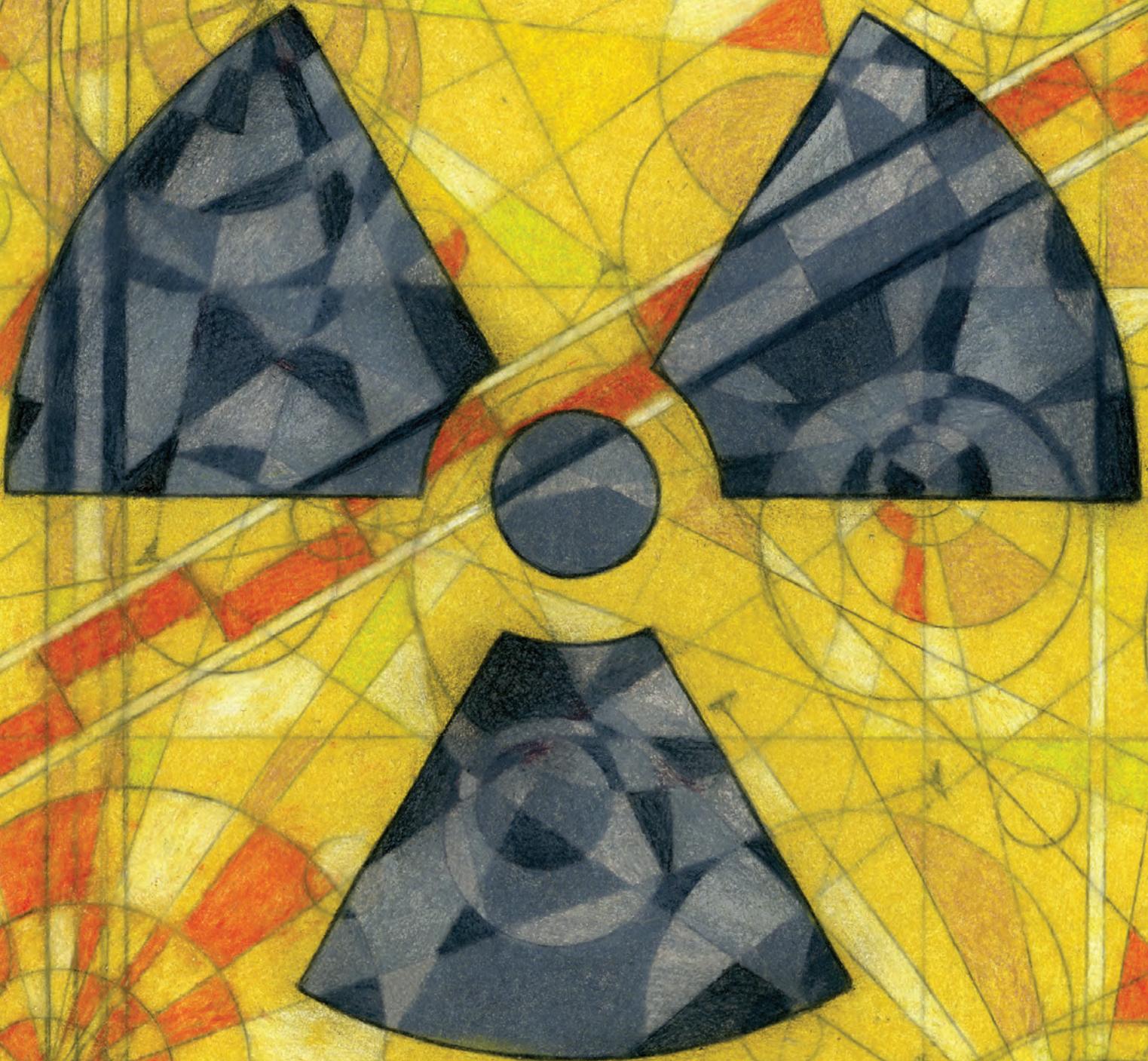


# High Country News

For people who care about the West

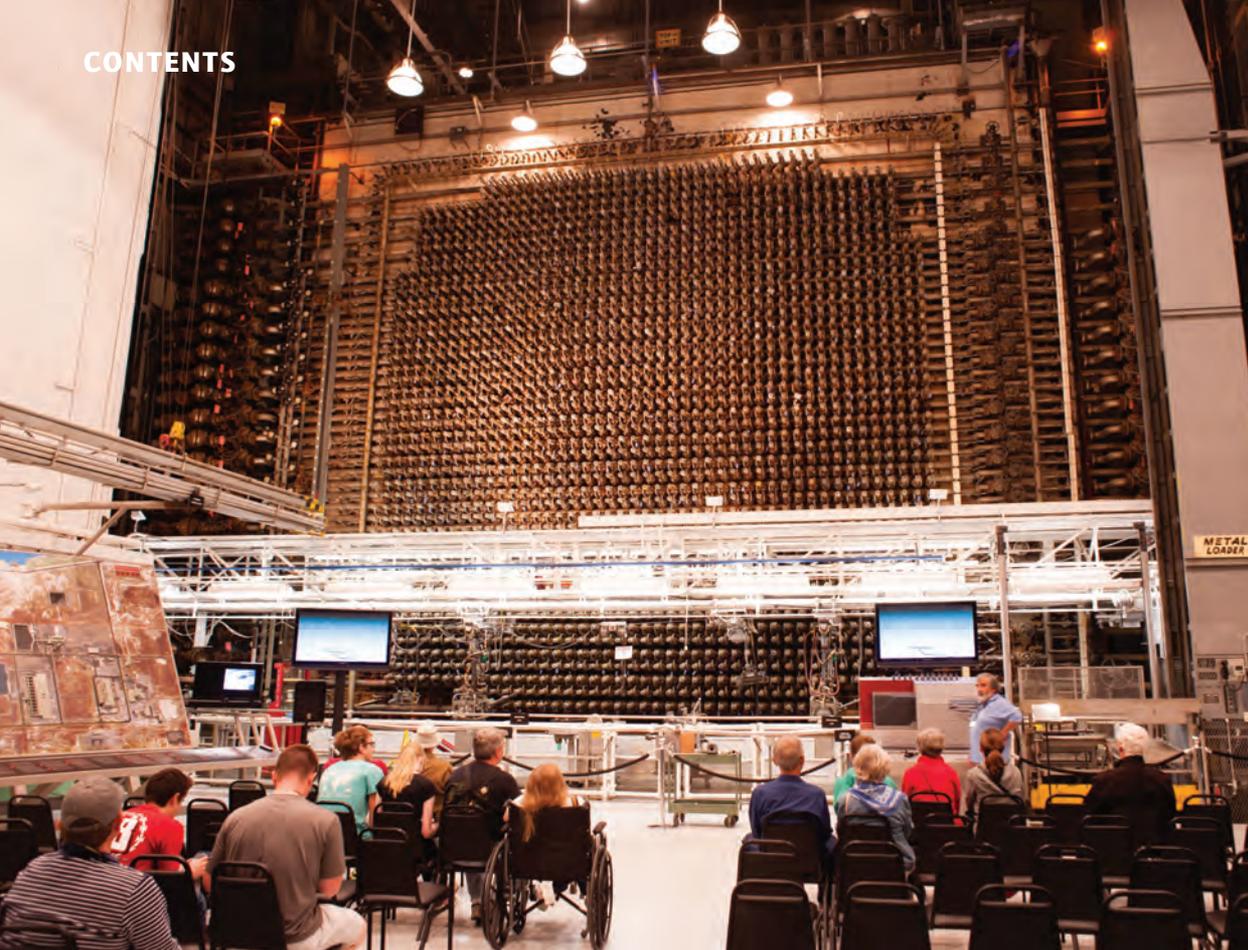


December 10, 2018 | \$5 | Vol. 50 No. 21 | www.hcn.org

## CRITICAL MASS

Despite a radioactive past, the West must again weigh a nuclear future

Jonathan Thompson | Heather Hansman



A tour group at the B Reactor of the Hanford nuclear site. MASON VRANISH / ALAMY STOCK PHOTO

Editor's note

Nuclear's long odds

A light breeze rustled the leaves clinging to the trees behind the Sunflower Café in Sonoma, California, Nov. 8. By the time I downed my second cup of coffee, it had stiffened into a gusty gale from the northeast; when I stepped outside 30 minutes later, billowing clouds of acrid, yellow-brown smoke were descending on the town square like a flock of J.K. Rowling's Dementors.



By the next day, the Camp Fire, more than 100 miles to the east, had burned an astonishing 70,000 acres, consuming the town of Paradise and killing more than 88 people, many of them desperately trying to flee through tinder-dry woodlands. In San Francisco, residents wearing masks struggled to breath air thicker than Beijing's toxic soup. Meanwhile, outside Los Angeles, the Woolsey Fire, fanned by the same late-season winds, raced through chaparral toward the sea, burning the houses of both rich and poor.

Coming on the heels of a deadly hurricane season and a tempestuous election, the blazes delivered an unmistakable message: Climate change is here, no matter how vociferously some deny it, and we have to take notice.

The activists profiled in this issue's cover story agree. Yet, their solution — a global expansion of nuclear power to replace carbon-spewing fossil fuels — is embraced by few in the U.S. To them, the solution is clear: Go nuclear or risk the planet. But, as Jonathan Thompson writes, nuclear power's future is more uncertain than ever. Utilities have largely turned to cheaper natural gas and solar and wind, and are considering shuttering existing nuclear plants as they come up for relicensing. Meanwhile, the long-hoped-for (and heavily subsidized) new generation of small, nimble plants — "nukes in a can" — has had trouble gaining traction, even in the conservative Interior West.

It's not just the economics. After all, we could decide to swallow the costs and go all-in on nuclear to slow what the latest National Climate Assessment report (released, ironically, the day after Thanksgiving) says is already upon us: the accelerated floods, droughts and fires that will cost us tens of billions of dollars annually.

But nuclear power and weapons production are both still saddled with a legacy of spills and meltdowns and radioactive waste, contaminating sites like eastern Washington's Hanford nuclear complex. As Heather Hansman reports in our second feature, the prospect of safely cleaning up these places seems as far away now as it did when cleanups started three decades ago.

Today's climate-savvy nuclear advocates acknowledge these obstacles but refuse to give up. The odds are long, the challenges perhaps insurmountable, but any optimism is welcome in these dark times. As my plane departed the Oakland airport Nov. 10, I could barely make out the San Francisco skyline. A few minutes later, we broke out into blue sky.

—Paul Larmer, executive director/publisher

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Illustration by Stephen Barnwell.  
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Cars abandoned by people fleeing the Camp Fire line the road out of Paradise, California.  
NOAH BERGER/AP IMAGES

### How to prepare for a wildfire

In the wake of the Camp Fire in Paradise, California, the deadliest and most destructive in state history, it is important to know some simple steps to take to prepare before the flames. Here are five steps recommended by fire safety professionals:

1. Determine if you live in a fire-prone area, known as a Wildland Urban Interface. This can be researched through the U.S. Forest Service.
2. Get ready ahead of time: Both long-term home maintenance and short-term planning can improve your ability to survive an evacuation scenario.
3. Know your evacuation plan and communicate it with your community and family.
4. Leave your property in good shape for first responders by attaching hoses, closing windows and removing flammable material from around your home.
5. Prepare to be without power or cell service during wildfire emergencies, and carry maps that can help guide you when services are down. CARL SEGERSTROM

Read more online: [hcne.ws/prepare-wildfire](http://hcne.ws/prepare-wildfire)

### Trending

#### Climate report details deep hits to the Southwest

The United States Global Climate Research Program released a federal report over the holiday weekend about climate change and its impact on the U.S. economy, infrastructure and more. The message is grim. In the American Southwest, for example, temperatures have increased and will keep going up, amplifying droughts. Climate change is also contributing to Southwestern water scarcity, while forests and other ecosystems have a harder time providing wildlife habitat, clean water and jobs. Southwestern tribes are especially at risk because of historical and ongoing threats to their adaptive capacity, and people across the Southwest will suffer more health effects. Taken in total, the assessment offers very little good news, but local efforts to adapt and mitigate are inspiring hope.

LAURA PASKUS

#### You say

HANK LAVIGNE: "Sadly, the GOP will consider this the cost of doing business."

KEN SAYERS: "That makes it sound like it is regional. The whole country will suffer from those hits."

GIBBY TIMLETS: "Getting rid of humans will be the best thing this planet ever did."

Read more online: [hcne.ws/sw-climate](http://hcne.ws/sw-climate) and [Facebook.com/highcountrynews](https://www.facebook.com/highcountrynews)

### Inside Colorado's 'hotbed' of wildlife conflict

Domestic sheep can transmit a deadly bacteria to bighorns when the two species mingle on public lands. Wildlife officials are supposed to make sure that wild and domestic sheep don't interact. But according to a trove of Colorado Parks and Wildlife documents recently obtained by *High Country News*, they mingle more frequently than previously known. And though failures on the part of ranchers, federal agencies and state wildlife managers are often to blame, it's always the bighorns that pay the price. The documents reveal that Colorado's wildlife agency has limited authority to effectively manage wildlife. In practice, a great deal of responsibility falls to permit-holders to keep domestic sheep separated from bighorn herds. Even when they fall short of their agreements, Parks and Wildlife can't take disciplinary action.

PAIGE BLANKENBUEHLER

Read more online: [hcne.ws/big-horn](http://hcne.ws/big-horn)

### Wildfire recovery is possible – for some Westerners

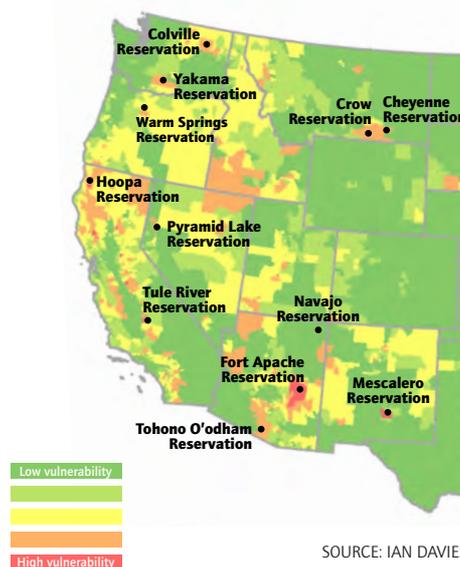
As Westerners prepare for future fires, new research suggests that the answer isn't as simple as avoiding flammable areas. In the academic journal *PLOS One*, researchers explained that for people living in wildfire-prone areas, the possible devastation is increased by socioeconomic and historical factors.

Most Americans living in high-risk areas are affluent, but these aren't necessarily the most wildfire-vulnerable Americans. Roughly 40 percent of Americans living in wildfire-prone areas, or about 12 million people, lack the resources to prepare for or recover from fire. In general, the study found that the elderly, disabled and non-English-speaking are more likely to be devastated by a fire.

By far, the most fire-vulnerable communities in the West are tribal nations: Native Americans, regardless of income, are vastly overrepresented in regions that are both fire-prone and fire-vulnerable.

