BUSTING THE BIG ONE

Activists claim that decommissioning Glen Canyon Dam will save water and restore a wild canyon. Are they right?

BY KRISTA LANGLOIS

"I just read what everyone else had forgotten."

—Jack Schmidt, watershed scientist who evaluated water savings and loss from Lake Powell and Lake Mead

In 1963, Glen Canyon was pronounced dead. Glen Canyon Dam had submerged its fabled grottoes, Ancestral Puebloan cliff dwellings and slickrock chutes beneath the stagnant water of Lake Powell, and forever altered the ecology of the Grand Canyon just downstream.

For wilderness lovers, the 710-foot-tall concrete wall stuck out of the Colorado River like a middle finger — an insult that helped ignite the modern environmental movement. In 1981, the radical group Earth First! faked a "crack" on the dam by unfurling a 300-foot-long black banner down the structure's front. The Sierra Club's first executive director, David Brower, considered the dam's construction a personal failure and spent the rest of his life advocating for its removal. And in his iconic novel *The Monkey Wrench Gang*, author Edward Abbey imagined a group of friends secretly plotting to blow up the dam and free the Colorado River.

In real life, though, Glen Canyon Dam and Lake Powell made it possible for millions of people to live and grow food in the arid Southwest. Together, the dam and the reservoir store precious snowmelt for year-round use, help generate electricity for 5.8 million homes, and enable states from the Upper Colorado River Basin to fulfill their legal obligation to deliver water to downstream states. Last year, the federal government underscored its support for the dam by finalizing a plan that will guide management for the next two decades.

Even so, an unprecedented interest in dam removals and the specter of climate change have created fresh hope for those who want to see the drowned canyon resurrected. From 1990 to 2010, the population of the American Southwest grew by 37 percent, even as the amount of water flowing into the Colorado River system shrank amid a historic drought. More people using fewer resources means that neither Lake Powell nor Lake Mead, the downstream reservoir created by Hoover Dam, have been full since 1999. And climate change promises to squeeze the water supply even further, with future droughts expected to bring even hotter and drier conditions.

Meanwhile, Lake Powell may be squandering the very resource it was designed to protect. Every day, water slowly seeps into the soft, porous sandstone beneath the reservoir and evaporates off its surface into the desert air. When more water flowed in the system, this hardly mattered. But in an era where "every drop counts," says Eric Balken, executive director of the nonprofit Glen Canyon Institute, it calls for a drastic re-evaluation of the Colorado River's plumbing. "The Colorado River can no longer sustain two huge reservoirs," Balken says. "There isn't enough water."

That's one reason the Glen Canyon Institute is pushing an audacious proposal called "Fill Mead First," which calls for the U.S. Bureau of Reclamation to drain Lake Powell and send the water downstream to Lake Mead. In theory, combining two reservoirs into one would shrink their surface area, reducing the amount of water that's lost to evaporation. It would also mitigate seepage, since Lake Mead is surrounded by hard volcanic rock rather than sandstone. The Colorado River would run freely through Glen Canyon and the Grand Canyon, but Glen Canyon Dam would stay in place to store water if cooler, wetter conditions return — a compromise of sorts.

Not long ago, the idea of breaching Glen Canyon Dam was laughably unrealistic. Since 1999, though, more than 850 dams have been removed from U.S. rivers, and ecological restorations that once seemed pie-in-the-sky are looking increasingly probable. There's just one problem: The science behind Fill Mead First is as muddy as the Colorado River itself.

IN 2013, THE GLEN CANYON INSTITUTE commissioned a study of Fill Mead First from advisory board member and hydrologist Tom Myers. The results, published in the *Journal of the American Water Resources Association*, found that Lake Powell loses enough water each year to supply Nevada's annual share of Colorado River water. Journalists and conservationists eagerly cited Myers' findings; for many, they offered the first compelling argument for decommissioning a dam that environmentalists have had in their sights for decades. In 2016, journalist Abrahm

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Glen Canyon Dam, far left, with Lake Powell spreading out behind it. Lake Mead, behind Hoover Dam, left, has walls of hard volcanic rock that don't lose as much water as the sandstone walls of Lake Powell. Some theorize that filling only Lake Mead would be a more efficient way to store water.
PETE MCBRIDE/GETTY IMAGES

Lustgarten wrote in *The New York Times* that Fill Mead First offered "a solution hard to ignore."

