

OPINION
GUEST ESSAY

The Colorado River Is Running Dry, but Nobody Wants to Talk About the Mud

By Dale Maharidge

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It's difficult to fathom how the Colorado River could possibly carve the mile-deep chasm that is the Grand Canyon. But if one thinks of the river as a flume of liquid sandpaper rubbing the land over millions of years, it begins to make sense. "The finest workers in stone are not copper or steel tools," Henry David Thoreau wrote, "but the gentle touches of air and water working at their leisure with a liberal allowance of time."

In 1963, humans stopped time, when the brand new Glen Canyon Dam on the Utah-Arizona border cut off the reddish sediment that naturally eroded the Grand Canyon. Today the river runs vodka clear from the base of the dam.



Sources: OpenStreetMap, U.S. Geological Survey. Satellite image by Copernicus. • By Gus Wezerek

But the silt never ceased arriving in Lake Powell, the reservoir above the dam. Each day on average for the past 60 years, the equivalent of 61 supersize Mississippi River barge-loads of sand and mud have been deposited there. The total accumulation would bury the length of Manhattan to a depth of

126 feet — close to the height of a 12-story building.



The Glen Canyon Dam holding back the waters of the Colorado River.

For years this mud was hidden beneath Lake Powell’s blue waters. Now, as climate change and overuse of the Colorado have drawn the reservoir down to record lows, the silt is exposed — forming “mud glaciers.” And because of a gradient created when the lake level falls, the giant mud blobs are moving at a rate of 100 feet or more per day toward the dam.

These advancing mud blobs pose existential threats to the water supply of the Southwest: One day they could form a constipating plug that blocks Glen Canyon, preventing the water from flowing downriver. They could also someday endanger the structural integrity of the dam.

Asked about the dangers that the sediment posed, Floyd Dominy, the commissioner of the U.S. Bureau of Reclamation in 1963, later quipped, “We will let people in the future worry about it.”

Now the future is here. With Lake Powell just 23 percent full, and Lake Mead, outside of Las Vegas, at 28 percent capacity, it’s time to stop trying to “save” Lake Powell. It should be abandoned and its water stored in Lake Mead.



Placid waters of Lake Powell as it rounds Antelope Point in northern Arizona.

Yet the Bureau of Reclamation, the federal agency in charge of managing water in the West, is desperately trying to keep the reservoir because it wants to keep the dam's electricity-generating turbines working. If the water level drops another 30 feet from the present elevation, the turbines will become useless.

The bureau recently issued ideas to create new outlets for lake water at lower elevations in the dam so it can keep producing power and delivering water to users in the Southwest, Mexico and California. But there's only one modification that would actually solve the sediment problem: boring two tunnels at the base of the dam, one at grade level with the riverbed. That would kill the reservoir but allow sediment to pass downstream. The bureau said this option had been discussed, but "not further considered."

The bureau is scheduled to continue meeting with water managers, tribes and others with an interest in Colorado River water starting this spring, before selecting a plan later this year. Those with a stake in the river's future should demand the bureau put that lowest tunnel back in play and allow the Colorado to run free in Glen Canyon again for the security of the water supply. The other options could leave the lake more than 200 feet below the already low levels, allowing the mud glaciers to continue advancing.



The Colorado River in Glen Canyon near Page, Ariz.

There's another good reason to say goodbye to Lake Powell. As it has shrunk, various side canyons of Glen Canyon are no longer underwater and willows and cottonwoods are sprouting on their banks. Narrow and twisting slickrock tributary canyons — with grottoes, soaring amphitheaters and hidden passages — are reappearing, like the images in “The Place No One Knew,” a Sierra Club book featuring Eliot Porter’s requiem photographs of pre-dam Glen Canyon.

That Glen Canyon, a thriving place of beauty and life, is the one I want back.

In 1969, when I was in the seventh grade in suburban Cleveland a nun gave me Porter’s book. It haunted me. In 1976 I took a Greyhound to Utah and went on a monthlong vision quest, backpacking parallel with the new reservoir, still 40 vertical feet from full. I witnessed remnants of some of the Eden-like canyons photographed by Porter before they were submerged.

In 1983, I camped on the shore of the lake next to Dave Foreman, a founder of Earth First! He’d come to protest the 20th anniversary celebration of the dam. We spent the night drinking from a case of beer. Two years earlier, Earth First! activists unfurled a 300-foot sheet of plastic over the face of the dam, simulating a crack. The lake seemed very permanent. It was brimming full.

Thus it was shocking in 2005 when I drove to an overlook and saw the water gone from the upper reaches of Lake Powell. (Little snow had fallen that winter in the mountains to feed the lake.) I then did something I never thought possible in my lifetime: I swam the Colorado in upper Glen Canyon. Because the lake had shrunk, it was at a spot that had been some 100 feet underwater for decades now exposed again to sunlight.

