

Hidden Passage

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429 East 100 South
Salt Lake City, Utah 84111
tel (801) 363-4450
fax (801) 363-4451
info@glencanyon.org
www.glencanyon.org

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Editor

Wade Graham
wade@grahamstudio.net

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Editor's Introduction

by Wade Graham

Last November, the Colorado River lost one of its greatest champions, Martin Litton, who died, aged 97, after a long career of defending the West's finest landscapes against ill-considered exploitation. Martin, along with David Brower and Katie Lee, was one of Glen Canyon Institute's prime movers when it was founded in 1996—a logical role, as he had spent most of his life defending the river. He was deeply involved in battling the Bureau of Reclamation's plans to put two dams on the Green River in Dinosaur National Monument and two more in Grand Canyon on the Colorado. Yet, tragically, success in those efforts was paid for, in part, with acquiescence by the mobilized conservation community to the construction of Glen Canyon Dam. After resigning an editing post at *Sunset* magazine when he couldn't convince its owners to take tougher conservation stands, he founded Grand Canyon Dories, pioneering wooden boats for commercial river trips in the Grand Canyon and elsewhere, and inspiring generations of young people to stand up for rivers. Nearly a year since his death, it isn't too late to offer two heartfelt farewells in this issue to Martin from friends who had floated and fought beside him.

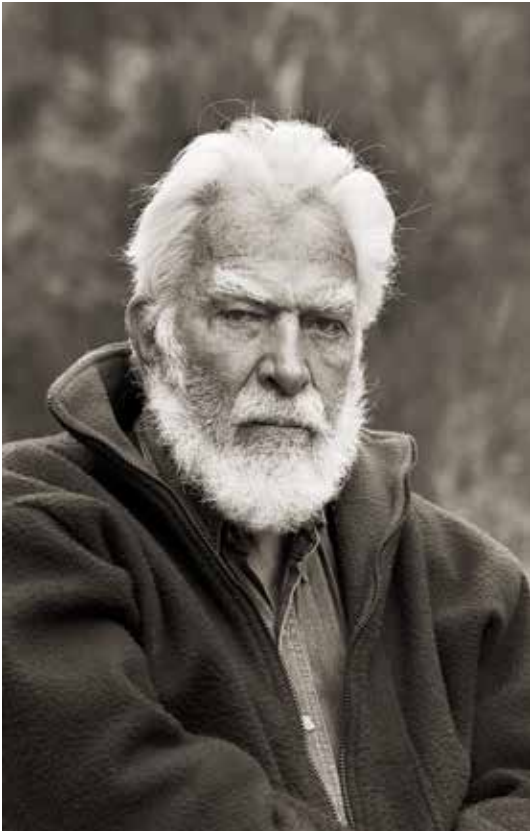
Gladly, the river has more defenders than ever, such as Daniel Beard, who has spent four decades working to reform western water policy, serving as a federal policy official, deputy assistant secretary of the Department of Interior, a lead staffer on the U.S. House of Representatives Committee on Natural Resources, ultimately becoming staff director, before being appointed commissioner of the Bureau of Reclamation by President Clinton, a position he held from 1993 to '95. Dan's new book, *Deadbeat Dams: Why We Should Abolish the U.S. Bureau of Reclamation and Tear Down Glen Canyon Dam*, articulates an extraordinary, powerful condemnation of the agency he once ran and its central role in the environmental and economic disaster that is federal water policy in the American West. The bureau continues to oversee a program of massive subsidies to agriculture totaling billions to prop up a parasitic oligarchy Beard dubs the Water Nobility, which has in effect taken over public projects and resources as its own, abetted by a dysfunctional if not corrupt Congress in thrall to it. He lays out a bold agenda for change: abolishing the Bureau, ending subsidies, giving responsibility for determining priorities for U.S. water management to an independent commission, and decommissioning dams that no longer make sense—if they ever did—beginning with Glen Canyon Dam. Beard argues clearly and forcefully for GCI's Fill Mead First proposal: "...the fifteen-year drought and the dim prospect for water supplies from Lake Mead and Lake Powell present us with an opportunity to implement a bold and innovative approach. We should drain Lake Powell, remove Glen Canyon Dam, and allow the Colorado River to keep Lake Mead full."

Martin Litton would surely approve of Beard dedicating *Deadbeat Dams* to "the next generation of water reform advocates."

Also in this issue are trip reports: from GCI's spring rafting trip down Cataract Canyon, and Bill Wolverton's account of four explorations in the vicinity of Trachyte Creek at the northern end of Glen Canyon, including, this past April, a brief but beautiful float down a newly free-flowing Colorado River from the Hite takeout (where Cataract Canyon trips normally end), down to Farley Canyon—a stretch previously under water. There is nothing more inspiring than seeing and feeling the grandeur of Glen Canyon in person, on foot or afloat, to know why it must be defended.

Goodbye to a Friend of Glen Canyon

by David Wegner



Martin on one of his later trips down the Grand Canyon. Photo by John Blaustein.

On November 30, 2014, the environmental community and Glen Canyon Institute lost a true river hero with the passing of Martin Litton. Martin was involved at the very beginnings of the Institute along with Anne and David Brower and Katie Lee, spurring us on and reminding us of the importance of places like Glen Canyon.

I first met Martin in the late 1970s while working for the Bureau of Reclamation on the Colorado River below Glen Canyon Dam. He was launching a Grand Canyon Dory trip at Lee Ferry and was interested why we were measuring water volumes. Martin did not trust the bureau or anyone associated with it. That day in 1978 began a trip over the next 36 years that never failed to elicit laughs and of course the trademark Litton admonition to "do more." Always we could do more.

I was lucky to spend time with Martin in the Grand Canyon on dory trips, in his airplane (once!) flying over the Sequoias, at his house in Portola Valley, California at many dinners with martinis, and at several events for the institute. Over the years Martin and I would try to talk at least monthly and discuss

conservation issues and his perspective on where the government had gone wrong. There was plenty of dialogue over that subject.

For Martin's 90th birthday we did a private river trip down the Grand Canyon along with two of Martin's sons. The trip was eventful in several different ways and every day Martin would regale us with stories of his flying adventures in Normandy on D-Day, his early days in Los Angeles and at *Sunset Magazine*, and his flights with various celebrities to fight for one issue or another. Whenever we ran into another river trip Martin was quick to admonish the "young folks" to fight for the environment before the "Bastards take it all away."

