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*Tucked in the Guatemalan highlands, Lake Atitlan has been described as the world's most beautiful lake.*

## Guatemala: When the World's Most Beautiful Lake Became Ugly ...and Smelly

By Ezra K. Fieser

**L**AKE ATITLAN — The first time I visited Guatemala's Lake Atitlan, I left with two inextinguishable memories. After winding through the mountains on the Inter-American Highway, we descended a small hill and followed a sharp bend to a clearing in the trees that revealed the lake. It was majestic. Tall, perfectly conical volcanoes, deep blue waters, surrounded by dark green vegetation — a landscape filled with so much depth and beauty that Frederic Church might have wept.

The second memory was less pleasant but equally enduring. After two days of exploring

the lake, visiting the little Mayan villages that surround it, hiking the hills and zipping across the water in hired boats, I came down with amoebas. It felt like someone lit a small fire in my gut every time I tried to ingest anything, from water to beef. A doctor later told me that I'd timed my visit — the end of the rainy season — terribly. He told me that the rainy season washes fertilizer and organic compost down into the water. "Your chances of eating or drinking something nasty are really a lot higher," he said. "People say it's clean, but the lake is very polluted."

Last month, when I took two friends to the



*Market day in the Mayan town of Santiago, Atitlan, on the southern shores of the lake.*

lake for their first visits, my first trip — and those memories — came back to me. Atitlan, which Guatemala's tourism industry gave the moniker "the world's most beautiful lake," is covered with a toxic coffee-colored sludge, a strand of cyanobacteria that gives off an awful odor — a tourist I spoke with likened being by the lake to sitting in an outhouse.

After years of overdevelopment and neglect, Lake Atitlan is as ill as I was during my first visit there, probably worse.

How could this have happened, I wondered. Atitlan is one of the most visited places in the country, a gem that has helped tourism grow. Guatemala treats well its other tourism sites. Antigua, the former Spanish colonial capital, has its own police force and — gasp! — trashcans on every corner. Parts of Tikal, the important Mayan city that sits in the lowland department of Petén, have been majestically restored.

Atitlan draws as many visitors as the others, and supports the local economy — not only the hotels and restaurants that give shelter and feed the tourists, but also the Mayans who fish from it, irrigate the fields with it or wash their clothes in it. Despite its importance, the lake has been ignored by the government, the residents and, largely, by the nonprofit groups that work around the lake. An examination of how the country's most beautiful lake fell ugly

reveals a series of boneheaded decisions nearly as ugly as the cyanobacteria itself.

**IT IS QUITE AN ACCOMPLISHMENT** for the lake to have been dirtied to this extent. Set at roughly 5,000 feet above sea level deep in the Western Highlands, Atitlan is enormous — covering more than 50-square-miles of surface area. According to the lake museum, it was formed some 84,000 years ago after a series of volcanic eruptions. This was, according to all scientific estimates, a huge eruption. Scientists have traced evidence (ash) of the eruption to lands as far away as Florida and Ecuador. In a perhaps overly dramatic description of the event in "La Obra Maestra de Vulcano," writer Jorge Sierra describes it this way:

*The earth trembled. The grave and prolonged thunderous sound was supergigantic. The sky, in little time, would turn black. Lizards, snakes and turtles ran to hide. Trees and plants shook with agitation. The largest volcanic eruption in Guatemala, and perhaps America, in the past million years was about to occur. ... It was a cataclysm, an ugly and deformed monster of fire — like a mythological god. It was a sea of incandescent rocks that exploded to a height of nearly 50 kilometers into the sky.*

The explosion left a caldera nearly 11 miles in diameter. After the eruption, volcanoes continued to form around the caldera. Today, the three volcanoes — Atitlan, Toliman and San Pedro, range from nearly 10,000 to 11,600



feet above sea level at their peaks.

The waters that would become Lake Atitlán filled that caldera. The lake floor has not been completely explored, but researchers have found areas that are more than 1,200 feet deep. It is the deepest lake in Central America, albeit not nearly as deep as others around the world, such as Lake Baikal in Russia.

