Where's the water?
Drought only part of the reason why Mexico can't settle 1.5 million acre-foot debt with the U.S.

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DELICIAS - Residents of this parched Mexican state use a new expression to hail foreigners nowadays, especially those from the United States.

No hay agua. There's no water.

It reverberates through the crumbling canyons that once were full reservoirs, the fallow fields now choked with dust and the halls of bureaucrats, whose eyes have glazed over from repeating the declaration.

"This drought has really done us in," said Monserrat Terrazas Payan, president of Chihuahua's Delicias Irrigation District, which has reduced its cultivated acreage by 85 percent since 1989.

If Mexicans appear to be on the defensive, it may be for good reason.

For two years, U.S. farmers have accused Mexico of stockpiling water owed the United States under a 1944 binational water treaty.

The quarrel has bound two distinct regions: the desert state of Chihuahua, an unlikely water source, with the semi-arid and coastal Lower Rio Grande Valley, an unlikely agricultural heartland.

As they've wrangled, officials on both sides of the border have had a lesson in the finite nature of ecosystems as they've watched the Rio Grande, which links Chihuahua to the Rio Grande Valley, peter out a hundred yards from the Gulf of Mexico.

The much-scrutinized, disputed and picked-over treaty regulates tributary runoff on both sides of the Rio Grande. Under it, the United States receives one-third of the flows from six Mexican tributaries, the principal one being the Rio Conchos in Chihuahua.

But since 1992, Mexico infrequently has trickled out water releases, never enough to comply with the treaty.

Last week, Mexican President Vicente Fox promised to deliver a water payment plan to U.S. officials by May 30.

Mexico has made pledges and failed to deliver in the past. Prospects aren't any better this time around.

The nation owes a debt of 1.5 million acre-feet - enough water to cover more than a million football fields with a foot of water - and the three largest reservoirs in Chihuahua, all in the Rio Conchos basin, are shriveling.

Barely there

Chihuahua's largest reservoir, La Boquilla, was built shortly after the turn of the 20th century, during the time of dictator Porfirio Diaz. The giant basin, during wetter times, could hold 2.35 million acre-feet of water, enough to comply with the treaty for seven years.

Now, where water once flowed, rolling hills have been exposed long enough for a home to be built in the reservoir bed.

Though downstream of the dam is a swath of tropical vegetation, a true oasis of palm trees in a desert, the trickle that flows from La Boquilla is an unhealthy apple-green due to the silt that's been kicked up by low flows.

"Caray! You can see the old water line. Look, the water must be 15, 20 meters below it," said Luis Roberto Fernandez Guillen, an engineer with the state water department.

The Francisco I. Madero Reservoir, with a much smaller capacity at 282,128 acre-feet, also is known as Las Virgenes for its two silvery statues of corn goddesses.

Martin Hernandez Saldivar, caretaker of the fishing village there, shuttled a small water pump down to the pebbly shoreline in a pickup.

He gestured toward some struggling trees in the village.

"They need water," Hernandez said.

When rain fell bountifully in Chihuahua, the lake level would reach and replenish their roots. It would have subsumed the restaurant and barbecue pits that now dot the shore.

