

Alaska Center for Climate Assessment and Preparedness

A NOAA RISA team



Image by David Csepp, NOAA

Annual Report

June 1, 2025 - May 31, 2026 of Award NA210AR4310314

Year in review

The Alaska Center for Climate Assessment and Preparedness (ACCAP) is an Alaska-based team working to build healthy and thriving communities, economies, and ecosystems. We have been working in Alaska for two decades, focusing on extreme events, preparedness, community resilience, and science communication.

This past year, through direct engagement, webinars, media, and other outreach activities, ACCAP has engaged with thousands of community members, industry professionals, researchers, Tribal representatives, educators, emergency managers, and government agencies across Alaska and beyond. By tailoring our work to specific locations and their needs, we serve as a reliable source of information, strengthen connections between partners, and support preparedness capacity.

The following report highlights some of the impacts ACCAP has on researchers, practitioners, and communities in Alaska in this performance period.

Meet the team



Sarah Trainor, director



Nathan Kettle, deputy director



Adelheid Herrmann, co-investigator



Alison Hayden, program manager, until September 2025



Brie Darr, program manager, April 2026 to July 2026

Rick Thoman, Alaska climate specialist



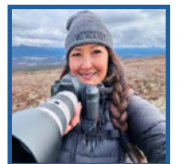
Zav Grabinski, geospatial analyst and data visualization specialist

Heather McFarland, science communications specialist, until May, 2026



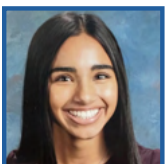
Caroline Erickson, research integration specialist

Crystal Frank-Welker, engagement specialist



Ed Plumb, weather and flood specialist

Eleanor Greenbaum, policy fellow, September 2025 to current



Anjali Shah, extreme weather and climate impacts fellow, September 2025 to June 2026