Still, the lake is, by all accounts, enormous, and beautiful. It is free of the industry that marks another beautiful Guatemalan lake, Amatitlán. Visiting the small towns around the lake feels like traveling between islands, a testament to both the lake's size and to the pace of life. Guatemala's *hora chapina* or Guatemalan hour, which, in effect, means you're expected about 45 minutes to an hour late for every appointment, is slow enough. The pace at the lake delays things by another 30 minutes. I've been on boats that were set to leave in five minutes, only to be delayed by an hour and a half 'just to see if anyone else is coming.' The Greek isles have nothing on Atitlán. It's a pace that fits the landscape. It's just slow enough to allow you to take it all in.

For some entrepreneurs, the draw of the lake was strong enough to overcome the strife of the civil war. A friend who owns an 'inn' in Santiago, Atitlán, the largest town around the lake, but one of the least touristy, said he purchased the land for his establishment at the height of the war, although the rooms were not constructed until the early 1990s. Atitlán's potential was obvious to anyone who visited.

When famed English author Aldous Huxley visited

Guatemala in the 1930s, he compared Atitlán with Italy's Lake Como in his book "Beyond the Mexique Bay." Of Como, he wrote, it "touches the limit of the permissibly picturesque." Atitlán, he wrote, "is Como with the additional embellishment of several immense volcanoes. It is really too much of a good thing."

Using that writing, Guatemalans have credited Huxley with calling Atitlán "the world's most beautiful lake." Irrespective of whether the interpretation is correct, that label has been applied to tourism brochures, Web sites, even travel guides. Dozens of hotels, restaurants, and tourist attractions have popped up in the years since. Today, you can do everything from take a horseback ride around the lake to ride on a zip line through the tree canopy.

### GENERAL JOSE MIGUEL RAMON YDIGORAS

Fuentes lasted five years as president of Guatemala, from March 1958 to March 1963. Compared to the long runs we're accustomed to in the U.S., five years might seem like a pittance. But in Guatemala in the years following the U.S.-orchestrated coup of 1954, that was a long run. His predecessor had served all of two-and-a-half years, a long run for post-coup presidents, and he ended his run after being shot to death.

To promote Atitlán, he introduced black bass as a way for the restaurants and hotels to attract more tourists with the offer of fresh lake fish.

It's a delicious catch, light and fleshy but still meaty, perfect for a variety of dishes. The black bass became just the thing that Ydigoras had wanted — a source of income for local fisherman and an added attraction for hotels and restaurants. During my first visit, I remember passing hotels with chalkboards promoting sales of freshly caught black bass.

However, black bass was as ecologically destructive as it was commercially successful. An invasive species, the bass ate through everything. It killed the native species of fish — which were small compared to the bass. It ate the large lake plankton. It even ate the young of the rare Poc duck, which, as a result, went extinct in the early 1990s.

The only thing the bass did not eat up were bacteria itself. "It ate everything except for the bacteria," said Monica Berger, head of Asociacion Atit Ala, a nonprofit that has pushed for a government cleanup of the lake. While she spoke, she held up both hands, the left hand acting as the bacteria and then right acting as the fish that was 'chomping' through everything.

"Without anything to keep it down,"





*The thick bacteria covers the water's surface and emits a foul odor when it dies.*



Through its fertilizer program, the government distributes, for free, chemical additives to help farmers increase yields. For poor farmers, the program is needed help. For the bacteria, it was essential. The fertilizer contained equal parts phosphorous, nitrogen and potassium.

Putting down the fertilizer was adding phosphorous to phosphorous. And because it was free, a farmer told me, it was added liberally. "Why cut down when it can help us grow more," he said. "We didn't know it was going to damage the lake."

A spokesman for the government's Ministry of Agriculture told me that the fertilizer is purchased in bulk and that it does not have the capacity to tailor the chemical content to the specific needs of the area. Around the lake, some 79 percent of the land is used for agriculture, the ministry said.

It's not the only source of phosphorous. Raw sewage is still pumped directly into the water in some towns. And even indigenous women, although unknowingly, contribute by washing their clothes on lakeshore rocks with soaps

she said, pushing her left hand toward her office's tile ceiling and opening her hand as if it were a flower blooming, "it bloomed."

It wasn't that simple. The bacteria were first detected in 1976, but in very small quantities. To thrive, it needed more than the lack of a natural predator, scientists told me.

