

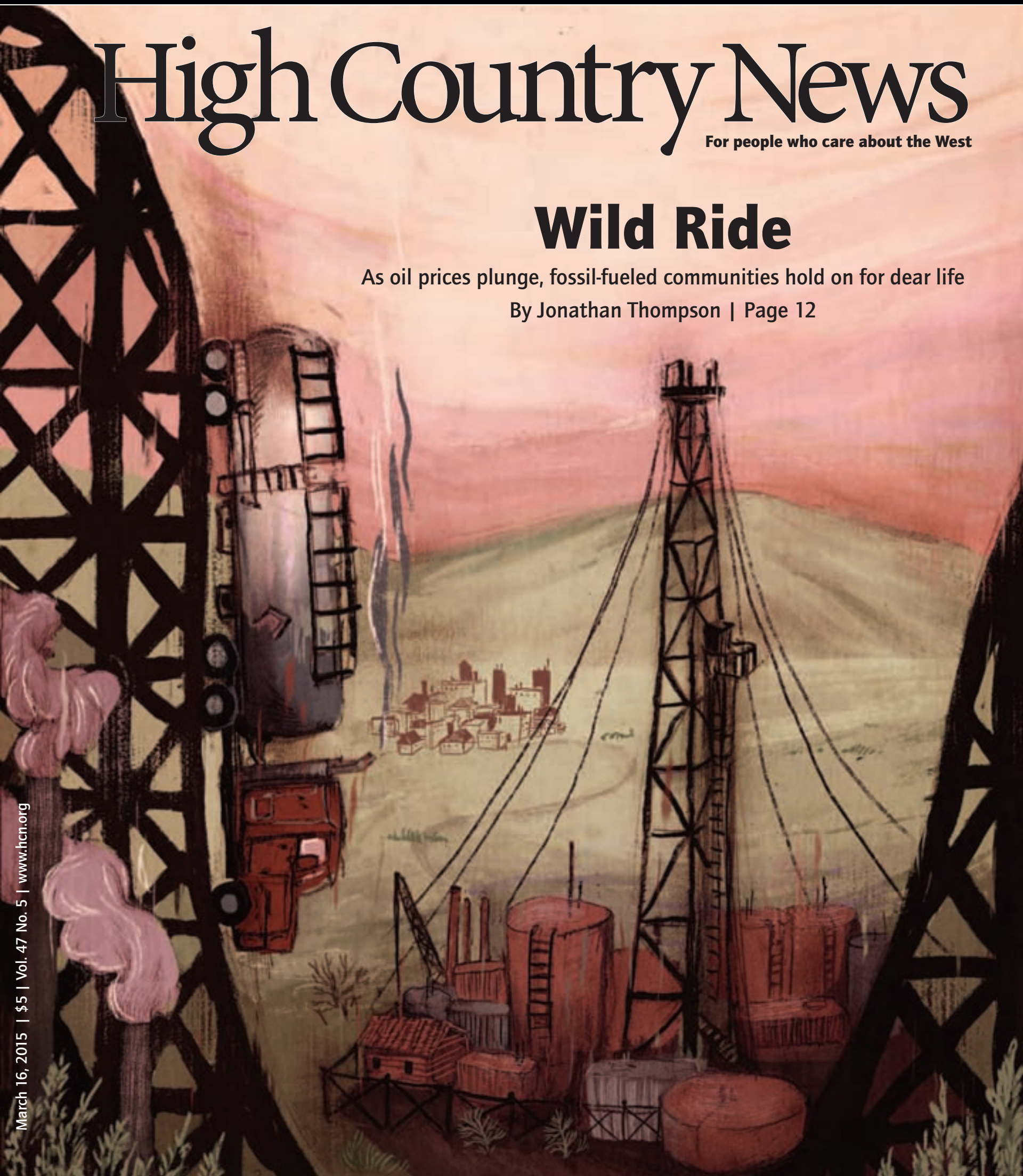
High Country News

For people who care about the West

Wild Ride

As oil prices plunge, fossil-fueled communities hold on for dear life

By Jonathan Thompson | Page 12



Please, Lord, send us another boom



I'm always inspired by the stories of the little old lady or gentleman who spends 50 years in a blue-collar job and somehow squirrels away millions of dollars. Like Robert Read, the Vermont mechanic and part-time J.C. Penney janitor, who was found, upon his death, to possess a deposit box crammed with stock certificates worth \$8 million. The money went to the local hospital and library, according to news reports.

I wish I could be that frugal. (Though Mr. Read may have taken his frugality to an extreme; his lawyer said, "He wouldn't even park close to my office because he didn't want to pay for parking.") A retirement-advice columnist said that if I had just started saving around \$5,000 a year back when I was 25 years old, I would be a millionaire by the time I hit 65. But I didn't listen.

Of course, back then saving even \$50 a month seemed impossible. It's hard to swim ahead confidently when you can barely keep your head above water. I have less sympathy for those lottery winners and professional athletes who do earn enough to save for a rainy day, but utterly blow their money. Unfortunately, some of the communities that have ridden the boom-and-bust roller coaster of the energy industry fall into this category, too.

As senior editor Jonathan Thompson reports in this issue, Farmington, New Mexico, which sits atop the fossil-fuel-rich San Juan Basin, has enjoyed almost a century's worth of the euphoric financial highs generated by high commodity prices, often for decades at a time. And yet, when the price of gas guttered out in 2008, and then oil did the same late in 2014, the town was as ill-prepared as ever to cope with the sudden loss of well-paying jobs and reduced tax revenue. It had never set up a rainy-day fund, and its leaders, while acknowledging the need to diversify their economy, have taken only timid steps in that direction.

One can only hope that the current double whammy of low oil and gas prices will spur the West's many Farmingtons to quit talking and start acting. It is possible; state governments in Wyoming and even in New Mexico have set aside billions in taxes paid by the industry, and that money is helping to maintain schools and keep other essential services going even as tax revenues continue to seesaw dramatically. But the wisdom of that approach has yet to filter down to the local level. So far, Farmington's basic strategy, as Thompson notes, is to simply wait hopefully for the next boom, just around the corner.

Or, as the bumpersticker adorning thousands of trucks around the West's oil and gas patches so succinctly proclaims: "Please God, send us another boom; I promise not to piss this one away."

—Paul Larmer, executive director/publisher

The natural gas plant in Bloomfield, New Mexico, whose stacks tower over a Catholic cemetery, pays the state more than \$200,000 a month in taxes.

BRIAN LEDDY



FEATURE 12

The Winter of Oil's Discontent COVER

Lessons from the fossil fuel roller coaster ride.

By Jonathan Thompson



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WEB ONLY www.hcn.org



North Six-shooter is one of the sites within Utah's 30-plus million acres of federal land that some legislators seek to transfer to the state.

TODD BURRITT

Federal-to-state land transfer battles across the West

Kindra McQuillan explains how a Utah bill aims to force an end to the debate, and provides a roundup of battles in other states.
hcne.ws/landtransfers

JOIN THE CONVERSATION

“If the fungus has no off-target organisms like beneficial insects, then it might be a winner. Too many times we hear from universities of some wonder product, which then bombs in real situations.”

—Sam Fuchs, commenting via Facebook on “New hope for beetle-killed landscapes” by Krista Langlois. hcne.ws/beetlefungi



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POLITICAL SCIENCE

Governor down

John Kitzhaber's peculiar and spectacular fall from grace

"He wants to capture those horses, move them a couple hundred yards and turn them loose."

—Bureau of Land Management attorney Coby Howell in the U.S. District Court of Wyoming, responding to a lawyer for wild horse activists who sued the agency last year, alleging that it had violated a federal law that requires the agency to maintain wild horses on public land but round them up on private land.

Associated Press

In February, on an especially strange Friday the 13th, Oregon Democratic Gov. John Kitzhaber announced his resignation. Over the past several months, *Willamette Week*, *The Oregonian* and other media outlets had revealed that clean energy consultant Cylvia Hayes — Kitzhaber's fiancée and energy policy advisor — may have violated ethics and public corruption laws by using her access to Kitzhaber's office for personal financial gain, possibly with his knowledge and participation. Since 2011, Hayes had reportedly landed at least \$213,000 in consulting contracts with groups working to advance the same causes on which she advised him.

"I have become a liability to the very institutions and policies to which I have dedicated my career," Kitzhaber conceded in a quavering voice. The state House speaker and Senate president, both fellow Democrats, had joined *The Oregonian* in calling for him to step down. Kitzhaber finally did so but remained defiant, denying wrongdoing and aiming a barb at his accusers and former allies, charging that he had been "tried, convicted and sentenced by the media with no due process."

BY SARAH GILMAN

The reversal in his political fortunes was indeed stunning. Kitzhaber was a popular and effective centrist politician who vastly expanded health-care coverage for vulnerable populations and championed environmental causes. He had comfortably won re-election to an unprecedented fourth term just months earlier — after the scandal first broke. And though federal officials were conducting a criminal investigation, no charges had been filed. The extent of Kitzhaber's involvement remained uncertain. So how did the governor fall so far so fast?

Public corruption appears about as scarce in Oregon as sunshine on its rainy coast. The state ranks eighth from the bottom for its rate of corruption convictions, according to unpublished research by Dartmouth professor emeritus Richard Winters. "In some ways, this scandal would be laughable in Ohio or Maryland or New Jersey," says Bill Lunch, Oregon Public Broadcasting's political analyst.

Consider, for instance, Illinois Gov. Rod Blagojevich, who stayed in office through multiple years of media scrutiny, federal investigation and indictments of associates and was only impeached after being arrested for, among other things, trying to sell a U.S. Senate seat. Or New Jersey's Chris Christie, who is still in office and nursing presidential hopes despite federal investigations into whether his administration closed bridge lanes and caused record traffic jams to retaliate against a mayor who refused to endorse his re-election.

But the last time an Oregon governor left office mid-term was in 1952, when Douglas McKay stepped down to become Eisenhower's Interior secretary. No one has ever resigned under a cloud. The state may be particularly queasy about scandal, Lunch explains, because of its deeply "moralistic" political culture: Oregonians still see government as a place for service and an agent for the collective good.

Even Hayes' and Kitzhaber's alleged transgressions fit this public-service mold, in a twisted way: They appear to have been motivated less by money than by progressive ideals. Hayes' unpaid work as a policy adviser, and her paying clients' agendas, involved fighting climate change and promoting clean energy and holistic measures of economic success that weigh the growth of the economy against things like environmental cleanup costs and income inequality. In a speech at Portland State University last April, Hayes described how she blithely dismissed Kitzhaber staffers' early concerns about her ambiguous role. "One of them said, 'You know, when you work for the governor. ...' And I said, 'I don't work for the governor, I work for the Earth.'"

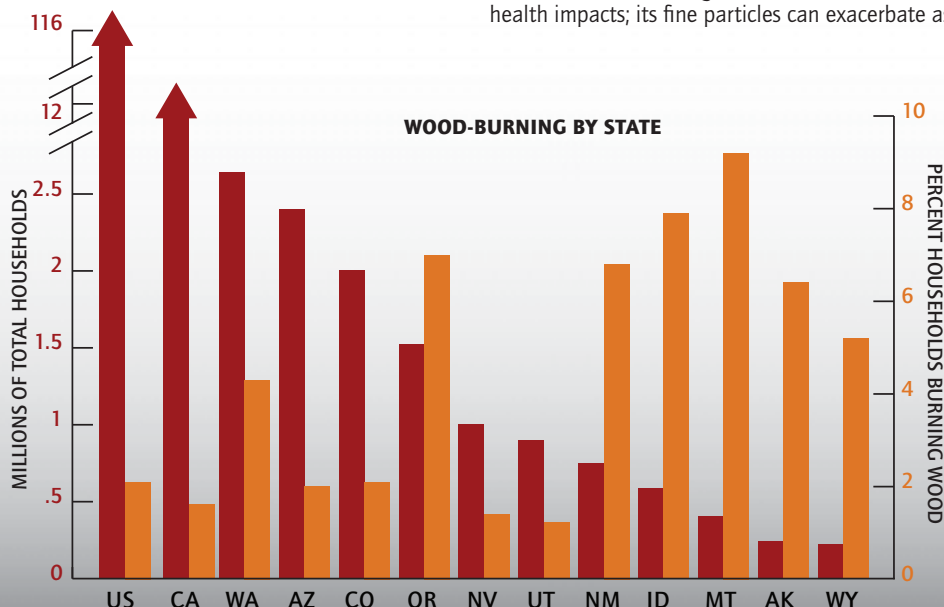
As a last-term governor with a Democratic majority in the Legislature, it's conceivable that Kitzhaber could have made good on his promise to price carbon. His successor, Democratic Secretary of State Kate Brown, is subject to a special election in 2016 and seems unlikely to make such bold moves for awhile. But some observers doubt Kitzhaber had the political capital,

Please see **Kitzhaber**, page 5

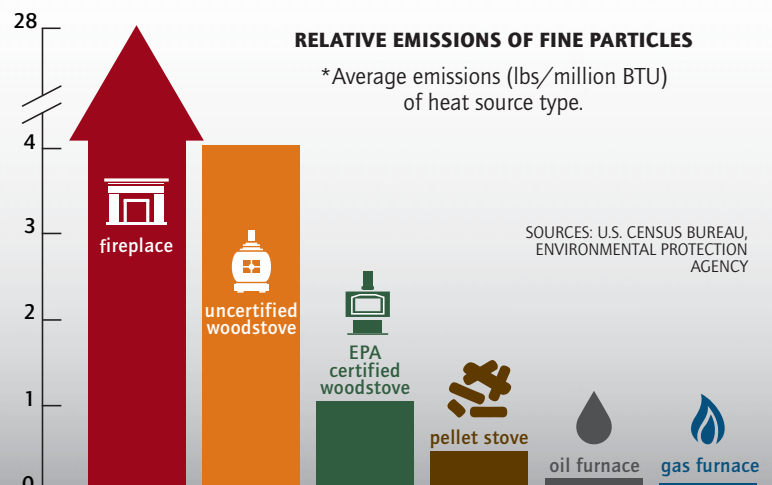
SNAPSHOT

Best way to burn?

A look at what's in Westerners' wood stoves



other respiratory problems. It can also contribute to low-hanging smog, prompting temporary local bans. In Utah, lawmakers have proposed a more far-reaching bill that would restrict winter wood burning in an attempt to curtail the state's "brown cloud" — angering residents who insist on the "right to burn." But if you're committed to wood-burning, the Environmental Protection Agency advocates using stoves designed to release fewer particles and burn more efficiently. Check out your best wood-burning options below. **KATE SCHIMEL**



SOURCES: U.S. CENSUS BUREAU, ENVIRONMENTAL PROTECTION AGENCY

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LIKE WATER FOR TRAFFIC

I found an interesting parallel in the March 2, 2015, issue of *High Country News* between our use of roads and our use of water. In “Big dig, big disgrace,” the trials and tribulations of Bertha’s attempt to dig a highway tunnel under the Seattle waterfront point to a counterintuitive reality, that more roads might lead to more traffic, not less. In the cover story, “Unite and Conquer,” the woes of Western water supply are discussed from the vantage point of a water manager trying to provide water to her area.

