

Winter 2017

# The Planet, 2017, Winter

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# THE PLANET

PEOPLE IN ACTION WINTER 2017





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*Nearly four decades ago, The Planet was a handcrafted advocacy magazine run by a staff of student activists. To this day, our mission statement is "to advocate for the environment through responsible journalism."*

*This year, I've reflected on what that mission statement means for The Planet. I'm a journalist. I strive for impartiality, and I ask the same of our writers and editors. So I wonder: Are we being true to the magazine's mission of advocating for the environment?*

*I think so. I advocate for the environment in the same way I advocate for science: as something larger than an individual fight. I want to live in an environment that works for people, plants, animals and the natural systems that support them. But the world is complex, and I don't know the best way to get there. The environmentalist or the industrialist might not know either. But I believe that discussion and evidence can help steer us in the right direction.*

*This quarter, we told stories about people working to find that balance. We followed a scientist working to improve forestry practices using research about underground fungal networks. Our politics reporters traveled to Olympia, where two prominent senators — one Democrat and one Republican — are shaping statewide environmental policy. We flew with a pilot set on photographing every glacier in the contiguous United States, and met a photographer documenting baby albatross dying from ingesting plastic from the Pacific Garbage Patch.*

*In the end, these are ordinary people in action. I hope their stories help you think, discuss and participate in finding a way forward.*

*Jesse Nichols**Editor-in-Chief*

In the Fall 2016 Human Health Issue, the article "Tackling Toxics" misstated a fact. We wrote that the Toxic Substance Control Act was signed into law before cars required seat belts. We meant to say before laws required passengers to wear seat belts. These errors have been corrected on our website.

THE PLANET MAGAZINE is the quarterly student publication of Western Washington University's Huxley College of the Environment. We are dedicated to environmental advocacy through responsible journalism.

This issue of *the Planet* is printed on Mohawk via uncoated bright white paper. It is made from 30% recycled content. Mohawk is a certified Women Owned Business Enterprise and is the first U.S. paper mill to offset 100% of its electricity with wind power renewable energy credits. It is also the first U.S. premium paper mill to shift toward carbon neutral production. Basically they're environmental superheroes. We are proud to support them.





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"Do you want to fly?" John Scurlock's voice was coming through the headphones that blocked out the noise of the plane. Scurlock grabbed my camera as I took hold of the controls. My knees were against the dashboard in front of me, and my elbows were pressed to my sides as I felt the plane respond to my shaky hands. I don't think there is any experience that could emulate the overwhelming feelings of liberation I felt in that moment.

Photo by Miranda Abrashi



Suzanne Simard explores the forest in Pacific Spirit Regional Park near the University of British Columbia in Vancouver, British Columbia.

# WEB OF THE WOODS

STORY BY ALLURA PETERSEN  
PHOTOS BY MIKE HITCHNER



*Suzanne Simard walks through a thick canopy of Douglas firs in Pacific Spirit Regional Park, a small urban forest in Vancouver, British Columbia. She crouches down and scrapes the forest floor with her bare hands. After a few minutes of digging, she delicately separates a slice of what looks like weathered paper from the soil. This, Simard says, is the reason forests are able to thrive for centuries.*

**UNDERNEATH HER FEET**, trees are exchanging non-stop information, nutrients and water through vast expanses of this thin material, made from the intricately woven roots of fungi. These networks, called mycorrhizae, allow forests of slow-growing, immobile trees to adapt to their changing environment by serving as avenues for what Simard refers to as “communication.”

Simard is a professor of forest ecology at the University of British Columbia. For the past two decades, she has studied how mycorrhizal networks allow trees and forests to survive. Through mapping the architecture of the underground fungi, Simard found the biggest, oldest trees nurture seedlings and neighboring trees, earning the affectionate title “mother trees.” Now, Simard is working with some in the logging industry to develop forestry techniques to protect forest ecosystems into the future.

Simard grew up in a family of loggers. Her grandfather and great uncles harvested the cedars that were used to build some of the first telephone poles in British Columbia in the 1940s. They weren’t trained ecologists or foresters, simply loggers trying to make a living. Her father would tell stories of felling old-growth trees with crosscut saws and sending them down mountainsides in hand-built log flumes. Simard spent summers in the woods of British Columbia where her father grew up. This fostered an intimate relationship between Simard and the natural world.

“If you spend a lot of time in the forest, you start to be like the forest,” Simard said. “You start to think like the plants and the trees, and it just makes sense.”

This connection led Simard to pioneer research on forest interactions, illuminating a forest of seemingly solitary organisms as a community of highly evolved beings. To do that, Simard injected trees with a radioactive form of carbon dioxide to track the carbon flowing through the forest. She used this research to build a digital map, visually confirming that almost every tree in the study area was connected to the others through their underground fungal helpers.

Simard planted related and unrelated seedlings around older trees, and found the forest elders could recognize how much DNA they shared with their surrounding seedlings, funneling more nutrients to their kin. If a seedling was sick, the mother trees would direct more carbon to stranger seedlings around her, reducing the chances of her kin spreading the threat through the forest, Simard said.

Simard published her doctoral dissertation in the journal *Nature* in 1997, sparking new studies across the world. A framed issue hangs in Simard’s cluttered office at UBC, among relics of her accomplishments in the time since her initial research. A plaque from her 2016 TED Talk sits high on a bookshelf, while pictures of her daughters and past projects cover her desk. Simard is now working to use her discoveries to tackle large-scale problems facing these forests.

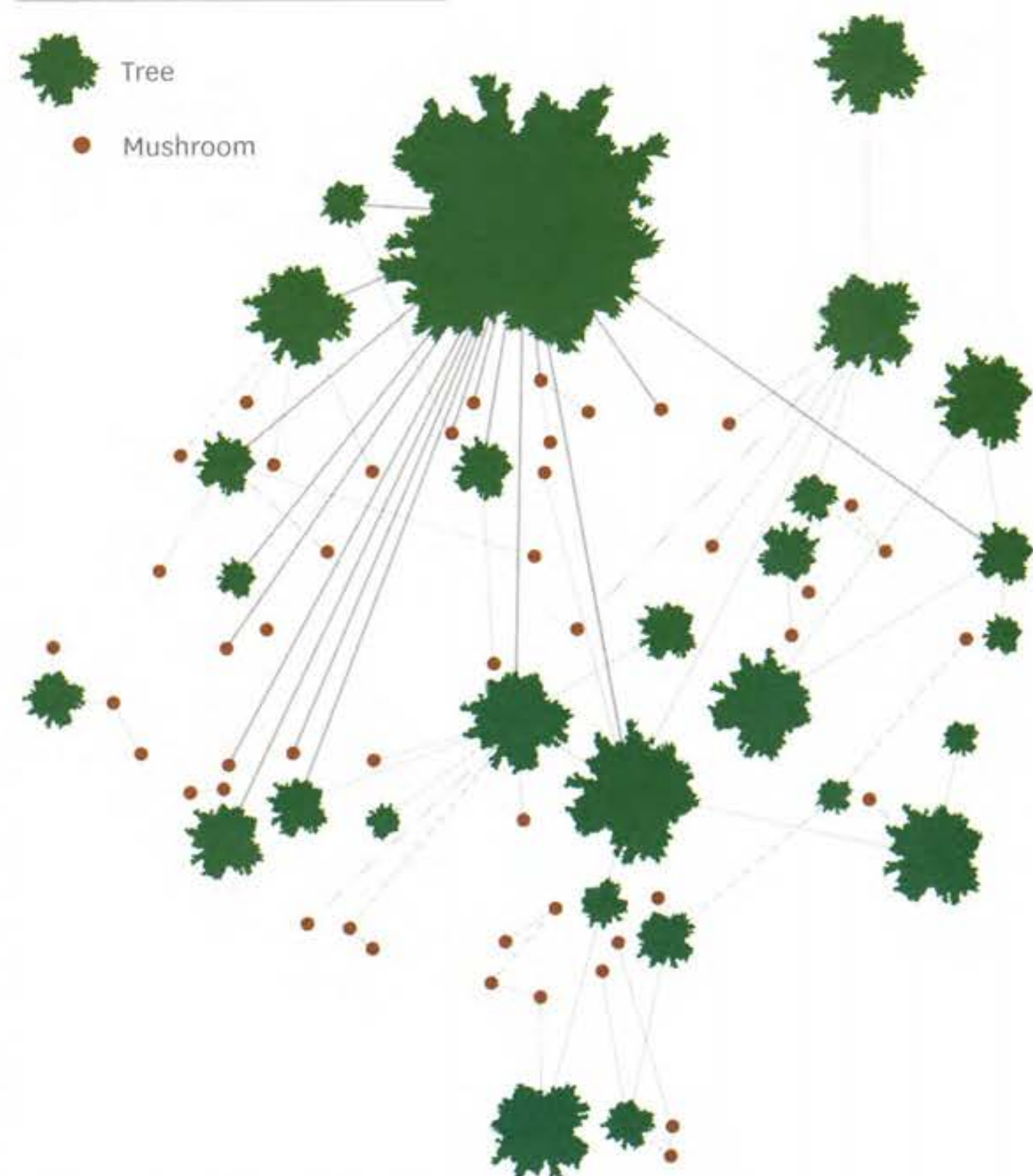
Simard began to recognize the environmental degradation from today’s logging during her time working for a forestry company. Now

armed with a \$929,000 grant from the National Sciences and Engineering Research Council of Canada, she is developing strategies to help forests adapt to climate change. This project, aptly named the Mother Tree Project, focuses on 21 Douglas fir forests across the province, ranging from those along the U.S. border to the northernmost forests in British Columbia.

Disconnecting trees through logging could spell disaster for the future of the forest as a whole, Simard said. Mother trees share all of their information and nutrients before they die natural deaths. However, if chopped down, all the nutrients are lost.

Simard is using the Mother Tree Project to search for techniques to support logging without making forests more vulnerable to climate change. By selectively logging in test areas, Simard is investigating how

## WOOD WIDE WEB



Simard mapped the underground fungal networks connecting trees in forests. She found large, old trees — which she dubbed “mother trees” — that connected to as many as 47 other trees.

This map is based on a 2009 study by Simard and colleagues.



