



FREQUENTLY ASKED QUESTIONS

PULSE FLOW

What is a pulse flow?

Think of it as a surge of water. It's what happens when there's a big rainfall or the snow melts into a river. The flow increases for a few days or weeks, and then goes back to normal. Rather than due to the natural weather cycle, this environmental demonstration will rely on river management actions by the U.S./Mexico International Boundary and Water Commission, the U.S. Bureau of Reclamation, and the National Water Commission (CONAGUA) in Mexico.

In late March, water from the Colorado River will be delivered to Morelos Dam at the U.S.-Mexico border and released into the riverbed, where water hasn't flowed regularly since 1960. The pulse flow will mimic the natural spring floods — although at a much smaller scale — that once nourished wildlife habitat in the delta and helped local communities to prosper.

Why is it important to introduce water to the riverbed in this way?

Releasing water this way will mimic the kind of natural pulse flows that help keep rivers healthy by spreading native plant seeds and creating conditions for those seedlings to grow and thrive. The goal is to reintroduce water into the delta, and begin to restore key parts of its ecosystem.

Why do a pulse flow for the Colorado River?

We know from nearly two decades of research and pilot restoration projects that a little water can go a long way in bringing the Colorado River Delta back to life. Adding a relatively small amount of water — less than 1% of the Colorado River's annual flow — can help existing native trees to reproduce. It can also help seedlings we've planted take root and spread seeds from native vegetation on a much larger scale. It's an important first step in restoring 2,300 acres of forest and marsh along a 70-mile stretch of river. That same water can help restore lands that are culturally and economically important to the tribes and communities that live along the Colorado River.

In addition to restoring the river and its affected lands, the pulse flow demonstration will also help inform better, long-term solutions for river restoration and water management. The pulse flow demonstration will have a significant monitoring component — involving scientists and experts from both countries — to determine the environmental benefits of the pulse.

Both the United States and Mexico believe that this pulse flow is a valuable undertaking to enhance the knowledge about the ecological health and the potential for improvement of the environment along the 23 miles of Colorado River where it forms the border between the US and Mexico as well as along the 70 river miles it flows downstream in Mexico.

What are the mechanics of the pulse flow?

The river corridor is bound by levees. Inside those levees, the river is formed by a channel, and then a series of terraces that increase in elevation as you move away from the river. The pulse flow is designed to inundate the lowest terraces. In some places, there is already standing water. But for 25 miles, the riverbed is dry. Perhaps the most dramatic scene will be where the pulse transforms this reach of sandy, barren desert into a flowing river. After several days of high flows, the water will begin to recede, rapidly at first and then more slowly for several weeks.

Starting on March 23, 2014, a total of 105,392 acre-feet (130 million cubic meters) will flow through the Morelos Dam. Water levels will rise, and the current will move quickly for several days, before coming down to a slower rate for up to 8 weeks. It will imitate, at a much smaller scale, the natural spring floods that once nourished wildlife habitat in the delta and helped local communities to prosper.

How much is 105,000 acre-feet. Can you put that into perspective?

One acre-foot of water is the same as 90 yards of a football field covered one foot deep. Put another way, 105,000 acre-feet is about 34 billion gallons of water. That amount is less than 1 percent of the Colorado River's average annual flow.

What's wrong with the delta?

The Colorado River Delta used to stretch over 2 million acres, with vast wetlands, forests and waterways extending from the southernmost point of the Arizona-California border to the Gulf of California in Mexico. As a growing population in both the United States and Mexico dammed and diverted the Colorado River over time, however, water flows dwindled and the delta dried up. Today the Colorado River rarely reaches the sea.

What challenges will affect the success of the pulse flow?

Groundwater, vegetation, climate and land conditions are quite different from the last time water regularly flowed in this region, around 50 years ago. Despite the existing scientific knowledge, it is difficult to precisely predict the environmental effects of the pulse flow. That's why it's so important that we monitor and learn from this experience so we can answer those questions in the future.

How has the natural habitat in this region been affected by the lack of river flows?

While there are still pockets of native habitat in the Delta that support fish and wildlife, much of the Delta's once vast stretches of riparian and wetland areas have disappeared or been taken over by exotic species, such as salt cedar, that do not provide good habitat for most of the species of birds that use the Delta year-round or as a migration stop on the Pacific Flyway. Marine life in the Gulf of California, including fish and shrimp, has also declined.

How has the dry delta affected the people who live along the Colorado River?