The first was a food source: phosphorous. That wasn't hard to find. The land around the lake, volcanic land, was naturally full of phosphorous. Deforestation is widespread around the lake. The indigenous population has cut down trees to use firewood as fuel, leaving the steep hills without vegetation. As a result, phosphorous-rich soil runs down into the lake, feeding the bacteria. But the amount of phosphorous that occurs naturally might not have been enough to allow the bacteria to proliferate.

The added phosphorous it needed was literally handed out by the government in the form of chemical fertilizers.

that contain phosphorous.

And scientists believe global warming has played a role. The lake's surface temperature long oscillated between 70 and 74 degrees. According to the government's recent report, the recent surface temperature has risen to a range of 73.5 and 77 degrees, warm enough to help the bacteria bloom.

**TO GET A BETTER LOOK AT WHY** the lake was being fed pollution and what effect the bacteria was having, I hired a boatman and tooled around the lake, hopping between small villages.

It was a clear Tuesday morning. Brushstrokes of white clouds hung in the air and a strong breeze blew from the north. I was staying at a little hotel in Santiago, Atitlan, on the south side of the lake. Santiago, long considered the most polluted area, was free of the bacteria. An algae barrier had closed the Santiago inlet to



the spread of the bacteria. In our 20-seat, single engine boat, we roared through the algae and into open waters that were clear just months earlier.

We hooked around the San Pedro volcano toward the small towns of San Juan La Laguna and San Marcos La Laguna on the south side of the lake. The fiberglass hull was lifted high by lake waves and slammed down on the water so hard that it felt like landing on concrete. I moved to the back of the boat and looked at the wake. The engine chewed through the bacteria and spit it out in clumps that looked as thick as mud. An odor began to waft up from the water. Not much visual or olfactive distinction exists between the dying bacteria and raw sewage.

Just how bad is it? Visibility has gone from nearly 40

feet to 3 feet and just 5 feet under the surface, in some parts of the lake, there is almost no oxygen. Certain blooms are 100 feet deep. A NASA image, taken from space, shows the bacteria in a giant swirl, curling around the lake edges and thickening in the middle.

We passed a set of pipes on the west side of the lake, running down from a small town into the water. That was sewage, I was told, being pumped deep into the lake. Without ability to treat the sewage, the towns began pumping it down into the lake in the 1970s and 1980s.

As we passed the towns another critical piece of the puzzle became apparent to me. The towns, which had developed quickly in the last decades, were haphazardly built, like building blocks stacked onto hills wherever they

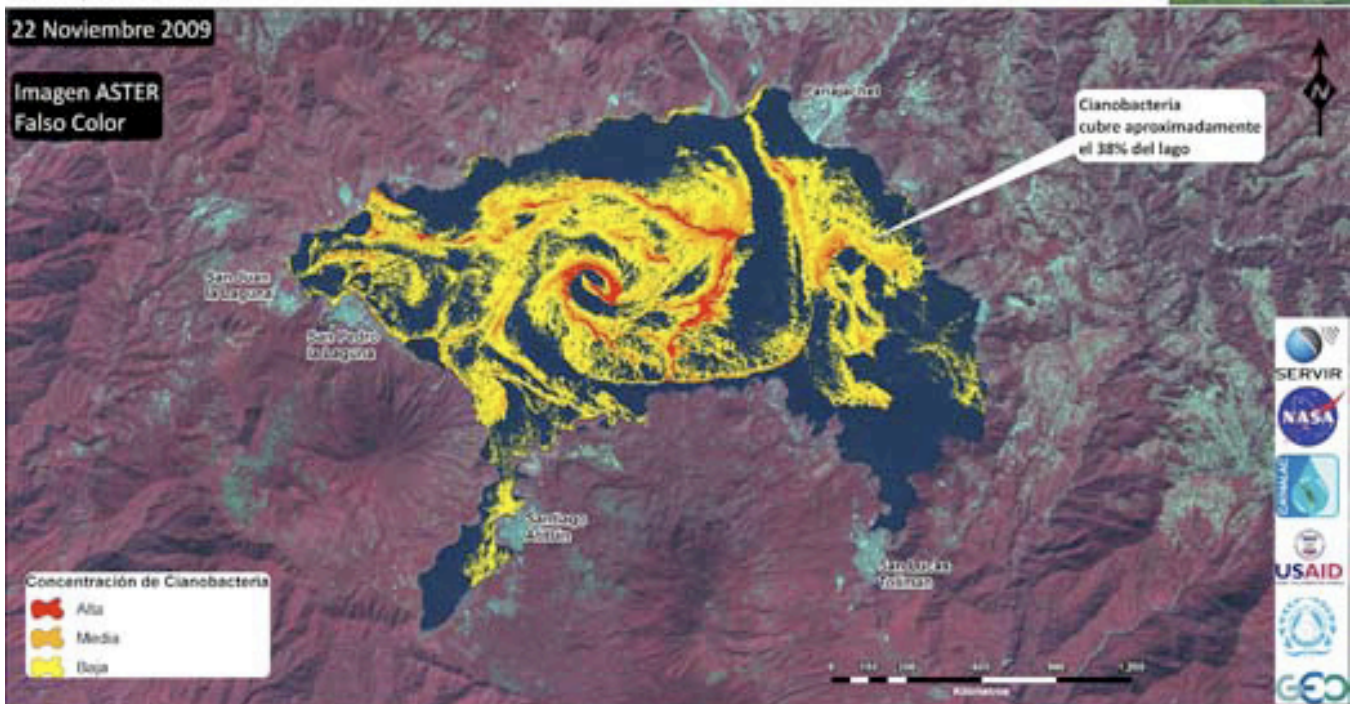
*A NASA satellite image shows how the bacteria spread.*

