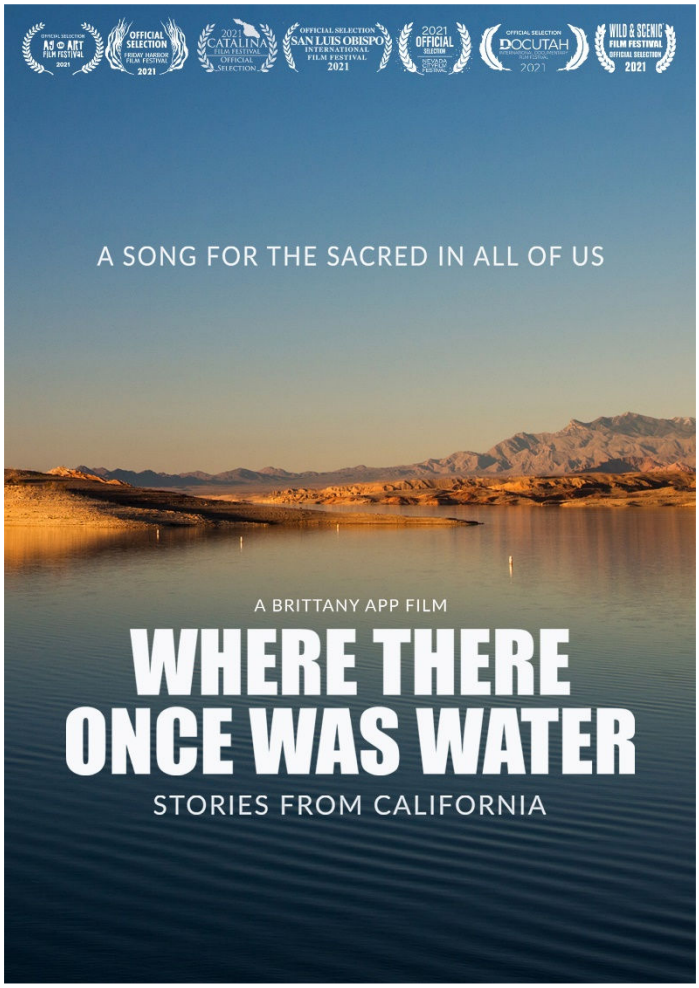
WHERE THERE ONCE WAS WATER



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Where There Once Was Water

This is a story about water. A song for the sacred in all of us. A documentary centered on solutions. This is a look at the driest of places - California and the Southwest - and the deepest of spaces - our inner worlds and the stories we choose to tell. We are invited to change our perspective, to rewrite our stories, and ultimately, to heal our broken relationships with the natural world.

Where land is desert, and water is scarce, we find hope and resilience in Navajo Nation. Where statewide infrastructure is failing, we find innovation and conservation. Where salmon and beavers are reintroduced into streams, we find restored ecosystems. With reforestation, we find healthier watersheds. In cities, we find urban farmers, healing soil and building community, in conversation with mother earth. Where cattle are managed holistically on grassland, we find cleaner groundwater and healthier springs. Instead of vineyards depleting aquifers, we find biodiversity, responsibility, and hope. Where traditional agriculture has sucked wells dry, we choose a new way forward. And in our own kitchens, we find we have great power, and great choice… to use less, waste less, and ask questions. To choose the water story we tell, one meal at a time.

The choice point has arrived. The old story will bring scarcity. But a new story, one that we can write together, may indeed lead us to abundance and water for all. Only through personal relationship with the sacred can we truly begin to heal. Water is life. Water is love. What can you do, in your life, to be a voice for the water?

California and the Southwestern United States

There are varying opinions on what comprises the southwestern United States, however many people believe that it includes the states of New Mexico and Arizona, and parts of Colorado, Utah, Nevada, Texas, and Oklahoma. According to the United States Census Bureau, since 1950, the population of the southwestern United States has been growing more quickly than the rest of the country.

Some people include California as a southwestern state, while others call it a western state. California has a population of more than 39 million people and is the most populous U.S. state. In 1970, the population only about 20 million people, meaning that California's population is approximately twice what it was fifty years ago. By 2050, the population of California is predicted to reach 45 million.

The Navajo Nation is a Native American territory that includes parts of Utah, Arizona, and New Mexico. It is the largest reservation in the United States, at about 27,000 square miles. In order to enroll as part of the Navajo Nation, a person must show that they are at least one-quarter Navajo. In 2020, enrollment in the Navajo Nation reached almost 400,000. Not all Navajos live on the reservation. According to the Navajo Water Project, 30 percent of Navajo Nation families do not have running water.

The Colorado River

The Colorado River is a major river in the Southwestern United States. It begins in the Rocky Mountains in Colorado and flows 1,450 miles, ending at the Gulf of California in Mexico. The river provides water to seven U.S. states—Colorado, New Mexico, Utah, Wyoming, Arizona, California, and Nevada—and Mexico.

