wrong time,” he says. “Nature is trying to readjust itself and find a new equilibrium. But right now it’s off balance, and that’s why we are in crisis.”

González says the Kuna have no faith that the Western world, much less the Panamanian government, will find a solution to the problem of global warming and rising sea levels.

“The white man won’t find the solution,” he says, adding it’s fruitless to expect meaningful help from countries that are causing the problem. “The



In the mid-19th century, the Kuna people began moving to the San Blas islands off present-day Panama, eventually establishing 38 communities on the archipelago and retaining 11 on the mainland. On account of rising sea levels, however, Kuna leaders are promoting a collective move back to the mainland. (Kike Calvo, AP Images)

western world has lost equilibrium.”

But the Kuna have played a role in their predicament, too, according to Héctor Guzmán, a scientist at Panama’s Smithsonian Tropical Research Institute. Guzmán, who has spent the last decade researching coral reef conservation and human impacts on marine ecosystems, has warned the Kuna since 2003 about their practice of “coral mining.”

The Kuna free-dive off the islands to pick live coral off the reef for use in filling in land and building seawalls. The practice, Guzmán says, is destroying the archipelago’s natural wave buffer and increasing the risk of island flooding.

Guzmán published his findings in an Oct. 2003 article for the *Journal of the Society for Conservation Biology* entitled “Natural Disturbances and Mining of Panamanian Coral Reefs by Indigenous Populations.” In the article, Guzmán warned that the coral cover of the archipelago reef had been depleted by 79% over the past 30 years due to a series of natural disasters—including a tsunami in 1982—and extensive coral mining by the Kuna. He found that the Kuna had backfilled 6.23 hectares of “new island” surface out onto the shallow reef to build more homes for their rapidly growing population.

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Video: Kuna Yala: Tradición y Cambio Climático. YouTube link: <http://www.youtube.com/watch?v=O2vcZl04Xs0&NR=1>

"Traditionally, the Kuna have gradually enlarged their island landmass by building coral walls out into the water, usually over mined shallow-reef areas or sandy beaches, and then filled the enclosed area mainly with corals, sea grass, and sand," Guzmán wrote in his 2003 report.

In a period of about 30 years, 10 scattered houses on one of the islands had turned into a cluster of 350, all of which was surrounded by 20 kilometers of seawall.

And that was nearly a decade ago. In a recent interview with EcoAméricas, Guzmán said the mining of coral continues. The Kuna, many of whom now live on tourism revenue generated from backpackers exploring the San Blas Islands, have recently constructed a series of airstrips using crushed coral. And in areas where the coral is running out, they have started to mine rocks from the rivers, Guzmán notes, adding: "They are destroying the reef."

Guzmán recognizes that climate change has led to a measurable rise in the sea level around the islands, but he stresses that the Kuna's continuous coral mining has "accelerated the process and increased their vulnerability to climate change."

His original report criticizing the Kuna's environmental destruction was met mostly by silence. He says one reason might have been that his findings were not consistent with the perception of indigenous people living in harmony with nature. "It was considered taboo for an outsider to suggest that the indigenous were part of the problem," he notes.

But as the symptoms of the problem have become increasingly apparent each season, Guzmán says, many of the Kuna are starting to realize the role they have played—even if they don't admit so publicly.

"They know that the white man and the indigenous are to share in the blame," Guzmán says. The proof of that, he adds, was the participation of several Kuna activists in a forum last July to address the problem of island flooding.

In conjunction with the Smithsonian Tropical Research Institute and the British Embassy, Kuna activists helped to produce a three-min-

ute video that was distributed on DVDs in the indigenous communities and posted on YouTube. The clip illustrates and explains in very clear terms in the Kuna language the problems resulting from coral mining.

Andreve, the Kuna environmentalist studying in Spain, says he thinks coral mining is "related to the flooding problem, but it's not the principal cause." He argues that if the coral mining were mainly to blame, "The flooding of the islands would be a constant problem, and not just a sporadic one."