**“WE ARE HAVING ORGANISMS GO EXTINCT AND WE’RE CUTTING DOWN OUR FORESTS. MAYBE BECAUSE WE HAVE HARDENED OURSELVES IN A WAY TO THESE OTHER LIVING ORGANISMS.”**


- JOAN MALOOF

FOUNDER OF THE OLD-GROWTH FOREST NETWORK

many mother trees loggers need to leave in order for the forests to remain healthy. Over 5-hectare areas, she is also planting a variety of tree species to test which mixes are most successful for regrowing forests after logging.

Simard said her work could eventually lead to higher timber yields for loggers in the long run. Forestry companies are excited by this prospect, she said, and some are reaching out to participate. Climate change provides an incentive for logging companies to rethink their practices, Simard said.


“We were all taught in elementary school not to anthropomorphize, but what is the result of that?” said Joan Maloof, the founder of the Old-Growth Forest Network, a Maryland-based nonprofit that promotes preservation of old-growth forests. “We are having organisms go extinct and we’re cutting down our forests. Maybe because we have hardened ourselves in a way to these other living organisms.”

Simard’s beliefs remain unchanged from her first publication: The role of mycorrhizal fungi in forest ecosystems warrants more attention than it has received. Practice often lags behind science, she said, but she is confident changes are in the works, resulting from research promoting public awareness of the larger issues within forestry. Simard champions the importance of stewardship within forests, and will always save time for a walk in the woods. 

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**ALLURA PETERSEN** is pursuing a degree in environmental studies at Huxley College. She remains a dear friend to a sprightly pothos and a humble comrade to all plants.

**MIKE HITCHNER** is a photographer and environmental studies student at Huxley who strives to capture the beauty of earth’s diverse landscapes while furthering public understanding surrounding the threats these ecosystems face.



Simard describes how mycorrhizal networks spread and allow trees to share nutrients and chemical signals with each other.



# CHANGING SLOPES



STORY BY KATJA TUNKKARI  
PHOTOS BY MATTHEW TANGEMAN

Skiers and snowboarders get a lift on Mt. Baker Ski Area's Chair Five. Skiing is a multi-billion dollar industry in the United States, with over 5 million skier visits last season in the Pacific Northwest alone.

*Climate scientist Sarah Myhre stood atop Artist Point, in the Mount Baker-Snoqualmie National Forest, during the summer of 2015. Before her was a panoramic view of the North Cascades. Myhre's eyes scanned the vista for any hint of white, but as far as her eyes could see, the terrain was almost completely devoid of snow. The summer snowpack had nearly vanished.*

*"This is not the Pacific Northwest I grew up in," Myhre said.*

**WHILE PURSUING AN EDUCATION** in climate and ocean science, Myhre came face to face with the prospect of imminent climate change. Unchecked warming poses a real threat to Myhre's home ski area and winter-dependent economies all over the world. Today, Myhre is driven by a desire to advance change by sharing scientific knowledge with the wider community. In 2015, she started doing that with an innovative campaign to bring science to the slopes of the Mount Baker Ski Area.

"There are real risks to my community in the future of unchecked climate warming. The place will be different," Myhre said. "It was my

hope that I could act as a facilitator to bring the science that is happening at the University of Washington that is so relevant to the ski area."

During her childhood, Myhre spent formative years splitting time between Seattle and Glacier, Washington, a small town in the foothills below Mount Baker. Mount Baker Ski Resort was a fundamental part of her family culture. During her undergraduate studies at Western Washington University, Myhre would often only see her parents for weekend ski dates. Skiing in those days enabled her to survive her adolescence, Myhre said. Today, it provides an escape from the stress of dealing with





ABOVE: Sarah Myhre gives a presentation at Backcountry Essentials outdoor equipment store in Bellingham.

impending climate change. Myhre makes the trip to Mount Baker nearly every weekend during the winter, often with her three-year-old son at her side.

Skiing is also a way for Myhre to reconnect with the community in Glacier. Nearly everyone in Glacier knows her name, including Gwyn Howat, Vice President of Operations at Mount Baker Ski Area. Howat lives in Glacier and has known Myhre since she was a young girl first learning to ski.

"She's able to see and believe in something that can be improved," Howat said.

Myhre is now a postdoctoral scholar at the University of Washington in affiliation with the Future of Ice Initiative, an institute centered around polar and climate science. Myhre's present-day work is in paleoceanography, the study of how the ocean changes over time. Currently, she is studying the changes that occurred in the ocean during Earth's most recent climate warming event, approximately 20,000 years ago, in order to anticipate how human-caused climate change may influence the oceans today.

Myhre's observation of the dwindling snowpack at Artist Point was preceded by an alarming ski season. Mount Baker and other resorts around the state were forced to close temporarily due to a lack of snow. The ski season of 2014-2015 was a turning point for Myhre. She came to terms with the real threat climate change poses to Glacier.

"Whether we can or cannot attribute 2015 to climate warming, we know events like that will become much more frequent by the end of the century. Those events are a window into what our snowpack could look like down the line," Myhre said. "It shows us what we have to lose."

Following that ski season, Myhre organized a series of lectures titled "The 1.5 Degrees Series and What We Can Do to Help," held at Mount Baker Ski Area. Cecilia Bitz, a UW climate and ice scientist, delivered a presentation regarding the future of ice. UW scientists Daniel Schindler and Nick Bond spoke on the future of salmon in the Pacific Northwest and the potential impacts of El Niño.

"It felt special to me as a community member to be able to sit there, talk to and listen to some of the best minds working on this issue," Howat said.

**"TRYING TO STEWARD  
THIS PRECIOUS  
WORLD AROUND US IS  
INHERENTLY VALUABLE.  
IT'S NOT JUST ABOUT ME,  
IT'S ABOUT ALL OF US."**

- SARAH MYHRE

POSTDOCTORAL SCHOLAR

UNIVERSITY OF WASHINGTON

Howat and Myhre are currently working on a similar event that will take place this March. Howat hopes the template she and Myhre created can be used for more events in the future.

The consequences of climate change extend far beyond Mount Baker. Washington state experiences a roughly 28 percent difference in skier visits between high and low snowfall seasons, according to research from the University of New Hampshire for the Natural Resources Defense Council, an environmental group. During the 2011-2012 season, the fourth warmest winter recorded since 1896, 50 percent of ski areas within the United States opened late and 48 percent closed early.

Ski resorts in the Pacific Northwest are especially at risk due to their proximity to the Pacific Ocean, where warm or cold ocean currents influence the air blowing over the coast. These currents can result in either a large amount of snow or a large amount of rain, said Daniel Scott, Research Chair on Climate and Society at the University of Waterloo.

Rural communities that depend on their "mom and pop" ski resorts are most vulnerable, Scott said. He suggested long-term planning to cushion the impacts of climate change. This includes investing in snow-making capacity, which Scott said might determine the survival of ski resorts.

As a publicly funded scientist, Myhre feels she has a responsibility to inform the public of the risks surrounding unchecked climate change. Scientists may be gifted in understanding the natural world, but often struggle to make their voices heard, she said. Her desire for real change sets her apart from others, Howat said.

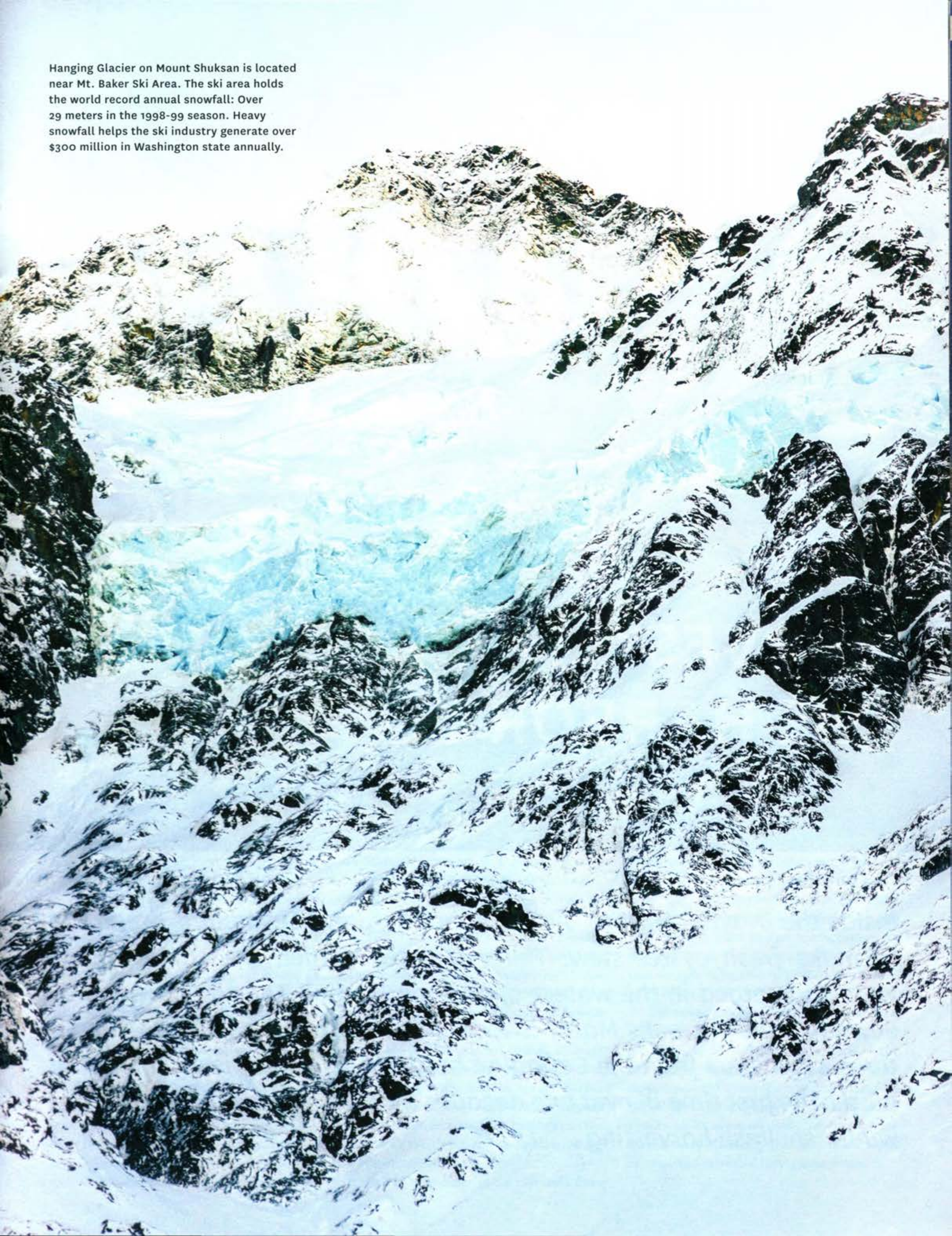
"Trying to do the right thing, trying to show up for big problems, is worth it. Trying to steward this precious world around us is inherently valuable," Myhre said. "It's not just about me, it's about all of us." 🌱

**KATJA TUNKKARI** is a junior studying political economy and journalism. She enjoys the exceptional skiing and hiking that the Pacific Northwest has to offer.