Tom Ballinger, climate scientist, October 2024 to current



Dan Bross, radio media specialist

Eva Burk, M.S. student



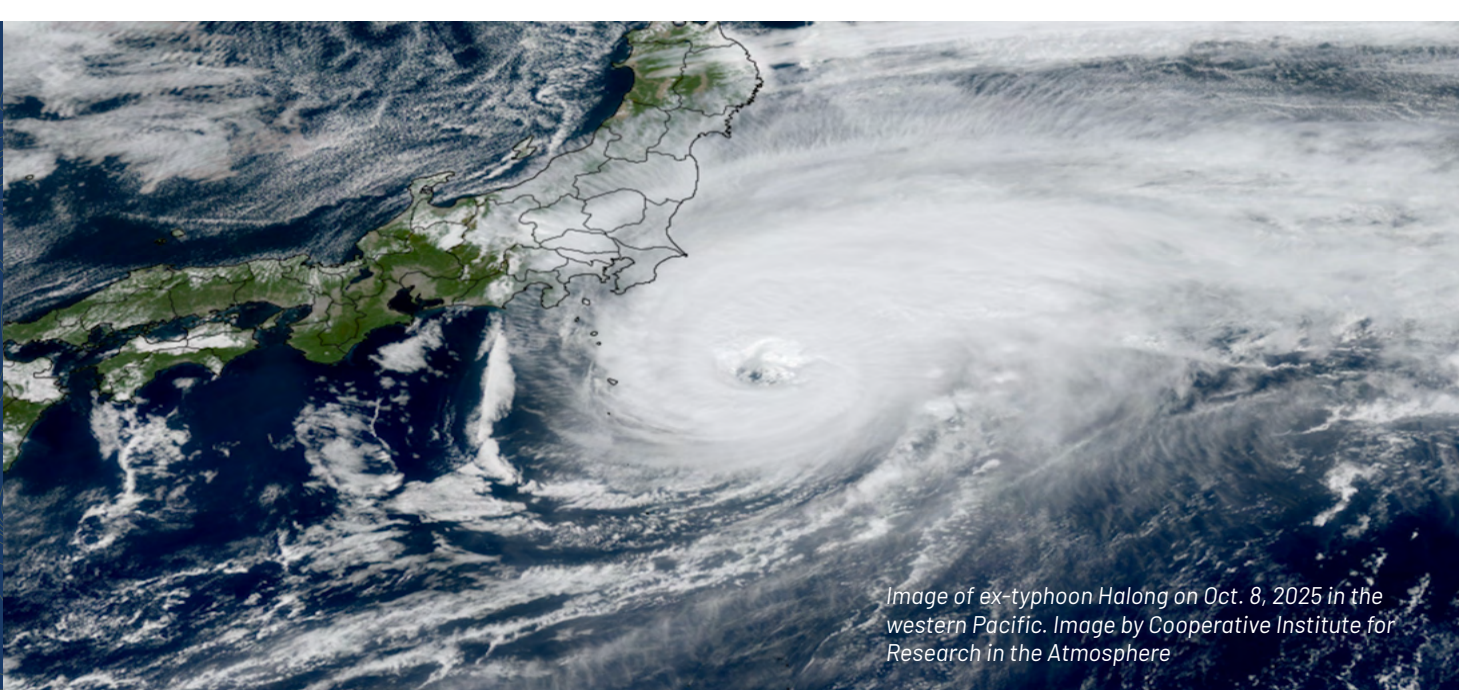


Image of ex-typhoon Halong on Oct. 8, 2025 in the western Pacific. Image by Cooperative Institute for Research in the Atmosphere

Ex-typhoon Halong: ACCAP's response to catastrophe

ACCAP leads: Rick Thoman, Ed Plumb, Heather McFarland

On October 11-12, 2025, ex-typhoon Halong produced the most impactful coastal flooding in history in parts of Southwest Alaska and wind damage across a much larger area. The communities of Kipnuk and Kwigillingok were almost entirely inundated by the highest recorded storm surge. One person died, two remain unaccounted for, and almost all residents were forced to spend the winter with family in other communities, including relocation to Anchorage. More than 1,500 people were relocated from more than a dozen communities.

ACCAP responded immediately to this catastrophe by raising awareness and through information sharing. Just two days after the storm, ACCAP team member Rick Thoman authored a widely reproduced article for "The Conversation" highlighting the meteorologic conditions, infrastructure damage, and community impacts of the

disaster. That article resulted in over 78,000 views. On November 13, Thoman and team member Ed Plumb provided one of the first public webinars reviewing the physical science aspects of the storm. With more than 240 registrations, this was one of the highest attended webinars in ACCAP's 19-year history.

Working with Thoman and Plumb, science communications specialist Heather McFarland produced a two-page factsheet that was in high demand at the Alaska Municipal League's annual meeting in early December, 2025. Thoman participated in panel discussions and provided presentations at the Tribal Climate Initiatives Gathering in January, 2026. Thoman and Plumb presented at the Alaska Forum in February, 2026, at Arctic Encounters and at the Western Alaska Interdisciplinary Science conference, both in April, 2026. These varied engagements highlight ACCAP's status as a trusted and reliable source of information about extreme events throughout Alaska.



Kipnuk, largely submerged by ex-typhoon Halong, on Oct. 12, 2025. Image by Alaska National Guard



About 300 residents were evacuated on Oct. 15, 2025 following Halong. Image by Alaska National Guard



Spring river break up in Galena. Image by National Weather Service

Building on the extreme events library

ACCAP leads: Rick Thoman, Anjali Shah, Ed Plumb; Project partners: Alaska Fellows Program

The frequency and intensity of extreme events like wildfires, landslides, harmful algal blooms, and coastal flooding are increasing in Alaska, yet historical records of events and their impacts are often incomplete and difficult to locate. ACCAP team member and Alaska Fellow, Anjali Shah, combed newspaper articles, disaster declarations, agency briefings, and other sources to create a suite of over a dozen outreach products that clearly communicate each event and its associated impacts.

The visually appealing products cover a variety of topics, including the 2025 ex- typhoon Halong that devastated parts of Western Alaska, the 1996 Miller's Reach Fire that burned over 300 structures near Houston, Alaska, and the 1980s flooding that caused widespread infrastructure damage in Southcentral Alaska. Documenting recent as well as historical events provides decision-makers and the general public with comprehensive information and context to reduce risk and enhance preparedness.