The real culprit, Andreve insists, is global climate change. He notes that a process called "coral bleaching"—or the whitening of coral in response to stress caused mostly by changes in ocean temperatures—is occurring on the San

Blas reef at depths greater than 15 meters, beyond the maximum depth the Kuna can dive on a full lung of air. He reports coral bleaching is also occurring on remote parts of the reef that are removed from the inhabited islands and the Kunas' coral-mining activities.

While the causes of the island flooding remain a subject of debate,

everyone seems to agree that it's important now to look beyond that problem and focus on the next potential environmental threat caused by a massive migration to the mainland.

Guzmán warns that the arrival of thousands of families to a delicate coastal region would be disastrous if the Kuna were to continue the same practices in a new area, increasing hunting activities or clearing swaths of forest for agricultural activities. He says matters would be still worse if the Kuna give in to outside pressure from Panamanian ranchers to use their mountain land for cattle grazing, as some already have suggested.

On the other hand, Guzmán believes the migration might also be a "golden opportunity" for the Kuna to start over in an orderly and planned manner. For that to happen, he says, there must be close cooperation between the Kuna and the central government.

So far, such cooperation has not occurred. Meanwhile, the waters continue to rise.

—Tim Rogers



Ariel González (photographed in Panama City), secretary general of the Kuna General Congress, says planning for the relocation has begun and will likely take six or seven years. (Photo by Tim Rogers)



Glacier law  
continued from page 1

swift, unanimous passage in 2008, suggesting that this time mountain-province governors brought their arguments and influence to bear. Kirchner, who after the 2008 veto was accused by green groups of caving in to mining interests, insisted: "I always defended glaciers."

Fueling tension over the glacier bill was sharp disagreement on whether the fast-growing mining sector should be viewed as an important means of provincial economic development or a major environmental threat.

Mining investment in Argentina amounted to US\$1.85 billion (7.3 billion pesos) in 2009, the government says. That marked a nine-fold increase since 2003, when Cristina Kirchner's predecessor—her husband, the late Néstor Kirchner—took office. The number of mining projects, meanwhile, increased from 40 to 403. And today, mining directly or indirectly employs 450,000 people in traditionally low-growth provinces, according to Argentine Mining Secretary Jorge Mayoral.

### Jobs and water

Mayoral and other opponents of the glacier bill spotlighted economic-impact figures in arguing against the legislation. Proponents, for their part, put the focus on safeguarding the country's water resources.

"Argentine society should know that their water is in danger of being polluted by mining interests," argued Miguel Bonasso, a lawmaker in the lower house of Congress who heads that body's Natural Resources Commission and helped lead support for the bill. (See Q&A—this issue.) "The only thing that is being attempted is to defend the pure water that flows from the mountains to the Atlantic Ocean."

Looming large in the debate was Pascua Lama, a vast, open-pit gold mining project that the Canadian company Barrick Gold is developing at an altitude of 4,000 meters on a site that straddles the Chilean-Argentine border.

Supporters of the bill hope the legislation will throw a roadblock in the way of the project, which will require an estimated investment of US\$2.8 billion to \$3.0 billion and is expected to begin producing in 2013. Barrick, however, said after the Senate vote that its activities in Argentina would continue "normally."

"Barrick doesn't have mining activity in the glaciers and already has put in effect an ample series of steps to protect [glaciers]," Rod Jiménez, Barrick's vice president for South America, told a French news service.

The new legislation, however, does not just prohibit mining and oil activity directly affecting glaciers, as was stated in alternative language supported by mountain-province governors and mining companies. The bill also

bans such work on so-called "periglacial" land, defining this as an area of "frozen soils that acts as a water-resource regulator."

Opponents of the legislation argued that the periglacial definition is far too broad.

"It's prejudicial to the development of mining projects because the majority of Argentine mines operate on frozen soil in the winter," said Daniel Tomas, a lawmaker from San Juan, one of the mountain provinces.

San Juan is the site of the Argentine portion of the Pascua Lama project as well as the entire extent of another Barrick mine, a gold and silver project called Veladero. San Juan Gov. José Luis Gioja is an enthusiastic mining advocate who argues projects such as Pascua Lama are in the best interests of his province.