**MATTHEW TANGEMAN** is a visual journalism student with a passion for deep powder, alpine granite and long, epic days in the mountains.



Hanging Glacier on Mount Shuksan is located near Mt. Baker Ski Area. The ski area holds the world record annual snowfall: Over 29 meters in the 1998-99 season. Heavy snowfall helps the ski industry generate over \$300 million in Washington state annually.







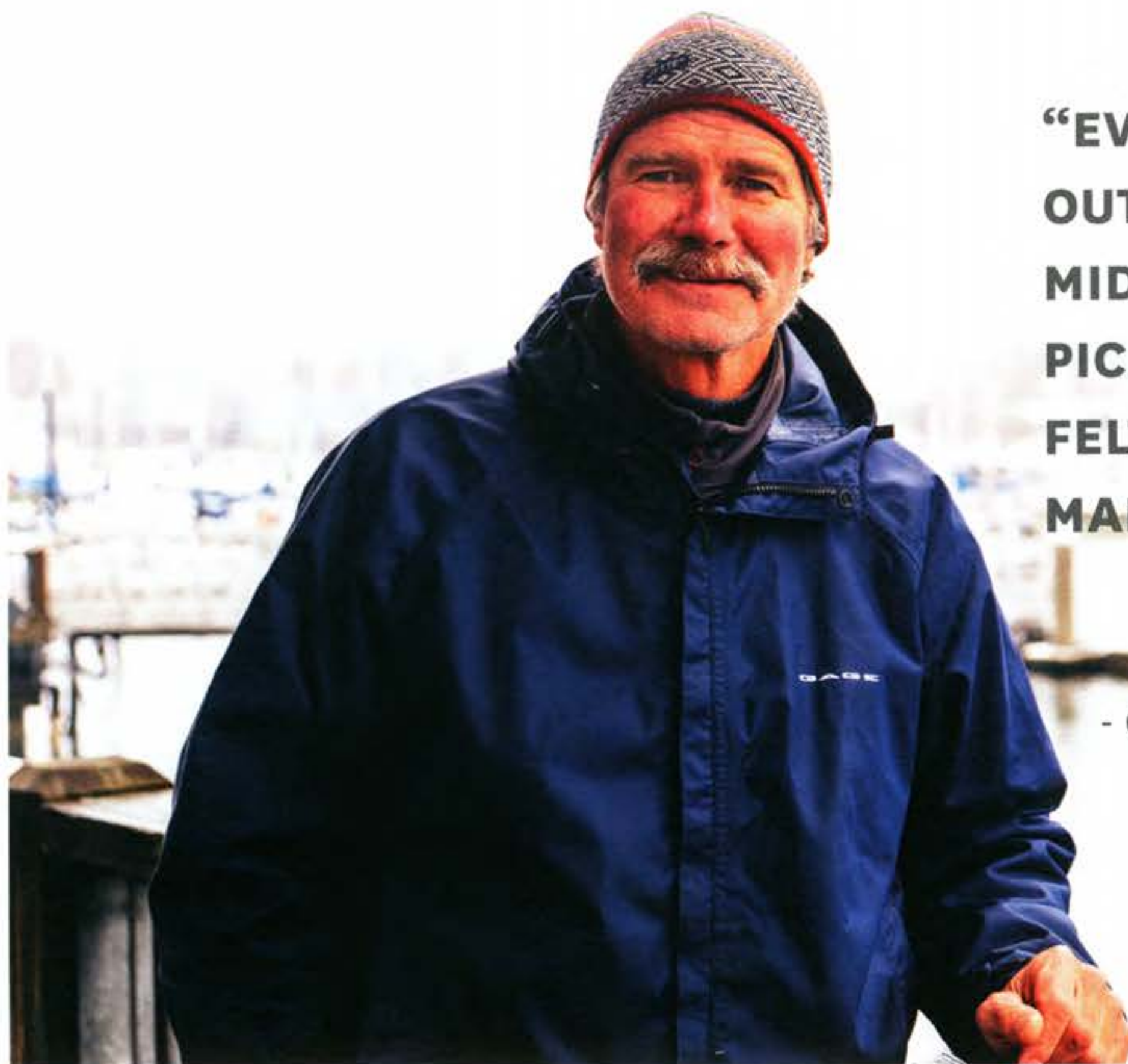
# HARVEST IN THE HARBOR

STORY BY AMANDA MCKAY  
PHOTOS BY JONATHAN PENDLETON

A woman holds an oyster harvested from Drayton Harbor earlier that day.

*Inside the Drayton Harbor Oyster Company, Steve Seymour is preparing to make fresh oyster stew. Thirty minutes earlier, the same oysters were submerged in the waters of Drayton Harbor. The shop, owned by Seymour and his son, Mark, is located in Blaine, Washington, about three kilometers from the Canadian border. This winter is significant. It marks the first time in over two decades that Drayton Harbor is open for winter shellfish harvesting.*





**“EVEN IF THEY WERE  
OUT THERE IN THE  
MIDDLE OF THE NIGHT  
PICKING OYSTERS, THEY  
FELT LIKE THEY WERE  
MAKING A DIFFERENCE.”**

**- GEOFF MENZIES, FORMER MANAGER  
DRAYTON HARBOR COMMUNITY  
OYSTER FARM**

**ABOVE:** Geoff Menzies, the former manager of the Drayton Harbor Community Oyster Farm, stands next to the harbor in Blaine, Washington. Menzies was instrumental in restoring the harbor after it was closed to shellfish harvesting in 1999 because of pollution.

**IN 1999, DRAYTON HARBOR** was closed to shellfish harvesting due to high levels of pollution. Geoff Menzies, who owned the oyster company at the time, considered walking away from the commercial oyster business altogether. But because of his love for the bay, Menzies decided to stay and fight for water quality in Drayton Harbor. Over the next two decades he worked to create awareness and action in order to reduce pollution and, more recently, restore shellfish harvesting in Drayton Harbor.

Originally from the East Coast, Menzies first started working with oysters in 1990. Seymour posted a job advertisement in *The Bellingham Herald* looking for help with his company. Needing work in the off season of his agricultural pest management business, Menzies responded and partnered with Seymour in the oyster company. It didn't take long for Menzies to get hooked on oysters, Seymour said.

When the Washington State Department of Health closed all of Drayton Harbor in 1999, it essentially sank the commercial oyster business the two had been running for almost a decade. Before the closure, Seymour took a job with the Washington State Department of Fish

and Wildlife and left the business to Menzies.

By then, Menzies had years of experience working in the harbor and had become attached to the work.

“I just didn't want to see the bay [forgotten]. I wanted to be involved in bringing it back,” Menzies said.

Menzies worked with agencies including the state Department of Health, the Washington State Department of Ecology, Whatcom County and the City of Blaine to put together strategies to help identify and combat the sources of pollution.

Fecal coliform bacteria, found in human and animal waste, is the main indicator of pollution in Drayton Harbor. It came from household septic systems, agriculture wastewater runoff, municipal sewer systems and waste dumped into the harbor from boats.

In the winter, higher rainfall increases runoff and more bacteria washes into the rivers and streams draining into the harbor. Because oysters eat by filtering out nutrients suspended in the water, fecal coliform bacteria can concentrate in their guts and make them unsafe for human consumption.

In 2001, Menzies got a call from Betsy

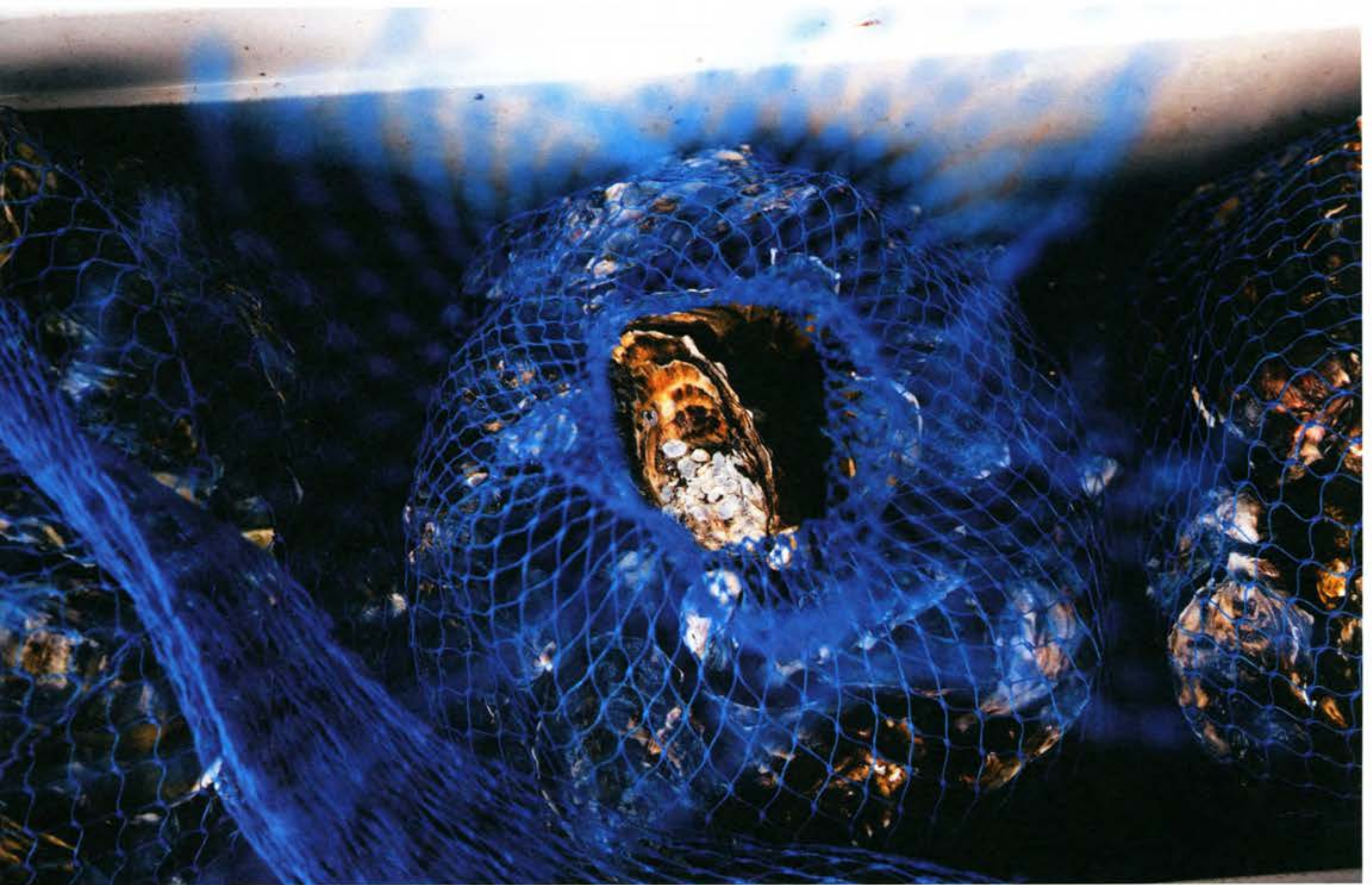
Peabody, the founder and executive director of Puget Sound Restoration Fund. Peabody said she wanted to help Menzies clean up the harbor.