Between 1991 and 1999, rainfall in Mexico's six tributary basins was below normal five years; in 1994 in the Rio Conchos basin it hit a low of 50 percent.
Luis L. Leon Reservoir is about the same size as Madero. Opened in 1968, it was the last to be built and is the last to capture Rio Conchos water before it arrives in the United States.
Storage levels now are at about 23 percent of capacity. Rowboats are beached 3 yards above the water, and burros graze among the desert plants that have sprouted in what used to be a reservoir bed.
"We've said over and over again, we don't have the water," insisted Horacio Almazan Galache, president of the Chihuahua state water department.
Freeing the little reservoir water that remains, most of which is needed to maintain the structural integrity of the dams, would deliver a small fraction of Mexico's debt to the United States, he said.
"But it would kill the three reservoirs," Almazan said. "The impact on the ecosystem would be terrifying."
Hoarding allegations
The lament is lost north of the border, where debate continues to rage over whether Chihuahua is hoarding water. U.S. officials have waved satellite images that show growing plumes of green around the reservoirs over the years.
"They are irrigating there," said Gordon Wells, program manager at the Center for Space Research at the University of Texas at Austin. "It's just an oasis of green out there compared with the rest of the natural vegetation."
But that doesn't mean U.S. officials should expect Chihuahua to sacrifice its farmers' livelihood to comply with the treaty, said Mary Kelly, director of the Texas Center for Policy Studies in Austin, which recently convened a binational water conference in Chihuahua on the issue.
"They have water if you want to say that their only priority, their only obligation, is to make a payment on the deficit," she said. "But put the United States in their shoes. What would we be doing? We'd be asking for some reasonable discussion."
If the question about Chihuahua's current water situation is unanswerable, the puzzle regarding its water use over the past decade has stumped all the experts.
Lower Rio Grande Valley farmers charge the cumulative shortfall of water from Mexico has cost the region $1 billion in agricultural losses, wilting thousands of acres of crops and forcing farmers to convert from irrigation-intensive vegetables to less thirsty sorghum and grains.
Chihuahuan farmers have done the opposite, according to information on the official Web site of Mexico's Secretaria de Agricultura, Ganaderia, Desarrollo Rural, Pesca y Alimentacion. While overall irrigated acreage in Chihuahua has expanded in the past decade, farmers also have converted their grainfields to alfalfa and other irrigation-intensive crops.
What the numbers don't show is how Chihuahua may have been able to do this, though National Water Commission data reveals one of the three irrigation districts on the Rio Conchos, near Ojinaga, has increased its irrigation releases by 5 percent since 1992.
Terrazas, the president of the Delicias Irrigation District, Chihuahua's largest, said farmers in his region have defied the state trend, shrinking cultivated acreage to 40,754 acres from 316,000 acres at the district's height. Farmers no longer receive water for two cultivations each year, now receiving only one.
"There's so little water, many farmers are pumping the river now, whereas before the water flowed to their crops alone through gravity," Terrazas said.
While it's possible that statewide irrigation rates, not completely reliant on the Rio Conchos, have masked the drastic reductions in Delicias, there may be another factor: groundwater wells. A growing number of them are supporting farmers in Chihuahua, which has abundant aquifers.
Figures from Mexico's National Water Commission indicate the number of groundwater wells in the Delicias region has increased almost ninefold since 1969, from 240 wells to 2,134 in 2001. Those wells also could prove to be the source of another problem.
Experts contend such widespread use of groundwater wells could draw down Rio Conchos levels in the long term, thereby impacting the Rio Grande.
"It is possible that if the aquifers are in the path of the Rio Conchos basin, and you pump out those aquifers in an area with a low water table, it could reduce the flow of the Rio Conchos into the Rio Grande," said Parr Rosson, an agricultural economist with the Texas A&M Agricultural Extension Service.
Wells of UT-Austin suggested that wells would have an impact only if they were near the headwaters of the Rio Conchos.
While hydrologists consider that question, U.S. farmers who have toured Delicias continue to maintain Mexico's failure to make water deliveries has more to do with politics than lack of water.
What they've learned could prove them correct.
Political realities

