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DEAR READER,

In March I attended a workshop on Orcas Island organized to help San Juan island communities prepare for a possible oil spill in the Salish Sea. Scientists spoke of the risk to marine life and the Coast Guard outlined what they would do if a spill happened. The workshop helped people understand their collective risk and illuminated their collective resources.

In the aftermath of a disaster, communities with strong social ties have been found to recover faster than communities with severe social divides. Water connects us all, both through our dependence on it and as it flows from place to place. My pollution becomes your pollution.

Forty-five years ago, the Clean Water Act was passed, becoming the first piece of legislation that regulated water pollution on a national scale. Today, it remains the most stout body of laws in place to protect our water. The law passed with overwhelming support from both Republicans and Democrats in Congress. Since 1972, consensus on environmental issues has become much harder to come by, but our dependence on clean water has not changed.

This quarter, The Planet told stories about how the Clean Water Act and clean water can create unlikely allies. We talked to a member of the Makah Tribe who hopes to never witness another oil spill in Neah Bay, and to the operators of the rescue tug boat prepared to prevent that from happening. We met farmers who entered into a partnership with Lummi Nation shellfish harvesters to try to clean up Portage Bay. We also spoke with the first administrator of the EPA, a man known for finding common ground between competing interests.

Still, these stories are rarely open and shut cases. For all it has accomplished, the Clean Water Act also tells stories of how far we have to go.

These are stories about the push and pull over resources. The way our differences can become our common ground and a way to achieve resiliency in the face of calamity. May these stories offer you a way to consider who your neighbors are, in the good times and the bad.

To the 45th anniversary of the CWA, and many more,

Frederica Kolwey
Editor-in-Chief
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White water churns through a narrow section of the Wenatchee River. Water quality degradation in the Wenatchee Valley could have serious impacts on the agricultural community.

Photo by Mathew Roland.
Photo illustration of lead pellets from a shotgun shell. Interior Secretary Ryan Zinke overturned an Obama-era ban on the use of lead ammunition on federal lands.
For 17 days straight, Martha Jordan was forced to watch a trumpeter swan die just out of her arm’s reach.

The swan, sick from ingesting lead ammunition pellets, flew across a frozen slough near a roadside ditch. Unaware of Jordan’s good intentions, the white-feathered, glossy-beaked bird escaped to the only place Jordan and her team of volunteers couldn’t access.

Dozens of concerned people called Jordan about the sick swan. Days passed. The swan didn’t move. By the time the ice broke and Jordan could reach it, the bird was alive but too sick to save.

“That was probably my most heart-wrenching one this year, knowing it’s only 100 feet from you, but you can’t go there because if you do, you could die,” said Jordan, a wildlife scientist and founder of the Northwest Swan Conservation Association.

Jordan took interest in the lead problem in 1999 after scientists found about 100 dead swans at Judson Lake, which straddles the border with Canada just west of the Whatcom County town of Sumas. In 2000, the event repeated itself. Almost 20 years later, swans continue to die of lead poisoning all over the Pacific Northwest, and scientists and government officials struggle to agree on a solution.

“Sometimes, I just come home and I want to scream because it’s so unnecessary,” Jordan said.

It only takes three accidentally ingested lead pellets to kill North America’s largest native waterfowl. Jordan and state wildlife biologists, who performed several extensive swan necropsies in the early 2000s, found over 300 pellets in some birds. Swans normally swallow pebbles to grind up their food, aiding in digestion. They often mistake the pellets for pebbles, which pass into the gizzard where acid breaks down the lead, allowing it to pass into the swan’s bloodstream.

What follows is a 20-day death of slow and painful paralysis.

The Whatcom Wildlife Rehabilitation Center, a small facility on the banks of the Nooksack River off Mount Baker Highway, takes in hundreds of sick swans every year from November to March. Almost all of these birds arrive unable to fly, lethargic, dehydrated, out of breath and expelling bright green feces — all symptoms of lead poisoning, said Alysha Elsby, the center’s lead rehabilitator.

When a sick swan arrives, rehabilitators first analyze its lead levels to determine whether the swan can be saved. From there, it takes two months of medication fed through tubes and syringes twice a day to remove the toxic metal from the bird’s body.

Only 10 percent of the hundreds carried through the center’s doors can be saved.

Over 3,000 trumpeter swans died in Whatcom County and the Sumas Prairie between 1999 and 2012, according to a report by University of Washington researchers published by the Washington Cooperative Fish and Wildlife Research Unit. Most of those deaths were due to ingestion of lead shot pellets.

It’s hard for wildlife scientists to locate the exact source of lead. The location where scientists find the carcass is not necessarily the same place the bird ingested its poison — these pellets are found all over. But Judson Lake remains the biggest known toxic hotspot in trumpeter swan territory because of one small plant: the water lily.

The roots of Judson Lake’s water lilies contain decade-old lead pellets, poisoning trumpeter swans as they feed. For years, the University of Washington scientists tried to keep birds off of the lake’s shallow surface by using bamboo sticks and plastic underwater fencing. This resulted in a 70 percent decrease
WHAT COULD YOU HAVE DONE WITH THAT MILLION DOLLARS FOR WILDLIFE HABITATS IF YOU DIDN'T KEEP USING LEAD?”

- MARTHA JORDAN
WILDLIFE SCIENTIST AND FOUNDER OF THE NORTHWEST SWAN CONSERVATION ASSOCIATION
EAGLES THAT GET AFFECTED BY THIS AS WELL," ELSBY SAID.

LEAD POISONING KILLS AN ESTIMATED 10 TO 20 MILLION ANIMALS EACH YEAR IN THE U.S., ACCORDING TO THE HUMANE SOCIETY OF THE UNITED STATES, A NONPROFIT ANIMAL ADVOCACY GROUP. THE ISSUE HAS BEEN HOTLY DEBATED ON BOTH STATE AND NATIONAL LEVELS.

ON THE OBAMA ADMINISTRATION'S LAST DAY IN OFFICE, U.S. FISH AND WILDLIFE SERVICE DIRECTOR DAN ASHE BANNED THE USE OF LEAD AMMUNITION ON FEDERAL LAND, CITING CONCERNS FOR THE TOXIC EFFECTS OF LEAD ON WILDLIFE. THE ORDER PRIMARILY BANNED LEAD-BASED FISHING TACKLE AND LEAD BULLETS, GENERALLY USED TO HUNT BIGGER GAME SUCH AS DEER AND ELK. BUT THE BAN MET RESISTANCE FROM SOME HUNTING ORGANIZATIONS. CONCERNS ABOUT THE HIGHER COST AND POORER PERFORMANCE OF NONTOXIC OPTIONS, SUCH AS STEEL SHOT, WERE COMMON COMPLAINTS.

ASHE'S BAN DID NOT LAST LONG. AS HIS FIRST ACTION IN OFFICE, INTERIOR SECRETARY RYAN ZINKE SIGNED AN ORDER ON MARCH 2, 2017, OVERTURNING THE BAN. HE MENTIONED INTEREST IN PROTECTING THE HUNTING AND FISHING COMMUNITY.

"IT WORRIES ME TO THINK ABOUT HUNTING AND FISHING BECOMING ACTIVITIES FOR THE LANDOWNING ELITE," ZINKE SAID IN A STATEMENT.

