kneedeep times

THE BAY AREA'S CLIMATE RESILIENCE MAGAZINE

January 2026

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Owls Catch & Release

PFAS in the Tri-Valley

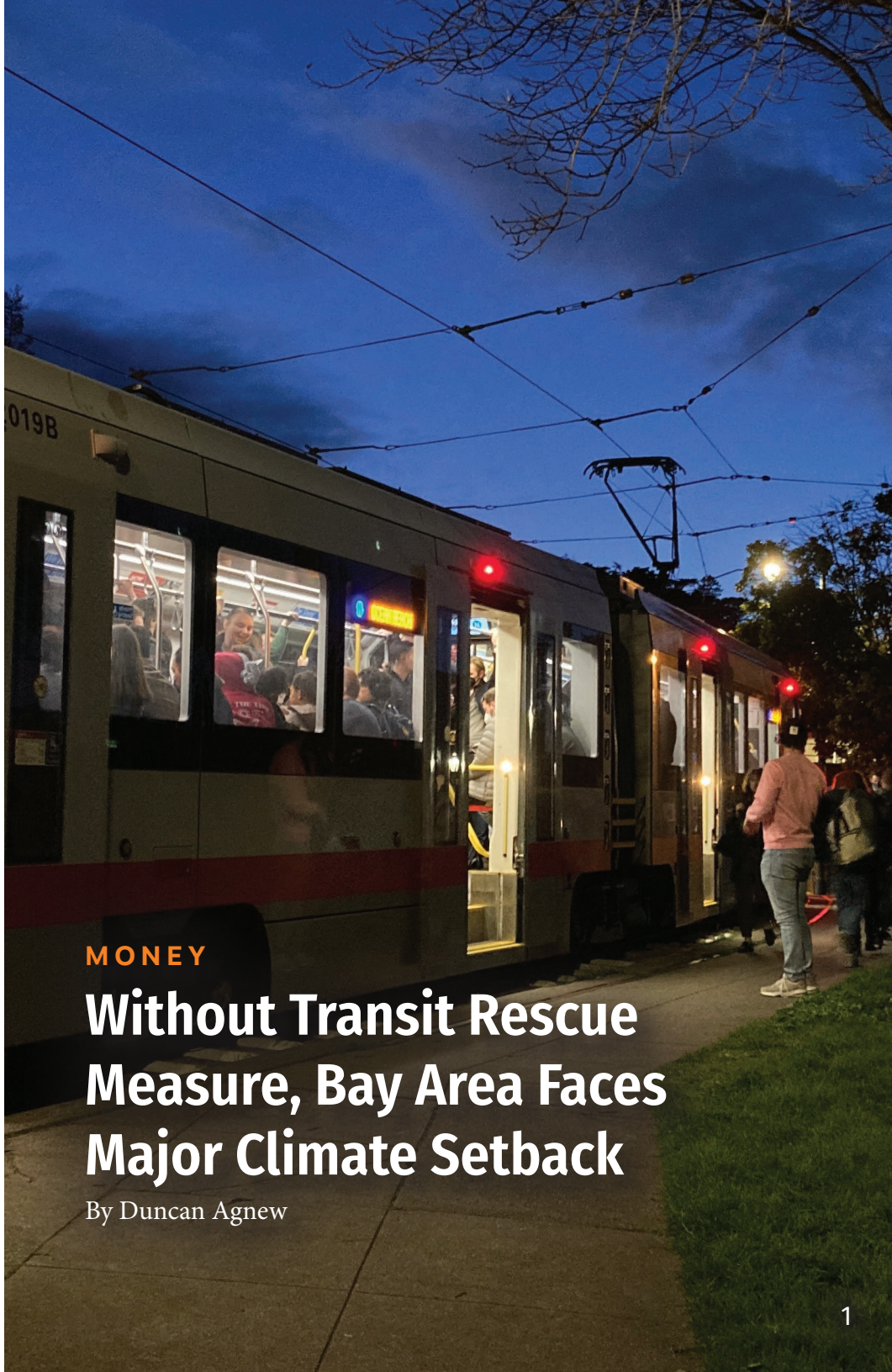
One Man's Five Fires

Who Will Inherit the Estuary?

Insurance Innovations Reduce Climate Risk and more

9 Stories of Climate Resilience

This zine offers key content selected from much longer stories. To read the full stories go to **kneedeeptimes.org**



MONEY

Without Transit Rescue Measure, Bay Area Faces Major Climate Setback

By Duncan Agnew

MONEY

Without Transit Rescue Measure, Bay Area Faces Major Climate Setback

Thousands more cars on the road. Millions more gallons of gas guzzled. A greater than 70% increase in traffic on the Bay Bridge. Up to 10 more hours spent commuting from the East Bay to San Francisco every week. Entire rail lines shut down.

That's the reality heading to the Bay Area like a freight train in the 2027 fiscal year, unless enough voters step up to pass a ballot measure funding public transit in November 2026.

The measure, authorized by SB63, will ask voters in Alameda, Contra Costa, San Mateo, and Santa Clara counties to support a half-cent sales tax, and San Francisco County for a full cent sales tax, to fund operations and improvements to BART, Caltrain, Muni, and AC Transit for the next 14 years. Without this bailout, those agencies are facing a combined budget shortfall of more than $800 million starting in 2027, largely due to remote work cutting fare revenues in half from pre-pandemic levels.

The vote has drastic implications for the region's goals for the economy, climate resilience, and equity. Long-term local and regional plans, according to experts, depend on the existence of a robust and connected public transit system to bring workers to business centers, keep cars off the road, and give low-income communities access to the wider Bay Area.