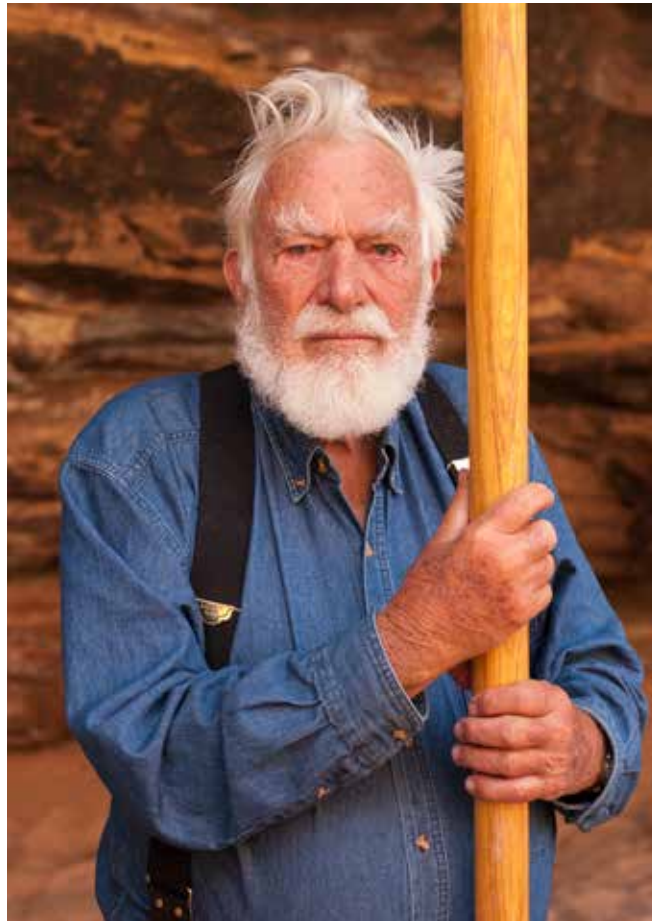
I talked with Martin about two weeks before he passed and it was obvious that he was slowing down. He complained about getting around, talked about his airplane, and about how I needed to get over there to get some stuff of historic value. The institute gave Martin the David R. Brower Conservation Award several years ago for his many years of working on Colorado River issues. Martin, I will admonish you with what you ended every one of our conversations with, "Try to be good." You led a remarkable life and left a boot print on the back of many politicians and government folks. We all owe you a debt of extreme gratitude. I will miss you old friend. See you on the river one day and we will drink, tell stories and laugh again.



Martin paints one of his dories in 1970. Photo by John Blaustein.

Remembering a Colorado River Legend

by Tom Turner



Martin in Grand Canyon in 2004. Photo by John Blaustein.

If the phone rang and it was Martin Litton calling, you'd need to be ready to talk---mostly listen—for an hour. If you placed the call, the same formula held. Martin loved to talk and to listen, and I think it was his passion that led him to carry on epic conversations, not to mention epic battles against dam-builders, redwood-loggers, nuclear-power-plant boosters, and others who would despoil Mother Nature.

I knew Martin starting in 1968 when I went to work at the Sierra Club and he was on the club's board. He was the fire-brand, the truth-teller. Dave Brower had the reputation of refusing to compromise, but Martin was even more rigid, and stopped Dave from compromising any number of times. "My conscience," Dave called Martin.

Martin had flown gliders in World War II, then worked as a gofer at the *Los Angeles Times*. On weekends he would visit wild places, among them Dinosaur National Monument in Utah, where the Bureau of Reclamation wanted to build two hydroelectric dams. Martin wrote fiery stories about the dam

proposals, illustrated with photos he took himself. These pieces caught the eye of Brower, newly ensconced as the Sierra Club's first executive director, who recruited Litton into the ranks of the Sierra Club to help fight the dams proposal in Washington, DC.

This was the beginning of a long and productive relationship. Martin later ran for and won a seat on the Sierra Club board, and he and Dave worked closely on efforts to block two dams in the Grand Canyon (successful, as the Dinosaur campaign had been), to block a massive ski resort at Mineral King in the Sierra Nevada (Dave was about to cave; Martin turned him around. This was also successful), to block construction of a nuclear power plant at Diablo Canyon on the California coast (unsuccessful, though a strong push is now underway to have the plant shuttered), to establish a Redwood national park in the coast redwood country (successful), and to protect the Giant Sequoias in the southern Sierra from ill-advised sanitation logging (jury still out).

After the *LA Times*, Martin became travel editor of *Sunset*, which he tried to turn into a conservation magazine. He eventually resigned when his boss refused to take a firm enough stand on matters involving redwoods. He thereupon established Grand Canyon Dories, which ran float trips throughout the West, including through the Grand Canyon itself, which he had played a major role in saving.

