

High Country News

For people who care about the West

Unite and Conquer

Las Vegas' notorious water czar was pugnacious and volatile. But Pat Mulroy launched a quiet revolution that could shield 40 million Colorado River users from the worst effects of catastrophic drought.

By Matt Jenkins | Page 10



Glass half full?



On Jan. 1, I joined 15 friends on a raft trip down the Colorado River through the Grand Canyon. That morning, our boats were covered in snow; the canyon's red cliffs, capped with white, looked like giant slabs of frosted carrot cake. The ranger said locals had never seen the place so wintry.

So we were delighted to return to Colorado — thousands of feet higher, where the river's Rocky Mountain headwaters lie — and find no sign of winter. "Mountain biking in a tank top. Suck it, New England," one of our trip leaders crowed from Durango on Facebook as a blizzard battered the East Coast.

But as the endless warm days slushed snow into mud and turned mud into hardpan, a growing alarm replaced our lizard-like impulse to bask. Between Jan. 25 and Feb. 8, 174 Colorado communities met or broke high temperature records. A few on the state's eastern plains even neared or surpassed 80 degrees Fahrenheit.

The Colorado River, which supplies 40 million people and a \$1.4 trillion economy, is already gripped by one of the worst droughts in 1,200 years, so the balmy weather doesn't bode well. And Lake Mead, the giant reservoir that supplies Las Vegas, may this year drop dangerously close to an official shortage.

This was among the grim possibilities that Patricia Mulroy, the former head of the Southern Nevada Water Authority, spent the latter half of her 25-year career preparing for. Now, a year after her retirement, cover story writer Matt Jenkins looks back at Mulroy's long fight to ensure that Vegas retained enough water to feed its growth even as the Colorado River shrank. Though many readers associate Vegas with selfish excess, Mulroy used its predicament to help push the river's water managers into a new era of deal-making and shared sacrifice. The goal is to stretch existing supplies as far as possible — with the side benefit of lessening the need for expensive and environmentally damaging new water infrastructure.

Though Mulroy has moved on, that part of her legacy is increasingly relevant: A NASA study released Feb. 12 suggests that if greenhouse gas emissions continue to rise at current rates, the Southwest and Central Plains have an 80 percent chance of succumbing to multi-decade megadrought in the latter half of this century. "There are degrees of screwed," Peter Gleick of the Pacific Institute pointedly told *Slate*, "and this paper suggests we're falling off the cliff."

Maybe. But how far we fall, and the severity of impact, may depend on how we choose to adapt — especially as Congress continues to ignore climate change. Mulroy reminds us that looming disaster can be a catalyst for change: A glass half-empty is still a glass half-full. So how will we make the best of this dry new normal — one where *any* snow along the Colorado, even in the Grand Canyon, must be seen as an ever more precious blessing?

—Sarah Gilman, contributing editor

Brazilian tourists Fernando, left, and Enrico Gil take a selfie with Lake Mead's "bathtub ring" as a backdrop. JOHN GURZINSKI/LASVEGASPHOTOGRAPHY.COM

FEATURE

- 10 **Unite and Conquer** **COVER**
Las Vegas' notorious water czar was pugnacious and volatile. But Pat Mulroy launched a quiet revolution that could shield 40 million Colorado River users from the worst effects of catastrophic drought.
By Matt Jenkins

CURRENTS

- 3 **Big dig, big disgrace**
5 **Endangered languages**
6 **Ted Schade: Dust devil**
6 **The Latest: Produced water**
7 **A share in the sun**
7 **The Latest: Aerial spraying in Oregon forests**

COVER
Patricia Mulroy, former head of the Southern Nevada Water Authority, poses at Las Vegas Springs, the city's original water source. JOHN GURZINSKI/LASVEGASPHOTOGRAPHY.COM



DEPARTMENTS

- 4 LETTERS
8 THE HCN COMMUNITY
Research Fund, Dear Friends
20 MARKETPLACE
25 WRITERS ON THE RANGE
'Paradise' has turned a little grim By Jenny Emery Davidson
26 BOOKS
The Possibilities by Kauai Hart Hemmings.
Reviewed by Annie Dawid
The Ploughmen by Kim Zupan.
Reviewed by Jenny Shank
27 ESSAY
The Other Journey Home By Nathaniel Brodie
28 HEARD AROUND THE WEST By Betsy Marston

WEB ONLY www.hcn.org



In the first installment of "Ranch Diaries," a new hcn.org series, Laura Jean Schneider tells how she and her husband decided to start their own cattle company in New Mexico.
hcne.ws/ranchdiary1

JOIN THE CONVERSATION

“When I worked in one, they called it ‘an explosion with a fence around it.’ I got into trouble for pointing out hazards. Hated it.”

—Bruce Ostermann, commenting via Facebook on "Refinery workers strike for safety" by Kate Schimel.
hcne.ws/workerstrike



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"I am in love. I do not believe I have been blinded. I am eyes wide open."

—Former Oregon Gov. John Kitzhaber, weeks before he announced his resignation amid a federal investigation into whether his fiancée, Cylvia Hayes, benefitted financially from their relationship, in a romance based on a shared belief in a greener future. *The New York Times*

GOVERNOR'S OFFICE FLICKR PAGE



Gov. Kitzhaber and Cylvia Hayes in happier times

A concrete bed, constructed at the bottom of a 120-foot access pit below the Alaskan Way Viaduct, will hold the Bertha tunnel-boring machine during repairs. SEATTLE DEPT. OF TRANSPORTATION

DEPT. OF TRANSPORTATION

Big dig, big disgrace

A new mega-tunnel won't save Seattle from the tyranny of traffic

Along the Seattle waterfront, beneath 60 feet of earth, lies a monument to human ingenuity. Her name is Bertha, and she's the biggest tunnel-boring machine ever built: longer than a football field, heavy as the Eiffel Tower, endowed with a tooth-studded face five stories tall. Like a giant earthworm, she can chew through dirt and eject it as slurry; in good soil, she's capable of digesting 35 feet per day. On one of her Twitter accounts (@BerthaDigsSR99), she has over 14,000 followers. She is, in every respect, a marvel, come to rescue Seattle drivers from an unsafe and unsightly elevated freeway.

There's only one problem: She's broken.

Bertha's saga began in 2001, when an earthquake damaged Seattle's Alaskan Way Viaduct. In 2009, city and state leaders agreed to replace the perilous viaduct with a 2-mile-long double-decker tunnel. Such a tunnel would require a custom-built machine, and on April 2, 2013, Seattle's mechanical savior arrived on a barge from Osaka, Japan. "Nice place you've got here," Bertha tweeted. "I was expecting rain."

As it turned out, Bertha would be the one who needed saving. On Dec. 3, 2013, she hit a steel pipe; soon after, she overheated. Workers eventually discovered that the bearing seals on her face had suffered damage. Bertha ground to a halt, 1,023 feet

Bertha by the numbers

\$80 MILLION
Cost of machine

\$1.00 – \$1.25
Proposed tunnel toll

439
Number of days between movement

30
Approximate number of buildings that have settled since rescue operations began

496
Twitter followers for @StuckBertha

51.4%
Percentage of *Yakima Herald* readers who think Bertha should go forward

into an 8,000-foot dig.

More than a year later, Bertha has barely moved another inch, the timeline for completion has been pushed back 20 months, and Seattleites are restless. The viaduct is still standing, shaky as ever. Buildings in nearby Pioneer Square have settled and cracked, perhaps as a result of attempts to rescue the stalled drill. In January, two Republican state senators introduced a bill that would kill the \$4.2 billion project altogether. "We can't just continue to pour billions of dollars into a hole with no sign of success on the horizon," said Spokane's Michael Baumgartner, one of the sponsors.

Bertha's proponents argue that if the viaduct comes down

without a highway to succeed it, all those displaced vehicles — up to 110,000 per day — will worsen the city's already nightmarish gridlock. But growing evidence suggests the relationship between highways and traffic doesn't work that way. To the contrary: If you don't build highways, the cars won't come.

Imagine living in Los Angeles. Once a week, you shop for groceries at a pricey supermarket two miles away. You could save money at the Walmart 10 miles down the highway, but with traffic that becomes a half-hour trip. So you stay close to home.

Now imagine that the city adds an extra lane to the highway. Surely, you think, the traffic will dissipate; now it's worth driving to Walmart.

But you're not the only one obeying that logic. Once the road is expanded, more folks use it to shop, visit relatives, go out to movies and restaurants. Soon, the highway is as clogged as ever.

That's exactly what happened when L.A. opened an expensive car-pool lane on I-405 last May. Four months later, traffic was a minute slower than it had been before. Economists call this phenomenon "induced demand": Build more roads, and peo-

ple will drive more. "What's interesting is that traffic increases in almost exactly a one-to-one relationship with road capacity," says Matthew Turner, an economist at Brown University and author of a 2011 paper called *The Fundamental Law of Road Congestion*. "You cannot build your way out of problems."

Back in the mid-2000s, many community leaders argued — and still argue — that Seattle didn't need to replace the viaduct. Improving surface roads and transit, they said, would be cheaper, safer, and more compatible with greenhouse gas reduction goals. But the so-called "surface/transit option" never got far. Abandon the highway, then-Gov. Christine Gregoire said in 2009, and "you can shut down business in Seattle."

Seattle's traffic is undeniably terrible — the fourth-worst in the country. Yet driving rates in Seattle and Washington state have largely been stagnant — and, in some places, falling — for over a decade. National rates have also dropped every year since 2004. The trend is probably generational: Young people drive far less than their parents did. "Bertha, to me, is a failure of imagination," says Clark Williams-Derry, deputy director of the Sightline Institute, a Seattle sustainability think tank. "It comes from a mindset that can't conceive of a world in which traffic volumes might be falling."

Eliminating highways could help expedite driving's decline: According to one review, up to 25 percent of traffic simply disappears when road capacity vanishes. In the aftermath of the 1989 Loma Prieta earthquake, and the fatal, seismically induced collapse of the Cypress Street Viaduct, San Francisco decided to tear down two elevated highways, the Embarcadero and Central freeways, and replace them with surface boulevards. The much-feared congestion crises never materialized. As it turns out, even improving public transit has little influence. Only downsizing roads can change driving habits.

Nonetheless, Bertha will almost certainly survive: Too much money and too many reputations are at stake to entomb her now; the bill to kill the project didn't receive so much as a hearing. Bertha recently began crawling toward an access shaft, from which a crane will hoist her head to the surface for repairs. "There's really no fiscally prudent course other than the course we're on," Gov. Jay Inslee said recently.

Though it may be too late for Seattle to turn back, other cities contemplating car-friendly mega-projects would be wise to learn from the city's struggles. "In the 1950s, bigger and more complicated seemed better," says Williams-Derry. "But today's transportation solutions are distributed, based on technology, more incremental, more efficient. Bertha is not a 21st-century solution." □



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ACCESS AND DISPARITY

Marshall Swearingen's article on the ongoing battle over access to public lands ("This Land Is Their Land," *HCN*, 2/2/15) highlights two of the most crucial concepts in the formation of the culture of the West: private ownership rights and the large amount of land held in the public domain. These two elements and the balancing act required to respect them both stand at the heart of what it means to live in the West. While most Westerners could undoubtedly add their own examples of denied access, there are also numerous compromises that have continued to ensure access to wild areas. Recent decisions on Colorado's Roan Plateau and the working trade-off brokered by Rep. Rob Bishop of Utah and the Southern Utah Wilderness Alliance are two that come to mind.

What the article barely alludes to, however, is the increasing disparity in wealth in the United States. As the middle class continues to shrink, countless Americans will be added to the ranks of those able to find recreational opportunities only on public lands, unable to afford the prices of prime Western lands or the fees of trophy-hunting outfitters. The problem is exacerbated in a climate in which increasingly wealthy interests (whether private or corporate) are allowed to treat the public domain as a private holding.

W. Vance Grace
Grand Junction, Colorado

BULLETS, OIL, FIRE

"This Land Is Their Land" exposes the problems of blocked access, but frames it in terms of landowners vs. access seekers. I have been on both sides of the issue, and I understand that it is not that simple.

Like many residents of Albuquerque's wildland-urban interface, I live a 10-minute walk from public land that connects to the wilderness. Unfortunately, developers have made access difficult for hikers, even though people have walked up the arroyos for centuries.