Reading about the lack of available water, and knowing that the West’s grand dam-building era has all but ended, begs the question: Does our use of water mimic our road use? Are we likely to use more water if it’s available and less if it is simply not? Water-use data from the U.S. Geological Service over the past 50 years seem to say this is true. While we were building dams and water projects through the 1960s and 1970s, Western water use kept growing. But since the 1980s, it’s actually decreased substantially. It is hard to believe, but our water use in 2010 is actually less than it was in 1970.

This, despite the fact that the Western population has grown by the millions and our economic output has grown by the billions. If our total water use has not increased in the past 40 years, why would it exponentially grow over the next 40 years? My guess is that it won’t, because there is no water to support it. Future water projects will more than likely be aimed at increasing the efficiency of existing uses, typically with the goal of preserving agricultural lands in the face of growing municipal water demands. These two articles provided me with a new perspective on our demand for water, and how flexible that demand might be. Just as fewer roads means less driving, maybe fewer water projects means lower water demand.

Brett Bovee
Fort Collins, Colorado

COSMOLOGIES OF STEWARDSHIP

Scott Carrier’s article “Chainsaw Diplomacy” (*HCN*, 2/16/15) missed an excellent opportunity to educate his readers on important restoration efforts currently underway in the Escalante River Basin of Utah. Instead of focusing on what these efforts are accomplishing in restoring



native habitat to a critical region, he seemed intent on pushing an agenda — creating a controversy between what he calls “entirely different cosmologies,” an issue that even the individuals highlighted in the article insist does not lie at the heart of their region’s struggles.

Carrier would have us believe that the cosmology that attributes the Earth to the special creation of a divine being leads to a particularly abusive use of the land and its resources. This approach is particularly reductionist. There are many believers, such as Wendell Berry, who affirm that the special act of creation actually impels humans to be more careful stewards of land and resources. Because the land is not ours and never will be, we are responsible for caring for it as temporary inhabitants. It is just such a “cosmology” that has informed Native care for the land for centuries, predating the cosmology of the “outsiders” in the Escalante region, which Carrier insists is based on reason and science.

As one surveys similar controversies around the West, it is apparent that “outsider/insider” issues surface in many other communities not tied to the particular cultural and religious expressions of life in the Escalante region. Writing about the Sagebrush Rebellion of the 1950s, Bernard DeVoto attributes these ongoing debates to a particular development of Western thought that is steeped in an economy based on extraction from a debtor region. As “insiders” struggle to make ends meet, they have been historically resistant to “outsiders” with an agenda that seems to flow from Easterners with money.

W. Vance Grace
Grand Junction, Colorado

WILDERNESS VETS

In May of 1966, I returned from a combat tour in Southeast Asia. It was a return full of challenges (“Wilderness as therapist,” *HCN*, 2/16/15). For two years, I had been surrounded by the noise and smell of war and had been trying to survive day to day. How was I going to cope? I needed to find a place where quiet and solitude dominated. West of Fort Collins, Colorado, a newly minted wilderness area was legislated into existence by the 1964 Wilderness Act — the Rawah Wilderness, named for the Ute word for abundant. For two weeks that summer, I found peace and solitude in abundance in the Rawah. The therapeutic value of wilderness is priceless.

Martin Sorensen
Lakewood, Colorado

OWNERSHIP?

There is so much talk about who should own public lands and how they should be managed (“This Land Is Their Land,” *HCN*, 2/2/15). I recommend a great book, *The Big Burn*, by Timothy Egan. In it, Egan outlines how Teddy Roosevelt was farsighted enough to see that all Americans deserve access to certain lands. He knew that railroad barons would end up with most of it, if something were not done to protect it. Nowadays, the backpacker from New Jersey has just as much right to public-land use as the local cattle rancher, miner or ATV rider. If Westerners had to have all the factories to produce the products we use (in our backyards), Utah would look a little bit more like, well, New Jersey.

David Poling
Grand Junction, Colorado



Not
from
HCN!

Subscriber alert!

An Oregon company is targeting *HCN* subscribers with unauthorized renewal offers. These offers are not from *HCN*! Find out more and report any offers you’ve received from the company at hcn.org/renewalscam.

Kitzhaber *continued from page 3*

and sources close to him say he had no immediate plans to try. His big climate priority for this session had been the renewal and full implementation of a low-carbon fuel program. After his departure, it still passed the Legislature easily.

In the end, as a rapid-fire legislative session ramped up, Democrats may have realized they had more to lose from standing by Kitzhaber than asking him to go. A poll last summer showed significantly more Oregon voters wanted Kitzhaber replaced than re-elected, due in part to the spectacular failure of the state's health-care exchange. But Republican challenger Dennis Richardson didn't stand a chance in the left-leaning state. And Brown is a more liberal Democrat, with her own long

legislative record of fighting for social and environmental causes. "I think there was a feeling that the governor needed to take one for the team," says Democratic strategist Jake Weigler. "It was not a matter of his own political fortunes anymore, but rather about the larger progressive agenda for the state."

In fact, for all the drama around Hayes and Kitzhaber, the ripple effects on the causes they championed have so far been undramatic. If anything, many of the state's leading environmentalists seem optimistic. Most laud Kitzhaber's ability to bring disparate sides to the table to compromise — particularly during his first terms in the '90s, when he oversaw the creation of a massive collaborative effort to restore salmon habitat. But

many felt his timber policies favored industry at steep environmental cost. "Our logging practices are the weakest on the West Coast," says Sean Stevens of Oregon Wild. "They don't keep water clean for wildlife or for people."

Brown "is going to be a strong ally," says Oregon League of Conservation Voters Executive Director Doug Moore. "I don't think it will be a step back. In some regards, it could be a step forward." Still, "a lot of people in Oregon are sad to see (Kitzhaber) go," adds Oregon Environmental Council spokeswoman Jessica Moskowitz. "A lot of people are still in office in other states who have done a lot worse." □

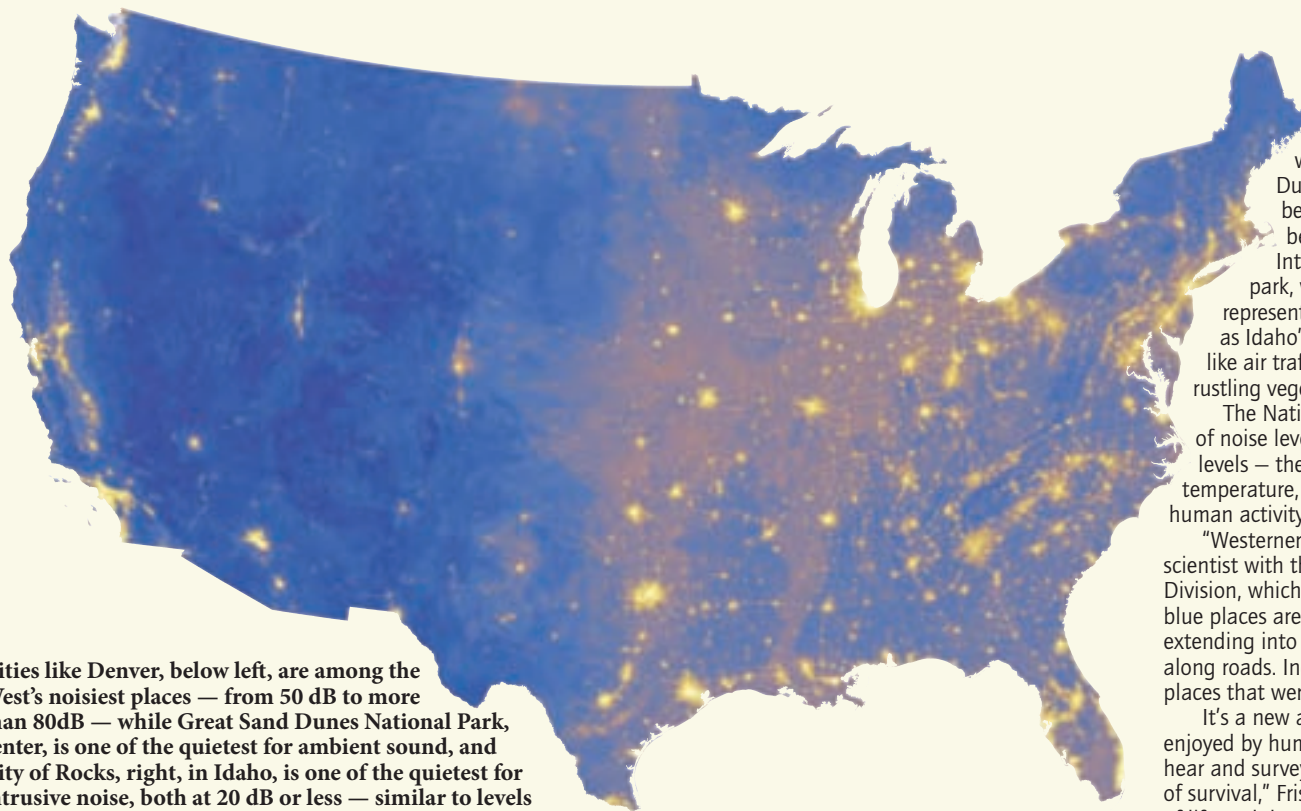
Hayes and Kitzhaber last June in Walla, Washington. FORMER GOVERNOR'S FLICKR PAGE



NOISIEST (55-67 dB)

(<20 dB) QUIETEST

Based on median daytime summer sound levels, expressed in decibels (dB), which are on a logarithmic scale: A 10 dB increase corresponds to a tenfold increase in sound energy. Source: NPS NATURAL SOUNDS AND NIGHT SKIES DIVISION



Cities like Denver, below left, are among the West's noisiest places — from 50 dB to more than 80dB — while Great Sand Dunes National Park, center, is one of the quietest for ambient sound, and City of Rocks, right, in Idaho, is one of the quietest for intrusive noise, both at 20 dB or less — similar to levels in pre-Colonial times.

SNAPSHOT

The quiet, noisy West

The West's quietest places often coexist with its noisiest. Colorado's Great Sand Dunes National Park is nearly as quiet today as before European colonization, and yet, partly because of its silence, air traffic from Denver International Airport can be audible there. The park, with its lack of wildlife- and water-sounds, represents one kind of silence; other wild places, such as Idaho's City of Rocks National Reserve, mask noise like air traffic with the sound of running water and rustling vegetation.

The National Park Service recently conducted a study of noise levels across the U.S. The study maps noise levels — the bluer the quieter — based on conditions like temperature, precipitation, and, of course, proximity to human activity.

"Westerners are quite lucky," says Kurt Fristrup, senior scientist with the agency's Natural Sounds and Night Skies Division, which conducted the study. "A lot of the deep-blue places are here in the West. At the same time, noise is extending into the landscape in these spider-web patterns, along roads. Industrial development is now penetrating places that were recently wild."

It's a new approach in the decades-old study of silence, enjoyed by humans and essential to animals. "Being able to hear and survey what's going on around you is a critical part of survival," Fristrup says. "For wildlife, it's literally a matter of life and death." KINDRA MCQUILLAN



LARRY JOHNSON/CC VIA FLICKR



MADELEINE DEATON/CC VIA FLICKR



NATIONAL PARK SERVICE



Darlene Arviso delivers water to homes on the Navajo Nation, where many houses have no direct access to public water systems. Her clients live on roughly seven gallons per day, while the average American uses 80 to 100. SARAH TORY

UNCOMMON WESTERNER

Darlene Arviso: Water lady

In the parched countryside of the Navajo Nation, delivery binds community

Ride GMC Isuzu

Number of miles driven in a week 250

Number of flat tires thus far 0

Favorite road snack
Mixed nuts

Favorite radio station
KHAC Navajo Christian Radio

Every morning, Darlene Arviso picks up her water truck at the St. Bonaventure Indian Mission, a cluster of brown trailers in Thoreau, New Mexico, and fills her 3,500-gallon tank from a metal water tower before setting out across the Navajo Nation.

Arviso, 50, has a long braid of black hair streaked with gray, and she speaks softly, in short sentences, her eyes fixed on the road. “You can’t drink that water,” she told me one clear blue morning in November, as we turned off the highway and passed a smattering of homes around a muddy pond. “It’s only for animals.”

Born on the reservation a few miles from Thoreau, Arviso grew up hauling water from the local church. For a while, she worked as a silversmith, then as a truck driver for construction crews in Albuquerque. Her days started at 3 a.m., so she could get to the city by 5:00. The driving didn’t bother her, but she missed seeing her children. As she got older, she found herself thinking about her grandfather, who was a medicine man, and his instinct to help people. When St. Bonaventure needed a driver for its new water truck, Arviso applied.

That was six years ago. Her clients call her the “water lady,” but she’s more than a delivery woman. She’s also the tether between the far-flung homes on a wide stretch of this shrubby, rocky, high-desert plateau. Arviso gives her cellphone number to all her clients, and sometimes they call her, asking for help. Perhaps they need food or extra blankets, or simply someone to talk to. “Sometimes,” she told me, “I’ll just pray with them.”

Arviso lives in a world that is hard for outsiders to comprehend. Nearly 40 percent of the estimated 173,000 Navajos living on the reservation lack access to running water. Although some have moved to newer, more centralized communities with water and electricity, many prefer to stay on the remote land they’ve occupied for generations.

“We’re a rural people,” Edmund Yazzie, a tribal lawmaker, says. “Some of us don’t want to live in subdivisions. I myself wouldn’t want to live in a subdivision.”

Over the years, the tribe’s public water utility has drilled new wells and begun hooking up homes to water mains, but it’s a monumental task; connecting a single home sometimes costs hundreds of thousands of dollars. And so, many people haul

their own water, driving up to two hours each way in search of a spigot. Others use livestock troughs, which are more conveniently located, though the water often makes people sick.

Meanwhile, the much-ballyhooed Navajo-Gallup Water Supply Project has been slow in coming. Despite the fanfare over the project, which is part of a 2010 settlement between the tribe and the state of New Mexico over the tribe’s 900,000 acre-feet of unclaimed San Juan River water rights, only a small percentage of the water will reach Navajos living out on the reservation.

“I taught my kids to haul wood and water,” Arviso told me as we drove. “But I taught them it’s important to help people, too.” Hauling water is part of everyday life here, but as more young people leave the reservation, getting by — especially for the elderly — has become increasingly hard.

Where the water mains end, Arviso steps in, delivering water to 250 homes in the area around Thoreau. Most days, she can reach only 10 or 12 of them. That means that the 400 gallons of water each household receives — the amount an average American uses in four days — must last a month.

Arviso’s days are still long; she leaves the house at 6:30 for her other job as a school bus driver. On a typical day, she’ll deliver around 3,000 gallons of water, driving up to 75 miles over rough roads. At 3:00, she’s back in the school bus, and by 6:30 she’s home, in time to make dinner.

BY SARAH TORY



For 20 years, the St. Bonaventure Indian Mission, left, has driven a total of nearly 2 million miles to bring water to the isolated households of the Eastern Navajo Nation. Lindsey Johnson, below, a Smith Lake elder, grew up hauling water from a local livestock pond. Today, she lives in a two-bedroom trailer with eight family members — still with no running water.