In addition to being available on the ACCAP website, the finished products were distributed at multiple meetings and conferences around the state and regionally relevant products were in high demand. The harmful algal bloom (HAB) fact sheet, for example, was well received at the Alaska Marine Science Symposium, with multiple researchers and community members expressing their enthusiasm for such a comprehensive and succinct document, as well as its potential uses in both research and community response.

Check out the extreme events library at <https://uaf-accap.org/projects/extreme-events-library/>

Harmful Algal Blooms

Overview

Harmful Algal Blooms (HABs) occur when certain phytoplankton species bloom and produce toxic compounds that accumulate in marine organisms when consumed. These toxins can cause diseases like Paralytic Shellfish Poisoning (PSP). In Alaska, the main source of these toxins is *Alexandrium catenella*, which releases Paralytic Shellfish Toxins (PSTs) that build up in shellfish, fish, birds, and marine mammals. Since 1975, at least 12 Alaskans have died from PSP – all during non-commercial harvests, indicating a disproportionate impact from subsistence and recreational harvests. Monitoring HABs requires funding for sampling and lab testing. This infrastructure is more established in urban-based regions with long-standing PSP activity like Southeast Alaska and Kodiak. However, warning systems are lacking in new HAB risks in Western Alaska, where laboratory and testing infrastructure is limited.

HAB formation: what is a bloom?

Alexandrium cells begin as **cysts** (Stage 1 in the figure above) in the seafloor, and can remain dormant for multiple decades. The cysts **germinate** (Stage 2) into a swimming stage when conditions such as water temperature, oxygen, nutrients, and light are right for growth. Then, they **rapidly divide** (Stage 3), increasing their cell concentration, sometimes producing and releasing **toxins** into the water column. Once conditions become unfavorable for growth, the cells stop dividing, reproduce, and re-enter the cyst stage, ready to bloom again (Stages 4, 5, 6). A "bloom" occurs when the cell concentration at Stage 3 surpasses **1,000 cells/liter (advisory limit)**. This is separate from the **regulatory limit**, which is a legally determined threshold of PSTs found in a marine organism's tissue above which consuming the organism may cause PSP. Both **advisory** and **regulatory** limits are used to inform communities of HAB-related risks.

HABs typically originate from U.S. National Office for Harmful Algal Blooms at Woods Hole Oceanographic Institution

Burned Area

Causes of Wildfire

Wildfires start when dry fuels are ignited by a spark. The spark can be natural (e.g., lightning) or human-caused. In the 1950s, the long, hot days in the summer contribute to wildfire with wind and low humidity air acting as accelerants. Approximately 38% of the Fairbanks North Star Borough has burned since 1947. However, there are large areas in the borough that remain untouched in part due to fire management that prioritizes protecting human life and property. Although this strategy is important for people and homes, it disrupts the boreal forest's natural burn cycle. As a result, these unburned areas contain more fuel which leads to greater risk of burning in the future. If fire management and policy should balance these competing forces.

Find up to Date Fire Information:

Please visit the **Alaska Wildland Fire Information** or the **Alaska Interagency Coordination Center** websites to learn more about current risks and past events

<https://afkfireinfo.com>
<https://fire.ak.state.gov>

Thanksgiving Day Storm

November 22, 1984

Overview

The Thanksgiving 1984 was exceptionally stormy in much of Southeast Alaska. A storm surge produced coastal inundations in areas unaccustomed to such flooding. High winds flipped airplanes, downed trees, caused widespread power outages, sunk boats, destroyed roads, and raised houses. Downtown Juneau experienced 32 mph wind gusts, the highest ever recorded. Residents recall cooking Thanksgiving turkeys on wood stoves due to power outages. In Tenakee Springs, nearly half the homes were either damaged or destroyed.

Weather Woes

The Thanksgiving Day storm was the 3rd in a series of storms to impact Southeast Alaska in late-November. The storm formed about 800 miles southwest of Sitka on November 21 and tracked rapidly northward. Sustained winds of 50-60 mph were recorded in Juneau. The storm coincided with the 1984 "King Tide," the highest astronomical tide of the year. The timing of this high tide was partially responsible for the coastal flooding that occurred during the storm.

