

Opinions About **WATER POWER**

by Jack Bradbury, Holly Kissner, and Martin Delgado



Table of Contents

The Need for Dams	4
The Problem with Dams	14
Geothermal Solutions	24
Glossary	30
Index	32



4



14



24

The Need for DAMS

by **Jack Bradbury**

A dam is a barrier that keeps water from moving forward. Some dams occur naturally, when logs and other debris jam a stream. Others are built by beavers, to create habitats for food and shelter. However, many of Earth's dams have been constructed by humans. These dams are an excellent source of energy, or power.

Long ago, humans learned about the power of flowing water. They

set about harnessing that power with dams. Human-built dams have changed the course of rivers and helped communities grow and prosper. Today's dams are complex engineering marvels. They provide clean and renewable electricity, jobs, protection from flooding, and fresh water for people and agriculture. Dams improve the quality of life for millions around the world.





Early Dams

Humans have built dams since ancient times. The ancient Assyrians, Babylonians, and Persians were among the first to dam rivers. Nearly 3,000 years ago, these Middle Eastern civilizations built dams to supply people with water for drinking and farming. The dams forced water into canals and ditches that would irrigate fields of grain and other crops. Because these ancient cultures used dams to farm so effectively, their civilizations grew into great empires.

Other early civilizations saw the importance of building dams. Ancient Egyptians built dams along the Nile River in North Africa. The Nile frequently flooded and washed away entire villages. Dams helped keep the river from overflowing its banks. In prehistoric Mexico, the Maya built dams from piled rocks to irrigate fields and control flooding.

▲ This dam in western Spain was built nearly 2,000 years ago.

As time passed, dam engineering became more effective. Currently, dams perform a variety of functions. Many are used to generate power. Some create reservoirs, or artificial lakes, for recreation and water storage. Others keep rivers from seasonal flooding. In some places, dams protect the environment by stopping dangerous debris from flowing downstream.

Today, dams are important to the lives of many people. The water people drink may come from a reservoir created by a dam. The fruits and vegetables they eat may have been grown with water from the same reservoir. The electricity they use may have been generated at a dam. Without dams, life in many communities would be very different.

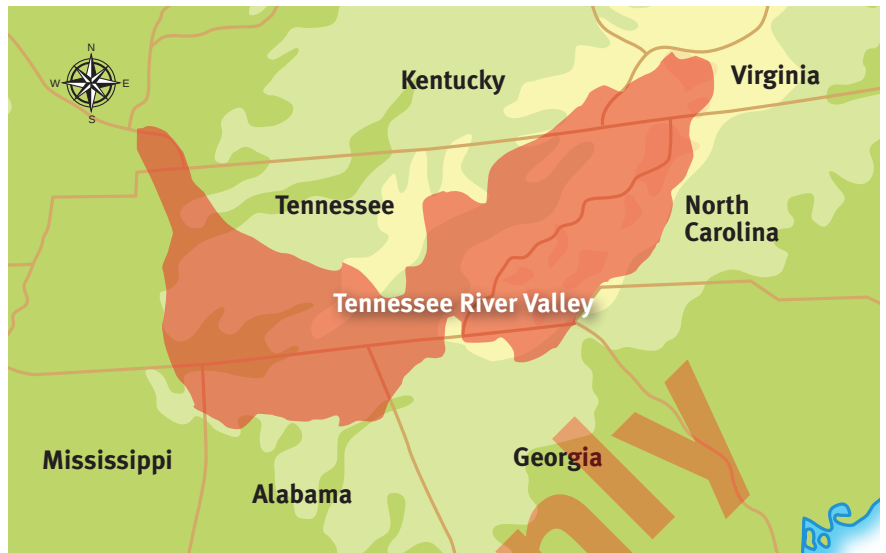
Helping People Prosper

One important river-damming project occurred in the United States in the 1930s, during the Great Depression. Millions of people were out of work. Many were homeless. President Franklin D. Roosevelt came up with a plan to create jobs. This plan was called the New Deal. Part of the New Deal included building dams on the Tennessee River.

At the time, the Tennessee River Valley was one of the poorest regions of the country. According to historian Robert A. Frederick, many families in the area survived on as little as \$100 a year. Roosevelt believed that building dams along the Tennessee River would bring factories and create jobs. The dams would also provide electricity and water to irrigate fields.

Roosevelt's plan worked. In a few short years, the dams in the Tennessee River Valley opened up new opportunities for thousands of people. The dams changed the lives of entire generations in the American Southeast.

Lorena Hickok▲



▲ The Tennessee River Valley includes parts of seven states.

>> FROM THE SOURCE

In 1933, journalist Lorena Hickok traveled to the Tennessee River Valley to report on the dam construction. In this passage from one of her letters, she praised what she saw.

"Ten thousand men are at work, building with timber and steel and concrete the New Deal's most magnificent project, creating an empire with potentialities so tremendous and so dazzling that they make one gasp.