Our arroyos are now platted into private lots. Our closest formal public access requires that we drive to a paved lot several miles away (when it is open). In an age of permissive open-carry rules, combined with "make-my-day" laws for confrontations on private property, unresolved prescriptive easements are potential gunfight zones. Still, hikers walk up the arroyos.

I have been on the other side of the issue, too, in Boulder County, Colorado. For



decades, I and my predecessors granted low-impact users permission to traverse a wild single-track trail and creek bed near homes. Sometime in the 1990s, the trail was taken over by gun-toting motorcycle, ATV and four-wheel-drive users who widened it, created new tracks and built unauthorized fire rings.

When I closed it to motorized use, local Jeep clubs forcibly re-opened it, claiming that I had illegally blocked a "public highway." Boulder County refused to enforce trespassing laws, even though there was no recorded easement (inverting the standard burden of proof). No government entity filed any access claim, but it still appeared on Forest Service maps, even though on private property.

My only recourse was to make it physically impassable and to win a lawsuit. The victims of the standard all-or-nothing access mentality were the traditional day hikers and birdwatchers who can no longer hike in a place that was ruined by the bullets, oil and fire of those who treated as if it were their land, all their land, and only their land. Now it is de facto wilderness, unused even by me.

Mark Boslough
Albuquerque, New Mexico

THE DOWNSIDE OF DENSIFICATION

As an Arizona resident for more than 30 years, I read "Transportation Transformation" with great interest (*HCN*, 11/24/15). I applaud the light rail, more bikes and walking. However, I believe there are unacknowledged consequences to the new, denser development. In reality, this push for infill in the center of communities is another building boom to accommodate higher populations. This is not about stopping sprawl — the outlying suburbs are already built. This new development will just put more roofs over more heads and use more resources. Where will the additional water come from?

Another consequence involves what

we might lose when we densify the center of our communities. Will new development change or replace existing, often historic, neighborhoods? Will it affect the quality of life of established residents, many of whom own their homes and have contributed to their communities for decades? Will actual traditional (walkable) neighborhoods be adjacent to out-of-character development that imitates aspects of the authentic historic? Will new tall buildings block the views and sun of established residents? Cast shadows or streetlights onto their homes? Invade their privacy?

Perhaps it is time we look at the environment costs of increasing the population of our communities. What is the carrying capacity of the arid Southwest, anyway?

Duffie Westheimer
Flagstaff, Arizona

FACEBOOK FEEDBACK

facebook.com/highcountrynews

... on Judith Lewis Mernit's story, "Why are environmentalists mad at Jerry Brown?"

Fred Rinne: "Brown takes big money from the Western States Petroleum Association and will not end fracking in our state. His water plan would, if enacted, wipe out river, estuary and bay ecosystems to benefit a few billionaire agribusiness crooks and developers."

Herb Alexander: "Sometimes you have to take yes for an answer. Help him, don't trash him."

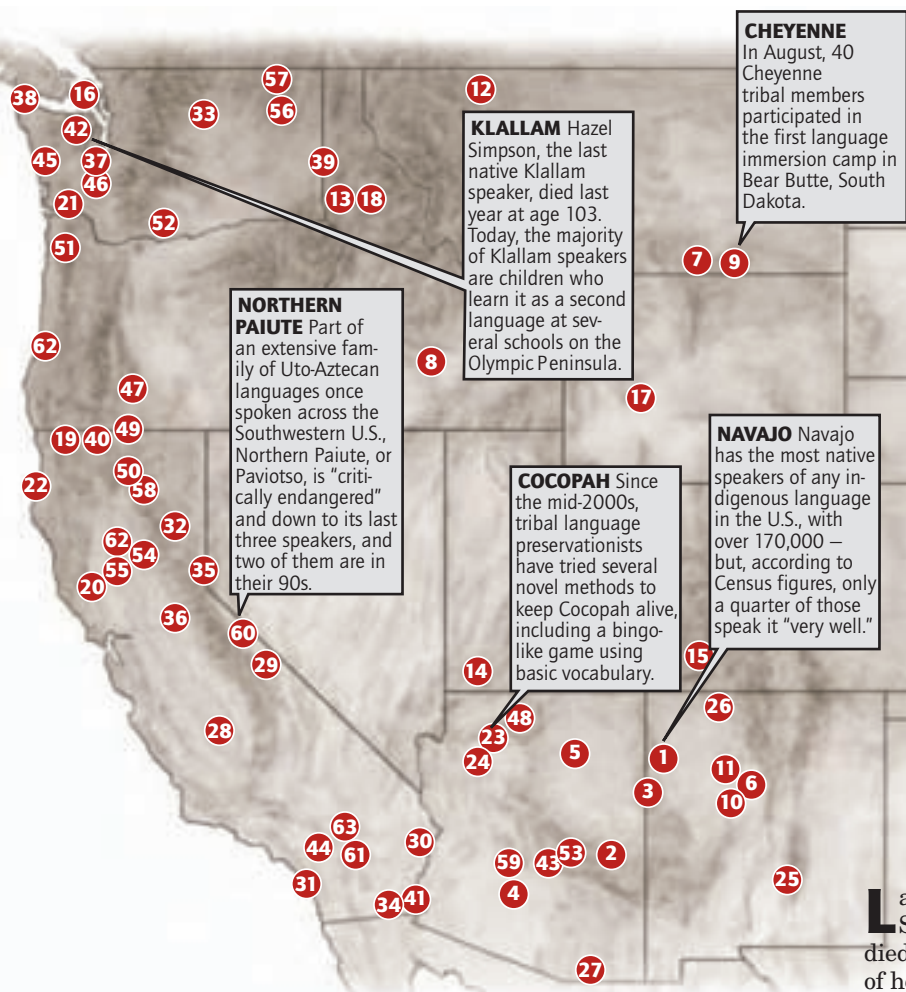
Michael Prather: "The governor needs to kill the tunnels concept and direct funding to the saving of the Salton Sea, a critical migratory bird pathway. His bullet train running through counties with 30 percent unemployment reminds me of India, with its 60 percent poverty, going to Mars. Sheesh. ..."



Not
from
HCN!

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A student copies Lakota words during a class at the Native American Community Academy in Albuquerque, New Mexico. BRIAN LEDDY

Endangered languages

Most of the native tongues of the West are all but lost

Roughly 250,000 speakers of more than 60 languages live in the West

Number on map	Language	Number of speakers	Number on map	Language	Number of speakers
1	Navajo	170,822	33	Okanogan	284
2	Apache	14,012	34	Diegueno	228
3	Zuni	9,432	35	Washo	227
4	Pima	8,190	36	Sierra Miwok	216
5	Hopi	6,776	37	Puget Sound Salish	207
6	Tewa	5,123	38	Makah	176
7	Crow	3,962	39	Coeur d'Alene	174
8	Shoshone	2,512	40	Hupa	174
9	Cheyenne	2,399	41	Yuma	172
10	Tiwa	2,269	42	Klallam	146
11	Towa	2,192	43	Yavapai	139
12	Blackfoot	1,970	44	Cahuilla	139
13	Sahaptian	1,654	45	Quinault	128
14	Southern Paiute	1,638	46	Cowlitz	110
15	Ute	1,625	47	Klamath	95
16	Northern Straits Salish	1,233	48	Havasupai	90
17	Arapaho	1,087	49	Chasta Costa	84
18	Nez Perce	942	50	Achumawi	68
19	Karok	700	51	Upper Chinook	58
20	Pomo	648	52	Santiam	50
21	Chinook Wawa	644	53	Maricopa	44
22	Yurok	491	54	Northwest Maidu	32
23	Cocopah	483	55	Wintu/Nomalak	62
24	Walapai	458	56	Spokane	20
25	Chiricahua	457	57	Columbia	17
26	Jicarilla	455	58	Atsugewi	15
27	Yaqui	425	59	Chemehuevi	15
28	Foothill N.Yokuts/Tachi	452	60	Northern Paiute	12
29	Mono	349	61	Cupeno	11
30	Mohave	330	62	Siuslaw	6
31	Luiseno	327	63	Serrano	5
32	Mountain Maidu	319			

247,580

SOURCES: US CENSUS AMERICAN COMMUNITY SURVEY (2010) AND CATALOGUE OF ENDANGERED LANGUAGES AT THE UNIVERSITY OF HAWAII.

Last February, 103-year-old Hazel Simpson of Port Angeles, Washington, died. This was notable not only because of her age, but because she was the last Native speaker of Klallam, the language of the S’Klallam Tribe of the Olympic Peninsula.

The S’Klallams have worked hard over the last decade to revitalize their language, publishing a dictionary and starting a program to teach Klallam as a second language to schoolchildren on the Elwha Reservation. But something irreplaceable died along with Simpson, the last living person to learn Klallam at home and speak it as a primary language.

Like endangered species, languages are dying across the planet. By one estimate, one language vanishes every 14 days. At this rate, according to language researchers from the University of Hawaii, between half and 90 percent of the world’s 7,000 distinct languages will disappear by the end of the century — a higher rate than the loss of the planet’s biodiversity. Of the 176 known languages once spoken in the U.S., 52 are thought to be dormant or extinct.

Languages die for complex reasons. But research suggests a combination of imperialism, economic development and mass urbanization, all of which tend to favor dominant national languages, such as English, Spanish, Mandarin and French. A recent study by an international group found a striking connection between economic growth and the disappearance of indigenous languages.

According to data from the U.S. Census Bureau, roughly 370,000 Native-language speakers live in the United States, approximately 250,000 of them in the West. Of the

roughly 70 Native languages still spoken in the region, Navajo is by far the healthiest, with more than 170,000 speakers.

Many languages, however, are down to their last speakers. Northern Paiute is one of dozens of Western tongues classified as “critically endangered.” Northern Paiute, also known as Paviotso, belongs to the Uto-Aztecan family of languages, once spoken by dozens of tribes from southern Mexico to Oregon.

Today, there are only three surviving native Paviotso speakers, all of whom live in Bridgeport, California, on the eastern slopes of the Sierra Nevada. Maziar Toosarvandani, a linguist from University of California, Santa Cruz, is working with these last speakers — two of them in their 90s — to build an online dictionary and a compendium of tribal stories.

Such efforts have proven invaluable. Toosarvandani points to the case of the Oklahoma-based Miami Tribe, where a scholar reconstructed the phonetics and grammar of this dormant language using 200 years of anthropological records. Today, the language is being taught to local schoolchildren through the Myaamia Center at Miami University in Oxford, Ohio. “There are examples of languages that have been extremely endangered or dormant, and that have been revitalized,” Toosarvandani said. “It’s possible. But you’ve got to have the documents to do it.”

The Endangered Languages Project, an ambitious partnership between Google and the University of Hawaii at Manoa, not only collects troves of information about the world’s threatened languages but plots them on an interactive online map.

These initiatives will not preserve threatened tongues. The hope, however, remains that linguistic information can be saved in a sort of time capsule, awaiting future rebirth. □

BY JEREMY MILLER

THE LATEST

Backstory

California **oil production has slid since the mid-1980s, but one drilling byproduct has soared.** In some fields, the ratio of “produced water” to oil is greater than 10 barrels to one (“Oil and water don’t mix with California agriculture,” *HCN*, 12/15/10). Produced “water” is actually a briny fluid often laced with contaminants including benzene, heavy metals and radiation. Most of the 130 billion gallons generated annually is pumped into underground disposal wells, or dumped into evaporation ponds. State regulation has remained spotty.

Followup

In February, **the Environmental Protection Agency found that state regulators had permitted more than 2,500 wells to inject produced water into federally protected aquifers** — many of which may contain water clean enough to drink. Nearly half the permits were issued in the last four years, according to the Associated Press, corresponding to increased drilling in the Monterey shale formation, which underlies much of central California. In addition to tighter injection regulation, clean water advocates want to ban the dumping of oil wastewater from hundreds of sumps and ponds.

JEREMY MILLER



CLEAN WATER ACTION



UNCOMMON WESTERNER

Ted Schade: Dust devil

A civil engineer tackles a massive cleanup

Don’t call Ted Schade a hero — definitely not an environmental one. Even though he’s largely responsible for the cleanup of cancer-causing dust from Southern California’s Owens Lake, something he accomplished by waging a decades-long David vs. Goliath battle against the Los Angeles Department of Water and Power — Schade will tell you: He is not a hero.