### Barrick becomes issue

The governor's critics, however, accuse him of slavishly defending Barrick. During the lead-up to the glacier bill vote, the accusation was made often, prompting Gioja to lose his temper when the subject surfaced in a meeting with a Greenpeace activist.

"I shit on Barrick and whichever [person or company]," he said at the meeting, held in his office in the presence of reporters. "I only think of the San Juan people."

In a calmer appearance before the Argentine Senate several days later, Gioja argued his province has a right to pursue economic development without federal interference. "The territory of San Juan is 80% mountains, 17% desert and barely 3% valleys with agricultural potential," he said. "We bet on sustainable mining, which can generate progress while respecting natural resources. And we won't bow to those who want to preach morality to us from 1,200 kilometers away [in Buenos Aires]."

A central argument of glacier-bill critics is that the legislation would violate the Argentine Constitution's Article 124, which gives the provinces authority over "natural resources that exist within their territory." But defenders of the law cite another constitutional provision, Article 41, that empowers Congress to set minimum standards for environmental protection.

"The law's objective is the adequate conservation of freshwater reserves and high-mountain ecosystems, in which glaciers are a key component," says Maria Eugenia Di Paola, executive director of the Environment and Natural Resources Foundation (Farn), an Argentine green group. "[The law] protects barely 1% of Argentine territory, which is occupied by glaciers and periglacial areas. It puts no obstacles in the way of productive activities elsewhere."

—Daniel Gutman

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## Dominican Republic reefs continued from page 1

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arm of Punta Cana's developers. "Between that and our own footprint leaving more nutrients in the water, it was in bad shape."

Throughout the Dominican Republic, as in Punta Cana, coral reefs have suffered as the tourism industry has grown. In the last three decades, the country has gone from backwater to boomtown, drawing over four million tourists a year. But since the late 1970s, the country also has lost between 32% and 35% of its coral reefs, says marine biologist Francisco Gerales, director of the Autonomous University of Santo Domingo's Marine Biology Research Center.

Like the rest of the Caribbean, which has lost as much as 80% of coral coverage in some areas since the 1970s, Dominican Republic waters have been overfished and polluted. The overfishing leaves fewer fish eating algae that attack reefs. Separately, the increase in carbon dioxide in the atmosphere has boosted seawater acidity, making it harder for corals to grow.

The National Oceanic and Atmospheric Administration (NOAA) says higher-than-normal temperatures this year have left coral reefs across the Caribbean at risk of bleaching. Bleaching occurs when higher-than-normal water temperatures cause the coral to expel its symbiotic algae, which provide it with food and brilliant colors. Without the algae, corals look white, or bleached. And the longer they remain so, the more likely they are to die.

### Marine footprint

Gerales says pollution, global warming and overfishing have affected all of the country's reefs, but he adds: "The areas with a high concentration of coral destruction and death are basically off the coast from the areas of concentrated development. It's a direct relationship between development and destruction."

The government has championed the tourism industry, which this year will bring in US\$4.4 billion, according to the World Travel & Tourism Council. That ranks tourism as the Dominican Republic's single biggest industry.

Aside from the established tourist centers of Punta Cana and Puerto Plata, which is on the northern coast, the government is actively promoting development in new areas of the country where coral reefs thus far have suffered little damage, Gerales says. These include the north coast's Samana Peninsula as well as Barahona and Pedernales in the southwest.

Critics fault the government for pushing tourism expansion without adequately considering environmental consequences of any kind, let alone the impact on reefs. Says Kheel: "When it comes to the government, this administration and its predecessors, the environment is way down on the priority list. And even on

that list, coral reefs are on the bottom."

Kheel adds, however, that the foundation set up by Punta Cana's developers has redoubled efforts to protect local reefs. After the University of Miami study was released, he says, the foundation launched a program aimed at cutting pollution and protecting local fish populations. The fishery-conservation measures have included enforcing catch seasons, establishing no-take zones and helping fishermen find tourism-industry jobs such as leading catch-and-release game fishing trips.

So far, there is no comprehensive federal protection plan for coral reefs. That duty would fall to the Environment and Natural Resources Ministry. A spokesman said the ministry addressed the issue in recent years by developing a plan to monitor coastal ecosystems and by passing a law to protect certain coral species.