## Contaminación por Cianobacteria Lago Atitlán

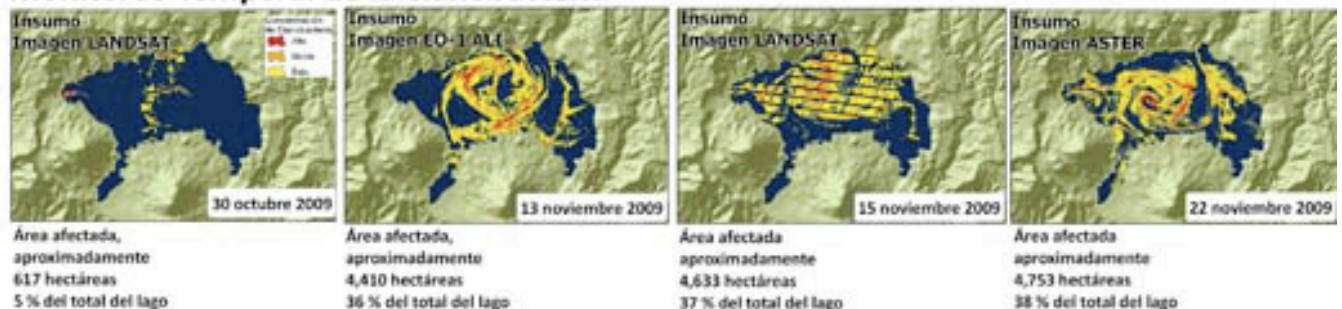
Sololá, Guatemala

22 Noviembre 2009

Imagen ASTER  
Falso Color



### Monitoreo Temporal de la Cianobacteria



Crédito de las imágenes: SERVIR/CATHALAC/NASA/USAID/GEO

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fit. The lack of construction codes has played a part in the erosion of the soil that is harming the lake.

As the boat slowed on our approach to the San Juan dock, I could see the bacteria more clearly. It was as if the water was rotting and coagulating, like clumps of rottenness lurked just below the surface.

A few moments later, I met Juan Chocoy, a third-generation fisherman, as he cleared reeds from the shores with some 35 other men. The clearing takes place annually in order for new reeds to grow. They act as a buffer that filters the runoff before it enters the lake.

Chocoy was young with a mousy face and a serious stare. He tilted his head forward as he spoke. "We've always lived off this lake, my father, my father's father, were all fisherman. You don't make a lot of money, but it's what you know," he told me. Chocoy left school after sixth grade and was taught to fish by his father. He recalls pulling tens of pounds of black bass and mojarra (a tilapia relative) out of the lake and selling it to residents in the villages and, less often, to restaurants. "When the government said that the lake was toxic, the people in the villages became afraid to buy the fish, so we stopped fishing," he said. "Now, we're unemployed. That's what we call ourselves, the unemployed. We don't have any way to support our families now."

His story was a common one. From the driver of a

three-wheeled tuk-tuk who said he barely earned enough to pay for gas, to the hotel owners who were getting half the normal number of visitors, to the restaurant owner whose dockside restaurant used to offer lake views and now struggled with lake smells—they were all suffering. Around 200,000 people live off the lake, either using the water to irrigate fields, fishing from it or profiting from the tourism business.