The director of the Great Basin Unified Air Pollution Control District, a California agency, Schade views his legacy with an engineer’s practical logic. “I had a lawbreaker. I’m a law enforcement officer,” he says, rummaging in a desk drawer for the badge he confesses he has seldom worn.

A lean, mild-mannered man with thinning gray hair, Schade, 57, seems more like Mr. Rogers’ sidekick than an environmental warrior. He is polite and genteel, the product of a Catholic education. But the strength that helped him successfully challenge one of the nation’s most powerful municipal departments sparkles in his eyes: steely blue, penetrating and amused. “I like the fight,” he says.

Schade (pronounced “shady”) works from Suite 9, his office under the red-tiled roof of a former Bishop motel that serves as headquarters for the tiny air pollution district. On the wall is a mid-1800s map

of the Owens Lake Mining District and a small pencil drawing of a snowy plover, the lake’s iconic bird. The miniature Japanese-inspired water fountain Schade built, complete with tiny bamboo spout, burbles.

“I’m a water guy, and this is the desert,” he explains with a shrug and quick smile.

For much of the last 24 years, he has haunted the dusty shores and crusty dry bottom of Owens Lake, monitoring air pollution. Schade loved the area from childhood visits, and, years later, on a whim, left a water-engineer job in San Diego County at twice the salary to join the air district. When he first heard of fugitive dust, he thought it sounded like something escaped prisoners left in their wake. But he soon learned that the ambient particles swirling over the basin were a major health hazard — and a violation of the federal Clean Air Act. Owens Lake is the largest single source of tiny particulate matter in the United States.

The 110-square-mile lakebed has been dry since 1926, 13 years after Los Angeles officials opened an aqueduct that diverted water 200 miles away to the young metropolis. The audacious water grab, memorialized in the 1974 movie *Chinatown*, turned the lake into a ghostly white alkali void. Winds sweeping down the Sierra Nevada kicked up a toxic brew of arsenic

and other carcinogens, carrying it up to 50 miles and threatening the 40,000 residents of Owens Valley with asthma and emphysema — even heart attacks.

“You don’t want to breathe this stuff,” says Schade. “It can kill you.”



JANIE BRAXTON LITTLE

Vocation

Civil engineer, on his Dec. 31 retirement: “My job here is done.”

Hometown

Orange County, California

Botanical prowess

Grows 150 varieties of organic roses

Literary prowess

Wrote *Owens Water Journal*, a collection of haiku

Artistic passion

Building furniture, clocks and office fixtures. “Woodworking is the most useful art.”

His ride

Yamaha 650.

He says

“We need the rabble-rousers, the alternative solution.”

BY JANIE BRAXTON LITTLE

Downdrafts kick up dust over Owens Lake.

BRIAN RUSSELL/GBUAPCD

He made it his mission to improve air quality, experimenting with dust-abatement techniques that required the least amount of water: shallow flooding, gravel, saltgrass. He meticulously documented airborne particulates. And he kept poking around the lakebed and finding more pollution. By 1997, he was prepared to order Los Angeles to implement dust controls under federal clean air regulations.

"And then the fun began," says Schade. L.A. balked; Schade persisted. L.A. sued. Courts backed the district. L.A. attacked. Schade increased monitoring. By 2013, the city was devoting 25 billion gallons of water annually and had spent more than \$1.3 billion on dust abatement. That reduced dust by 90 percent — but it wasn't enough.

Throughout the struggle, Schade remained committed to a fundamental principle: "Los Angeles has caused a problem. It has to clean up after itself." He recounts the ensuing barrage of personal insults with obvious relish: empire builder, out-of-control regulator, zealot. "If they stopped calling me names, I'd know I was not doing my job."

It did get ugly, says Pete Pumphrey, a retired attorney and president of Eastern Sierra Audubon. After each setback, Schade regrouped and returned to the battlefield. "He's one of those people able to see the outcome and just keep working toward that vision."

During Schade's 24 years, three months and 20 days with the air district, Los Angeles went through five different Department of Water and Power managers. Through it all, Schade stuck to his tactic of "making agreeing agreeable because the alternative is so bad."

It finally worked. When Eric Garcetti became mayor of Los Angeles in 2013, he brought in new managers who were interested in solutions, not unending combat. "They knew a lousy legal strategy when they saw one," Schade says. Meanwhile, Schade and the air district had finalized tests of a new waterless dust-abatement method. Late last year, the city agreed to control the dust on up to 53.4 square miles of lakebed, using enormous bulldozers to dig deep furrows that capture and retain the loose dust. The agreement promises clean air for Owens Valley and allows Los Angeles to save 3 billion gallons of water annually — a classic win-win.

In a press release touting the settlement, Mayor Garcetti described Schade as "a truly great environmentalist." Of all the names he has been called over the years, this is the most surprising one and, considering the many past insults, it's from the office Schade least expected. "It's ironic," he says, with a rare full-on grin. "I guess I finally got through." □



Nancy Lillquist at the Ellensburg, Washington, Renewable Park. Even though she paid a steep price as an early supporter of community solar, she's still a big fan. KATRINKA KALARCHIK

ENERGY JOURNAL

A share in the sun

Community solar comes of age in the West

Nancy Lillquist was never optimistic that solar panels would work on her roof in Ellensburg, Washington, a college town on the Cascade Mountains' dry eastern slope. The neighborhood's big conifers blocked the sun. As a city council member, she noted the irony: Even as she and her fellow council members advocated for solar, they were also encouraging planting more trees for shade.

Then Lillquist found another option: In 2006, she invested \$1,000 in a solar-powered renewable energy park the city's utility had just built. The project, which would grow to 109 kilowatts over the coming years — enough to power a dozen homes — occupied open city-owned ground near soccer and baseball fields. Lillquist's contribution paid for about one solar panel in the facility, whose output would earn her and about 100 other residents a credit on their utility bills.

When the Renewable Park came online, it was by many accounts the birth of "community solar." The concept addresses a basic problem: While many homeowners support clean energy, the majority of residential rooftops lack sufficient solar exposure. Renters usually can't install solar panels, no matter how sunny their rooftops, and some homeowners simply can't afford them.

Ellensburg's idealistic experiment cost more than \$1 million to complete. And because the city bought in just before solar began a steep price drop, its solar electricity costs seven times more than the cheap local hydropower. Subscribers like Lillquist will probably never recoup their investments. Nevertheless, she says,

"it feels good to make energy locally."

"People were coming from all over the country to look at the project," she says. Other cities followed Ellensburg's lead. Municipal utilities in Ashland, Oregon, and St. George, Utah, soon created those states' only community solar arrays. In 2007, the Sacramento Municipal Utility District filled its 1-megawatt community solar program — roughly nine times larger than Ellensburg's — with 600 subscribers. More than 20 other Western utilities have since adopted shared solar, some with projects many times the size of Ellensburg's.

Spurred by dramatically lower solar panel prices and rising demand, community solar "has reached a tipping point," according to Becky Campbell, a senior researcher at the Solar Electric Power Association. That means solar energy is on the cusp of being available to everyone. But it also means that Ellensburg's ideals are feeling the strain of going mainstream.

Community solar hasn't had an easy path forward. Most people are served by for-profit, "investor-owned" utilities, which are accountable foremost to their shareholders and are heavily regulated by states. In those utilities' territories, community solar frequently encounters "regulatory underbrush," says Joseph Wiedman, a solar law expert representing the nonprofit Interstate Renewable Energy Council.

Some of that underbrush involves "net metering." Forty-three states require investor-owned utilities to reimburse customers with solar on their property for the electricity they supply to the grid. But

Please see Community solar, page 24

THE LATEST

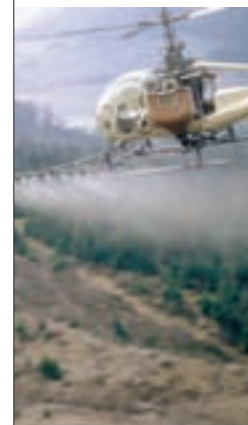
Backstory

In recent years, timber companies have begun **spraying herbicides from helicopters to kill competitive forest weeds** ("Fallout," *HCN*, 11/10/14). Some of those chemicals used, such as 2,4-dichlorophenoxyacetic acid — an ingredient in Agent Orange — have **sickened nearby residents**; some can even cause kidney failure. Oregon is alone among Western states in allowing aerial spraying near homes and schools with no advance warning.

Followup

On Feb. 10, Oregon legislators proposed a law **requiring timber companies to give officials at least a week's notice before aerial pesticide spraying** and to identify which chemicals they plan to use and where. The bill also directs the state's Agriculture Department to establish no-spray residential buffer zones. "Oregon isn't doing enough to protect the health of rural citizens from aerial herbicide sprays," state Sen. Michael Dembrow told *The Oregonian*. "It's time to change these outdated policies."

JUDITH LEWIS MERNIT



BUREAU OF LAND MANAGEMENT

BY MARSHALL SWEARINGEN

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Nampeyo, a Tewa Hopi potter of the Hano Pueblo in northeastern Arizona, decorating pottery in 1903. Yellowware open bowl, detail, attributed to Nampeyo. c. 1905. HOMER EARLE SARGENT, JR. LIBRARY OF CONGRESS, PRIVATE COLLECTION

IN SEARCH OF NAMPEYO: THE EARLY YEARS, 1875-1892

Steve Elmore
220 pages,
softcover: \$50.
Spirit Bird Press, 2015.

Nampeyo was the one of the first Native American artists to be recognized and honored by Euro-Americans. The elegant abstractions of this traditional Hopi potter brought her fame and launched an art movement in the late 19th century. But she rarely signed her work, and much of it was later lost. In his book, *In Search of Nampeyo*, Steve Elmore, a New Mexico-based artist and gallery owner, tracks what he believes is her work through museum storage rooms, private collections and even old, mail-order catalogues, where her pieces may have sold for as little 50 cents. What Elmore uncovers suggests an inventive potter, who may have created over 10,000 pieces and who patiently reworked intricate ideas until she was satisfied. Elmore reintroduces us to a distinctive artist whose work deserves rediscovery and celebration.

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January exodus

As if the short, cold January days were not depressing enough, it was also a bit lonely at *High Country News'* mother-ship in Paonia, as a good portion of the staff deserted us for some or all of the month. Copyeditor extraordinaire **Diane Sylvain** made her annual pilgrimage to St. Benedict's Monastery near Snowmass, Colorado, for several days, leaving the rest of us to try to avoid lapsing into commas. Meanwhile, art director **Cindy Wehling** bailed to Hawaii for a week of well-deserved vacation.

Writers on the Range editor **Betsy Marston** gallivanted around the world, to Ireland and Spain, before spending a few weeks in Berlin, Germany. Her husband, *HCN's* legendary publisher **Ed Marston**, wrote: *Berlin is thus far living up to expectations. Bitter and raw "suicide" weather; overcast even when Berliners call it sunny; and gruff store employees who think retail service is telling you to stop bothering them. But a wonderful city nonetheless because of its fascinating past and present and all the foreigners here, in a nation that used to be 98 percent German.*

Then there was a mass exodus into the Grand Canyon, via rafts, by Web editor **Tay Wiles**, contributing editor **Sarah Gilman** and correspondent **Krista Langlois** and contributor **Danielle Venton**, along with many others. They got on the river at Lees Ferry on New Year's Day following one of

the biggest snows on record, their rafts covered with several inches of powder. But over the next three weeks, as they made their way through the Big Ditch, the weather improved. So much so, in fact, that it was perfect for a wedding: Langlois married her beau, **Jesse Mogler**. The bride, reputedly, wore a lifejacket; no word on whether the groom was equally prepared.

VISITORS

Fortunately, our solitude was broken by one visitor: **Erin Minks** of Alamosa, Colorado, who stopped by with her daughter, **Noelle**, while tracking down "a nest" of old college friends who live near Paonia. Erin had recently unearthed an issue of the magazine that she'd saved, from over 15 years ago. She says it influenced her work as a staffer for Mark Udall, Colorado's former senator, and that she plans to keep reading in her next job: forest planner for Rio Grande National Forest.