Terrazas said that Mexican irrigation districts shifted from government to user control in 1992. That has had a role in developing a water conservation movement in Chihuahua, with the state now investing in hydroponic projects and promising farmers assistance for drip irrigation installation.
But it also may have changed patterns of reservoir control; it was in 1992 that Mexico first began to accumulate a deficit under the treaty.
"You can see the way the Delicias district is laid out. Even if they were to make releases, does the federal government still have enough control to get the water past the irrigation district?" Kelly asked.
Farmer Arturo Grife agreed Mexican growers became more vigilant regarding water use after irrigation district administration changed, with farmers keeping a tighter grip on their water.
"Like everything, when the government controls it, it never functions well, because the government has no direct interest," he said. "Anything that's privately owned will be managed better out of self-interest."
Along with that shift came the drastic year of 1995, when lack of rainfall forced the Delicias district to shut down completely, Terrazas said.
Wells said that year is striking in the satellite photography.
"In 1995, the entire irrigation project failed," he said. "I have never seen an irrigation district that large in the Western Hemisphere collapse."
Though rainfall levels returned to almost normal in 1996 and 1997, that dry year has left an indelible mark on farmers in Delicias, who trace all their water conservation efforts back to that time period.
"In terms of how they manage that irrigation project, I think '95 had a really big influence," Wells said. "They're willing to do everything except revisit 1995 again."
Kelly maintains the district over-irrigated in 1996 and 1997 to capitalize on the fortuitous rainfall. That, combined with low rainfall again in 2000 and 2001 most likely depleted much of the water that should have gone to the Rio Grande Valley, she and other observers say.
But even more disturbing to U.S. farmers are Chihuahua's plans for further water development.
Plans by state officials to tap even more water out of Luis L. Leon with a pipeline surfaced last winter. And a vision of Delicias as the alfalfa-cultivating backbone of the ample dairy industry in Chihuahua and Torreon may be problematic for a desert region, Kelly said.
"The shift away from corn and sorghum to alfalfa in Delicias, part of which has to do with the North American Free Trade Agreement, is quite scary," she said. Because of cheap U.S. and Canadian crop imports, "farmers have shifted to what they view as a higher value crop."
"They envision that the way they're going to maintain themselves is a focus on dairy and alfalfa," Kelly said. "And that's a bad thing for the river and their ability to meet treaty obligations in the future."
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"What would we be doing (in Mexico's shoes)? We'd be asking for some reasonable discussion."
Mary Kelly, director of the Texas Center for Policy Studies in Austin, on Mexico's water debt to the united states.
"The shift away from corn and sorghum to alfalfa ... is quite scary."
Mary Kelly
on Chihuahua farmers' shift
to thirstier crops.

Caption: A fishing boat sits in the gravel surrounding the Francisco I. Madero Reservoir near Camargo, Chihuahua. The lake has sunk to an all-time low.
Felipe Lopez sprays an irrigated alfalfa field with pesticides in the heat of the day in Chihuahua.
Burros roam the desertlike lake bed at the Luis L. Leon Reservoir. The state of Chihuahua has been experiencing drought. Residents say the weather in May usually is cool, but not this time around.
Felipe San Miguel trims away dry leaves from a tomato plant in a sun-baked field where drip irrigation is being used in Delicias, Mexico.
Gil Ronquillo shows off a type of small cherry tomatoes grown in a nursery that uses very little water in Delicias.
Ureil Falconi, manager of Rancho El Chueco, oversees workers in a tomato field where drip irrigation is being used. The drip irrigation concept conserves water.

Making do with little
Like other Valley farmers, Joe Aguilar is going through the motions so he can collect crop insurance.

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LA JOYA - From 3,000 acres of lusty green shoots, hundreds of acres of Joe Aguilar's fields have been reduced to what looks like a bad case of mange.

Friday's storms dropped almost an inch of rain, bringing some relief. But water has been so scarce in the Lower Rio Grande Valley that last year, Aguilar cut back what traditionally have been onion fields to only 400 acres of irrigated corn and sorghum, which require less water.

Still, to collect on the insurance for a ruined crop, he must continue to seed his acreage, whether or not it's irrigated. Many of his thinning fields look like those of neighboring farmers.

"Some spots were moist, and some weren't, and that's why it's very patchy," Aguilar said. "With the insurance, you have to go through the motions."

He and about 1,500 other Rio Grande Valley farmers have been going through the motions for a decade now, as they've toughed out a drought exacerbated by a water debt of 1.5 million acre-feet owed the United States by Mexico under an international treaty.

Aguilar, whose father was a farmer, says his operation has been breaking even. He has used well water to supplement dwindling releases from the Rio Grande. The situation is one that his father, who's 80, doesn't understand.

"He never went through this," said Aguilar, 48. "All they needed to do back then was pay their water and electricity and turn on the pumps."

Aguilar has rights to Rio Grande water for his crops, but levels in both Falcon and Amistad reservoirs that are approaching record lows have practically voided those rights.

"It's like having an account in the bank, and the bank runs out of money," he said. "Then, it doesn't matter how many checkbooks you have."

Recently, Aguilar watched a single worker flood-irrigate his sorghum. He hopes he'll have enough water for two irrigations this year. Aguilar used to have eight to 10 full-time workers, and during the harvest, his fields bustled with 500 to 600 employees.

"We would have a vehicle that came in here selling snow cones and candies," he said.