WHILE ZINKE'S SIGNING CEREMONY WAS CELEBRATED BY HUNTING AND GUN RIGHTS ORGANIZATIONS AROUND THE COUNTRY, CONSERVATIONISTS LIKE JORDAN CONTINUE TO STAND FIRMLY AGAINST THE USE OF LEAD AMMUNITION.

"THEM [HUNTERS] TELL ME THAT LEAD IS CHEAPER," JORDAN SAID. "THIS IS THE MESSAGE I GIVE BACK: WE SPENT MORE THAN A MILLION DOLLARS UP AT JUDSON LAKE, TRYING TO SOLVE THE LEAD SHOT PROBLEM AND THE POISONING OF ALL THESE SWANS. IT'S STILL ONGOING. WHAT COULD YOU HAVE DONE WITH THAT MILLION DOLLARS FOR WILDLIFE HABITATS IF YOU Didn'T KEEP USING LEAD?"
KEEPING POLLUTION AT BAY

STORY BY SYNNOVE VANDAL
PHOTOS BY LINCOLN HUMPHRY
Filled with 41 million liters of brown, saturated cow manure, clay-lined lagoons sit behind Rich Appel’s dairy farm waiting for the proper conditions to be emptied on the grassy fields in the distance.

CONCENTRATED ANIMAL FEED operations, including Appel’s dairy of more than 200 cows, are required by law to dispose of their manure in ways that will not harm the environment. While Appel’s clay lagoons meet current regulations, the Portage Bay Partnership, a new agreement between the Lummi Nation and Whatcom farmers focused on controlling runoff and potential pollutants from dairy farms in Whatcom County, might change the way farmers like Appel store their manure.

After 15 months of negotiations, seven dairy farmers in Whatcom County and Lummi tribal members signed the Portage Bay Partnership on January 5, 2017. The document acknowledges farmers’ contributions to water toxicity and requires farmers to create new water quality improvement plans. The goal is to reduce manure runoff and reopen Portage Bay to shellfish harvesting by the Lummi.

The closure of Portage Bay has cost the tribe an estimated $850,000 in revenue each year, according to a letter the Lummi Indian Business Council sent to the EPA.

Shellfish harvesting is much more than a revenue source for the Lummi, it’s their culture, said Charlie Tebbutt, an attorney representing the Lummi.

“For many people it’s part of their way of life, it’s part of their fabric of life, the closure has just torn that fabric,” Tebbutt said.

Lummi Nation officials declined to respond for comment.

The disagreement between the two sides centers around the farmers’ responsibility for the pollution at Portage Bay, their next steps and even who the inspector should be to oversee the process.

After failing to receive support from state officials, the Lummi approached attorneys with concerns over dairy farmers’ contributions to the toxic levels of contaminants in Portage Bay, said Andrea Rodgers, an attorney representing the Lummi.

Though he doesn’t believe manure runoff from Whatcom farms is completely responsible for the most recent closure of Portage Bay, Appel said he and the six other farmers in the partnership are trying to work with the tribe to create an agreement that will help reopen Portage Bay.

“We want to farm, they want to fish, and we both want to live here and farm here for another hundred years, even longer,” Appel said. “We have a lot of the same goals, but there isn’t a lot of trust.”

Reaching an agreement and signing the document was step one to the partnership. Step two is not as clear.

Larry Stap, one of the signatories to the partnership and the owner of Twin Brook Creamery in Lynden, Washington, said he isn’t sure what the improvement plans will look like but he hopes they’ll be a compilation of the plans he’s already legally required to follow.

Stap said he is worried about what the Lummi expect from the water quality improvement plans.

“If the Lummis make the demand for a water quality improvement plan so onerous that I can’t abide by it, all you’ve done is thrown a wedge further between us,” Stap said.

Around Stap’s farm, large puddles from recent rain can be seen close to his cows. If any manure got into the puddles, contaminated
WE SHARE IN THE SITUATION THAT'S BEEN CREATED, AND AS WE IMPROVE WATER QUALITY TOGETHER WE ALL SHARE IN BEING ABLE TO CELEBRATE THAT.

- DOUG ALLEN

MANAGER, BELLINGHAM FIELD OFFICE, DEPARTMENT OF ECOLOGY

water could wash into nearby streams or absorb into the ground.

Contaminated streams feed into larger bodies of water, like Portage Bay. According to the Washington state Department of Ecology, the shellfish in these bays pump contaminated water through their systems and absorb the toxins. When a person eats shellfish from one of these contaminated bays, they consume all the toxins the shellfish has absorbed.

Mounds of gravel line the cow pens to prevent the manure and puddles from mixing on Stap's farm. He chose to add these barriers because he tries to do whatever he can to prevent any discharge, he said.

Stap thinks a lot of little things cause the pollution, including sewage systems from the city of Lynden. For evidence, he points to data from water quality monitoring stations at Fishtrap Creek. A map of fecal coliform levels at specific spots shows heightened levels in Fishtrap Creek near the city center of Lynden, and lower levels next to the farms.

Ambient water quality testing is done over time by Ecology to monitor levels of fecal coliform, said Doug Allen, manager of Ecology’s Bellingham field office. Ecology relies on the trend of fecal coliform colonies in water samples to determine what areas need work.

“We track those and that gives a better assessment of how we’re doing, rather than grabbing a sample and saying, ‘this is the problem,’” Allen said.

Allen said the random sample testing the dairies use to support their claims that they aren’t at fault for the contamination of Portage Bay is a lot less reliable than averages of consistent testing over time.

Inspections of the farms by an independent inspector and the first water quality improvement plans were supposed to be completed by May 1, 2017, per the agreement. But that hasn’t happened yet.

The farmers did not approve the first inspector proposed by the Lummi, which seemed like an effort to postpone moving forward, said Tebbutt, the attorney for the tribe.

“They’re stonewalling at this point despite an agreement to the contrary,” he said.

But farmers insist they are committed to addressing the problem through the agreement, rather than face costly litigation.

“There is nobody in Whatcom county that could endure a lawsuit,” Appel said, adding it would have cost the farmers more to defend themselves in a lawsuit than to settle outside of court.

The combined effort between the Lummi and Whatcom farmers is a unique and progressive attempt at tackling water quality improvement and environmental stewardship, Tebbutt said. Legal battles surrounding dairy waste management are not uncommon in Washington. Tebbutt has worked on several dairy cases in Yakima, Washington, with long legal proceedings.

“We share in the situation that’s been created, and as we improve water quality together we all share in being able to celebrate that,” Allen said. No one wants to believe they’re at fault for pollution, but if everyone accepts some responsibility and does their part, progress will be made.

Though the next steps are still murky, Appel has high hopes for the partnership.

“The tribe wants a level of certainty and so do the farmers,” Appel said. “We’re going to have to figure it out.”

SYNNOVE VANDAL is a global communication studies major at Fairhaven College. She sees nature as the medicine to any woe and spends all of her free time exploring the mountains.

LINCOLN HUMPHRY is a visual journalism major. He received an associate degree in communications before moving to Washington from the mountains of Virginia in 2016 to finish school and explore Cascadia.

LEFT: Manure from cows at Twin Brook Creamery might be contributing to poor water quality in the Nooksack River.
An occasional blackened tree is the only reminder that the worst pipeline disaster in Washington history once devastated Whatcom Creek. After nearly two decades of restoration, scorched vegetation has given way to new life.