MAYA L. KAPOOR Read more online: [hcne.ws/wildfire-economics](http://hcne.ws/wildfire-economics)

### Wildfire vulnerability based on landscape risk and socioeconomic factors of recovery



SOURCE: IAN DAVIES



Havasu Riviera State Park, where Arizona State Parks and Trails bulldozed potential archaeological sites.

ARIZONA STATE PARKS DEPARTMENT

### What is lost when cultural sites are bulldozed?

In October, a former archaeologist with Arizona Parks and Trails accused his former boss, Sue Black, of violating dozens of archaeological sites while developing parkland, many of them holding evidence of Native American heritage. In the wake

of the claims, Arizona Gov. Doug Ducey fired Black and her deputy director. Now, tribal leaders wait for the results of a criminal investigation.

ELENA SAAVEDRA BUCKLEY

Read more online: [hcne.ws/bulldoze](http://hcne.ws/bulldoze)

## 830,000

Number of barrels of heavy crude oil per day that could be carried from Alberta to the Gulf Coast through the proposed 1,200-mile Keystone XL pipeline. But in November, a federal judge ruled against the Trump administration on a lawsuit filed by the Indigenous Environmental Network. Now the State Department must supplement an earlier Environmental Impact Statement and take a "hard look" at the effects of current oil prices, potential increases in greenhouse gas emissions, possible damage to cultural resources and new data on oil spills.

JONATHAN THOMPSON Read more online: [hcne.ws/keystone](http://hcne.ws/keystone)

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Rebecca Hemer, Karen  
Howe, Pam Peters,  
Doris Teel  
GRANTWRITER Janet Reasoner  
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circulation@hcn.org  
development@hcn.org  
advertising@hcn.org  
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## HATE-GROUP AGITATION

I just read your article on the Citizens for Equal Rights Alliance with great interest and gratitude (“Why don’t anti-Indian groups count as hate groups?” *HCN*, 11/26/18). I’d be interested regardless, but I am a landowner in Sanders County, Montana, and have been bombarded by the oddest, most addled, acerbic and confusing series of votes on the irrigation district — the Flathead Water Compact — over the years. My takeaway from your article is: Of course; I should have guessed. All the communications have been so melodramatic that I could make neither heads nor tails of them, but I now realize that this is hate-group agitation, using symbolism I am unfamiliar with.

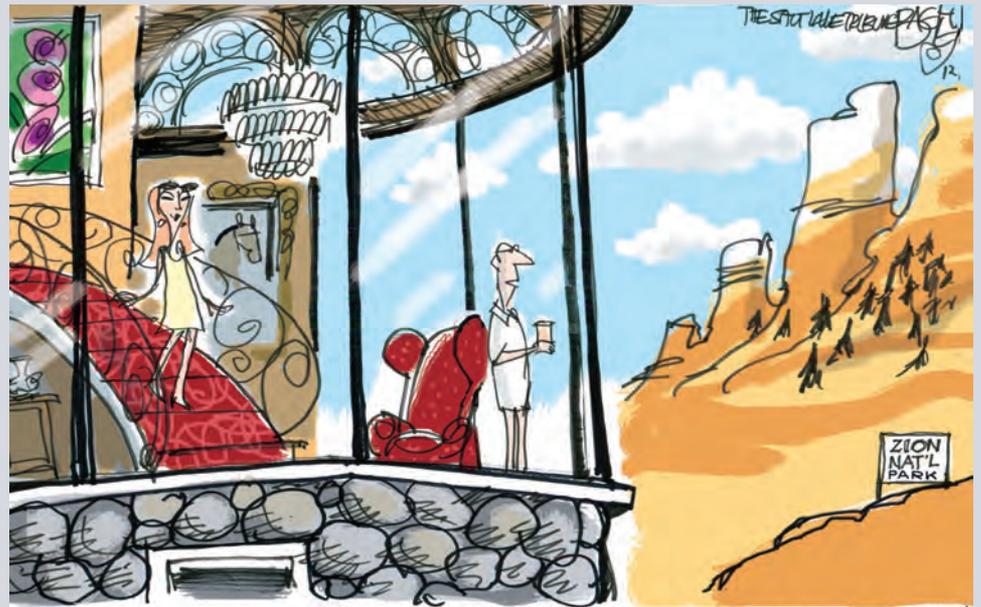
I have to interact with everyone as an individual, and I do not seek disengagement. The designation of the people who believe the CERA spin — who are, as you point out, susceptible to latching onto horrid stereotyping and the “getting things for free” discourse — as hate-group sympathizers will only polarize and invigorate more. Yet to me, this discussion provides clarity and understanding. I await the results of the Southern Poverty Law Center’s analysis and wonder how CERA will compare nationally with other groups. It will require of the SPLC, perhaps, a novel framework in order to account for the relationship of Native American culture to land and water.

*Sarah Rogers*  
Boulder, Colorado

## VOTER EXCLUSION

As facetious as it might sound, the lawmakers in North Dakota could be included on a list of anti-Indian hate groups (“Why don’t anti-Indian groups count as hate groups?” *HCN*, 11/26/18). The evidence: North Dakota’s 2017 voter ID law, which requires strict forms of identification, including street addresses. The law disenfranchises voters on American Indian reservations, where street addresses often do not exist and many residents get mail by post office box. The law requires voters to have a street address to constitute a “valid” ID for registration. This potentially affects 20 percent of the average voter turnout in the state.

State legislators created the law following State Democratic Sen. Heidi Heitkamp’s victorious election in 2012 by a mere 3,000 votes. In that election, she received heavy support from Native



“DON’T YOU JUST WANT TO BELT OUT A VERSE OR TWO OF ‘THIS LAND IS MY LAND, THIS LAND IS MY LAND?’”  
PAT BAGLEY/THE SALT LAKE TRIBUNE VIA CAGLECARTOONS.COM

Americans in the state. (Heitkamp lost in the 2018 midterms, to Republican Kevin Kramer, by more than 35,000 votes.) An initial challenge to the law last year overturned key provisions of the legislation, enabling more Native Americans to vote, but the U.S. Supreme Court upheld a district court ruling in September that reinstated the stricter law. Now we have entire swaths of land out West — reservations — where the basic right of American citizens, the right to vote, has been made prohibitively difficult.

*Pete Simon*  
Arvada, Colorado

## 'LIMOUSINE LIBERALS' AND 'REDNECK RIFFRAFF'

In the excerpt from her new book, *Desert Cabal*, Amy Irvine speaks volumes of truth in a few carefully chosen words (“Contrarian Cowboy: A note to Edward Abbey,” *HCN*, 11/12/18). I nodded in recognition as she described the contrast of old-time rural folk with the vociferous shouts of urban activists who fail to recognize that their lifestyles are as problematic as those of the “redneck riffraff” when it comes to impacting our most beloved outdoor places. I embody both sides. I am part of the problem.

*Linda Paul*  
Boise, Idaho

## DOING JUSTICE TO OUR STORIES

A few of the recent letters to the editor (Ferm, 10/29/18, and Mumaw, 10/15/18) lamenting *High Country News*’s shifts toward coverage reflecting the issues faced by people in the region — not just white recreationists, ranchers or public-lands managers, but people, including immigrants, prisoners, queer people and others, who have often been overlooked in the American West’s homogenous image of itself — make me wonder what direction these readers wish the magazine would take instead.

I can’t remember a time when *High Country News* was not a part of my life, from cutting out funny pictures in the black-and-white newsprint pages as a child to now, nearly 30 years later, looking forward to my annual holiday gift renewal from my parents. (You’re not getting out of it this year, Dad!) The magazine has always seemed to reflect my family and my communities’ conversations, as we’ve learned and grown and, hopefully, become better at listening to the stories that might not look like our own, but have equally shaped the regions we call home, in all its contradictions, beauty, injustices and nuance. Thank you for always striving to do justice to our stories.

*Erica Watson*  
Denali Park, Alaska



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## Where police are failing Indigenous women

*Poor data collection complicates the issue of the missing and murdered*

BY GRAHAM LEE BREWER

A landmark report from the Seattle Indian Health Board's Urban Indian Health Institute paints a critical picture of law enforcement, data collection and media coverage of missing and murdered Indigenous women and girls (MMIWG) in the United States. There is no authoritative accounting of MMIWG in the U.S., but it is estimated that in Canada, up to 4,000 women have gone missing or been murdered over the last several decades.

The study, issued Nov. 14, documents 506 unique cases in 71 cities across the country, most notably in the West. The report shifts focus from rural reservations and tribal communities, which have been hit hard by the crisis, to urban areas. Today, 71 percent of American Indians and Alaska Natives live in towns and cities, yet little to no research has been done on violence against American Indian and Alaska Native women in urban areas.

Of the 71 cities listed in the report, Seattle ranked number one, with 45 identified cases involving missing and murdered Indigenous women and girls. Albuquerque came in second, with 37 cases. The matter is further complicated by the fact that half the cases in Albuquerque are not categorized as "murdered" or "missing" people because the local police did not so categorize the cases. According to the report, the Albuquerque Police Department was one of six law enforcement agencies that failed to respond to Freedom of Information Act requests.

"That's a database and a system being complicit in the erasure and the genocide of Native people. If there is no data on us, we don't exist," said Abigail Echohawk, director of the Urban Indian Health Institute and a member of the Pawnee Nation of Oklahoma. "No matter where (Native women are), whether in the data or in the media, they completely disappear."

Researchers gathered the data from Albuquerque from missing persons databases, news reports, social media and interviews with family members.

The report's database goes back to the 1940s, but two-thirds of the cases collected occurred between 2010 and 2018. And researchers emphasized that the scope of the problem is likely much greater than that, given the amount of data that appears to

be missing. The reasons range from underreporting and poor record keeping to institutional racism in the media and poor relationships between law enforcement and Indigenous communities. Echohawk says that this creates yet another obstacle for the government agencies and lawmakers who rely on such data to make their policy decisions.

Of the 506 cases cited in the study, 95 percent were not covered by media outside of their local market. One case received 47 percent of the national coverage — that of Savanna LaFontaine-Greywind, a member of the Spirit Lake Tribe, who was pregnant when she was murdered by her Fargo, North Dakota, neighbor in 2017.

Law enforcement data on homicides that do exist are also often mistakenly categorized, with American Indian and Alaska Native women identified as white or Hispanic. In Seattle, researchers were given an updated list after the department's homicide unit found that, until the early 1980s, the letter "N" in its system meant "Negro" and not "Native American." Of the 25 women and girls the study identified in Gallup, New Mexico, 20 were not listed in law enforcement records. Seventy-five percent of the women and girls in the study lacked any tribal affiliation, meaning that even tribal governments have no way to fully comprehend how

the issue is affecting their own citizens. Ninety-eight cases could not be categorized as either "missing" or "murdered" owing to poor record-keeping by local law enforcement.

This lack of information and awareness, both on the part of law enforcement and reporters, can encourage the use of stereotypes, which tend to shroud the seriousness of the problem, said Sarah Deer, a professor and author on Native American law and a member of the Muscogee (Creek) Nation.

"A big reason Native women and girls go missing is because people make assumptions that these people chose to live a high-risk lifestyle," said Deer. "And so law enforcement and sometimes local community leaders are saying, 'This isn't someone that we're going to be looking for.'"

An analysis of record-keeping and police practices is part of Canada's National Inquiry into Missing and Murdered Indigenous Girls, established in 2016. Canada, unlike the U.S., is treating the problem as a national crisis. Through community hearings and testimony before the Canadian government, the inquiry is gathering and recording the stories of Indigenous people, along with statistics and expert testimony, in an effort to understand and address the root causes of the problem. The final evidence-gathering hearings will be held in December, and the inquiry's commissioners will submit a final report to the Canadian government by May 2019.

Echohawk hopes the data set released on Nov. 14 will force policymakers to recognize the issue and take action.

"We did this (study) because Native people needed this in their hands to put in the faces of policymakers and say, 'Now I have the data, you can't ignore me any longer.'" □



Participants in Native American Indian Lobby Day gather in Washington's Capitol building to protest Missing and Murdered Indigenous Women in January. Authors of a new report hope the new data will push policymakers to recognize the issue and take action.

TED S. WARREN/AP IMAGES

Graham Lee Brewer is a contributing editor at *High Country News* and a member of the Cherokee Nation. [@grahambrewer](https://twitter.com/grahambrewer)

## THE LATEST

### Backstory

In 2011, archaeologist Marcy Rockman became the first person appointed to study climate change's impacts on cultural resources in national parks. **That year, the GOP-controlled Congress cut her program's budget by 70 percent;** with less than \$3 million, Rockman studied national parks across the country. At the same time, then-Park Service Director Jonathan Jarvis commissioned a scientific report that urged park managers to "boldly and decisively" prepare for severe climate shifts ("How the Park Service is planning for climate change," *HCN*, 8/22/16).

### Followup

**On Nov. 2, Rockman resigned, saying that she had to fight to perform even basic tasks.** Her resignation letter reiterated the importance of addressing climate impacts and added that the Park Service did not adequately support cultural resources, thereby hampering her efforts, "as throughout I've remained effectively a program of one." Rockman now plans to work with the International Council on Monuments and Sites to encourage greater inclusion of cultural and natural heritage considerations in reports from the Intergovernmental Panel on Climate Change.

JODI PETERSON



Marcy Rockman at the 2017 Climate March at the White House. ANDREW S. POTTS



## This Arizona lawmaker intends to force a reckoning with climate change

*Democratic spitfire Rep. Raúl Grijalva will take the helm of the Natural Resource Committee*

BY PAIGE BLANKENBUEHLER

*Less than a week before the midterm elections, U.S. Rep. Raúl Grijalva, D-Ariz., released a report detailing how the House Committee on Natural Resources, on which he has served for 14 years, stacked its hearings with industry interests. "Under Republican leadership," he wrote, "hearings have disproportionately included witnesses who pad their profits by degrading public lands."*

*Now that Democrats have won a majority in the House, Grijalva will have his chance, as the committee's new chairman, to change the direction of the governing body that oversees federal lands and energy and water resources. Grijalva's committee will also oversee and investigate the Interior Department, employing the system of checks and balances that Grijalva thinks his predecessors neglected.*

*In late November, High Country News spoke with Grijalva about his priorities and what his leadership could mean for climate change policies and resource management in the West. This interview has been edited for clarity and length.*

**High Country News:** As you assume chairmanship, what do you hope to do differently than the outgoing chairman, Rep. Rob Bishop, R-Utah?

**Raúl Grijalva:** We have an opportunity to take this committee and its priorities and its policies and legislative initiatives and steer it in a different direction. Under our

jurisdiction, we have issues that have to be dealt with — tribal sovereignty, education, health care, historical and cultural resource preservation.

The other issue is climate change. It touches every issue that we deal with, and the fossil-fuel extraction industries are making such a rush for resources in our public lands. This administration, in two years, has made every effort to suppress science and dumb down the issue of climate change. We want to elevate that again to the status it deserves in decision-making.

