Reading Selection

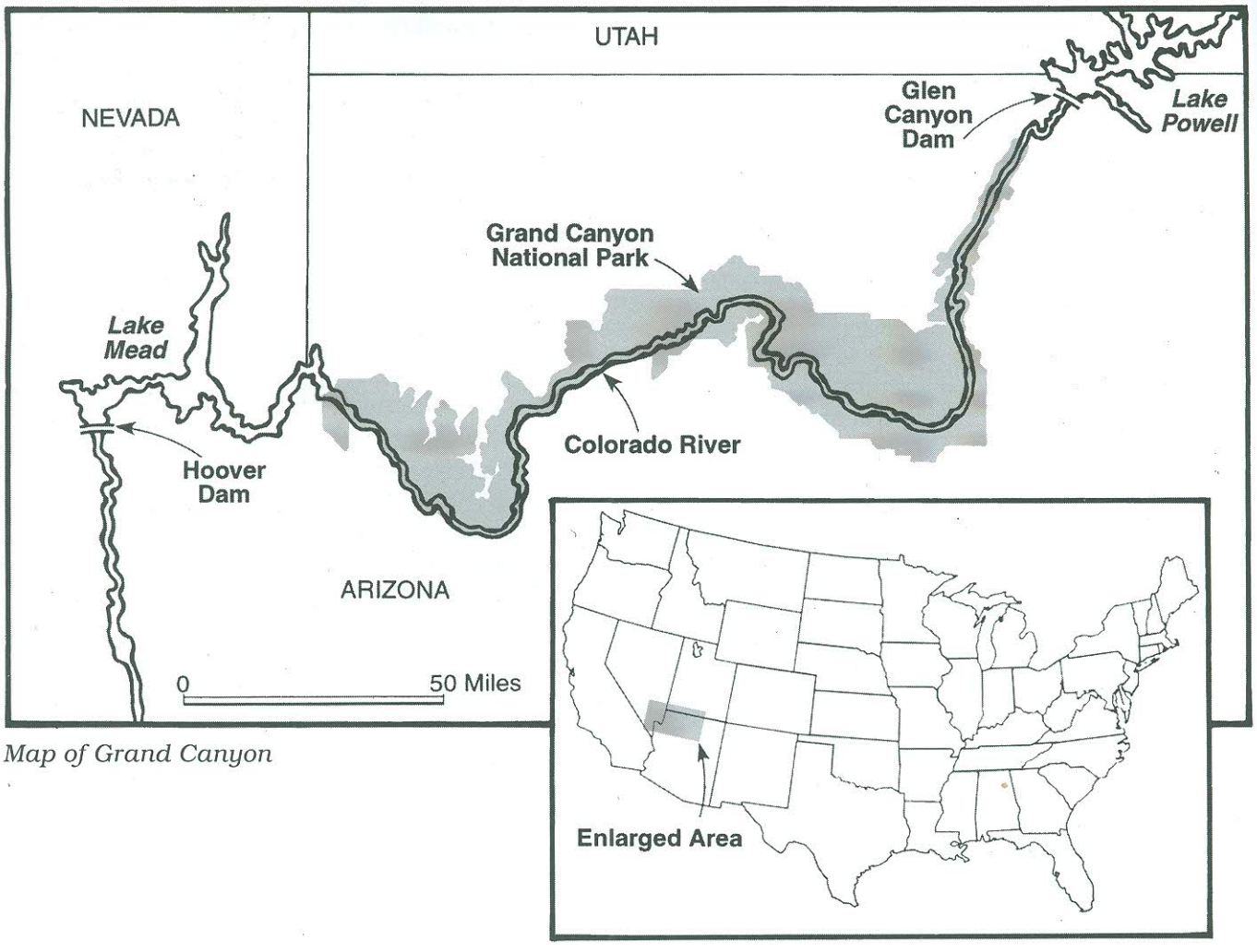
Releasing a River

It is March 26, 1996. A group of scientists stand at the base of the Glen Canyon Dam on the Colorado River. They are looking at the landscape shaped by the river. Earlier in the day, they canoed along the river observing its banks and the organisms—like ambersnails and the southwestern willow flycatcher—that live there.