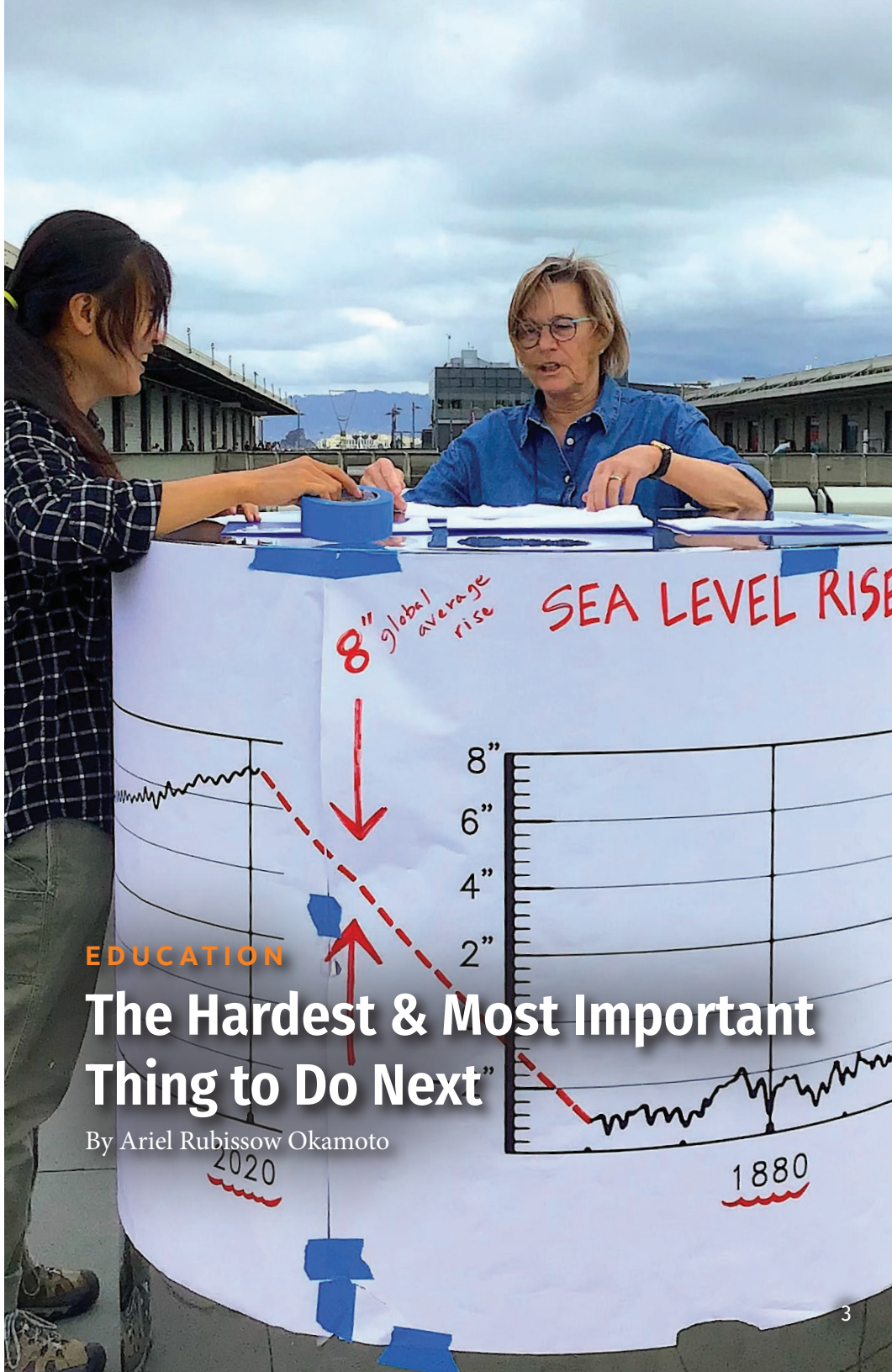
"There's a scenario where it's really a question of whether it would make any sense to operate anymore, and this would be completely devastating to the region's climate goals," says Rebecca Long, director of legislation and public affairs for the Metropolitan Transportation Commission.

"Our long-range planning, and all of our population growth and housing planning and housing growth, is really focused on transit-oriented development and putting more affordable housing near transit. Without that reliable BART system, and other systems, to support that housing, that entire model of how we're going to grow kind of goes out the window," she says.

If BART were to shut down entirely, according to its own estimates, cars in the Bay Area would burn 35,000 to 70,000 more gallons of gas per day.

The SB63 ballot measure, however, "allows cities to think strategically about future growth, integrating our housing and climate goals with the certainty that we will have reliable transit to support those ambitions," Santa Clara County Supervisor Margaret Abe-Koga says. "It empowers our local agencies to focus on long-term strategies that keep our region competitive and sustainable."

STORY 10/25: https://www.kneedeeptimes.org/bay-area-public-transit-2026-ballot-measure/



EDUCATION

The Hardest & Most Important Thing to Do Next"

By Ariel Rubissow Okamoto

EDUCATION

The Hardest & Most Important Thing to Do Next

The kid wanted a scraper. And once he had it, every kid on the Exploratorium's waterfront on Bay Day wanted one too, says oceanographer Jim Pettigrew. Each year, during maintenance of the NOAA buoy bobbing between Piers 15 and 17, visitors help scrape and scrub while learning about ocean science. "The kid's name turned out to be Davey, and he came three days in a row to help," says Pettigrew.

That kind of hands-on, place-based learning was on display at the museum's September "pop-up" on the Embarcadero sidewalk: a small shoreline lab, touchable 3D-printed models, charts, and flood-scenario screens.

"Place-based education is about the local, about where you live," says the Exploratorium's Susan Schwartzenberg.

Inside the museum, she and the team have been "rearranging, retuning, and reconceptualizing" their exhibits to better communicate local sea level rise impacts. A new partnership with local agencies is allowing the museum to "tell a more complex story," and add new exhibits about adaptation strategies. "We want to make it clear that as an institution we're civically involved in addressing our local climate issues," says Schwartzenberg.

This project grew out of a years-long difficulty for the Exploratorium to fulfil a requirement of their original development permit: funding a costly fill-removal project. In September, the SF Bay Conservation and Development Comission agreed that a free public education program could serve as a creative, negotiated public benefit instead.

For BCDC, the change reflects a broader evolution in how the region must respond to sea level rise. Scientists project a sharp acceleration in rise as early as 2030. "Without taking adaptation measures, the costs…could be over $230 billion," says BCDC chair Zack Wasserman. "We need to educate people so we can create the demand to assemble the funds necessary to minimize damage to our shores."

Back at the sidewalk pop-up, 20-something dudes study models and maps, surprised to learn they're walking atop the city's aging seawall. By June 2026, this new education program will be increasingly visible on the waterfront. Let's hope it helps locals gain the knowledge and life skills needed to confront one of the region's wickedest problems to date: an expanding Bay.

STORY 9/25: https://www.kneedeeptimes.org/bcdc-exploratorium-sea-level-rise-education/

SCIENCE

Volunteers Catch and Release Tiny Owls For Science

By Amy Moore

SCIENCE

Volunteers Catch and Release Tiny Owls For Science

This Halloween, biologist Julie Woodruff did not hand out candy to trick-or-treaters. Instead, she spent the evening in a dark Sonoma County forest waiting to intercept northern saw-whet owls. Woodruff leads a banding project to track these migrating owls, relying on community volunteers to advance her research.