SARAH TORY

Usually, it's a sandwich: pork chop or ham and cheese. Some days, when the roads turn to wet concrete after heavy rains or snow, she can't make deliveries.

Soon, though, she may get help from a well planned for Smith Lake. DigDeep, the organization behind the project, generally develops water projects in countries like Cameroon and South Sudan, but George McGraw, its founder, has made the Navajo Nation a new priority. Arviso and others may be used to limited water, but McGraw sees it as deprivation. "In the U.S., there are a lot of laws that have governed water use for a long time, and those laws are based on property," he says. "They're water rights, not the right to water."

McGraw is still negotiating the myriad obstacles to drilling a well out here, where contamination from old uranium mines reaches deep into the groundwater. The full cost of the project, which includes installing indoor storage tanks and solar heaters in individual homes, will run almost half a million dollars — more than five times the price DigDeep usually pays for a comparable project.

Two years ago, when McGraw first met with people around Smith Lake, many were skeptical. They'd heard promises before, but a new well never came. "They've already tried," one man said. Arviso chimed in. "I told them, 'You're supposed to have faith.'"

The Smith Lake well would mean that 5,000 people no longer have to drive as far to get water. Arviso will be able to refill her truck without going all the way back to Thoreau, allowing her to deliver more water to more people.

In the early afternoon, we reached the home of siblings Vivian and Jeff Barbone, who live in a clearing overlooking a forested mesa. In their yard, a patch of dusty earth, a few rusted cars sat under a single gnarled juniper.

Beside the house, four large blue plastic drums stood in a neat row. Arviso uncoiled a long plastic tube from the tank on the back of the truck and inserted it into one of the barrels. "It's the Yellow Buffalo," Jeff said, nodding toward the truck. Arviso turned the metal lever, her hands protected from the cold in a pair of neon-green gloves, releasing a stream of water.

Along with water, Arviso often delivers boxes of food or wood to the Barbones, who also care for their mother. She lives in a small, separate house on their property, without electricity or running water, and she uses an old woodstove for heat in the winter. They have one car, which Vivian takes to work. "Sometimes Jeff can't manage," Arviso said. "It's hard to get wood without a car."

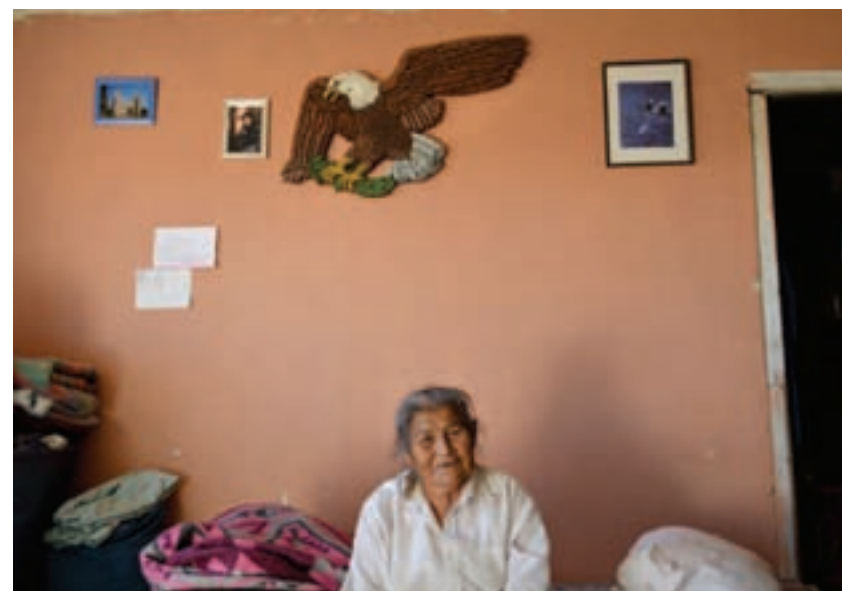
After the buckets were filled, Vivian disappeared into her house. She returned with a plate of freshly roasted piñon nuts. Arviso took a handful, and the two women chewed them carefully, cracking the shells between their teeth to get at the morsel inside.

"I just can't give water and leave," Arviso told me later. "I have to ask them if they're doing okay. Some people don't have anybody to lean on."

When I asked about water, Vivian, who's in her late 50s and has a sprinkling of freckles across her cheekbones, sighed briefly. "We haven't had running water in over 30 years."

Leaving the Barbones, we passed the abandoned lot overlooking Smith Lake, where one day soon the new well could be dug. Right now, it's just a few acres of scratchy-looking grass surrounded by an old wooden fence and a boarded-up house. Until recently, Arviso was the only one in her family with running water. But when her septic tank broke a few months ago, the tribal utility shut her tap off. She doesn't know when they'll fix it. In the meantime, she'll keep driving the Yellow Buffalo.

"People tell me I can't ever leave my job," she said as we drove away. A middle-aged man walking along the highway waved at the truck. Arviso waved back and aimed the truck toward home. "They say, 'We're depending on you.'"



The case of the snotty streams

A mysterious algae is smothering wild rivers — and may hold clues to their future



RICK SWART/ODFW

THE LATEST

Backstory

The Oregon chub, a minnow endemic to the Willamette River drainage, was common in sloughs, marshes and beaver ponds until habitat loss and invasive species reduced the population to fewer than 1,000.

In 1993, the chub was added to the federal endangered species list. Though more fish are listed than mammals, birds, reptiles or amphibians, none have been successfully recovered.

"Freshwater habitats are the most endangered worldwide," said native fish expert Peter Moyle ("The little fish that could," *HCN*, 3/3/14).

Followup

In February, the chub became the first fish ever to be taken off the list. (The Modoc sucker, in Oregon and California, has been proposed for delisting; a decision is due in May.) Its recovery involved numerous habitat restorations and introductions, some on private land, but required no major water or land-use changes. "In most of the West, we deal with the concern that we're going to take away water that people need," says Oregon Fish and Wildlife biologist Paul Scheerer. "That was not the case here."

CALLY CARSWELL

On a cool, wet July morning at the Rocky Mountain Biological Lab in Gothic, Colorado, thick clouds erased the hulking mountains from view. The former mining town is a working summer camp for scientists. Brad Taylor, a Dartmouth professor, met his wife here. She studies bees, and he studies fish, the bugs they eat and the algae that set the bug buffet.

These days, he's especially preoccupied with one kind of algae — an enigma that haunts wild rivers worldwide. Wearing a blue rain jacket and an orange baseball cap over salt-and-pepper hair, Taylor stood in a bubbling stream on lab property, his eyes searching the rocks for *Didymosphenia geminata*. *Didymo* (pronounced "Did-i-mo") is a single-celled algae or "diatom." Diatoms are among Earth's most common life forms and the foundation of aquatic food webs. They're only visible through microscopes, but if you've ever slipped on a slimy river rock, you've encountered them.

Less than a decade ago, however, *Didymo* became much easier to spot here. The cells began sprouting stalks about the thickness of human hairs that coalesced into sprawling underwater manes, which felt like wet, dirty wool. They did the same in Colorado, Idaho, Wyoming, Montana, South Dakota, Connecticut, West Virginia, Canada, Chile, New Zealand, Poland. The algal mats smothered streambeds for miles. They were inconvenient, threatening and gross — described, in scientific

journals, as "mucilaginous." In the popular press, *Didymo* was dubbed "rock snot."

The mats mucked up fishing in popular rivers, like Montana's Kootenai. Anglers' casts got lodged in gobs of snot. They seemed capable of clogging water intakes, and, in the Rockies, were also bad for fish. The worms that carry whirling disease, an exotic killer of native trout, thrive in *Didymo* blooms. The mats even change the food web.

To demonstrate, Taylor grabbed a flat rock from the stream, and scraped pimples of *Didymo* into a dish. A mess of fidgeting midges emerged, but few large mayflies. Blooms favor small insects, Taylor explained; they can take refuge in the mats, while the larger ones become entangled and more vulnerable to predators. Here, that's stunted the growth of some trout. Taylor next scraped a *Didymo*-free rock, revealing a diverse mix of bigger bugs. "You don't need a Ph.D. to be able to say something's going on," he said.

Something — but what? Puzzlingly, the algae colonize rivers that are virtually devoid of phosphorus, the nutrient from farms and septic systems that often stimulates nuisance algae. So what's behind *Didymo*'s advance? And can anything be done to make it stop?

If you fly-fish, you might have heard that *Didymo* is an invasive species. That may not, in fact, be true.

Canadian freshwater researcher Max Bothwell is one of the people most responsible for popularizing this idea. Now, he

and Taylor are its most vocal critics. Bothwell, whom Taylor lauds as the "Yoda" of rock snot, spent much of the 1990s trying to finger its cause on Vancouver Island. *Didymo* cells were native there, but the blooms were new. Bothwell looked for evidence that rivers' phosphorus levels had increased, but found none. Their hydrology hadn't shifted significantly. Experiments also ruled out ultraviolet radiation from the waning ozone layer as the culprit.

In 2004, Bothwell got a new clue when blooms were discovered in New Zealand, where *Didymo* cells had never been seen, despite thorough diatom surveys. Here, scientist Cathy Kilroy and others argued, *Didymo* was a recent immigrant, transplanted by humans. After a research trip to New Zealand in 2006, Bothwell started to wonder if Vancouver Island had suffered an introduction, too — perhaps of a new genetic strain more prone to stalk production. Combing historic records, he noticed that the blooms coincided with an uptick in fishing and the popularity of felt-soled waders, which prevent anglers from slipping in streams, but, if not properly dried and cleaned, can transport living cells. Plus, the blooms seemed to occur at popular fishing spots. The evidence for introduction of a genetic super-stalker was circumstantial, Bothwell wrote in his 2009 *On the Boots of Fishermen* paper, but it seemed convincing.

The paper was a hit: *Didymo* was declared invasive the world over. In some places, felt-soled waders were banned.



Epeorus deceptivus and other flat mayflies decrease in abundance in response to *Didymo* blooms. BOB HENRICKS



Public agencies and fishing groups launched educational campaigns, encouraging anglers to “check, clean and dry” their gear between rivers and switch to rubber-soled boots. In the past, says Dave Kumlien, who works on invasive species for Trout Unlimited, the stream-fishing community resisted the idea that they helped spread whirling disease, which, like a lot of aquatic invaders, was mostly invisible. “This is one that people could see, and it screwed up your fishing,” Kumlien says. “*Didymo* got stream anglers thinking about what they were doing. It began to shift the paradigm of behavior.”

Bothwell thought he’d solved the mystery. “Finally, this monkey was off my back,” he says. “It seemed to make sense.”

Except it didn’t — not entirely, anyway. By then, Brad Taylor was separately studying *Didymo* in Colorado, where invasion seemed an unlikely explanation. The cells had long been present in streams, but Taylor and others never saw long, thick mats around the field lab until 2006 and 2007. In 2008, however, the mats didn’t appear. They smothered streambeds again the next year, but didn’t in 2011. And *Didymo* erupted only



Brad Taylor stuns fish to observe the effects of whirling disease, which increases in response to *Didymo* blooms, in Copper Creek, Colorado.

COURTESY CRYSTAL EDMUNDS/COAL CREEK WATERSHED COALITION

in certain streams, even though the cells lived in many others. If the blooms were caused by an invasion of a genetic mutant, shouldn’t they grow every year, in every stream?

Taylor suspected something in the environment had shifted. The blooms followed unusually warm springs and rapid snowmelt. In non-bloom years, on the other hand, substantial snowpacks melted gradually, more as they had in previous decades, when *Didymo* cells remained benign. Taylor measured flows in unaffected and affected streams; the latter peaked about two weeks earlier, because they drained smaller watersheds, or were more exposed to the sun.

Around the same time, Bothwell and Kilroy — who had been running experiments in New Zealand — made an unexpected discovery: *Didymo* bloomed when levels of the nutrient phosphorus *dropped*. Typically, the opposite is true. Most algal blooms — the toxic blue-green variety in Lake Erie, for instance — are caused by spikes in phosphorus.

The drop *Didymo* responded to was so small it wasn’t even measureable with traditional tools. That’s why changes in the nutrient’s levels hadn’t registered in other streams despite testing. The scientists think cells produce stalks to allow the cells to move up into the water column, where they have a better shot of accessing traces of phosphorus, which they need to divide and reproduce.

Taylor and Bothwell began brainstorming potential causes of phosphorus declines. Last spring, they published a paper detailing their leading theories — and

arguing that *Didymo*, rather than being invasive, is probably native to most places it’s bloomed.

If they’re right, *Didymo* may ultimately be a lesson in how minor environmental changes can have outsized effects on ecosystems. Taylor now believes the Colorado blooms are linked to changes in the timing of spring, a sign of the warming climate. When spring comes early to the Rocky Mountain Lab — as it does with increasing regularity — rapid snowmelt could be flushing phosphorus from soil in one big pulse, rather than delivering it gradually, depriving streams of the nutri-

ent after the snow is gone. Or, when plants “turn on” early, they might use more of the available phosphorus, leaving less for streams. Most likely, some combination of these factors is at work. Elsewhere, phosphorus declines could be a symptom of nitrogen pollution, from the atmosphere or fertilizer applications.

U.S. Geological Survey diatom expert Sarah Spaulding agrees that the evidence that phosphorus regulates blooms is compelling, but thinks Taylor and Bothwell have been too quick to dismiss the human role. The idea that human-caused changes in phosphorus and nitrogen are driving the blooms “might be true,” she says, “but it needs to be shown with data.”

Cathy Kilroy, in New Zealand, tends to agree with Taylor and Bothwell that in much of the world blooms are likely to be the result of environmental changes. But many questions remain. There is still no historic evidence, she says, of the cells in New Zealand streams, and it’s even possible that a boom in environmentally triggered blooms “facilitated (the) spread of cells, possibly to places where *Didymo* wasn’t present previously.”

Taylor acknowledges that more research is needed. But if *Didymo* was introduced to some rivers, he believes, it will continue to spread, whether on the boots of fishermen or the hooves of livestock and wildlife. “If environmental factors are causing the blooms, that’s the main issue,” he said. “We need to nail down if *Didymo* is a good sentinel for impending changes” — the canary-in-a-cage for rivers, warning of important shifts most of us can’t yet perceive. □



DON BRIGGS

THE LATEST

Backstory

Railroad cars full of flammable crude oil are rattling through the West, hauling more than six out of every 10 barrels produced in the Bakken to refineries, according to a 2014 report. **Washington state has already seen a major uptick in oil-train traffic and at least one derailment.** Shell Oil wants to build a new facility north of Seattle that would take in six 100-car locomotives per week (“Flash point,” *HCN*, 11/24/14).

Followup

Last month, following West Virginia’s massive oil train derailment and explosion and reports of a Bakken train leaking oil in Washington, **Skagit County blocked Shell’s proposed facility until the company completes a full environmental review.** The U.S. Department of Transportation predicts an average of 10 oil train derailments per year over the next two decades. But the recent drop in oil prices means fewer trains are rolling out of the Bakken; perhaps — at least for now — there’s less chance of another disaster.