After crossing a vast mud flat, I bobbed downstream and then slipped and fell in muck on the way back to my clothes. It wasn't a pleasant experience. Yet the swim had to be done. The lake soon re-flooded the site after a wet winter.

What I didn't realize in 2005: The river was flowing over a mud glacier that was 140 feet above the original channel. I swam over a mass of mud biblical in scale.

River raft guides were among the first people to pay attention to the delta. As the reservoir level dropped, ugly, gooey mud flats were exposed, making camping difficult. "It was a wasteland that wasn't safe to step on," said Mike DeHoff, a semiretired river guide whose boat shop in Moab, Utah, has become a command center for studying the sediment. But as the deposits flushed downstream, the banks became inviting places to pitch tents, and the once-buried rapids in Cataract Canyon began re-emerging.



Mike DeHoff of the Returning Rapids team fording the cold, muddy waters of White Canyon Creek that feeds into the Colorado River in Utah.

Mr. DeHoff wondered when other rapids would come back. So in 2019, he began agitating for someone to examine the mud, and, with some friends, formed the nonprofit Returning Rapids Project. One of their first moves was to take a group of scientists on raft trips to study the sediment. The river by then had knifed into the delta, leaving towering escarpments of loose-packed sand. On one excursion they dubbed it the “Dominy Formation,” after the former bureau commissioner.

Mr. DeHoff, who says it’s ridiculous that someone in his position should rank as an authority on the subject, describes the mud as “a massive byproduct of our appetites for water that no one wants to pay attention to. Who manages it and what the heck are we going to do?”

The Returning Rapids Project placed cameras to film the erosion, making time-lapse images. One December afternoon in his shop, over strong river-guide coffee made on a portable propane burner, Mr. DeHoff showed me speeded-up videos of slabs of sediment calving off and crashing into the river to be carried away to the reservoir.

Mr. DeHoff noted that the Bureau of Reclamation regularly monitored sediment in the early years of the reservoir. But it stopped in the wet years of the 1980s, saying it would take 7 centuries for Lake Powell to fill with soil.



Deep mud forming along the surface of the Dominy Formation along the Colorado River in Utah.