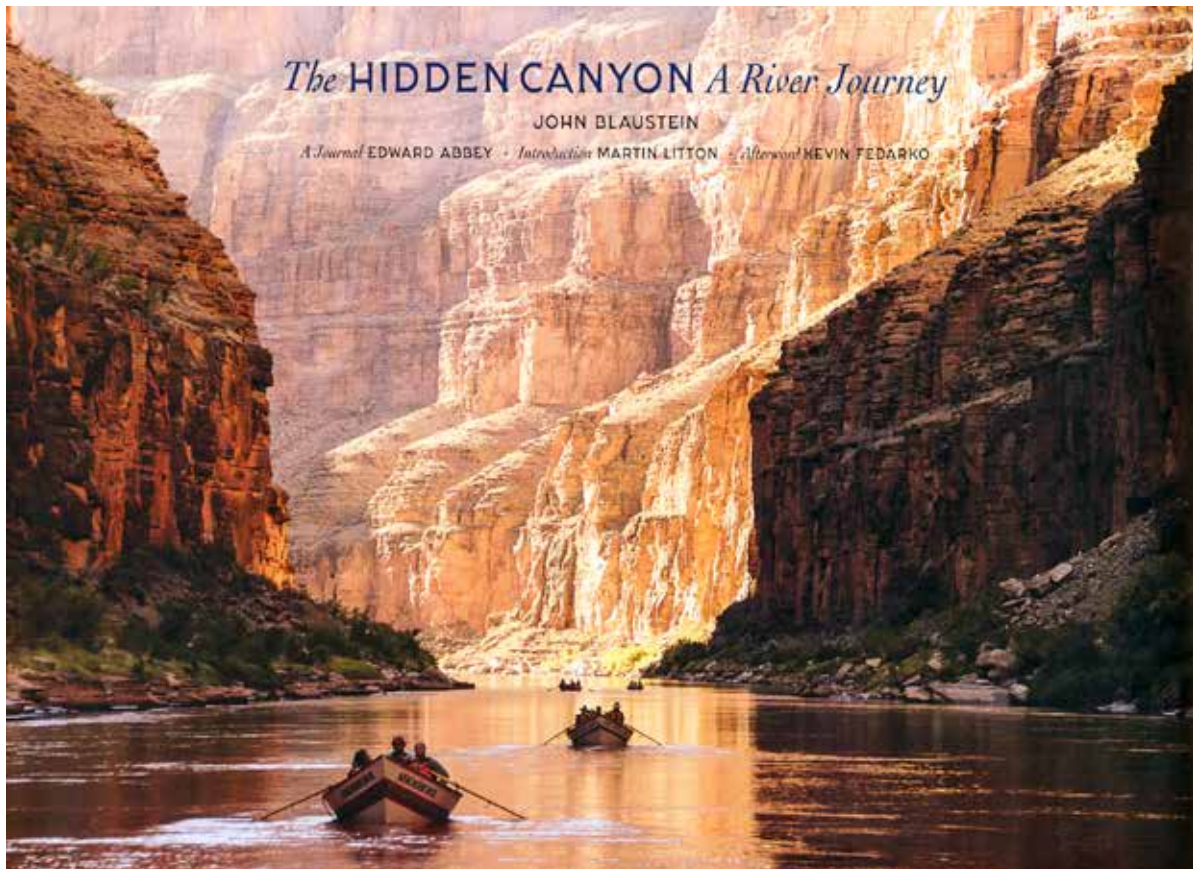
He was not only determined and tireless; he was also generous. I phoned him once looking for an aerial photo of Mineral King to use in an Earthjustice publication, assuming Martin had several. He didn't, so he and Esther, his wife of forever, hopped into his single-engine plane and flew the 300 or so miles to get the shots, Martin at the controls, Esther manning

the camera. The weather when they arrived was lousy, so they returned home and took another trip a few days later. They wouldn't let us pay for the fuel, let alone for the photos.

Did I say that when Martin rang, you would happily drop whatever you were doing to have a chat? Those chats were always enjoyable, entertaining, and inspiring.

Farewell, Martin. The earth owes you a great debt.

Tom Turner's biography, *David Brower, The Making of the Environmental Movement*, will be published by the University of California Press on October 1, 2015



The images in this article are featured in the 2015 edition of *The Hidden Canyon* by John Blaustein.

GCI Oral Histories — An Interview with Roy Webb

By Eric Balken

Roy Dale Webb is one of the most highly regarded river historians in the Intermountain West. A certified archivist at the University of Utah Marriott Library, Roy has written five books on the histories of the Green and Colorado Rivers, chronicling the earliest expeditions and modern cultures that grew around river running. Born in Farmington, New Mexico, he grew up on the banks of the San Juan and Animas rivers, developing an intimate connection to the West's rivers from his earliest days. He's run nearly all stretches of the Green River below Fontanelle Dam, and nearly all stretches of the Colorado River from Grand Junction to Pearce Ferry, including 30 trips through the Grand Canyon. He's served on Glen Canyon Institute's advisory committee for 19 years. GCI's Eric Balken recently sat down with Roy to talk about his connection to the river and Glen Canyon's history.

EB: What was your first memory of the river?

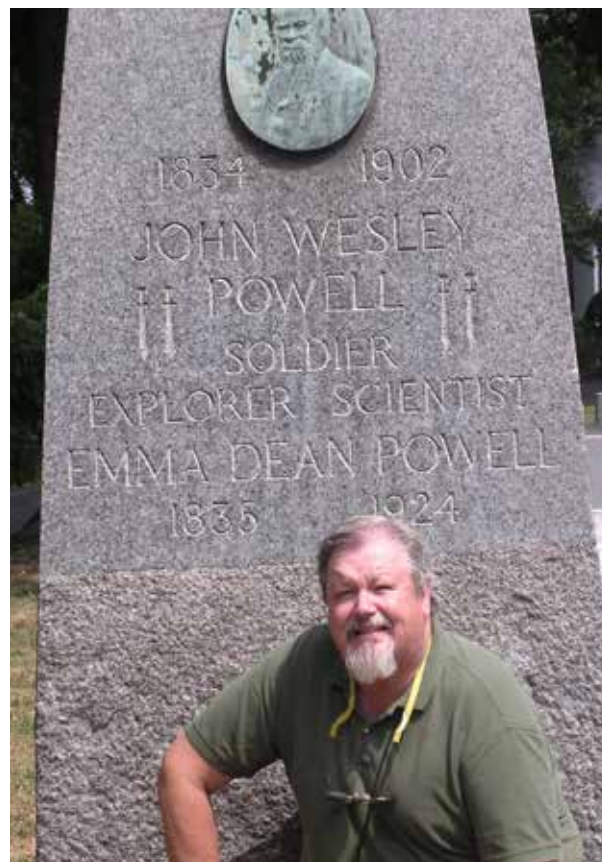
RW: We moved into a housing development on the south side of Farmington, New Mexico. It was on the point of land between the San Juan and the Animus Rivers. We'd drive over the bridge, and I really remember the San Juan River, how it was sometimes low and calm and sometimes it would be raging—because it would flood in the spring. That really struck me. As I got older, the elementary school I went to was actually right by the river. We could see cottonwoods and willows, and past that horses, and past that there was the river. As I got older in that neighborhood, we started building forts there and playing and doing things that kids do and we were always around the river. Every now and then we'd venture out and swim in it. So it was early on that I grew up with it.

EB: What was your first river trip?

RW: My nephew, who I grew up with in Vernal, Utah and I would go and float down all the canals in Vernal on inner tubes. That was my first experience with actually floating on the water—barbed wire and culverts and all kinds of things. The very first I went down the river in a boat was in the early 1970s, when I was going out with this Mormon girl. Her ward was taking a trip on the Green below Flaming Gorge Dam, so she talked me into going and trying to convert me—and I was converted, you might say. I was converted to the river, because it was fabulous.