JEREMY MILLER



Tufts of *Didymo* adhere to a rock, left. A microscopic image shows the silica cell wall of the *Didymo* diatom, above. BRAD TAYLOR; SARAH SPAULDING/USGS

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A pine marten peeks out from a tree hollow in Shoshone National Forest, Wyoming. THOMAS D. MANGELSEN/WWW.MANGELSEN.COM

YELLOWSTONE WILDLIFE: ECOLOGY AND NATURAL HISTORY OF THE GREATER YELLOWSTONE ECOSYSTEM

Paul A. Johnsgard, photos by Thomas D. Mangelsen

256 pages, paper:

\$29.95.

University Press of Colorado, 2013.

In *Yellowstone Wildlife*, Paul Johnsgard describes the region as shaped like the print of a raccoon's paw. Aided by famed photographer Thomas Mangelsen, Johnsgard carefully examines each toe of the paw, tenderly tracing the wrinkles on every digit. In the process, he and Mangelsen explore some well-travelled ground: Yellowstone National Park is one of the country's most visited parks, thanks largely to its photogenic wildlife. But Mangelsen's photographs catch the park's iconic animals in unusual and often domestic moments, from a pair of sandhill cranes guarding their nest to a group of coyote pups roughhousing in the rocks. Meanwhile, Johnsgard teases out Yellowstone's wide range of habitats and inhabitants, recounting the hibernation of the tiny western jumping mouse, the early lives of beavers and the trials of the park's elk herds. All told, it's an affectionate portrait of a well-loved place.

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See you in April

With our 22-issue-per-year publishing schedule, we're skipping the next issue. Look for *High Country News* again around April 13. In the meantime, check hcn.org for fresh articles, and follow us on Twitter and Facebook. And happy spring!

WELCOME, ELIZABETH SHOGREN

At a time when many newsrooms are reducing staff, *High Country News* is growing — hiring a special Washington, D.C., correspondent. **Elizabeth Shogren** will explore and explain the many ways that federal agencies, politics and policies impact Westerners' daily lives.

As a Moscow correspondent for the *Los Angeles Times*, Elizabeth once found herself pressed up against the tank that Russian President Boris Yeltsin famously climbed on during a 1991 coup. Later, President Clinton told the then-White House correspondent how it felt to be impeached: "Not bad." Elizabeth began covering the environment for the *LA Times'* Washington bureau because she was enthralled by the wild landscapes of Utah and Wyoming. For the past decade, she was NPR's environment correspondent, covering the 2010 BP oil spill, climate change, endangered species and the impacts of air pollution on communities.

When she's not reporting, Elizabeth enjoys cross-country and telemark skiing. On weekends, she escapes to Virginia's Shenandoah National Park. "Joining *High Country News* gives me a chance to report deeply about how major Western issues play out on the national stage," she says. "The U.S. drilling boom and the emerging

impacts of climate change make this a crucial time for this beat." Watch for her stories in the magazine and at hcn.org.

C'MON BY AND VISIT US

We're always delighted when our readers take the time to visit our headquarters in tiny Paonia, Colorado. We try to mention everyone in this column. But if we miss writing about you, please drop us a line, so we can remedy the omission. (editor@hcn.org)

Gary Hall of Denver came by recently while looking at houses in Paonia. Originally from Michigan, the graphic artist fell in love with mountains as a young man. Now he's ready to leave the big city behind, he says, and being a longtime *HCN* reader, thinks Paonia might make a good home. Howdy, neighbor (we hope)!

A HAUNTING NEW BOOK

For the second time, *HCN* contributor **Hannah Nordhaus** has written a book that sprang from a story she wrote for us. *The Beekeeper's Lament* was based on "The Silence of the Bees" (*HCN*, 3/19/07). This month, HarperCollins will release *American Ghost: A Family's Haunted Past in the Desert Southwest*. "It's something of a history wrapped in a ghost story, about my efforts to find and understand my great-great-grandmother, Julia Staab, a mail-order German bride whose 19th-century ghost is said to haunt a luxury hotel a few blocks off Santa Fe's Plaza," says Hannah. She first wrote about Julia in her essay "The Soul in Suite 100: A ghost story" (*HCN*, 10/22/12). For more, see www.hannahnordhaus.com.

—Jodi Peterson for the staff



Elizabeth Shogren with her son in Arches National Park. JEFFREY SNAY

The Winter of Oil's

*Lessons
from the
fossil fuel
roller-
coaster
ride*

Wet snow splatters on my windshield as I drive from Durango, Colorado, toward Aztec, New Mexico, on a January morning. As the highway crosses the state line, the cultural landscape changes. Humanity's detritus is jumbled together in an oddly organic, entropic way: A rusty gas well tank nudges a rotting wood shack next to a trailer, with tires on its roof; seven cars overgrown with weeds huddle together out front like old friends having coffee.

Then there's New Mexico's penchant for signs — from big billboards to quirky little placards — which makes for a more interesting, if less aesthetically pleasing, drive. No fewer than four mark the edge of town. "Welcome to Aztec, Home to 6,800 Friendly People and 6 OLD SOREHEADS." "Winner All America City 1963." Then, a bit farther in, "Jesus Saves," and "Bubba Does Income Taxes."

Today, however, the most important signs loom over gas station parking lots, announcing that gasoline is selling for just over two bucks, cheaper than it's been for a half decade. Here, where folks tend to drive long distances, mostly in large pickup trucks and SUVs, the prices elicit joy: U.S. motorists will save more than \$2 billion per week thanks to low gas prices, and the locals here are happy to get their share.

And yet, those falling numbers also make people anxious. Aztec is the smallest of a triad of towns that include Farmington, population 45,000, and Bloomfield, population 8,000, in

the heart of the San Juan Basin, 10,000 square miles of mesas and canyons and scrub-covered high-desert plains that sprawl across much of northwestern New Mexico and into Colorado. The region's shale, sandstone and coal beds, souvenirs of an ancient inland sea and its swampy shoreline, store vast quantities of coal, oil and, especially, natural gas, which is so abundant it seeps out of the earth unbidden in places.

For nearly a century, the economic fortunes of these three communities have hinged on fossil fuel extraction. While environmental regulations, national policy and subsidies for energy companies can affect the situation, nothing does so more than the price of the commodities. When oil or natural gas prices rise, so do the fortunes of Aztec, Farmington and Bloomfield. When they drop, the effects ripple through the economy, from the dozens of oil- and gas-related businesses, to local and state governments.

Jason Sandel is the executive vice president of Aztec Well, a conglomerate of drilling and oilfield service companies run by his family. Back in 2008, Aztec Well and the rest of the region were battered by a crash in the price of natural gas, the Basin's cash crop. So Sandel and his troops turned to crude, riding the record-breaking wave of high oil prices that ignited booms in North Dakota, southeastern New Mexico, Wyoming and Colorado. By mid-2014, Aztec Well and its subsidiaries had 825



Discontent

FEATURE BY JONATHAN THOMPSON

employees and 14 rigs drilling, some as close as the south side of the Basin and others as far away as Utah and Pennsylvania.

But late last summer, global demand for petroleum faltered. The U.S. was extracting more oil than it had in decades, and the Saudis, rather than curtailing production to stabilize prices, decided to just keep pumping away in order to retain their market share. "We are living in the confirmed world of a price war," says Daniel Fine, associate director of the New Mexico Center for Energy Policy at New Mexico Tech. And the Saudis seem to be winning. The global oil price slumped from nearly \$115

per barrel in June of last year,

to less than \$50 in January.

And even as other

Westerners dusted off

their Hummers and

SUVs and happily

hit the road, town,

county and state

governments in

the oil patch,

from Alaska

to Texas,

braced for

the after-

shocks.

When I meet Sandel in his office, I'm a little surprised:

He resembles a Brooklyn hipster, albeit a burly one, with a long, well-mannered beard, tortoiseshell Ray Ban prescription glasses and a stylish button-up shirt. If a lumbersexual is a fashion-conscious urbanite who looks theoretically ready to do some clear-cutting, then Sandel could serve as the standard-bearer for stylishly casual "roughnecksexual" oil-and-gas dudes. I refrain from sharing this thought.

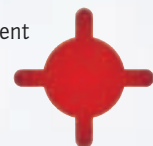
Sandel is coping with once again having to scale back his enterprise, laying off workers and stacking rigs in the yard, but he is happy to talk, as long as I don't intend to "spin the article negatively, (to push the community) away from energy development due to its volatility." Yet no matter how I spin the story, there's no hiding from the facts: To hitch one's fate to fossil fuels is to take a wild roller-coaster ride that can overrun other economic sectors and fray the social fabric. And the carnary driving this ride is not the local community, but the global marketplace.

I'm not here, however, to build an economic or even environmental argument for eschewing oil and gas development — we've heard all of those before. I'm here to learn how the roller coaster works, and to glean from Sandel any lessons, or warnings, he's gained from experiencing two busts in less than 10 years — lessons he can share with the neo-boomtowns, now busting, of the shale revolution.

Aztec Well rig workers brave a winter storm to set up a natural gas-powered drilling rig near Lybrook, New Mexico. BRIAN LEDDY

**2,500
square
miles**

Approximate size of methane "hot spot" that sits over the San Juan Basin. It is the largest and most concentrated such hot spot in the country. The methane, which is an extremely potent greenhouse gas, is believed to come from leaks in oil and gas infrastructure, from "venting," from releases during well completions and from natural seeps that occur where the methane-bearing coal beds breach the earth's surface.



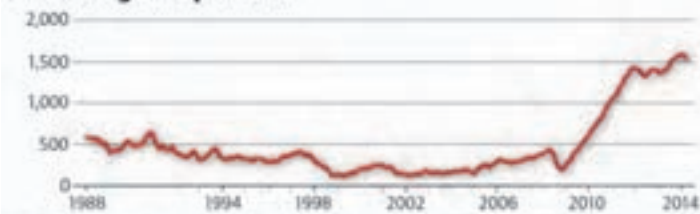
SOURCE: FOUR CORNERS: THE LARGEST U.S. METHANE ANOMALY VIEWED FROM SPACE, AMERICAN GEOPHYSICAL UNION.



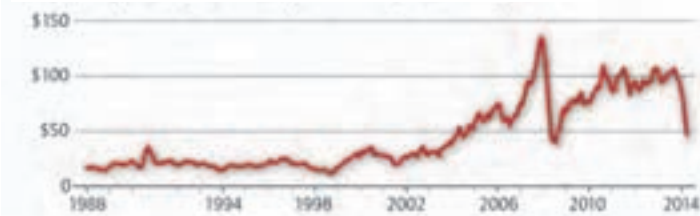
Oil and natural gas – rigs follow prices

Rig counts follow price, and serve as a barometer of industry's economic activity.

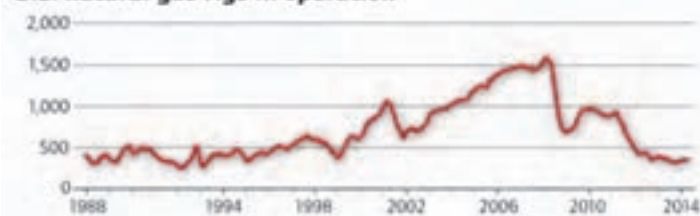
U.S. oil rigs in operation



Oil spot prices, dollars per barrel, Cushing, Okla.



U.S. natural gas rigs in operation



Natural gas spot prices, dollars per million Btu



Prior to 1997, the EIA priced natural gas differently than it does now.

Source: U.S. Energy Information Administration

FROM AZTEC WELL'S HEADQUARTERS, you can see the company's fenced-in yards, filled with trucks and drilling apparatus; the Aztec Speedway, also run by the Sandel family, which on warm Saturday nights becomes a chest-rattling shrine to the internal combustion engine; and the regional office for Oklahoma-based WPX Energy, one of the biggest oil and gas producers around. And just over there is the site where, in 1921, the Aztec Oil Syndicate drilled the first producing well in the basin, triggering the first boom and putting the region, and the state, on the path to its fossil fuel destiny.

In the decades that followed, the industry sprang forth mostly untethered, acquiring lucrative oil leases in sketchy deals with a newly formed Navajo government, "fracking" wells by exploding nitroglycerin in them. But in the 1930s, the state also began to insist that industry return a little in exchange for all it was taking, by implementing a severance tax, a school tax and a conservation tax, all on hydrocarbon production.

As a result, when El Paso Natural Gas built a pipeline in 1951 from the San Juan Basin to California, opening up vast new markets and sparking a transformative boom, the state was able to reap some of the bounty. At the time, Farmington was a quiet ag town of a few thousand people, surrounded by so many orchards that the train up to Durango was known as the Red Apple Flyer. In just a few years, it ballooned to nearly 20,000 people.

In 1963, Sandel's grandparents, Wayne and Stella, started Aztec Well. The industry was in a lull at the time, but the roller coaster rocketed back up a decade later, when a series of energy crises sent oil prices into the stratosphere. In 1980, a mind-boggling 62,000 wells were drilled in the U.S., about three times the number drilled during the recent shale boom. New Mexico officials again had fiscal foresight, creating a permanent fund fed by severance tax revenue, something that could provide help when the oil and gas ran out.

In an uncanny foreshadowing of the future, however, global oil prices ebbed, and OPEC's market share shrank. In response, the cartel flooded the market with petroleum, causing the price to crash at roughly the same time that the feds deregulated the natural gas market, causing that commodity to lose value, as well. The West's energy fields were abruptly abandoned.

Jason Sandel was just heading into middle school at the time. His grandfather had passed away, and his father, Jerry, was at the company's helm. He kept it afloat by holding on to only "the

best-of-the-best employees, (making sure) they were receiving an honest day's wage for an honest day's work," says Jason Sandel. Their one rig was entirely staffed by salaried toolpushers, or rig managers, and welders were constructing cattle guards for public use. As often as not, payroll checks came right out of the family's savings account.

A "ghost town" feel settled into Farmington, broken only by an early '90s surge, when companies, hoping to take advantage of federal tax credits before they expired, started drilling for coalbed methane. And while the situation inspired some talk about diversifying the economy, folks mostly felt angry at their impotence. Jason Sandel recalls "a rise of conservative attitudes and nationalism as a result of feeling out of control."

Sandel, by then a young man, wasn't having any of it. "All of my life, (my father) told me to stay out of the oil and gas industry. It's dangerous, it's cyclical," he says. So instead, he pursued politics, his father's "hobby" — the elder Sandel served in the New Mexico Legislature for 30 years, finally retiring in 2001 after he lost his bid to become lieutenant governor. Jason Sandel got a degree in political science from the University of New Mexico, going on to become an analyst and then chief of staff for the New Mexico Senate majority leader. Like his father, he's a Democrat, an anomaly in this very conservative district, dominated by an industry that tends to side with the GOP. He worked for Bill Richardson, back when he was in Congress, and continues to donate to Democratic causes and politicians, including New Mexico Sens. Martin Heinrich and Tom Udall. "I love politics," says Sandel. "It's something I really geek out on."