In 1922, those seven states negotiated the Colorado River Compact, an agreement on the amount of water that each state can use. At the time the agreement was made, the river was estimated to have an annual flow of 15 million acre feet per year. Under the agreement, the upper basin states—Colorado, New Mexico, Utah, and Wyoming—get half of that (7.5 million acre feet), and the lower basin states—Arizona, California and Nevada—get the other half (7.5. million acre feet). It was later discovered that the average flow of the river is actually lower than originally estimated. In addition, under a later agreement, Mexico was also given a share of the river water (1.5 million acre feet). The 1922 agreement states that the upper basin states must deliver the 7.5 million acre feet to the lower states before they can take their share, meaning that the upper basin states could potentially not have enough water to meet their own needs if flow drops significantly.

Water from the Colorado River is also stored in Lake Mead and Lake Powell, which are giant reservoirs. There is an agreement about water rights related to those reservoirs, where some water rights will be reduced if levels in the reservoirs get below certain thresholds.

Groundwater

Groundwater is water that is stored in the earth. It is stored in layers of rock or sediment known as aquifers. These layers make up a groundwater basin. Groundwater can naturally come back up out of the ground in wetlands or springs. People can also access it by digging wells that reach down into the aquifer. In dry years, people tend to take more groundwater to make up for shortages elsewhere. For instance, according to the California Department of Water Resources, groundwater makes up about 38 percent of the state's water supply in an average year, and 46 percent in a dry year.

When people consistently take more groundwater than is naturally replenished, the elevation of the groundwater drops. This can cause some wells to run dry, and deeper wells must be dug in order to get to the water. Using too much ground water can also cause the ground to slowly sink, which is called subsidence. This has happened in the Central Valley of California, as farmers have used more groundwater than is replenished. A new law is aimed at stopping this. The Sustainable Groundwater Management Act states that withdrawals from the aquifer cannot be greater than the rate at which it is being replenished.

California Agriculture

California is an important agricultural area that produces a large quantity of nuts, fruits and vegetables. According to the California Department of Water Resources, it is one of the most productive agricultural areas anywhere in the world. The agency says, "California is the only producer of 13 commodities and is a top producer of more than 74 different commodities in the U.S. The state exports a huge quantity of agricultural products, bringing more than $20 billion into California's economy." According to the California Department of Food and Agriculture, more than two thirds of all the fruits and nuts grown in the United States, and more than a third of the vegetables, are grown in California. However, the Department of Water Resources stresses that all this agriculture takes a large amount of water. It says, "In an average year, approximately 9.6 million acres are irrigated with roughly 34 million acre-feet of water; an amount that would cover 31 million football fields with 1 foot of water."

Much of California's agricultural production takes place in the Central Valley. The Central Valley comprises approximately 20,000 square miles. According to the United States Geological Survey (USGS), it contains three-quarters of California's irrigated land. Much of the irrigation water comes from above-ground sources, however a significant amount of groundwater is also used to irrigate Central Valley crops. USGS states that the Central Valley has the second-most pumped aquifer system in the United States.

Where California Gets Its Water

The California Department of Water Resources explains that three-quarters of California's water falls as rain and snow in the watersheds in the northern part of the state. However, it says that the lower two-thirds of the state needs 80 percent of the state's overall water. The agency explains that as a result of this imbalance, California imports water from the Colorado River, and has also created extensive water transport systems; the Central Valley Project and the State Water Project.

The Central Valley Project was completed in the 1930s. It transports water from Lake Shasta, which is in northern California, to Bakersfield, which is in the southern Joaquin Valley. According to the Water Education Foundation, it includes 18 dams and reservoirs, 11 power plants, and 3 fish hatcheries.

The State Water Project was built in the 1960s and 1970s. It is a large system of dams, aqueducts, power plants, and reservoirs that supplies water to millions of people and thousands of acres of farmland. It includes the tallest water lift in the world—the Edmonston Pumping Plant—which pumps water up 1,926 feet.

The Public Policy Institute of California explains California's overall water use. It says that about half is environmental, which is defined as: "Water in rivers protected as 'wild and scenic' under federal and state laws, water required for maintaining habitat within streams, water that supports wetlands within wildlife preserves, and water needed to maintain water quality for

agricultural and urban use." Forty percent is used for agriculture, and the rest—ten percent—is for urban uses.

Drought in California and the Southwest

As a result of low precipitation and high temperatures, much of the southwestern United States and California is classified as in a drought, and has been for many years. According to the National Integrated Drought Information System, all of California is in a drought, much of it classified as "severe" or "extreme." In April 2022, it reported that 2022 had been California's driest year to date in the past 128 years. Overall, it reports that 88 percent of the western United States is in drought. According to the United States Environmental Protection Agency, many areas have been in drought conditions since the agency began monitoring them in 2000.