From his office at Utah State University, however, watershed scientist Jack Schmidt watched the growing support for the idea with professional caution. A former chief of the U.S. Geological Survey's Grand Canyon Monitoring and Research Center, Schmidt has played a crucial role in efforts to mitigate Glen Canyon Dam's ecological impact. He came up with the experimental "pulse flows" that sent floodwaters raging through the Grand Canyon to redistribute ecologically vital sediment, and he believes that solving the West's water shortage will require similar out-of-the-box thinking. So he wanted to know: Was this really a viable plan?

Last spring, Schmidt and his students began digging up every study they could find on Lake Powell. Schmidt corresponded frequently with Myers to make sure he understood how Myers had reached his conclusions, and he met with representatives from the Glen Canyon Institute and the Bureau of Reclamation. He spent months tracking down a single obscure paper by a USGS scientist "who just wouldn't answer his damn phone."

"I didn't go out and run new models or do anything new," he says. "I just read what everyone else had forgotten."

In November 2016, Schmidt reported his findings in an 80-page technical assessment released by Utah State University's Center for Colorado River Studies. Contrary to Myers' results, he concluded that, based on the available data, Fill Mead First would not result in significant water savings.

In part, this is because Schmidt was able to plug more data into his analysis than Myers had, including relatively new evaporation data. But it's also because Schmidt and Myers used different projections for how much water seeps out of Lake Powell. The most recent studies of seepage were conducted in the 1970s and '80s, when Powell was new and the desert beneath it was like a sponge that hadn't yet soaked up much water. Over the years, as the sandstone became more saturated, seepage rates have likely decreased. The problem is that nobody knows exactly how much, or how much of that water eventually drains back into the river.

"There's very little data," Myers says.

Yet although Schmidt and Myers reached different conclusions about the merits of draining Lake Powell, both scientists agree that the exercise underscores how little we know about the impact of one of America's most controversial dams. "I was genuinely surprised by how little research goes on on Lake Powell," Schmidt says. Compared to Lake Mead, where state-of-the-art science allows water managers to understand exactly how much water is lost, much of the data on Powell are decades old. That means any conversation about saving water by decommissioning Glen Canyon Dam is riddled with uncertainty.

That same uncertainty swirls around the social and environmental repercussions of draining the West's second largest reservoir. Over its 50-year life, Glen Canyon Dam has blocked hundreds of millions of tons of sediment from being carried downstream. That sediment now sits at the bottom of Lake Powell, much of it contaminated by agricultural runoff, mining waste and even uranium. Some people believe a drained reservoir could be eligible for Superfund status, others that it would soon rebound to a natural state. And while draining the reservoir could benefit native fish by rebuilding habitat and restoring warm, naturally fluctuating flows to the Grand Canyon, it would end the year-round whitewater trips that are possible thanks to regular releases of water from the dam. It would also devastate the residents of nearby Page, Arizona, who depend on the tourism the reservoir supports.

To get a sense of what this all means for the future of Glen Canyon Dam, I called political scientist William Lowry, who has written extensively on dam removals. He said that although the West has embraced river restoration with a fervor unimaginable a few decades ago, no one proceeds with a task as monumental as decommissioning Glen Canyon Dam without agreement on the dam's true costs and benefits.

Today, a lack of good data means those trade-offs are subject to interpretation. Which means that until the federal government invests in new research, the Colorado River stands little chance of being unshackled. □

Correspondent Krista Langlois lives near Durango, Colorado.
@cestmoiLanglois