



2025 IN REVIEW

2025 was a year of expansion and progress toward the Alaska Climate Adaptation Science Center's goal of providing the best available science to partners and decision-makers across the state of Alaska. In particular, the Alaska CASC supported researchers from the University of Alaska and the U.S. Geological Survey focused on cryosphere hazards and the continued development of high-resolution climate data for the state. Our work helped individuals as well as federal, state, and city planners understand potential climate impacts, with examples including the new Southeast Alaska avalanche map and Juneau Glacial Flood Dashboard. We also continued to enhance the Alaska CASC's suite of climate adaptation tools through the development of Northern Climate Reports, the Alaska Wildfire Explorer, and the Arctic Data Collaborative.

This year we built further expertise and capacity within the Alaska CASC by bringing on an incredibly talented group of new students, researchers, and staff. We welcomed the first ever cohort of the Alaska CASC Ambassadors, whose projects focus on topics ranging from improving fisheries management and food security to engaging citizens to support early detection of invasive species. The second cohort of our Alaska Regional Science Synthesis Team interns began this summer, and our Fellows Program assisted early-career researchers and graduate students with their work on environmental DNA, wildfire, remote sensing, and riverine ecosystems. The Alaska Tribal Resilience Learning Network continued to support Alaska Native Tribes and villages, and we strengthened our relationships to learn about research needs and priorities throughout Alaska through our engagement with the Sustainable Southeast Partnership and Northern Latitudes Partnerships.

Read on to learn more about our year of conducting, supporting and communicating actionable science.

AK CASC HELLOS

Lia Ferguson

joined the AK CASC as a Science Communicator after completing the 2024 Regional Research Science Synthesis Team internship. She is based out of Fairbanks.

Jolene Auliye joined the AK CASC as Tribal Climate Resilience Liaison based in Shaktoolik, Alaska.

Andrew Maguire joined the National CASC Climate Adaptation Technical Services team based out of Anchorage.

Anna Spiers joined the AK CASC with the ORISE program. She is based out of Oakland, CA and works with wildfire data processing.

Sarah Clement joined the AK CASC as a Postdoctoral Fellow in climate program research and is based out of Fairbanks.

Gigi Friedman, Alexis Isherwood, Diego Noreña, and Taylor Saulsbury joined the AK CASC as Alaska Regional Science Synthesis Team interns during the summer of 2025. Diego and Taylor are based out of Juneau, and Gigi and Alexis are based out of Fairbanks. This year's report is mostly a result of their hard work!

LEADERSHIP

Kristin Timm has stepped into the role of AK CASC University Co-Director along with University Co-Director Scott Rupp. Kristin, a nationally renowned communication expert and scientist, started work with the AK CASC in 2012.

Landslide Resilience on Prince of Wales: Communities Prepare for a Shifting Future

By Alexis Isherwood

In late November 2023 torrential rain and fierce winds pummeled Southeast Alaska as a powerful storm system swept through the region. Already vulnerable from persistent wet weather, the saturated hillsides gave way, triggering destructive landslides that washed out roads and knocked out power across Prince of Wales Island. Nearly a year later in November 2024, the Tribal Resilience Learning Network worked with Klawock Cooperative Association to convene community meetings with local residents, scientists and emergency managers to discuss landslide risk and response on Prince of Wales Island. Through community meetings and site visits in Klawock, Hydaburg, Craig and Kasaan, Alaska CASC Tribal Liaisons and catalysts worked closely with partners from the Sitka Sound Science Center, RAND Corporation, Ecotrust, and the Central Council of Tlingit and Haida Indian Tribes of Alaska to better understand the threat of landslides and explore ways to prepare for future events.

These community meetings were made possible through the Strengthening Resilience Today project, a year-and-a-half-long training cohort led by the Tribal Resilience Learning Network. The project combines Indigenous Knowledge with climate science to create strategies for adapting to climate-related challenges, including the increasing risk of landslides. By fostering relationships among community leaders, scientists and emergency planners, the Strengthening Resilience Today Project equips local partners with tools to identify vulnerabilities and build long-term resilience.