EIGHTEEN YEARS AFTER the Olympic Pipeline explosion, Carl Weimer, executive director of the Pipeline Safety Trust, walked along a nature trail once drowned in gasoline, pointing to clues of the tragedy. While physical traces of the explosion continue to fade, environmental restoration was just the beginning. The real cleanup would extend beyond Bellingham, taking Weimer before Congress to speak on behalf of a devastated and angry community, setting the stage for debates over pipeline safety regulations that continue today.

On June 10, 1999, a fireball ripped through the heart of Whatcom Falls Park. A dent in the 643-kilometer Olympic Pipeline had ruptured underground and close to a million liters of gasoline bubbled to the surface and surged downhill to Whatcom Creek. A curtain of toxic vapors drifted through the park and enveloped Liam Wood, an 18-year-old fly fisherman who was exploring the creek for salmon. Moments later, he collapsed into the water and drowned. Farther up the creek, 10-year-olds Wade King and Stephen Tsiorvas had found a source of entertainment familiar to many their age: a fireplace lighter. The explosion engulfed about a kilometer of Whatcom Creek and sent a tower of black smoke taller than Mount Everest into the air. Both boys passed away the next day.

An army of people were brought in to assess damages and work on restoration, said Mark Henderson, a water quality specialist for Bellingham’s Department of Ecology. On the first day, his team wore respirator suits and trudged through thick, yellow water, bagging thousands of dead fish that had floated to the surface and surged downhill to Whatcom Creek.

"It'd be really nice if you could trust everybody to do the right thing, but, in fact, they don't," Henderson said. "You've got to hold people's feet to the fire."

A few days after the explosion, Weimer and a small group of environmentalists, doctors and lawyers met to do just that. Over breakfast at the Old Town Café in Bellingham they hatched a plan to start a pipeline watchdog coalition called SAFE Bellingham. As residents struggled to make sense of the tragedy, Olympic Pipe Line Company was scrambling to
Carl Weimer, Whatcom County council member and the executive director of the Pipeline Safety Trust, a local nonprofit that started as a result of the 1999 Olympic Pipeline explosion in Bellingham.

install a new pipe and resume service to Seattle Tacoma International Airport.

"They were going to do it real quick, before they even had a clue why the pipeline had failed, and that didn’t make much sense to people,” Weimer said.

The courts agreed. Within a month, a federal criminal investigation was filed against Olympic Pipe Line Company. Olympic and its owners doled out more than $180 million in fines and settlements, and federal regulators kept the pipeline closed longer than any other pipeline in U.S. history at the time.

In 1999, rules related to pipeline safety were thin. Prior to the explosion in Whatcom Creek, once a pipeline was constructed no laws required it to be inspected further, Weimer said. Incident data was scarce and pipeline maps were not accessible. But a few months after Weimer and the families first testified in front of Congress, the Pipeline Safety Act of 2000 passed in Washington, which required periodic inspections of pipelines.

After a slew of fatal accidents in 2000, including an explosion in New Mexico that killed a dozen campers, Congress approved a 2002 bill that further tightened regulations. Similar bills followed in 2006, 2011 and 2016.

"It seems like every time there's a tragedy they step it up a little bit more, and then when people forget after a few years it starts backsliding again,” Weimer said.

Weimer walked along the trail toward the water treatment plant where the Olympic Pipeline first ruptured. He pointed in the direction of Kulshan Middle School. A year after the explosion, Olympic was required to test the pipeline by filling it with water and increasing the pressure past normal capacity. A large section of the pipe burst near the school.

He paused as an excited flock of eighth graders ran past and giggled amongst themselves. Julie Bennett, their science teacher, trailed behind and greeted Weimer.

"Hi,” she said to him, before adding, "You’re my hero.”

She told Weimer that over the years she had used the Olympic Pipeline explosion to teach a unit on properties of matter and chemical reactions to her students.

“You just walk out of my room and the pipeline’s right there,” Bennett said. “So, if you’re a middle schooler and you’re like ‘why do we have to study all this stuff?’ I’m like, ‘well, let’s go see what happened a few years ago.””

Weimer’s ability to help crack open a na-
tional debate on pipeline safety was fueled by a lifetime of tackling environmental issues. After graduating from the University of Michigan in 1976 with a degree in Natural Resources and Environmental Education, he spent the next decade working in various natural resource agencies around the country. In 1983, he and his wife moved to Whatcom County. Two decades later, after 13 years as the executive director of RE Sources for Sustainable Communities, a local environmental organization, Weimer was asked to lead the Pipeline Safety Trust.

"I actually tried to get out of it," Weimer said with a laugh.

But after two nationwide searches proved fruitless, he agreed to lead the coalition. In 2003, when U.S. District Judge Barbara Rothstein endowed the Pipeline Safety Trust with $4 million, she said she knew it paled in comparison to the lobbying power of the oil industry.

She was quoted in news reports saying, "It's not even David and Goliath. It's more like Bambi and Godzilla."

In 2005, Weimer ran for a position on the Whatcom County Council, a seat he still holds.

Seth Fleetwood, a fellow progressive and former member of the Whatcom County Council who served with Weimer in the mid-2000s, said Weimer was good-natured and had strong ethics on environmental preservation.

"I've always enjoyed working with Carl," Fleetwood said. "He's been a brave leader in our community for many, many years."

The Pipeline Safety Trust's work is far from done. Over the last 20 years, 11,400 pipeline accidents spilled more than 300 million liters of oil and gas around the country, according to the federal Pipeline and Hazardous Materials Safety Administration. That's enough liquid to flood Western Washington University's campus nearly one meter high with oil. Among those accidents, 832 were classified as "serious" and resulted in 310 deaths, 1,300 injuries and approximately $7 billion in damages.

To this day, dozens of federal pipeline safety regulations still in effect were written by oil and natural gas industry groups, said Rebecca Craven, program director for the Pipeline Safety Trust. Many of these regulations are copyrighted, meaning the public has to pay to access them.

"It's not the fox guarding the henhouse," Craven said, quoting Weimer. "It's the fox designing the henhouse."

On a table outside of her office, a toy Godzilla wearing a hard hat stands beside a small Bambi figurine.

"[Pipeline safety is] a fairly fascinating subject because you're dealing with the oil and gas industry, who's probably one of the most powerful industries on earth, but finding out that there’s ways you can outmaneuver them, and sometimes work with them," Weimer said.

TYLER KENDIG is a journalism student at Western Washington University. He prefers pursuing stories that have an element of investigative reporting.

REGAN BERVAR is a Bellingham native studying visual journalism. She believes in the power of a picture to say 1,000 words.
Lee First shuffled a few rocks around with her foot along the side of the railroad tracks bordering Bellingham Bay.

“It’s kinda fun looking for coal,” First said, holding up a jet black chunk. The piece had likely fallen off a passing train bound for British Columbia. It had probably been mined from a seam somewhere in Wyoming’s Powder River Basin, a tiny fragment representing a big chunk of the American energy economy.

In 2013, five environmental groups, including the organization where First is affiliated, Bellingham-based RE Sources for Sustainable Communities, filed a lawsuit against Burlington Northern Santa Fe (BNSF) Railway for dropping coal into waterways and violating the Clean Water Act.

They reached a settlement in March of 2017. These environmental groups are the first in the country to take action against this particular Clean Water Act violation. Any state with coal transports near waterways could find evidence to bring a similar case to court.

Across the United States, trains transporting coal or petroleum coke - petcoke - speed along railroad tracks and jostle material out of the train car in clouds of dust or in chunks. In many cases, railroad tracks run beside bodies of water.