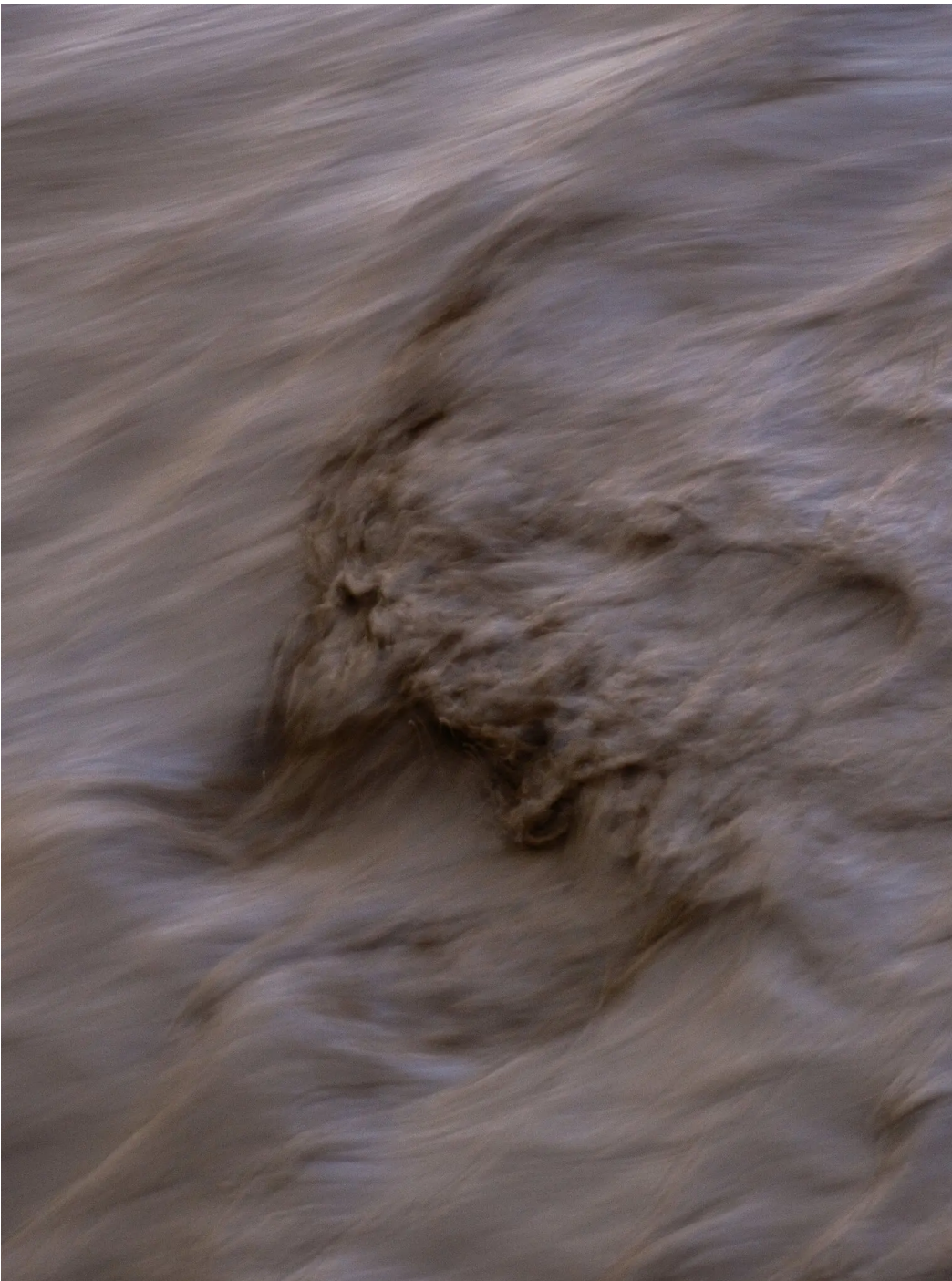


For the bureau, the sediment has become “a problem they would like to ignore,” said Eric Balken, the executive director of the Glen Canyon Institute. Its core mission is to see Lake Powell emptied and Lake Mead kept as full as possible.

No one knows for certain the lifespan of Lake Powell, given the twin crises of climate change and water demand. One scientist I spoke to gives it a century. Mr. Balken is more pessimistic, saying it’s probably measured “in a matter of decades.” But today, no one expects Lake Powell to ever again be full. Like a martini glass, the lake takes exponentially more water to raise the level the higher you go.

The most unhinged mud glacier threatening Lake Powell is astonishingly fast and has moved several miles over the course of a year. It’s on the San Juan River, a tributary that begins in Colorado and flows west across the Navajo Nation, eventually joining Lake Powell. It carries less water but proportionally a higher sediment load than the Colorado, “more of a river of literal mud,” said Cari Johnson, a University of Utah geology and geophysics professor.

Picking an exact date for when the San Juan’s mud plug travels the final 20-plus miles to Glen Canyon is in the realm of a wager for Las Vegas bookies. It will certainly someday arrive. When depends entirely on snow and rainfall in the Colorado River watershed, and how much water is used.



Muddy waters of a flash flood along Wahweap Creek that feeds into Lake Powell in Utah.

When it reaches Glen Canyon, it could clog the deep and narrow channel a few dozen miles uplake from the dam, and halve or slow the flow of the Colorado, making management of the river difficult. This could disrupt water deliveries to millions of people in cities and towns, as well as farmers and tribal communities downstream.

Mr. DeHoff of the Returning Rapids Project thinks the nutrient-rich sediment should be allowed to pass through a decommissioned Glen Canyon Dam, on to Lake Mead, where it could be shipped to farmers in places like California's Imperial Valley.

Jack Schmidt, director of the Center for Colorado River Studies at Utah State University, warns this is

impossible, given the volume of mud. His solution? Move the sediment further downriver. That will be very expensive — in the tens of billions of dollars. Moving sediment through the dams involves dredging or piping sand and mud long distances. And the dam itself would have to be redesigned to allow silt to pass through it.

If Powell is drained, this kind of engineering will be essential. Without it, Lake Mead would start filling up with sediment, eventually becoming useless, with mud eventually replacing all the water behind Hoover Dam. But there's still plenty of time to save Mead with this plan.



Glen Canyon Dam above the Colorado River. Photographs by Cody Cobb for The New York Times

And even if it takes 50 to 100 years for the mud to become a serious problem, Dr. Schmidt thinks Glen Canyon Dam eventually will have to be re-engineered anyway. “That natural sediment load cannot be blocked from the sea forever,” he said.

For now, the Bureau of Reclamation isn’t commenting on draining Lake Powell. Its priority appears to be generating electricity from the dam. But there are other options for making clean power. The cost of solar and wind power has plunged. The bureau’s study said renewable energy is “scalable,” with the caveat: “this is not Reclamation’s expertise.”

It does have the expertise to decommission Glen Canyon Dam today, and begin studying how to move sediment downriver through the dams. It will take years to implement any plan.

“It is a house of cards,” Dr. Schmidt said of the sediment. The only certainty is that when the day of reckoning comes, he added, “It will cost a lot.” And in the meantime he said it’s not wise to keep both Lakes Mead and Powell each half or less full.

Lake Powell, I believe, is the one that should be drained. And then Glen Canyon should be declared a national park. It was the most beautiful stretch of the Colorado River, and if we allow nature to do its work, the entire canyon would return to what it looked like in Eliot Porter’s book.

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