**HCN:** How will you do that?

**RG:** We will begin to look at ways in which our jurisdiction can help mitigate the effects of climate change. We'll do that legislatively, by holding hearings and introducing policy initiatives. My committee will revisit all of the rules that have been changed by this administration that have to do with climate change and science, the Endangered Species Act, the Wilderness Act, and responsibility over our federal waters and waterways. The list goes on and on.

**HCN:** How effective can you realistically be in changing the direction of the committee?

**RG:** The prerogatives of the current administration will limit our authority. With this administration, we have had no oversight hearings. Our requests for accountability and inquiries for information have been ignored. But I'm going to re-establish a co-equal status.

Rep. Raúl Grijalva speaks with reporters on Capitol Hill last January. SUSAN WALSH/AP

I have a list of every inquiry the committee has made — many went unanswered by the Interior Department. We are going to send those inquiries again. We want answers to all of these questions. If we get the information, we proceed from there. If we are ignored again, we are in a realm where we need to use legal authority. We, as the majority, have options that we didn't have as a minority. That includes subpoenas.

**HCN:** How will you change the committee's posture toward climate change and wildfire, now that we're seeing much longer fire seasons?

**RG:** There is no way to deny it: The planet is getting hotter, it is getting drier, and one of the things we need to do is confront the issue of these wildfires and other natural catastrophes that are happening — and confront them with the urgency that they demand. The president doesn't think climate is the reason. That denial is embedded in Interior and this administration. We need to elevate the importance of addressing climate change.

Our response has been reactive. We have always dealt with the fire issue as a budgetary issue, and we should, but it's more than that. The issue of climate change cannot be denied. We need to look at how we change building standards and where we decide it's OK to build homes. In some cases, denial (of building permits) is a good thing.

**HCN:** How do you plan to handle the scandals and lawsuits facing Interior Secretary Ryan Zinke?

**RG:** There are 14 Inspector General investigations looking into Interior Secretary Ryan Zinke and the Department of Justice is taking a look at him. (*Editor's note: So far, investigators have yet to confirm any wrongdoing.*) At some point, those dogs start nipping at your heels. We've reached a point that Zinke needs to move on.

There's no question that the extractive industries have had a free rein under Zinke. It's no coincidence that Grand Staircase-Escalante National Monument was shrunk because of coal deposits. Bears Ears (National Monument) was shrunk because of nearby uranium deposits. The criteria of making decisions on how to best conserve and have a multi-use philosophy for our public lands and assets has been skewed in one direction and one direction only.

The extractive industries are protecting Zinke. He's curried favor with them, and they are protecting him. He has a responsibility to protect the multi-use philosophy of the department. He's failed. Resources are there not just for extraction. □

# As border wall grows, tunnels proliferate

*The Trump administration is ignoring a big question:  
How do you secure a border below the ground?*

BY SARAH TORY

On a recent Friday in October, Tekae Michael, a Border Patrol agent who handles public affairs, drove a large SUV along the towering corrugated metal fence that marks the U.S.-Mexico border near Otay Mesa, an industrial area southeast of San Diego. To her left lay another fence, topped with concertina wire, creating a 14-mile corridor complete with stadium lighting, hidden motion sensors and surveillance cameras that lent the border an atmosphere of impenetrability.

But appearances can be deceiving. Michael pointed to where cuts had been made near the bottom of the secondary fence. Dense fog poses another challenge, she added. “It only takes a minute to get over, and then you can just vanish.”

It’s one thing to build a wall — or reinforce an existing one — to secure the border above the ground. But how do you secure the ground beneath it? There, Michael admitted, the border looks more like Swiss cheese. Since the early 1990s, 65 tunnels have been discovered in the Otay Mesa area, mostly built for drug trafficking. But human smugglers sometimes use existing storm drains to ferry migrants across, too. In the U.S., finding and dismantling those tunnels (the “subterranean threat” in Border Patrol lingo) falls to a little-known group of agents within the agency — the Confined Spaces Entry Team, or, simply, the Tunnel Rats.

The agents struggle to stay ahead of the digging. On Sept. 19, Mexican officials unearthed another tunnel, starting from

a private home in the town of Jacume, 60 miles east of Tijuana. Although the tunnel still lacked an exit into the U.S., it did succeed in crossing the border, despite the presence of a 16-foot-high steel bollard wall.

Sandwiched between the two border walls overlooking the warehouses of Otay Mesa, Michael handed out helmets and harnesses to a group of reporters, including me. Below us lay the Galvez Tunnel, which the Border Patrol has kept open for training and media tours since its discovery in 2009. Before the U.S. began building a wall along the Southwest border, there was little need for tunnels, Lance Lenoir, the head of the five-member Tunnel Rats team, told me. A few cables strung between wooden posts were all that marked the boundary between the two countries.

Then, “we put a fence up,” said Lenoir, whose brusque manner was tempered by the image of a cartoon rat on the back of his camel-colored shirt. Since the early 1990s, when border security tightened, an average of two cross-border tunnels have been found every year. Smugglers use them to transport ever-larger quantities of drugs into the U.S. — most successfully, the Sinaloa Cartel, whose notorious kingpin, El Chapo, masterminded the first cross-border *narcotúnel* from Agua Prieta to Douglas, Arizona, in 1989.

Still, Lenoir noted, enhanced border security is not the only reason for the proliferation of tunnels; the rise of cartels and a growing U.S. drug market have

played a role, too. Over the years, officials have found nearly 200 tunnels along the 2,000-mile-long U.S.-Mexico border, mostly in Arizona and California. They range from rudimentary crawlspaces to “super tunnels” that cost upwards of a million dollars to build and are equipped with elevators, electric lights, and disguised exits and entrances. Lenoir refused to describe them as sophisticated, though. “I would not want to give our enemies that kind of credit,” he told me, insisting that I write these details down in my notebook: “The only thing that’s of note when it comes to these tunnels in San Diego is their persistence and audacity.”

Inside the tunnel, 70 feet underground, Lenoir pointed admiringly to the orange tubing covering the electrical wires that run along the gray sandstone walls, sculpted with chisels and jackhammers. “One of the few quasi-professional jobs I’ve seen,” he said.

Professional or not, stopping the tunnels is harder than one might expect. Like many others, the Galvez Tunnel started inside a warehouse in northern Tijuana and ended in Otay Mesa, taking advantage of the heavy truck traffic in and out of the area to help distract unwanted attention. Working with Mexican officials to stop the tunnels is another challenge: There are fewer resources and attention devoted to the issue in Mexico. Right now, Lenoir said, “We’ve closed off these tunnels on the U.S. side, but they’re completely open in Tijuana.” One time, after experiencing a feeling of *déjà vu*, he found himself in the same tunnel that he and his team had previously found and plugged. The builders had simply dug around what the Tunnel Rats had closed off.

Since at least the ancient Egyptians, humans have dug tunnels, and yet even with modern technology, it’s surprisingly hard to detect them. Agents can deploy small robots equipped with cameras to check for smuggling activity, and they can use sonic radar to monitor different ground densities, but mostly, they rely on tips and informants who keep tabs on the warehouses in Otay Mesa — a strategy Lenoir likened to “knowing your battlefield.”

After the hour-long tour was over, we clambered back up the ladder and emerged into the glare of the Southern California sun. Through the slats in the wall, the cars and people and buildings of Mexico were visible just a few feet away. From here, the border didn’t look like a battlefield, any more than the wall seemed like an impenetrable barrier. In the end, it appeared, all it would take is some digging. □

Sarah Tory is a correspondent for *High Country News*. She writes from Carbondale, Colorado.

✉ @tory\_sarah



A wild horse corral facility in Hines, Oregon. GREG SHINE/BLM

## THE LATEST

### Backstory

About 67,000 wild horses and burros roam the West’s public lands. Federally protected since 1971, the animals are both costly and controversial. **The Bureau of Land Management spends \$76 million per year on their oversight, and around two-thirds of them live in permanent holding pens.** Most observers agree the population must be controlled, but disagree strongly on how to do so (“Is there a way through the West’s bitter horse wars?” *HCN*, 11/9/12).

### Followup

**In early November, the BLM abandoned its plan to spy about 100 wild mares in Oregon,** after a lawsuit brought a temporary halt to the research. Wild horse advocates prefer a contraceptive vaccine that makes mares infertile for about a year, but the BLM says its widespread use on herds that roam thousands of acres isn’t feasible. Instead, the agency plans to increase adoption incentives to find homes for more horses, and will likely continue searching for a humane, permanent sterilization method.

JODI PETERSON



Border Patrol Agent Jeremy Wilkins inside the Galvez Tunnel near San Diego.

SARAH TORY/HIGH COUNTRY NEWS



## The arboreal erratic

*A coastal Alaska rainforest tree makes its unlikely home in Oregon's dry mountains*

STORY AND ILLUSTRATION BY SARAH GILMAN

**B**otanists have a joke about time, distance and themselves.

Where most people walk about three miles in an hour, botanists will tell you they dawdle along at one mile every three hours. After all, it is only when you pause that the green blur of a forest resolves into individual species.

Joe Rausch, head botanist for the Malheur National Forest in Oregon, claims to be different, though. The barrel-chested 44-year-old looks more like a firefighter than someone fascinated by the genetics of miner's lettuce plants. "I am impatient for a botanist," he said.

This "impatience" is relative. It's true that Rausch strode down the trail, deep in central Oregon's Aldrich Mountains, well ahead of forest geneticist Andy Bower

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Sarah Gilman writes and draws from Portland, Oregon.

and former Forest Service Northwest region botanist Mark Skinner, who stopped every 20 feet to inspect a new wildflower, exclaiming, "You don't want to walk by all this stuff, do ya?" But as we switch-backed down a hot, bright slope of yellowing grass, Rausch also lingered over his fair share of plants, especially trees emblematic of the mountain range's parched climate — juniper, ponderosa pine, mountain mahogany dangling with horsehair lichen. It was a good thing, too: Our destination was the kind you can easily miss, where a few steps take you into a different world.

Rausch signaled for us to leave the trail where it crossed a shadowy notch in the mountainside, threaded by a stream. The desert forest fell away as we climbed, and we soon found ourselves in a cooler, wetter grove of feathery conifers. Their limbs joined overhead like linked hands,

softening the unblinking sunshine to an ethereal glow. These are the last creatures a botanist would expect to find in this place: a wayward pocket of Alaska yellow cedars, hundreds of miles inland from their core range, which stretches along the rainy coasts and cold mountains of Southeast Alaska and British Columbia, and through the high Cascades in western Washington and Oregon.

Yellow cedar has long been one of the far Northwest coast's most culturally and commercially important trees, with strong, decay-resistant wood prized for building and sculpture, and soft fibrous bark used in weaving. They're thirsty, too. Ketchikan, Alaska, deep in yellow-cedar country, receives a squelchy 150 inches of precipitation annually. The Aldrich Mountains get just 21.

"Why are these *here*?" I asked Rausch.

*Please see Arboreal, page 22*

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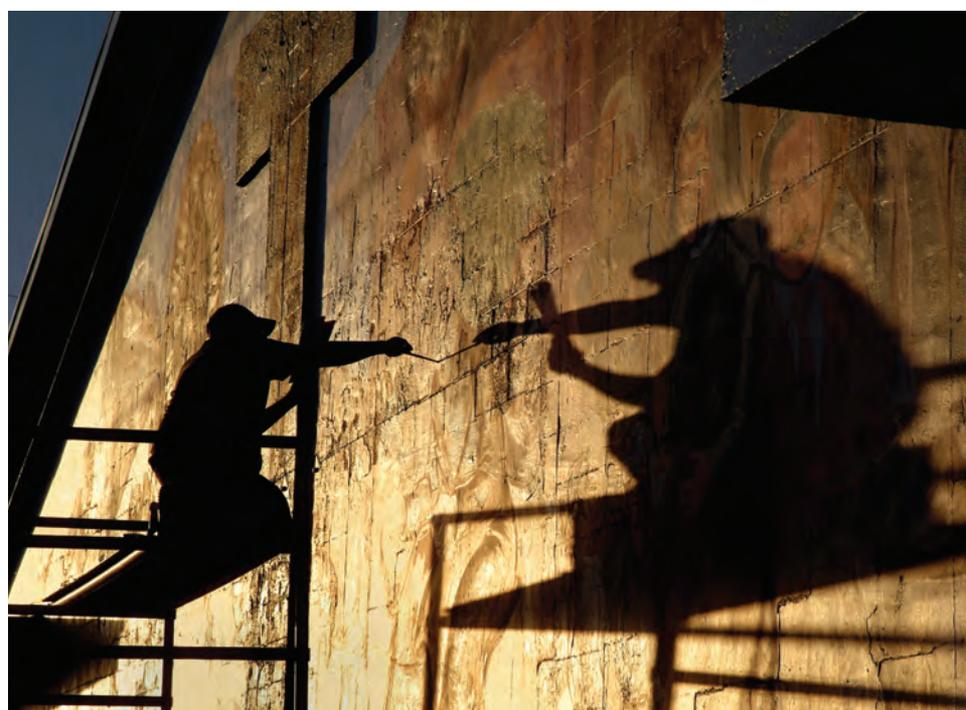
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*Muralista. Segundo Barrio, El Paso, Texas, 2006.* BRUCE BERMAN

**CUTTING THE WIRE: PHOTOGRAPHS AND POETRY FROM THE U.S.-MEXICO BORDER**

By Bruce Berman, Ray Gonzalez and Lawrence Welsh  
 136 pages, softcover: \$29.95.  
 University of New Mexico Press, 2018.

In *Cutting the Wire*, photographer Bruce Berman frees the Borderlands from its stereotype as a place where barbed-wire-topped walls loom over the poor and desperate, revealing a more complete reality where ordinary people experience the banalities, triumphs and fragility of life. In photographs taken over four decades, readers gain a sense of the complexity of this region, where religion is painted on the walls and the *desaparecidos* are remembered on telephone poles.

Berman's images are accompanied by the rich and illuminating poetry of Ray Gonzalez and Lawrence Welsh, who tell the story of the Borderlands through artfully crafted scenes and narratives. "These are real places, real people, real images brilliantly portrayed in photos and words," author Daniel Chacón wrote in a review. "A lot of artists just don't 'get it' ... so it's refreshing to see a representation of our region from people who know what life is like here." BY JESSICA KUTZ



*Angel of Juarez, Mexico, 1999.*  
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 Jeff Snyder | Divide, CO  
 Margie Sohl | Salida, CO  
 Hong & Sunnie Son | Hiawasse, GA  
 Lawrence Sprague | Andover, NH  
 Thomas St. Martin | Denver, CO  
 Ron & Joy Surdam | Jackson Hole, WY  
 Diana F. Tomback | Denver, CO  
 Bill Tonkin | Boise, ID  
 Richard & Sandy Towers | San Antonio, TX  
 David Trout | Port Orchard, WA  
 Stephen Vago | Sterling, VA  
 Bill Voigt | Laramie, WY  
 Christal Waters | Davis, CA  
 Gary Werner | Madison, WI  
 Aaron Wernham & Jana McAninch | Bozeman, MT  
 Dave White | Grand Junction, CO

## A most welcome winter

Looking out on the rain now washing away last weekend's snow here in Spokane, Washington, I envy the folks at *High Country News'* home base in Colorado, where a healthy dose of white stuff is flying around the Rocky Mountains (though not, as of press time, in Paonia). The people of the Four Corners are particularly grateful, given the persistent drought that has gripped the region lately.