EB: As Glen Canyon is the confluence of so many tributaries to the Colorado River like the San Juan, the Dirty Devil, and the Escalante, it's a geographically special place. How do you think the Native Americans viewed the Glen Canyon region?

RW: Emotionally and spiritually, I don't really know. But especially for the ancient Pueblo people, they actually used it a lot. There were thousands and thousands of archeological sites in Glen Canyon. They were covered up when the reservoir filled, and they scratched the surface on that, with the salvage



Roy in front of John Wesley Powell's gravesite in Arlington National Cemetery.

surveys. And so there were thousands of sites, and not only the Anasazi, and the people who lived in Glen Canyon area, but the later peoples - the Navajos and the Utes, the Paiutes, and everybody who passed back and forth. They were much more mobile than we give them credit for. People think, just because you don't have a car, you can't go long distances. The Comanches would travel from the plains of Texas, all the way to Browns Park, to trade. People would pass back and forth all the time. And that meant that they would pass through Glen Canyon because there wasn't a passage across Cataract Canyon or the Grand Canyon that bookended it. You couldn't get across those. But you could get across Glen Canyon. You could ride a horse, you could walk to the edge, find a way in, and cross and keep going.

EB: Tell me a little bit more about that salvage process.

RW: It was started as soon as the dam was authorized in 1957, and they went right up until the water started pushing them out of the way, so almost six years. Jesse Jennings of the University of Utah department of anthropology coordinated

the whole thing and he depended on graduate students to go down and run the whole thing. He was down there all the time, he expanded it out to cover not only Glen Canyon, but areas that were going to be impacted like up the San Juan River, even near areas that weren't going to be impacted. And used that same funding to cover that.

He also did some archaeological work up in Flaming Gorge, not nearly as much as they wanted to because nobody wanted to work there. Everybody wanted to work in Glen Canyon, because that's where the real archaeology was. It resulted in tens of thousands of artifacts. You can't even see the number of artifacts up there; it would take you a lifetime just to see it. We have here in the library a set of their photographs just for safe-keeping. We have a whole set of negatives from all the sites that were organized by archaeological site. That was a major undertaking and I think there's probably a precedent from the Tennessee Valley Authority, they did some kind of salvage work when they were building their dams in the 1930s. But this was such a remote area at the time. There was nothing out there; no towns, no phones, no lights, no motor cars. It was a huge effort and made a lot of archeological careers.

EB: I've heard that there were three thousand sites discovered, does that sound right to you? But you said they were just scratching the surface, right?

RW: Yeah, I've always heard that there were three thousand or thirty five hundred sites. Those are just the sites they found and documented. Then there were hundreds of others, thousands of others, even, who knows. I mean it was obviously a really heavily used area. Again, for those same reasons, it was accessible. For the ancient people it had a temperate climate, and there was water there, which meant there would be game there. There would also be edible plants, so, I mean what's not to love? That's home right there, for them.

EB: Do you think that because people saw what was lost at Glen Canyon that it sparked a fire that was able to stop the Grand Canyon dams?

RW: Definitely, absolutely, I think so. I mean Brower was so shocked by what he had agreed to, by agreeing to the flooding of Glen Canyon to stop the Echo Park Dam that he was not going to let that happen again. And you know he recruited people; Martin Litton, and Charlie Eggert, and other people who were just as motivated and committed. And who had also cut their teeth in the Echo Park Dam fight, and had been on the losing side with Glen Canyon.

EB: What would you think is the most unusual or important artifact that you guys had, either in the archives, or the natural history museum? Is there one salvage piece or one even piece of history that you have, relating to Glen Canyon that stands out?



Roy rows through Warms Springs rapid on the Yampa River in 1995.

RW: We actually just took down an exhibit today of odd materials and special collections. One of the things that we had on display was a piece of the *Charles H Spencer* which was a steamboat that was built at Lee's Ferry by Spencer and named after himself. The idea was to run up Glen Canyon to Warm Creek and collect coal, and then bring it back down to Lee's Ferry and use it to run the boilers for his little plaster mining operation there. So we have a couple pieces of that. That's kind of neat, to have a piece of that boat in your collections. And I think the things I like the most are the journals, there are so many journals of people that went down the river. And their impressions. And their photographs and things.

That's one thing I want to say too; how my involvement with Glen Canyon Institute started out. When it first started, twenty years ago, when Rich Ingebretsen started talking about taking down the Glen Canyon Dam and that sort of agitated people to the point that they started thinking about it. And I was here, that was just when I started here as a multimedia archivist and in charge of the photograph and film collections. And it dawned on me at the time that as this became a political issue, as people started talking about this they were going to remember that their uncle Alma went down with the boy scouts in 1960 and took all these pictures and they were sitting in the closet and what do I do with them. I wanted to position the University of Utah to be the place they thought of. That they said, "I'm going to give these to the U of U, because I don't want to keep them" I really feel like that was successful. If you can't go down Glen Canyon, at least we've got pictures of it.

Floating Glen Canyon in the 21st Century

By Bill Wolverton



In late September, 1999, I made a trip down Trachyte Creek, a Glen Canyon tributary west of North Wash, where Utah highway 95 runs. Among other things, I found a way to climb out of the canyon across from the entrance to Woodruff Creek, which I had hiked down a year earlier. By then I had run out of time and could not pursue this any further. I had already found a way out of the canyon farther upstream and made my way across Trachyte Point over to the rim of North Wash, and that exploratory foray would have to suffice for now.

But I kept that route out of the canyon in mind, and in November, 2003, made another trip, this time down Woodruff again, with the intent of climbing out the other side of Trachyte Creek and continuing on to see if I could climb the large, prominent Navajo sandstone dome overlooking Glen Canyon across from Hite. I knew the reservoir in Glen Canyon was getting pretty low due to several dry years, and wanted to see how it looked. It was easy getting there from Trachyte, the key being the route out of the canyon. As I approached the back side of the Navajo dome I caught a glimpse of the Hite launch ramp, high and dry far from the water, and just involuntarily broke into a great big smile. It was a beautiful sight. Climbing the dome turned out to be easy, and led to a wonderful view of the late Glen Canyon. The Hite marina floating docks were still there, but had been towed downstream from

where it had been to deeper water so it would not end up grounded as the reservoir continued to recede. A flotilla of houseboats remained tied up in a buoy field nearby. The reservoir elevation was 3601.23, almost 99 feet low, and the Colorado River was flowing again, past Hite and just past the entrance to North Wash before dying in the slack water of the reservoir.