“When you want to tackle something, you have to invest in it,” Peabody said.

The Puget Sound Restoration Fund launched the Drayton Harbor Community Oyster Farm in 2001 with Menzies as the manager. It was designed to get members of the community involved in growing and harvesting oysters. To do this, Menzies and the restoration fund convinced the state health department to allow them to plant oysters where harvesting was prohibited. The goal was to reduce pollution enough to be able to harvest the oysters in three years.

Between 2001 and 2004, Menzies and the restoration fund worked on highlighting the main sources of fecal coliform bacteria in the community. The group wrote quarterly oyster reports and published them in *The Bellingham Herald*. The City of Blaine continued intensive repairs to its sewer system. The county conducted inspections and repairs of home septic systems and increased their public outreach.





ABOVE: Even though business is relatively slow during the winter season, hundreds of oysters come out of each daily harvest in Drayton Harbor.

“The ultimate question was: Can we eat from this place or not?” Peabody said.

They got the answer in June 2004. Drayton Harbor reopened for harvest during the dry months when pollution levels were low. Menzies and volunteers at the community oyster farm worked around the clock to harvest the oysters they had planted.

Two or three nights a week, Menzies and several volunteers would go out at 11 p.m. and dig up oysters until 4 a.m. The next morning, they would meet again to sort and bag all the oysters.

“Even if they were out there in the middle of the night picking oysters, they felt like they were making a difference,” Menzies said.

Reopening the harbor was a triumph for the community, and the collective vision was inspiring, Peabody said.

Between 2004 and 2013, the community oyster farm continued to harvest, and Menzies continued water quality sampling. Whatcom County inspected septic systems, worked with local farmers to reduce agricultural runoff and encouraged the community to pick up pet waste.


In 2013 Seymour returned to the oyster business, taking over the community oyster farm with his son, and turning it back into a privately managed farm.

The state health department recognized high levels of rainfall caused increased bacteria in the bay, but it was unclear how much rainfall made the oysters unsafe. Through his own water quality testing, Seymour determined it takes a major storm to make the harbor unsafe. It took him three years to convince the state health department of his findings, he said.

In 2016 Drayton Harbor opened for year-round shellfish harvesting. It was a dream come true for Seymour. Still, during big storms, Seymour or his son eat a few of their raw oysters and wait a day before serving them to customers.

Even though Menzies is retired from the oyster business, he likes to stay informed about the happenings in Drayton Harbor.

“They are developing through their business a really fantastic sense of community,” Menzies said. “I think that is what’s going to tie people more and more to helping to protect the bay.”

In Seymour’s shop, across from the bar where people come to taste the fresh oysters, a sign warning people of the health risks almost blends into the décor of the space. It doesn’t seem to hurt business, which often has his shop at standing room only. 

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**AMANDA MCKAY** is a Huxley College junior studying environmental policy. She is from Portland, Oregon and believes that good policy will help move society towards a more sustainable future.

**JONATHAN PENDLETON** is a visual journalist at Western Washington University. He sees photography and photojournalism as a powerful medium in creating change and discovering meaning in our day-to-day.





# A TALE OF TWO DISTRICTS

**A STATE LEGISLATIVE** district line cuts through the center of Bellingham, Washington. To the south, the 40th District — containing parts of Bellingham, Skagit County and the San Juan Islands — is home to Democratic senator Kevin Ranker. To the north, the 42nd District of northern Whatcom County is home to Republican senator Doug Ericksen.

Both serve on the Energy, Environment and Telecommunications committee in the Senate. Both are popular within their district. Both raise goats. Ericksen's daughter is named Elsa, and Ranker's daughter is named Else (pronounced like Elsa).

But beyond that, the political, cultural and economic contrasts between the two serve as an allegory for a nation divided.

Sen. Ranker champions progressive environmental policies at the state level, and served on Obama's National Ocean Council. Sen. Ericksen serves a constituency that includes people working in agriculture and at oil refineries, and was tapped to serve on the Environmental Protection Agency transition team for the Trump administration in January.

During the 2017 legislative session, both senators face complicated tasks. Ericksen juggles two jobs on opposite ends of the country. Ranker is the lead Democrat working on the state budget, balancing education funding with environmental protection.

The Planet took a look at how both men came to this point in their careers, and how their respective histories inform their goals as legislators.





# DOUG ERICKSEN

STORY BY JUSTIN STERCULA  
PHOTOS BY MIRANDA ABRASHI

*The senate floor in Olympia was quiet on the afternoon of Thursday, Feb. 1, 2017. It was 4:30 p.m., three hours after a scheduled hearing, but the floor remained empty. Conversations in the chamber halls were hushed murmurs. The senate was waiting on Sen. Doug Ericksen, a Republican from Washington's 42nd District, whose flight out of Washington, D.C. had been cancelled earlier that day.*

Ericksen has split his time between the coasts since President Donald Trump appointed him to his Environmental Protection Agency transition team in January. The appointment is causing Ericksen to miss time in Olympia to fulfill his new duties in the nation's capital. The senator's absence has created controversy in Olympia and his district. Ericksen, however, is confident in his ability to fulfill his obligation to both Washingtons.

In Olympia, Ericksen is the chair for the Senate Energy, Environment and Telecommunications Committee. In Washington, Ericksen is the temporary Special Advisor to the Administrator and Communications Lead for the new administration's EPA team. He has also been mentioned as a top candidate to head the EPA's Northwest regional office.

During a press conference in Olympia on February 2, Ericksen downplayed the logistical challenges of splitting time between Olympia and Washington. He called the appointment a unique opportunity. That press conference was originally scheduled for February 1, but was pushed back because of a shift in Ericksen's travel plans.

"I have received an outpouring of support from the people I represent in the 42nd Legislative District who think this is a

great thing," Ericksen said at the conference. "Overwhelmingly the support from home has been they're proud of what's happened. They're excited I'm part of this process."

Not all of Ericksen's constituents support his new job. On February 9, constituents from the 42nd District filed a petition with the Whatcom County Auditor to recall his senate position in response to his dual roles, citing his absences from committee hearings and votes in Olympia.

Ericksen has voiced doubts about the scientific consensus that human greenhouse gas emissions are altering the climate. He has received campaign contributions from a range of oil and gas companies, including British Petroleum and Phillips 66, which both operate refineries in his district.

Luanne Van Werven, a fellow Republican who represents Ericksen's district in the state House, sees him as an ideal environmental legislator.

"One thing I know about Sen. Ericksen is that he is passionate about the environment. As a matter of fact, that's even his background," Van Werven said.

But Todd Donovan, a political science professor at Western Washington University and a Whatcom County Councilman, is skeptical of the senator's purported environmental

advocacy.

"He has no environmental policy. [He's] a champion of industry and interests that not only contribute to him, but that are big players in his district," Donovan said. "He's got two refineries in his district and he represents those interests. He is not an environmentalist."

Ericksen's career has been intertwined with environmental issues since college. After graduating from Cornell University, he travelled to Taiwan to teach English, and said he was disturbed by the heavy levels of air pollution there.

Ericksen enrolled at Western, graduating with a master's degree in political science in 1995. In a 2016 interview with Business Pulse, a publication from the Whatcom Business Alliance, Ericksen called his time at Western enlightening, finding that some working in the environmental field had a separate agenda that he called anti-capitalist and anti-American.

Before his bid for the senate, he took a job at the state Department of Fish and Wildlife, working to promote the agency's agenda with the state legislature, according to his official biography. In 1998, during the administration of Democratic Gov. Gary Locke, Ericksen claims credit for helping craft the state's Salmon Habitat Recovery Act.

His environmental record since being



# KEVIN RANKER

STORY BY KRISTEN TARR

elected is less to the liking of environmental groups. The Washington Conservation Voters gave Ericksen a lifetime score of six percent.

"He is very, very low on that scale, and is much lower than a number of Republicans," said Nick Abraham, Communications and Accountability Manager for the organization.

Many of Ericksen's colleagues consider his pro-industry positions a virtue that will improve his ability to do both jobs.

"Ericksen brings a balanced approach to considering the diverse values of environmental stewardship, economic development and the general quality of life in Washington. He will help develop that same balanced approach in the EPA," state Rep. Jim Walsh, a Republican from Aberdeen in southwest Washington, said in an email.

For Matt Krogh, Director of the Extreme Oil Campaign at the Bellingham office of the activist organization Stand, seeing someone like Ericksen in a position at the EPA is a concern.