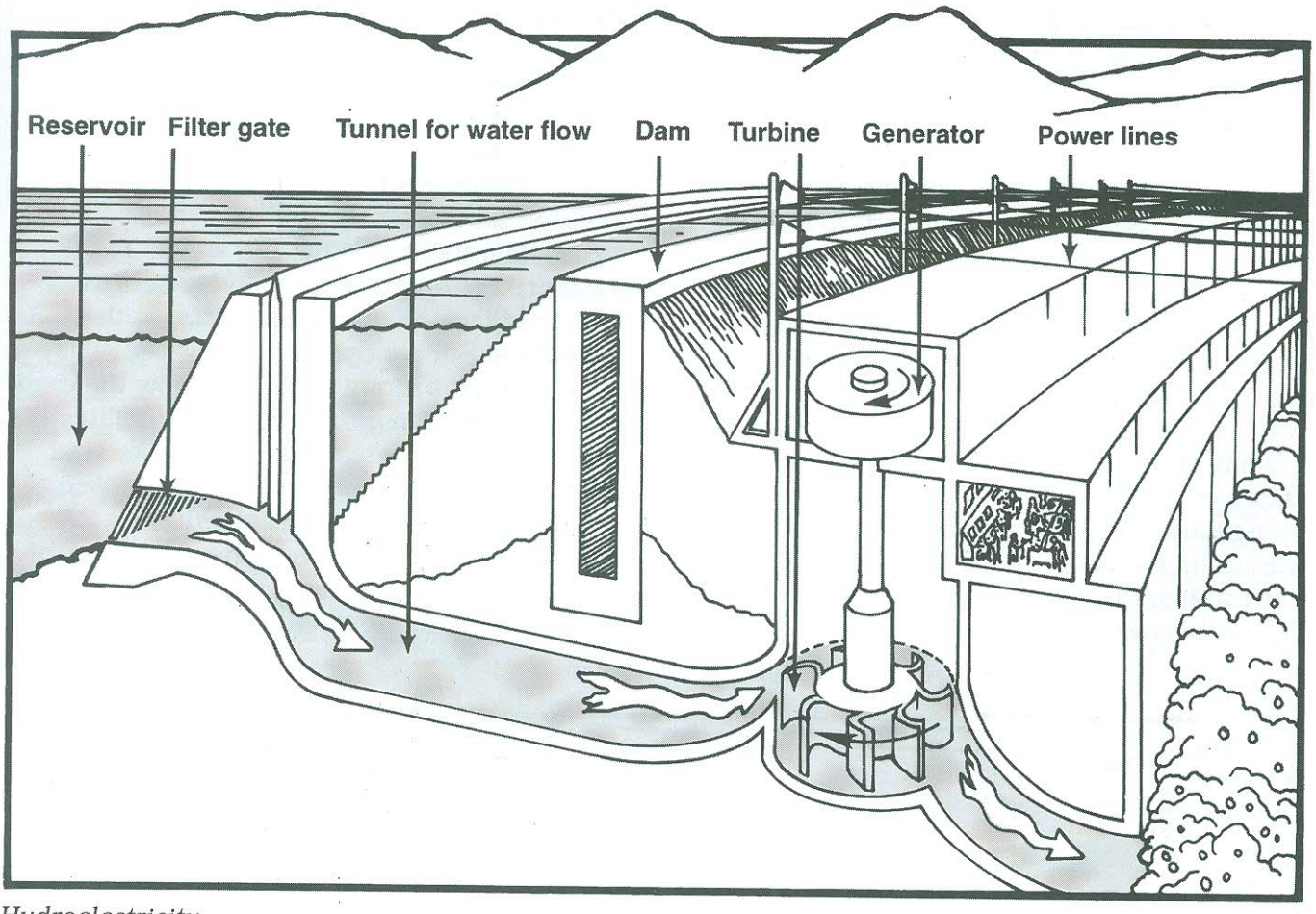
Millions of years ago, the Colorado River flowed across the Colorado Plateau. The land was high and flat then. Over the centuries, the Colorado River and its floods sculpted and shaped the land until a huge, deep canyon formed—the Grand Canyon.