First is the North Sound Baykeeper. Her job is to look for Clean Water Act violations around Bellingham Bay and the surrounding area.

“Trains have gone by for at least 50 years and most of that time they haven’t had any covers on the rail cars,” First said. “They’ve been dropping dust and chunks of coal, which get ground up and contaminate the water along the tracks when it rains.”

When coal or petcoke — a solid byproduct of oil refining — gets in water, toxic chemicals like mercury, arsenic and polycyclic aromatic hydrocarbons, PAHs, are discharged and the water becomes more acidic. PAHs can harm fish larvae, mussels and shellfish, and can be cancerous to humans.
It is a direct violation of the Clean Water Act if these toxic chemicals reach a water source. Prior to an Eastern District Court of Washington ruling in 2014, no court had explicitly described coal trains as a point source under the Clean Water Act.

BNSF conducted field studies showing each coal car can drop 227 kilograms of coal every 161 kilometers. Each train has an average of 120 cars. Based on the field studies, BNSF established a coal dust emission standard for their trains, called the coal-loading rule. This regulation requires coal to be loaded in a bread loaf shape to reduce wind resistance and the coal must be sprayed with a topping agent called surfactant.

"Surfactant is sort of equivalent to a hairspray," said Dan Jaffe, a researcher at the University of Washington who studied the effects of coal dust from trains. "It works most of the time, but not all the time. If it's windy, the crust will eventually break and the coal dust can be released."

Three years after the initial suit, the case concluded in March 2017. The U.S. District Court ruled BNSF must conduct a study on the feasibility of covering the coal cars during transit. Along with the study, BNSF is responsible for cleaning accumulations of coal and petcoke along the railroad tracks in five locations near the Columbia River. BNSF is required to pay $1 million for projects that will help improve water quality in the state of Washington.

"I think it's a big win for our waters," said Katelyn Kinn, an attorney with the Puget Soundkeeper Alliance, one of the plaintiffs. "It's a precedent-setting requirement to have the railway really take a hard look at how to stop the discharges of the coal trains."

In a statement released after the settlement, BNSF asserted this agreement accurately reflects the railway's long-term goal to address the coal dust problem. Despite the settlement agreement for removal and cleanup of coal near the Columbia river, BNSF denies all accusations of Clean Water Act violations.

The removal of the coal and petcoke is limited to the ground surrounding the train tracks and doesn't include any coal that has landed in the water nearby.

"The biggest victory is yet to come," said Chris Wilke, the Executive Director at the Puget Soundkeeper Alliance. "We felt that the settlement we reached is the most direct route to getting the covers implemented in the shortest amount of time."

The car cover study will last for approximately two years. If this study is successful, BNSF will make efforts to amend the coal-loading rule to require car covers, the next major step toward addressing the toxic legacy of coal transportation.

"IT'S A PRECEDECENT-SETTING REQUIREMENT TO HAVE THE RAILWAY REALLY TAKE A HARD LOOK AT HOW TO STOP THE DISCHARGES OF THE COAL TRAINS."

- KATELYN KINN
ATTORNEY, PUGET SOUNDKEEPER ALLIANCE

JULIA MATTINGLY is studying environmental economics and energy policy at Huxley College. She is passionate about energy issues and bringing change that will allow the environment and the economy to work together.

MATHEW ROLAND is a junior at Western Washington University studying visual journalism and film. His favorite projects are those that combine art and environmental science.

TOP: Hundreds of miles of BNSF railway run alongside waterways, such as Bellingham Bay and the Columbia River. As a result of the railway's proximity to these waterways, coal contamination is common.

LEFT: Large pieces of coal get broken into smaller bits by passing trains. These small pieces of coal can eventually end up in the water, contaminating rivers and bodies of water like the Puget Sound.
Cars whiz past as Megan Lee leans down to begin work among a small collection of plants directly alongside Magnolia Street in downtown Bellingham. She digs almost eight centimeters deep into dirt that falls off her shovel in dark clumps. She pulls out trash, laughing to herself as she sees what people have tossed in the roadside garden.

LEE IS THE in-house horticulturist for Aslan Brewing Company and is also in charge of maintaining three Downtown Improvement Gardens, or DIGs. The gardens are designed to filter bacteria, oil, heavy metals, grease and other pollutants from stormwater. These gardens were installed in downtown Bellingham to reduce the impacts of stormwater runoff in Whatcom Creek. Two and a half years later, a hopeful vision has given way to the complexities of maintaining the gardens. City officials and garden stewards like Lee are working to navigate those issues.

The gardens were built in 2014 with funds from a Washington state Department of Ecology grant. Bellingham currently has 36 gardens around the city, all strategically located in places where stormwater flows into pipes that eventually lead to Whatcom Creek.

The gardens in Bellingham were inspired by the Green Street Steward Program in Portland, which implemented gardens to filter stormwater before it runs into the Willamette River. Similar to the Portland program, Bellingham businesses can volunteer to maintain a garden by weeding and picking up trash.

Lee studied urban planning at Western before signing on as the plant specialist for Aslan. Her role as a garden steward isn’t always glamorous.

"It’s weeding and calling Public Works to say, ‘Hey, I need more mulch,’ or ‘Hey, there’s way too much sediment in here,” Lee said.
LOCATIONS OF BELLINGHAM DOWNTOWN IMPROVEMENT GARDENS

Healthy gardens:
- Gardens should be free of trash to reduce the chance of clogging up the soil
- Plants should be chosen to fit the climate, but should be able to withstand periods of drought when there is no stormwater to filter
- A layer of mulch is needed to assist with removing metals and reducing weeds

Unhealthy gardens:
- Dying or dead vegetation keep a DIG from filtering at its full potential
- Too much fertilizer can damage the plants. Plants in the gardens absorb nutrients from filtered stormwater, but excess fertilizer is harmful
- DIGs flood during storms but frequent flooding is a sign of a clogged layer

Lee weeds the gardens four times a year and trims the lavender in the fall. Every day she picks up trash like gum, cigarettes, wrappers and dog waste from the gardens.

When the gardens were first built, the city held workshops to teach stewards how to maintain and care for the gardens, but training for new stewards isn’t mandatory.

As a result, stewards often aren’t sure how to maintain the gardens, and a periodic check from the city has not been enough, Lee said.

Urban stormwater runoff is one of the leading causes of pollution to the Puget Sound, according to the City of Bellingham’s 2013 Stormwater Management Plan. Once in the Sound, runoff can be lethal to fish in a matter of hours.

Stormwater is lower on the regulatory pecking order than aquatic pollution from industries or sewage plants, but the sheer volume of stormwater makes it an important issue, said Freeman Anthony, project manager for the DIG program and civil engineer for the Bellingham Public Works Department.

In a 2016 study, scientists from Washington State University and NOAA found gardens with a similar design to the Bellingham gardens filtered almost 90 percent of the polycyclic aromatic hydrocarbons, PAHs, from the stormwater. PAHs are chemicals produced by burning fossil fuels. Some PAHs have been found to be carcinogenic and toxic to marine organisms.

The City of Bellingham is required by Ecology to do periodic water quality monitoring of Whatcom Creek, but since the gardens were only constructed a couple years ago, it’s too early to tell whether the rain gardens have improved water quality, Anthony said.

The city’s Public Works Department is in charge of checking the gardens annually to make sure they are working. The crews vacuum up excess sediment and mulch the gardens, which helps deter weeds from popping up.