Disaster Declared:

Nov 23 Tenakee Springs Mayor Debbie L. Schmitt declared disaster.

Nov 26 Governor Sheffield declared state disaster for impacted communities, requested for a Presidential disaster declaration.

Public & Individual assistance grants and temporary housing provided in Juneau, Yak, Sitka, Agassiz, and Tenakee Springs.

Total damages in the region estimated to be around \$3.4 million (in 1984 dollars).

Source: Images taken from a 1984 photo by Sitka

Weather and climate webinars reach thousands

ACCAP leads: Rick Thoman, Ed Plumb

ACCAP webinars are geared towards decision makers, emergency managers, community members, and the general public. Our goal is to communicate recent advancements and happenings with extreme events, climate, and weather, and improve access to clear and relevant guidance that helps reduce risk and supports better decision-making across the state.

During this performance period, ACCAP refined its webinar approach to focus more directly on preparedness, hazard awareness, and actionable information. This included increasing the frequency of webinars and emphasizing timely topics tied to recent events and practical tools, helping participants better understand how to apply weather and climate information in their daily lives and work.

These changes led to a significant increase in participation and engagement across the series. A standout example was the webinar "Adventurer Meets Expert: A Practical and Scientific Guide to Using Windy.com in Alaska," which focused on one of the most widely used weather tools in the state. The session highlighted both the strengths of the platform and common pitfalls that can lead to misinterpretation of forecast conditions for travel over land, water, and ice by multiple means, including foot, snowmachine, boat, and aircraft. It drew 643 registrations and 361 live attendees, by far the highest participation of any ACCAP webinar to date.

ACCAP's webinars are an established and trusted resource used by Alaskans to inform real-world decisions, from daily travel to seasonal planning. By delivering timely, practical, and trusted information, ACCAP webinars are helping communities, agencies, and organizations make safer, more informed decisions across Alaska.

By the numbers Oct 2025 - May 2026

19 webinars delivered

2,980 registrations

135 average registrations per webinar

40-60% of registrants watch live

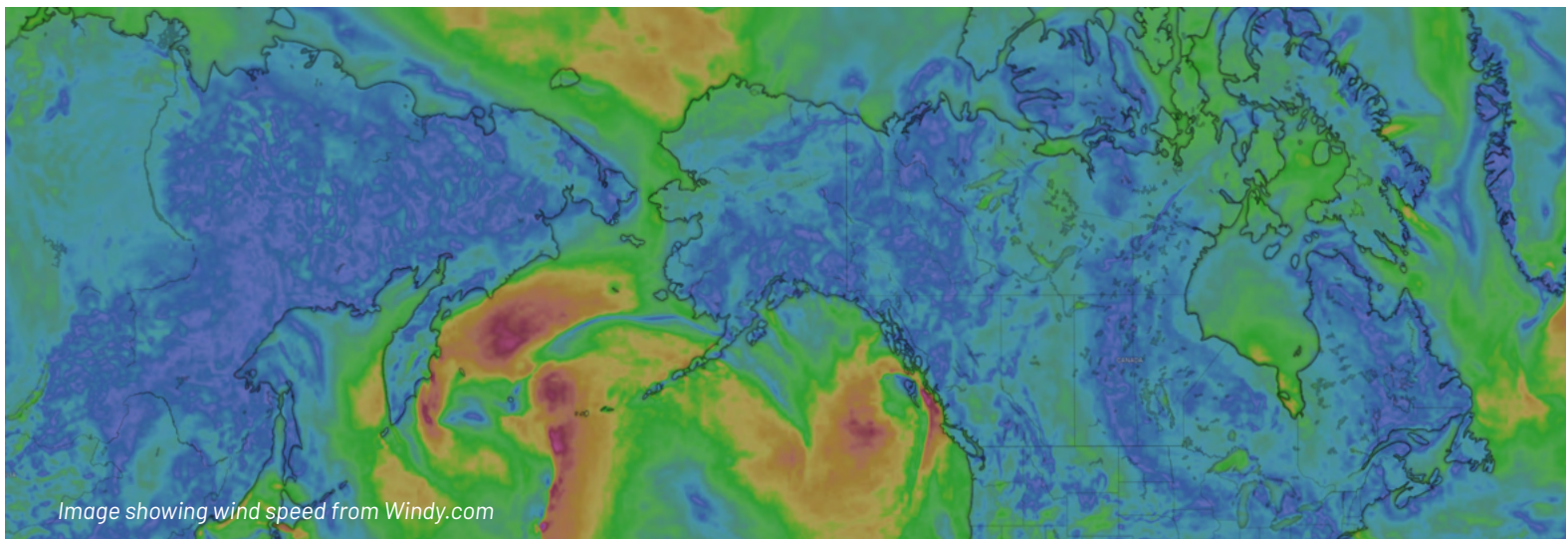
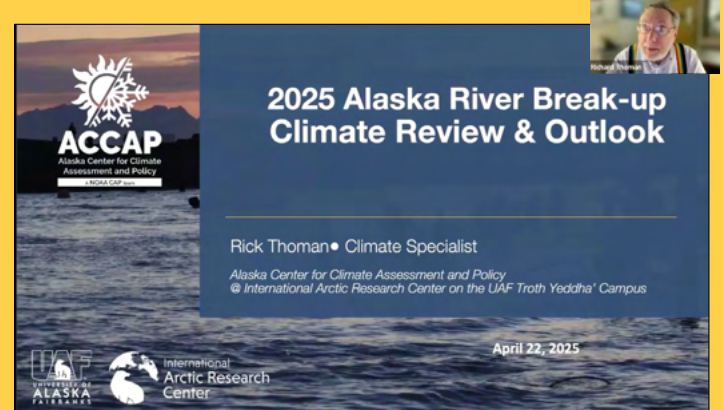