The ministry has also expanded its fisheries arm, placing representatives in offices throughout the country—including Punta Cana—to clamp down on overfishing, which directly affects the health of the reefs. Yet budget figures show the environment ministry division that oversees coastal waterways has been cut by 26% since 2009, leaving it with about \$1 million to spread over 1,100 miles of coastline.

### Reef calculus

Increasingly, coastal advocates cite the economic role of reefs. "In terms of water activities, especially attracting tourists, coral reefs are like our lifeblood," says Richard Brown, who runs dives in the country's waters.

A study last year by the U.S.-based World Resources Institute (WRI) concluded that each meter of beach in front of a resort adds an average of \$1.57 to the nightly room rate, per person. The Dominican Republic's beaches lose about 50 centimeters a year to erosion. States the WRI: "All-inclusive resorts in the Dominican Republic could lose \$52 to \$100 million over the next 10 years from beach erosion."

And coral reefs, the WRI says, "have suffered significant mortality in recent decades." That could be bad news for beaches. Not only do reefs protect the coast, they give it some of its finest sand as material that has grown on them is ground down by waves and currents.

Says Ruben Torres, director of Reef Check Dominican Republic, a local green group that commissioned the study: "We are trying to make it clear that the coral reefs are really a central piece of our tourism industry and they need better protection and more resources. From our point of view, the message hasn't hit home yet with the government."

—Ezra Fieser

Around the Region  
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grove swamps on the Osa Península; land along the Naranjo and Savegre rivers in western Costa Rica; and La Amistad park along the Panama border, a region that houses 90% of the country's known plant species.

The U.S. government gave US\$19.6 million in debt relief under the deal, and The Nature Conservancy, a U.S.-based environmental organization, contributed \$1.6 million toward the cost of debt reduction and an additional \$2.3 million for the Costa Rican conservation.

It's the second such swap arranged between the two governments. The U.S. government and environmental groups agreed to cut \$26 million of Costa Rica's foreign debt in exchange for the country spending the same amount on tropical forest conservation in a 2007 debt-reduction deal.

"These agreements make Costa Rica, one of the most biologically diverse countries on earth, the largest beneficiary under the TFCA [the U.S. Tropical Forest Conservation Act, which enabled such swaps]" the U.S. Treasury Department said.

The act gives eligible developing countries opportunities to reduce concessional debt with the U.S. in exchange for conservation efforts, the treasury department said. The program has provided more than \$100 million to 11 countries, including Guatemala, Panama, El Salvador, the Philippines and Bangladesh.

Costa Rica's National Biological Institute, or INBio, is still in the process of selecting applicants from conservation groups seeking to receive funds under the 2007 swap.

Covering less than 0.1% of the earth's surface, Costa Rica hosts as much as 5% of the world's biodiversity, according to The Nature Conservancy. It seeks to become the first developing country in the world to establish a perma-

nently financed protected areas system that addresses climate change challenges.

**Follow-up:** For statements on the swap, respectively, from the U.S. Treasury Department and The Nature Conservancy, go to [www.america.gov/st/texttransenglish/2010/October/20101015143059su0.594869.html?CP.rss=true](http://www.america.gov/st/texttransenglish/2010/October/20101015143059su0.594869.html?CP.rss=true) and to [www.nature.org/wherewework/centralamerica/costarica/](http://www.nature.org/wherewework/centralamerica/costarica/)



### Mexico City plastic-bag law off to a bumpy start

It's one thing to pass an environmental measure and another to enforce it. Confusion surrounding a Mexico City ordinance to cut down on the use of non-biodegradable plastic bags appears to be proving the point.

Put into effect in August 2009 after being passed by the city legislative assembly, the measure makes it illegal for grocers and other vendors in the Mexican capital to distribute non-biodegradable bags to customers for free. Alternatively, vendors can hand out biodegradable bags or charge for regular ones.

Stores were given a year to prepare for the change. As of August of this year, those failing to comply were liable for arrest, 36-hour jail terms and fines of up to 20,000 days of the minimum wage, or roughly US\$80,700.