Once a year isn’t enough, Lee said. She thinks maintenance should come out sometime in the winter and again in the spring.

“Right now, from the winter there is a ton of sediment built up in the little pools, which is what it’s designed to do, but that needs to be removed,” Lee said. “That sediment is now traveling into the garden and into the gutter, which is exactly what we don’t want.”

The sediment from the three gardens Lee manages would fill about 12 garbage bags, she said.

It will be hard to tie any future water quality improvements in Whatcom Creek directly to the downtown gardens, but Anthony hopes to see improvement in future water quality measurements.

The gardens are one tool used to limit pollution entering the bay, and Lee sees a huge benefit with the program as long as people tend to their upkeep.

For Anthony, too, the collective aspect of the effort is key to its success.

“You can get a lot done if you involve the community and get people to make it a priority,” he said. “Admittedly, they can look rough through the winter, but it’s amazing what they will do. Every year, by late May, early June, people are saying ‘man, those things look good.’”

MATTIE WILSIE is a multidisciplinary studies undergraduate with a public relations emphasis at Western Washington University. She is determined to create positive change and make a difference in the community through nonprofit work.

ILANA NEWMAN is a Fairhaven student studying photojournalism and outdoor recreation, and she spends as much time as possible in the mountains searching for rocks, views and photos.
FORAGING FOR ANSWERS

STORY BY MEGHAN SCHILLING
PHOTOS BY ILANA NEWMAN

A flock of harlequin ducks takes flight as Todd Sandell rips past in his 4-meter-long boat. After turning into Birch Bay, he hucks a double-sided metal rake overboard, putters forward a meter and pulls up a dripping, slimy pile of seaweed from the water.
SPRING 2017

SANDELL, A SENIOR FORAGE fish biologist at the Washington Department of Fish and Wildlife, WDFW, is on one of his frequent survey runs. Although he records the species of seaweed he hauls in, he’s in search of something else: herring spawn. He is monitoring the herring at Cherry Point, which juts into the northeastern Puget Sound, near Ferndale. This particular stock of Pacific herring has unique genetics and habits that may provide scientists with insight on maintaining biodiversity in the region.

The Pacific herring have also become a political chess piece in ongoing battles between industry and environmental groups over land use at Cherry Point.

Herring are a species of forage fish, meaning they are the main food supply for large marine organisms. But around Cherry Point, the population has plummeted by 92 percent, falling from around 13,600 metric tons of spawning individuals to less than 900 metric tons since 1973. Though population declines are being seen across most herring stocks in the Puget Sound, none have been nearly as dramatic.

On the boat, Sandell grabs one possible explanation for the problem: a stringy seaweed with tiny round orbs protruding from the sides. He identifies it as Sargassum, a non-native species in the Salish Sea. Research by his department shows the Cherry Point herring have begun to prefer this seaweed for spawning instead of the eelgrass typically preferred by most other Pacific herring.

Diving birds pull the egg-covered weeds from the seafloor, and unlike eelgrass, the bubbles cause the vegetation to float to the surface, where it is extremely susceptible to predation. Currently, there’s a dramatic increase in seal and sea lion populations that find the herring spawn to be a delicious treat. While predation definitely contributes to the decline of the stock, many factors are at play, said Dayv Lowry, a scientist at WDFW.

“Everybody’s always looking for a specific reason,” Lowry said. “Unfortunately it’s never that clear cut in science.”

Overfishing in the 70s and 80s led to a rapid decline of the stock, 9,000 metric tons just between 1973 and 1983, Lowry said. Since the 80s, the area has been closed to fishing, but the stock was soon bombarded with more threats.

Industry began to take over the area in the form of two oil refineries and an aluminium smelting plant, said Natalie Lord, aquatic reserve monitoring and stewardship coordinator at RE Sources, a nonprofit environmental group based in Bellingham. This increased the risk for habitat degradation, higher levels of pollution and rapid introduction of invasive species, Lord said. All of these factors work together to perpetuate the loss of the Cherry Point herring stock.

“It’s death by a thousand cuts, not just one smoking gun,” Lowry said.

This loss of biomass not only affects the Cherry Point herring population, it also impacts the entire ecosystem. Forage fish are vital to the ecosystem, Lord said. They feed on plankton and aquatic vegetation, then provide nutrients to the higher levels of the food web, such as salmon and whales.

The Cherry Point herring fill a distinctive role in providing food for many species. Their unique genes cause them to spawn in the summer, while most other stocks spawn closer to early spring. The early spawners are able to provide a bountiful food source as migratory species arrive, but food becomes more sparse as the summer hits.

Lowry estimates the life cycles of over a dozen species of birds, about five species of marine mammals and 20 species of fish are linked to this area because of the spawn timing.

This ability to spawn in the summer may also be the key to their survival. Lord thinks as the ocean warms, the Cherry Point herring have already begun to adapt to the warmer temperatures.

Below: Scientists aren't sure what species of seaweed the herring prefer for spawning, as it seems to change depending on the location.
"As the climate warms or changes, these guys are now suddenly potentially a genetic reserve that’s adapted to warmer temperatures, and that might be really important later on down the road," Sandell said.

Lowry disagrees. He believes this could cause the stock more problems. It’s possible the warm summer water is already the limit for this stock, and if the temperature continues to rise, the viability of the eggs will be compromised.

It’s nearly impossible to predict how the forage fish will adapt to climate change in the Puget Sound, but that doesn’t discourage Lowry and Sandell. Currently, scientists can only genetically distinguish two of the 19 stocks of Pacific herring in the Sound, but they are working to change that.

The only way these stocks can be distinguished are by their spawning grounds. When they return to open waters, they can no longer tell them apart. This means the ecological significance of each stock is relatively unknown. If researchers are able to genetically separate each stock, they would have the ability to trace which stocks are contributing most to particular food webs. This would allow protective measures to go toward the stocks that are most vital to ensuring the health and biodiversity of the Puget Sound.

For Cherry Point herring, their spawning grounds lie, in part, on a 92 hectare parcel of shoreline designated as an aquatic reserve. Numerous attempts have been made to add more industry to the area. Before any new projects can go forward, the Fish and Wildlife Department must assess impacts to the herring population. In addition, RE Sources plans to renew the six-month moratorium on new fossil fuel facilities passed last winter.

While these protections can’t guarantee the survival of this herring stock, Lowry holds out hope the population will make it.

"Just having that protection in place ensures that if and when the fish are there to spawn, they will have somewhere to spawn, which is a very significant thing for these fish," Lowry said.

MEGHAN SCHILLING is a Fairhaven student pursuing a degree in ecological engagement, which combines topics of ecology, communications, and education to understand methods for connecting people with the environment.

ILANA NEWMAN is a Fairhaven student studying photojournalism and outdoor recreation, but she spends as much time as possible in the mountains searching for rocks, views and photos.

RIGHT: Waves break at the Cherry Point Aquatic Reserve. The BP oil refinery at Cherry Point contrasts with the natural landscape of the aquatic reserve. The possibility of building more industry in the reserve could harm the ecosystems and life in the area, including the Cherry Point herring.
Stuart Strand, a professor at the University of Washington, beams as he holds up a round petri dish containing genetically altered seedlings — one of many from research conducted over decades. He places them in a container among rows of others like it. Some are typical, unmodified grass. Others have received genes from bacteria that enable the plant to break down pollutants that pose a risk to human health.
GENERATIONS OF MILITARY testing since World War II have led to a buildup of toxic chemicals that cycle through the earth. RDX, Royal Demolition eXplosive, is a particularly nasty one used in plastic explosives. When it rains, the water-soluble chemical seeps into the soil and contaminates groundwater and drinking wells. Through his research, Strand hopes to limit future contamination at military testing sites around the country.