Over six weeks this fall, Woodruff and a group of citizen scientists spent four nights a week, from just before sunset until nearly midnight, waiting for the owls to arrive. No bigger than cans of beans, the birds can be snagged in a fine mesh net erected vertically between two poles. Once caught, they are carefully extracted, fitted with a numbered band, and examined. Volunteers record biological data before releasing owls back into the night.

"I'm a morning person, so just staying up at night is the biggest challenge," says volunteer Jeff Robinson. But he wouldn't give it up. "It's a great privilege to just be able to do this stuff."

While the owls have been studied extensively in eastern states, there is far less data on migration and populations in the west. The data Woodruff records help scientists fill in these gaps and better understand impacts from development, logging, and climate change.

Northern saw-whet owls are moderately vulnerable to climate change. A warming climate increases the likelihood of wildfires (which burn habitats), spring heat waves (which threaten nestlings), and heavy rains (which can inundate nests and impede insect foraging).

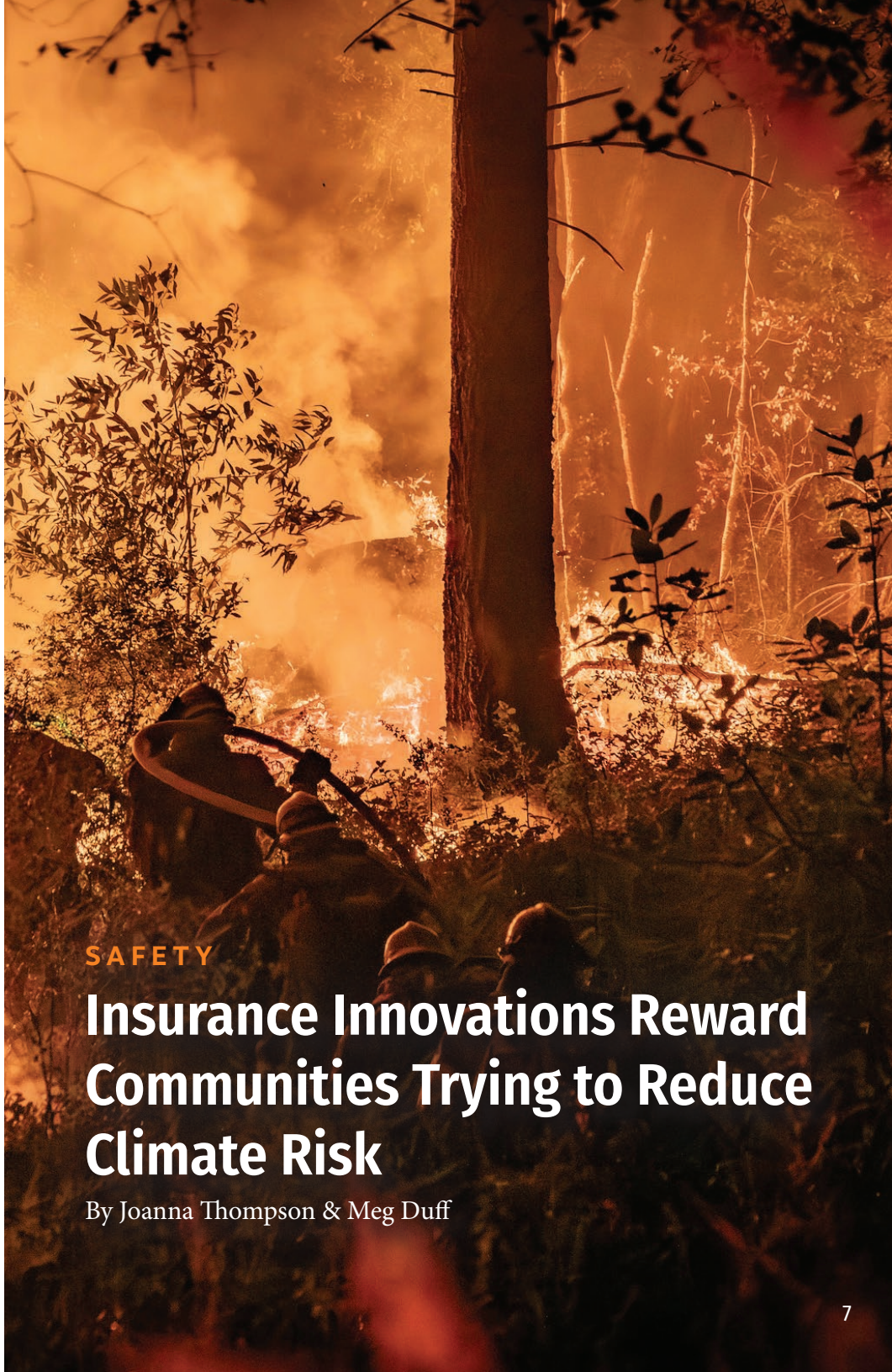
Missy Zepeda, an environmental consultant, began volunteering this season. So far, she's extracted three owls and banded four. "It's really important to have these long-term monitoring projects that can see the direct effects of climate change and educate the public," she says.

Owls banded by Woodruff in Santa Rosa have shown up at banding sites in the East Bay, Chico, and Arcata. Soon, Woodruff will collaborate with researchers at multiple sites around the state to flesh out a fuller portrait of the owls.

But mysteries remain. Researchers debate whether the owls are migratory or nomadic. "They're probably annual migrants," Woodruff says, "but also nomadic in the sense that they don't follow a specific pattern." These characteristics may help the owls adapt to climate change by following prey and good nesting habitat to less impacted areas.

Citizen scientists, whatever their reason for volunteering, are essential for Woodruff's research. "I can't do it all myself," she says.

Story 11/13: https://www.kneedeeptimes.org/citizen-science-project-owls-santa-rosa/



SAFETY

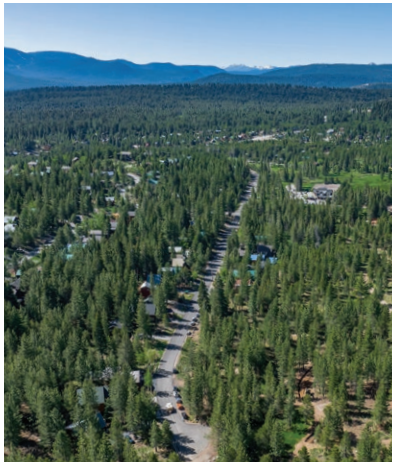
Insurance Innovations Reward Communities Trying to Reduce Climate Risk

By Joanna Thompson & Meg Duff

Insurance Innovations Reward Communities Trying to Reduce Climate Risk

Nestled in the Sierra Nevada mountains between Lake Tahoe and the site of the infamous Donner party encampment, Truckee, California is a ski town best known for trees and snow. But once the snow melts, the pines become a wildfire liability.