Image by S. Hillebrand, USFS

Alaska's most trusted public climate communicator

ACCAP leads: Rick Thoman, Dan Bross, Heather McFarland

During this performance period, Rick Thoman continued to serve as one of Alaska's most trusted public climate communicators through regular appearances across radio, podcasts, broadcast news, print media, and digital platforms. His outreach focuses on helping Alaskans understand weather extremes, climate trends, sea ice conditions, coastal storms, and seasonal forecasting in clear, locally relevant terms. His work supports informed decision-making and preparedness throughout the state.

Partnerships with public radio stations and regional media outlets strengthen access to locally relevant climate information across Interior, Western, and Southwest Alaska. Recurring appearances on public radio programs and podcasts increased public engagement with Arctic and sub-Arctic climate science. Rick's media work broadens understanding of rapidly changing environmental conditions affecting transportation, food harvest, infrastructure, and public safety.

Throughout the year, Thoman is featured on the weekly "Beyond the Weather" radio program and he contributes weekly climate segments to rural Alaska radio stations serving Nome, Bethel, Dillingham, and other communities. These broadcasts provide accessible, regionally specific explanations of rapidly changing conditions on the West Coast and in Interior Alaska.

In addition to broadcast media, Thoman maintains a strong public presence through newspaper columns, newsletters, and social media engagement. His commentary and expertise are widely cited by Alaska and national media outlets during significant weather and climate events, reinforcing his role as a key source of climate information for communities, policymakers, and journalists statewide.



ACCAP contributes to new research

Forecasting fire for managers

ACCAP team: Rick Thoman

As wildland fires in Alaska and its boreal forest become more extreme, preparing for the upcoming wildfire season has become increasingly challenging for fire managers. This study was developed to create summer fire outlooks in close collaboration with fire managers to address their need for early-season outlooks. These outlooks align with the timing of critical early-season decision-making by fire managers, including resource allocation and national coordination.

Borries-Strigle, C., Bhatt, U., Bieniek, P., Burgard, M., Stevens, E., Strader, H., Thoman, R., York, A., Ziel, R. (2025) *On using dynamical seasonal forecasts to develop management-driven wildland fire outlooks in Alaska*. *Climate Services*. <https://doi.org/10.1016/j.cliser.2025.100592>.