Southeast Alaska is especially vulnerable to landslides due to its glacially carved landscape, steep slopes and thin soils. In this region, landslides are primarily triggered by intense rainfall from atmospheric rivers, narrow bands of moisture in the troposphere that deliver prolonged, heavy precipitation. Climate change is creating conditions for more frequent atmospheric rivers, increased precipitation, and heavier rainfall events that contribute to landslide activity. Warmer, wetter winters and more freeze-thaw cycles weaken slope stability while rising temperatures are causing more snow to fall as rain, increasing soil saturation. Oversaturated ground loses cohesion, making

slopes more prone to failure especially when strong winds dislodge trees and disturb the weakened soil. As a slide gains momentum, it can quickly become a serious hazard, damaging infrastructure, destroying homes and public facilities, and uprooting forests.

During the meetings residents voiced concerns over landslides cutting their communities off from essential services such as medical care and grocery stores. Landslides frequently shut down and damage roadways on Prince of Wales Island, requiring extensive repairs and disrupting daily life. In 2019 a landslide blocked the main road to the small town of Thorne Bay and the Haida village of Kasaan on eastern Prince of Wales. A hillside collapsed, cutting off the primary route in and out of the area. Although residents could still access the villages by boat or via a nearby logging road, the incident made travel difficult and dangerous, emphasizing the need for increased coordination and emergency planning amongst Tribes, municipalities, Native corporations, the U.S. Forest Service, Alaska Department of Transportation and Public Facilities, and other landowners on Prince of Wales.

The Alaska CASC has aimed to convene partners in this region to address landslide risk. Through its involvement in the Southeast Alaska Landslide Information and Preparedness Partnership, the center has collaborated to help unify efforts among Tribes, researchers, agencies and local governments to draft a strategic action plan for the region. Gabriel Wolken holds joint appointments with the Alaska CASC and the Alaska Division of Geological and Geophysical Surveys. He has contributed by working with the DGGs and USGS Landslide Hazards Program, which has a combined focus on landslide susceptibility and triggering. Part of this coordinated effort involves facilitating community-based development of early warning systems and deploying weather stations throughout the region to improve scientific understanding of hydrometeorological conditions associated with landslide occurrence. As climate change continues to increase landslide risk in the region, collaboration rooted in both science and local and Indigenous Knowledge will be essential. By building strong partnerships, sharing expertise and voicing community concerns, residents are laying the groundwork for a more resilient future.



◀ A 2019 landslide cuts off access to Kasaan and Thorne Bay blocking the island's main road and isolating residents from essential services and neighboring communities. UAF photo by Allison Bidlack, AK CASC.



◀ During the workshop, scientists and researchers from the AK CASC visit a landslide site on Prince of Wales Island to better understand the threats posed by unstable terrain. UAF photo by Allison Bidlack, AK CASC.

Reading Rings: Subfossil Wood Reveals a Glacier's Climate History

By Gigi Friedman

In 2023 Alaska CASC research ecologist Jeremy Littell, six students and a team of Juneau Icefield Research Program scientists skied miles across glaciers and ice ridges to follow up on a report of a five-needle pine tree dwelling in the forests that lined the Llewellyn Glacier. A finding of this species, known as the whitebark pine, would be biogeographically uncharacteristic to British Columbia's Juneau Icefield. The nearest known whitebark pines reside nearly 400 miles away. While crevasse hopping did not unveil the pine, the team stumbled upon something astounding: a preserved graveyard of weathered, centuries-old tree stumps.

The gnarled wood reveals information about the advance and retreat of tree lines across hundreds of years. Tree lines respond to changing climate and temperatures, inching forward and drawing back at the edges of their survival conditions. Using the preserved wood, the team could investigate past climatic conditions of the Juneau Icefield region, presenting the possibility of better understanding future glacier retreat.