The lake is the second-most visited site in the country, behind Antigua, and tourism generates an estimated \$200 million a year. "It's essentially the only thing we have here, the only thing they have," Berger told me, referring to the residents. "It's a poor country, as you know, and this is a big issue for them. It should be a big one for the government, too."

**THE GOVERNMENT TOLD ME** it is working on a multi-part plan to clean up the lake. A draft of that document calls for an ambitious undertaking.

First, sewage-treatment plants for 15 communities that currently don't treat waste must be constructed. Second, farmers need to cut down on the amount of phosphorous that's being added to the soil. The plan proposes converting 80 percent of farmers to organic production within three years. It would then need to educate the residents and the tourists about the lake's fragile state. That would include convincing boatmen to stop dumping oil



*Out-of-work fishermen clear reed from the shores. The reed acts as a natural buffer, keeping runoff from entering the open waters.*



*Atitlan from one of the hills that surrounds it.*

into the water, to tell Mayan women to stop washing their clothes with phosphorous-laden soap on lakeshore rocks. In short, it would be a huge culture shift.

And it would be expensive. The initial steps alone would cost \$37 million, an amount the government has already said it does not have. For the plan to be fully implemented over the next decade or so, estimates range as

high as \$350 million. Is it worth it?

“If they put everything in place, if they do everything that needs to be done, cutting the sources of pollution, and everything else, the lake can and will come back,” said Margaret Dix, a University del Valle scientist who has been researching the lake since the 1970s. “But it will never be like it was 100 years ago.” □

# Current Fellows

## **Elena Agarkova • RUSSIA**

May 2008 - 2010

Elena is living in Siberia, studying management of natural resources and the relationship between Siberia's natural riches and its people. Previously, Elena was a Legal Fellow at the University of Washington's School of Law, at the Berman Environmental Law Clinic. She has clerked for Honorable Cynthia M. Rufe of the federal district court in Philadelphia, and has practiced commercial litigation at the New York office of Milbank, Tweed, Hadley & McCloy LLP. Elena was born in Moscow, Russia, and has volunteered for environmental non-profits in the Lake Baikal region of Siberia. She graduated from Georgetown University Law Center in 2001, and has received a bachelor's degree in political science from Barnard College.

## **Pooja Bhatia • HAITI**

September 2008 - 2010

Pooja attended Harvard as an undergraduate, and then worked for the *Wall Street Journal* for a few years. She graduated from Harvard Law School. She was appointed Harvard Law School Satter Human Rights Fellow in 2007 and worked as an attorney with the Bureau des Avocats Internationaux, which advocates and litigates on behalf of Haiti's poor.

## **Eve Fairbanks • SOUTH AFRICA**

May 2009 - 2011

Eve is a *New Republic* staff writer interested in character and in how individuals fit themselves into new or changing societies. Through that lens, she will be writing about medicine and politics in the new South Africa. At the *New Republic*, she covered the first Democratic Congress since 1992 and the 2008 presidential race; her book reviews have also appeared the *New York Times*. She graduated with a degree in political science from Yale, where she also studied music.

## **Ezra Fieser • GUATEMALA**

January 2008 - 2010

Ezra is interested in economic and political changes in Central America. He is an ICWA fellow living in Guatemala where he will write about the country's rapidly changing economic structure and the effects on its politics, culture and people. He was formerly the deputy city editor for *The News Journal* (Wilmington, DE), a staff writer for *Springfield Republican* (Springfield, MA) and a Pulliam Fellow at *The Arizona Republic*. He is a graduate of Emerson College in Boston.

## **Derek Mitchell • INDIA**

September 2007 - May 2010

As a Phillips Talbot Fellow, Derek will explore the impact of global trade and economic growth on Indians living in poverty. He has served for the past year as a volunteer for Swaraj Peeth, an institute in New Delhi dedicated to nonviolent conflict resolution and Mahatma Gandhi's thought. Previously he was a Fulbright scholar in India at the Gandhi Peace Foundation. He has coordinated foreign policy research at George Washington University's Institute for Communitarian Policy Studies and worked as a political organizer in New Hampshire. Derek graduated with a degree in religion from Columbia University.

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