In November, on the campus of our satellite office at Western Colorado University in Gunnison, Editor-in-Chief **Brian Calvert** introduced author **Michael Kodas**, co-director of the University of Colorado Boulder's Center for Environmental Journalism, who discussed his recent book, *Megafire: The Race To Extinguish a Deadly Epidemic of Flame*. The discussion was especially timely, given California's catastrophic wildfires and the Nov. 23 release of the second volume of the *4th National Climate Assessment*, which estimates that "the area burned by wildfire across the western United States from 1984 to 2015 was twice what would have burned had climate change not occurred."

Frequent *HCN* contributor **Ben Goldfarb's** book *Eager: The Surprising, Secret Life of Beavers and Why They Matter* made *The Washington Post's* list of "50 notable works of nonfiction in 2018." An excerpt from the book, "How beavers make the desert bloom," appeared earlier this year in the magazine (*HCN*, 9/3/18). In its one-sentence description of *Eager*, *The Washington Post* asks: "Can those paddle-tailed, buck-toothed dam builders offer humans some help in restoring our ailing environment?" We here at *HCN* know that Ben's answer is a resounding yes. Congratulations, Ben, on a "dam" fine book!

Meanwhile, an article from former editorial fellow **Lyndsey Gilpin** appeared in the *Columbia Journalism Review*. In "What I've learned in two years trying to shift narratives about the South," Lyndsey describes how she tries to tell nuanced stories about the region in her upstart publication, *Southerly*.

**Ted Wood**, who photographed oil and gas development — and the people affected by it — for our story, "When Your Neigh-

borhood Goes Boom," (*HCN*, 10/29/18) stopped in at the Paonia office just before Thanksgiving. Ted, who says the story drew a lot of attention on Colorado's Front Range, was passing through Paonia with **Amanda Prentiss** and a crazy Boston terrier named **Tilly**, on a road trip that included Santa Fe, New Mexico, and Basalt, Colorado.

A group of 15 people from the Montrose Rec Center in nearby Montrose, Colorado, spent well over an hour touring the Paonia office Nov. 15, asking probing and intelligent questions, such as, "What kind of mistakes do you especially watch out for in fact-checking?" Copy editor **Diane Sylvain** joked about always double-checking names and definitions, specifically noting the correct explanation of NEPA. Guess what: In "Sagebrush Rebel appointed to Interior Department" (*HCN*, 11/26/18), we failed to do just that. The federal environmental law NEPA is the National Environmental Policy Act, not the National Environmental Protection Act. We regret the error, and not for the first time.

—*Carl Segerstrom,*  
for the staff



Full of frosty trees for rosy-cheeked families, Grand Mesa, just north of Paonia, was bustling the weekend after Thanksgiving.

LUNA ANNA ARCHER/HIGH COUNTRY NEWS

# GENERATION ATOMIC

*Can a new generation of environmental activists  
save nuclear power?*

*Clean power forever,  
within our grasp,  
by splitting atoms,  
it's come to pass.  
Tomorrow will be so great.  
Clean power forever,  
will be our fate.*

—“Clean Power Forever,”  
lyrics by Eric Meyer, founder of  
Generation Atomic, 2018.

**E**mma Redfoot stands at a whiteboard in a small conference room, sketching neutrons, protons and nuclei, her voice rising enthusiastically as she explains nuclear fission:

A neutron blasted into a uranium-235 atom shatters the atom, releasing energy and yet more neutrons that split other uranium atoms, causing a frenetically energetic chain reaction. “The crazy thing about nuclear energy is that it turns mass into energy,” she says, her gray-blue eyes opening wider. “It. Destroys. Mass!”

On the other side of the thick glass window here at the Center for Advanced Energy Studies (CAES) on the outskirts of Idaho Falls, Idaho, the mercury approaches 100 degrees, the sun an angry orange blob behind the thickening gauze of smoke from wildfires across the region — a reminder of the toll fossil fuels are taking on the planet.

But Redfoot says that the situation isn't hopeless, that we can slash greenhouse gases and still have nice electrified things, including this comfortable climate-controlled room, without making

the planet hotter and drier and smokier. To do so, however, we must embrace nuclear power — conquer our irrational fears of radiation and return to “a story that can be told in terms of abundance in the world we live in.”

Redfoot is a nuclear engineer, a devout environmentalist and an unflinching advocate for nuclear power. Renewable energy alone is not enough, she says; only if we use nuclear too can we eliminate fossil fuel burning. Sure, nukes have their problems, she says. But in true technophile form, she assures me that those problems can be fixed — through engineering.

One such problem is nuclear power's inflexibility. Redfoot explains that when a nuclear plant operator tries to ramp reactor output up or down in response to changes in electricity demand or in solar or wind power production, xenon-135 and samarium-149, or “fission product poisons,” build up. She pauses when she sees my eyes widen with alarm at the term, then looks ruefully back at her whiteboard: “Nuclear is really terrible with names.”

In fact, nuclear is terrible with public perception in general. It's a problem that even Redfoot, who has a bit of a Sissy Spacek-circa-1975 vibe and wears a cheery “Atoms for Peace” T-shirt, acknowledges can't be engineered away. “The negatives are usually what people start with when they think of nuclear,” she says.

So Redfoot accentuates the positives. Together with a growing collection of climate-hawk pro-nuclear folks, many of

them fellow millennials, she is determined to brighten the view of nuclear energy.

These activists are self-consciously grassroots-scrappy. No slick and polished ad campaigns here; instead, they stage pro-nuclear rallies that emulate the iconography of the 1980s-era no-nukes movement and the playful energy of anti-war agitator Abbie Hoffman's band of youth activists. They sing opera, tag their tweets with #SplitDontEmit and have developed a pro-nuke smartphone app. They even organized a Nuclear Pride Festival, complete with music,



theatre and cartoonish logos of flowers emerging from nuclear cooling towers. Eco-modernist Michael Shellenberger, the high priest of the movement, calls it Atomic Humanism. I think of it as Green Nuclear Evangelism.

“We believe that nuclear power can and will actually save the world,” Matt Bennett, vice president of public affairs for the left-leaning think tank Third Way, told the Nuclear Energy Assembly in 2016. “We are never going to reach our climate goals if we just focus on things that are in vogue at the moment.”

#### **WHEN NUCLEAR POWER FIRST**

**APPEARED** in the West, it sundered an environmental community primarily focused on protecting wildlands. Some members of the Sierra Club, including its charismatic director, David Brower, opposed Pacific Gas & Electric’s 1966 proposal to build the Diablo Canyon nuclear generating station on the Central Coast of California mainly because it would industrialize the coastline, not because they were ideologically opposed to nuclear power. Others saw nuclear plants as preferable to river-killing,

wilderness-drowning dams. The issue divided the Sierra Club, but ultimately the group supported the plant, which got licensed in 1968.

Brower left the club and started Friends of the Earth, where he continued his fight against Diablo Canyon. He was joined by the anti-nuclear San Luis Obispo Mothers for Peace and the Abalone Alliance, which rose up alongside the reactor containment domes in the 1970s. In 1979, some 30,000 protesters, musicians and politicians — including Gov. Jerry Brown, then in his first

**Nuclear engineer and activist — and environmentalist — Emma Redfoot poses outside the Vallecitos Nuclear Center near Livermore, California, where the dome of a nuclear power plant that once produced 40,000 megawatt-hours of electricity still stands.**

SARAH CRAIG



Diablo Canyon Power Plant in central California, contentious from the start, is scheduled to close in 2025. HERB LING

period as governor — attended a Stop-Diablo concert and rally. That same year, Pennsylvania's Three Mile Island suffered its meltdown, the Church Rock spill in New Mexico sent millions of gallons of radioactive effluent onto the Navajo Nation, *The China Syndrome* hit theaters, and a rousing, star-studded "No Nukes" concert rocked Madison Square Garden, with Jackson Browne, Carly Simon, John Hall and Bonnie Raitt imploring the world to "take all your atomic poison power away."

Neither the growing wave of popular opinion and pop culture, however, nor the discovery of new seismic faults near the plant, could stop Diablo Canyon — not even the revelation that its blueprints were flawed. In 1985 — the year before the Chernobyl incident — the two reactors began churning about 18 million megawatt-hours of low-emissions juice into the electrical grid each year, powering some 1.7 million homes.

Emma Redfoot was born several years later. She grew up in Montana, spending a good part of her childhood outdoors in the woods and mountains. After high school, she pursued environmental studies at Lewis and Clark College. During that time, she traveled to Latin America to work on a permaculture farm and then to research service tourism. It came to her that the two most pressing issues facing her generation were global warming and global poverty. And energy was the key to tackling both.

"Energy is the ideal thing to empower people," she told me at CAES, a part of the sprawling, federally run Idaho National Laboratories that boasts a strangely Silicon Valley-like feel, right down to the brightly colored beanbags in the lobby. Millions of people who lack access to the grid are forced to burn wood, coal, dung or even tires and other garbage for cooking and heating, to the detriment of their health and the planet's. They need electricity, she said, but getting it from fossil fuels merely centralizes the pollution. Wind and solar have problems, too; they are intermittent and require lots of space.

No source of electricity is truly clean or carbon-free. Material for solar panels or batteries must be mined, wind turbines manufactured. Uranium mining, milling and enrichment are energy-intensive, and coal mines and natural gas wells ooze methane. When the entire fuel life cycle is taken into account, however, nuclear is among the most climate-friendly, emitting 100 times less carbon per megawatt-hour than coal and 50 times less than natural gas — even less than photovoltaics. Fission spews none of the nasty air pollutants emitted by burning coal, and only a fraction of the solid waste. Nuclear, Redfoot concluded, is the best way to pull people out of poverty without contributing to climate change, so she headed back to school at the University of Idaho to pursue a master's degree in nuclear engineering.

To members of Gen X and their

elders — the now-middle-aged baby boomers who grew up under the threat of nuclear annihilation — Redfoot’s path can seem a little jarring. They remember the No Nukes movement, *99 Luftballons*, Three Mile Island, *War Games* and *The Day After*; in the West, they witnessed firsthand the deadly legacy of uranium mining and milling and nuclear tests. But Redfoot, like much of the self-proclaimed Generation Atomic, was brought up after the Cold War ended and the term “mutually assured destruction” had faded from the lexicon. The alarm over the Chernobyl disaster had ebbed; “No Nukes” was merely a graying relic of her parents’ generation, like the vinyl recordings of its soundtrack.

This lack of baggage, combined with the existential angst induced by climate change, allows millennials to see nuclear power much as their grandparents might have, back when Dwight D. Eisenhower delivered his 1953 “Atoms for Peace” speech. Nuclear energy would help redeem the world from the terrible scourge of atomic weapons, the president said; it would be used to “serve the needs rather than the fears of the world — to make the deserts flourish, to warm the cold, to feed the hungry, to alleviate the misery of the world.”

That optimism drew Redfoot to Diablo Canyon for an internship. But when she arrived, she found the plant — and nuclear energy in general — facing its own existential crisis. Before a new generation of safer, more nimble nuclear power plants could be deployed to save the climate, the atomic evangelists would first have to save the existing infrastructure.

**WHEN REDFOOT ARRIVED** at San Luis Obispo in 2014 to take her engineering prerequisites at Cal Poly, PG&E’s effort to renew its 40-year operating license with the Nuclear Regulatory Commission and its lease on state lands was well underway. The plant’s two reactors, which comprise the Western Grid’s third-largest generator after Arizona’s Palo Verde nuclear plant and Washington’s Grand Coulee Dam, had been fissioning for years without any major incidents. Yet PG&E officials knew the renewals were no slam dunk; Friends of the Earth, Mothers for Peace and other opposition groups, concerned about nearby earthquake faults, the waste problem and the plant’s fish-killing cooling system, would make sure of that.

Each day, Diablo Canyon sucks up about 2.5 billion gallons of ocean water to generate steam and cool the reactors, before spitting it out — 20 degrees warmer — back into the Pacific. The process kills an estimated 5,000 adult fish and 1.5 billion fish eggs and fry every year. The warm-water discharges also alter the aquatic ecosystem in Diablo Cove. In 2010, the state of California ordered coastal plants to do away with so-called “once-through” cooling systems. To keep its lease, PG&E would have to retrofit the plant with less deadly cooling technology.



That would cost billions, and in today’s electricity market, it’s just not worth it.

An abundance of cheap natural gas and the rise of renewables have brought wholesale electricity prices down, making both nuclear and coal plants less cost-effective, even without the expensive cooling-system upgrades. Plus, the variability of solar and wind, which produce only when the sun is shining and the wind is blowing, has increased the need for flexible generation that can quickly increase or decrease the amount of juice going into the grid. Natural gas is limber in that way but nuclear is less so, thanks in part to those darned fission poisons Redfoot described, which make the reaction less efficient. PG&E was increasingly seeing the bottom-line appeal of letting the plant go dark.

All this helped spark the nuclear evangelism movement. Shellenberger left the Breakthrough Institute and started the pro-nuclear advocacy group Environmental Progress. Diablo Canyon engineer Kristin Zaitz and reactor operator Heather Matteson founded Mothers for Nuclear to lobby for keeping the plant running for another 20 years or more. Zaitz, who wrote that she “grew up on the writings of John Muir,” was dumbfounded that environmentalists wanted to shutter the plant, even at the expense of the climate.

The advocates argued that closure would not only rob the community of 1,500 high-paying jobs, it would deprive the state’s grid of its single largest generator of low-emissions juice. They cited the 2012 shutdown of the San Onofre Generating Station near San Diego, due

in part to radioactive-steam leaks, as a prelude to what would happen when Diablo Canyon shut down.

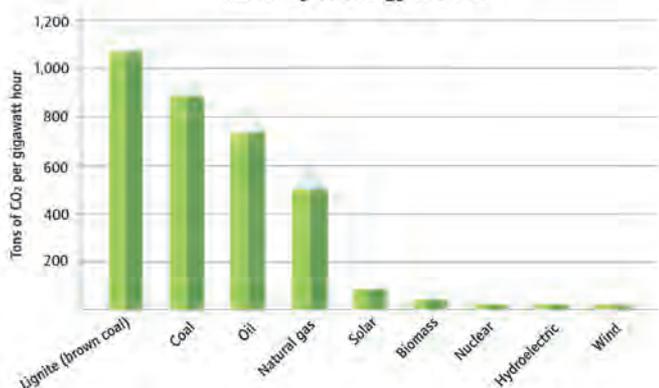
In order to fill the 18,000 gigawatt-hour void left by San Onofre’s departure and to meet increasing electricity demand due to rising temperatures, California grid operators turned to natural gas. Generation from gas jumped by a whopping 30,000 gigawatt-hours, resulting in an annual increase of more than 20 million tons of additional carbon emissions — about half of which could be directly attributed to San Onofre’s closure. It was as if by taking a nuclear plant offline, California had fired up a massive coal-fired power plant and run it full-bore.