Jason Hajduk-Dorworth is no stranger to fire hazards. The former Santa Cruz fire chief retired to Truckee in 2024, where he now serves as an administrative director for the Tahoe Donner homeowners association, which encompasses 6,500 homes. In his career, Hajduk-Dorworth has watched wildfire risks rise and insurance companies begin to retreat from forest-adjacent California communities.



"People can't get insurance, or insurance is really expensive and they're getting dropped," he says. So he started applying his firefighting expertise to insurance risk reduction.

Tahoe Donner has, for decades, worked to lower the risk of wildfire by carefully managing more than 1,000 acres of surrounding forest. But insurance rates didn't take that work into account. So the association collaborated with the Nature Conservancy, risk analytics agency Willis Towers Watson, Globe Underwriting, and the University of California, Berkeley to craft a new plan.

This year, their efforts paid off. In May, Truckee and the greater Tahoe Donner area scored the first community wildfire resilience insurance policy in the U.S. to reward effective forest management in the cost of the policy.

Folks living in Tahoe Donner have engaged in forest management since the 1970s, but their wildfire wakeup call came in 2007, when a blaze came too close for comfort. The project picked up in earnest in 2015, when residents began removing downed trees, thinning underbrush, and strategically rearranging fuel so that if (and when) it does burn, the fire is confined to one area.

A 2021 white paper co-authored by the Nature Conservancy and Willis Towers Watson estimated that these efforts reduced the chances of wildfire damage by 20-40% annually. This data was sufficient to convince an insurance company to underwrite the $2.5 million policy, reducing the rate it would normally charge by nearly 40% and lowering the deductible by almost 90%.

"It requires a lot of work, so having that accounted for in the rate is a motivator," says Kristen Wilson, a forest scientist with the Nature Conservancy.

Tahoe Donner's policy uses a parametric, rather than indemnity, model for payouts. Parametric insurance works by paying out based on quantifiable benchmarks, like acres scorched in a wildfire, rather than couches or cabinets gone up in flames. These plans typically cover a geographic area rather than an individual home or vehicle, which can make it easier for a whole community to get on board.

But tying insurance to nature-based solutions is no easy task.

"For us to calculate these impacts, it required a lot of custom modeling of the specific area. And big insurance companies cannot afford to do that with every little community here and there," says Guillermo Franco of reinsurance firm Guy Carpenter. For now, that cost can be prohibitively expensive at the homeowner's insurance level, but it can work for larger community-scale plans, he adds.

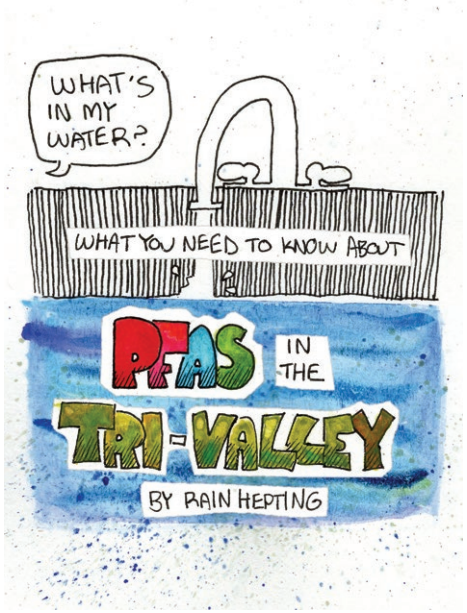
Another pilot, which Franco is leading with UC Santa Cruz's Mike Beck, is looking at how communities facing different risks could insure one another directly. They're developing a reciprocal exchange insurance program, in which two cities in disparate disaster regions cover insurance for one another. Pairing different types of risk should, Franco says, reduce the chances that both cities would need a payout at the same time.

There may be no one-size-fits-all model for alternative disaster insurance; each policy may need to be tailored to the needs of a particular locale. But the end result could be a more robust and eco-friendly insurance landscape.

"The more you engage with communities and the people on the ground, as it were," says Beck, "the more likely it is that you're going to find solutions."

STORY 9/25: https://www.kneedeeptimes.org/disaster-insurance-innovations-reduce-climate-risk/

What to Know about PFAS in the Tri-Valley Area



The Tri-Valley region is known for its small-town feel and easy charm, but nothing is ever simple when it comes to California's water supply. Since 2018, Pleasanton has been grappling with a plume of groundwater contaminated with per- and polyfluoroalkyl substances (PFAS), a group of industrial chemicals that scientists say can accumulate in the environment and the body, with harmful effects on human health.

The city has taken its wells offline and now purchases all its water from Zone 7 Water Agency, which operates two PFAS removal treatment plants and draws a majority of its supply from surface water. Still, local residents question the safety and future of their water supply, especially as climate change intensifies the frequency and severity of droughts that can cause more groundwater to be used.

"Shelter in place only works if your home can actually keep toxins out. Ours can't — and most homes here can't. So we need accurate alerts, real air monitors, the best technology at the refinery, and real enforcement — not after the fact, but before something goes wrong."

Heidi Taylor, co-founder of the refinery pollution prevention advocacy group Healthy Martinez. (Story: 11/25)

"Prescribed burning is a way to manage the landscape so we can live more in harmony with it. I want to be more involved going forward and hopefully for the rest of my life get to go out on the weekends and do some burning. It's a great way to be in community."

Rose Carges, Climate Action Corps fellow participating in a Learn and Burn workshop (Story: 12/25)

"The challenge is the mental resistance to change that I often experience. It's not negative, it's just people are unaware of what the benefits could be ..."

Shy Walker, environmental education group Ninth Root (Story: 10/25)

"About a third of the public is not that excited about drinking from our wastewater, even though it will be the most highly treated and super safe water that there is."