In the lab, Strand shows plants at every stage of growth, ranging from small petri dishes to larger cube-shaped boxes containing the plant specimens. Colleague Long Zhang is responsible for inserting the genetic material. He holds up a petri dish and points to white calluses on the sprouts, evidence of the genetic modification. These little plants have a long way to go before they can move to the lab’s larger containment room where they will be put to the test, removing RDX in a controlled environment.

If the lab tests are successful, the grasses will be planted on training ranges to degrade the RDX released from munitions, intercepting the chemical before it reaches the soil.

Just as someone with a lactose intolerance can consume lactase, an enzyme allowing them to break down lactose without getting sick, the plants with the bacterial enzyme can digest the chemicals, leaving little to no trace.

“They’re not grass you’d see out along the highway,” said lab manager Ryan Routsong. “They’d be in highly regulated areas and military munition spaces.”

The U.S. Department of Defense funded the project to reduce RDX pollution in military testing. The success of the plants so far has led the DOD to continue funding the project as it enters its field-testing phase, Lt. Col. James Brindle said.

“These chemicals are extremely energetic,” Routsong said. When they are rained on, the chemical is mobilized and leaches into the soil and groundwater.

When people drink this water, or grow vegetables on nearby land, they risk ingesting trace amounts of RDX into their bodies. In humans, this chemical causes seizures and is also suspected to cause cancer. It’s estimated that over 100 bases and testing facilities and their surrounding areas are contaminated by RDX. The adult plants in Strand’s lab could be a viable solution.

The chemical is nearly impossible to eradicate once it’s been introduced, and there aren’t many known fixes for the existing damage.

“RDX itself is very hard to degrade,” Strand said. “It’s never been seen on Earth before we [humans] invented it.”

Using engineered plants to tackle the problem comes with its own complications. Near the doorway of Strand’s lab, sticky red floor mats pull any residual pollen off of shoes, making sure nothing is tracked outside. Some of the adult plants are kept behind a clear plastic tent to prevent the spread of pollen or cross-contamination. Strand makes sure the plants are isolated from outside ecosystems. Some of the grass is currently being tested in isolated outdoor plots. The results will determine if further tests are needed for approval from the U.S. Department of Agriculture.

Switchgrass, creeping bentgrass and western wheatgrass are a few of many plants that will be modified in Strand’s lab. The enzymes that allow them to degrade RDX were originally discovered by Neil Bruce, a researcher at the University of York, in England, who works with Strand on the RDX research.

After the chemical compounds are broken down, the plants thrive off of nitrogen released in the degradation process, which works as a fertilizer to help the plants grow.

On the far side of his lab, Strand opens a door to reveal a room of the full-grown plants. The jungle-like room is waist high with grasses, each labeled for their specific purpose. Up on a shelf, vines of pothos ivy hang down in tendrils, matching the ones that wrap around Strand’s office. The ivy contains genes that degrade carcinogenic air pollutants, like benzene, in homes, which Strand hopes to sell in the future.

Whether on a military testing range or in Strand’s office, the plants sprouting in his lab suggest a new way to eradicate harmful carcinogens and pollutants from the environment.

MADISON CHURCHILL is an environmental policy major and plant enthusiast at Huxley College.

LINCOLN HUMPHRY is a visual journalism major. He received an associate degree in communications before moving to Washington from the mountains of Virginia in 2016 to finish school and explore Cascadia.

ABOVE LEFT: Stuart Strand displays transgenic RDX-degrading grass at his lab at the University of Washington.

BELOW LEFT: Mature genetically modified plants that could potentially spread pollen to wild plants are contained separately at the lab.
The second week of last November was a miserable one for Steve Swanson. That Monday, Swanson learned he and his wife had lost their lifetime health coverage. Tuesday, President Trump won the election, a total downer, he said. Thursday, they received news the local Naval Air Base on Whidbey Island would be quadrupling their training flights. With their home only about three kilometers from a landing strip, this meant a cacophony would soon be descending around them in the form of new jet planes.

“We gotta get out of here before that happens,” Swanson said.
BUT THE VERY next day, the Swansons received a letter in the mail that put a damper on their plans. The Navy had conducted studies on test wells and found elevated levels of Perfluorooctanyl sulphonic acids, or PFASs, in the local groundwater and were asking residents for permission to test private wells.

Swanson, a retired emergency room doctor, suspected this was a bad sign. He was one of the first to sign up for testing and to get back results. His well, from which his family had been drinking for the last 19 years, contained PFASs at a concentration of 440 parts per trillion, more than six times the EPA's lifetime advisory level of 70.

"You can't sell without a well," Swanson said.

They were stuck with the property and wouldn't be moving anytime soon.

Over the next few weeks, the family reshaped their relationship with water, a resource often taken for granted in rainy Washington state. Ten-gallon water jugs line the Swansons' garage, their only drinking water source. Attractive green carafes, as Swanson's wife calls them, are scattered around the bathroom, some being used to rinse toothbrushes, others for washing their faces. Plastic containers with small spigots are tucked away in the pantry for easy access.

Though this system limits the Swansons' PFAS intake, the contamination still remains a threat.

As of April, testing conducted by the Navy has identified eight wells contaminated with PFASs on Whidbey Island. Several wells had similar contamination levels to the Swansons’, meaning residents could be consuming quantities of chemicals higher than their recommended lifetime intake through their drinking water alone.

The chemicals originate from film-forming foam, a firefighting tool used by the Navy to control oil-based fires. Firefighting foams are effective because they cool the fire as well as coat it, restricting the flow of oxygen and extinguishing the flame.

"I've been out there in a raging fire putting foam on it from the fire truck and it really knocks it down; it just smothers it," said Mike Welding, public affairs officer at the Whidbey Island Naval base and former firefighter. The foam was primarily used for training to control small aircraft fires.

Today, the bases use a foam free of PFASs, but some hangars still house large blue barrels containing the old foam. The Navy stopped purchasing the PFAS-filled foam in 2001, but the extent of the use is difficult to evaluate. The Navy does not keep records of how much foam was used and at what times.

PFASs were put on the nation’s radar in 2000, when it was discovered the DuPont chemical company dumped over 6,000 metric tons of the chemicals into water sources near their plant in Parkersburg, West Virginia. The Navy’s trouble with PFASs began in 2014 near Willow Grove, Pennsylvania. There, almost half of public drinking water wells in surrounding towns were closed due to contamination. This prompted naval airbases around the country to start testing their own wells if there was a historic use of PFAS-laced foam.

Back on Whidbey, the Navy has tested 133 wells centered around two airbase facilities: Ault Field, north of Oak Harbor, and the Outlying Landing Field, just south of Coupeville. Only a small fraction of these tests came back positive for high levels of PFASs, but the news has had a drastic impact on the small community.
PFASs are resilient chemicals, resisting decomposition for long periods of time. They are widely used and found in many manufactured products like paper plates, packaging, furniture, carpet, clothing with gore-tex and teflon pans.

In higher doses, these chemicals can cause health problems. According to research published in the journal Environmental Health Perspective, PFASs in pregnant mothers significantly reduced the size of their children. In animal studies, PFASs were linked to liver problems, birth defects and mortality, as well as multiple cancers.