CORRECTION

Judith Lewis Mernit, in her Feb. 2 story about Gov. Jerry Brown's uncertain climate leadership ("The Limits of Legacy"), said the organization 350.org led a Feb. 7 climate march in Oakland, California. A number of environmental and labor groups collaborated on the march, of which 350.org was just one.

—Jonathan Thompson and
Kate Schimel for the staff



From left, Danielle Venton, Krista Langlois, Tay Wiles and Sarah Gilman soak up the sun in the Grand Canyon. LOGAN WOODS-DARBY



Unite

and Conquer

Las Vegas' notorious water czar was pugnacious and volatile. But Pat Mulroy launched a quiet revolution that could shield 40 million Colorado River users from the worst effects of catastrophic drought.



The morning of Tuesday, Sept. 27, 2005, brought hints of a classic New Mexico fall, with a forecast high in the 80s and a trace of rain. But in a Wyndham Hotel at the Albuquerque airport, not far from where the rugged buttress of the Sandia Mountains rose into the autumn sky, life was anything but serene. Tensions were rising around a conference table in a rented meeting room, and the catered sandwich platters sat forgotten.

For more than a year, the Southwest's top water bosses had been shuttling between airport hotels all over the region. Regulators from the seven states that depend on the Colorado River, together with major urban water-agency managers, faced a collective crisis that threatened the water supply of nearly 40 million people and a \$1.4 trillion economy: A six-year drought that showed no signs of letting up.

No one at the table that day commanded more attention than Patricia Mulroy. Then 53, Mulroy was the lead negotiator for the state of Nevada and the head of the Southern Nevada Water Authority, the powerful agency that supplies Las Vegas with its water. Partial to pantsuits and shirts with popped collars — a look she picked up from Katharine Hepburn — Mulroy has a crisp, wrinkle-proof bearing and an often unnerving intensity.

For her, the stakes were especially high. Las Vegas' population was exploding, but the city had rights to less than 2 percent of the river's water, and that was running out fast. The one resource Mulroy had in abundance was money: In 2005, the Water Authority would rake in more than \$363 million.

Inside the Wyndham, negotiations reached an impasse as representatives from Arizona and Colorado locked horns over differing interpretations of a key part of the complex body of law that governs the river. "It just went on and on and on," says assistant New Mexico Attorney General Steve Farris. "And the longer it went on, you could just see Pat getting angrier and angrier and angrier."

Finally, Mulroy had enough. "I'd heard all the

nonsense I was going to listen to," she remembers. "And I blew my cork."

Bristling, she rose abruptly and warned everyone that they stood at the brink of war. "She said, 'Nevada has very little water, but the one thing I do have is millions and millions of dollars, and I can afford to spend years in the Supreme Court fighting you all,'" remembers Farris. "So you need to figure out whether you're going to help me out — or we're going to court.'"

Then she stormed out, headed for the next flight back to Vegas. Everyone sat in stunned silence. "It was just like a bomb had gone off in the room," says John Entsminger, then one of Mulroy's lead attorneys.

Suddenly, Mulroy burst back in — to retrieve the cellphone she'd left behind in her fury. Then she turned and disappeared once more, the heavy door slamming behind her.

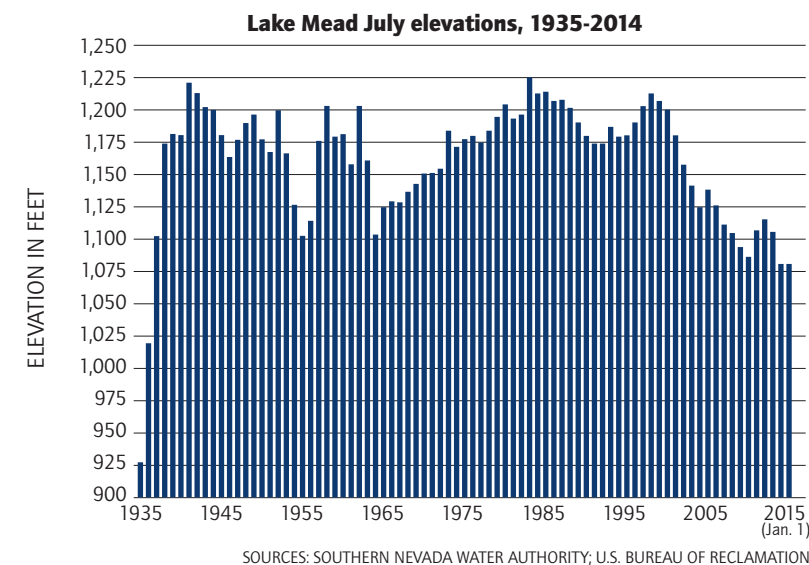
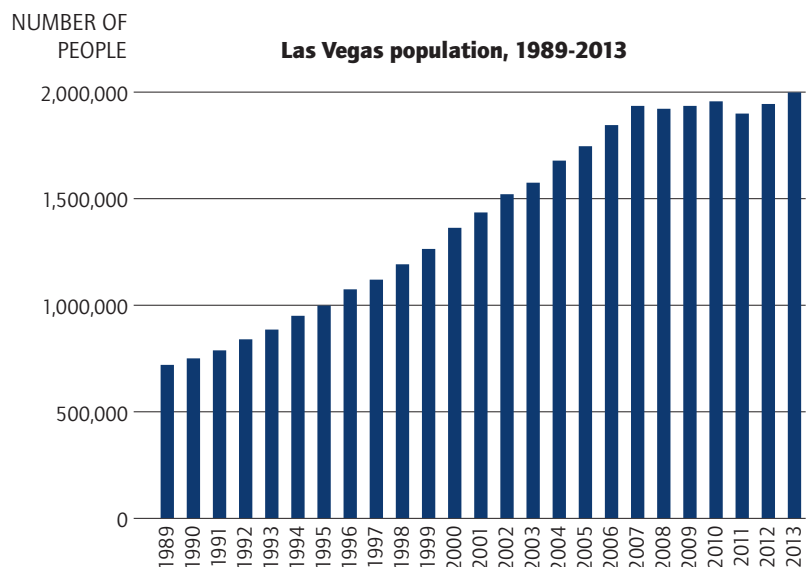
This was classic Pat Mulroy: brash, blunt, combustible and sometimes her own worst enemy. Yet by last February, when she retired after 25 years as Nevada's top water boss, Mulroy had challenged much of the legalistic dogma on the river and forced a radical new style of deal-making in the face of crisis.

"She really was a major force in transforming the way the states worked on the Colorado River," says Bruce Babbitt, U.S. secretary of Interior under President Clinton.

Today, the drought that the water bosses were contemplating in 2005 is dragging into its 16th year, and scientists recognize it as one of the worst in more than 1,200 years. Mulroy was pugnacious, but she also argued for a spirit of flexibility and shared sacrifice. And in doing so, she helped launch a quiet revolution that will shape Colorado River politics far into the future, and perhaps provide a path to safety in the face of intensifying scarcity. Yet even as that transformation ripples forward, a moment of decision is nearing in another of Mulroy's campaigns — a multibillion-dollar water project that stands starkly at odds with much of what she preached.

Former Las Vegas water czar Pat Mulroy earlier this year. Mulroy had a fierce reputation — and a fondness for personally chauffeuring climate scientists and other visitors to the Las Vegas airport to catch their flights.

JOHN GURZINSKI/
LASVEGASPHOTOGRAPHY.
COM



Patricia Mulroy in 1996 at the new Southern Nevada Water Authority Desert Demonstration Garden in Las Vegas. The Water Authority would go on to institute conservation measures that reduced per capita household water use in Vegas by about a third and slowed Vegas water usage even as the population exploded. LENNOX MCLENDON/ASSOCIATED PRESS

Mulroy came to the world of Western water as an outsider. Born in Germany in 1953, Elizabeth Patricia Gallagher was the daughter of a German mother who had herself been born in Java. Her father was a civilian contractor who helped run U.S. airbases. Mulroy also lived in Libya for several years. Her childhood left her with a cosmopolitan sensibility. “As a family, we had always viewed the world as one place,” she told me last March, in a conference room just outside her former office.

Mulroy first came to the city that would become her longtime home in 1974, on a scholarship to University of Nevada, Las Vegas, where she would earn her bachelor’s and master’s degrees in German Expressionist literature. She began a doctoral program at Stanford, but ran out of money and returned to Las Vegas in 1978.

“She was broke,” says Richard Bunker, Clark County manager at the time, who hired Mulroy as his assistant and became her political godfather. “And that’s when I hired her at the county.” Mulroy quickly proved her mettle. “She was the hatchet man,” he says. “She had a tough reputation.”

In 1978, she also met Robert Mulroy, a county finance manager. On weekends, Bob worked as a ski patroller at the nearby Lee Canyon Ski Area, and Pat rode in the rescue toboggan as a mock victim. The two married in 1981; their son, Ryan, was born in 1986, their daughter, Kelley, in 1987.

In 1985, Mulroy became deputy general manager of the Las Vegas Valley Water District, one of seven water agencies that supply Vegas and its suburbs. By 1989,

she was general manager — and found herself with a fight on her hands. The seven agencies were running out of water and squabbling over what remained. “Southern Nevada was in meltdown,” she says. “It was acrimonious and ugly.”

It took three years to find “peace and a pathway forward,” as she puts it, by convincing the other agencies to cooperate under the banner of a new superagency called the Southern Nevada Water Authority, whose primary goal would be to ensure water supplies for the entire metropolitan area. From the start, it was clear that Mulroy would be in charge. “There was no way in hell,” says George Forbes, then Boulder City manager, “that she was going to play Number Two to anybody.”

Then Mulroy turned outward. In the 1920s, when the Colorado River was originally divvied up, Las Vegas was little more than a railroad stop, and Nevada was a sparsely populated desert. The other six states that share the river received nearly all the water — and the power. Mulroy was determined to change that by challenging the so-called “law of the river,” an amalgamation of more than four-dozen statutes, international treaties and court decrees that other states’ managers adhered to, Mulroy notes sarcastically, as if they were Moses’ tablets. With southern Nevada’s warring agencies now united, Mulroy was ready to take on the other states. “When we said something,” she says, “they knew we meant it.”

For his part, Bunker likens Mulroy’s entrance into the broader realm of Colorado River politics to unleashing “a flash-bang grenade” on a bunch of “old, mossback, gray-headed guys.”

Mulroy’s grand entrance came at a critical time for Las Vegas, which was well on its way into a major boom. In 1992, when Mulroy took charge of the Water Authority, roughly 840,000 people lived in the metropolitan area. Over the next decade, that number would nearly double. By 2002, Mulroy fully expected to have hit the limits of Nevada’s full Colorado River allocation of 300,000 acre-feet — roughly 98 billion gallons per year — even as the city continued to swell.

So she launched a campaign to wrest more water from the Colorado. Roughly 70 percent of the river’s water is used for agriculture, and many urban water agencies see that as a reservoir on which they might draw if necessary. But there’s very little farming in southern Nevada, so Mulroy was forced to look toward other states. This was sacrilege in a system where each state traditionally guarded its own allocation of the river as if it was more precious than gold.

Her sights eventually fell on Chevron, which held rights to water that it hoped to use to extract oil shale in western Colorado. The company needed a way to put the water to use until the shale industry took off. One way to do that might be by



A ferry navigates Lake Mead in February, framed by the famous “bathtub ring” left by receding water. The reservoir now stands just 13 feet from a critical level for triggering water cutbacks.

JOHN GURZINSKI

"You need somebody to be yelling at the top of their lungs. And Pat was very willing to provide that service."

—David Hayes, deputy secretary of the Interior under both Clinton and Obama

leasing it to Las Vegas.

That, however, would run headlong into a hallowed proscription in the state of Colorado. Owing to the structure of the law of the river, the upstream, Upper Basin states — Colorado, Wyoming, Utah and New Mexico — and their downstream, Lower Basin counterparts — Nevada, Arizona and California — form two separate negotiating blocs, which are set squarely in opposition to each other on key legal controversies. And Colorado officials have long maintained that, under the law of the river, transfers between the Upper and Lower basins are illegal.

Though it would be decades before Colorado needed its full river allocation, officials there saw Chevron's water as critical to the state's future economic development. If Las Vegas came to depend on the water, they feared, Colorado might lose its rights through a sort of adverse possession.