Kirsten Struve, water supply division at Valley Water. (Story: 11/25)

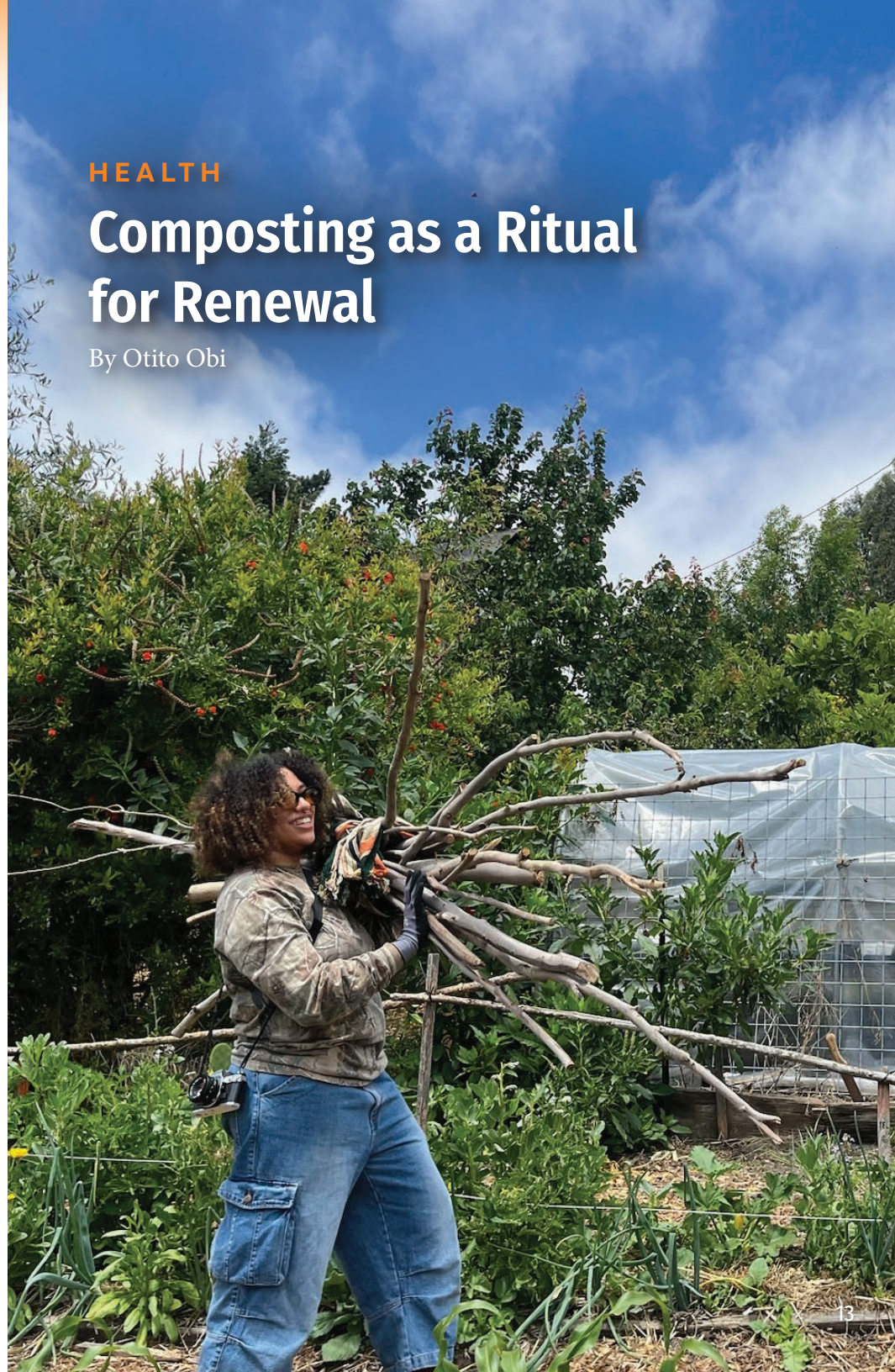
"It is important that people not fall for the false sense of urgency promoted by the data center industry. There's no urgency requiring us to abandon climate commitments and ignore other environmental regulations."

Jonathan Koomey, co-author of data center study

HEALTH

Composting as a Ritual for Renewal

By Otito Obi



Composting as a Ritual for Renewal

Along a south-facing slope in the El Sobrante watershed, wisps of smoke waft from a long bundle of dried sage in the hands of Gabby Abebe, an organizer with Sankofa Roots. Sankofa is a land-based learning and healing organization that connects Black, Indigenous, and queer communities with nature. Their offerings include emergency preparedness training, skill shares, workshops, campouts, and volunteer days.

Today the Sankofa team is hosting a soil and compost volunteer day at Soul Flower Farm. One by one, Gabby waves sage over each volunteer. Maya Blow, Soul Flower Farm's founder, invites us into a large wooden gazebo. We circle up on colorful rugs and introduce ourselves. "I'm here because my ancestors brought me here. At least that's what I believe," says Jeremiah Haskins, a Rudy Lozito Fellow. The fellowship is based at Urban Tilth, an organization that trains residents of Richmond to build more sustainable food systems.

Volunteers share that they're excited to learn more about soil and composting so they can better tend to their gardens at home. Blow thanks us all for being here and brings us on a journey through the history of Soul Flower Farm.