When Littell and his team first set out to locate the whitebark pine, they weren't prepared to sample dead wood. The scientists, first calling themselves the "Treeple" in 2023, revisited the site in 2024 as the Treeple 2.0, collecting thirty-four samples of both dead subfossil wood and live wood. A question soon arose: what happened to these trees?

In the summer of 2024, Littell's team answered this question. Using a combination of dendrochronology, also known as tree ring science, and carbon-14 dating, the team roughly calculated the ages for their trees. C-14 dating works by using the predictable rate of decay of the isotope C-14. Trees soak up C-14 while alive and stop absorbing the isotope once they die. Comparing the amount of C-14 to the ratio of other carbon isotopes, namely carbon-12 and carbon-13, allows scientists to



▲Scientist Jeremy Littell at the USGS Alaska Science Center. UAF photo by Christian Thorsberg, AK CASC.

estimate the age of the wood. Using dendrochronology, the scientists analyzed how external factors, such as temperature or precipitation, may have impacted tree growth. Over the course of a year, most trees build a single ring that consists of a light early wood and dark late wood band. The team found temperature to be the primary limitation for growth. Higher summer maximum temperatures corresponded to greater growth.

Littell's team dated some subfossil wood samples to be around 1,000 years old. These trees would have existed during the Medieval Warm Period, a time where warmer temperatures permitted trees to establish themselves at slightly higher altitudes. The Little Ice Age disrupted the warmth with abrupt and rapid cooling. During this time, new seedlings probably could not germinate reliably at the higher altitude tree lines. The adult trees at these heights eventually died, littering their skeletons on the landscape. Trees didn't recolonize that altitude until around the 18th century, and then only sparsely, leaving the land unoccupied for several hundred years. Littell searched within the rings to identify a tree that bridged the two periods. However, the team didn't have a sample that convincingly overlapped the living and dead wood.

The search for this overlapping ring will continue during the summer 2025 expedition. Twenty years ago, other scientists visited this icefield and noted six trees that could fit the bill. If their records are correct, the next generation of Treeple will have the opportunity to build a 1,000 year chronological documentation of tree rings for the region. But first, the Treeple will have to find those trees.



▲Scientist Jeremy Littell studies wood through a microscope and displays tree ring samples collected throughout his expedition. UAF photo by Christian Thorsberg, AK CASC.

NORTHERN NOTES

AK CASC GOODBYES

We'd like to thank the following folks for their time at the AK CASC, and wish them luck in their next endeavors.

Katelyn Demoski has moved on from her position as Tribal Climate Resilience Liaison.

Megan Pittas has moved on from her position as Program Coordinator.

Carolyn Rosner has retired from her position as a web developer and communicator.

Christian Thorsberg has moved on from his position as a Science Communicator.

Jerilyn Kelly has moved on from her position as a Tribal Climate Resilience Liaison.

AK CASC ON AIR

Kevin White, AK CASC funded scientist, was interviewed on his project on avalanches as a driver of mountain goat mortality on CBC Yukon's "Midday Cafe" with Leonard Linklater.

Micah Hahn, AK CASC management team member, joined Alaska Public Media's "Line One" radio show to discuss the health impacts of wildfire smoke.

AK CASC Ambassadors Barbara Morgan and Charmaine Lewis confirmed the expansion of Invasive European Green Crab to Ketchikan. The crab's discovery was covered in a KRBD interview.

Meet Ambassador Hekia Bodwitch

By Taylor Saulsbury

In 2025, the Alaska CASC launched its inaugural Ambassadors Program to build new relationships with University of Alaska faculty across the system. Among the first cohort is Hekia Bodwitch, an Assistant Professor of Marine Policy at University of Alaska Southeast. Bodwitch's work centers Indigenous perspectives in state and federal fisheries decision-making. Her past has guided her to places all over the globe, from Californian farms, back to her maternal homeland of New Zealand and all the way to the Canadian Arctic, exploring how climate change research can be produced and improved in partnership with locals and Indigenous communities.



▲ AK CASC Ambassador Hekia Bodwitch. Photo courtesy of Hekia Bodwitch.