Last year, 2014, I did a trip with two others in late March from Ticaboo Creek behind the Little Rockies around to Trachyte Creek and out Trachyte. From Trachyte two of us made a long, one-day side trip out to the dome across from Hite to see how things were looking there. What we saw was quite unlike the scene 11 years earlier. Instead of the river entering the reservoir near North Wash it now flowed almost as far as could be seen downstream, which was to the vicinity of Farley and White Canyons. A bit of the reservoir was barely discernible, several miles away. Of course it was a “drear and hideous scene” (Cactus Ed, *Slickrock*, 1971), with the river flowing through nothing but barren mudflat. But at least it was a flowing, muddy river, and it was in Glen Canyon.

At some point, then or later, an idea began to germinate. There is a long established access road down Farley Canyon, which has served as an informal shoreline launching area for motorboaters on the reservoir. Might it be possible to float



Photo by Bill Wolverton.

from Hite down the newly flowing river to Farley Canyon and take the boats out there? Only one way to find out.

A scouting trip on foot from the camping area at Farley Canyon in early March revealed that the reservoir extended up Farley to within a stone's throw of a road, making for a very short carryout of the boats from the end of navigable water to a vehicle. Continuing on overland north of Farley, the view of the reservoir was an apparent river flowing all the way past Farley, and a look with binoculars revealed very noticeable current. The slack water could be seen beyond Farley, in the vicinity of Trachyte Creek on the other side. Things looked ideal. The reservoir was low enough, and there was enough sediment built up, to have flowing river all the way to Farley Canyon, yet it was high enough to extend up Farley almost to a road for taking boats out with a minimum carrying distance. There would be a flat water paddle of about $\frac{3}{4}$ mile up Farley Canyon from the "new" Colorado River. The reservoir elevation was around 3592 at the time, 108 feet below full pool. Better do this soon. All I needed was someone to go with me for a second vehicle to do a car shuttle. That ended up being my good friends Bruce Chesler and his wife Paulette from Escalante.

We camped out near Hite the night of April 8, then spotted Bruce's Jeep at Farley Canyon in the morning of the 9th. We launched at what normally serves as the takeout for Cataract

Canyon trips. It was pretty much just as Glen Canyon had been said to be—a slow, relaxing, lazy trip, just drifting along, no need to paddle except to point the boat whatever direction we wanted to be looking. By early afternoon we had arrived at the entrance to Farley Canyon, and we stopped there to eat and spend some time before bidding farewell to the river. From there we paddled up Farley to the end of the reservoir and it was over, in a little less than 3 $\frac{1}{2}$ hours. Not the greatest river trip, but it was a flowing river, and it was in Glen Canyon, 52 years after the canyon was executed, condemned to drown, presumably forever.

What next? It's projected that an increased balancing release of 9 million acre feet will be made from Glen Canyon to Lake Mead next year. It's been another low water year, even with record setting rains in May. The increased releases could cause a significant drop in the reservoir next year. At some point it may become possible to float all the way to Red Canyon, several miles farther downstream, if there is enough sediment built up so that the river will be flowing that far. Doing that will depend on finding a suitable take out somewhere near the end of the Blue Notch road. A little scouting will be required.

Stay tuned.

GCI Hosts Lecture by Former Commissioner of Reclamation Dan Beard in Salt Lake City

—EB



Dan Beard speaks to an audience of more than 100 people at a lecture sponsored by Glen Canyon Institute. Photo by Jay Beyer.

Earlier this Spring, Glen Canyon Institute hosted several events with former Commissioner of the Bureau of Reclamation Dan Beard, who was traveling in support of his new book *Deadbeat Dams: Why We Should Abolish the U.S. Bureau of Reclamation and Tear Down Glen Canyon Dam*. To celebrate Dan's provocative new book, GCI invited Beard to Salt Lake and hosted a reading and book signing at Ken Sanders Rare Books, a benefit dinner at the University of Utah Fine Arts Café, and a lecture titled "Saving the Colorado River: A New Perspective" At the Museum of Fine Arts Dumke Auditorium.

With a distinguished career in politics, including serving as Chief Administrative Officer of the U.S. House of Representatives, Deputy Assistant Secretary of the U.S. Department of the Interior, Staff Director of the U.S. House of Representatives Committee on Natural Resources, and Commissioner of the Bureau of Reclamation, Beard knows the intricacies and flaws of Western water policy more than anyone.

In his talks, Beard discussed the urgent need to reform management of the Colorado River, and highlighted the failed water policies that have led to the degraded and over-used river we now know. He made clear that "Western water is about politics, not policy." He pointed out the many flaws

of a system that has been corrupted by special interests and wastes billions of taxpayer dollars through antiquated federal subsidies. He claimed that constructing Glen Canyon Dam was a politically made decision that can and should be undone. "Just because we made a mistake in the past doesn't mean we have to live with it today" Beard said.

In light of the water shortage in the Colorado River Basin which has brought lakes Powell and Mead to less than half full, he argues Glen Canyon Dam is no longer necessary. "If it's not serving its purpose of storing water and not generating a significant amount of electricity, what is it there for?" Beard asked. Being one of the most magnificent canyons in the world, he argued that Glen Canyon should have never been dammed, and should be allowed to restore to its natural beauty.

There was tremendous turnout at all the events, opening up the conversation about Glen Canyon's restoration to a wide audience, and generating significant attention from news outlets like *High Country News*, *Radio West*, *The Salt Lake Tribune*, *The Deseret News*, *The Ogden Standard Examiner*, and *KUER Salt Lake*. In addition to his visit to Salt Lake, Dan gave talks in Logan, Moab, Provo, Washington D.C., Malibu, Los Angeles, Fort Collins, Boulder, San Diego, and Prescott.

GCI Teams Up with National Geographic to Release Glen Canyon Historical Story Map

Since the floodgates of Glen Canyon Dam were closed in 1963 and the Eden behind it was drowned, the beauty and inspiration of unspoiled Glen Canyon has lived on in the memories of those who knew it, and the photos and motion pictures they captured. Now, with the help of National Geographic Digital Maps, Glen Canyon Institute is proud to launch the Glen Canyon Historical Story Map, which offers a new interactive experience of “the place no one knew.”