Image by NSFWS

Insights from ex-typhoon Halong, an Arctic cyclone of tropical origin

ACCAP team: Rick Thoman and former ACCAP climate scientist John Walsh

Ex-typhoon Halong on October 11-12, 2026, was the most impactful coastal storm in history in parts of Southwest Alaska. Devastating flooding from storm surge and strong winds resulted in significant impacts to dozens of communities, including loss of life, infrastructure damage, and the displacement of 1,500 people for an indefinite period. Research efforts to better understand the physics that drove Halong began very soon after the storm.

This model-based work showed that elevated sea surface temperatures in the north Pacific Ocean and southern Bering Sea resulted in the storm becoming more intense than it would have otherwise been in the presence of historically typical ocean temperatures. The paper also documents an increase in recent decades in the number of storms originating at tropical or subtropical latitudes that reach Alaskan waters.

Yang, M., Wang, Z., Walsh, J., Doyle, J., Thoman, R., DuVivier, A. (2025) *Insights from Ex-Typhoon Halong (2025) – An Arctic Cyclone of Tropical Origin*. *Bulletin of the American Meteorological Society*. <https://doi.org/10.1175/BAMS-D-26-0004.1>.

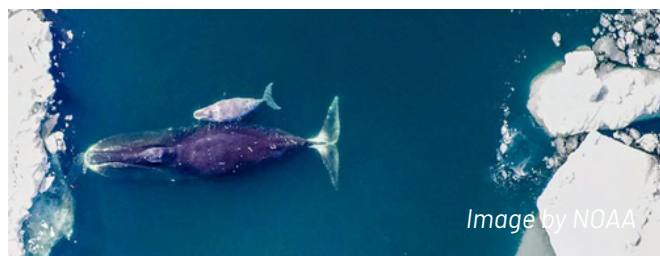


Image by NOAA

Bowhead whale feces link toxic algal blooms in the Arctic to ocean warming

ACCAP leads: Rick Thoman

Over the last two decades, ocean warming and rapid loss of sea ice have dramatically altered the Pacific Arctic marine environment. These changes are predicted to increase the prevalence and toxicity of harmful algal blooms. Analysis of bowhead whale feces shows that more toxins from typically warm-water toxic algae species are entering Arctic food webs as northern oceans warm and lose sea ice.

This study also provides converging biological, oceanographic, and atmospheric evidence that warming Arctic conditions are associated with increasing algal toxin exposure within marine food webs. Rising toxin levels may have implications not only for Arctic wildlife but also for Indigenous communities in Alaska that depend on marine resources for subsistence and food security.

Lefebvre, K., Charapata, P., Stimmelmayer, R., Lin, P., Pickart, R., Hubbard, K., Bill, B., Sheffield, G., Bowers, E., Anderson, D., Fachon, E., Thoman, R. (2025) *Bowhead whale faeces link increasing algal toxins in the Arctic to ocean warming*. *Nature*. <https://doi.org/10.1038/s41586-025-09230-5>.

Achieving success in the co-production of knowledge

ACCAP team: Sarah Trainor, former PhD student, Margaret Rudolf; Project partner: Figus Consulting LLC

Co-production of knowledge is a process of bringing together diverse perspectives from researchers, agencies, and community partners to achieve a shared research goal. ACCAP research examined co-production of knowledge as a collaborative approach and provided a framework for research with Alaska Native communities.

Rudolf, M., Trainor, S., O'Connor, J., Figus, E., Humm, R. (2025) *Multi-faceted perspectives of success: factors to achieving co-production of knowledge across cultures*. *Community Science*. <https://doi.org/10.1029/2023CSJ000074>.

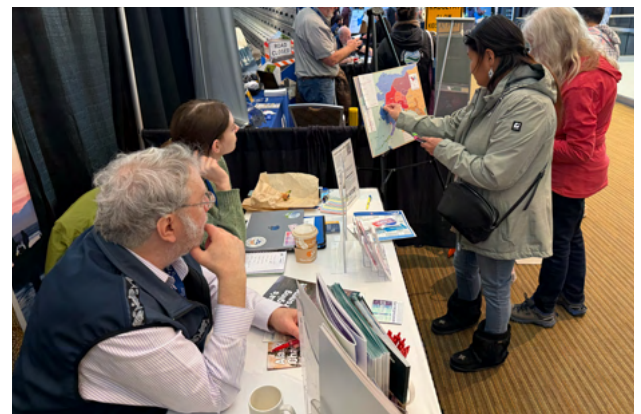
Supporting partners, leaders, and managers