"That's a lot of power over polluting industries that [the] EPA is supposed to have right now, and that Sen. Ericksen would be almost certainly determined to relinquish were he in charge," Krogh said.

Where Krogh sees cause for concern, Rep. Matt Manweller, a Republican from central Washington's 13th District, sees opportunity.

"Most EPA rules are adopted with little input from the states. Thus, their one-size-fits-all rules rarely work for Washington. Sen. Ericksen will bring an important perspective as someone who has been intimately involved in state-level policy making," Manweller wrote in an email.

Faced with a recall effort in his home district and editorials from newspapers in the state calling for his resignation, Ericksen's attempt to juggle two jobs is not escaping scrutiny. He is in a position to play a large role in environmental policymaking at the state and federal level. 📍

*Editor's note: Sen. Ericksen didn't respond to several requests for an interview. This is a developing story, and we will include major updates in the online version of the story following the print release.*

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**JUSTIN STERCULA** is a public relations undergraduate at Western Washington University. He is fascinated by the political element of environmental issues and policy-making.

**MIRANDA ABRASHI** is a sophomore studying communications and political science. She is passionate about photography, the environment and experiencing them together.

TOP LEFT: Sen. Ericksen answers questions from television reporters after a state Senate hearing.

BOTTOM RIGHT: Sen. Kevin Ranker sits in his office in Olympia, Washington.

State Sen. Kevin Ranker began developing an environmental ethic as an eight-year-old while surfing with his family in northern Los Angeles County. Sitting on his child-sized surfboard, he watched a school of bat rays glide through a kelp forest in the water below. He thought to himself, "This is what I want to do." Now representing Washington's 40th District in the state Legislature, Ranker says he still feels like a little kid driven to save the world.

This legislative session will test Ranker's environmental ethic. He serves on the Energy, Environment, and Telecommunications Committee and as lead Democrat on the Senate Ways and Means Committee. Ranker is directly involved in trying to secure funding to protect Blanchard Mountain, a hiking spot just south of Bellingham, from logging. Blanchard Mountain could be open to logging as soon as this summer if money isn't found to fulfill a 10-year, \$14 million agreement.

Blanchard Mountain is a popular recreation spot for hikers, runners, paragliders and cyclists. Tucked along Chuckanut Drive on the line between Skagit and Whatcom counties, Blanchard Mountain is the only place in Washington where the Cascades meet the Salish Sea.

Ranker has lived near the coast his entire life, moving from England to Australia, then to California, before settling on Orcas Island, just west of Blanchard Mountain. A runner as well as a surfer, Ranker enjoys running Blanchard's steep trails.

Blanchard State Forest is part of a public land trust managed by the state Department of Natural Resources. The land must be periodically logged to provide revenue for Skagit County schools.

In the early 2000s, amid growing concerns that logging threatened the areas, a

group of conservation and recreation stakeholders in Skagit County, including the senator, came together to write the Blanchard Strategy. The \$14 million agreement would permanently protect the roughly 650-hectare core, about one-third of the forest, said Kyle Blum, Chief of Staff for the Commissioner of Public Lands.

Ranker has become a linchpin to making the agreement a reality. And his activism appears to be popular with his constituents, who re-elected him in 2016 with over two-thirds of the vote.

"He's been a strong advocate for the Blanchard Strategy, a strong advocate for not logging Oyster Dome and the remainder of the core, and really working hard to help us find money in the capital budget," Blum said.

The Legislature has funded half of the agreement over the past ten years, but the agreement expired in 2015. The state still needs \$7.7 million more in revenue. This legislative session is the last chance to find money in the state budget.

But even as the clock ticks down, Sen. Ranker still occasionally finds time to reconnect with thing that first led him into environmental politics. This past October, he competed in a surfing competition alongside his 8-year-old daughter Else. She is also finding her own environmental ethic through time on the water.


"She's very clear," Ranker said, "when she grows up, she's going to be an animal rescuer." 🐾

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**KRISTEN TARR** is a junior from Columbia, Missouri studying environmental policy and energy policy through Huxley College. She is passionate about sustainable living and renewable energy technologies.





A photograph of a man with a beard and glasses, wearing a blue long-sleeved shirt, working in a dimly lit studio. He is holding a microphone stand. The studio is filled with various musical instruments, including large gongs and singing bowls. A large, glowing, spherical object is visible in the background. The lighting is warm and focused on the man and his work area.

Various instruments fill Jordan's studio, including several large gongs and singing bowls, reflecting his love for "resonance."

# MOURNING MIDWAY

STORY BY CLAIRE GASKINS

PHOTOS BY MATTHEW TANGEMAN

*Chris Jordan's professional photography career began in a junkyard. Jordan was taking pictures on Seattle's waterfront when he came across a giant pile of garbage sitting behind a fence. He asked a guard if he could enter and photograph the pile, but was turned away immediately. The next day, under the cover of heavy fog, he returned and snuck into the recycling yard. The guard left as Jordan was taking pictures, unknowingly locking him in. To get out, he had to dismantle his camera, put the pieces through the fence and lay down in a puddle to squeeze under the gate.*

RIGHT: A young albatross filled with plastic on Midway Atoll. Photo courtesy of Chris Jordan.







**SINCE THAT INAUSPICIOUS START,** Jordan has spent the last 18 years documenting mass consumption. His work has brought him from piles of trash in Seattle to the shores of Midway Atoll, an island in the very middle of the Pacific Ocean. Jordan has shown his work in solo and group exhibitions around the world and has won numerous awards. His experiences have shaped his understanding of the power of grief, and strengthened his desire to use photography as a force for change.

Jordan did not pursue photography professionally until he was 38 years old. He was a lawyer for ten years before he realized he was only following that path to protect himself from his fear of failing as an artist. He became a professional photographer the moment he walked into the Washington State Bar Association and resigned his license to practice law, Jordan said.

Shortly after Jordan left his law office, his friend and fellow photographer Phil Borges visited his studio. He saw Jordan's images from the recycling yard and encouraged Jordan to explore the idea of mass consumption. The suggestion lit a spark for Jordan, who has studied the issue ever since.

In 2008, Jordan attended a conference with scientists interested in ocean plastic pollution, where he learned about the Great Pacific Garbage Patch. Anywhere from 4.8 million to 12.7 million metric tons of plastic entered the ocean in 2010, according to a 2015 study in *Science*. Wind and currents pull the plastic across the Pacific Ocean in large clockwise spirals called gyres. Eventually, the plastic settles into the middle of the spirals.

Near the Great Pacific Garbage Patch sits Midway Atoll, a six square kilometer patch of sand and volcanic rock famous as the site of a fierce World War II battle. Albatrosses living on the island mistake pieces of plastic for food and feed it to their babies. The plastic blocks the digestive tract of the babies, making them feel full, according to a study published in the journal *PLOS ONE*. As a result, they eat less and don't get the nutrients they need to survive.

In September of 2009, Jordan visited Midway Atoll and found the island littered with dead baby albatrosses. Bright pieces of plastic still filled their guts.

"I was devastated when I came back from Midway the first time," Jordan said. "I fell into a state of depression."

After his first trip, Jordan thought he was done with his project, but Native American medicine healers helped him make the decision to return to Midway. Jordan eventually decided to make a film about the island.

One day during his fifth trip to Midway, Jordan rode his bike through the forest during nesting season. He was staring at the trees as they passed by, imagining a scene for his film, when he felt a bump under his front tire. He had run over a baby albatross in its nest.

"I just absolutely, completely lost it. I've never felt so helpless," Jordan said.

It took three days for the bird to die. Jordan visited it every evening as it slowly lost its energy.

Around the time he first went to Midway, Jordan had been reading about grief. The combination of the books and his experiences on the island shaped the way he approaches his work today. Jordan wants to remind people of their love for the earth, and believes he can do this by unlocking the power of grief.

"Grief is not the same as sadness. Grief is the same as love," Jordan said. "Grief is the love that we feel for something that we're losing."

Jordan worked to put the grief he felt on



Jordan discusses the ideas and emotions surrounding his work alongside a photo he took of a dead albatross on Midway Atoll, an island in the Pacific.





ABOVE: Concentrations of plastic in the ocean between 4.76 and 200 millimeters in size. Birds sometimes mistake small pieces of plastic like these for food. Orange represents areas with the highest plastic concentration and gray represent areas with the lowest concentration. Source: 5 Gyres Institute.

**“GRIEF IS NOT THE SAME AS SADNESS. GRIEF IS THE SAME AS LOVE. GRIEF IS THE LOVE THAT WE FEEL FOR SOMETHING THAT WE’RE LOSING.”**

- CHRIS JORDAN  
ARTIST, PHOTOGRAPHER

Midway into his images. He approaches his photography with feeling and trusts what he feels about his subject will be evident in the final product.

“I want to allow my heart to be broken by my subject,” Jordan said. “I want to fall in love with my subject. And I do.”

Many people studying plastic in the oceans noticed Jordan’s work. Marcus Eriksen, co-founder of 5 Gyres, an organization focused on promoting action against plastic pollution, said he admires Jordan’s work for its ability to provoke empathy.

Eriksen described a conference they both attended in Oslo, Norway where Jordan showed a clip of an albatross courtship ritual. Eriksen explained that initially, played at a normal speed, the clip looked like a series of fast movements that were not meaningful to the human eye. Then Jordan slowed it down to a

speed everyone could understand. The ritual looked more human, with the birds tucking their heads under their wings and clacking their beaks together as if kissing. Eriksen said this simple act of slowing down the clip reduced half of the audience to tears.

Regan Rosburg, an artist and graduate student who was mentored by Jordan, described his upcoming film.

“It’s a journey,” Rosburg said. “It’s realizing the loss, identifying the thing that you love and then realizing that you feel pain because you lost this.”

In his dimly lit studio, surrounded by books, Buddha figurines, Tibetan singing bowls and two massive gongs, Jordan talked about the emotions that drive his work. He said he can never make the difference he wants to make. He just wants to sound the alarm as long and as loud as he can. He believes conscious-

ness and humanity can change, and he makes that his goal.