So when Jim Lochhead, a strategy advisor for Colorado, heard about Mulroy's negotiations with Chevron, he quickly booked a flight to Vegas and delivered a warning: Back off. "She would have gotten years and years of litigation," Lochhead said last year. "And she wouldn't have gotten any water."

Mulroy turned her attention to the safer territory of the Lower Basin. Water managers there were already bandying about a series of interstate "banking" proposals, under which the states could store water for each others' use. Both Arizona and California were interested, but Nevada's need was urgent.

Finally, in 2001, Mulroy got what she wanted: The Southern Nevada Water Authority inked a deal under which it would pay a counterpart in Arizona to buy water from farms there and store it underground. In return, the Water Authority could, in later years, take an equivalent portion of Arizona's share of the Colorado River directly from Lake Mead, the massive reservoir just east of Las Vegas from which the

city already draws most of its water.

Though it was pitched as a banking deal, it was really an exercise in figuring out how to move water across state lines. "If you think about it, it's pretty much the exact same thing as us going to Arizona and buying water and moving it to Nevada," says David Donnelly, who was Mulroy's engineering and operations chief and the principal architect of this deal. "Except in this case, Arizona buys it, takes the water and banks it for us — and then we get it back in the future."

It was also the first federally sanctioned deal for a water transfer between two states. But Mulroy has only ever spoken about it euphemistically because transfers, even within the Lower Basin, are so politically charged. "Don't ever call it a transfer," she scolded during a 2008 interview. "It's a *banking agreement*. That thing will disappear on us tomorrow if we call it a transfer."

She had learned a crucial lesson, however. In the years that followed, Mulroy would — despite her reputation as a woman who didn't mince words — speak an increasingly convoluted lingua franca that would eventually include enigmas like "intentionally created unused apportionment." It sounds like gobbledygook, but it was all for a larger end.

"I learned it's not what you do, it's what you call it," Mulroy told me. "You find the right name for it, and you can do anything."

The opaque language bought managers leeway to try new approaches within the arcane system of interstate water management on the river. That helped Mulroy in her quest for water to sustain Vegas' runaway growth. Ultimately, however, it would help all the Colorado River water bosses weather a much bigger looming disaster.

The dawn of the 21st century brought signs of a grim new reality. The winter of 1999-2000 was dry. So was the next one. Then, during the winter of 2001-2002, snowpack in the river's Rocky Mountain headwaters — source of most of its water — plunged to just a quarter of average.

For decades, bright minds have warned that the compact that divides up the river's water — based on some of its wettest years — promises considerably more than the river can actually deliver. Add the corrosive impacts of climate change, and it's likely that, by mid-century, water managers will have to make do with one-fifth to one-quarter less water than they have legal rights to. By 2002, that problem was becoming alarmingly real for Mulroy.

"We were holding out hope that there would be a late spring storm, and it was not happening," she says.

On a Friday morning in April that year, Mulroy's top managers gathered. "Pat walked into the meeting and just said: 'We've got to have a plan,'" John Entsminger remembers. What had long

been a rule of thumb for Mulroy suddenly became gospel: "We have to live 20 or 30 years in the future," she says. "And we have to assume the worst."

That year, the water level in Lake Mead, one of two giant reservoirs on the river's mainstem, would fall 25 feet. Were it to drop another 100, one of Las Vegas' two water intakes would go dry and the city's supply would be roughly halved. Sixty-five feet below that, the second intake would suck air.

The Water Authority immediately put itself on a water diet, ramping up a "cash-for-grass" program that ultimately paid Las Vegas \$189 million to tear out their lawns, cutting per-person water use in the city by about a third. In 2005, the Authority approved construction of an \$817 million "third straw" that would draw water from deeper within Lake Mead than the existing intakes could reach.

Meanwhile, the river's flows kept fading — and tensions between the states reached a fever pitch. Thanks to a 40-year-old U.S. Supreme Court decision, the U.S. Secretary of the Interior has the power to declare an official shortage in the Lower Basin, which would effectively allow him or her to take control of river management. In May 2005, then-Interior Secretary Gale Norton gave the feuding water bosses an ultimatum: Figure out how to deal with the drought, or face federal intervention.

Norton made the threat, but Mulroy drove people into deal-making mode. "You need somebody to be yelling at the top of their lungs," says David Hayes, deputy secretary of the Interior under both Clinton and Obama. "And Pat was very willing to provide that service" — mostly by threatening to sue her colleagues.

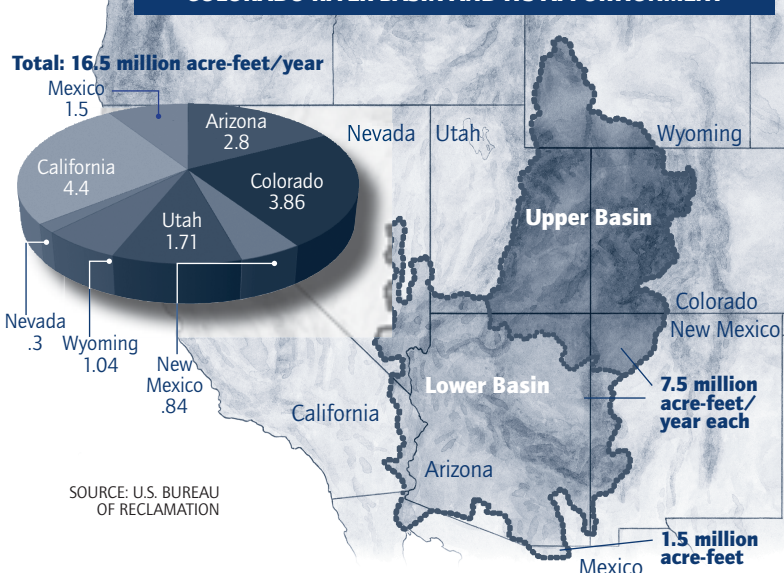
Because fights over the Colorado River are interstate disputes, they automatically go before the Supreme Court. And, at least in part because water cases are such arcane, complex pieces of litigation, the Court has done a famously poor job of resolving them. For most water managers, sending river issues to the Court was a dangerous crapshoot. Mulroy, though, had little to lose and much to gain — which gave her a critical strategic advantage.

"Mulroy was willing to be really tough and invite people to roll the dice," says Peter Culp, an Arizona attorney who has been closely involved in Colorado River policymaking over the past decade. "She'd suggest that that was a really dumb thing to do — but if they wanted to roll the dice, she'd go find some."

"That uncertainty," Culp adds, "was a big driver for cooperation."

That was exactly the point Mulroy was trying to make when she stormed out of the Albuquerque airport hotel in 2005. Even as she was slamming doors behind her, she knew that the only hope for a durable solution lay in the same sense of strength in unity that had driven the creation of the Water

COLORADO RIVER BASIN AND ITS APPORTIONMENT





Authority 15 years earlier. “She obviously advocated passionately for Las Vegas. But she realized that she wasn’t going to get anywhere if she didn’t look at how she was going to help solve some of the bigger issues on the river,” says Lochhead. “Essentially, we were going to find solutions that protected each other.”

So began a marathon three-year round of negotiations, whose intensity did little to curb Mulroy’s appetite for Benson & Hedges DeLuxe Ultra Lights. But the resulting agreement, finalized in 2007 and carefully pitched as a set of “interim guidelines” that will expire in 2026, lays out a damage-control plan for when the river finally sinks into official shortage.

Key to the plan is a series of trigger points that will force the Lower Basin states to throttle back their water use. As the surface level of Lake Mead — currently at 1,088 feet above sea level — sinks below 1,075, 1,050 and 1,025 feet, the states will face progressively greater reductions in the amount of water they can pull from the river. Those cutbacks will sting, but they’ll slow the rate at which the shortage worsens — giving

managers like Mulroy more options for managing the crash. “If I’m sitting at a negotiating table and I’m agreeing to a certain level of shortage,” she explains, “I have a backup plan at home that tells me how I’m going to manage through that.”

The shortage agreement has several components. One of the most important allows the Lower Basin states to put money toward water efficiency projects, fallowing farm fields, desalinating seawater, or “importing” water from elsewhere; they can then sock that water away in Lake Mead. That will help boost water levels and thereby postpone the moment the reservoir falls below 1,075 feet — the first trigger for shortage.

As a whole, the agreement is essentially a strategy to help water bosses stall for time — and pray for snow. Think of it as the roulette-wheel theory of drought survival: Each year that the states manage to stave off a shortage, or keep it from deepening to the next tier of cutbacks, they buy themselves another spin of the wheel. That means one more shot at the jackpot: a big winter snowpack that refills the reservoirs — or at least brings

enough water to buy yet one more spin of the wheel.

“We’re headed for worse shortages,” Mulroy says. “If we can move water around, and backfill other people’s shortages, and take advantage of every opportunity that comes along, then we’ve got a better chance of adapting to what is invariably going to happen on that river system.”

Mulroy was by no means the only person responsible for the deal. It took a whole raft of open-minded, adaptable counterparts from the other states, many of whom maintain far lower public profiles than Mulroy. But as her negotiating counterpart and cautious ally Jim Lochhead — the man who flew to Vegas in 1993 to confront Mulroy — puts it: “It wouldn’t have happened if she weren’t there.”

The agreement could mark the beginning of a new era of hydraulic inventiveness. Water managers are less and less likely to try to engineer themselves out of a problem with massive, Hoover Dam-style projects. Instead, they’re becoming adept at shuffling a finite — and shrinking — supply of water around to cover the

Mulroy testifies at a 2011 hearing about her plan to pump water from eastern Nevada. The project — with a price tag of more than \$15 billion — is still mired in legal challenges. CATHLEEN ALLISON, NEVADA PHOTO SOURCE



Wheeler Peak, the centerpiece of Great Basin National Park, rises from Spring Valley, near the Nevada-Utah border. The remote, sparsely populated area is a key piece of the Southern Nevada Water Authority's planned groundwater project.

RALPH MAUGHAN

most desperate shortfalls. In that sense, the 2007 shortage agreement opened the Rubik's Cube era of water in the West. And while it was born from crisis as a damage-control measure, the deal may prove to be a first step toward long-term sustainability.

Just south of the U.S.-Mexico border, the river once flowed to the sea in the Colorado River Delta. But after more than 80 years of re-plumbing for cities and farms, the river has rarely reached the Gulf of California, and the Delta has turned from a fabled Eden into a kind of wasteland.

In 2000 and 2005, Mulroy and her Western counterparts were entangled in two lawsuits, which argued that water operations in the U.S. were harming populations of U.S.-protected endangered species that happened to live across the border in the Delta. The water agencies ultimately prevailed, though not without an eleventh-hour congressional rider.

What's surprising, then, is that even as Mulroy battled in court, she simultaneously urged that Mexico's concerns and the Delta itself — which she called “a black eye for the whole river community” — be included in discussions about the river. Mexico has rights to about 9 percent of the river's water, but for many U.S. water managers, the neighboring

country “might as well have been an alien planet,” Mulroy says. Soon after the turn of the 21st century, though, Mexico began insisting that it be treated as an equal partner, which meant something had to be done to restore the Delta. “My attitude is: Let's put the skunk in the middle of the table,” says Mulroy. “Let's talk about it. And let's deal with it.”

In fact, as long ago as 1998, Mulroy had started sending water bosses across the border to tour the Delta. Members of her staff would drive roughly 1,000 miles to ferry water managers from the San Diego airport to Mexicali, Mexico, and then farther south to the river's end.

Soon after the 2007 shortage agreement was finalized, U.S. water bosses began another five years of intense negotiation with their Mexican counterparts. That led to Minute 319, an amendment to a nearly 70-year-old water treaty between the two nations. At its heart was a provision for a manmade flood designed to restart some of the natural ecological dynamics of the Delta.

Yet when that so-called pulse flow was finally released last March, Mulroy wasn't there to watch. Her prize had always been something else. Minute 319 also allows U.S. water agencies to fund water-efficiency investments on Mexican farms and canals in exchange for water that — as under the Arizona banking and

2007 agreements — they can use in their own systems.

“She saw opportunity in the Delta,” Lochhead says — for adding yet more flexibility to the system to avoid shortage, and to protect Vegas' supply. “She also saw potential political danger.”