At the beginning of 2022, the National Integrated Drought Information System reported that major water storage reservoirs were extremely low; Lake Powell was at 27 percent of capacity and Lake Mead at 34 percent. In California, Lake Shasta was at 34 percent and Lake Oroville at 44 percent. The Climate Program Office reports on some of the negative effects of these low levels. It says, "The drought has led to unprecedented water shortages in western reservoirs threatening drinking, agricultural, and tribal water supplies; electricity supply generated from hydroelectric plants; and fishing and recreational activities."

Drought conditions have spurred numerous attempts to conserve water. For instance, in July 2021, California governor Gavin Newsom asked Californians to voluntarily reduce their water use by 15 percent. It is widely believed that drought will be a continuing problem in the southwestern United States and California in the future.

Access to Clean Water

Drought is not the only water-related problem in the United States. A significant number of people do not even have access to clean water for their basic, everyday needs. According to a 2019 report by Dig Deep and the U.S. Water Alliance, more than 2 million Americans do not have running water or basic indoor plumbing. The authors of the report explain that some people live in areas that do not have the necessary infrastructure to provide clean water, while others live in areas where the water supply has become contaminated. They give some specific examples: "On the Navajo Nation in the Southwest, families drive for hours to haul barrels of water to meet their basic needs. In the Central Valley of California, residents fill bottles at public taps, because their water at home is not safe to drink. In West Virginia, people drink from polluted streams. In Alabama, parents warn their children not to play outside because their yards are flooded with sewage. In Puerto Rico, wastewater regularly floods the streets of low-income neighborhoods. Families living in Texas border towns worry because there is no running water to fight fires." Native Americans, African Americans, Latinx, and people living in poverty are the most likely to face water issues.

Solutions

There are numerous potential solutions to water-related problems in the United States. Regenerative agriculture is one. This type of agriculture focuses on using practices that regenerate the land, such as controlling and rotating cattle grazing, and reducing reliance on synthetic chemicals. One of the key elements of regenerative agriculture is a focus on building healthy soil. The Savory Institute explains that unhealthy soil is linked to many water-related problems. It says, "For many years, large areas of grasslands around the world have been turning into barren deserts. This process, called desertification, is happening at an alarming rate around the world. Desertification creates large areas of exposed soil which dramatically decreases the effectiveness of rainfall. Water evaporates or runs off instead of soaking into the soil where it is available for plants and living organisms and recharges water tables. This change leads to the increasing frequency and severity of floods and droughts — even with no change in rainfall in a specific region." In contrast, when the soil is improved through regenerative agriculture, it is able to hold large amounts of water, and the chance of flood and drought is reduced.

Reforestation also help with water-related problems. Forests play a critical role in the water cycle. The National Forest Foundation states that they are actually the single biggest source of freshwater in the United States. It explains, "Forests capture, store, and filter water. High-elevation forests hold water as snow in the winter, releasing it gradually through the spring and summer in to downstream water supplies. Other forests funnel water into lakes, streams, and groundwater aquifers." Further, forests ensure that all that water is clean. The Foundation says, "Fallen needles, leaves, branches, logs on the forest floor absorb nutrients and sediment before they reach water. These processes have made water from forested watersheds of the highest quality in the nation. Conversely, when forests are degraded, nutrients and sediment flow into the stream, making the water unsafe for us to drink without additional treatment."

Individuals can also have a big impact on water issues by understanding where their water comes from, and how their water use affects their environment. By understanding how they use water, people everywhere can better conserve this valuable resource.

Additional Resources

Books

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- William DeBuys, *A Great Aridness: Climate Change and the Future of the American Southwest*. Oxford: Oxford University Press, 2013.
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- B. Lynn Ingram and Frances Malamud-Roam, *The West Without Water: What Past Floods, Droughts, and Other Climactic Clues Tell Us About Tomorrow*. Berkeley, CA: University of California Press, 2015.

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- Navajo Water Project, "About the Project." https://www.navajowaterproject.org/project-specifics
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- Run4Salmon 2021. http://run4salmon.org
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- United States Geological Survey, "California's Central Valley." https://ca.water.usgs.gov/projects/central-valley/about-central-valley.html
- United States Geological Survey, "Locate Your Watershed." https://water.usgs.gov/wsc/map_index.html
- USDA Natural Resources Conservation Service, "Soil Health." https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/soils/health/?cid=stelprdb1048783
- Water Education Foundation, "Colorado River." https://www.watereducation.org/aquapedia/colorado-river
- Wild Trout Trust, "Beavers Beneath the Surface." https://www.wildtrout.org/content/beavers-benefits-beneath-the-surface

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