Now, he has four full-time employees and adds another to drive a harvester when it comes time to reap.

Down by the Rio Grande, Aguilar's pump sucks up 1,200 gallons of water a minute. After almost two straight days of irrigating, he will have received enough water to cover about 13 acres with one foot of water though he uses it frugally.

"When it's real dry like this, we kind of slick the water off," he said. "We push it along the field, because we don't want it to soak in. We stretch it out."

On the southern bank, a Tamaulipas, Mexico, farmer's pump hums.

"I don't know if they're pumping legally or not," Aguilar said. "They're having the same problem we're having - they're not getting any water."

Even as the creditors close in, Aguilar, who has three children around college age, said he doesn't blame Chihuahuan farmers for his problems. He's more upset with the loss of a U.S. market for vegetables, which have flooded across the border from Mexico for the past five years, he said.

Proposed U.S. government funding for conservation projects for Valley farmers won't matter without a market for the region's main crop, he said.

"If the government gives us money for water, but we have no market, we can't sell," Aguilar said. "If we had a market, the government could forget about us. We'd be doing real good."

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"It's like having an account in the bank, and the bank runs out of money."
Joe Aguilar
Valley farmer, on water rights practically voided by dwindling Supplies.

Caption: Farmer Joe Aguilar stands in a field planted with cotton near Palmview. The cotton plant in the foreground should stand at least 2 feet high, but the seedling is unusually short this year because of a lack of water.

Mexican fields are dry, too
But some farmers succeed with new techniques and smarter crop choices.

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DELICIAS - If Arturo Grife's 297 acres of crops are lustrous and thick, it's because he's learned to stretch his waning supply of well water.

When the drought struck in all its severity several years ago, Grife invested in a drip irrigation system. He began planting crops that use less water, like oregano; and seeding winter crops, like garlic, to take advantage of two growing seasons.

Nonetheless, he has seen levels of his two wells drop by 36 to 40 feet.

"Last year was horrendous, because it barely rained, and this year, it hasn't rained," Grife said. "Wells thrive on the water below the surface, the groundwater, and that has to be replenished with rain."

While U.S. farmers accuse Mexico of hoarding 1.5 million acre-feet of water due the United States under an international treaty, farmers in Chihuahua's verdant Delicias Valley say they have been wrestling with drought conditions for a decade.

The valley's irrigation district, which receives water from the Rio Conchos stored in two reservoirs, La Boquilla and Francisco I. Madero, encompassed more than 316,000 acres at its height in 1987, making it Chihuahua's largest.

But that doesn't account for hundreds of farmers outside the irrigation district such as Grife who use well water. Some farmers within the irrigation district similarly supplement reservoir releases.

Grife, 54, who studied agronomy and took over the family farm five years ago, continues to cultivate alfalfa, a water-intensive crop that Chihuahua's dairy industry uses as forage for its cows. But to offset that water use, he uses water conservation techniques, such as seeding his tomatoes in greenhouses and transplanting them.

Modernization of his farming operation has been its salvation.

"If we had continued to operate as we did five years ago, we would have had to reduce our cultivated lands by half to survive," he said.

Grife is one of a handful of Delicias farmers using cutting-edge techniques, such as drip irrigation. Instead of flooding furrows between crop rows with water, as his father did, Grife has installed tubes and a pressurized pump that deliver droplets of water and fertilizer to the crop roots.

But most Mexican farmers don't have the money to invest in drip irrigation, he said. And the drought has hit the irrigation districts especially hard.

"If there were any less water, it would provoke an uprising. There's been a lot of unemployment," Grife said as he watched a handful of his 150 harvesters cut garlic.

His wife, Elsa Laura Grife, also helps out during the harvest.

Accusations by U.S. farmers, that Mexico has flooded their crop markets, fly both ways. Grife said he sells his alfalfa, oregano and tomatoes in Mexico, while half of his garlic is sold in the United States.

But he said he would welcome a blockade of international bridges by U.S. farmers, as some have proposed. The high cost of fertilizer, fuel and electricity in Mexico makes it difficult for farmers to compete with cheaper U.S. crop imports that appeared with the North American Free Trade Agreement in 1994.

"I'd be ecstatic at a blockade, because it would keep their products out of Mexico," Grife said.

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