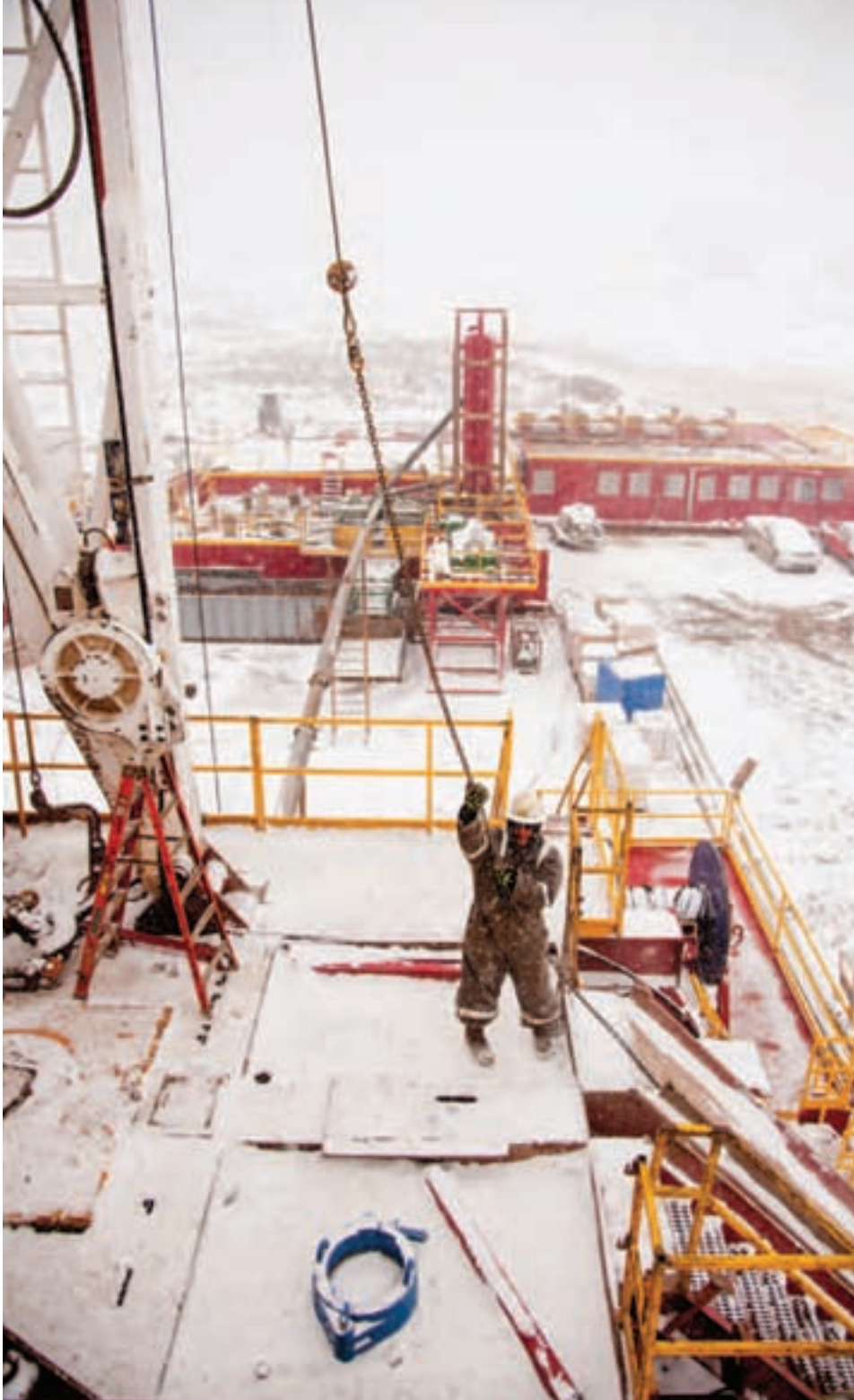
But after his mother died, Sandel decided to come home to raise his own family in Farmington and help with the business, signing on full-time at Aztec Well in 2001. At the time, the region was more than a decade into the coalbed methane push, and there was little reason to think it would ever let up. Sandel learned the business but kept his political skills polished. He got elected to Farmington's city council in 2006 and served for eight years, pushing for quality-of-life improvements, such as bicycle-friendly streets and better infrastructure to deal with summertime flash floods. He supported economic development and tried to steer the city, which runs its own electric utility, away from purchasing more coal power.

Sandel also advocated for the oil and gas industry, pushing back against regulations and, especially, talking up the industry's positive economic impact. He endorsed a move by state legislators from the San Juan Basin to punish communities that regulate the oil and gas industry by withholding severance tax funds, and he relaxed regulations on drilling within Farmington, which already has more than 300 wells within the city limits.

In 2013, Aztec Well's Jason Sandel stands on the platform of a rig designed to drill a horizontal well used to extract oil from the Mancos shale formation. Because the San Juan Basin was late to the shale oil game, Sandel had to send many of his rigs elsewhere.

CHRIS ROBERTS/THE FARMINGTON DAILY TIMES





Aztec Well's innovative Hyduke 1000 is powered entirely by natural gas, a cleaner option than diesel. It is currently drilling for oil for WPX Energy, and is one of only a few rigs currently operating in the San Juan Basin. BRIAN LEDDY

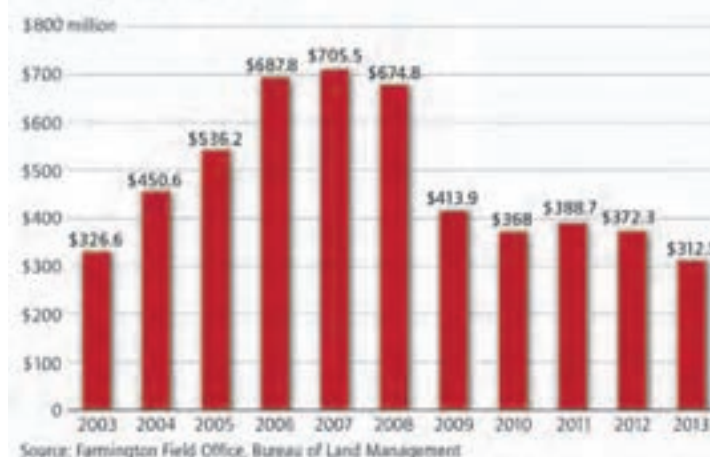
12.5 percent

Royalty rate paid by companies on dozens of wells operating on state land in the San Juan Basin, despite the fact that the going rate is 16.66 to 18.75 percent. These companies have assumed old leases, and their rates, thus causing the state to lose millions of dollars per year.



Federal royalties for the San Juan Basin

Companies pay royalties on oil and gas extracted from public land, and about half of it goes back to the state.



298 million

Barrels of oil extracted from the New Mexico portion of the San Juan Basin since the 1920s.



1.1 billion

Barrels of water "produced" from oil and gas wells on the New Mexico side of the San Juan Basin since drilling began. The water, which is usually salty, sometimes radioactive and always unfit for consumption, must be disposed of by the energy companies.

SOURCE: BUREAU OF LAND MANAGEMENT

\$ **\$5.03m** \$

Gross receipt taxes paid to the city of Farmington by oil and gas companies in fiscal year 2007.

\$ **\$2.1m** \$ Gross receipt taxes paid in 2013.

SOURCE: CITY OF FARMINGTON

\$ **\$10m** \$

Total amount paid in oil and gas royalties to 2,800 individual Navajo mineral interest owners during the last three months of 2014.

SOURCE: BUREAU OF INDIAN AFFAIRS

"SHOULD WE SHOW HIM THE SCARE MAP?"

asks Maureen Joe, assistant field manager for the Farmington Office of the Bureau of Land Management. Joe, a small woman with shiny black hair, seems to delight in the prospect of frightening a reporter. Dave Mankiewicz, another assistant field manager — the curmudgeonly TV-style cop to Joe's cheerful one — hands me the map, showing every well ever drilled in the San Juan Basin, with little red dots for gas, black ones for oil.

It is scary. The northern and central sections of the Basin are almost solid red; in the south and west, dense swarms of black dots string out along the oil-bearing formations. Dark pinpricks surround Chaco Culture National Historical Park. Huerfano Mountain, or *Dzil Na'oodilii*, where First Woman and First Man and then Changing Woman lived — a sort of Garden of

Eden in Navajo cosmology — is embroidered with red and black. The BLM office we sit in, on a fine piece of real estate in the upper-class part of town, has three wells within a quarter mile, and a pumpjack grinds away right next to a golf course green down the road.

To find a stretch of land anywhere in the core of the Basin that hasn't been drilled or isn't covered by roads, tanks, pipes or some other hydrocarbon-related infrastructure is nearly impossible — the infrastructure *is* the landscape. "We've got so much pipeline in the ground, it's like rebar," says Mankiewicz. "If you had an earthquake, the ground wouldn't even shake."

The industry is similarly entangled with the community's streetscapes, culture and economy. A drive around the Aztec-Farmington-Bloomfield triangle is a bit like a cruise through a giant open-air oil-and-gas mall, with roadside businesses peddling goods and services for every link of the hydrocarbon production chain: Elite Swabbing Service, Compressco, Weatherford Fishing Tools and Permian Power Tong. It's not entirely monolithic: Toolpusher's Supply, for example, is just across from the Adult Video store, which is watched over sternly by a billboard showing Jesus. And Halliburton's yard, brimming with giant trucks and byzantine equipment, is sandwiched between a Great Harvest Bread place and a Wal-



greens on Farmington's main drag. Some residents of a trailer park just behind it got sick and were evacuated in 2006 after an acidic fracking fluid spill.

When any of these businesses make a sale, they pay a gross receipts tax to the state, city and county. The businesses pay property taxes, on their land, equipment and oil and gas production. Producers pay severance and emergency school taxes on the gross value of oil or gas that they sell to the state, in addition to royalties to the feds, the state, tribes or private landowners. And the operators of the natural gas plant north of Bloomfield, where the sci-fi-skyscraper-like distillation columns tower directly over the shrines and graves of a Catholic cemetery, pay state natural gas processor's taxes.

These funds, in turn, pay for everything from firefighters' salaries to roads to day-to-day governmental operations. Earnings from the state's \$14 billion Land Grant Permanent Fund, which is fed almost entirely by oil and gas royalties on state lands, support New Mexico's public schools. The Severance Tax Permanent Fund's earnings are allocated to capital projects across the state, for everything from sewage systems to school playgrounds to a jaguar exhibit at the Albuquerque zoo. A 2014 New Mexico Tax Research Institute analysis found that at least one-third of the state's general fund comes from the mélange of taxes and royalties paid by the industry.

Layered on top of that are philanthropic donations from industry, for everything from the public library, to the United Way, to the regional symphony and Farmington's museum, which will soon feature a pretty spectacular "Energy Wing." Just down the road from the aforementioned BLM offices, San Juan College's new \$16 million School of Energy facility is nearing completion. More than \$8 million of the cash came from BP, Merrion Oil & Gas and other industry donors, with \$5 million coming from the severance tax permanent fund.

This progressive effort to make industry pay its way has effectively put the governments of New Mexico — and Farmington and San Juan County — into the oil and gas business. The upside is that those communities get to share in the profits. The downside is that everyone, from the toolpusher to the symphony-goer, is dependent on an extremely volatile global market. And while the state can tolerate busts with help from its flush permanent funds, local governments have no such cushion. Any efforts to rein in or regulate industry, or even try to whittle a new leg or two for the one-legged economic stool, are readily interpreted as attacks on schools, local governments and, really, the people who live here.

"THE DRILLING RIG IS THE CRYSTAL BALL,"

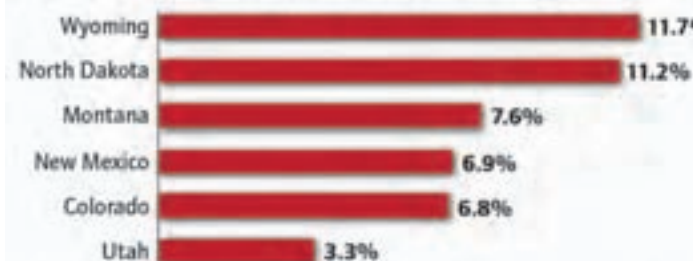
says Sandel. "As go drilling rigs, so goes the rest of the economy. I can say, by name, 50 people who have a job for each drilling rig going to work." Multiply that by an average salary of about \$75,000 and add in the gross receipt taxes on a \$1 million to \$10 million drilling job, and then multiply that by the number of drill rigs in operation — the rig count — and you've got a mighty big impact.

Back in the summer of 2008, 40 rigs were running in the San Juan Basin and 2,000 nationwide, the result of a long run of high natural gas prices. Aztec had 14 rigs operating in the region, and it and its subsidiaries — trucking, equipment rental, oilfield services companies — employed more than 700 people. Gross annual revenues were in the \$100 million range, marking 400 percent growth since 2000 and easily making the company Aztec's biggest single source of gross revenue taxes. "They were good years," Sandel says wistfully. "It's what built this building."

The BLM's Farmington Field Office handed out drilling permits — 3,500 over a five-year period — like a bank hands out lollipops, and the distinction between public employee and private industry blurred. The district manager

Oil & gas production tax rates

Effective local and state tax rates on the gross value of oil and gas extracted.



Note: Alaska's effective tax rate fluctuates according to price and other factors, and is often offset by generous incentives. Source: Headwaters Economics



Greg Merriam, facing page, of Merriam Oil, has pushed Farmington to diversify its economy, with only limited success. At left, San Juan County Chief Executive Officer Kim Carpenter has watched the general fund go up and down with oil prices. BRIAN LEDDY

at the time, Steve Henke, received a few favors from the industry, like trips to golf tournaments and an \$8,000 donation to Henke's son's baseball team. When he retired from the BLM in 2010, he became president of the New Mexico Oil and Gas Association, an industry lobbying group.

Federal royalties from wells in the San Juan Basin topped \$700 million one year, and state severance tax revenues were close to \$1 billion. Schools got a per-pupil funding increase, allowing the Farmington district to hire more teachers and up their salaries. The local construction industry was going gangbusters to accommodate new businesses and residents.

Industry leaders cringed when, in mid-2008, New Mexico implemented the "pit rule," one of the strongest regulations regarding the disposal of drilling wastewater. Yet it did nothing to slow drilling. Meanwhile, industry cheered as both political parties, and even the Sierra Club, touted natural gas, which emits about half the carbon dioxide and far fewer other pollutants than coal when it's burned, as a "bridge fuel" to cleaner renewables. It seemed as if the boom was just beginning.

But as T. Greg Merriam, president of Merriam Oil and Gas, a local company, told me, there's an old saying in the industry: "Nothing helps low prices like low prices, and nothing hurts high prices like high prices." Soaring natural gas prices, with help from government subsidies and a fortuitous pairing of horizontal drilling and hydraulic fracturing, had spurred a frenzy of drilling in shale formations nationwide, most notably the Marcellus shale in the East. Suddenly, the market was glutted, and prices plummeted.

Between October of 2008 and January of 2009, Aztec Well idled 75 percent of its equipment, and almost as many workers. The company's annual revenues were cut in half. The San Juan Basin alone lost an estimated 5,000 jobs, and the Farmington metro area went from having one of the

lowest jobless rates in the country to having one of its highest in just a few years.

The pain spread to the city and county and then up to the state level. Since almost all of the industry-related taxes and royalties are based on the gross value of oil and natural gas, the price drop resulted in a proportional hit to state coffers. That rippled down to the schools. In Farmington, they were saved from mass layoffs by relying on attrition, such as teachers leaving to follow their spouses to other oilfields.