Currently, there is legislation restricting the amount of PFASs that can be used in consumer goods, but Washington state holds no regulation limiting levels in soil and water. Instead, the number that has fueled the discussion is the EPA lifetime health advisory limit, announced in 2016.

The Navy has stressed to Whidbey Island residents that the EPA limit is a health advisory level. According to the EPA website, these levels are non-enforceable and non-regulatory, serving solely as technical information for state agencies.

Still, the health advisory limit initiated the Navy's testing in surrounding communities, Welding said.

"If they find wells that exceed the health advisory, then the Navy will go out to those residents and provide safe drinking water," Welding said. "Here, it's bottled water. That's the short term mitigation."

The Navy is still determining how to approach the issue in the long term. The task of creating a comprehensive solution is made difficult by the lack of data available about Whidbey Island's groundwater. The flow direction of groundwater and the PFASs within it has still not been determined. Instead, the Navy is testing wells based on the assumed direction of the flow.

Welding said the most important thing is to protect people's personal safety. But Seattle lawyer Corrie Yackulic isn't as convinced about the Navy's motives.

"When you're a criminal and you hear footsteps, then turn yourself in, it's not necessarily because you're a good guy," Yackulic said.

Yackulic is representing a group of Whidbey residents, including Swanson, preparing to file a lawsuit against the Navy. Their claim will be based on the argument that the Navy violated nuisance laws, which protect homeowners' free use of property. In this case, Yackulic and her clients believe negligence on the part of Navy employees led to water contamination, directly impacting the residents.

The Swansons experienced this first hand. When they heard their water was contaminated, one of the first things to go was the family's organic garden. Now, the garden is little more than a fenced compost pile. Roots and stems are heaped haphazardly in what was at one time a steady and healthy source of food.

"To think we were trying to do something good for us, only to find out it's really harmful," Swanson said.

Washington state is trying to close the gap between the EPA limit and creating its own enforceable regulation. In 2016, the Washington Department of Ecology formed the PFAS CAP Advisory Committee, a group charged with developing a chemical action plan for PFASs and other unregulated chemicals. Their plan will be packaged in the form of
"WHEN YOU’RE A CRIMINAL AND YOU HEAR FOOTSTEPS, THEN TURN YOURSELF IN, IT’S NOT NECESSARILY BECAUSE YOU’RE A GOOD GUY."

- CORRIE YACKULIC

LAWYER, SEATTLE, WASHINGTON

recommendations which legislators can use to turn into law.

Though regulations might quash any future incidents before they occur, they won’t change the reality facing Whidbey residents. A cleanup and water filtration system may help remediate the current situation, but until then, the Swansons and other Whidbey Island residents will be drinking their water out of plastic bottles.

ROBERT JOHNSON is a writer and editor interested in environmental policy and local government. A California native living in Bellingham since 2012, he is currently enrolled at Western Washington University, where he is studying journalism.

MIRANDA ABRASHI is a sophomore studying communications and business. She loves photography, the environment and where they intersect.

ABOVE: The Swansons’ well water is rarely used unless they are watering their flowers. They can no longer use the water on their organic garden because the produce absorbs the chemicals.
On December 4, 1970, William Doyle Ruckelshaus, a 38-year-old Assistant U.S. Attorney General in the Department of Justice, was chosen as the first administrator of the Environmental Protection Agency. For two and a half years, Ruckelshaus would shape the role of federal government in effecting environmental change through the management of science and policy.

Almost 50 years later, Ruckelshaus, who now calls Western Washington his home, wrote an op-ed in The New York Times, "A Lesson Trump and the E.RA. Should Heed." His letter urged the current administration not to carry out its proposed budget cuts of 31 percent and firing nearly 4,000 EPA employees. By throwing himself back into the political fray, Ruckelshaus hopes to protect the viability of the agency he helped create.

To Ruckelshaus, President Trump’s vision for the EPA somewhat mirrors that of the original “Make America Great Again” president, Ronald Reagan.

“There were two challenges,” Angell said. “There was a need to explain what the EPA was to the broad public ... [and] to establish its credibility with the regulated parties.”

While the public demanded protection against toxic pollutants that threatened their health and safety, the parties would need to be convinced through legislation. Statutes like the Clean Air and Clean Water Acts would give states the power to regulate pollution, with the EPA stepping in only when needed.


“[Nixon] vetoed the Clean Water bill,” Ruckelshaus said. “Most people had forgotten that. He didn’t pass it with a big brouhaha — he vetoed it.”

Less than two days later, Congress almost unanimously overruled Nixon’s veto.

“They felt that if they confronted their constituency head-on on an issue like this, they weren’t going to get reelected anyways,” Ruckelshaus said. “So why not go down with your guns flying?”

This kind of bipartisanship, where legislators step across the political aisle in an effort to work alongside the opposite party, seems like a lost art in modern America, Ruckelshaus said.

“Even though I was most of my life a Republican, I must say the
Republicans deserve the biggest criticism for what’s happening in Congress,” he said.

Mary Ruckelshaus, Bill’s daughter, has watched that political polarization develop throughout her father’s career. Mary was 11 years old when her father started working in the EPA.

“He’s not afraid to get in front of people and share his vision,” Mary said. Now a senior research scientist at Stanford University and director of the Natural Capital Project, she supports her father’s guiding principles on regulation.

In order to understand the problem, interested parties must gather and discuss the facts of the issue before jumping into policy options, Ruckelshaus said.

This separation between assessing the problem, and choosing how to act on it, is central to Ruckelshaus’ strategy. By doing so, researchers avoid getting entangled in policy decisions, and policy makers avoid politicizing facts for political gain, he said.

While facts guide the research, the people guide the policy. The role of the EPA is to serve the public, and part of that requires informing and educating, Ruckelshaus said.

“You have to be open, you have to share with the public all the issues you’re trying to address, and all the things you’re trying to weigh,” Ruckelshaus said. “If you don’t do that, there are chances of losing them.”

The need to agree upon a common basis of fact, with public input, is crucial to shaping environmental policy. The role of educational institutions, like that of the William D. Ruckelshaus Center at the University of Washington and Washington State University, is key in acquiring and distributing this kind of research.

“The universities are among the few institutions left in the country that people trust,” Ruckelshaus said. “And so out of that trust, come scientists and fact gatherers that people trust.”

Ruckelshaus discusses the triumphs and occasional disfunctions of the EPA, which he believes contributed to contemporary political polarization.
Once people can agree on these facts, then legislation can follow. Current polarization, Ruckelshaus said, is due in large part to the fact people refuse to find any common ground in research, let alone policy.

Ruckelshaus sees this politicization of facts as a symptom of a divided Congress, one that he sees as more than just a threat to the environment. He sees it as a threat to government stability.

Still, despite party lines being etched into the floor of the Capitol, Ruckelshaus hopes the U.S. can lead the fight for the environment once more. He recalls the global impact the ERA had on effecting international environmental policies, where delegations from countries like Japan and Indonesia gathered at EPA offices to see what could be done.

Now, he fears budget cuts and an unwilling Congress will cripple the international prowess the U.S. previously held in safeguarding the environment and public health.

"We were in the lead, worldwide, in the best way, I think: by showing people what they can do to protect themselves," Ruckelshaus said. "And we lose all that."