Many stores still haven't made the switch. But, so far, none has been fined—reflecting the vagueness of a law that has caused a lot more confusion than waste reduction.

The problems are many. The government has failed to set a universal price for plastic bags or even define "biodegradable." Shopkeepers have been left to wonder what type of bag they are legally allowed to give away, and they're able to charge as little—or as much—as they want for the ones they sell.

And under the law, city authorities can issue fines only in response to formal citizen complaints, a policy that runs counter to mind-your-own-business Mexican attitudes while leaving storeowners deeply paranoid about the steep sanctions.

The government acknowledges clarification is needed. "The law is not clear," says María Eugenia González, chief legal director for the Mexico City environmental department. "It needs to be modified."

While Mexico City's Legislative Assembly debates how to do that, officials say the law is nevertheless doing some good. Some stores have stopped using plastic bags or started charging for them. Others are offering biodegradable bags. And in a sign of the growing recycling spirit, reusable cloth sacks increasingly can be found for sale at checkout registers.

What's more, the city says the plastics industry has become more receptive to talks about recycling programs. "They thought this was just a play thing," says Arnold Ricalde, the social coordinator for the Mexico City Waste Commission. "Now they are aware they have to participate. They have to be part of the solution and not part of the problem."

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### Roof gardens take root in Mexico City

The Mexico City Environment Secretariat has earmarked 9 million pesos (US\$700,000) over three years to build roof

gardens on public buildings.

Evelyn Pichardo, an architect who works on the project in the environment department, estimates that buildings in the city center whose roofs sometimes reach temperatures of 60 degrees Celsius rarely ticked above 24 degrees once the technique was in place.

Using a process that it says has been employed in Germany for decades, the city and some private companies have turned the tops of buildings green by putting down a layer of waterproof and anti-rooting material on the roof's surface, followed by a drainage layer, a filter and then earth and the plants themselves.

The flowering succulent genus sedum is the source of plants for most parts of Mexico City, including the roof above the city center subway station, Insurgentes, and the roof of the city's Belisario Domínguez Hospital.

The plants resist wind, which is much stronger a few stories from street level, and Mexico City's extremes of weather, which goes from fierce heat during the dry season to pounding rain during the rainy season.

"Hotels, homeowners and private institutions are all setting up green rooftops," says Felipe Leal, a trained architect who heads the city's urban development department.

The city discounts property taxes by 30% for anyone who hosts a rooftop garden. Leal added that city planners seek to bring together a network of people and groups for each specific project that might then go on to work together independently.

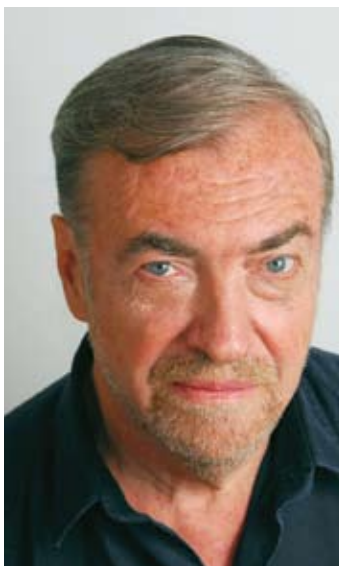
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## Q&amp;A:

# Argentina's Bonasso won't bow to governors on mining

Miguel Bonasso has been well known in Argentina for four decades. In the 1970s, he headed a Buenos Aires newspaper and worked briefly as communications advisor for President Héctor Cámpora, who resigned in 1973 after just 47 days in office to make way for the return that year of Juan Perón as president. A member of the Montonero guerrilla movement, Bonasso went into exile in Mexico during the military regime that ruled Argentina from 1976 to 1983. Back to Argentina in 1984 after the country had returned to democracy, he won praise for "Memory of Death," a book he wrote about the military's campaign of kidnapping, torture, and murder. In 2003, he won a seat in Argentina's lower house of Congress, the Chamber of Deputies, where as a legislative leader on environmental issues, he spearheaded passage of a native-forest protection law in 2007 and glacier-protection legislation this year. (See related article—this issue.) Bonasso spoke recently at his office in the Argentine Congress with EcoAméricas correspondent Daniel Gutman.