“That’s what I’m trying to deliver with my film and with all of my work, is a grief ritual. So that people can feel their sadness and remember what we love — that we love our world,” Jordan said. 🌍

**CLAIRE GASKINS** is a senior studying environmental science through Huxley College. She is passionate about environmental issues and wants to spend her life promoting positive change.

**MATTHEW TANGEMAN** is a visual journalism student with a passion for deep powder, alpine granite and long, epic days in the mountains.





# EYE IN THE SKY

STORY BY CIERRA JACK  
PHOTOS BY MIRANDA ABRASHI

John Scurlock explains the changes he made to his camera in order to photograph while flying.

*Tall evergreen trees line either side of the airport in Concrete, Washington. The airport — little more than a small lounge and about a dozen airplane hangars — reflects the feel of the small town, whose quiet streets seem almost abandoned. In front of one of the hangars, John Scurlock stands beside his small, yellow single-engine plane.*

**OVER THE LAST** several decades, Scurlock has made a career of photographing glaciers from the sky. He shares his photos with scientists around the country who use them to study how glaciers have changed over the decades. Scurlock's photos provide a visual tool to educate the public on the stark reality of glacial recession.

Scurlock is 62 years old, and has the weathered face of someone who has spent decades in the mountains. When he started taking photos from his plane, it wasn't for science. Back then, he called himself a "backcountry traveler," focused on capturing mountains in the winter.

"I knew right away when I was flying around up there initially that I was seeing it in a condition that was basically unknown," Scurlock said.

Over the years, Scurlock started sharing his photos with colleagues who studied glaciers. Right now, Scurlock is working on photographing every glacier in the lower 48 states. Scurlock started this project in 2004 with Andrew Fountain, a researcher at Portland State University. The only glaciers Scurlock has left are in Colorado and a few in Wyoming's Grand Tetons.

He also worked with the National Park Service in Washington, repeatedly photographing eight glaciers in Washington's three national parks to help the park service's glacier monitoring program.

For that project, Scurlock worked alongside Jon Riedel, a glacial geologist for North Cascades National Park. Many of the photos are used for comparative studies. Geologists compare his work to photos taken as far back as the 1930s.

Scurlock's photos "give us a really nice perspective on how the glaciers have changed," Riedel said. He called Scurlock his "eyes in the skies."

Before every flight, Scurlock checks the weather and methodically runs through a set of checklists.

"If it's thrilling, then I'm doing something wrong," he said.

Then, it's time for takeoff. Scurlock speeds down the runway in Concrete and rises into the air, heading east toward the Eldorado Glacier on Eldorado Peak. The peaks of the Cascades stretch out for kilometers below the plane's wings.



Getting a good, high-quality photograph through the plexiglass-enclosed cockpit isn't easy. Over the years, Scurlock installed homemade tools to help with glare reduction, including a black foam hood he puts on his lens and a black drape he puts up behind the cockpit.

Snow transformed peaks accessible by foot in the summer into vast powdery slopes that would make any skier drool.

"The Coleman Glacier on the north side of Mount Baker has moved steadily uphill from Glacier Creek over the time that I've been looking at it," Scurlock said.

The glaciers of the Cascades feed Puget Sound's largest watershed, the Skagit River, which snakes through a valley far below Scurlock's little yellow plane in the late afternoon sun. Between 6 and 12 percent of the river's flow comes from summer runoff. Due to shrinking glaciers, the summer flow rate is declining, according to a study published by Riedel and Mike Larabee for the park service in 2016.

Back on the ground, Scurlock said he isn't a scientist and doesn't have precise measurements, but the data seems to follow his observations. Glaciers in the Olympics declined by 33 percent between the 1970s and 2009. Many glaciers in the North Cascades declined by about 20 percent in the same timeframe, Riedel said.

By mastering the complex techniques of shooting photos from the air, Scurlock has helped scientists study glaciers, all while doing what he loves: flying. 📸

**CIERRA JACK** is a junior studying environmental policy through Huxley College. In her free time she enjoys rock climbing, taking photos and spending time in the mountains.

**MIRANDA ABRASHI** is a sophomore studying communications and political science. She is passionate about photography, the environment and experiencing them together.

**TOP RIGHT:** John Scurlock adjusts his seatbelts and reviews a start-up checklist before getting ready to take off. He is an avid and frequent flyer, but he doesn't take any chances.

**MIDDLE:** John Scurlock flies his homebuilt plane 2,300 meters above Concrete, Washington toward Eldorado peak located in the North Cascades National Park.

**BOTTOM RIGHT:** John Scurlock frequently flies over Lookout Mountain during his local flights.



Scurlock's homebuilt Van's RV-6 plane sits on a runway in Concrete, Washington. He has flown it since 2001 and modified it for his photography.



# WASTE ERASED

STORY BY CHRISTINA DARNELL  
PHOTOS BY JONATHAN PENDLETON



Gwen Larned, the Zero Waste Coordinator at Western Washington University, holds out a 32-ounce Mason jar containing all the trash she's produced in a month.

*Gwen Larned sits in her living room, surrounded by cardboard boxes filled to the brim with recyclable bottles, paper and glass. A 32-ounce Mason jar stands in front of her, filled with plastic wrap, a plastic tea package, a bottle cap, lint, rubber bands and receipts. The trash inside the jar is all the waste Larned has produced in the past month.*

**LARNED, A JUNIOR** at Western Washington University, used to spend hours doing her makeup before school and had piles of clothes from shopping. After coming to Western, Larned has turned that lifestyle on its head. Today, she produces a fraction of the average American's waste. Larned's commitment to zero waste starts at home, but her determination carries over into all aspects of her life.

Larned is from Leavenworth, Washington, which she said isn't known for being an environmentally conscious town. When she

came to Bellingham, she realized Western was different and fell in love with its progressive attitudes.

"The real focus for Gwen came when she visited Western for the first time. That lit a light bulb for her," said Anne Conrad, Larned's mother.

Once she realized Western had a Business and Sustainability program, Larned became interested in sustainability on campus. She realized zero waste was something she could do to address what she saw as a problem in society.

"It's not what you can't give up that you should do something about. It's what you can give up that you should do something about," Larned said. "A person who will give up nothing won't change anything."

She was inspired by another zero-waste advocate named Lauren Singer, who only generated enough trash to fill a 32-ounce Mason jar over four years. Not everyone in the country has the ability to reduce their waste in this way, Larned said. But she hopes to increase people's access to zero-waste alternatives.



The average American produces 60 kilograms of trash per month, or about two kilograms of trash a day. Larned's waste for a month weighs about 50 grams. In 2012, food waste accounted for 21 percent of the trash produced in the United States, the highest of any category measured, according to the Environmental Protection Agency. Plastic accounts for 13 percent of waste in the country.

Walking into Bellingham's Community Food Co-op grocery store armed with glass containers and reusable bags, Larned makes a beeline to the bulk food section. She sizes up the various grains and granolas, and scoops rainbow corkscrew pasta into her jar. A piece of tape on the lid shows the weight of the empty jar. When Larned goes to checkout, she'll only be charged for the weight of the food inside.

After collecting her dry items she heads toward four enormous buckets of peanut butter. As Larned fills her next pre-weighed jar with a chunky variety, she spills some on her finger and licks it off.

Next, she fills up another pre-weighed empty plastic container with dish soap and grabs a couple of individual toilet paper rolls covered with recyclable packaging before

moving past the feminine hygiene section. She switched to a reusable product called a DivaCup to eliminate tampon waste. Larned glances in at the next aisle but walks past it.

"I really avoid this whole aisle," she said. Virtually every item there, from chips to juice, is packaged in non-reusable or non-recyclable material.

She can find alternatives for certain packaged products. In a blog documenting her experience, called Trashy Radical, she suggests finding alternatives to make different versions of the same meal. For instance, she makes her own hazelnut milk out of raw hazelnuts and uses that as her dairy substitute in smoothies.


On top of living a zero-waste lifestyle at home, Gwen has worked as the Zero Waste Coordinator in the Office of Sustainability at Western for three years.

Larned admits she has room to grow when it comes to being an environmentalist: She drives a Jeep, she noted.

"I would love to be vegan, but if I see cheese, I'm probably going to eat the cheese," she said, laughing.

A commitment to zero waste shifts people's perspective on how the world

functions. Larned said we all need a little perspective shifting once in a while.

"If you disagree with some aspect of how our society functions, then you should do something about it," Larned said. 

**CHRISTINA DARNELL** is an environmental science major with an emphasis in marine ecology at Huxley College of the Environment. She loves ocean photography and hopes to become an expert on ocean pollution in the future.

**JONATHAN PENDLETON** is a visual journalist at Western Washington University. He sees photography and photojournalism as a powerful medium in creating change and discovering meaning in our day-to-day.

*LEFT: Larned shops at the bulk section at the Bellingham Community Co-op, using repurposed jars and containers to hold her goods.*

*RIGHT: Larned uses reusable plastic sacks to hold small produce like mushrooms.*

*BOTTOM: Larned brings reusable bamboo utensils to school and work to avoid using disposable utensils.*



**“A PERSON WHO WILL GIVE UP NOTHING WON'T CHANGE ANYTHING.”**

- GWEN LARNED  
ZERO WASTE COORDINATOR  
WESTERN WASHINGTON  
UNIVERSITY







# RACHEL'S RIVER

STORY BY ANDIE WALL

PHOTOS BY MATTHEW TANGEMAN

*Sometimes when Rachel Vasak has a bad day, she visits the trees she helped plant over two decades ago. Her rubber boots crunch the fallen leaves as she walks the path above a culvert. As she presses her palms into the bark of an alder tree, she describes the first salmon habitat restoration project she took part in. Before the project, this creek was a garbage-filled ditch, choked with reed canarygrass.*

*"It was just an absolute mess," she recalls.*





**LEFT:** Rachel Vasak quizzes a group of fourth and fifth grade students from Pioneer Meadows Montessori on their knowledge of salmon habitats alongside Schell Creek in Ferndale, Washington.

**BELOW:** Volunteers Keith Hensyel and Rachelle Mills help spread mulch along Squalicum Creek. The Nooksack Salmon Enhancement Association had one of their largest volunteer turnouts at their work party on Martin Luther King Jr. Day in 2017.