A Lake Made by Humans

The scientists turn around to look at the massive concrete wall that holds back part of the Colorado River. Behind the dam is Lake Powell. It is the human-made lake, or **reservoir,** that formed when workers built the dam in 1963. Operators of the dam can control the flow of water that passes through the large pipes in the dam and into the canyon.



Map of Grand Canyon



Hydroelectricity

The water stored in the reservoir is used to make electricity. This **hydroelectricity** can provide power to homes and businesses. Just like a waterfall, water from the lake gushes through narrow openings inside the dam. The water hits the blades of **turbines,** or engines, and causes them to spin. These engines power the generators that make electricity.

Towns as far away as 250 miles receive water piped from reservoirs along the Colorado River. Towns can receive water from the reservoirs even during a drought. **Irrigation,** which brings water to farmland through drainage channels, provides farmers with water for growing crops.

People use the reservoir for recreation, too. Swimming, boating, and fishing are only a few of the fun things people enjoy doing on Lake Powell.

Swoosh! The Water Is Released

The dam was built to create electricity. But today, the scientists are going to open the dam. They will create a human-made spring flood.

Swoosh! The dam opens. A thunderous roar echoes through the canyon. More than 117 billion gallons of water blast out of the large tubes at the bottom of the dam. The scientists plan to leave the dam open for a week.

Why would anyone want to flood a canyon on purpose? Before 1963 when the dam was built, the river flooded every spring. The water eroded huge amounts of soil and deposited it along the river's banks. Beaches and sandbars formed when the floodwater pulled back. People on rafting or canoe trips could camp on the beaches. Fish could hide behind the sandbars in the warm, still water and lay their eggs. All along the river, the

ecosystem, or environment in which plants, animals, and their environment interact, depended on the floodwater.