Miguel Bonasso

The provincial governors who favor high-mountain mining projects complain that a line of conduct is being imposed from Buenos Aires with little understanding of the realities of their provinces.

Now they try to talk about federalism in irritating speeches, when really all they are defending are business deals. Look [at my legislative credential]. Here it says that I am a national deputy, though I was elected in Buenos Aires. And we can legislate for the whole of Argentina. The Argentine Constitution says that the natural resources belong to the provinces, but the provinces have ceded to the nation the authority to set minimum environmental-protection standards. Some governors are defending the private interests of mining companies. And I want to tell them that although the glaciers are in their provinces, they don't belong to them for, among other reasons, rivers fed by glacial melt cross various provinces and thus are a federal issue. We cannot permit suicidal projects

because they supposedly give work to some.

## What is the importance of the glacier-protection legislation Congress just passed?

It's fundamental for Argentina because in the Andean mountain chain we have a zone 3,000 kilometers long and 100 kilometers wide—some 300,000 square kilometers—where there are a series of ice formations that are still not totally identified as glaciers, but many are [glaciers]. That's why this law establishes, in a strategic way, that the state should take an inventory, since [glaciers] constitute a fundamental hydrological resources, in particular for arid areas. In the summer, mountain rivers spring from glaciers as the ice melts. Although the law in principle is not anti-mining, it has come into conflict with mining interests, in that some transnational mining companies such as Barrick Gold already have established themselves in the high mountains—for example, in San Juan province—with giant open-pit operations. There they intend to dynamite the mountains, which would cause acid rain, and use gigantic quantities of water that comes from periglacial areas, which might be contaminated by hundreds of tons of cyanide that is used to separate gold from other metals. The strong reaction of mining companies against this law demonstrates that they are operating in glacial and periglacial areas.

## The debate on this bill seemed to go beyond the immediate question of glaciers and became a discussion of the role of mining in Argentina in the coming years. Do you agree?

Yes. The debate allowed Argentine society to stop seeing these questions as if they had nothing to do with those who live in big cities or are involved in environmental protection. It permitted Argentines to learn glaciers are a substantial source of potable water. Mining companies will now have a harder time advancing their projects because the people know Europe has prohibited open-pit mining and that in Argentina, seven provinces have prohibited it, and for a fundamental reason: that it involves the use of cyanide. In the environmental area, the precautionary principal is fundamental because when a significant environmental disaster occurs it is often irreversible.

## Has the Forests Law approved in 2007 protected woodlands from the advance of the agricultural frontier and the timber industry?

The law has had problems in its implementation because it affects powerful interests. And just as the glaciers law is intended to protect water, the forests law is intended to protect the air. It must be recognized that in Argentina barely a fifth of the native forests that existed at the outset of the 20th century remains today. One of the problems we have is that the national Constitution, since it was rewritten in 1994, established that natural resources belong to the provinces. And in many cases the provinces have not acted responsibly with respect to the spirit of the law. There's a very recent example in Córdoba province where the legislature approved a land-use management plan that allows the cutting of native forests. There is a very serious conflict between the provincial governments and the national government. And one of the big battles we have to fight is that of communication.

## How much has environmental policy had to do with your differences with the government of President Cristina Kirchner?

A lot. We had to go through a very painful process to approve the forests law, one in which non-governmental groups played a decisive role. Greenpeace gathered 1.5 million signatures [in support of the legislation]. Then the government waited a year and a half to implement the legislation. It did it after the city of Tartagal, in Salta province, suffered through a terrible deluge that was unleashed because of the disappearance of forests. This government not only doesn't have an environmental policy; it has an anti-environmental policy. Consider that now the Environment Secretary, Homero Bibiloni, continues to say that the pulp plant [the Finnish company] Botnia built in Uruguay, across the river from Argentina, is causing pollution when he failed to bring the evidence [of such pollution] before the UN International Court of Justice. Now, with the glaciers law, we've won a very important battle against the president, who in 2008 vetoed [the bill] as a courtesy to her political allies.