The Delta was but one issue in which Mulroy's enlightened rhetoric was a means to self-interested ends. Mulroy was initially agnostic about climate change. But 2002, that *annus horribilis* when the snowpack failed, changed her mind. “The one thing that always kept me awake at night,” she says, “was two 2002s, back-to-back, with the reservoirs already down as far as they were.”

Mulroy went on to argue, far more openly than any other water boss, that it was time to take climate change seriously. “Are we just going to pretend we're Nero and play the fiddle?” she said last March. “Or are we going to proactively avoid a catastrophe?”

Mulroy realized that the world was changing in ways water managers couldn't yet fathom, and she went out of her way to court climate scientists like the University of Arizona's Jonathan Overpeck. In 2009, he and his Colorado colleague, Brad Udall, flew to Las Vegas for a climate change symposium at the Palms Casino. Mulroy spent the afternoon talking with them before shuttling

them back to the airport in her GMC Yukon. Overpeck was impressed with her concern. “I think a lot of water managers don’t want the public to worry,” he says. “Pat understood that there’s a real problem here, and that if we don’t talk about it, we won’t solve it.”

Mulroy was feeling the heat herself, in every sense of the word. Despite her longtime determination to live a quarter-century in the future, she was still scrambling to keep up with falling reservoir levels: She would ultimately spend nearly \$1.5 billion on a series of massive water intakes to pull water from lower and lower levels in Lake Mead.

In many ways, Mulroy symbolizes the era in which we *all* are at the mercy of a hostile climate. Her credo of dependence and cooperation could become a sort of rallying cry for the 21st century’s grim realities: We are all vulnerable, but we are in this together.

“We all, as a larger basin, are going to be short,” Mulroy said in a notable talk at the University of Colorado law school in 2013. “And we all, as a larger basin, are going to have to bring everything to the table to bring almost 40 million people, and productive agriculture, and national parks, and recreational uses, and tribal nations, and endangered species through the knothole.”

Yet Mulroy’s proselytizing about that perilous knothole would serve a larger purpose: It would become the mainstay of the campaign for her biggest and most controversial idea.

Mulroy always had a Plan B for getting more water. Back in 1989, she made a dramatic opening move: She applied for permits to pump 800,000 acre-feet of groundwater — more than two-and-a-half times Las Vegas’ share of the Colorado — from a 20,000-square-mile expanse of cattle country in eastern Nevada. The area is far off the beaten path, in a starkly beautiful world of wide valleys dotted with sagebrush and winterfat, ranch outposts, desert springs and the craggy peaks and bristlecone pines of Great Basin National Park. It’s also home to three national wildlife refuges and at least five federally protected endangered species, including several rare desert fish.

The \$1.5 billion project, which was the largest groundwater-pumping effort ever proposed in the U.S., opened a gigantic rift between Las Vegas and rural Nevadans. Mulroy backed off the effort to seek permits — until the dry year of 2002, and pressure from the other Colorado River water bosses, spurred her to resurrect it.

Mulroy repeatedly insisted that she wouldn’t actually build the project unless forced to. In 2013, she told the state Legislature that it “is a project of last resort. That means nothing else is possible: There is no way to desalt water; there is no way to exchange water; nothing else is possible to save Lake Mead.” Even so, the Water Authority has already spent more

than \$133 million pushing the project forward.

And last March, Mulroy invoked the threat of climate change as justification for building it: “Cities, in order to adapt to climate change, *have* to diversify where their water comes from — period, end of conversation.”

Despite a shoestring budget, the project’s foes have already managed to drag the permitting process out for a decade by fighting it in state and federal court. And even as regulators and the Water Authority have whittled back the project’s scale, its estimated cost has ballooned to at least \$15.5 billion.

Mulroy’s groundwater crusade has constantly forced her to contend with the ghost of William Mulholland, the notorious Los Angeles water boss who siphoned water more than 200 miles from the rural Owens Valley through the Los Angeles Aqueduct in the early 20th century, ruining the valley’s farming communities. Mulroy hopes for a better legacy. She has long argued that if Las Vegas does have to tap the groundwater in eastern Nevada, it can recharge extra water into the aquifer when it’s available. Meanwhile, she says, the Water Authority can work with local communities to ensure they’re not harmed.

“The days of just going into an area, voiding it of its water resources, and letting happen what will — that can’t happen anymore,” says Mulroy. “There has to be a balance.”

Yet Mulroy has steadfastly refused to agree to objective triggers that would decrease or shut off pumping if it begins harming springs or ranches in rural Nevada. In fact, the legal fight against the project now hinges on this very issue. Without explicitly defined triggers, there’s no legally binding assurance that the Water Authority won’t simply pump the aquifer to exhaustion — which would make the groundwater project an enterprise completely at odds with the credo of shared fate, accommodation and mutual sacrifice that Mulroy urged on the Colorado River.

This is the darkest shadow hanging over Mulroy’s legacy, and it has caused deep unease within her own camp. Steve Sisolak is the chairman of the Clark County Commission, which encompasses the Las Vegas metropolitan area, and since 2009, he has also been a member of the Water Authority board. The more he learned about the project’s potential impacts and the resistance against it, the more worried he became. “It was like: Wait a minute, this isn’t making sense to me,” Sisolak remembers thinking. “This isn’t a good idea.”

The challenges to the proposal, he says, were greater than anyone had anticipated — yet Mulroy refused to back down. “Instead of taking a step back and saying, ‘OK: Let’s re-evaluate,’” he says, “it was like, ‘No: We’re just going to put our foot on the pedal harder to make this happen.’”

Today, Colorado River bosses face the frightening possibility of being caught in a “megadrought” so bad that, even if they do look 25 years ahead, the end may still be beyond view. And while the new generation of Colorado River agreements is unprecedented, those deals can only delay and soften the crash; they can’t prevent it.

It’s not hard to imagine a point where the possibilities of this new style of cooperative problem-solving will run out, when even the best minds on the river are outmatched by the pitiless cycles of the trade winds and the oceans, aggravated by an atmosphere full of greenhouse gases. Mulroy has raised the prospect of the drought becoming so bad that it will necessitate “outmigrating 40 million people” from the Southwest.

Yet there’s still a tremendous safety net for the trillion-and-a-half-dollar, primarily urban, regional economy the river feeds: that 70 percent of the river’s water that flows to roughly 5.7 million acres of farms. A 2013 study by Michael Cohen and colleagues at the Pacific Institute estimates that in the Colorado River Basin, irrigated pasture and forage — mostly alfalfa for cattle — uses an amount equal to about a third of the water in the river. Freeing up just 6 percent of that, through increased water efficiency or outright water sales, would double Las Vegas’ share of the river.

Politically, it would not be easy. But the reality is that the Southern Nevada Water Authority and other agencies are already plumbed into a system that could theoretically provide more water than they’ll need for centuries, even in the face of megadroughts and climate change. And contrary to popular rhetoric, Western cities can turn to farms for water without killing off farming. California is a quarter century into a successful effort to develop, test and refine ways of structuring water transfers that allow farming to continue.

On the Colorado, the new generation of water agreements that Mulroy and her fellow water bosses have negotiated has set the stage for much broader-scale transfers from farms to cities, which will be especially critical in enabling cities to ride out a deepening drought. It’s still far from a wide-open market, but many of the old taboos are breaking down as the law of the river is revised, rewritten and adapted for a drier future.

All of which points up a central paradox of Pat Mulroy’s personality. She has long been known for making outrageous moves. In 1989, she launched the groundwater project in the face of widespread furor within Nevada. In 1993, she poked a finger in Colorado’s eye when she tried to buy water from Chevron. In 2006, she seemingly threatened to have Nevada’s top water regulator fired — something she later denied. In 2009, as Barack Obama was about to take office, Mulroy suggested that the federal government tap the Mississippi River — more than 1,300 miles from Las Vegas — in a New

“Sometimes, you need to look straight into the eyes of disaster in order to start rethinking. People will not change unless they absolutely have to.”

—Patricia Mulroy



Seven years ago, construction began on the “third straw,” an \$817 million water intake that will allow Las Vegas to keep pace with sinking water levels in Lake Mead. The project is scheduled to go into operation this summer.

COURTESY SOUTHERN NEVADA WATER AUTHORITY



Deal-style program to create jobs and ease water shortages in the West. In 2011, when the Mississippi flooded, Mulroy pitched the idea again.

“What we’ve said, continually,” she told me last March, “is that there’s not a single option too far out there to be worth looking at.”

Yet all of that may simply have been a smokescreen for the delicate chess setup — for concepts like farm transfers — that she was doing much closer to home. Ultimately, Mulroy’s real M.O. was incrementalism: a tireless determination to slowly expand what was possible *within* the law of the river. Rather than taking a sledgehammer to the Colorado River’s sacred tablets, she assiduously covered them with sticky notes and asterisks.

Cumulatively, Mulroy was always pushing a bigger program. All of the innovations since the drought began — while carefully pitched as pilot programs and interim measures — have been small advances in Mulroy’s broader initiative, launched more than two decades ago, to open up the law of the river to greater possibilities. That, in large part, is her legacy: pushing everyone into the new era of aquatic contortionism that it will take to fit everything through the knothole.

This is the true revolution on the river. And although water managers remain profoundly reticent about the critical role that water transfers play in this transformation, the proof lies in the rapidly accumulating addenda to the law of the river. In their 2007 “interim” agreement, water bosses included a little-remarked provision that could allow Nevada, Arizona or California to buy water from farms in another Lower Basin state, as long as all three states agree. In 2012, Minute 319 added Mexico as yet another place the Lower Basin states could turn for water.

Some of these provisions lie dormant — for now. But “if the system’s dropping like a rock and Southern Nevada’s out there running around with a checkbook,” says one person who helped write the post-drought agreements, “a lot of farmers are going to take advantage of that.”

In fact, over the past eight months, agencies have developed two new programs under which they hope to begin moving water later this year. In July, the Water Authority, Metropolitan, the Central Arizona Project, Denver Water and federal Bureau of Reclamation approved an \$11 million pilot program to fund water-efficiency improvements on farms or pay farmers to temporarily idle their fields, and thereby infuse the system with an additional 75,000 acre-feet of “shared” water over the next two years. That will boost the odds that drought and climate change don’t push the reservoir levels past the crucial shortage triggers. In October, the U.S. began discussions with Mexico about that country’s participation in the program. And in December, the Lower Basin states, urban agencies and the federal government approved the Pilot Drought Response Actions program, which

gives the states an additional vehicle to fund efficiency improvements or fallowing programs and add another 1.5 to 3 million acre-feet of water to Lake Mead over the next five years, which the water agencies can then individually recover later.

It's now indisputable that farm transfers will help shield 40 million people from the worst effects of catastrophic drought. The wider extent to which they might supply future urban growth remains a persistent riddle.

Mulroy is exceedingly careful to note that farm-to-city transfers "can't be viewed as the easy solution." But much goes unspoken on the river. And even Mulroy — the consummate incrementalist — allows that, sometimes, real change comes only with the convulsive push of a crisis.

"Sometimes, you need to look straight into the eyes of disaster in order to start rethinking," she told me last March. "No issue will be resolved until the time is right and the circumstances are right. People will not change unless they absolutely have to."

Mulroy retired on Feb. 6, 2014. Her husband, Bob, is suffering health problems, and as Mulroy put it soon after she stepped down: "There's no good time. It's just time."

John Entsminger, whom Mulroy hired in 1999, replaced her as head of the Water Authority. Mulroy now holds fellow-

ship positions with the Brookings Institution and the University of Nevada, Las Vegas, and she's a member of the powerful Nevada Gaming Commission, which oversees the state's casino industry.

No agency on the Colorado River bears the mark of a single person as much as the Southern Nevada Water Authority, and Mulroy's legacy will live on for decades. But Lake Mead continues to fall, and the groundwater project lurks in the wings, potent and explosive: a rocket-powered relic of the mega-engineering era, wreathed in whiffs of spraypaint and grease, waiting for liftoff. This, in contrast to Mulroy's studied incrementalism on the river, is her go-for-broke project: the moon shot.

This summer, Lake Mead could drop below 1,075 feet. Though an official shortage won't be declared until it's that low on January 1 of a given year, Mulroy has long said that when Lake Mead does hit 1,075 feet, the Water Authority must decide whether to fully commit to the groundwater project.