This past year, Bodwitch and her team—Alex Jenkins, a Ph.D. student at UAF, and Mia Siebenmorgen Cresswell, an undergraduate student at Dartmouth University—have been conducting interviews with community members, advisors and policymakers related to subsistence harvesting of salmon and other marine organisms. These discussions can inform changes needed to engage Indigenous Knowledge in marine policy. From these interviews she learned one of the ways to improve marine governance comes from having more voices at the table to interpret existing laws.

“When I ask community members to share their knowledge with me, I try to also bring information to share that is valuable to them,” Bodwitch said. “The more I learn about policy making processes, the better equipped I am to help others navigate any regulatory and political hurdles they might encounter.”

She expresses gratitude to the financial support she's received from the NSF EPSCOR Interface of Change project, as well as the Alaska CASC.

Featured publications

P. Bieniek, C. F. Waigl, U. S. Bhatt, T. J. Ballinger, R. T. Lader, C. Borries-Strigle, J. Hostler, E. Fischer, M. Burgard, E. Stevens, H. Strader. 2025. The impact of snowoff timing and associated atmospheric drivers on the Alaska wildfire season. *Earth Interactions*. 29:1: DOI: <https://doi.org/10.1175/EI-D-24-0001.1>.

J. Dann, S. Zwieback, P. Leonard, W. R. Bolton. 2025. Evaluating aufeis detection methods using Landsat imagery: Comparative assessment and recommendations. *Science of Remote Sensing*. 11: DOI: <https://doi.org/10.1016/j.srs.2025.100230>.

K.A. Fitzgerald, J. R. Bellmore, J. B. Fellman, M. L. H. Cheng, N. Boyles-Muehleck, C. E. Delbecq, J. A. Falke. 2024. Juvenile coho salmon growth differences track biennial pink salmon spawning patterns. *Freshwater Biology*. 69: 1583-1595. <https://onlinelibrary.wiley.com/doi/10.1111/fwb.14328>. DOI: <https://doi.org/10.1111/fwb.14328>.

▲ Find more publications at akcasc.org.

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▲ Kristin Reece takes water quality measurements at one of her field sites on the Chena River. UAF photo by Raven Dawson, CFOS.

Meet AK CASC Fellow Kristin Reece

By Diego Noreña



▲ AK CASC Fellow Kristin Reece. UAF photo by Erik Schoen, IARC.

Kristin Reece, an Alaska CASC Fellow and graduate student at the University of Alaska Fairbanks, brings a deep connection to both the land and the people of Alaska to her research. Originally from Selawik and raised in Fairbanks, Reece took a non-traditional path into science. She began her academic journey in early childhood education, eventually becoming a preschool director before deciding to return to school in 2019, this time to pursue a field she once found intimidating, science.

Reece first studied at Ilisagvik College, Alaska's only tribal college, where she earned an associate degree in allied health. That step opened the door to science, where she later joined the Biomedical Learning and Student Training program at UAF, where she was introduced to molecular genetics and ichthyology under the mentorship of Andrés Lopez and graduate student Maggie Harings. Although she initially resisted working with fish, she quickly became immersed in the world of environmental DNA, a method for studying organisms through genetic material found in water samples. She then began conducting research on salmon in the Yukon River Basin.

Today, Reece is conducting fieldwork on the Chena and Tanana Rivers under the mentorship of Erik Schoen and Andrés López, studying the predation of juvenile salmon and salmon eggs by species like northern pike and Arctic grayling. Her work combines eDNA sampling with genetic analysis of fish stomach contents to better understand predator-prey relationships, all while collaborating closely with Tribal communities. “I’m really excited to learn from their experience and their connection to land and learn all the observations and knowledge that they’re willing to share.”

For Reece, science is as much about the people as it is about the data. She leads outreach workshops for rural Alaska students, bringing lab techniques to riverbanks and showing Indigenous youth that they too have a place in science. “I didn’t see people like me in these spaces growing up,” she says. “Now I want to be that person for someone else.”



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