The green evangelists predicted the same carbon surge if Diablo Canyon were to close. But PG&E believed it could avoid that scenario: Demand for electricity was actually going down, the company said, because of an increase in distributed generation from solar and wind, efficiency measures and a changing electricity market. In 2016, the utility announced it would shut Diablo Canyon down in 2025, following a plan endorsed by greens and unions that would provide a “just transition” for the community and the workers, and replace lost power capacity with low-carbon sources other than natural gas.

The nuclear evangelists are skeptical of this plan, which outgoing Gov. Jerry Brown signed off on in September. Shellenberger calls it a “back-room” deal “negotiated by corrupt institutions behaving unethically and perhaps illegally.” The activists’ complaint, though, goes

At an Environmental Progress-sponsored pro-nuclear march in Chicago in October 2016, Emma Redfoot, center back, stands beside pro-nuclear activists, including Mothers for Nuclear founders Heather Matteson (braid) and Kristin Zaitz, front row, right. COURTESY OF EMMA REDFOOT

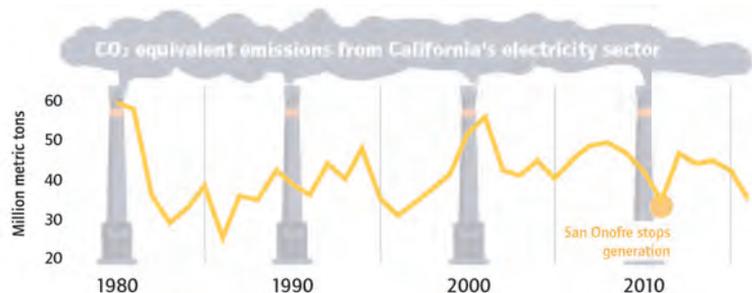
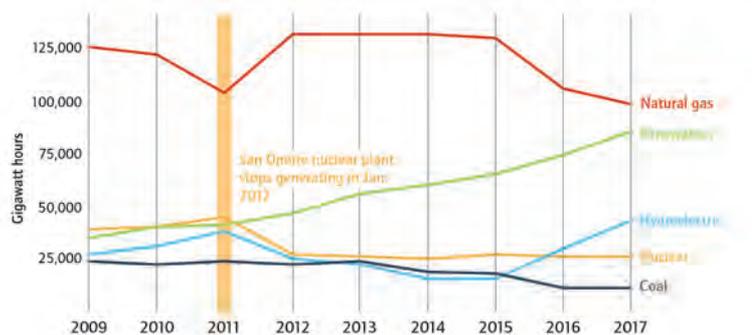
**Average greenhouse gas emission intensity of energy sources**



When emissions from all phases of power sources' life cycles are accounted for, from mining to manufacturing to generating power, nuclear rivals even solar power in terms of climate friendliness.

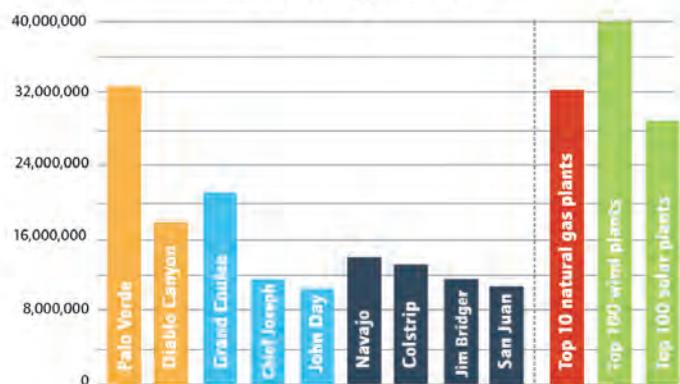
SOURCE: WORLD NUCLEAR ASSOCIATION

**Power generation industry balance in California 2009-2017**



When the San Onofre nuclear plant stopped producing power in early 2012, California grid operators filled the void with natural gas, reversing the downward trend of greenhouse gas emissions from the state's electricity sector. The problem was exacerbated by the loss of hydropower that year, thanks to drought, and by increased electricity consumption due to heat. Since then, renewable power sources have gained a larger share of the state's power mix, and overall power consumption has decreased, bringing emissions back to pre-2012 levels. SOURCE: CALIFORNIA ENERGY COMMISSION

**The West's top generators**



Nuclear power plants are among the largest generators on the Western Grid, each with annual outputs equal to dozens of the biggest wind or solar installations combined. SOURCE: ENERGY INFORMATION ADMINISTRATION

beyond the politics: Jettisoning Diablo Canyon, they say, will delay the move away from fossil fuels.

"Diablo Canyon acts as the reliable ground on which wind and solar can be built," Emma Redfoot told California land commissioners in June 2016. "I cannot see how replacing a clean source of energy with a clean source of energy is a step forward."

**BUT THE SIMPLE ARGUMENT** that nuclear plants should stay because they are cleaner is increasingly complicated these days by the economic and political factors involved. When coal plants face a shutdown for economic reasons, they have a huge domestic coal-mining industry willing to spend millions on lobbyists and campaigns to try to keep them open. Nuclear plants facing retirement get far less help, despite the fervent support of their green proponents.

That's in part because globalism has reduced the domestic uranium-mining lobby to a mere shadow of its Cold War self. In 2017, U.S. uranium producers kicked out a record low of just 1,150 tons of uranium concentrate (compared to the 600 million tons of U.S. coal mined for power production last year), or about 5 percent of the fuel consumed by domestic nuclear plants. The other 95 percent comes mainly from Canada, Australia, Russia and Kazakhstan. Only about 400 people currently work in the U.S. uranium-mining industry. That's not exactly a formidable voting bloc, nor are its members easily transformed into the kind of "real America" working-class icons that coal miners have become.

Rather than spend political capital on fighting for Diablo Canyon, the two largest domestic uranium producers, Ur-Energy and Energy Fuels — which owns the Daneros Mine and White Mesa Mill near Utah's Bears Ears National Monument — petitioned the Trump administration to force utilities to collectively purchase at least 25 percent of their fuel domestically. Nuclear boosters, including the Nuclear Energy Institute, the industry's biggest lobbyist, aren't so keen on the idea, however. Limits or tariffs would increase the cost of uranium and therefore the operating costs for nuclear plants, making them even less competitive with natural gas.

The Trump administration made a feeble attempt to throw imperiled nuclear plants a lifeline this past summer by forcing utilities to buy coal and nuclear power regardless of the cost, but that rule is currently on hold. Green nuclear evangelists, meanwhile, don't want that kind of help. "Nuclear people are so unhappy that we keep getting saddled with coal," says Redfoot. After all, nuclear's strongest marketing asset is that it's *not* coal. If Trump were genuinely interested in helping nuclear, Redfoot said, he would have kept President Barack Obama's Clean Power Plan, which limited emissions from coal-fired plants, as well as rules

limiting methane pollution from oil and gas production. A high price on carbon emissions would also give nuclear a leg up on natural gas and coal.

That's not to say that nuclear power isn't getting a boost from the federal government. On the contrary: Over the past decade, substantial federal dollars have been invested in a new generation of so-called advanced reactor designs. This summer, the Department of Energy's Gateway for Accelerated Innovation in Nuclear doled out \$53 million to various endeavors, and in September, a bipartisan coalition led by Sens. Lisa Murkowski, R-Alaska, and Cory Booker, D-N.J., introduced a bill that would direct the department to support the development of advanced reactors.

At the head of these politically sexy innovations is a project pushed by a Portland, Oregon-based company called NuScale, which would include 12 60-megawatt reactors installed on the vast landscape near Idaho Falls co-opted by the Idaho National Laboratory. Utah Association of Municipal Power Suppliers, or UAMPS. With 46 members scattered across the Interior West, UAMPS will own the euphemistically named Carbon Free Power Project — if it gets built.

NuScale claims that its small modular reactors, or SMRs, will be safer and use less water than conventional reactors. But the big selling point is their relatively low buy-in cost. A utility could, theoretically, build a micro-nuke plant for less than \$2 billion upfront, a bargain next to the \$27 billion or so currently being spent to construct new reactors at the Vogtle plant in Georgia. The reactors would be manufactured in a facility, then trucked to the installation; what NuScale loses in economies of scale, it hopes to offset with the volume of reactors produced.

NuScale's corporate demeanor screams scrappy startup, but it's actually mostly owned by Fluor Corporation, the global construction conglomerate that was the lead contractor on the \$60 billion cleanup of the former Hanford nuclear weapons complex in eastern Washington. (See story on nuclear waste cleanup efforts on page 18.) Fluor has spent over \$12 million on lobbyists over the last three years; it has been a major political donor, primarily to Republican campaigns, and it put \$250,000 into Trump's Inauguration Day fund. The feds have been generous in return: NuScale has received nearly \$288 million in grants from the federal government since 2014, including \$47 million in 2018.

NuScale hopes to be generating power in 2026. It has already cleared the first licensing hurdle with the U.S. Nuclear Regulatory Commission and is well into the second phase. But nothing will happen unless UAMPS succeeds in selling the concept to its members. Thus far, it's run into resistance in Price, Utah, where leaders fear it would help kill the local coal industry; in Truckee, California, because it would hamper the

community's efforts to go 100 percent renewable; and in Los Alamos, New Mexico, where people are leery of investing in unproven technology, not to mention the high projected operating costs relative to other energy sources. Anti-nuclear activists in Utah and Idaho are battling the project, too, mostly because it will use a lot of water and add to the growing stockpile of radioactive waste.

Redfoot said she is "impressed" that UAMPS finds value in nuclear, but for all of her desire to keep existing nuclear generation online, she's decidedly cooler on new construction, including the UAMPS project. Beginning in about 2006, domestic electricity consumption stopped its long and steady climb and hit a plateau. Until it starts rising again due to mass electrification of transportation or industry, Redfoot said, "it's hard to make an argument to build new reactors now in the U.S."

**IN SEPTEMBER, THE DEPARTMENT OF ENERGY** posted a video on Twitter. It's in black-and-white, with artificial scratches added to give it a vintage look, and stars Generation Atomic founder Eric Meyer, belting out an aria in a smooth baritone. "Clean Power Forever," he sings, "within our grasp. By splitting atoms, it's come to pass. Saving 2 million lives, just in this past century."

The video was filmed as part of a CAES advocacy training session at Experimental Breeder Reactor number 1, west of Idaho Falls, where in 1951, nuclear fission was first used to generate and transmit electricity. EBR-I is now a museum that serves as a church of sorts for nuclear evangelists. Its mid-century, retro-futuristic, sleek and chunky control panels and knobs and valves evoke a more optimistic era — a time when the same terrible yet elegant process that annihilated two Japanese cities and ended World War II prophesied the dawn of a more prosperous Atomic Age and might even be employed "in accomplishing such bizarre tasks as irrigating the Sahara and melting the ice cap on Greenland."

The difference is that today's nuclear evangelists hope to employ atomic fission to keep those same ice caps frozen — and to save lives. The 2 million lives Meyer sang about come from a 2013 paper by NASA scientists Pushker Kharecha and James Hansen, who brought the looming climate change catastrophe into the public eye three decades ago. It estimated that nuclear power had prevented 1.84 million air pollution-related deaths. That figure does not include mortality caused by climate change, such as the scores of lives lost this fall to climate-exacerbated fires in California, or, for that matter, the non-air-pollution-related deaths caused by coal or natural gas extraction.

Yet it also misses the human and environmental cost of mining and milling uranium, the countless Western uranium miners and millworkers, and the people who lived nearby — both Navajo and white — who have gotten cancer, kidney



disease or other maladies from exposure to uranium and its radioactive "daughters." The nuclear evangelists' assurances that mining is safer now are belied by the fact that one of the few uranium facilities left in the U.S. — Ur-Energy's Lost Creek in-situ operation in Wyoming — has had at least 40 violations, spills or "reportable events" since 2013, including a release of 1,625 gallons of uranium-containing production fluid this summer.

"Nuclear needs to take ownership of its history, of the harm done to the Navajo people," says Redfoot, even as she notes that all the uranium mining and milling up until the late 1960s was intended for weapons, not energy production, including the activities at Rocky Flats and Hanford. But it also needs to move forward, she says, and the policymakers, the influencers and the environmentalists must rationally weigh the risks of continuing to generate power with nuclear fission against the far more pressing risk of burning fossil fuel at anywhere near the current rate.

Nuclear reactor waste — evangelists prefer the term "spent fuel" — is also a risk, Redfoot acknowledges. But the Atomic Action app points out that the 80,000 or so metric tons of spent fuel that U.S. reactors have produced since 1968, stacked 24 feet high, could all fit onto a single football field; and that all of that material is accounted for, and its storage in dry casks is highly regulated and closely monitored. Compare that to coal power plants, which annually kick out tens of *millions* of tons of nasty fly ash, slag and other solid waste, in addition to all the toxins and particulates that spew from the smokestacks, as well as the billions of gallons of briney, contaminated "produced water" that oil and gas wells vomit each year. These fossil fuel waste streams are toxic and can be radioactive, while federal regulations on their disposal are virtually nonexistent.

Though the nuclear evangelist movement is far from monolithic, its acolytes generally believe that the current spent-fuel situation — with waste stored on site in large, sealed canisters — is perfectly

adequate. Shellenberger has written that he would like to see the idea of a national depository abandoned altogether. Instead, he thinks that the \$45 billion or so in an industry-funded depository savings account should be given back to existing nuclear plants like Diablo Canyon to keep them running.

Either way lies risk. On the one hand, there is the possibility of reactor meltdowns, of bomb-building terrorists acquiring enriched uranium or the plutonium that is a component of nuclear waste. On the other hand, the Intergovernmental Panel on Climate Change recently warned that without immediate and severe cuts in greenhouse gas emissions, the global temperature will rise 2.7 degrees Fahrenheit or more above pre-industrial times within just a couple of decades, manifesting in rising seas, crippling drought, pestilence, megafires and devastating floods. If something's not done soon, the climate change catastrophe may grow far worse by the time Generation Atomic reaches middle age.

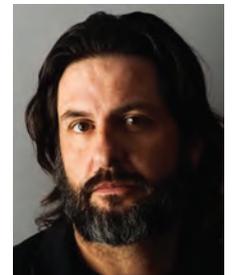
What's a little radioactive steam, a football field's worth of waste and a few thousand or so dead fish next to that?

This is the calculus that drove Meyer to quit his jobs as a Minnesota labor organizer and professional opera singer to head to California to support Diablo Canyon and then start Generation Atomic, and travel the world serenading anti-nuclear protesters with "I can't help falling in love with U (as in U-235)." It's even pushed the consistently anti-nuclear Union of Concerned Scientists in November to change its tune and join the green nuclear evangelists' fight to keep some existing nuclear plants running for the sake of the climate.