That project has been known variously as the Cooperative Water Project; the "in-state" project; the Northern Resource System; and the Groundwater Development Project. No name that's been tried has ever really stuck, and none does justice to its ambition.

Why not call it the Patricia Mulroy Groundwater Extraction and Delivery System? Why not turn all 263 miles of

pipeline, the 245 miles of high-voltage power lines and all the pumps thundering in the desert, into a monument to Mulroy's mind — to the idea that the future need not repeat the past, and that, with the benefit of hindsight from the Owens Valley, things really *can* be done differently? With her name on the line, perhaps it really could be run as a different kind of project: a paragon of balance and a monument to sustainability.

Still, Mulroy helped blaze a trail into a new era, where real innovation comes in the kinds of packages that can't be affixed with commemorative plaques. Plenty of ambitious Western water projects endure today only as yellowing blueprints, historians' curiosities, ghosts from a different era. Ultimately, perhaps, the greatest testament to Pat Mulroy's vision will be that the project that would have borne her name finds a home among all the dream ventures that were never built — because they didn't have to be. □



Matt Jenkins has covered water for *High Country News* since 2001. He currently writes from Washington, D.C.

This story was funded with reader donations to the High Country News Research Fund.



This is the first in an occasional series that looks at the people and ideas helping the West better understand and better use its water, as the threat of prolonged drought looms. The series will highlight possible solutions to the specific problems brought on by the drought — from the way we allocate water to the way we consume or conserve it. Yes, there's less water than we'd like. And yet, there's more than enough, if we're wise, to keep the glass half full.

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1,000 watts (W) = 1kW

1,000kW = 1 megawatt (1MW)

In Colorado, Xcel Energy's **largest coal-fired power plant** can generate up to **1,400MW**

A **typical 250W solar panel** can produce about **45kWh** per month

To provide for its electrical consumption with community solar ...

... an average Colorado **residence** would need a **16 solar panels**, about 4kW

... a **supermarket** would need **3,200 panels**, about 800kW

... the entire state of **Colorado** would need **112 million solar panels**, about 28,000MW

SOURCES: XCEL ENERGY, U.S. ENERGY INFORMATION ADMINISTRATION

A solar array at Taos Academy Charter School was one of New Mexico's first community solar projects.

COURTESY SOL LUNA SOLAR

Community solar, continued from page 7

in most states those policies don't apply to customers who fractionally invest in a community solar project. Some community solar organizers have instead tried to distribute the returns to their investors as cash — an approach that turns their projects into profit-seeking ventures and exposes them to securities laws. These projects have to register with state or federal authorities — a process that can cost anywhere from \$100,000 to \$1 million — or else apply for complicated exemptions that often require costly help from lawyers and accountants.

Even states that encourage community solar have problems. Linda Irvine and 35 residents of Whidbey Island, Washington, scraped together \$430,000 to build a 50kW solar array near a community garden in 2011, selling the energy to the local utility and collecting a 2009 state incentive for community solar. But navigating tax laws and getting exemptions from securities laws made the whole experience “a bit overwhelming,” Irvine says.

The city of Portland, backed by the U.S. Energy Department, tried to build 80kW of shared solar in 2011, but the effort bogged down in state securities laws and other financing hurdles. Andria Jacob, who oversaw the project for the city, says: “You come up against too many barriers.”

By 2010, the price of solar panels was less than half of what it was in 2006, and consumer interest was growing. Community solar was poised to become a big business — if only someone could bring an easy, replicable model to utilities that might not otherwise take the initiative.

A company called Clean Energy Collective, founded in 2010, approached the local electric cooperative in rural northwestern Colorado and proposed a community solar project. Electric co-ops, like municipal utilities, have regulatory autonomy and a mandate to serve their members, and Clean Energy Collective made the utility an offer it couldn't refuse: The company would build the project, as-

sume the financial risk, even calculate the bill credits, as long as the utility agreed to buy the electricity and distribute the credits on customers' bills.

Clean Energy Collective learned to navigate securities laws and claim federal tax credits, and built a 78kW solar array near the local wastewater treatment plant. The project turned a profit. Clean Energy Collective went on to partner with more rural co-ops, including one in New Mexico, where it created that state's first community solar project for a Taos school in 2012.

It got a boost when a Colorado law, the “Community Solar Gardens Act,” cleared state regulators. The law, first passed in 2010, requires investor-owned utilities, including Colorado's major utility, Xcel Energy, to build 6MW of community solar per year into their already existing state renewable mandate of 30 percent by 2020. It was the first legislation in the country to establish clear policies for how community solar should work. Between 2012 and 2015, Clean Energy Collective constructed 11 projects hooked to Xcel's grid, most around 500kW in size — roughly five times bigger than Ellensburg's Renewable Park. Colorado now leads the nation in community-owned solar, and 75 percent of the state's electricity customers have access to a project.

That's made Colorado into a model for other states. Passing laws like the Community Solar Gardens Act is probably the most direct way to expand community solar, says Wiedman.

But that's “a pretty heavy lift,” he adds. Investor-owned utilities often resist, lobbying hard. In 2012, for example, California's two biggest utilities crushed a bill that would require utilities to fold up to 2,000MW of shared solar into their renewable energy requirements. Advocates pushed through a more modest bill in 2013, paving the way for up to 600MW of shared solar in California by 2019.

Now, even investor-owned utilities are joining the community solar game, albeit on their own terms. “A lot of it is purely economics,” explains Jason Coughlin, a

financial analyst for the National Renewable Energy Laboratory. Ellensburg's Renewable Park cost more than \$9 per watt, while today the installed cost of solar — solar-panel cost plus construction and permitting — has dropped to less than \$3 per watt.

“Utilities feel a lot more comfortable with (community solar) now,” says Solar Electric Power Association's Campbell, who's working with more than 50 utilities now considering new programs.

Susannah Churchill, a policy director for the nonprofit advocacy group Vote Solar, says big utilities are also getting smarter. “(They're) seeing that people want the ability to decide where their energy comes from,” she says. Unlike an individual homeowner's rooftop solar, shared solar, if managed by the utility, lets the utility be the middleman and turn a profit.

Even Pacific Gas and Electric, one of California's big three investor-owned utilities, proposed a community solar program while it fought the state's shared solar law. To Churchill, the proposal was little more than another green power program, in which customers would pay a premium for generic solar energy from utility-solicited projects. PG&E continued to push that model as California's Public Utilities Commission considered rules to implement the state's 600MW of new shared solar, but Churchill and others pressed for options that would favor smaller and more local projects.

In January, California regulators issued a split decision: Utilities will be allowed to sell power from their shared solar projects, but they're also now required to buy electricity from third-party developers like Clean Energy Collective that could site projects locally on brownfields or schools. The decision is “a really important moment” for shared solar as it expands across the country, Churchill says.

It's also a nod to community solar's hardscrabble roots in Ellensburg. After all, it was there that the ideal of not just clean, but local, energy took off in the first place. □





Carbonate Mountain in March 2013, at a time of year when it's usually deep in snow. DAN ROBBINS/IDAHOSSUMMITS.COM

'Paradise' has turned a little grim



OPINION BY
JENNY EMERY
DAVIDSON

January glowed brightly around us as we hiked the ridgeline of Carbonate, the mountain flanking the Big Wood River on the edge of Hailey, Idaho.

It's a popular hiking spot, generally in late spring and fall. The entire trail is open to the sky, and switchbacks quickly unfurl views of the Smoky Mountains, Camas Prairie and the star-pointed peaks of the Pioneers. Even when I'm out of breath, it's hard not to fling up my arms and whoop at the glory of it all.

As my husband and I scrambled toward the summit, slushing through small pockets of snow, our dog bounded ahead. Dark midwinter days can be tough, and it felt good to be in the sunshine, working hard. The mountainside was dotted with people. A fit, gray-mustachioed gentleman crossed our path on his descent and gave a half-cocked smile. "Just another tough day in paradise," he said.

We laughed and nodded. That line — "just another tough day in paradise" — is slung around a lot in this area around the plush Sun Valley Resort. It's a statement edged with both gratitude and smugness. "Tough," of course, is always said ironically. We enjoy majestic views, sparkling rivers and sage-scented air. I'm sure that some of us feel like we're part of "the geography of hope," as Wallace Stegner called it in his wilderness letter 50 years ago.

On this particular winter day, the Pioneer peaks were embossed like crisp white linen on a brash blue sky. Yet it was hard to ignore that we were approaching the 6,720-foot summit in January while wearing running shoes. And we were walking on bare ground in midwinter for the second year in a row.

A hike that we always considered closed until April is fast becoming a January tradition.

A year ago, the snowpack in central Idaho was only half of average, which meant tough times for local businesses and a winter economy built around skiing. Farther down the watershed is Magic Reservoir, the water storage facility that allows the dry Snake River Plain to bloom with alfalfa, sugar beets and grain. The reservoir was predicted to fall far short of irrigation demands, and people were worried, until spring rains came and dampened the tension for a while longer. This year, the snowpack started out fair, but it has been receding over the past month. We've had rain for days at a time — in February! — that washes away yet more snow. Worries about summer water have surfaced again.

The ground we've hiked on Carbonate for the past two Januaries has suffered from more than inadequate snowfall. In August 2013, Carbonate was engulfed in the 111,490-acre Beaver Creek Fire. Smoke ghosted the valley; ash choked the river. The south side of the mountain, thick with sage and rabbitbrush, burned hot and fast. The east side burned longer, as solitary pines torched one after another. So the ground we hiked in January 2014 was black. This January, the ground still looked raw, more gray now than black. A few snow banks clung to shady spots.

As we arrived at the summit of Carbonate, frayed prayer flags fluttered, and a mosaic of stickers from coffee shops and outdoor gear companies covered the metal flagpole. A faded yellow ribbon still clung to the pole, honoring the American

soldier from Hailey who was held captive in Afghanistan for five years.

A friend once told me, "The hard thing about living here is that there's so much pressure to be happy." Ultimately, she retreated to a place near Magic, that reservoir 30 miles downstream. Her view from her trailer consists of a wide expanse of desert and a dugout lake. She finds that stark view a little easier to live with.

Paradise in Idaho's Wood River Valley has some scorched edges these days, and those edges might be as significant as the peaks. Still, we try to look to the future with optimism. Perhaps more snow will come before spring truly arrives. Perhaps the reservoirs will fill. And when the hillsides flash green and the yellow balsamroot blooms, our hopes for summer will flicker, too, and we'll forget both snow and fire.

For now, we relish the hikes we get to take on Carbonate, though we probably should not. Much of the vegetation here was burned by the fire, and our footsteps pounding away at the bare ground surely nudge it closer to erosion. But on a midwinter day, when the sky is blue and the sun is bright, we can't resist walking the line — burned-out and muddy as it is — along that rough and tender edge. □

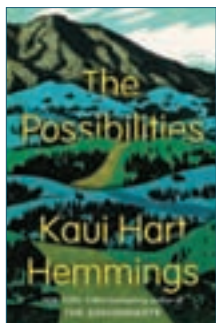
Jenny Emery Davidson lives in central Idaho and serves as the executive director of The Community Library in Ketchum.

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Grief's possible outcomes



The Possibilities
Kaui Hart Hemmings
274 pages, hardcover:
\$25.
Simon & Schuster,
2014.

In Kaui Hart Hemmings' new novel, *The Possibilities*, the tourist town of Breckenridge, Colorado, becomes the setting for a family tragedy that is also a romance. Like her previous book, *The Descendants*, which went on to become a hit movie, *The Possibilities* grapples with the complexities of modern family life. After a young man named Cully is killed in an avalanche, everything in his orbit is upended: the relationships between parents and children, lovers and ex-lovers, grandparents and great-grandparents, the self and its discontents.

Over three days, the reader travels with Cully's mother, Sarah, from Breckenridge to Colorado Springs for a memorial service, and back again, accompanied by Cully's father, grandfather and a female friend of Cully's, whom the bereaved family has never met. Not much happens, yet everything changes. Hemmings is a writer of humor and nuance, charting the internal trajectories of grief as they manifest in her characters.