"It was ominous," says Farmington City Manager Rob Mayes, who was faced with a sudden loss of nearly 20 percent of gross receipt tax revenues, the city's main source of funding. "It just fell off a cliff."

"Every time we have a decline in price," says County Chief Executive Officer Kim Carpenter, "that equates to several million in less input to the general fund." Carpenter's annual county budget introductory letters serve as a sort of chronicle of the deepening bust, and are filled with woe and the sound of gnashing teeth. Between 2009 and 2012, Carpenter could offer only one piece of good news: Farmington got itself an Olive Garden.

Meanwhile, the local industry had to sit and watch drilling go nuts in other parts of the nation. Even as natural gas prices crashed, oil prices shot upward thanks to high global demand, sparking shale-drilling rushes from North Dakota to Texas. Initially, the San Juan Basin was left out — it had been too tied up in coalbed methane drilling to make much effort to drill shale, particularly for oil. But you couldn't argue with the price signals.

"We had to chase the oil," says Sandel. "We had built up so much equipment, and there was a likelihood it would never all work here again. So we sought out other areas and became a national company." Aztec Well opened offices in southern New Mexico's Permian Basin, Kansas, Utah and Pennsylvania.

Other local companies took a simi-

lar tack. Pesco, which began building gas field equipment back in the '70s, started building oil field equipment, too. A company that had long manufactured compressors for local gas companies began shipping out of state. Only the fact that those companies kept their bases here, rather than uprooting and following the next boom, kept the community from drying up altogether. Workers who had settled into the area's relatively affordable suburban homes also stayed, commuting to distant oilfields for two-week-on, two-week-off cycles. It was a form of economic diversification, albeit a limited one — chasing after oil and gas, wherever they might be.

Then, starting in 2012, the drill rigs returned to the ash-colored earth of the southern San Juan Basin, this time looking for oil in an old play near Chaco Canyon and the mostly Navajo communities of Lybrook and Counselor. It has hardly been a boom — at most, a dozen rigs have operated at one time — but the oilfield traffic and activity has been rough on the locals, while most of the jobs and other economic benefits go to Farmington. The exception is royalty payments to Navajo allotment holders, which, when prices are high, can provide a big bonus to impoverished families.

\$1.96 million

Contributions from the oil and gas industry to New Mexico state political campaigns in 2014.

\$494,000

Contributions from trade unions to New Mexico state political campaigns in 2014.

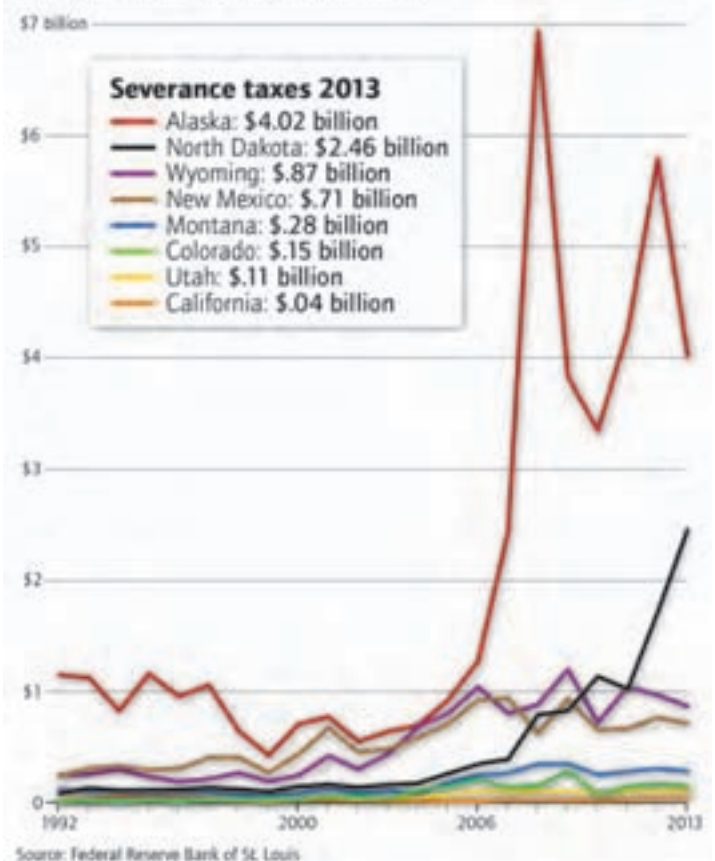
\$61,000

Contributions from pro-environmental policy interests to New Mexico state political campaigns in 2014.

SOURCE: NATIONAL INSTITUTE ON MONEY IN STATE POLITICS

State severance tax collections

State severance tax revenues fluctuate according to commodity price, and all of these states will take big hits in 2015 collections.



78

Percentage of Alaska's total tax revenue that comes from oil and gas severance taxes.

46

Percentage of North Dakota's total tax revenue that comes from oil and gas severance taxes.

SOURCE: ROCKEFELLER INSTITUTE OF GOVERNMENT

But late last year, oil prices started shrinking, the victim, again, of that "high prices hurt high prices" rule, and of the laws of global supply and demand. Those allotment royalty checks? They're about half of what they were last June. When I visited Sandel in late January, his company had pulled five rigs out of operation, representing a loss of millions of dollars of potential revenue. By the end of February, just two rigs were running in the Basin; nationwide, tens of thousands of oilfield workers lost their jobs.

The full impact of the latest bust has yet to trickle down to the rest of the economy. The general public might be oblivious now. But give it a few months, says Bob Beckley, the owner of 3Rivers Brewery and Restaurant in downtown Farmington. "Everyone enjoys driving around on all that cheap gas," he says, "but they don't understand how important the oil and gas industry is to us."

Back in August, New Mexico state

economists expected \$6.4 billion in revenue for the 2016 fiscal year; in early February, that estimate had plunged by \$200 million, thanks entirely to dropping oil prices. City, county and school officials are bracing for the blow, looking for places to cut costs. Aztec Well has no place left to send its rigs besides its own yard. "It's the uncertainty of the commodity price that's driving how fast this is going," says Sandel. "We don't know what the floor is."

ON A WEDNESDAY MORNING in February, a group of oil and gas managerial types, economic development folks and a few non-industry business owners gather for a workshop at San Juan College called "Thriving in the New Normal." It's both a grim and an optimistic title, one that acknowledges that it may be years before prices go back to where they were, but that it's possible for local businesses to survive and even prosper, nevertheless.

Perhaps someone here will have a big vision for how the community can get off this roller-coaster ride once and for all. That's a vision I have yet to encounter during any of my visits to city hall, to county offices and to Farmington's eerily quiet historic downtown, where each block has at least one payday loan joint and a couple of vacant storefronts.

Most of what I hear is a version of what one man says at the workshop: "Sure, diversifying the economy is fine, but we can't forget what we do best." And that, of course, is fossil fuels. One government official tells me in all seriousness that newly "robust" environmentalists are a bigger threat than price volatility. Another says that the local economy isn't really *that* dependent on oil and gas, after all. The prevailing sentiment, even in the workshop, is this: You just gotta hunker down, tighten your belt, and endure. It'll come back. It always does.

Except when it doesn't. Prices will go

The story of an oil well, by the numbers

By Jonathan Thompson | Infographic by Eric Baker

Application October 2011

Encana Oil and Gas, a Canadian company with its U.S. headquarters in Denver and a small office in a new strip mall on the north edge of Farmington, applies to the New Mexico Oil Conservation Division for a permit to drill a 4,000-foot-deep well with a 4,000-foot horizontal lateral through the oil-bearing rock. It's located on state land on scrub-covered flats south of Farmington, just a couple miles from the Great North Road constructed by the Chacoan culture a millennium ago. The area's already pockmarked by development — there are about two dozen well pads in a one-mile radius. It's an old play, given new life by high prices, horizontal drilling and multi-stage hydraulic fracturing. This well will become one of more than 23,000 active oil and gas wells in the San Juan Basin.

Drilling the well February to April 2012

The well is drilled and then completed, or fracked, the most intense phase in terms of economic impact. It puts about 50 people to work, each earning on average \$75,000 per year. This phase also costs the company anywhere from \$1 million to \$10 million, which is subject to state and local gross receipts taxes at a rate of 5.125 percent for the state, and 1.18 percent for the county. The state receives more than \$300,000 for a \$5 million drilling and completion job, with a portion sent back to the county.

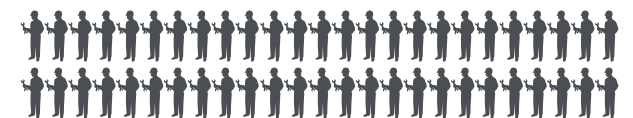


Total employment impact, in salaries: **\$312,500**

Total Estimated GRT Revenues: **\$300,000**
(Gross receipts tax to the state and county general funds)

Operating the well April 2012 and beyond

Number of workers to operate a rig: **50 workers**



Average oil well service worker's salary:

\$50,000

Once a well is completed and producing, it continues to require servicing, maintenance and occasional work-overs, which explains why the San Juan Basin's highways and backroads teem with big white pickup trucks and water-tanker trucks, even when there are no rigs drilling. Oil and gas wells produce huge quantities of water, which must be disposed of. About a year and a half after this well was drilled, a piece of equipment broke and some 15 barrels, or 630 gallons, of oil were spilled onto the ground. The company had to hire a vacuum truck to come clean it up. These services do generate gross receipt taxes for the community, though it's tough to quantify how much. And industry insiders tell me that, once it's producing, a well creates one full-time job or less.

Total employment impact over the 20-year life of the well: **\$1 million**

The New Mexico Oil & Gas Tax Key

Rates usually apply to value of product minus royalties and transportation costs

Tax

O&G School
O&G Conservation
O&G Severance
Ad Valorem Production

Rate

3.15% on oil; 4% on natural gas
.19%; .24% when crude is > \$70/bbl
3.75%
Property tax of local jurisdiction

Where it goes

State General Fund
General Fund & Reclamation Fund
Severance Tax Bonding & Permanent Fund
County

up, sure, but natural gas production has been falling in the San Juan Basin since 1999, despite an almost unprecedented frenzy of drilling between 2003 and 2008. What happens when the cash crop dries up?

I find an answer in an unexpected place: at the monolithic headquarters of Merrion Oil & Gas, which overlooks Farmington from the same complex that houses city hall.

“The answer is easy,” says T. Greg Merrion, president of the company since 1992. “You’ve got to diversify. But it’s complicated. It’s like turning the Titanic. You gotta change the way you think, change the way you do things.”

Merrion’s father started the company back in the 1960 and, judging from the headquarters, it’s done all right. Paintings by prominent Southwestern artists adorn the lobby walls, and a huge sculpture — sandstone and glass panels jutting from a rust-colored steel base —

dominates the space. Merrion, dressed in a North Face fleece, baggy jeans and running shoes, actually relishes the bust as an opportunity to go bargain-shopping for oil and gas properties. As a well-known philanthropist, however, he doesn’t want to see the community suffer.

After the 2008 bust hit, Merrion got together with other community leaders and hired consultants. They suggested focusing on agriculture and tourism, and courting light manufacturers and health-care providers. Proposals include everything from converting the nearby massive coal plants to natural gas to better promoting mountain biking and OHV trails and the area’s Native American culture. They rejiggered the local economic development agency with this in mind, but getting there “is a marathon, not a sprint,” says Merrion. It takes time. It takes money. And, of course, it takes political will.

And that, says Sandel, another

surprising advocate of economic diversification, is what is lacking; it’s one of the reasons he didn’t run for a third term in city government. “We do very little as a community to market this stuff,” he says. “No one can carry that vision, carry that torch to bring people together.”

THE CARWASH ON AZTEC’S EDGE is doing a brisk business on a Friday afternoon, as workers stream into town from the gas patch and line up their big white trucks to try to scrub off the mud, which is still axle-deep out on the mesas and north-facing slopes. There is enough work merely maintaining the existing wells and infrastructure in the San Juan Basin to keep business going. I’m headed the other way, back out into the patch, along a rutted road and past some byzantine equipment, to the Alien Run trailhead, one of the places Sandel would like to promote.

106 billion cubic feet

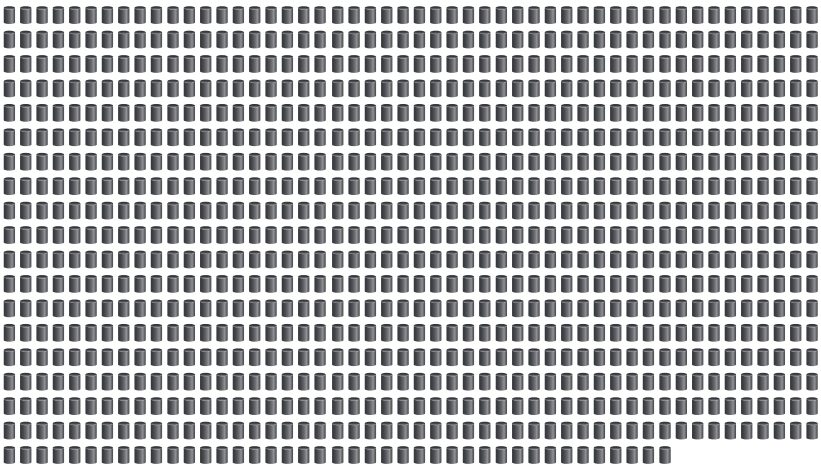
Amount of natural gas that was flared, burned off, or vented from oil and gas wells in North Dakota, New Mexico, Wyoming, Colorado, Utah and Montana between 2006 and 2013. No royalties or federal or state taxes were paid on this gas, representing a loss of tens of millions of dollars of potential revenue for state and local governments.

SOURCE: TAXPAYERS FOR COMMON SENSE



Production June 2014 (high oil prices)

Total oil production: 941 barrels



Approximate price paid per barrel of oil: \$90



Gross value of oil sold: \$84,520

Royalties to Land Grant Permanent Fund for producing on state-owned land: \$14,087

Total taxes paid to state and local governments: \$5,961

Breakdown of taxes:

Oil and gas emergency school tax: \$2,219

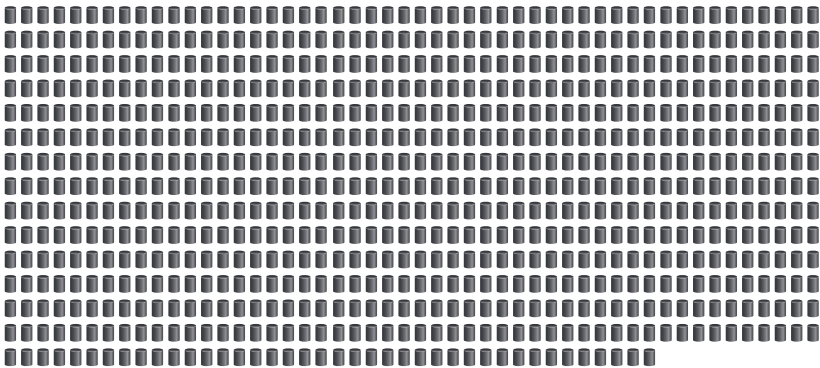
Oil and gas severance tax: \$2,641

Oil and gas conservation tax: \$169

Ad Valorem (county property) tax on production: \$933

Production February 2015

Total oil production: 740 barrels



Projection based on previous months' average; oil wells typically produce less and less over time.