Today, Ruckelshaus continues to pen op-eds about what's happening in Washington D.C., and also works on the boards of multiple environmental organizations, including the Energy Foundation.

"I look for ways of making it clear to people what these policies are likely to do if they continue to be pursued," Ruckelshaus said. "People's initial reaction is 'we didn't know [you] were still alive!'"

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XANDER DAVIDSON is studying political science and journalism at Western Washington University. He hopes to have a better understanding of what brings people together, as well as what divides them.

MIRANDA ABRASHI is a sophomore studying communications and business. She loves photography, the environment and where they intersect.
At the west entrance of the Strait of Juan de Fuca, ships loaded with oil leave the open ocean and squeeze into the tight shipping lane separating the Olympic Peninsula from Vancouver Island. As that boundary is crossed, the likelihood of an oil spill intensifies.

Every year, about 4,200 deep draft commercial vessels make their way through this narrow waterway. These crafts include cargo ships, oil tankers and passenger vessels that can carry over 11 million liters of oil each in their fuel tanks alone.
SHIPS PLOW PAST the Makah Marina as they enter the strait. In the marina, in the tiny town of Neah Bay, sits a fleet of oil spill response vessels, armed with equipment to try to remove oil from the water and limit the damage caused by a spill. But only one boat in the fleet exists to prevent oil spills: the tugboat Montana, the fleet’s Emergency Response Towing Vessel, or ERTV.

Once deployed, the 37-meter-long vessel assists and hauls massive industrial ships in distress to a safe harbor, before they become the source of a spill. Since 1999, the tug has been deployed 57 times, but due to a recent push to increase fossil fuel exports from Canada to Asia, its workload could grow.

For the Makah Tribe of Neah Bay, whose reservation encapsulates the marina, the costs of an oil spill are written into their history. In 1991, a 185-meter-long freighter, the Tuo Hai crashed into the Tenyo Maru, a much smaller Japanese fish-processing vessel, just offshore of nearby Cape Flattery. Within minutes, the Tenyo Maru plunged to the sea floor.

“They just kept coming and they cut the Tenyo Maru in half,” said Kirk Wachendorf, the interpretive specialist at the Makah Museum and a member of the Makah Tribe.

After the incident, Wachendorf ascended the highest nearby point, Bohokus Peak, where he could see the carnage of the shipwreck as a dot on the horizon.

The Tenyo Maru discharged over 375,000 liters of oil and fuel into the sea as it sank. Globs of oil that bubbled up from the wreck were carried by currents to the northern coast of Oregon and across the strait to Vancouver Island. Members of the Makah Nation and cleanup volunteers later found thousands of seabirds covered in oil washed up on the beaches.

“Everybody here has relatives and friends who fish for a living,” Wachendorf said. “A lot of people here collect seafood from the shore and from the rocks. They were concerned about how that was going to affect everything.”

The spill spurred an effort to prevent similar events from occurring in the future. In 1994, approximately $5.2 million was awarded in a settlement to the Tenyo Maru Oil Spill Natural Resource Trustees, which includes the Makah Tribe and several other governmental agencies. The Makah Tribe allotted its portion of the settlement to help install the tug.

Once in place, the state of Washington took full financial responsibility for the vessel. In July 2010, legislation transferred costs associated with the vessel to the petroleum industry and to cargo and passenger ships. They now pay 57 and 43 percent of the cost, respectively.

“The industry is quite literally paying for a tug not to work,” said David Byers, spill response manager for the Department of Ecology.

Byers said the tug is basically their insurance plan. The state requirements mean the industry has the ability to respond to an incident that might otherwise become a costly spill.

Perched high up in the cabin of the Montana, the crew of three or four peers out at the creeping tides, while dozens of rowdy sea lions bark below.

Alan Heaven, a middle-aged crewmember in a gray t-shirt, climbs down from his post to greet the occasional local or passerby. He said the crew’s job is largely to sit by the phone, waiting for a call to action. It’s a quiet gig compared to Heaven’s earlier maritime experience.

Previous stations and training endeavors included weathering a tsunami in Okinawa, encountering pirates near Iraq, even traveling near the coast of North Korea, Heaven said.
The tugboat Montana is stationed in Makah Marina in Neah Bay, Washington. Its crew is prepared at all times in case of an emergency.
Despite the low-key nature of his new position, Heaven said the sense of ease only sticks around until they receive a call for help. Extensive safety considerations go into a response. Then, once the tug reaches the vessel in need of rescue, some crazy tricks start to take place. The crew uses line-throwing guns to quickly attach to the vessel in distress. The tug also needs to be able to access the ships it rescues from all angles.

"All these other boats have straight propeller shafts and then propellers in the back. These tugs have what they call Z-drive, so the propellers actually spin around 360 degrees of rotation. There’s not a rudder," Heaven said.

Essentially the tug can move forward, back or even directly sideways, he said. The vessel has prevented an estimated 70.4 million liters of oil from spilling into the strait, according to Ecology.

John Veentjer, the secretary of the ERTV Compliance Group, sees that number as misleading. He said it is uncertain what the fate of those cases would have been without the tug.

Veentjer also said the tug in Neah Bay is costing the industry about $2.9 million per year. The 2015 annual revenue of just one U.S. oil company, Exxon Mobile, was $246 billion. Veentjer pointed out that vessel costs are likely passed onto the consumer.

"You buy gasoline, you might be paying for it," Veentjer said.

Kinder Morgan, one of the largest oil transport infrastructure companies in North America, recently received approval from the Canadian government to expand the Trans Mountain Pipeline, which ends at a terminal in Burnaby, British Columbia. This expansion would allow Kinder Morgan to send roughly 350 additional tankers through the Strait of Juan de Fuca each year, Veentjer said.

This would provide about an eight percent increase to the overall amount of deep draft commercial vessels passing through annually. Veentjer believes the vessel could handle such an increase.

"Even if you add 350 more tankers in here, the chances of having multiple incidents for which the tug might be needed are extremely, extremely rare," Veentjer said.

For the Makah Tribe, history shows even a single incident can be devastating. As the traffic increases in the Strait of Juan de Fuca, Wachendorf said they desire security for their home and protection of natural resources for generations to come.

"We’re always in a situation where we could take off and go," Heaven said.

For the Makah Tribe, history shows even a single incident can be devastating. As the traffic increases in the Strait of Juan de Fuca, Wachendorf said they desire security for their home and protection of natural resources for generations to come.

"We’re always in a situation where we could take off and go," Heaven said.

**Breyanna Waldsmith** is pursuing a degree in environmental science. She is content when living close to the Earth, and believes nature provides entertainment, spiritual fulfillment, and the wonder necessary for inquisition.

**Regan Bervar** is a Bellingham native studying visual journalism. She believes in the power of a picture to say 1,000 words.
The Canadian government granted oil and gas company Kinder Morgan permission to expand their Trans Mountain Pipeline last November. With the oil set for export out of Burnaby, British Columbia, activists, regulators and industry leaders are discussing ways to mitigate the added risk of tankers navigating the narrow waterways of the Salish Sea.

**Kjell Redal** is a multimedia storyteller interested in telling compelling narratives through even more compelling imagery. His work largely revolves around science, outdoor adventure, politics and travel.

**Paul Bikis** is a visual journalist based in the Pacific Northwest, with a focus on action sports and environmental conservation.

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“If human civilization is going to invade the waters of the earth, then let it be first of all to carry a message of respect.”

- JACQUES COUSTEAU