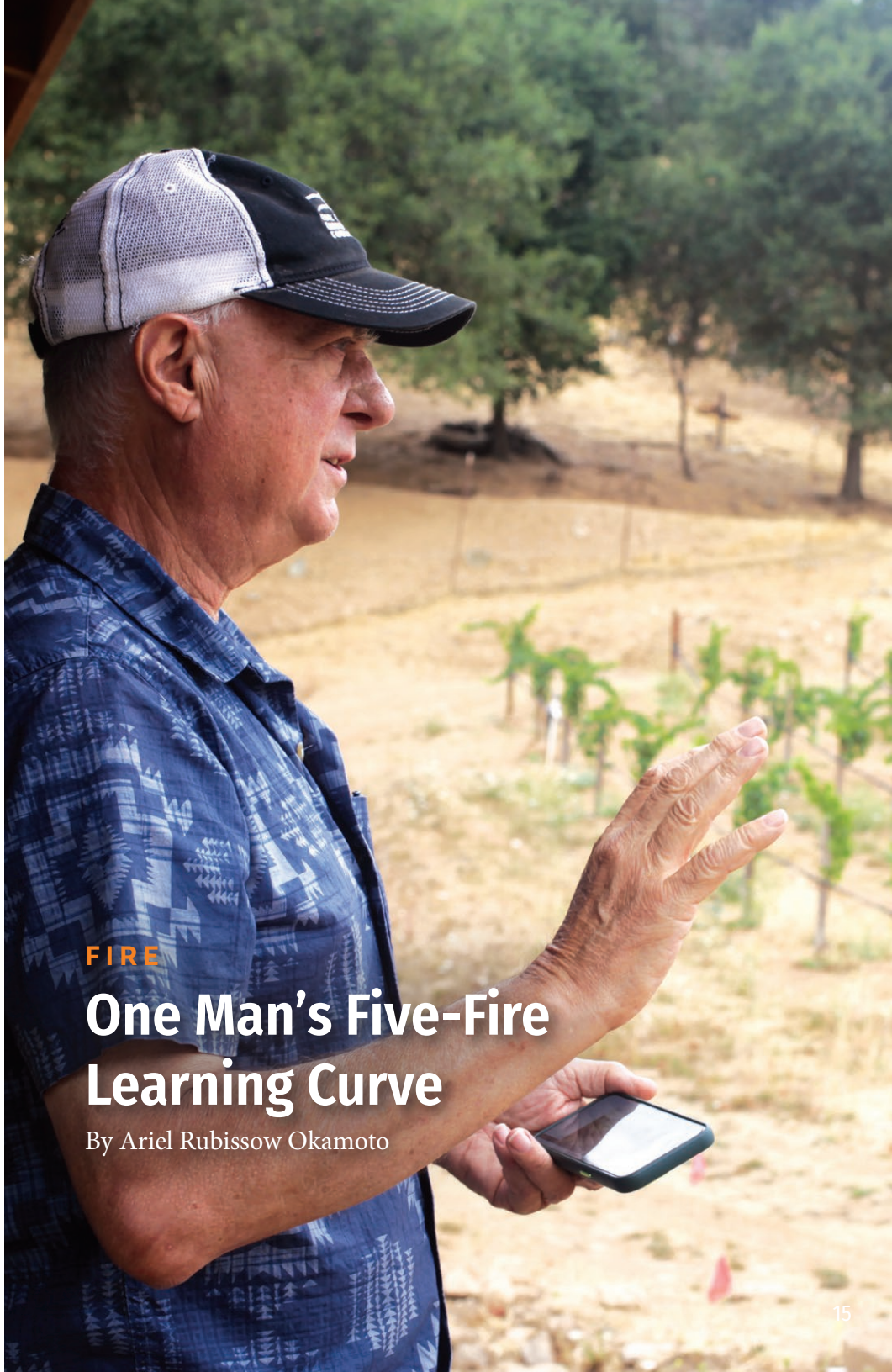
"It started as an experiment to see how much we could produce of what we consume," explains Blow. "Within a year, 90% of our dinner plate came from the farm."

Then, Blow gives us a lesson on soil and explains various composting methods, including hot and cold piles, compost teas, and vermiculture. "Anything biodegradable can be composted," she says — including animal products, urine, and blood, which enriches soil with healthy minerals.

After group stretching, we trek down a mulched hill to build the compost pile. We work to Afrobeat music, layering cardboard, branches, greens, and browns. We drag barrels of hay down the hill on large blue tarps and add them to the compost. We sprinkle nutrient supplements, and spray water. We continue on like this, layer by layer until the pile is about four feet high. In six months the compost will be ready to enrich the ground.

"For Black, Indigenous, and queer communities, working with soil is not just practical — it's deeply spiritual," says Jamani Ashe, the founder of Sankofa Roots. "It invites us to remember who we are and how we belong. In a world that treats us as disposable, composting reminds us that nothing is wasted. It's a radical act of resistance and renewal — one that reclaims our relationship to land, body, and spirit."

STORY 8/25: https://www.kneedeeptimes.org/composting-as-a-ritual-for-renewal/



FIRE

One Man's Five-Fire Learning Curve

By Ariel Rubissow Okamoto

One Man's Five-Fire Learning Curve

Steve Rasmussen lives far enough into the wilderness around the Napa Valley, about a mile from the town of Calistoga, that his phone bristles with apps — weather, helicopter flight paths, fire flare ups. Since he and his wife bought the 796-acre vineyard and woodland property in 2015, he's been through five fires. Rasmussen's Palisades Canyon escaped the 2017 Tubbs Fire, but three years later, 90% of his acreage burned. He learned the hard way what it meant to live on a fire-prone ridge, working alongside PG&E and CAL FIRE as they cleared brush, staged operations, and rebuilt roads. He updated his buildings, built fire breaks and defensible space, and began studying how to navigate grants for post-fire recovery.

"If you act like a steward of your property, rather than building a fortress to keep everyone away, you start meeting your neighbors and working with other people. You start a community that buys into the whole idea of wildfire preparedness together," says Rasmussen.

It's a belief he has in common with another brainy guy on the Napa Valley fire scene: Joe Nordlinger, CEO of the Napa Firewise Foundation. "Fire doesn't really care if you're rich or poor. It doesn't care if you lean left or lean right," he says. "Fire just moves based on three things: fuel, terrain, and weather. Because of that, wildfire resilience is a unifying thing."