**VASAK HAS DEVOTED** most of the last 20 years of her life to restoring salmon runs across Whatcom County. She began her journey volunteering for a stream rechannelization project at Schell Creek in Ferndale, Washington. Today, armed with the resources of a nonprofit organization, Vasak is tackling over a century of salmon habitat abuse.

Vasak was born in a small cabin outside of Walla Walla, Washington. Her parents were involved in the organic farming movement. Watching their passion at work instilled a curiosity for the natural world and seeded a strong conservation ethic in her. Vasak voluntarily attended night school to graduate a year early from high school.

At Western Washington University, she studied fluvial geomorphology — how water interacts with the landscape. In the Northwest, salmon-bearing streams are a key part of the field, Vasak said. In 1996, one of her professors was a board member for the Nooksack Salmon Enhancement Association, and suggested she further her education by volunteering with them. Eventually, she was offered a job. Relishing the challenges the association faced, she

climbed the staffing ladder. However, in 2007 she resigned from her position as program director to start a family.

“I thought that owning and running a small café would be a good hobby while I was at home with the baby,” Vasak said.

The arrangement wasn’t a good fit, she said. Vasak returned to the Nooksack Salmon Enhancement Association in 2008, and was hired as the organization’s executive director.

Measured by volunteer effort, the association is one of Washington state’s largest Regional Fisheries Enhancement Groups, a network of 14 nonprofits created by the state Legislature to promote salmon recovery. Since 1991, the association has completed over 400 restoration projects. Its mission is to repair habitat damage, the biggest threat to salmon in the Nooksack River.

“Our goal is to work ourselves out of a job,” Vasak said.

Saving or restoring habitat is widely seen as a key to combatting declines of populations. Chinook salmon in the Puget Sound were officially listed under the federal Endangered Species Act in March 1999.

“We have treated the land as if we can do whatever we want without consequence,” said John McLaughlin, a professor at Western and volunteer with the association. In reality, he said, what happens anywhere in the landscape affects river functions and salmon runs. A broken relationship between humans and the land can threaten salmon, he said.

Salmon migrate from a marine environment to freshwater streams to mate. They require a specific environment to spawn: fine gravel and moderate stream flow to bury their eggs, shade to block out hot sunlight, tree limbs and stream banks to hide from predators and clean water to breathe. Salmon will spawn only once before dying. Their bodies then decay, returning nutrients to surrounding plants and animals. The association measures restoration effectiveness by tracking the total number of dead and live salmon as well as the spawning nests in their recent restoration sites each year.

Under Vasak’s leadership, the association worked to make the land usable for both humans and salmon. Volunteers completed nearly a dozen habitat enhancement projects and planted over 6,000 trees and shrubs in 2015.



Vasak's son Fenton attends Pioneer Meadows Montessori school next to Schell Creek. For ten years after its restoration, the creek was almost empty. However, over 40 coho were spotted spawning in the stream this year.

On a crisp January afternoon, Vasak met her son and his classmates at the creek to tell them its story. She spoke about it like she was describing an old friend.

"When I first met this creek, this is what it looked like," she said, holding up a storyboard filled with pictures of an exposed, flat creek bed.

Today, Schell Creek freely weaves through the Ferndale highlands and down through the farmlands. Large alders provide shade to cool

the water, and their branches form natural dams and pools where fish spawn.

It wasn't long until an excited squeal broke the afternoon air.

"Rachel, we found a dead carcass!" hollered two blonde-haired girls, who rushed Vasak to the riverbank. Peering down the bank, Vasak used an alder limb to uncover a slimy white flap.

"Everything's gone except part of the skin and the backbone," she explained. Many animals — including birds, bugs and baby salmon — cycle nutrients back into the ecosystem by feeding on carcasses.

Most of the habitat around the Nooksack has been converted to urban development. As

the executive director, Vasak is the day-to-day face of the association, working directly with community members and landowners.

"[Rachel] really listens to what the landowner's needs are or what the area's needs are, and then she works to meet those needs," said Dorie Belisle, a board member for the association and an owner of the apple orchard Bellewood Acres.

Back at Schell Creek, Vasak bends down to pick up a broken black cottonwood limb. She brings it to her nose and inhales deeply.

"This bud, if you smell it, is one of my favorite smells on the planet," she said. 🌲



**ANDIE WALL** is an Alaskan-grown commercial salmon fisherman. She is pursuing a major in environmental science and a minor in communications at Western Washington University.

**MATTHEW TANGEMAN** is a visual journalism student with a passion for deep powder, alpine granite and long, epic days in the mountains.

**LEFT:** Rachel Vasak stands alongside Schell Creek, the site of her first work party with the association in 1996. Prior to the work party, salmon couldn't spawn in Schell Creek. Today, at least 40 coho salmon spawn each fall in the fully restored creek.

## WHAT MAKES A HEALTHY SALMON STREAM?

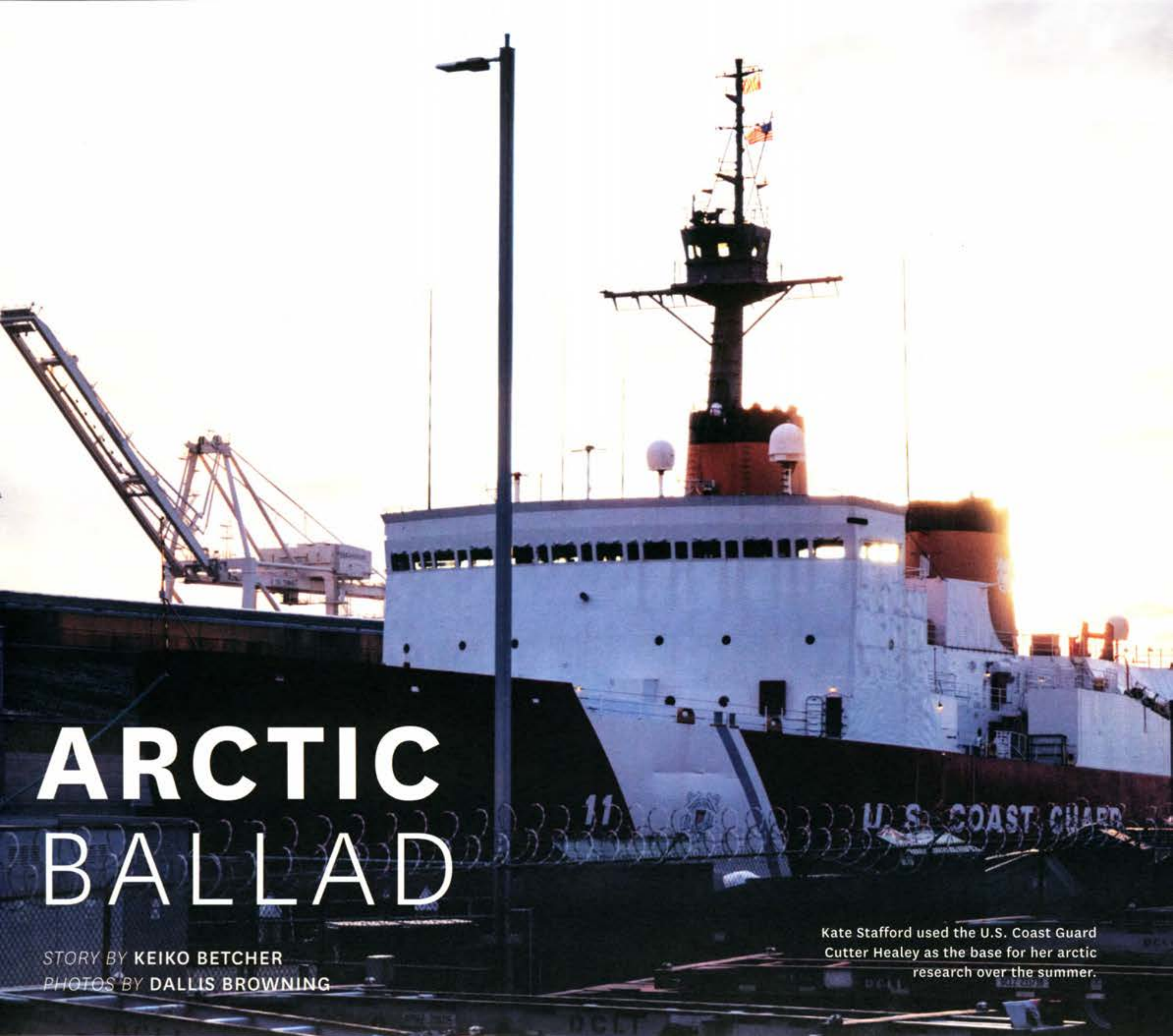
PLANTS AND TREES ALONG THE BANKS SHADE THE STREAM

A WINDING WATERWAY SLOWS THE STREAM

STUMPS AND LOGS CREATE POOLS WHERE SALMON CAN REST

STEADY GROUNDWATER FLOWS AND GRAVEL BOTTOMS ARE IDEAL FOR FORMING SALMON NESTS





# ARCTIC BALLAD

STORY BY KEIKO BETCHER  
PHOTOS BY DALLIS BROWNING

Kate Stafford used the U.S. Coast Guard Cutter Healey as the base for her arctic research over the summer.

*A thick fog sits above an endless desert of ice. A white puff rises from Kate Stafford's breath. It seems to be the only sign of life for kilometers — until she lowers a hydrophone into the water and begins to listen to the songs of the sea.*

*It's the spring of 2016, the time of year when the underwater soundscape is most vibrant. Beluga whales whistle, walrus make tapping sounds and bowhead whales sing complex melodies. Stafford can distinguish between the different mammals, which are crucial for the culture and diet of the people living in the nearby town of Utqiagvik, Alaska.*





Kate Stafford points to Utqiagvik, Alaska, the region where she studied whales.

**STAFFORD IS AN OCEANOGRAPHER** at the University of Washington and a leader in underwater acoustics. She studies marine mammals by listening to them. Recently, she has been listening to whales in the Chukchi and Beaufort seas to understand how climate change affects their behavior. Winter sea ice in the Arctic has declined by 1.6 million square kilometers since 1979, an area over eight times the size of Washington state. While many animal populations that rely on the ice are seriously threatened, Stafford's work has helped reveal that some humpback and orca whales appear to benefit from sea ice loss.