And it's what inspired Redfoot to get her degree this August and head to California to work as a fellow for Oklo, a startup that's developing a very small fast reactor that could be deployed in places like India, where some 300 million people lack grid access — a number, Redfoot says, "that breaks my heart."

"For me," she concluded, "being an environmentalist is being pro-nuclear." □

**An artist's rendering of a 60-megawatt micro-nuclear reactor similar to what is proposed for the area near Idaho Falls.** COURTESY OF NUSCALE



Jonathan Thompson is a contributing editor at *High Country News* and the author of *River of Lost Souls: The Science, Politics and Greed Behind the Gold King Mine Disaster*.

✉ @jonnypeace

This coverage is supported by contributors to the High Country News Enterprise Journalism Fund.

# No Fix for Our Nuclear Past

*At Washington's Hanford nuclear site, failing infrastructure and make-do plans*

**T**he Hanford nuclear complex in eastern Washington lies in a green-gold sagebrush steppe, so big you can't see the edges of it and shimmer in the summer heat. The only landmarks are low-slung buildings on the horizon and ancient sand dunes scrubbed bare when the glaciers melted. There's almost no trace that this is the biggest nuclear waste dump in the country. The scale of nuclear waste is like that: sprawling out into the metaphysical distance, too big for the human mind to hold.

That's what John Price tells me. He's the tri-party agreement section manager for the Washington Department of Ecology, which regulates Hanford, the site of the country's first plutonium

production plant. (The other two parties are the U.S. Department of Energy and the Environmental Protection Agency.) On a sweltering June evening, we stand on the edge of the site's central plateau, wind buffeting our faces as we stare at the bony frame of the future vitrification plant. If you were to pull a shot glass full of liquid out of one of the tanks buried near us, it would kill everyone with 100 yards instantly. And the danger would not disappear: Plutonium has a half-life of 24,100 years. The plant is supposed to start processing the most toxic waste in 2036. But construction has stalled out and most of the waste sits in underground tanks, some of which have begun to fail. "Suppose all these things are starting to fall apart faster than we can clean them up," Price says. "It becomes a really interesting moral question."

Over the ridge north of us, the Columbia River curves around the site, appearing motionless until you get close and see how much water is pushing past the banks. Over the past year, a series of accidents has put the spotlight on Hanford, its aging infrastructure and the lack of a long-term solution. In May 2017, part of the Plutonium Uranium Extraction Facility, which holds rail cars full of solid waste, collapsed. Later that year, workers tearing down the Plutonium Finishing Plant were contaminated with plutonium and americium particles when an open-air demolition went wrong. In December,



**Inside one of the tanks at Hanford, where the cleanup operation continues.**

COURTESY OF WASHINGTON RIVER PROTECTION SOLUTIONS



others inhaled radioactive dust at the same site, halting work indefinitely. Then, in June of this year, the Department of Energy (DOE), which is responsible for the site, released a proposal to reclassify some of the high-level waste as less toxic, with what's called a "Waste Incidental to Reprocessing" evaluation, so they could clean it up sooner and more cheaply.

"There's a lot more work to do than there is money to get it accomplished," Price said. "We've really come to a fork in the road."

Across the country, big energy companies are considering a move from coal to nuclear-fueled plants even as sites like Hanford remain mired in many-decades-long cleanups of radioactive landscapes. As the possibility of more waste looms, Hanford has become a flashpoint for



people who fear that there's no safe way to deal with our nuclear legacy. In this era of climate change and large-scale environmental degradation, the site raises the question: Can we ever clean up the mistakes of our past?

**IN FEBRUARY 1945**, Col. Franklin Matthias, the eager young civil engineer who directed construction of Hanford, took a train to Los Angeles to hand-deliver the first 100-gram plutonium plug fabricated at the site to a courier from Los Alamos, New Mexico. It would become the core of bombs like the Fat Man, dropped on Nagasaki that August. As he handed off the hockey puck-sized object, he told the courier it cost \$300 million to make.

The production of those pucks would prove to cost far more than even Matthias

could have calculated, mostly due to the radioactive detritus they left behind. The Government Accountability Office estimates cleaning up Hanford could total more than \$100 billion. Since 1989, when Hanford was first designated as a Superfund site, 889 buildings have been demolished, 18.5 million tons of debris have been put in controlled landfills, and 20 billion gallons of groundwater have been treated. With three decades of work, the scope of the problem has been greatly reduced, but the really toxic stuff is still on site. The groundwater beneath Hanford is never going to be clean enough to drink, thanks to a cocktail of chemicals: strontium-90, which deteriorates marrow in the bones of humans and animals and takes 300 years to break down; hexavalent chromium, which mutates salmon

eggs; and technetium-99, which dissolves like salt in water and has a half-life of 211,000 years.

The 586 square miles of sage still hold the 324 Building, home to highly radioactive nuclear containment chambers called hot cells, less than 1,000 feet from the Columbia and right across from the town of Richland, where many of the Hanford workers live. In the central plateau, where the ghostly vitrification plant stands, the Waste Encapsulation Storage Facility holds 1,936 radioactive cesium and strontium capsules currently kept in a glorified swimming pool. If an earthquake were to crack the pool, or the water supply were to run dry, those isotopes, physically hot and linked to bone cancer, would spread quickly.

The knotty heart of the cleanup is the

**The B Reactor sits in the sagebrush steppe of the Hanford Site, Washington, along the banks of the Columbia River, where a massive cleanup continues.**

STUART ISETT



The water around the cesium and strontium capsules in the pools at Hanford glows an eerie shade of blue in an effect known as the Cherenkov Glow.

The light comes from radioactive cesium and strontium decay.

DEPARTMENT OF ENERGY

tank farm, on the central plateau, where 56 million gallons of high-level waste — the official term for the long-lived radioactive material leftover from plutonium production — sit in 177 underground tanks. Each tank holds a unique mixture of sludge, solid, supernate liquid and crusty saltcake — a witch’s brew of 1,800 different chemicals that are buzzing, off-gassing and breaking down. Sixty-seven of the 149 carbon-steel single-shell tanks and one of the newer 28 double shells have leaked, but the Energy Department refuses to build new ones, and every year the timeframe for cleanup gets longer.

“If you think it’s nearly intractable, that’s because it is,” said Randy Bradbury, the communications director from Washington’s Department of Ecology, one of the three parties that regulates the

site. “The biggest mind-boggling thing about it is that we’re all going to be dead before this is cleaned up.” That timespan challenges our decision-making, which is much more suited to responding to accidents than to multigenerational cleanup projects. Philosopher Timothy Morton categorizes nuclear weapons, waste and explosions (not to mention climate change and the longevity of Styrofoam cups) as “hyperobjects” — real-life objects that are too large in time and space for humans to fully grasp. How, then, can we calculate all their costs?

The Department of Energy spends billions of dollars on the cleanup each year; next year, it has a \$2.4 billion budget. But those billions are barely enough to keep the wheels on, and the Government Accountability Office estimates that the

last 15 percent of the cleanup could be as expensive as the first 85 percent, which has already taken 30 years. Maintaining the tanks alone costs \$300 million a year, and the minimum amount needed to keep things safe increases as time goes on and infrastructure ages. There currently isn’t enough federal funding to meet cleanup benchmarks, and no money has been allocated for accidents like the tunnel collapse that contaminated workers.

At the current rate of funding and cleanup, the DOE’s Richland Office, which manages most of the site, falls another year behind schedule every two years, and the Office of River Protection, which oversees the tank waste, slips back a year every three. This year, President Donald Trump proposed slashing the budget for Hanford cleanup by \$230 million.

**IF YOU’RE A CIVILIAN**, one of the only ways to get a close look at the hyperobject that is the complex cleanup process is to score a seat on one of the Department of Energy’s annual cleanup tours. On a sun-beaten summer day, I boarded an overly air-conditioned short bus packed with retirement-aged folks. Joe Guyette, the volunteer tour guide, has worked at Hanford since 1973; before that, he was in the Army, where he says he got the better part of a lifetime’s dose of radiation. He does these tours to try allay negative perceptions of Hanford and show the public just how complicated the cleanup is.

“It’s clear that sometimes they haven’t been careful,” Guyette says. “They get criticized about it, but they’re doing the best they can.”

Guyette took us on a tour of the water treatment plant, where we talked about those groundwater plumes. We drove by the cocooned reactors and the dark, hulking plutonium finishing plant, hoping to get a sense what is actually worth being scared of, what constitutes cleanup, and how nuclear waste changes over time. He took us to a three-quarter-scale mock-up of the tank farms, because it’s impossible to go near the real ones, and we watched videos of water cannons trying to scour the tarry waste off the inside of the tanks.

Cleaning up the tank farm requires moving the waste out of the single-shell tanks, which are each as wide across as a tennis court and can hold up to a million gallons of waste, and into the sturdier double-shell tanks. From there, it will — theoretically — be vitrified, or turned into glass, at the as-yet-unbuilt vitrification plant and then sent to the stalled-out proposed federal nuclear repository at Yucca Mountain in Nevada, or to another long-term storage facility. Every step is excruciatingly complex. The massive tanks were designed to hold radioactive materials, not release them, so any material in these tanks has to come out through a pipe just 12 inches around. Challenges like this have forced Hanford managers to invent every step of the cleanup process, from how to sample the

contents to how to keep video cameras from burning up in the radioactive heat inside. It's a constant guessing game, where the questions of how to store the waste and neuter its effects change endlessly. That's why in June, the Energy Department proposed reclassifying the remaining high-level waste in the C section of the tank farm as low-activity waste, and then filling the tanks with grout to stabilize the remaining 66,000 gallons of waste, so it could be kept onsite permanently. The department thinks that it would be safe enough to close the door on the tank cleanup once the grout is in, except for long-term monitoring.

According to the tri-party agreement that governs the cleanup, the Energy Department is currently required to get 99 percent of the waste out of the tanks and vitrify it, but Sherri Ross of the department says the definition of high-level waste overlooks the fact that much of the waste is no longer very toxic. They've taken 1.7 million gallons of waste out of the C Farm tanks, or about 96 percent. Of the residual that's left, the bulk of the material has less than a 30-year half-life, so it's already become half as radioactive.

The move has resurfaced a question that has plagued Hanford experts for years: Is it better to do a decent job now, or the best job later?

Some people believe a fast response may be safer than a slower, more thorough response. "Until all the waste is out of those tanks, it's almost inevitable that more of them will leak," Bradbury says. The tanks, built starting in the 1940s, were designed to safely contain waste for up to 40 years on the assumption that we'd have figured out a long-term plan by then. But we haven't, at Hanford or anywhere else.

High-level waste was never supposed to stay on site permanently. The waste from the tanks is intended to be vitrified, turned into glass rods, then sent to a federal repository, where it would sit, isolated, forever.

But that repository doesn't exist yet, and it's possible that it never will. The Nuclear Waste Policy Act of 1987 designated Yucca Mountain, Nevada, as the spot to store the waste. Despite \$15 billion spent studying the site, and a growing cost to hold the waste at other sites, plans for Yucca have been in limbo for decades, in large part because of opposition from Nevadans, including former Senate Majority Leader Harry Reid, D-Nev., who don't want the waste transported through or stored in their state. A bill to reopen Yucca passed the U.S. House of Representatives as recently as May, but failed in the Senate.

"We've made stuff that will be dangerous for millennia and we deal with it in two-year congressional cycles," said William Kinsella, a North Carolina State University professor whose research includes nuclear weapons cleanup. "We don't want to make hasty decisions, but it's a chokepoint for nuclear constipation."

That has created expensive and dangerous blockages throughout the nuclear waste management system. Without a place to send waste, the cleanup at Hanford has no real endgame. Because of the long-term impossibility, the Hanford Advisory Board — a coalition of tribal members, community volunteers and government workers who advise the agencies that manage the site — is constantly worried that the funds might dry up while the tanks are still full. The fear of slashed funding, and the cleanup's long delay, is part of what drove the Department of Energy to consider grouting.

But the proposal worries watchdog groups, who are concerned about shortsighted cost-saving measures that could

troubled cleanup efforts as well as experts' failure to account for the many ways its dangers manifest.

Ross explained to a room full of gray heads why her people at the Energy Department thought they could do it safely. "Your concern is what if we're wrong," she said to the crowd. "I hear that."

She says they'll look at how the closed system is going to perform over the long term. Their model goes to 1,000 years, but they'll also consider what might happen in 10,000 years, and model out to the half-life of plutonium, 24,000 years. They plan to use what they call "institutional controls" — signs, gates and infrastructure — to keep people away from the waste for 100 years.



put surrounding communities at lasting risk by keeping 700,000 gallons of waste that's currently classified as high-level, and that might ultimately leak to the river on site. "What the DOE is proposing is to make the Hanford site a high-level waste repository in all but name," said Tom Carpenter, executive director of the Hanford Challenge, an environmental advocacy group. "That does not belong in an agriculture zone in a major river system in an earthquake zone."

**LEAVING WASTE, EVEN IF IT'S CONTAINED,** has proved a hard sell with the public. In meetings over the plan in October, people pointed to past failures. "The history of Hanford is one of wishful thinking," one speaker told the assembled experts. That distrust has roots in the site's constantly

But people close to Hanford argue there are too many unanswered questions. For example: If there's a leak 100 years in the future, will the government have money to deal with it? What happens if people are trying to farm at Hanford in 100 years? Or 1,000 years? How do you tell people in 200 years not to disturb the soil? How can you be sure they'll understand the same things we do — the same language, the same symbols?

"When I hear people say things like, 'This will never happen,' I really want to caution them," Rod Skeen of the Confederated Tribes of the Umatilla Indian Reservation told the Hanford Advisory Board. He says that traditional water uses, like fishing and sweat lodges, mean the tribe's exposure is different than what the Energy De-

**The vitrification plant, still under construction, will convert high-level radioactive waste into a stable glass form for storage.**

HANFORD VIT PLANT

partment might assume exposure looks like. Tribes have historic treaty rights to hunting and fishing grounds within the site, and they've asked the DOE not to reclassify waste in the past, because of concerns about how that waste would trickle down into the ecosystem, and their food system.

Those kinds of low-probability but high-risk odds have created an environment that University of Washington professor Shannon Cram calls "the politics of impossibility." How do you navigate a situation where safety is impossible to promise? The people in charge of caring for Hanford are trying to prevent unknown future problems, and fix past generations' mistakes. But in the face of a budget crunch and an overwhelming cleanup, it's nearly impossible to know what's right.

Cram, who has studied the long-term public health effects of Hanford, says it's likely that Hanford will never be completely clean, and that, if some waste is always going to remain in the ground, the real challenge is deciding what an acceptable level of exposure is.

"I think it's really misleading to call it cleanup," Cram says. "It's not clean, it's contained and monitored." Cram remains concerned about the possibility of disaster being passed on to future generations. "The brewing threat doesn't get enough attention, because a lot of it is looming

in the future," she says. "We basically as a country have to learn how to have the appropriate amount of fear."