There's a chance to create a new kind of industrial life, with decent wages, decent housing. Gosh, what possibilities!"



Types of DAMS

Dams come in many different shapes and sizes. Engineers classify each type of dam based on its function. Here are several:



Gravity dams: These giant dams are made from concrete or stone. They are designed to hold back large amounts of water. The weight of the dam resists the water pushing against it. Gravity dams are used for wide river valleys or narrow gorges.



Storage dams: Engineers design storage dams to store water when it rains. This water can then be used as a source of drinking water. Some storage dams provide a habitat for fish and other animals. They also store water for power or for irrigation.



Coffer dams: Cofferdams are temporary dams used to channel water away from a construction site. The dams are usually built upstream. Water is redirected into a tunnel that bypasses the construction site.



Detention dams: Detention dams are used for flood control. They reduce the flow of river water downstream by storing some of the extra water in a reservoir. Detention dams lessen the impact of sudden floods.



Diversion dams: These dams divert water from a river and move it off to a canal or ditch.



Debris dams: Workers build these dams to stop sand, gravel, and driftwood from flowing downstream.

Making a Desert Bloom

The American Southwest today is a great example of the benefits a dam provides. One of the world's greatest technological marvels of all time is the Hoover Dam. It lies just southeast of Las Vegas, Nevada, in a place called the Black Canyon.

Like the Tennessee River Valley dams, the Hoover Dam was built during the Great Depression. It was constructed mainly to prevent the



▲ Hoover Dam under construction, 1930s

Colorado River from flooding and to generate hydroelectric power—power created using the force of moving water. The dam is one of the largest human-made structures in the world.

The Hoover Dam transformed the region's landscape. Before the dam was built, most of the Southwest was a dry, harsh place filled with cacti and scorpions. Very few people lived there.

All that changed when workers completed the dam in 1936. The dam helped turn arid parts of California and Arizona “green.” Farmers from hundreds of miles away could now use Colorado River water to irrigate fields that would provide the United States with many of its fruits and vegetables. The dam also generated electricity that allowed cities to grow and prosper. People began moving to the Southwest.



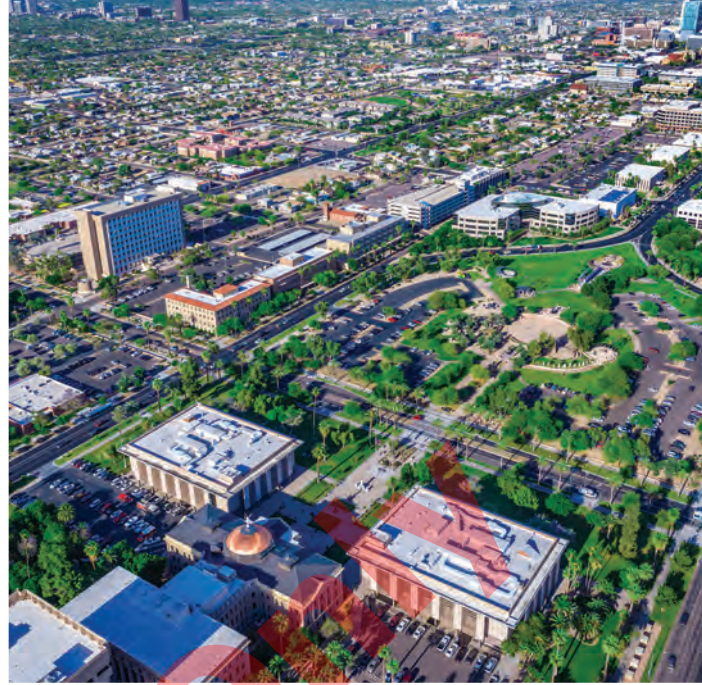
Hoover Dam



Today, in part because of the Hoover Dam, millions of people are able to call the American Southwest home.

The dam also influenced American life in other ways. In 1941, the United States entered World War II. Electricity generated by the dam provided factories with the power to build military planes and ships. These planes and ships helped win the war.

Today, the Hoover Dam irrigates two million acres of farmland in California and Arizona. It also provides water for the cities of Los Angeles, California; Las Vegas, Nevada; and Tucson and Phoenix, Arizona.



▲ Phoenix, Arizona, is green and fully powered because of the Hoover Dam.

Hoover Dam

by the Numbers

Completion Date: 1936

Cost: \$165 million

Type: Gravity dam

- At its base, Hoover Dam is as thick as two football fields.
- At 221 meters (726 feet) high, Hoover Dam is almost 61 meters (200 feet) taller than the Washington Monument in Washington, D.C.
- It took 3.4 million cubic meters (4.5 million cubic yards) of concrete to build Hoover Dam, roughly enough to build a 1.2-meter-wide (4-foot-wide) sidewalk around the equator.

Sources: PBS and History.com