It has been over a decade since Stafford's first trip to the Arctic, and since then, the region has become central to her research. Stafford suspends underwater microphones, called hydrophones, in the water near the bottom of the ocean to listen to marine animals.

Traditionally, scientists could only re-

search underwater Arctic mammals when they came to the surface on rare clear days. Because of this, research was costly and slow.

Stafford uses hydrophones to monitor the behavior of underwater mammals year-round, no matter the weather or the location of the mammals relative to the surface. The technology also allows her to display accurate frequency drawings from the recordings, known as spectrograms.

Stafford used recordings to observe the migration patterns of beluga whales in the western Beaufort Sea, just north of Alaska. She heard the whistles of the beluga population for a longer period than usual and much later into the year. Stafford said this is likely due to sea ice melting earlier and forming later into the year. As temperatures rise, the whale habitats expand.

Stafford suggested the longer whales can swim in the Beaufort Sea, the more they can

eat. While climate change is allowing belugas to linger in the far north and increasing Arctic humpback populations, it is possibly eliminating habitat and intensifying food competition among other species, Stafford said.

Stafford has gathered long-term data across five Arctic seas and straits, as well as the North Pacific and Indian oceans. Stafford's recordings allowed her to identify different blue whale populations and discover a possible wintering ground of the critically endangered Spitsbergen bowhead whale population in the western Fram Strait. These discoveries are important when it comes to managing and planning shipping lanes to protect these whale populations.

Stafford got involved in underwater acoustics while earning her Ph.D. at Oregon State University. She initially wanted to tag sperm whales to see how deep they dive, but technical barriers made data hard to retrieve.



# CLIMATE CHANGE IN THE ARCTIC

Climate change will likely spell different fates for different animals. The U.S. Fish & Wildlife Service projects these climate change results for arctic wildlife.

## BIRDS

**PROS:** The potential for warmer summers and delayed freezing could improve reproductive success for some bird species.

**CONS:** Changes in ocean currents that prevent fish from entering lakes would be detrimental to birds that prey on fish.



## LAND MAMMALS

**PROS:** Longer and warmer growing seasons for plants could increase plant biomass leading to greater productivity and survival for herbivores and omnivores.

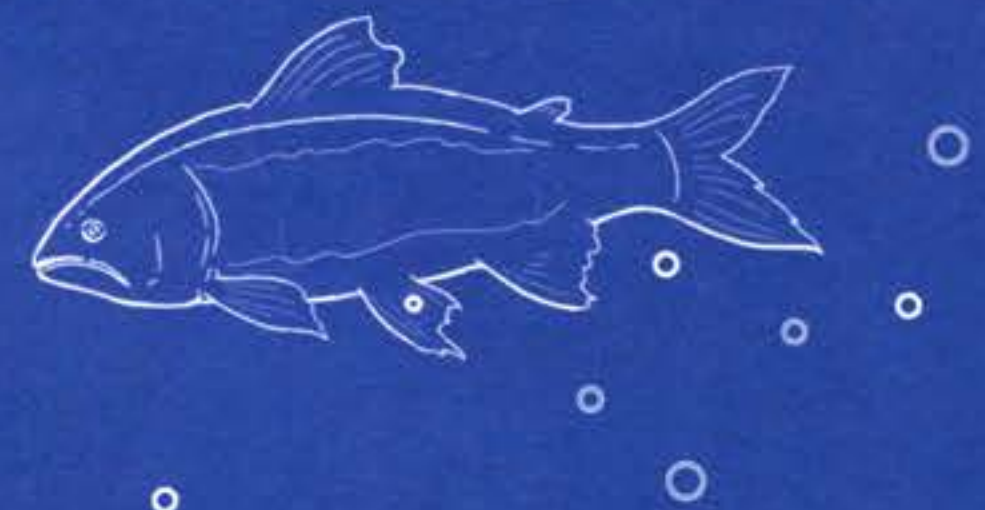
**CONS:** Shorter snow season could lead to flooding of dens and earlier hibernation emergence.



## FISH

**PROS:** A warmer climate could increase ecosystem productivity, resulting in increased population of many species.

**CONS:** Water temperatures influence migration patterns. This can restrict movement and access to preferred habitats.



## MARINE MAMMALS

**PROS:** Feeding grounds could increase as sea ice melts.

**CONS:** Many whale species have complicated life cycles that appear to be dependent on finding certain resources in certain places at certain times. Changing ocean temperatures might affect their ability to navigate as efficiently as needed.



Instead, her discovery of hydrophones drew her into the world of underwater acoustics.

"Kate has been at the vanguard of the field of acoustic ecology," said Sue Moore, a senior scientist at the National Oceanic and Atmospheric Administration's office of Science and Technology in Seattle. "I know of no one else in the field that has that breadth of experience."

Erica Escajeda, a graduate student at UW, joined Stafford on an Arctic summer research cruise in 2016. Despite being stuck in the middle of the ice on the U.S. Coast Guard Cutter Healy for four days, Stafford continued to work. While her students played games and watched movies, she got a head start on her next project. However, Stafford did have time for one game.

"Kate is wicked good at trivia," Escajeda said.

In her office at UW, Stafford opens up her iTunes library. It is filled with songs performed





LEFT: Stafford studies whales in the Arctic waters near Alaska. Photo courtesy of Kate Stafford.  
RIGHT: Stafford inspects a hydrophone, an underwater microphone she uses to study whales.

by unique artists—whales. She types “bow-head” into the search bar and her office fills with two repeating sounds: a combination of what sounds like a baby cow and a slide whistle. This is the song of the bowheads. She leans over the speakers as she anticipates the next sound, slightly nodding in synchrony with the whale song.

“It’s not beautiful or melodic, but I quite like it,” Stafford says.

Once a year Stafford returns to Utqiagvik, Alaska, a coastal town of just over 4,000 residents. Stafford brings the locals to her hydrophones to listen and presents her research to students and the Alaska Eskimo Whaling Commission. Stafford learns more about the Arctic environment with each visit. Last May, a man warned her of a lesson he had learned from his elders: If the ice sounds like crying puppies, you need to get off. It could be breaking up.

“One of the interesting things about the Arctic is people have lived there for millennia,” Stafford said. “That really gives it this extra special wrinkle for me.”

The barren Arctic landscape is nearly devoid of trees and plants. People in Utqiagvik rely heavily on marine mammals, birds and fish for nutritional and cultural needs. Food security is a growing concern. Melting sea ice and altered migration patterns of Arctic animals may threaten food access for local communities.

Additionally, hearing is the most important sense for marine mammal communication, whether it’s between a calf and its mother or a warning of nearby predators. With less sea ice

and more open water, there is more space for large waves, which make a lot of noise, Stafford said. Ships, whether they are in the Arctic for oil and gas development, research or tourism, also make noise. Disruptive sound can interfere with the communication between marine mammals, she said, putting their survival at jeopardy and in turn, depriving the Arctic people of their food sources.

Stafford plans to publish a paper on the acoustic detection of orcas to determine if declining sea ice is allowing them to become major predators in the Arctic. In June 2017, she will embark on a cruise to examine migratory pathways of beluga and bowhead whales on both sides of St. Lawrence Island, located between Alaska and Russia.

“It’s kind of like ‘Where’s Waldo.’ It’s ‘Where’s Kate’ in the world at a given time, because she really walks the walk,” said Donna Hauser, a research associate at UW.

For most people outside the Arctic Circle, the land they live on is not disappearing beneath their feet. Without directly experiencing the effects of climate change, there’s less of an incentive for people to cut emissions. However, a few degrees north, the Arctic is experiencing a taste of the fate climate change has in store for the rest of the world.

“What shapes the ecosystem is the sea ice, and the sea ice is going away. It’s going away really quickly, and we need to take action right now. Right this second,” Stafford said. 🌐

**“IT’S NOT BEAUTIFUL OR MELODIC, BUT I QUITE LIKE IT.”**

- KATE STAFFORD, OCEANOGRAPHER  
UNIVERSITY OF WASHINGTON

**KEIKO BETCHER** is a junior at Western Washington University studying geography. She considers herself an islander and has a fascination with the ocean.

**DALLIS BROWNING** is a visual journalism major and is passionate about spreading environmental awareness.



## THE PLANET MAGAZINE | ONLINE STORIES



## MELISSA RICE

NASA plans to send a new rover to Mars in 2020. The goal is simple: Find evidence of life on the red planet. A group of scientists, including Melissa Rice, a planetary science professor at Western Washington University, met in February to present NASA with eight potential landing sites for the new rover. While Rice's proposed site didn't make it to the final three possibilities, Rice continues to work with NASA to develop the cameras that act as the rover's eyes in its search for life-containing rocks to bring back to Earth.



## FRED BECKEY

Fred Beckey is a legend on the rock wall. In his 94 years, Beckey pioneered hundreds of first ascents up unclimbed peaks. But more than a half-century of car camping, road trips and mountaineering is starting to catch up to him. For the past 10 years, a team of filmmakers have been working on a documentary exploring Beckey's life and the physical toll climbing for over eight decades has taken on him. Photo courtesy of Dirtbag film.



## JULIE HIRSCH

Microbiologist Julie Hirsch is building an army to fight environmental degradation, one Whatcom County classroom at a time. She is arming the county's elementary and middle school students with shovels and muck boots, capitalizing on their curiosity and providing opportunities to interact directly with the Puget Sound ecosystem. The Planet takes a look inside Hirsch's four week Garden of the Salish Sea Curriculum, which has been taught to over 2,000 students since 2012.



## JAY INSLEE

Gov. Jay Inslee has spent his career pushing environmental policies in the U.S. House of Representatives, signing aggressive environmental protections as governor and even writing a book on alternative energy implementation. Now, he has a plan to fund state education programs: pay for it with a tax on carbon dioxide emissions.

## AJI PIPER

Young activists across the country are attempting to prove that when it comes to litigating over climate change policy, age is just a number. Sixteen-year-old Seattle resident Aji Piper is at the heart of efforts to sue the federal government and the Washington State Department of Ecology over what he sees as a failure to address the threat a changing climate poses to his generation's quality of life. As the case moves forward at the state and federal level, Piper balances high school with a packed calendar of political rallies and court dates.



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*"The greatest danger to our  
future is apathy. "*

**- JANE GOODALL**