Made possible by the generosity of Phil and Keturah Pennington, who meticulously photographed and documented their trips down Glen Canyon in the early 1960s, the Glen Canyon Historical Story Map gives the public a chance to take a virtual trip down the river, wander up its side canyons, and see it from the air. From the banks of the Hite Ferry crossing to the deepest slots of Glen’s side canyons, anyone can now enjoy an up-close and personal experience with Glen Canyon.

The Glen Canyon Historical Story Map is the first component of GCI’s Colorado River Living Atlas Project, which will eventually document restoring canyons and landmarks, recreation opportunities, and a provide a chance for the public to submit their own observations. GCI looks forward to continuing our partnership with National Geographic, as well as other photographers, writers, explorers, and scientists to create the definitive Glen Canyon user experience.

We invite you to experience the Glen Canyon Story Map now at www.glencanyon.org.

—EB



http://www.glencanyon.org/media_center/map-tour

Shortages on the Colorado River — A Balancing Act on the High Wire of Water Politics and Climate Change

By Dave Wegner

On June 23rd the elevation of Lake Mead dropped below elevation 1075 feet (ft). This was a symbolic event as by dropping below this elevation the seven basin states and the Federal Department of the Interior reach an operational threshold in management of the Colorado River.

This announcement had been anticipated since 2002 when the flows into Lake Powell fell to 25% of average. The events of 2002 made folks realize that the amount of available water in the Colorado River system could not meet projected demands. A lot of finger pointing resulted, a bunch of meetings, and of course a realization that more water development was needed. The Department of the Interior and the seven Colorado River Basin states entered into a protracted dialogue of how to manage Lake Powell and Lake Mead under low water (shortage) conditions. The resulting agreement in 2006, with adoption by the Secretary of the Interior in 2007, is called the Interim Guidelines. These guidelines, often referred to as the Shortage Guidelines, are in effect until 2026 with renegotiation to commence in 2020.

A Bit of Context

The Colorado River water storage system is composed of a variety of federal, tribal, state and local reservoirs, diversions, and groundwater augmentation components. Reservoirs Powell and Mead plus smaller reservoirs upstream, collectively captures the water from snowpack which, when full, holds about 60 million acre feet (maf) of water in storage.

As recently as 1998 the two reservoirs were both full and collectively held in excess of four years-worth of domestic and agricultural water supply. As of July 2015 the system is presently down to less than 18 months of water. The reasons for this tremendous reduction in volume are the product of three primary drivers: (1) snowpack in the mountains in Colorado, Wyoming, Utah and New Mexico have been far below average for the last several years; (2) the runoff pattern is changing due to warmer temperatures, increased melting rates caused by dust-darkened snow and high nighttime temperatures; and (3) use demand levels have risen in all 7 basin states.

Historical Colorado River Allocations

There are three major classes of Colorado River allotment holders – the Lower Colorado River basin (California, Nevada and Arizona), the Upper Colorado basin (Wyoming, Utah, Colorado and New Mexico) and the Republic of Mexico. Priority is set for who has rights to water and in water order developed as Colorado River Law of the River was devel-

oped.

Within the three classes of Colorado River allotment holders there is further prioritization. Present Perfected Right (PPR) holders are those who were physically diverting and beneficially using Colorado River water prior to the Colorado River Compact (1922). These PPRs are the most senior and have the highest priority. The second priority were those Federal and PPRs that were established prior to September 30, 1928. The third priority for water rights are those that contracted for Colorado River water between September 30, 1928 and September 30, 1968. The fourth priority is the Central Arizona Project allocation (September 30, 1968). The fifth priority are those users who have contracts for any surplus apportionment of water. These classes and priorities become important as shortage conditions occur in the Colorado River.

The Colorado River Compact of 1922 is the basic underlying document that determines the process and boundaries of how the Upper and Lower Colorado River basins are operated. Everything works well when the Colorado River system reservoirs are full and we get excess water running into the system. Today the system is under severe stress and getting worse.

In 1922 there was limited hydrologic data available for determining how much water was in the Colorado River system and there were far fewer people in the West who would depend on the water from the river. In 1922 the Compact negotiators believed that they had over 17 maf of water available to divide up. The commissioners allocated 15 maf of water, 7.5 maf for each of the two basins with the lower basin getting rights to develop up to 1.1 maf of additional water from the tributaries in the Lower Colorado River basin.

Specifically the compact requires the Upper Basin states not deplete the flow of the Colorado River below 75,000,000 acre feet (9.3 km³) during any period of ten consecutive years. The states within each basin were required to divide their annual 7,500,000-acre (30,000 km²) foot per year (289 m³/s) share allotment among themselves. The requirement to provide 75,000,000 af over any 10 year period is captured in Title III of the Compact. This requirement, especially during drought and low reservoir conditions, restricts the amount of water development that the Upper Basin states can do. In simple terms, the Upper Basin states cannot cause the flow of the Colorado River below Lee Ferry to fall below 75,000,000 in any 10 year period. If the reservoir levels in Lake Powell drop to a point where the Bureau cannot release the annual 7.5 million acre feet Compact requirement and their share of the Treaty with Mexico (0.73maf), the Upper Basin States will be in violation of the Compact. Nobody sees any value in not

their share of the Treaty with Mexico (0.73maf), the Upper Basin States will be in violation of the Compact. Nobody sees any value in not meeting the compact requirements.

Colorado River Basin Upper Colorado River Compact of 1948.

Upper Colorado River Basin (7.5 maf/yr)

Colorado	51.75% (after AZ 0.5 maf deducted)*	
		3.86 maf/yr
Utah	23.00%*	1.71 maf/yr
Wyoming	14.00%*	1.04 maf/yr
New Mexico	11.25%*	0.84 maf/yr
Arizona	0.70%	0.05 maf/yr

Lower Colorado River Basin (7.5 maf/yr)

California	58.70%	4.40 maf/yr
Arizona	37.30%	2.80 maf/yr
Nevada	4.00 %	0.30 maf/yr

Additional Allocations

Mexican Water Treaty (1944)		
Colorado River, Rio Grande River, Tijuana River	1.5 maf	
Lower Basin Surplus water (when available)	1.1 maf	

Where are we today?