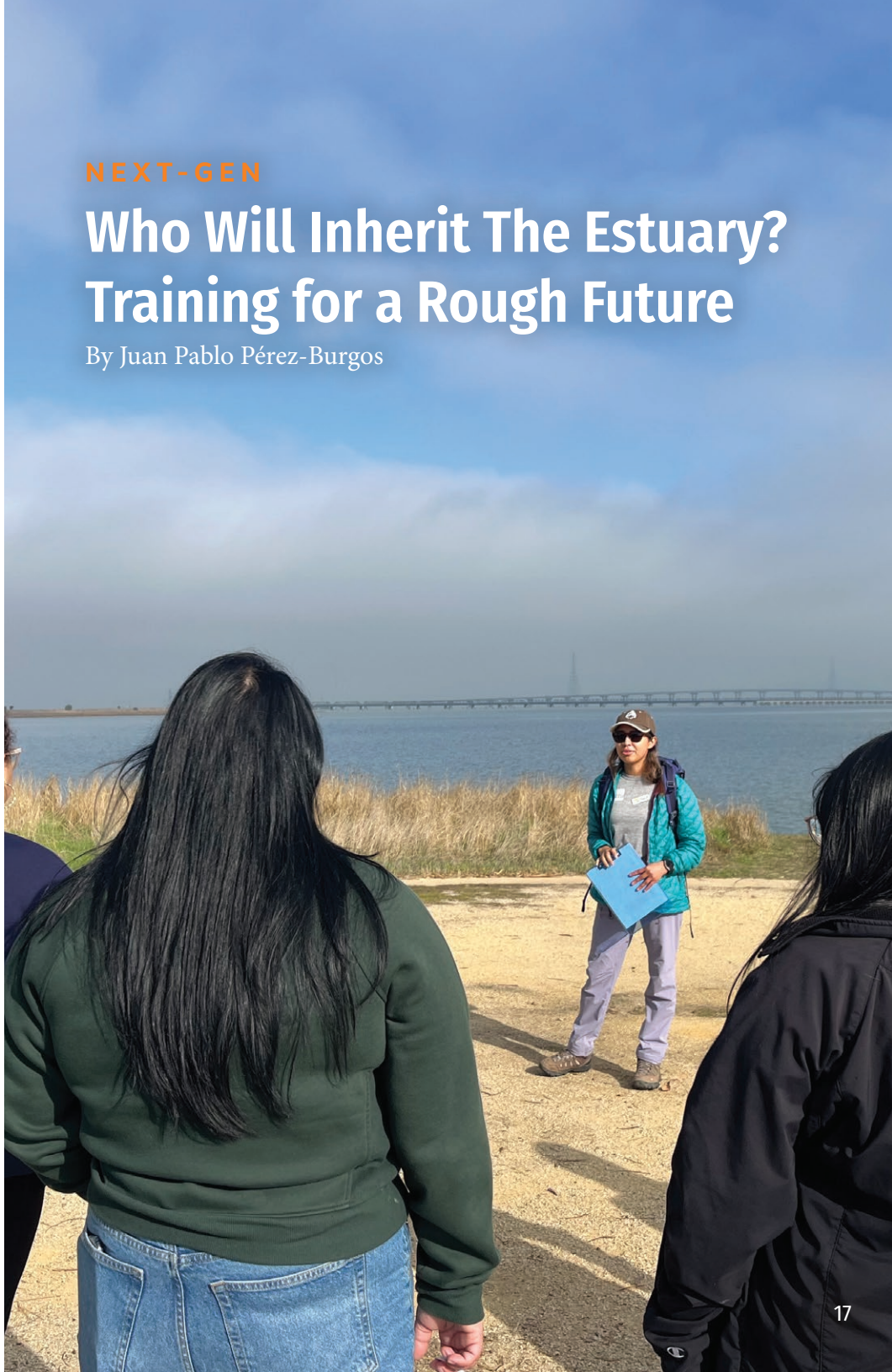
Nordlinger bought his own 28 acres after the Wragg Canyon Fire of 2014, and has since grown Napa Firewise into a "mothership" of fire preparedness, with 22 community-based fire councils. Firewise has undertaken more than 500 projects focused on vegetation and fuel management, a valley stewards initiative, and the "care and feeding" of its local councils.

At the same time, the Napa Resource Conservation District has been reinventing itself. In 2017, "our RCD didn't even have a forestry program," says Ali Blodorn, who now directs the district's forest health initiatives. Historically focused on soils, water, and wildlife-friendly farming, the district has joined neighbors in the regional North Bay Forest Improvement Program.

These systems were just beginning to gel when the Glass Fire torched 67,000 acres of the Napa Valley — a "crystallizing moment," Nordlinger says. In the years since, Rasmussen has joined his local fire safe council, helped organize the Palisades Fire Watch, and pushed through the maze of RCD site visits, maps, environmental reports, and federal rate sheets to help himself and his neighbors get an EQIP grant for landowners in the scar of the Glass Fire.

"We're a little canyon of old men, but we still get stuff done," he says.

STORY: 9/25: https://www.kneedeeptimes.org/steve-rasmussen-napa-valley-fires/



NEXT-GEN

Who Will Inherit The Estuary? Training for a Rough Future

By Juan Pablo Pérez-Burgos

Who Will Inherit The Estuary? Training for a Rough Future

On a bright fall morning, Paola Bueno leads a dozen students through the marshes along East Palo Alto's shores.

She stops beside a waist-high shrub with silvery leaves, snips a few, and passes them around. One by one, the students smell the scent of the California sagebrush, also known as cowboy cologne. It's one of the many native plants that the nonprofit Grassroots Ecology, where Bueno works, has planted in the last few years to bring the marsh back to life. She points out others — pickleweeds, juncus, and wildflowers — and shows photos of two critters that deeply depend on them to live: a spike-beaked shorebird called the Ridgway's rail and the salt marsh harvest mouse, small enough to slip unseen through the pickleweed.

These students are part of the Estuary Youth Council, a six-month program that brings together young people from marginalized communities around the San Francisco Estuary, from Stockton to East Palo Alto. Now in its second cohort, the program selects eight to 10 participants, ages 17 to 24, who are passionate about the environment and eager to learn about the estuary, the challenges it faces, and how it shapes surrounding communities.

The goal, says Diana Fu of the SF Estuary Partnership, is to develop the next generation of environmental leaders. Along with professional development training, participants spend time in the field, seeing firsthand how different shoreline habitats work and what threatens them.

"A lot of decisions about our environment are being made without the input of young people," Fu says. "And because young people will be inheriting the estuary — our cities, our towns, and our ecosystems — it only makes sense that they should have a say."

For her capstone project, which every council member must complete by the end of the program, three student trainees — Catalina Maldonado, Em Pham, and Dylan Huynh — are making a zine about the estuary and how it's being affected by climate change. But they also want to inspire young folks like them to act and, as Huynh puts it, "make them feel like they are part of something bigger."