Not only have plants, animals and marine life been hard hit, but also residents of the Delta, people including the Cocopah and Cucapa — who have lived on the land for thousands of years — have been deprived of the landscape and river they used to hunt and fish. These activities are central to their communities, not just for sustenance but to honor their cultural identity, as well.

Restoring 2,300 acres of forest and marsh along a 70-mile stretch of river, can generate rural economic activities and job opportunities for local people, including river restoration, tourism, recreational hunting, and sport and commercial fisheries.

How will the pulse flow help?

The pulse flow will help establish healthy, self-sustaining cottonwood and willow trees at key restoration sites in the delta. These sites can in turn, help increase the populations of local and migratory birds, many of which are endangered or threatened. If the pulse flow is successful, it might lead to similar events in the future, which could also generate rural economic activities and job opportunities for local people including river restoration tourism and commercial fisheries.

On a larger scale, this project shows how governments and stakeholders with diverse interests can come together to manage the river for people and nature in the face of drought. If it can be done across international borders, then surely we can do it in the rest of the Colorado River Basin and other places in the world!

Will the pulse flow reconnect the Colorado River to the sea?

The pulse flow may temporarily link the Colorado River to the Gulf of California, but not permanently — that is our long-term goal.

Who makes up the team of binational scientists? How were they chosen?

The United States and Mexico worked with NGOs in 2013 to convene scientists and experts from both countries, some with career-long experience working in the delta, and others who are known as leaders in the fields of hydrology, geomorphology, and riparian ecology. These scientists recommended the design for the pulse flow (the timing and volume for how the water should be released), and devised a plan to monitor the impact of the pulse flow. The United States and Mexico are funding implementation of the monitoring plan, which will be carried out by federal agencies, universities, and NGOs.

Where is water for the pulse flow coming from?

The water comes from a joint effort and investments for conservation projects by the governments of the United States and Mexico as specified in a 2012 water-sharing agreement between the United States and Mexico. That agreement — known as Minute 319 — provides benefits for water-users on both sides of the border, as well as for the environment

Why is the pulse flow being done now?

The pulse flow is an important component of Minute 319 — a component that both countries agreed to implement in 2014. Both countries are committed to honoring their Minute 319 obligations. Undertaking the pulse flow at this time will allow both governments to obtain the necessary information to make progress towards a long-term comprehensive agreement, in accordance with Minute 319.

Additionally, scientific experts from both countries have determined that this is the best time of the year to provide water to promote germination of native plants and to avoid germinating invasive salt cedar.

Will there be future pulse flows?

This will be the only pulse flow event during the current agreement. However, we hope this effort will encourage the governments and stakeholders to explore options for future joint cooperative actions to create water for the environment.

DROUGHT

Hasn't the Colorado River Basin been in drought for more than a decade?

The Colorado River Basin has been in drought for 14 years.

The Colorado River storage system is about 50 percent capacity, or 2 years worth of the River's average yield. This is an enormous reserve, even under the extended drought conditions that the Basin has been in since 2000. The U.S. Bureau of Reclamation's most recent 24-month study shows a *zero* probability that Lake Mead's water will drop to a level that would trigger shortages to U.S. or Mexican users during either 2014 or 2015.

Where is water in the Colorado River coming from?

The Colorado River is sustained primarily by snowpack in the Rocky Mountains in Colorado and Wyoming. At present, snowpack conditions in the Colorado River Basin are quite favorable, particularly in comparison to recent years. This winter the snowpack has so far been 100 percent of normal or better in nearly all of the areas of the Basin that yield most of the Colorado River Basin runoff.

While these conditions could change over the next month, the Basin is on track to have a reasonably good runoff year, which will increase storage levels in Lake Powell and other Colorado River Basin reservoirs and would further reduce the probability of near-term shortage conditions in the Basin.

How does California source its water?

California draws from five primary sources of water: (1) water transported throughout the state from Northern California via the Central Valley Project and State Water Project, (2) water transported from the eastern side of the Sierras via the Los Angeles Aqueduct, (3) local groundwater and drainage basin in the greater Los Angeles area (which drain to the Pacific), (4) groundwater in the Central Valley and (5) water transported from the Colorado River via the Colorado River Aqueduct.

The massive State Water Project and Central Valley Project gather and transport water from major rivers in northern California that naturally flow into the Sacramento Bay-Delta (near the top of the Central Valley), as well as smaller rivers that naturally drain into California's Central Valley. All of the rivers that supply the State Water Project and Central Valley Project have their source in the Sierra Nevada mountain range (with drainage basins that terminate in inland water bodies or at the Pacific Ocean). Snowpack in the Sierra has been extremely low this year, contributing to serious limitations on this supply source.