"A surprise spring of tears floods my vision. ... None of this makes sense. Part of me wants to jump off the balcony. Part of me wants to sing from it. I love and hate this life." Gazing at Pikes Peak after yet another surprising revelation about her son, Sarah tries to reconcile opposing realities. At the same time, she begins constructing a new identity for herself, one that no longer includes motherhood.

A native of Breckenridge and a descendant of settlers, Sarah turns a wry gaze on the ritzy ski-town residents of the former



A snowboarder triggers an avalanche. IVAN CHUDAKOV /SHUTTERSTOCK

miners' hamlet. Tidbits from Breckenridge history sprinkle the domestic drama, like the story of the minister who deliberately rang his morning bells early to awaken the hungover residents. "One day some of the townspeople used dynamite mining caps to blow up his church steeple."

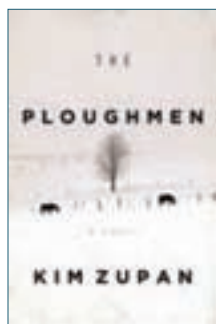
Parts of the novel elicit laughter, others flashes of the deepest sorrow. *The Possibilities*, like a sturdy chairlift, trans-

ports the reader from the bottom to the summit of life, taking in the whole human range between ecstasy and despair.

"I live in a beautiful place. The surrounding pines, so impossibly tall, sparkle with snow. I tilt my face and inhale, willing my surroundings to enter me somehow and to remind me how small I am."

BY ANNIE DAWID

Beauty and malevolence in Montana



The Ploughmen
Kim Zupan
272 pages, hardcover:
\$26.
Henry Holt, 2014.

Valentine Millimaki has hit a stretch of bad luck as Missoula novelist Kim Zupan's dark, lyrical debut *The Ploughmen* opens. Millimaki, who works for the Copper County sheriff's department in Montana, is skilled at tracking missing people in the wilderness with his trusty German shepherd, searching for hunters, hikers and wandering children before they succumb to hypothermia. He's known for his high rate of successes, but over the past year, he has been finding only dead bodies. Millimaki is on call whenever anyone goes missing, but as the newest member of the force, he's also expected to work the jail's graveyard shift.

This jeopardizes his marriage to a wife he hardly sees, and brings him into the role of a confessor for John Gload, a notorious hit man who has finally been caught.

Gload takes a shine to Millimaki, in

part because they both grew up on farms, and begins to regale him with tales of his crimes during the long jailhouse nights. Millimaki's superiors encourage the conversations, hoping to solve old cases, but even as Millimaki tries to convince himself that he's only spending time with Gload for information, a twisted friendship blossoms between the two men. As Millimaki's personal life continues to unravel, and he struggles with unrelenting insomnia, he finds "to his horror that he missed the old man's company."

Gload, with his massive hands, calm demeanor and "oddly courtly" manners, fits right into the literary tradition of the charismatic killer. He's a smooth and steady assassin, like Cormac McCarthy's Anton Chigurh, and can analyze and manipulate others as easily as Thomas Harris' Hannibal Lecter.

In *The Ploughmen*, Zupan, who teaches carpentry at Missoula College, explores the darkest impulses of humanity and sets them alongside the incomparable loveliness of Montana, which he conveys through densely poetic, Faulknerian prose. Millimaki himself marvels at the contrast, wondering, "what in this beautiful country could inspire such evil."

Death and loneliness permeate the vast Western landscape, but the beauty with which Zupan describes them turns *The Ploughmen* into a sort of ornate requiem. "Crows and magpies swarmed the humming power lines overhead," he writes, "awaiting the tender carrion and greeting with caws and croaks the plentitude of the refulgent day."

BY JENNY SHANK

The other journey home

The birth of my daughter has me thinking about Ed Abbey. Not the Abbey of legend — Ol' Cactus Ed, shooter of televisions, defender of wolves and wild rivers. Not the Abbey whose books first spoke to me as I raged against the confines of Los Angeles as a teenager; not the Abbey who convinced me to work seasonal jobs in state and national parks for 10 years; and not the Abbey whose exhortations to “explore the forests, climb the mountains, bag the peaks, run the rivers” I received as scripture from a desert prophet.

No, I've been thinking of a different Abbey. The melancholic, often deeply unhappy Abbey who struggled to balance the opposing pulls of domesticity and wilderness. The Abbey who fled one marriage only to immerse himself in the troubles of another, then another, then another, then another. The Abbey who drifted from one seasonal park job to the next in large part because, as his biographer Jack Loeffler remarked, “in his endless oscillation between solitude and society ... he was rarely totally happy in either set of circumstances. Always longing, forever turbulent, never at peace.”

This is the Abbey who speaks to me now.

For a decade, I worked in some of the most beautiful and remote places in the world: Kachemak Bay State Park, Point Reyes National Seashore, Glacier National Park, Grand Canyon National Park. Living apart from what Abbey dubbed the “clamor and filth and confusion of the cultural apparatus,” I was responsible only for myself and what fit into my car. Each spring I'd throw myself into a new place, and spend the summer building trail. When the long days shortened to wintry nubs, I'd travel or work in some sunny elsewhere.

The nomadic life has its drawbacks: constantly applying for new jobs, making friends only to leave them, rarely earning much money or receiving benefits. It's a life predominantly enjoyed by 18- to 25-year-olds, but it's one that a 29-year-old Abbey entered with a wife and two children. He'd convinced himself that sustaining both a family and a seasonal, wilderness-based life was “within the realm of concrete actuality.” Three marriages later, he admitted, with characteristic candor, “My wives got sick and tired of the constant moving around and the poverty-level income.”

For a decade, my girlfriend, Kelly, and I both gloried in the independence of the seasonal life. We worked in different parks and places, apart almost as often as we were together. But eventually we

accepted that our biggest regret would be to let our rambling detract from what the distance and the desert had taught us to truly value. So we married. And so I left my beloved Southwest and followed Kelly to the Pacific Northwest, where we have remained for an unprecedented four years, and where we recently welcomed our daughter.

Here, too, my life mirrors Abbey's. When Abbey was 34 — the same age I am now — he followed his second wife and two children from Albuquerque to Hoboken, New Jersey, where he worked, miserably, in a welfare office cubicle. Like Abbey in Hoboken, I now sit inside most of the day, switching my gaze between the glow of a computer screen and the rain dripping from the eaves outside my home office. Like Abbey, I long for simple days on naked rock under desert sun. For Abbey, those simple days became, like the “black sun” in his 1971 novel of that name, “a blinding and terrible beauty which obliterated everything but the image of itself.”

Here, then, the biography of the man whom I've consciously or unconsciously emulated for 20 years becomes a cautionary tale. For Abbey abandoned his second

wife and two children and headed off, in his words, to “exile in the desert.” Like the desert prophets before him, Abbey was willing to sacrifice — repeatedly — his children, his wife, and even what he admitted was significant happiness to his uncompromising love of place, his idea of how life should be lived. Even in this, I find something to emulate: the belief that one should not — one cannot — compromise what one holds most dear. This is exactly why, no matter how often I secretly admire or perversely envy Abbey's life, no matter how often I scheme and dream of ways my family can live in what remains of our nation's wild areas, I will follow Abbey no further down his particular rough and lonesome road.

Instead, at the end of a long day, Kelly brings our daughter into my office, and we three stand and look out at the rising moon. I sound a low howl, Kelly adds her coyote yips, and my daughter looks from one of us to the other, beaming bright, and I'm as happy as I ever was alone and free on a desert trail. □

Nathaniel Brodie's essays have appeared in Creative Nonfiction, Terrain.org, The Humanist and other publications.

In a moment of contentment, Edward Abbey reads with his fourth wife, Renee Downing, at a Forest Service fire lookout on Aztec Peak, Arizona, in the Sierra Ancha Mountains in 1978.

BUDDY MAY





HEARD AROUND THE WEST | BY BETSY MARSTON

NEVADA

A "firearms tourist attraction" just a shuttle ride away from the Las Vegas Strip ginned up a novel promotion for Valentine's Day, reports the *Las Vegas Review-Journal*. Machine Guns Vegas invited newly divorced women to stop sobbing over their wedding gowns and "have fun shooting up the dress with an M1919 Browning machine gun." The gun frequently stars in shoot-'em-up movies because it fires a brisk 400-600 rounds per minute. Men are also welcome to try the \$499 "Just Divorced" package, which encourages the recently uncoupled to shoot any marriage-related item of their choice — excluding any photos of recently shed partners. "They're not allowed to shoot a picture," said the business owner, who rejoices in the name Genghis Cohen. "They can do it privately, but if a nut job shoots a husband or wife ... we don't want to be involved in a lawsuit." Cohen anticipates success because he's done the math: About 315 couples get hitched in Las Vegas every day, but national statistics indicate that about half of those marriages will flop. That adds up to thousands of heartbroken lovers who might need to soothe their pain by blasting faded bridal bouquets or worn-once bowties and cummerbunds into eternity. Not that Machine Guns Vegas lacks a sense of romance: It also hosts weddings. "We facilitate all levels of love here," says Cohen.

COLORADO

Speaking of jaundiced views of marriage, the weekly *Ouray Plaindealer* shared a sly remark from Nov. 12, 1909: "A girl is always petted and fussed over before she is to be married, much like we give a Thanksgiving turkey care just before the slaughter."

ARIZONA

The Waste Management Phoenix Open unfortunately failed to manage its own waste recently: Fans of the PGA tour had to step carefully to avoid "puddles of raw human waste when a row of Crowd Pleaser port-o-potties overflowed," reports *The Week* magazine.



COLORADO

Chuck Koehler was hiking in the Garden of the Gods near Colorado Springs on a windless, quiet day after a fresh snowfall. Suddenly, he told the *Independent* weekly, a drone with four propellers appeared, flashing red and green lights and hovering just 12 feet above his head. Koehler considered picking up a rock and beaming it. But he refrained, although he considered a nonviolent alternative, one that raises a legal (and perhaps philosophical) question: "If a man is alone deep in the woods and a drone approaches — and he moons the drone — is this public indecency?"

MONTANA

Ah, indecency: Missoula knows something about that. Last August, 200 mostly naked bicyclists rolled through the city as part of a Dare to be Bare event, celebrating the right of bicyclists of all types of body shapes and attire (or lack of it) to share the roads. If you saw video of the bikers on their tiny seats, you probably thought: That looks *really* uncomfortable. Participants seemed

to have had a good time, but some observers were incensed, including David Moore, a Republican state lawmaker who clearly never wants to see a biker in a thong again. Moore recently introduced a bill that would expand the state's indecent exposure law to prohibit "any nipple exposure, including men's," as well as any garment that "gives the appearance or simulates" any part of a person's nether region, reports the *Billings Gazette*. That wouldn't include yoga pants, but Moore believes "should be illegal in public anyway." The bill, which the Legislature killed in mid-February, was written with the help of retired professor Walt Hill, who explained, "I want Montana to be known as a decent state where people can live within the security of laws and protect their children and associates from degrading and indecent practices."

WYOMING

What should a Sublette County deputy sheriff wear on the job? Western attire, of course, especially since the county includes Pinedale, which *True West* magazine recently designated "a true" Western town, reports The Associated Press. Not so fast, partner: Sheriff Stephen Haskell has introduced a dress code requiring deputies to wear black boots, a black ball cap, and black trousers and tan shirt. This did not sit well with Deputy Gene Bryson, who said, "I've had a cowboy hat on since 19 — I don't know. That's what looks good to me in the sheriff's department. It's Western. It's Wyoming." Bryson retired after 28 years with the department.

OREGON

The mysterious war between joggers and owls has heated up in and around Salem's Bush Pasture Park. In the fourth "angry owl" attack since January, a bird plucked Brad Hilliard's sweat-stained hat off his head, scratching his neck in the process, reports AP. It was identified as a barred owl, a tough species that's been causing trouble for endangered spotted owls as well as joggers. The federal government is now killing thousands of barred owls in an attempt to give their spotted kin some relief.

WEB EXTRA For more from Heard around the West, see www.hcn.org.



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“In ads and reports and TV spots, Big Oil tried to frame the sage grouse issue as an economic rather than a scientific matter, while portraying supporters of an endangered species listing as unsavory agitators.”

Jimmy Tobias, in his essay, "Crude tactics worked against the sage grouse," from *Writers on the Range*, www.hcn.org/wotr