The Lower Colorado River basin states have developed fully their water allocations while the Upper Colorado basin states have not. By the Colorado River Compact, the Upper Colorado River basin states are allocated 7.5 maf/yr for development. As of 2005 they have developed and are using approximately 4.0 maf/yr. Projections made by the Upper Basin states are estimating that by 2050 the development of Colorado River water may reach 6.1 maf/yr.

The challenge is that the Lower Basin states demands have grown to a level that is only sustainable if the Upper Basin States make releases above the Compact and Treaty obligations. The water budget at Lake Mead, based on Bureau of Reclamation numbers, shows the problem – there is just not enough water coming into Lake Mead under normal conditions:

Inflow to Lake Mead	= 9.0 maf
Release from Powell + side inflows	
Outflow from Lower Colorado River system	= 9.6 maf
AZ, CA, NV and Mexico delivery	
+ downstream regulation and gains/losses	
Lake Mead annual evaporation	= 0.6 maf
Balance	= - 1.2 maf

In other words, if only 8.23 maf is released from Lake Powell every year (the legal requirement), this alone results in a loss of 1.2 maf per year in Lake Mead which equates to a storage decline of 12 feet per year. No matter how you look at the numbers we are in a losing volume game at Lake Mead. In order to meet the water needs, a full Lake Powell and big snow years are required to make the mathematics work. This “Structural deficit” drives the Lower Basin states and Mexico to shortage conditions (i.e. lower reservoir elevations). While NV and Mexico share in this structural deficit and shortage, AZ is taking the biggest reductions and feeling the most impacts in reduced allocations.

The second big factor that is happening is the impacts associated with climate change. Over ninety-percent of the climate models show a decrease in available water of anywhere from 10 to 30 percent. This is on top of the limited amount of water available due to basin development.

What will happen next?

The process for declaring a shortage and putting into motion the shortage criteria is outlined in the 2007 EIS. The key date is where the elevation of Lake Mead is at on January 1st. Anything more than elevation 1075 feet means the states and the Bureau continue to manage the reservoir levels as business as usual (8.23 maf release). Depending on the Bureau’s projections under the 24-month Studies (run monthly) and projected inflow to Lake Powell and projected elevations of both reservoirs Powell and Mead, releases from Glen Canyon Dam can fall into various operational and equalization protocols.

This complex dance of operations is based on historic data (questionable in the new normal of runoff patterns in the Colorado River Basin), anticipated runoff volume and resultant reservoir elevations. In water year 2015 we have bounced from Upper Elevation Balancing to Balancing tier based on runoff changes due to low snowpack and anticipated runoff.

The current projected runoff into Lake Powell (July 2015) is 6.3 maf (88% of average). Based on the April 2015 Bureau of Reclamation assessment, water from Lake Powell to Lake Mead will be a “balancing release” 9.0 maf and will attempt to be completed by September 30, 2015. This effort is being done to ensure that the volumes between the two reservoirs are near equal. Operators are doing all they can to keep the Lake Mead elevations above 1075 on January 1, 2016.

If however the elevation on January 1, (or 2017 or any subsequent years) is less than 1075 a sequence of both operational and administration events will take place. No reductions will occur in California’s allocation under the 2007 Guidelines.

Operational Determinations

Stage I. Lake Mead elevation on January 1 is less than 1075 ft and above 1050 ft.

2007 Shortage criteria call for a reduction of allocations from Lake Mead of 333,000 af.

Arizona gets reduced in their Colorado River allocation to the Central Arizona Project by 320,000 af – an 11.4% reduction.

No water to the Arizona Water Banking Authority.
Cuts will include reduced water deliveries to the Agriculture Settlement Pool with impacts to the agricultural entities with CAP contracts.
No cuts to the municipal and industrial entities with CAP contracts or Indian water deliveries.

Nevada allocation from the Colorado River is reduced by 13,000 af– a 4.5% reduction.

The reduced allocation will occur at the Southern Nevada Water Authorities Lake Mead intake for Las Vegas

Mexico delivery will be reduced by 50,000 aft – a 3.3% reduction (agreed to in Minute 319 and is considered voluntary)

Stage II. Lake Mead elevation on January 1 is less than or equal to 1050 ft and above 1025 ft.

2007 Shortage criteria call for a reduction of allocations from Lake Mead of 417,000 af.

Arizona takes a 400,000 af reduction – a 14.4% loss of their total allocation

Nevada takes a 17,000 af reduction – a 5.6% loss of their total allocation

Mexico takes a 70,000 af reduction – a 4.7% reduction from their 1.5 maf Water Treaty agreement.

Stage III. Lake Mead elevation on January 1 is less than or equal to 1025 ft. and above 1000 ft.

2007 Shortage criteria call for a reduction of allocations from Lake Mead of 500,000 af.

Arizona takes a 480,000 af reduction – 17.1% loss of their total allocation.

Nevada takes a 20,000 af reduction – a 6.7% loss of their total allocation.

Mexico takes a 125,000 af reduction – a 8.3 % loss from

their full Treaty obligation.

Stage IV. Lake Mead elevation drops to or equal to 1,000 ft, the Department of the Interior begins formal consultation with the seven Colorado River basin states.

Implications of reservoir conditions below 1,000 ft.

The Southern Nevada Water Authority will have trouble withdrawing water from Lake Mead.

Less than 4.5 maf of storage will be left in Lake Mead.

There will be reduced power generation at Hoover Dam due to lower elevation head and increased potential for entraining air into the generator intakes with the high likelihood for cavitation and impacts to the power generators themselves. Hoover Dam has a nameplate capacity for electrical generation of 2,079 MW. When the reservoir reaches 1,000 ft that capacity is cut in half to 1,046 MW and at 950 if further reduced to 696 MW. This will have implications to the power grid in the Southwest. Dead pool at Hoover Dam is 895 ft.

Administrative Dance - Options for the Future

Traditionally, the way the Colorado River basin states have dealt with water crisis has been reactive, basically policy making driven by crisis. What the Secretary of the Interior will do once the 1,000 ft elevation in Lake Mead is reached has some options.

Option 1 . Allow Lake Mead to continue to fall. Eventually reaching Dead Pool

SOI continues to make all scheduled deliveries until there is insufficient storage available

As legal demand (priority water right holders) exceed available supply, the SOI will follow the Law of the River priority system. This will focus on clarifying and enforcing existing rules

Central Arizona Project and post – 1968 users = reduced first

Pre-1968, non – PPR users are next tier

PPRs and Federally reserved rights reduced last

When Lake Mead reaches Dead Pool (elevation 895 ft) deliveries are limited to run of the river (annual inflow from Lake Powell plus side lower basin tributaries
With the states consider new interstate arrangements such as water banks, water marketing, water transfers

Option 2. Take emergency action to protect elevation 1,000 ft.