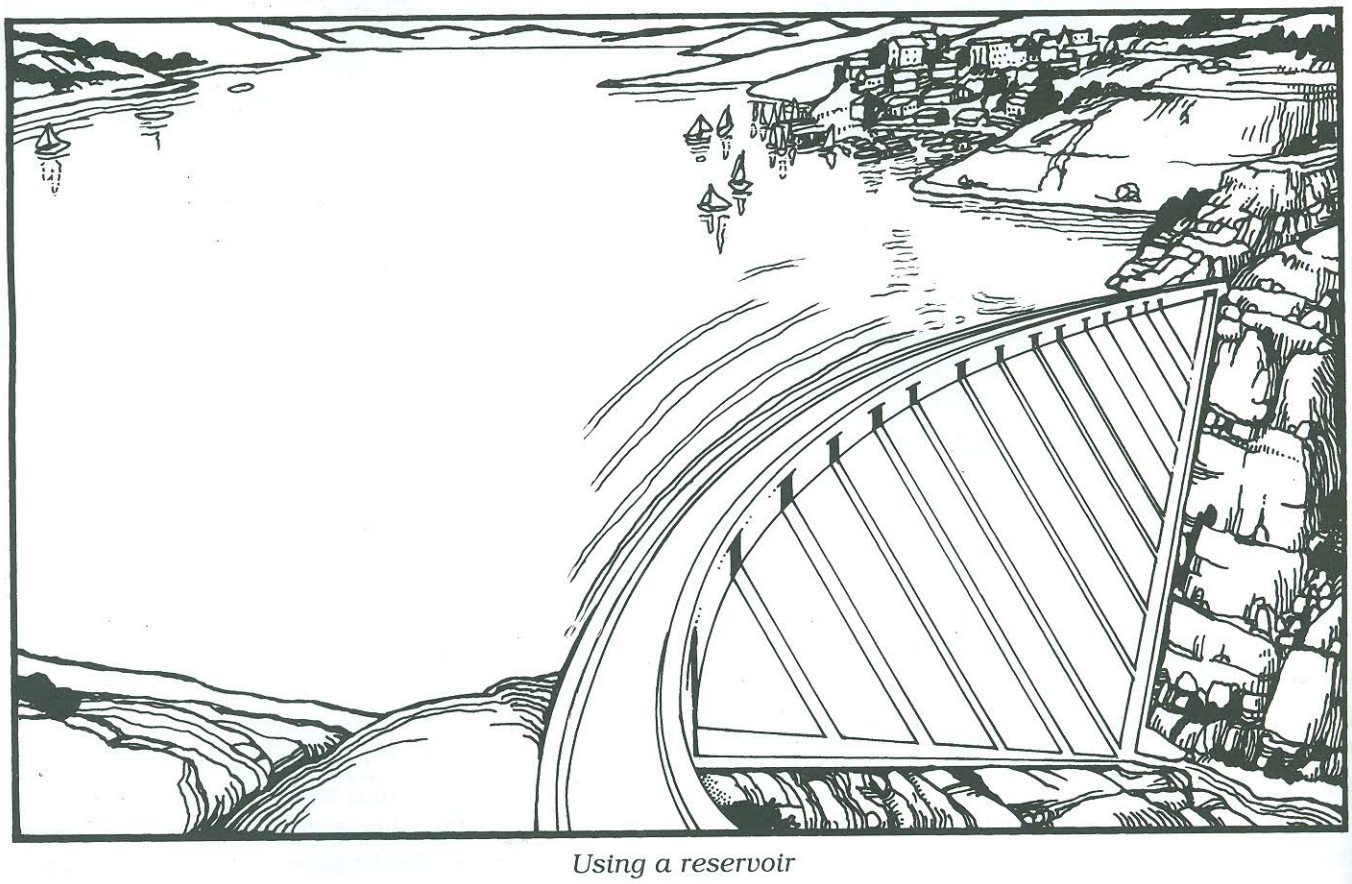
When scientists and engineers dammed the river, it no longer flooded each spring like it had for centuries. Across the country, scientists observed that dammed-up rivers were getting smaller. Trees sprouted in the middle of dry riverbeds. Some rivers, like the Colorado, no longer reached the sea. No wonder! Except during extremely high flood years, humans collect and use almost all the water in the entire Colorado River.

What were the scientists' goals for flooding the river? They wanted to restore the beaches along the river's banks. They also hoped the human-made flood would help bring back the natural habitat that plants and animals lost when the river was dammed.

Planning the Human-Made Flood

Scientists carefully planned each step of the flood. They tied transmitters to boulders to study how floods move sediment. They tagged endangered organisms. They even moved snails to higher ground before opening the dam.

And then there was the red water. To measure the speed of the flood, scientists who study water, or **hydrologists,** at the U.S. Geological Survey dyed the water red. They set up stations along the river below the dam. Each station transmitted data to satellites in the sky. Students, teachers, scientists, and others were asked on the World Wide Web to predict how long it would take the red floodwater to reach each station. Because of computers and satellites, people across the world could follow the flood as it happened!



Using a reservoir

USGS Gaging Stations	Predicted Arrival of Flood	Actual Arrival of Flood (estimated)
Lees Ferry	2 hours, 45 minutes	3 hours
Above Little Colorado River	14 hours, 16 minutes	13 hours
Above Grand Canyon	18 hours, 41 minutes	15 hours
Diamond Creek	40 hours, 39 minutes	37 hours

One person's predictions for the flood

More than a week later, the floodwater reached the Hoover Dam 300 miles away at the lower end of the Grand Canyon. What were the results of releasing the river? It will take a long time to tell how the flood affects plants and animals in the river habitat. But after the dam was closed and the flooding stopped, beaches could be seen along the river. Scientists are calling the flood a success. They might release the river every 10 years.

Humans have learned many ways to control the flow of water. Now they are realizing the effects. What do you think are the benefits of a dam? What are the disadvantages? Should humans release other dammed-up rivers? You might want to do some research to find out more about this topic.