Approximate price paid per barrel of oil: \$38

(Western Refining's average price paid for San Juan Basin oil in February)



Gross value of oil sold: \$28,120

Royalties to state land office for producing on state-owned land: \$4,684

Total taxes paid to state and local governments: \$1,993

Breakdown of taxes:

Oil and gas emergency school tax: \$738

Oil and gas severance tax: \$879

Oil and gas conservation tax: \$45

Ad Valorem production tax: \$321

Royalty Explainer

Royalty	Rate	Where it goes
State Land	16.66-18.75%	Land Grant Permanent Fund (investment earnings fund public schools)
Federal Land	12.5% and up	51% to federal government; 49% back to state
Indian Allotment	18% and up	Individual allotment holders
Tribal	Varies	Tribal government
Private	Varies	Landowner

Epilogue: After spending more than \$350 million on its San Juan Basin venture in 2014, when oil prices were high, Encana announced in February that it would cut back expenditures to less than \$100 million in 2015, drilling no more than five new wells.

I lace up my shoes and hit the trail, which winds through juniper and piñon, occasionally crossing undulating sections of slickrock. It's a meditative place to run, despite or maybe because of the inescapable background drone of gas wells and compressors. Aztec locals established the trails on BLM land several years back, naming it for a purported 1948 UFO crash in the area. Aztec once attempted to market the crash as a tourist draw, à la Roswell, even hosting its own UFO conference. It didn't take, but the trails are popular, and the town hosts a mountain bike race here every May.

Intrepid explorers also head out onto the county's gas-patch roads in search of dozens of natural arches, remote Chacoan pueblos and artist Georgia O'Keeffe's "Black Place," which, ironically, was "discovered" thanks to nearby oil and gas development. The Bisti Badlands south of Farmington draw early spring crowds, a surprisingly high proportion of them from Switzerland, Germany, France and other parts of Europe. Shoppers from at least a 100-mile radius come to Farmington's sprawling mall, two super Wal-Marts, a Target, Sam's Club, and a herd of chain restaurants. And Farmington still lives up to its name: The Navajo Agricultural Products Industries farms, with the help of copious irrigation, have transformed a huge swath of high desert south of the city into a Midwestern-esque plain of potato, corn, wheat and alfalfa fields.

This is economic diversification, sure,

Feb. 1, 2015

Date North Dakota's 2 percent extraction tax incentive rate on horizontal wells became effective, due to falling oil prices. The incentive is designed to keep drillers drilling even in a low-price environment, but (combined with lower prices) it results in reduced revenues to the state.

SOURCE: STATE OF NORTH DAKOTA



but it's happened without a plan, and no one's figured out how to monetize it. During my hour-long run, the gas wells I pass pump hundreds of tax dollars into state, county and school coffers; I, however, contribute absolutely nothing. When I buy a case of those orange peanut-butter-cracker things from Sam's Club, I'm helping Sam back in Arkansas, but not the city or the state, since New Mexico exempts food and medicine from the gross receipts tax. If you work in Farmington's leisure and hospitality sector, you'll earn, on average, \$12,000 per year, compared to \$90,000 for local petroleum engineers. And since the NAPI farms are owned by the Navajo Nation, they're mostly tax exempt. Economic development is as much about creating mechanisms to capture cash as it is about simply attracting it. The state has clearly demonstrated that with oil and gas.

With that in mind, I ask both Merrion

and Sandel a final question: "If you could give the new, and future, boomtowns of the shale revolution one piece of advice, what would it be?"

"My advice to boomtowns is to establish a community 'boom fund' that would be modeled after New Mexico's severance tax permanent fund — but structured for communities as opposed to the state," Sandel says. "I'd then dedicate a specific portion of the interest off this fund for the purpose of economic development and diversification." It seems like an obvious approach, and Merrion answers my question almost identically. But Farmington's been busting and booming for 95 years, and there is still no community "boom fund," and the city has made no serious efforts to diversify the economy.

"What I want, 20 to 30 years from now, is for someone to say, 'Boy, I'm sure glad our community decided to diversify,'" says Merrion. "It's never too late to start." Then he looks up at a replica of a Puebloan pot sitting on the mantle. Perhaps he's thinking of the Chacoan culture that, a millennium ago, also modified the landscape in ways that are still visible and, ultimately, went bust. Most likely driven by drought and overconsumption of local resources, the people pulled up stakes and headed east and south, to the banks of the Rio Grande, to Zuni, to Hopi. "Well," says Merrion, "it could be too late. There are communities that have lived or died by production of natural resources." □



Jonathan Thompson, HCN's senior editor, writes from Durango, Colorado.

This story was funded by a grant from the McCune Charitable Foundation.

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

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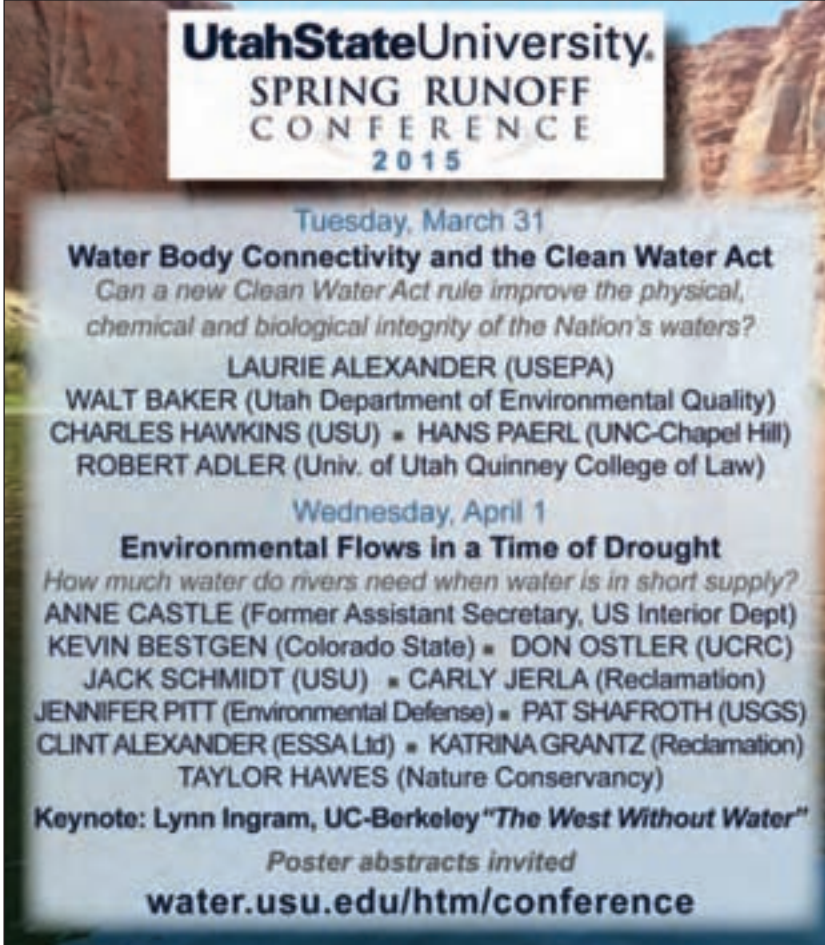
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Tuesday, March 31
Water Body Connectivity and the Clean Water Act
Can a new Clean Water Act rule improve the physical, chemical and biological integrity of the Nation's waters?
Laurie Alexander (USEPA)
Walt Baker (Utah Department of Environmental Quality)
Charles Hawkins (USU) • Hans Paerl (UNC-Chapel Hill)
Robert Adler (Univ. of Utah Quinney College of Law)

Wednesday, April 1
Environmental Flows in a Time of Drought
How much water do rivers need when water is in short supply?
Anne Castle (Former Assistant Secretary, US Interior Dept)
Kevin Bestgen (Colorado State) • Don Ostler (UCRC)
Jack Schmidt (USU) • Carly Jerla (Reclamation)
Jennifer Pitt (Environmental Defense) • Pat Shafroth (USGS)
Clint Alexander (ESSA Ltd) • Katrina Grantz (Reclamation)
Taylor Hawes (Nature Conservancy)
Keynote: Lynn Ingram, UC-Berkeley "The West Without Water"
Poster abstracts invited
water.usu.edu/html/conference

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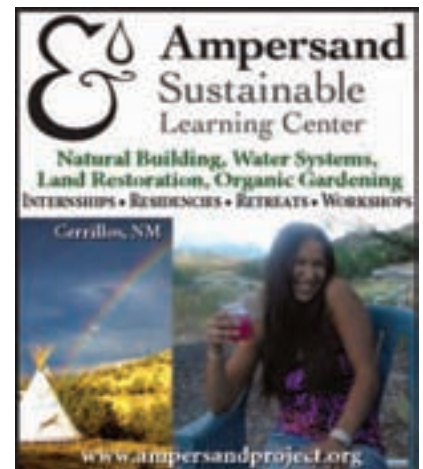
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A crew hired to remove conifers from aspen stands was part of a project paid for through Secure Rural Schools funds on the Salmon-Challis National Forest. COURTESY SALMON VALLEY STEWARDSHIP

Rural communities in the West need a fair shake



OPINION BY
GINA KNUDSON

The failure to include the Secure Rural Schools program in this year's federal budget puts a spotlight on a public-lands identity crisis that has been simmering, and sometimes boiling over, for decades.

President Theodore Roosevelt got it right in 1908. Roosevelt understood that his big vision of creating a national forest system would have enormous financial implications for the communities that border these forests.

But now, both the original intent of the national forest system and the pact made with local communities seem like relics of the past. Recent federal budget decisions and discussions make it clear: We in America have become confused about what our national forests mean to us, and we simply don't give a damn about the neighboring communities.

The national forest system was created to protect and improve forests, secure water flows, and produce a continuous supply of timber. In fairness to the counties that contained these designated federal lands, Congress promised to share with them 25 percent of the receipts derived from the sale or use of commodities from each national forest. Mostly generated from timber sales, the money that went to the counties helped pay for critical services, such as public schools and roads.

When environmentalists successfully challenged the Forest Service's timber mission though the 1980s and '90s, Oregon Democratic Sen. Ron Wyden was among those who worked to broker a new deal with communities. His Secure Rural Schools and Community Self-Determination Act, enacted in 2000, was an attempt to honor the U.S.

government's commitments to the West's rural communities.

The act not only offered counties money for schools and roads; it also earmarked funding for the restoration of forests and watersheds. The idea was to give out-of-work loggers and other members of the local workforce a chance to earn a living by taking care of the public forests. In communities like Salmon, Idaho, where I live, we used that money to improve aspen stands, keep noxious weeds from choking out native plants, and improve the trails that allow the American public access to some of the special lands they rightfully own. We kept families in town, thanks to this work.

For some members of Congress, such as Republican Doc Hastings of Washington, the former chairman of the House Natural Resource Committee, that wasn't enough. So the Secure Rural Schools law was eliminated by Congress, largely on the theory that eliminating funding would spur more timber harvests.

For most of us living in the rural West, this was a strange rationale: Trying to force the Forest Service to harvest more timber seemed at best grandstanding, at worst insulting. Legislative wand-waving is not going to bring back my town's sawmill or its workforce, and it will not cure the forests of insect and disease or magically alter public values that have shifted from extraction to restoration. That train has left the station.

In 1908, President Roosevelt and Congress insisted that sharing timber revenues with impacted counties was the right and politically wise thing to do. Until we return to that approach, we will continue to see states challenging federal land ownership and management

in a vain attempt to fill the vacuum.

We'll also be turning our backs on what looked like hope for rural communities and the land, a chance to recognize and invest in the bond that local people have with their places.

Agriculture Secretary Tom Vilsack said in January of this year that Forest Service lands "contribute more than \$13 billion to the economy each year through visitor spending alone." The department also says that Forest Service lands provide 20 percent of the nation's clean water, at a value estimated at \$7.2 billion annually.

Theodore Roosevelt recognized that a fair share of the national forests' most important commodities of the time belonged to the counties that housed national forest lands. If we've now decided that the commodities we most value on these forests are recreation and clean water, let's re-balance the books with that in mind. Those of us in rural places may have endured steeply declining education budgets over the past few years, but even we can cipher that 25 percent of \$13 billion is a whole lot more than the \$50 million counties will share this year. Our national forests are worth more than the timber we harvest, and forest communities deserve an honest share. □

Gina Knudson is the director of Salmon Valley Stewardship in Lemhi County, Idaho. The loss of Secure Rural Schools means a reduction of more than \$2 million to Lemhi County's budget.

Writers on the Range is a syndicated service of *High Country News*, providing three opinion columns each week to more than 70 newspapers around the West. For more information, contact Betsy Marston, betsym@hcn.org, 970-527-4898.

WEB EXTRA

To see all the current Writers on the Range columns, and archives, visit HCN's Web site, www.hcn.org

No empathy for traumatized men

The Brightwood Stillness, Mark Pomeroy's debut novel, begins with a "Special Report" from the Portland, Oregon, police department: A high school science teacher, Hieu Nguyen, has been accused of sexual misconduct by a female student. During this crisis, Hieu could use the support of his friend and fellow teacher, Nate Davis. But Nate is dealing with his own troubles after being stabbed by a student in the school's parking lot.

The two men react to trauma in opposite ways. Hieu hides in his house, pummeling his family with anger. Nate pushes his girlfriend, Hieu's sister, away and flies across the Pacific Ocean to search for his Uncle Sammy, his surrogate father, who deserted the family nearly 30 years ago — 10 years after

Nate's own father vanished.

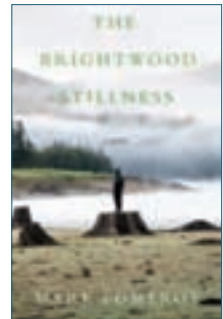
The novel is set in the mid-1990s, when cellphones and the Internet are still uncommon. Events move forward at the pace set by phone booths and letters — a rhythm that allows Hieu and Nate time to navigate the emotional minefields of their complicated pasts.

The Davis family cabin, which sits in a patch of western Oregon forest called Brightwood, plays a strong supporting role in the story. Far away in Jakarta, Nate thinks of it, longs to "head down to the confluence of Boulder Creek and the Salmon River, smell the water and last year's leaves along the shore ... to hike up Wildcat Mountain, take in the clear-cut, climb onto one of the big stumps and check out the view." The place is also

the setting for a life-changing moment for Hieu and yields some clues about Sammy's conflicted mind and current whereabouts.

"How glorious it is sometimes," Pomeroy writes, for a man "to be angry and alone." *The Brightwood Stillness* shows the challenges faced by teachers in our me-first, litigious society, especially when racism becomes a factor. It tries to unravel the complicated tangle of commitment and trust integral to human relationships, as well as the consequences of emotional isolation. But despite all the drama in *The Brightwood Stillness*, its characters aren't much changed, and the story ultimately glides to a predictable end.