How is water diverted from the Colorado River to California?

Water from the Colorado River is diverted to California via the Colorado River Aqueduct, which transports water from Parker Dam over the mountains to the Southern California cities and through the All American Canal, which provides irrigation water to the Imperial Valley and other nearby irrigation areas. There are also some diversions from the river to nearby irrigation projects.

What about communities in California that are really struggling for water right now?

Most of the California communities that are really being hit hard by drought are not dependent on Colorado River water. In southern California, which does receive water from the Colorado River, they are getting their full allocation of Colorado River water.

MINUTE 319

What is Minute 319 and what does it include?

Minute 319 is a binational agreement between the governments of the United States and Mexico that arises under the authority of the 1944 Water Treaty between the two countries. Put simply, Minute 319 allows the United States and Mexico to share Colorado River surplus water in times of plenty, and reduced water deliveries shortages in times of drought. Minute 319 also lays the foundation for environmental restoration of the Colorado River Delta.

Minute 319 also includes:

- Extending measures from a 2010 agreement, Minute 318, to allow Mexico to defer delivery and store a portion of its Colorado River allotment in US reservoirs;
- Establishing proactive basin operations through the binational sharing of benefits of water that may be available temporarily through high Lake Mead reservoir conditions and also reducing water delivery to users in the US and Mexico when reservoir conditions are low in order to reduce the risk of more severe reductions in the future;
- Establishing a program of Intentionally Created Mexican Allocation (ICMA) whereby Mexican water resulting from conservation projects or new water sources projects could be stored in the United States for delivery to Mexico in the future; and
- Implementing an important pilot exchange program under which U.S. entities assist in funding joint investment in water infrastructure and environmental projects in Mexico. These investments provide water benefits to the U.S. agencies in exchange for their funding and generate water for Mexico over the long term.

- Implementing measures to address salinity impacts stemming from the joint cooperative actions.
- Commitment to pursue additional opportunities for joint cooperative projects in the areas of environmental restoration, water conservation, new water sources, and system operations.

What are the benefits of Minute 319?

Minute 319 is particularly important for water management and delta restoration because it hinges on a ‘partnership principle.’ It allows the United States and Mexico to share in good years and dry years, encourages both countries to invest in water conservation, outlines an environmental program to better manage existing resources, and better manage unpredictable water availability in the future.

How long does Minute 319 last?

Minute 319 will expire on December 31, 2017. One of our major goals is to see the US and Mexico adopt a successor agreement that extends key terms of Minute 319, including commitments to support flows for the Colorado River delta into the future. In addition, we would like to see more agreements like Minute 319 used in river management in the Colorado River basin and elsewhere, because it’s a model for responsible water sharing and conservation.

RAISE THE RIVER

What is Raise The River?

If there’s one thing we’ve learned, it’s that we can go farther and do more when we do it together. Raise The River is a unique partnership of six U.S. and Mexican non-governmental organizations committed to restoring the Colorado River Delta. The Raise The River partners are: [Environmental Defense Fund](#), The [National Fish and Wildlife Foundation](#), [The Redford Center](#), [The Nature Conservancy](#), [The Sonoran Institute](#), and [Pronatura Noroeste](#). Some of us have worked together for nearly two decades, conducting scientific studies on the Delta, using private funds to bring small amounts of water to the Delta, and involving local communities in pilot restoration projects.

In 2012, we hit a milestone with Minute 319. Raise The River will match each country’s commitment to provide water for the Colorado River Delta, and will use water acquired through the Colorado River Delta Water Trust to implement habitat restoration on a larger scale. Raise The River’s goals include raising funds to support 2300 acres of habitat restoration and supporting the Trust’s acquisition of water rights from willing sellers in the Mexicali Valley to provide the water needed to sustain restoration sites.

What are Raise The River's long-term goals?

Our current goal is to raise \$10 million by 2017. The money will be used to conduct essential restoration work, such as removing non-native invasive species, planting native trees and vegetation and acquiring water rights dedicated to environmental restoration in the Delta. In meeting our goal, we will rebuild the habitats that support local communities and wildlife.

How can members of the public get involved?

By raising awareness, money and, ultimately, the water level of the river, we will restore the wetlands and reconnect the river with the Gulf. The Delta is the most broken reach of the Colorado River. If we can fix the Delta, we can demonstrate that no place is beyond hope. Join us in rewriting history. Every dollar counts. You can get involved by joining in our efforts. Visit our [website](#) to learn more, or help us [meet our fundraising goal](#). Check us out on [Facebook](#) and [Twitter](#), and become a part of the solution.