**THE LATE SUMMER LIGHT** slips out as we drive back to town, passing historic tribal hunting grounds and driving by the beach where Price likes to launch his boat to paddle on the Columbia. We trace the edge of the 195,000-acre Hanford Reach National Monument within the site, where 43 new-to-science plant and insect species were found during a Nature Conservancy survey in the '90s.

I ask Price what he thinks the worst-case scenario might be, and he says there are two things that keep him up at night. The first is a dramatic natural disaster, such as an earthquake or a fire, that would damage the fragile infrastructure and cause a massive spill. The site sits at the drought-prone edge of the Cascadia subduction zone, so both are likely. The week before our visit, a fire burned 2,500 acres here, and we can still smell the charred sage. But Price's second fear is about the equally insidious threat people pose to themselves: A lack of long-term protection and the erosion of care. He says the paradox of Hanford is trying to convince people that the site is safe now, but that in 500 — or 1,000 — years, it might not be, and that we have to make decisions with those unknown risks in mind.

"I'm not really worried about today,

broad-scale, but I'm worried about the future," he says, when we stop on the north side of the river and look back toward the hulking shells of the former reactors. "I don't want to sensationalize the groundwater plumes or the collapses, but the no-Yucca solution is a real threat."

As Price thinks about the cleanup's future, he's concerned that we can't see the limit of what might happen here, in a worst-case scenario. And he worries that the fear of nuclear waste's slippery threat will fade, even if the threat itself doesn't, or that controls will loosen as people become overwhelmed by the scale of the problem.

To fix our past mistakes, we need to have more foresight than the people who came before us. But that's nearly impossible. In the 1940s, Hanford scientists faced an immediate fear by creating weapons that ended a war but left an unplanned toxic legacy. Today, as we struggle to disentangle ourselves from energy sources that leave us with multigenerational problems like climate change, there's little evidence for further-reaching imagination in our decision-making. It's still impossible to know what we can't see coming. And if we fail, this waste pile and more like it will remain our legacy, sitting in overlooked corners like the empty eastern Washington plains, for longer than humanity can comprehend — or even remember. □



Heather Hansman lives in Seattle, where she writes about water and the West. *Downriver*, her first book, will be out in April. Follow her @hhansman

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## Arboreal, continued from page 8

He beamed and lobbed the question back at me. "Right?"

The grove has been only thinly studied, so no one is certain of the answer. But scientists believe that the trees belong to the forests that may have blanketed these now-severe highlands during the last ice age, which ended roughly 12,000 years ago. When glaciers retreat, they often leave behind giant, freestanding boulders called "erratics" that seem out of context with their surroundings. Here, in the Cedar Grove Botanical Area, the long-lost climate that made those glaciers left behind a sort of arboreal erratic, protected, perhaps, by the north-facing slope and the cold springs that feed the stream we hiked up.

Pollen records from the region confirm that other tree species suited to colder, wetter conditions were once more widespread here. As the climate changed, they gave way to those with warmer, drier proclivities. In the 1974 paper that formally described the yellow cedar grove, researcher Robert Frenkel speculated it was a last remnant of a landscape chewed away over centuries by heat and wildfire. Just one other far-inland fragment is known, in eastern British Columbia.

The yellow cedars' hold on this patch of

Oregon soil may be increasingly tenuous, though. Under current climate change forecasts, the forest that surrounds them will grow yet warmer and drier, and, thanks also to fuel buildup, more prone to burning. Yellow cedars are poorly prepared for wildfire. The thin bark that works so well in the warp and weft of blankets and hats does a poor job insulating the trees from extreme heat, and their shallow roots are easily scorched. In 2006, the Forest Service set an ill-advised backburn through Cedar Grove as part of an effort to fight the Shake Table Complex Fire. Tragically, the backburn was enough to kill 90 percent of the mature cedars in the 26-acre protected area — all save the 2-acre swatch where we stood.

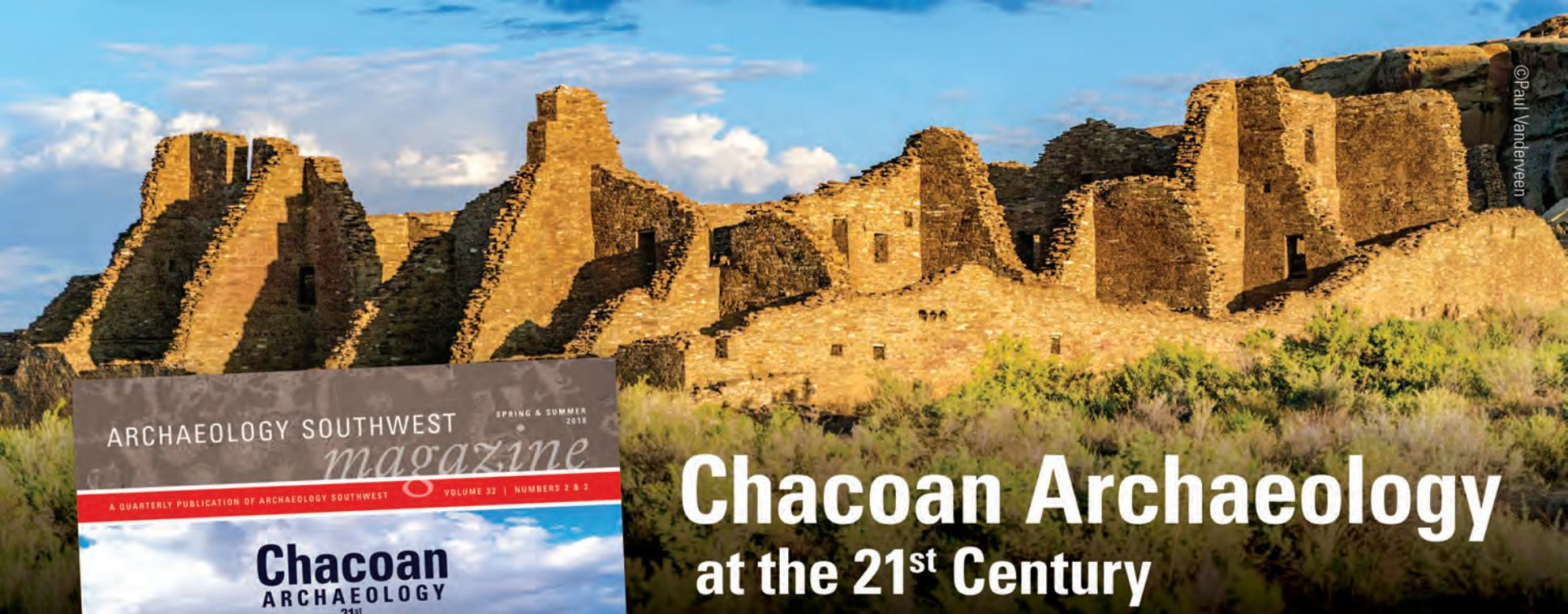
Fire scientists recently discovered that hundreds of the older cedar trees here had lived through past ground fires before dying in the backburn, suggesting the species may be more resilient than previously thought. But it's unclear whether this will provide any hedge against future blazes. If not, flames may erase them from this extreme margin of their range, while ice threatens them in their northern coastal strongholds. Warmer temperatures have reduced snowpack at low elevations enough to expose the trees' shallow roots to the extreme cold of spring frosts. They

are freezing to death in such high numbers that the U.S. Fish and Wildlife Service is considering whether to list them under the Endangered Species Act.

For now, central Oregon's grove seems to have begun a slow rebound. Beneath fire-killed trees, Skinner and Bower were relieved to see thousands of yellow cedar seedlings fighting towards the sun. They looked fragile and improbable, spindly green sprays catching the light. But they had grown taller since Rausch last saw them, several years ago. He broke away from us to examine a spring where it poured directly from beneath the exposed roots of a healthy, mature cedar as big around as a rain barrel. The water here is consistently several degrees cooler than in most other springs he's checked on the Malheur over the years, using the pocket thermometer he carries for this purpose. Maybe it will stay that way, anchoring the cedar grove even as the world changes around it.

Rausch reached into the sparkling water, lifted it in quick handfuls to his mouth. I did the same. It was icy and clean and tasted like snowmelt. It tasted like some other season, some other place, some other time. I looked at my watch and realized four hours had passed. We'd covered less than a mile. □

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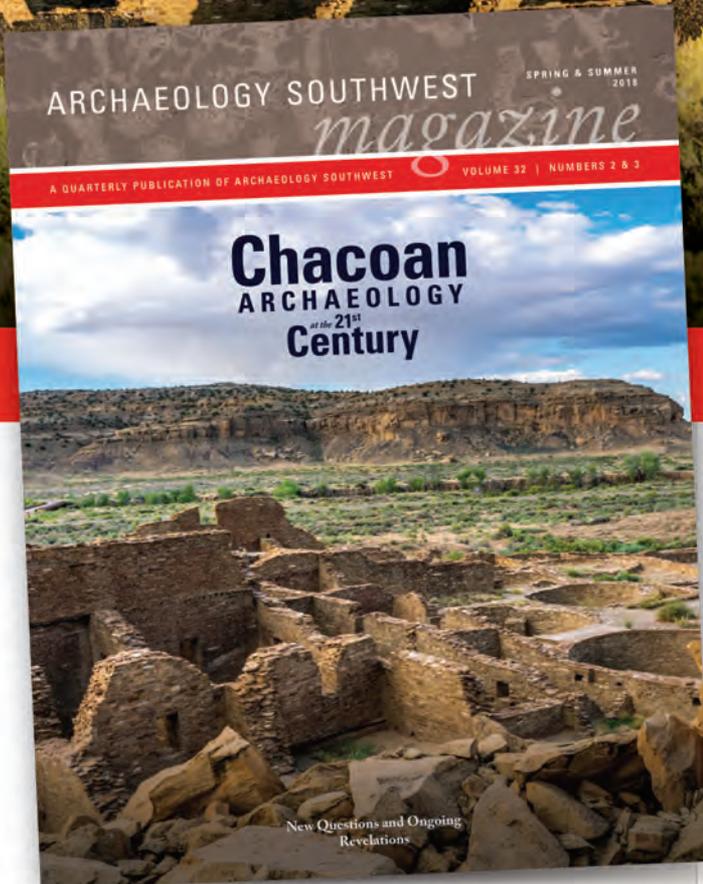
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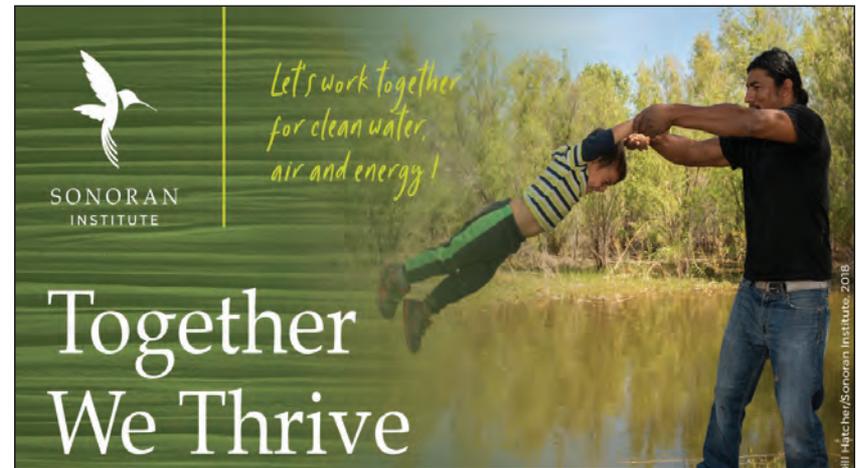
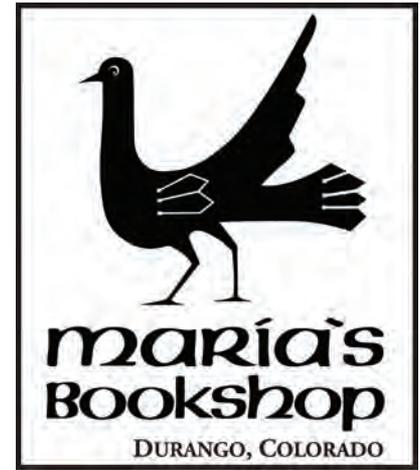
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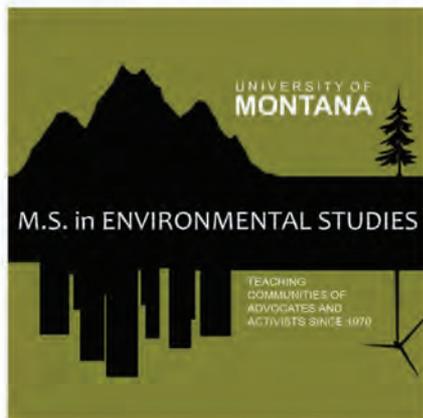
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## Looking for love in all the wrong places



**Buffalo Cactus & Other New Stories from the Southwest**  
 Edited by D. Seth Horton and Brett Garcia Myhren  
 278 pages, softcover: \$24.95.  
 University of New Mexico Press, 2018.

It's hard to hide from the news these days, even in the pages of a book. *Buffalo Cactus*, a collection of 21 recent stories with Western settings, delves into hot-button issues such as immigration and addiction, and even, inadvertently, the #MeToo movement. It features one story by disgraced author Ron Carlson, who resigned from UC Irvine in August 2018 (five months after *Buffalo Cactus* was published), following allegations of sexual misconduct.

Aside from the Carlson story, which the reader can easily ignore, *Buffalo Cactus* offers a chance to move past the stark headlines and discover the nuanced human stories that underlie them. Alberto Álvaro Ríos's "Ten Seconds in Two Lives," opens the collection with the affecting, fable-like tale of Julio and Marta, two legal immigrants from Mexico, young, in love and struggling financially as they start out their new lives together. One day, Julio unwittingly becomes involved in a drug deal, earning \$200. In the end, crossing the U.S.-Mexico border had not been nearly as momentous as the couple expected, but this transaction, Julio thought, "felt like the moment, the thing he always thought he would feel, the line, the crossing over."

Many stories share this focus on people eking out a living on the margins of society. In Judy Troy's "Lugar Tranquilo," two elderly widows living in a mobile home retirement community in Santa Fe become friends. Louise's late husband's gambling left her nearly penniless, but she cheerfully supports herself with a job at a hotel. "A job took you out of yourself and into the drama of the world," she

thinks. When a few mistakes convince her manager she's too old to work, she must depend on the kindness of her neighbor.

Victor Lodato's heartrending story "Jack, July," captures the hopeless loop of meth addiction as a young man makes his way down Speedway in Tucson on a blistering day, seeking drugs, shelter and love. Through quirky, piercing details, Lodato brings us into Jack's mind, offering insight into the experience of meth addiction: "People going fast rearranged the furniture, or crawled around looking for carpet crumbs. Anything that used your hands, which, compelled by the imaginative fervor of your mind, became tools in a breathless campaign to change the shape of the world."