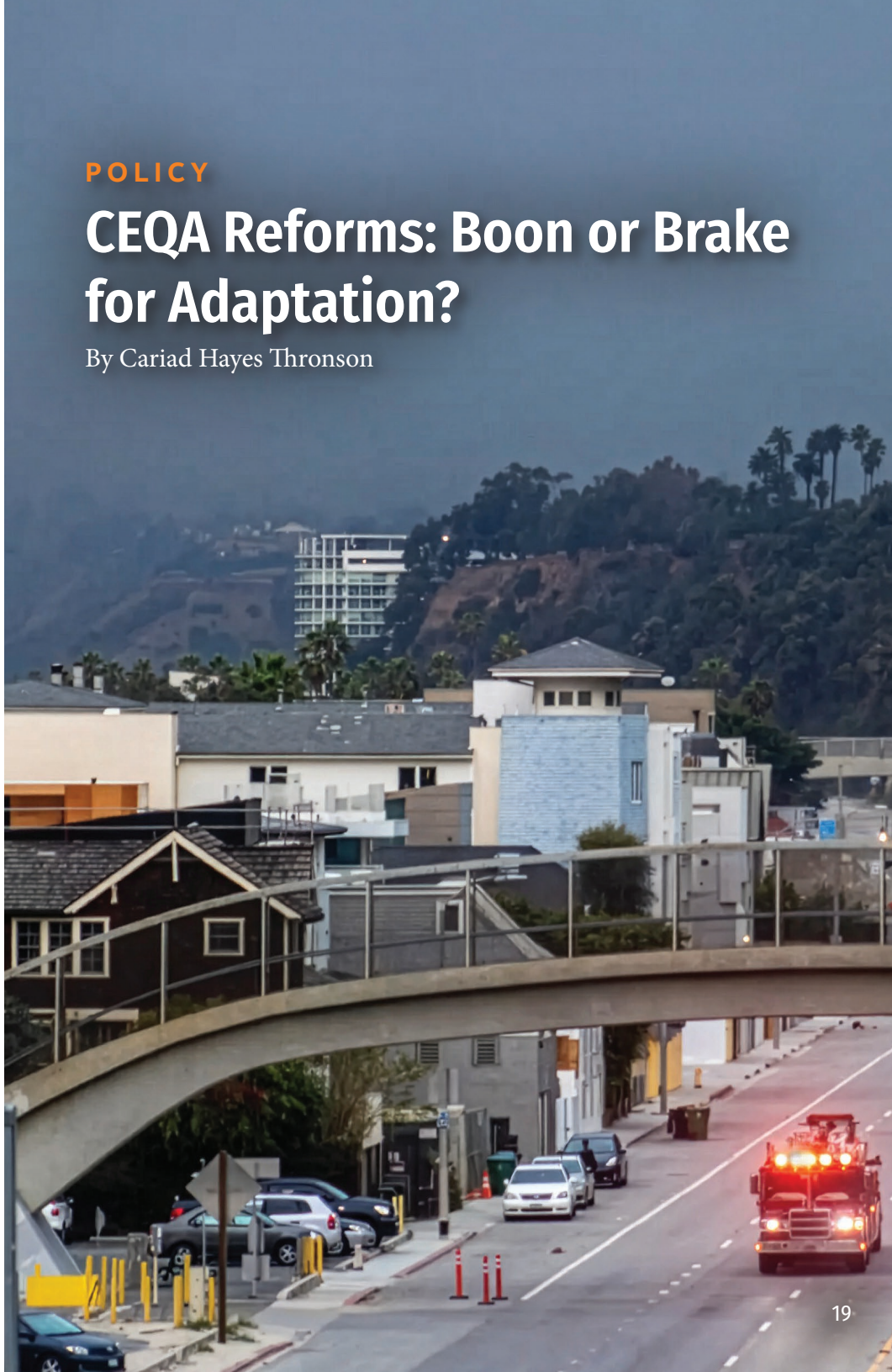
"When you look from afar, it looks like there's nothing you can do," he says. "But then, when you see all these different groups tackling the issue from different perspectives, it makes it feel like there's a foreseeable goal you can work towards, and it's not an unbeatable problem."

STORY 11/25: https://www.kneedeeptimes.org/san-francisco-estuary-youth-council/

POLICY

CEQA Reforms: Boon or Brake for Adaptation?

By Cariad Hayes Thronson



CEQA Reforms: Boon or Brake for Adaptation?

While housing advocates and developers are cheering new legislation that will sharply limit the California Environmental Quality Act, many environmental groups are outraged by what they say was a rushed and opaque process that will eviscerate environmental protections.

Critics of CEQA, which requires projects needing government approval to assess potential environmental impacts and identify mitigation measures, have long contended that it exacerbates the state's housing crisis by impeding development.

Billed as reforms that will streamline housing and infrastructure development, AB 130 and SB 131 were enacted over the summer of 2025 as part of the state budgeting process. Under the new laws, infill housing and other types of development that meet certain criteria, including size, location, and density requirements, will be exempt from CEQA.

The changes will likely advance the goals of Plan Bay Area, a long-range plan to make the region more resilient and equitable, says Metropolitan Transportation Commission Planning Director Dave Vautin.

"This CEQA streamlining action is one piece of a larger puzzle that is necessary to make it easier to build homes, so we can both address the region's cost of living challenges and reduce the number of folks who have to move outside of the Bay Area and commute into it," Vautin says.

But UC Davis' Mark Lubell notes the new laws do little to direct new development to areas with less vulnerability to climate change.

"In the Bay Area, we're seeing a lot of new housing developments getting proposed in low-lying areas that are vulnerable to flood risk, because that's where the space is," he says. "If you're going to try to accelerate the speed at which the housing supply grows, it should be done alongside trying to manage where it goes."

Community groups have other concerns, particularly about a provision that would allow manufacturing projects to skip environmental review if they're built on former industrial land.

The new laws do have some good news for sustainable growth, though. A provision will allow developers to mitigate vehicle miles traveled by contributing to a state Transit-Oriented Development Implementation Fund to support development near public transportation.

"There have been previous CEQA streamlining bills that the state has pursued, and it does take time to understand the magnitude of impact," says MTC's Vautin. "I think we'll have a better sense of some of the implications and consequences of the bills as we go forward over the next couple of years."

STORY 10/25: https://www.kneedeeptimes.org/ceqa-reforms-environmental-impact/

Snapshots from our Stories

"Yes, shoreline hardening will have some impacts [on neighboring properties], but it's on the order of centimeters compared to meters of sea level rise."

Ellen Plane, Scientist at SF Estuary Institute (Story: 12/25)

"Letting nature do the work is always going to be the cheapest option. We want to come up with these management sweet spots where we're doing right by the watershed and we're also doing right by … our marshes and our mudflats."

Scott Dusterhoff, sediment scientist at the San Francisco Estuary Institute (Story: 9/25)

"Really large dollar amounts from the federal BRIC program had been allocated to the region's [resilience projects], and those have been withdrawn. There's no good way to just stitch together other funding sources because implementation dollars are so large."

Carolyn Yvellez, Bay Area Climate Adaptation Network (Story: 9/25)

"LA is never going to be climate resilient if the streets department refuses to work with the transportation department and they refuse to work with the engineering department. All these agencies have to be on the same page and aligned behind a capital infrastructure plan that prioritizes climate resiliency."

Sam Bloch, author Shade, The Promise of a Forgotten Resource (Story: 10/25)

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WANT MORE?

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