Under Option 2 the SOI could apply direction through negotiation to determine who gets the remaining water in the Colorado River, regardless of priority. For example this could mean an allocation to Nevada to meet health and safety concerns; an allocation to CAP to meet core municipal needs and U.S. Tribal responsibilities (federal reserved water rights), or combinations of other options.

Under this option the SOI actions will displace the Law of the River direction and impacts will likely occur to users other than CAP and SNWA. These reductions will likely happen to agricultural users and Mexico.

Option 3. The Basin States Alternative

As the negotiations from 2002 to 2006 proved, the basin states can find ways to work together toward solutions that share the risk of reduced Colorado River water. For starters the existing structural deficit of 1.2 maf has to be reduced. A couple of key items need to be determined:

How much reduction is necessary and develop target reductions that share the risk

Develop a funding pool, much like they did in Minute 319, to fund specific conservation, augmentation or land fallowing programs

Brackish water desalination

Ocean water desalination

Water Reuse and recycling of irrigated agricultural and municipal runoff and return flows.

States take responsibility if targets are not met

Spread the risk of climate change to all

Protect existing water users from new development

Provide incentives for limiting new development

Provide flexibility and short term options including the use of the market

The Department of the Interior must steps up to reduce overall system losses by at least 500,000 af.

The Department of the Interior must lead by creating more wet water through support of water reuse and recycling grants and program leadership.

Summary

The Department of the Interior, along with extensive input from the seven Colorado River Basin states, tribes, water users and the public published the “Colorado River Basin Water Supply and Demand Study” in 2012. This study con-

firmed what everyone already expected, that the wide range of solutions are needed to mitigate and adapt to anticipated Colorado River shortages.

In the spring of 2013 the Department of the Interior along with the Basin states, tribes, and others initiated a follow-up effort, entitled “Moving Forward” in an effort to develop future considerations and next steps identified in the Basin Study. In May 2015 this report was released with conclusions focusing on the key areas of water conservation, water reuse, and environmental/recreation flows. It is hoped that through these interactions that actions be initiated to address with the shortage conditions. As Lake Mead hit 1075 on June 23rd, it is clear that time is not on a long protracted dialogue and that leadership, thinking outside the proverbial water developer box, and collaboration is necessary.

The implications of climate change to the Colorado River system cannot be ignored or avoided. Under the Colorado River Compact (Article IIId) requirement of 75,000,000 af every ten years (a delivery obligation to the upper basin states), the unallocated Upper Basin apportionments are essentially the last priority on the river and will bear the full brunt of less water in the system. If reduced flows continue the pre-compact present perfected rights are the most senior in the Upper Basin. These PPR’s amount to approximately 2.2 maf. The upper Colorado River Basin is vulnerable to climate change and to significant cut backs of water supply for development.

There are significant resistance to change throughout the Colorado River Basin. The issues of certainty, equity, confusion generated by the water developers, and the ground rules for moving forward will be challenging. The Glen Canyon Institute continues to track and follow the dialogue between the basin states, the tribes and Interior. Our goal is provide science based ideas and doable actions that can help the basin states meet the impending shortage conditions and through the effort provide the ability for Glen Canyon to be restored. We are hoping you will continue your support of our programs.

60% of Colorado River
water is consumed for
livestock feed¹

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High Water in Cataract Canyon — GCI's 2015 Green and Colorado River Trip

— DW

Last June, 18 intrepid GCI supporters and six river guides from Holiday River Expeditions set out from Mineral Bottom on the Green River for 5 days and 4 nights of adventure, camaraderie, and insightful discussions on restoring Glen Canyon. For the last couple of years, GCI has contracted with Holiday to provide logistics and guides for trips through Cataract Canyon on the Colorado and the lower San Juan River. This year began with expectations of a San Juan run but low flows in early May required a shift back to Cataract. Little did we know that two weeks of heavy rain in the region would yield high flows on the Green and Colorado with lots of trees and sediment being moved. Camping locations were at a premium but there was hardly any other river trips to compete for camps.

We began the trip with a hike down the road to Mineral Bottom on the Green River in Canyonlands National Park. Once checked out by the Park Service we pushed our flotilla of two triple rigs, four inflatable kayaks and one stand-up paddle board off, were captured by the current, and began our adventure. Guests had a choice of just sitting in the boat, getting close to the water in kayaks or trying their hand at

the paddle board.

On a GCI trip you have an option of listening and participating in a morning talks or spending time alone. Morning discussions, led by Dan Beard, Former Commissioner of the Bureau of Reclamation and Dave Wegner, GCI Trustee, ranged from climate change, dam removal, the Law of the Colorado River, recreational uses, to hydropower and electrical grid security and economics. The morning talks led to day-long conversations (between hikes, swims in the river and eating) and a good deal of debate over restoration of Glen Canyon. Those evening discussions even included a visit from “Elvis” and some guitar playing around the fire.

Glen Canyon Institute offers these trips to educate and to learn. Holiday River Expeditions does all the cooking and organization, with some of the best river guides in the business, all with years of on-river experience and knowledge of the West and its rivers. In 2016, GCI plans to join with Holiday for another trip on either the San Juan, Yampa or Cataract Canyon. Give the GCI office a call at 801-363-4450 to let them know your interest and the river you would like to explore with us. It will be an experience you will not forget.



Kayakers enjoy a stretch of flat water on the Green River. Photo by Dan Quigley.



Sunset at Spanish Bottom. Photo by Dave Wegner.

A collage of images used for an advertisement. The top left shows a group of people in a blue raft navigating white-water rapids. The bottom left shows a person standing on a red paddleboard on a calm lake, with snow-capped mountains in the background. The right side of the collage features several colorful dry bags (blue, purple, red, yellow) and a blue inflatable pad. The text 'CHANGING THE WORLD ONE LIFESTYLE AT A TIME' is overlaid in large, bold, black letters. The JPW logo and contact information are also present.

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“Removing dams makes economic and environmental sense. Removing Glen Canyon Dam makes the most sense of all. We need to begin the dialog about why and how to remove this obsolete structure.”

—Dan Beard