Las Vegas appears in all its seedy glory in Robert Rosenberg's "Circus Circus," where a mother embarks on a frantic quest to find her 4-year-old daughter at a dilapidated casino after her estranged husband, a chronic gambler, loses her there. Connie worked at the cashier's cage at a casino and had always told herself not to succumb to gamblers' advances. "I knew I looked prettier on their lucky nights." But Connie let her guard down once, a misstep that results in a child and marriage to an unreliable man. As their tragicomic search unfolds, Connie realizes the disappearance has been a setup, her husband's way of forcing her to relieve him of parenting responsibilities.

Another Southwestern woman facing the prospect of single motherhood animates Kirstin Valdez Quade's masterful "Ordinary Sins." Crystal is unmarried, pregnant with twins, and working in the office of a Catholic church in Santa Fe. Al-

though she has visibly flouted her church's rules, her stability and compassion keeps it running despite its clashing priests: a fragile but beloved recovering alcoholic and a by-the-book Nigerian, "horrified by her messy fecundity," whose stentorian homilies alienate his parishioners.

The lives of some of the West's essential workers, seasonal guides to the region's outdoor attractions, are the focus of Corey Campbell's "Ocean-Friendly Cuisine." The narrator, Katherine, is part of a two-woman team leading a foreign tour group on a bus through Arches and the Grand Canyon. This peripatetic job suits Katherine, who, in the wake of her mother's death, "quit marriage and my nursing program and found this desert," she explains, deriving solace from drifting. Still, she can't help but seek connection with an appealing widower from Croatia.

A quest for connection unites all these stories thematically, even if many of their characters choose to live in the West precisely because of the solitude its wide-open landscape offers them. From an itinerant adjunct professor in Las Cruces in Robin Romm's "Adulthood," who fails to resist the comforts of a less-than-ideal relationship, to an older woman in Sierra Bellows' title story, who tolerates — with disastrous results — her late-in-life paramour's desire to keep a buffalo calf in his suburban Arizona neighborhood, these characters' hearts keep getting them into trouble. But as much as their yearning for one another is the source of many of their failures, their inextinguishable love is, in the end, their triumph.

BY JENNY SHANK



LUNA ANNA ARCHER

## Is sporting a Patagonia fleece now a political statement?



NEWS  
COMMENTARY  
BY MONICA  
GOKEY

In early November, I was surveying the aftermath of the Mesa Fire in west-central Idaho with several carloads of people from all walks of Western life. There were representatives from the timber industry, local elected officials, a team of “-ologists” from the U.S. Forest Service and several faces from the conservation community. I was there as a radio reporter. Apart from my regular uniform of headphones and a mic, I was dressed appropriately for a 40-degree day in the field, in Muck boots, jeans, a scarf and a 20-year-old Patagonia fleece.

It’s that last item that’s been on my mind ever since.

At one point during the tour, we were standing in a circle, looking up at needle freeze. This is what happens when a fire burns hot enough to fix the needles on an evergreen tree in a windswept position, like something you’d see in a Dr. Seuss story. Fire managers use it as a forensic tool to determine which way a fire moved across the landscape.

When everyone was looking up at the fire’s aftermath, I glanced at the people gathered around me. I noticed that a gentleman from an Idaho conservation group and I were the only two people wearing something overtly labeled Patagonia, and I inwardly cringed.

It’s a cardinal sin for reporters to display anything that might lead sources to believe we are anything but neutral parties. In my entire adult life as a journalist, I’ve never contributed to a political group, nor have I attended any kind of cause-driven event, except in my professional capacity. People routinely ask me how I “really” feel about certain issues, and I usually tell them the truth — that sometimes I go into a story leaning one way or the other, but the more I learn about both sides, the more I find myself in the middle. My job is to find the facts, make sense of them, and produce a fair story that gives readers or listeners enough information to make up their own minds.

Before the 2018 midterm elections, I never thought twice about which warm clothes I wore in the field. I couldn’t tell you the brand of the borrowed down jacket I wore during my third trimester on a reporting trip to sagebrush country last winter, nor which of my several sets of underlayers I stripped down to while hauling rocks alongside small-claims miners in south-central Idaho last fall. I choose my attire based on my desired level of dryness, warmth and comfort, and some low bar of style.

But after Patagonia’s endorsement of two Democratic candidates this fall, I started to wonder if I’d unwittingly committed a fashion faux pas that day in the forest.

Many in the conservative community seem to

think so. An ad I’d recently seen from a stockman’s advocacy group played in my mind. The Public Lands Council offers a “Patagonia shame” patch that people can iron onto their clothing to cover up the Patagonia logo. The group pegs it as a cure-all for people who want to wear their warm garments without the disgrace of supporting a company with a liberal political agenda.

Patagonia’s conservation ethos — stereotyped as a liberal cause in recent years, though people on both sides of the aisle share these values — is hardly new news. Patagonia is one of several outdoor apparel companies that have denounced national monument reductions, a fight that reached a boiling point last year when the Outdoor Retailer trade show decided to leave Utah over the state’s campaign to shrink Bears Ears National Monument.

What is new is the company’s endorsement of two Democratic candidates in hotly contested U.S. Senate races — Jon Tester of Montana and Jacky Rosen of Nevada. It was Patagonia’s first foray into championing specific candidates in high-stakes elections, and both the company’s picks won. “Hundreds of corporations back political candidates,” the company said in a press release. “The difference with our activism is that we put our logo on it.”

So ... does that make it a political statement to wear something bearing that brand name?

When I examine the problem up close, new truths bubble to the surface. I realize I would never wear an NRA T-shirt, just like I would never wear a Greenpeace one. I’m deliberate in not taking a side, either passively or actively. Those ethics matter to me. But I’m less judicious about noticing where my consumerism intersects with political activism, and maybe that needs to change.

That day in the forest, if someone had pointed to my fleece and asked me if I believed in Patagonia’s political agenda, I would’ve shrugged and said I believe in wearing warm clothes on a cold day. But I’m open minded to the possibility that wearing a Patagonia sweater might someday be seen as a statement about one’s self and one’s political values. If that day comes, I suppose I’ll have to retire my favorite fleece. Or, at the very least, find my own cool patch to sew over the logo. □

*Monica Gokey is a print and radio journalist in Idaho’s west-central mountains.*

After Patagonia’s endorsement of two Democratic candidates this fall, I started to wonder if I’d unwittingly committed a fashion faux pas that day in the forest.



Sandhill cranes lift off from the Columbia National Wildlife Refuge, Washington.

CHRIS PARMETER

## The arresting quiet of a crane

A cow-trodden pasture is a far cry from wilderness, but it beats a strip mall.

There had been such a racket, just moments ago. We were gathered at the Columbia National Wildlife Refuge to witness the sandhill crane migration, and we heard the birds before we saw them. They cooed and clucked over our heads as the sun slipped toward the distant Cascade Mountains. Then they appeared, wings arced high, dainty legs dangling in anticipation of the shallow water below. As they landed in the crowded marsh, songbirds whistled from cattail perches, hidden frogs croaked a din, and a pair of beavers splashed in the fading light.

Now, on a hill a mere two miles west, the Columbia plateau is suddenly quiet. Arrestingly quiet. So quiet I only notice when someone breaks it by cracking a beer. The sound stuns the way a good, hard laugh exposes long-held sullenness, and leaves me wondering what has changed.

Our camp on the Seep Lakes Wildlife Area — Washington state land that hugs the refuge — sounds empty by comparison, but the view is nearly the same. All around us is a wide expanse of scrub steppe awash in spring-green bunchgrass and teal sage. Umber buttes rise where violent floods scoured the ancient basalt. Below our camp, water glints like mercury in the bottom of a bathtub. But there is no cooing, croaking or clapping. There is only the wind, into which someone gasps, “That smell!” referring, of course, to the unmistakably pungent scent of cow.

Although I have spent the day tracing hoof trails from the trodden bank of one watering hole to the trampled edge of another, I just now consider the impact of the grazing cattle. Like much of the plateau, this area is a jumble of federal, state and private land. A rancher owns some acreage surrounding the small lake and graciously allows the public to use it. Camping is no longer allowed inside the refuge, so we sleep here and then migrate there for the birds.

It seems reasonable that a creature with 10 million years of generational knowledge would make wise choices about where it sets down, and standing here amid the silence and stink, I assume the cranes are avoiding the cows. Herds of cattle lumbering haphazardly across a landscape can trample nests and chew through wetland vegetation. If I were a crane, the cow’s embarrassing dumbness would be enough to send me to the refuge. But I seem to have overlooked something larger.

North of our camp sits the Potholes Reservoir, a body of water shaped like a squid, laid out amid the

sagebrush with its head pointed southeast and its long blue tentacles winding northwest. It is part of a massive public works project initiated in 1933 that siphons water from the Columbia River to irrigate this otherwise arid plateau. River water leaking from the fields of wheat and barley that surround the blue squid flows into the reservoir through the tentacles. Some is reapplied to the fields, some seeps into ponds, lakes and marshes. It is because of all this that the cranes still come here.

This broad, open land had seemed wild, but it is actually heavily managed — most of all, its water, collected and dispersed at deliberate intervals to mimic wetland habitat. Only about 30,000 sandhill cranes stage here (compared to 600,000 in Nebraska), but they do well. Inside the refuge, farmers partner with conservation managers to grow grain that lures birds. Elsewhere, they leave free calories strewn about fallow fields. Even the cows, grazing ignorantly on public and private land, are helpfully chomping down habitat-hindering invasive weeds.

This is not unique. Government initiatives, including the Conservation Reserve and Stewardship programs (whose fates may be decided by changes to the farm bill), pay the nation’s farmers and cattlemen to help maintain wildlife habitat. A cow-trodden pasture is a far cry from wilderness, but it beats a strip mall, and with half of the West’s wetland resources already lost to development, wildlife biologists are less worried about cows than they are about the remaining ranchers selling off their acreage.

The refuge is designed to provide safe passage through a maze of built environments. Wilderness, by definition, is uncultivated, allowing wild things to suffer or prosper despite us. A bear, which could live and die without ever stumbling upon a person, might know wilderness. A crane, which spends its life hopping over us, cannot. Cranes depend on us because we control their universe of food, water, space and danger. Domineering as we may be, our presence is in their best interest. They would fare far worse without our help in the world we’ve created.

Still, it must seem odd that we gather in droves just to watch them splash in noisy marshes. Like parents keeping a watchful eye from poolside recliners, we corral them in the shallow end. Speaking of which, it turns out that the cows are not to blame for the silence near our camp. The nearby water is too deep for cranes to stand. □

Stephen R. Miller is a Ted Scripps fellow in environmental journalism at the University of Colorado. Follow @SMillerPNW



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THE WEST

**Esquire** magazine writer **Charles P. Pierce** finds himself flummoxed by the novel constitutional interpretations, or “bafflegab,” of Mike Lee, the senior Republican U.S. senator from Utah. In a speech to The Federalist Society, Lee warned that America will face another civil war unless a host of “unconstitutional” federal programs are eliminated, including funding for K through 12 public education, the Interstate Highway System, workforce regulation, the Department of Commerce and especially what Lee calls “the huge glut of federally owned land.” Lee also claimed that Social Security, federal child labor laws and Medicare have no basis in law. His conclusion is stark: The country must choose between “federalism or violence.” Pierce’s own conclusion is equally stark: The Utah senator’s grasp of the actual Constitution, he says, is “eccentric,” if not outright “batsh\*t.”

COLORADO

**Some 500 people paid from \$199 to \$349** each to take part in a “Flat Earth International Conference” in Denver, the *Denver Post* reports. According to its website, the conference promised to “uncover and debunk pseudo-scientific ‘facts’ while presenting the true evidence which shockingly points to our existence on a flat, stationary plane.” As the YouTube channel “Globebusters” explains, “We’re not on an actual ball. It’s a plain and the outsides of it are being held in. We believe the oceans are being held in by Antarctica, and it is not necessarily a continent so much as it is a boundary that encompasses the oceans.” On their website, conference organizers helpfully answered common questions, such as, “Will I fall off the edge?” Rest assured, the answer to that is “no.”

CALIFORNIA

**The historic wildfires in Northern California**, which killed scores of people and destroyed thousands of homes, spurred some public officials to find a scapegoat. Apparently forgetting that he is not in charge of the Forest Service, which is managed by the Agriculture Department, Interior Department Secretary Ryan Zinke told *Breitbart News* that “it’s not a time for finger pointing,”



UTAH *Terms of endearment.* PAM KING

even as he pointed the finger at “radical environmentalists” for interfering with forest management: “This is on them,” he said firmly. For his part, *The Hill* reports, President Donald Trump blamed federal bureaucrats, accusing forest managers, in a widely quoted remark, of failing to “take care of the floors. You know, the floors of the forest, very important.” The president added that “Finland spent a lot of time raking and cleaning and doing things, and they don’t have any problem.” Fire behavior these days, much like the behavior of some political leaders, is becoming increasingly unpredictable. In an effort to get beyond blame, the *Los Angeles Times* talked to a number of fire experts. One of them, Jonathan Pangburn of the California Department of Forestry and Fire Protection, said that when the Camp Fire spread from the forest to the town of Paradise, it changed from a wildfire to an “urban conflagration”: Fierce winds sent burning embers through the air and ignited one house after another. “It was some of the most intense fire behavior that I have ever witnessed,”

Pangburn said. For Jack Cohen, a retired fire research scientist, one important lesson was that houses and other buildings needed a “defensible perimeter”; he cites the experience of medical staffers and patients from the Paradise hospital who found their escape blocked by flames. They abandoned their vehicle and survived by climbing onto the roof of a home. There, they cleared debris from the gutters, wet down the roof and managed to keep the fire at bay even as it consumed the houses around them. “A house that doesn’t burn is the best place to be during a wildfire,” Cohen concluded.

COLORADO

**In old Norse legends, a troll was a demon**; these days, trolls are another kind of demon, those snarky commenters on the internet. But then there’s the magnetic attraction of “Isak Heartstone,” a 15-foot-tall smiling troll made of recycled wood by the Danish artist Thomas Dambo. The resort town of Breckenridge, Colorado, placed Dambo’s troll along a trail behind a residential neighborhood, reports *Atlas Obscura*, and in a single year, Isak’s soulful eyes attracted thousands of visitors. Leigh Girvin, a 46-year resident of the area, loved the troll, too, but said its popularity caused serious problems: “Imagine 10,000 people knocking on your door asking for directions.” The troll had many local defenders, and arguments in town about keeping it were heated. “This is what trolls do,” said Girvin. “They bring out our best and our worst.” Finally, on Nov. 15, the town dismantled the troll board by board and removed it. Only temporarily, though: Isak will return to be reconstructed in a less populated area. At the least, said Haley Littleton, a spokesperson for the town, everyone learned about the power of public art: “We felt a kind of pride and amazement at what creative art was able to do.”

**WEB EXTRA** For more from Heard around the West, see [hcn.org](http://hcn.org).

Tips and photos of Western oddities are appreciated and often shared in this column. Write [betsym@hcn.org](mailto:betsym@hcn.org) or tag photos #heardaroundthewest on Instagram.



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