BY CHÉRIE NEWMAN



The Brightwood Stillness

Mark Pomeroy
279 pages, softcover:
\$18.95.
Oregon State
University Press, 2014.

Hollywood horse havoc

Modern movie directors are expected to go to extremes to earn the disclaimer that "No animals were harmed" in the making of their films. It's easy to chuckle at the thought of studios hiring, say, cockroach wranglers. But the latest novel by Oregon writer Molly Gloss might make readers appreciate the need to enforce standards for humane treatment, not just for animals but for human beings as well.

Falling From Horses is set largely in Hollywood in the late 1930s, when the

movie industry cared little for the welfare of animals or even human stuntmen.

In a folksy, easy cadence, narrator Bud Frazer looks back on his life, recalling the months he spent trying to succeed as a movie cowboy when he was 19 years old. "Well, I was foolheaded in those days, looking for ways to get myself into trouble — carrying too much sail, as we used to say," Bud reports.

Bud grew up in Echol Creek, Oregon, on a ranch that his parents later lost. His

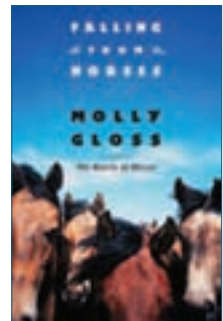
little sister died for reasons that become clear as Bud's story unfolds, in chapters that alternate between his life in Oregon and in Hollywood.

On the bus to Hollywood, Bud meets Lily Shaw of Seattle, who is determined to become a great screenwriter, an aim she only achieves after many hard knocks. As Bud and Lily scramble to gain a toehold in the movie industry, they maintain their platonic friendship, which is based mostly on seeing movies together and discussing them.

Bud learns that the cowboy film heroes he grew up admiring aren't what they appear to be — many of them are "fakes who couldn't ride worth applesauce." He also discovers how dangerous filming horse scenes is, especially on shots of battlefields rigged with trip wires and cliff-jumping scenes. Dozens of horses are killed in the business, and several riders are severely injured.

Gloss' detailed picture of Hollywood's Golden Age is rich and enlightening, capturing the struggles of low-level movie cowboys as well as those of ambitious women like Lily. Bud's family's ranch life and hardships serve as a stark counterpoint to the glossy Western myth that filmmakers created. It's as though Gloss has flipped over the burnished surface of classic Hollywood Westerns to show the messy stitching underneath.

BY JENNY SHANK



Falling From Horses
Molly Gloss
330 pages, hardcover:
\$25.
Houghton Mifflin
Harcourt, 2014.



Roy Rogers and his palomino, Trigger. Trigger was one of the most famous horses in Western films, starting with his debut in *Under the Western Stars* in 1938. CLASSIC MEDIA

Passing through Gateways

It's hard for me to reconcile these two very different Gateways and think of them as one, because they're not.

It takes about three natural breaths, in and out, to drive through Gateway, Colorado, if you're driving the posted speed limit (40 miles an hour) on Colorado Highway 141. Gateway is a spectacularly beautiful place about 55 miles south and west of Grand Junction on the Unaweep-Tabeguache Scenic and Historic Byway. Like a lot of little places all over the West, this backwater spot has no city limits, no ordinary beginning or ending; it is the tiniest of black dots on the map of western Colorado. If you drive through Gateway, you probably won't see any of the 80 people who live in "town," although if school's in session, you might notice a few school vans and pickup trucks in the gravel lot of the tiny K-12 public school, which has about 30 students and four full-time teachers. If you're there at recess, you might see some of the 20 elementary kids outside playing soccer, using four plastic chairs, borrowed from the principal's office, for goals.

In 1985-'86, I was one of those four teachers. Gateway was then at the tail end of a classic boom-and-bust extraction economy. The boom times first hit in the 1880s, when copper mining was big, followed over the next 100 years by successive waves of pitchblende, carnotite, vanadium and uranium. In the 1980s, mining and milling were on the way out, though logging and ranching still seemed downright stable as occupations go. When I taught there, most of my students lived on historic homesteads in and around Gateway and the Unaweep Canyon. I can still hear their jokes and talk in my head, still remember the shape of their handwriting on the page, still see their plaid flannel shirts and sunburned faces and, once in a while, their furtive snuff-filled lower lips at the all-school morning meetings. I had little sense of the power and the presence of community when I first arrived in Gateway, no lofty motives for moving there, and only a dim awareness of the kind of toughness and endurance it took to live in a place like that.

I had come from Pagosa Springs, another relatively small town in southwestern Colorado, where I taught high school English and coached skiing for 10 years before becoming restless. I thought at the time that moving from one small town to another,

even smaller town was somehow romantic, an anachronistic adventure, insofar as no one I knew of had taught multiple-year students in a one-room schoolhouse for at least — oh, 100 years or so. To be honest, I also figured that if I didn't like it, I could transfer to a larger school in Grand Junction after a year. I thought of Gateway as a retro stop on the Pony Express, a frontier outpost, a red-rock desert version of exile in the Aleutian Islands.

My students turned out to be as tough and scrabbly as the ground itself, and although I only had 14 students in grades seven through 12, I learned very quickly how difficult — no, how impossible! — it was to teach eight kids in one room instead of 150 students divided up into tidy sections by grade level. As a teacher, I felt like both an insider and an outsider in the community. I was invited to dinner at almost every student's home at least once, and I got to know parents and siblings and even dogs and cats on a first-name basis. On the other hand, I was an outsider to the closely interlocked family histories in the community, and I attended the Christmas program, community-wide dinners and dances, and Bible studies as a welcomed but largely detached guest, not truly a part of the tight, fierce web that held the community together.

I'm pretty sure my letters to friends and family at that time were full of pride (at having chosen such an unusual, isolated place to live) and bravado, and more than a little amazement that such a place could still exist in the year 1985. At a baccalaureate service in the tiny church that year, the pastor told the two high school graduates: *Don't count yourselves out because Gateway is small and this school is small. Small things in nature can have great impact, meaning, and strength — like fleas,* he said. *And flies, and commas.*

I agree about the commas.

But living 60 miles from anywhere was not easy, and I ended up taking another teaching job in Grand Junction after the year was over. I thought at the time that Gateway would always be there for me to visit, to come back to. But the Gateway I knew began to change in about 1995, when John Hendricks, of Discovery Communications fame, bought a ranch outside of town and then gradually began to purchase other ranch properties up and down the Unaweep Canyon and adjacent to the Dolores River. Longtime Gateway residents looked at these acquisitions with little suspicion, at first; this seemed to them a bit of a lark, much more puzzling than threatening: Why would a guy like that want to live here when he could live anywhere? In addition to the whiff of celebrity, Hendricks brought some much-needed improvements to the community in the form of a wastewater treatment plant and grass for what had been a school playground composed of dust and tumbleweeds. He also worked with The Nature Conservancy and the Mesa County Land Trust to set aside some of his acreage for conservation and historic easements.

By 2005, however, John Hendricks' influence on the Gateway community took the shape of an incredibly luxurious, upscale eco-tourist resort complex called The Gateway Canyons Resort and Spa, which currently features three restaurants, two high-end hotels, swimming pools, and



Red sandstone buttresses overlook Gateway Canyons Resort. BROOKE WARREN

a host of eclectic activities, including a monster truck-driving track, a skeet and trap-shooting range, an auto museum, and a vacation package called a Curiosity Retreat, which provides not only world-class amenities, but also lectures and forums on a host of intellectual topics.

The Resort, together with all of its associated facilities and programs, exists in stark contrast to the town of Gateway, which is located about half a mile north of the development. On a visit during the last week of August — a warm Saturday afternoon in what should have been peak season — the Resort itself was eerily empty; although there is exquisitely planned space for at least 500 vehicles, there were no cars in the hotel and restaurant parking lots, and no people other than ourselves wandering about. There were just 14 cars and motorcycles in front of the Auto Museum and a few more outside the Adventure Center; no one was checking in at the desk, although the clerk told me that the Resort was often full to capacity. But by and large, on that afternoon, the entire complex seemed to be weirdly quiet.

The Resort has just completed a large-scale renovation project in which its hotel offerings have been updated (hence the going rate of \$599/night, which is at the low end of the pricing structure) and its restaurants expanded (the Paradox Grille offers less-expensive fare, while the Entrada is strictly high-end). In addition, the Resort moved one of its commercial ventures, a gas station and convenience store called the Outpost, from Resort property into the actual town of Gateway. A woman I talked with in the Outpost explained that the store really “needed” to be separated from the Resort, so that the Resort did not have to deal with highway traffic — Harleys, Subarus, stray bicyclists — and could concentrate instead on Resort customers, who have less prosaic needs than gasoline and hot dogs.

When I compare Gateway Canyons Resort and Spa to the community I knew, it’s hard to escape a sense of loss, of disconnection, of head-scratching disbelief at the material phenomenon that is the Resort. In a paradoxical way, the Gateway of pre-Resort days was also a puzzle, a place out of time, because it was so isolated, so unbelievably small. It’s hard for me to reconcile these two very different places and think of them as one, because they’re not.

When the Resort was in its planning stages, John Hendricks told the Mesa County Commissioners that he wanted to “revitalize” the town of Gateway and help it get back on its feet. Ironically, however, what I see when I go back to Gateway now — to volunteer at the school or visit with friends — is not a town that is being revitalized, but a community that is slowly being erased. The Gateway cemetery, for example, which has existed for almost 100 years, is now located on Resort property, and those who live in Gateway must ask for permission to visit it. And plans have been approved for a new “luxury” residential subdivision, which falls within the Resort’s intended sphere of commercial influence but which violates the spirit of John Hendricks’ promise that “this corner of Colorado would be preserved as nature had created it” even as the Resort grows and changes.

Here’s the thing that saddens me: As of February 2015, the school teeters on the brink of closure; there are four fewer students in 2015 than there were in 2014. Meanwhile, because it’s good for business, Resort facilities and attractions are packaged and marketed without ever mentioning the town of Gateway at all. In newspaper articles, and particularly in photographs of the area, the community of Gateway — both the one I knew and the one that is there now — is simply no longer visible. But even if visitors to the Resort can’t see it, my Gateway is still there, tucked like a strand of windblown hair behind the curve of the river and the bend in the highway. □

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Aggie Wareham, 83, and the author remember their time in Gateway, top. Wareham has lived there her entire life and was the sole graduate at the school in 1948. Sun shines through trees on land outside of Gateway that has been bought by the resort, center. A dirt road extends past discarded household items in the town of Gateway, bottom. BROOKE WARREN



HEARD AROUND THE WEST | BY BETSY MARSTON

THE WEST

Massive solar plants are springing up like dandelions in California, Nevada and Arizona. “Rapid growth” doesn’t do it justice: According to the Center for Land Use Interpretation, based in Culver City, California, more than a dozen huge installations, ranging up to 500 megawatts each, are under construction, each one ranking among the world’s largest. With the help of a drone, the center’s winter publication, *The Lay of the Land*, provided breathtaking photos of some of the area’s existing photovoltaic power plants. Their scale is startling, as ranks of solar panels stretch endlessly across flat valley land. Seen from high up, some look remarkably like the Nazca lines, Peru’s ancient desert geoglyphs. Two neighboring plants in the remote Carrizo Plain of California — the Topaz Solar Plant and California Solar Ranch — cover close to 10 square miles and together can produce a total of 750 megawatts. Driving this regional solar boom is California, whose Legislature has mandated a cutback on fossil fuel dependence.

WYOMING

It didn’t start out as a fight between equals, reports the *Jackson Hole News&Guide*, though it became a fight to the death. The aggressor was a lion, true, but a small, 40-pound feline that had already survived frostbitten ears as well as a vicious attack by an eagle, while its intended prey was a waddling porcupine more interested in chewing bark and digging for fungi and bulbs. Mark Elbroch, Teton Cougar Project leader, said that though porcupines sometimes survive lion attacks, the big cats usually win. One young lioness he studied killed 24 porcupines in less than three months: “One of her techniques was to climb trees and throw porcupines to the ground, injuring or stunning them enough for her to attack their vulnerable bellies.” This particular encounter, however, ended like the fifth act of a Shakespearean tragedy: Both animals died, the lion eventually succumbing to quills that worked their way into one lung. As the Bard might say, “The rest is silence.”



OREGON Ready for roadside chow. EMILY JANE DAVIS

UTAH

Bicyclists celebrated last September when the Salt Lake City Council passed an ordinance requiring businesses with drive-thrus to serve two-wheelers along with four-wheeled vehicles. That seemed like a reasonable idea to many, but take-out parity ended abruptly when the Utah Legislature recently voted 20-6 to override the city’s ordinance. Why did hungry bikers get the shaft? According to the *Salt Lake Tribune*, one business owner cited employee safety: “Workers at the order window may become targets of harassment from customers on bikes who have neither sedan door nor seatbelt to restrain them.” Derek Smith of Presidio Insurance had another rationale, if you can call it that: “When people are doing illegal drugs and they get the munchies, they approach the drive-thru.”

THE NATION

When New York Times columnist Timothy Egan gets on a roll, Katy bar the door. His target recently was Utah, which “is to the dietary supplement business what Northern California is to marijuana” — a \$13 billion business based on charlatanry and well-connected lobbying. Egan specifically scolded Republican Utah Sen. Orrin Hatch, because Hatch, back in 1994, “midwived

through Congress a new industry protected from all but minimal regulation.” By law, supplements can’t claim to cure disease, but they can claim to make you healthier in some sort of “natural” way. Recent studies in this country and Canada, however, revealed that the ingredients of many expensive supplements were nothing more than grass clippings or other fillers you could more accurately label “junk in a pill.” If you still trust supplements, Egan concludes, “go buy some possible Ginkgo biloba-free Ginkgo biloba, and thank Orrin Hatch for the unfettered right to be a sucker.”

COLORADO

Pink flamingos, religiously themed grottos and chubby, bearded gnomes are certainly matters of individual taste (or lack thereof), but few of us feel the urge to “liberate” them from other people’s yards. Yet someone in Boulder, Colorado — with tongue firmly in cheek — has formed a Gnome Liberation Front to free these particular statuettes from lawn service. The revolution began when a gnome abandoned longtime resident David Smith, who seemed puzzled, noting that his missing statue was merely “your typical tacky-looking kind of gnome.” The gnome-napper, as the *Boulder Daily Camera* dubbed him, explained in a poem left behind that Smith had failed to appreciate the gnome’s long service, so now, its days of “guarding your yard like a Roman slave” were done. “In one sense, it’s kind of amusing, but in another sense, it’s a little bit unnerving,” Smith said. The “violation of property” was bad enough, he said — “and then the taunting.”

MONTANA

Would you like to live in a well-designed can? A Missoula company called Montainer buys metal shipping containers for \$3,000-\$5,000 and turns them into complete 192-square-foot homes, each with bathroom, kitchen and washer-dryer. The \$65,000 “housette” is called the Nomad 192, and its shell, says CEO Patrick Collins, is “corten steel” and will never rust.

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“Everywhere I live in the West, I am regularly reminded that I am not ‘from here,’ and as a result, my opinions always carry with them a kind of asterisk.”

Michael Dax, in his essay, “Don’t label me an ‘outsider,’” from *Writers on the Range*, www.hcn.org/wotr