Many Alaska communities face increasing risks from extreme events, such as coastal storms, flooding, and wildfire, while also navigating limited local capacity and limited funding support. Aware of people's busy schedules, ACCAP meets people where they are engaging with state and local government officials, including those from rural Alaska communities, with exhibit booths and presentations at state and regional conferences. In such a large state, we find this approach successful in learning about local needs and in developing new project partners.

Conference attendance created space for direct, two-way conversations with state, regional, and local emergency managers, community leaders, researchers, industry partners, and Tribal organizations about locally relevant hazards and preparedness needs. Themes from these conversations included the need for accessible data, locally relevant scenario planning, and stronger partnerships to support preparedness capacity among state, Tribal, and local partners. These themes reinforced the importance of ACCAP's role as a bridge between science and community decision-making.

Providing space for conversations

- A booth at the [Alaska Municipal League Annual Conference](#) provided ACCAP with an understanding of which environmental stressors communities are concerned about by region and enabled several in-depth discussions about key concerns, inspiring potential future projects.
- Attendance at the [Alaska Division of Homeland Security and Emergency Management's Annual Emergency Management Conference](#) supported relationship-building with local leaders and emergency management professionals.
- The [Western Alaska Interdisciplinary Science Conference](#) brought together rural residents from the region and other parts of the State, as well as researchers, scientists, and practitioners. ACCAP members presented on research and observed the emergency preparedness needs expressed by attendants.
- Rick Thoman's invited keynote presentation at the [Mat-Su Salmon Science & Conservation Symposium](#) focused on environmental changes of particular importance to salmon in this region's complex environment.
- ACCAP staff attended the [Climate Initiatives Tribal Gathering: Research Partnerships and Knowledge Sharing](#) meeting, which brought together Tribal representatives from villages and regions across Alaska, as well as researchers and practitioners, to exchange knowledge on climate change and other environmental challenges. Participation in this meeting helped to shape ACCAP's future preparedness, engagement, and partnership activities across Alaska.
- At the [Alaska Forum](#) conference, ACCAP hosted a booth and presented on extreme events, including ex-typhoon Halong, wildfire change, and gaps in weather observations. ACCAP drew strong engagement, which highlighted the value of integrating scientific analysis with local knowledge and lived experience to inform preparedness.



Alaskan's rely on ACCAP's trustworthy and consistent work

Tools and information for decision-making

ACCAP provides location-specific information that directly informs decisions in energy infrastructure maintenance and siting, rural infrastructure projects, and prioritizations in emergency preparedness, such as staging resources to respond to spring river break-up.

The ripple effects of this work include limiting injuries or loss of life, reducing idle crews unable to work in inclement weather, creating beneficial conditions for subsistence and commercial hunting and fishing, and enabling rapid response capabilities for emergency response and/or disaster recovery.

Following ACCAP's "Alaska Spring River Breakup Outlook" webinar, a military weather official at Joint Base Elmendorf-Richardson reported that information presented during the webinar prompted him to alert senior leadership to potential flood risk in a Yukon River community. The participant noted that *"the information provided yesterday was extremely valuable and actions are being planned now to help protect lives and real property."*

Staff from the Alaska Maritime National Wildlife Refuge described ACCAP's January 2026 webinar on weather forecasting tools as *"extremely valuable for those of us conducting field work in remote parts of Alaska"* and requested a downloadable version for use in training personnel deployed to remote field camps with limited internet access.

One interviewee living in rural Alaska, who contributed to ACCAP's five-year program evaluation, said that *"the information ACCAP puts out is absolutely necessary to this region as it's the only regionally 'customized' information we get through Rick Thoman, who understands the region, the region's weather, and the region's need as we are so underserved by so many government services."*

Understanding how to work in rural Alaska and with tribal communities

The brochure developed by Adelheid Herrmann, ACCAP's Senior Research Professional, titled "Landscape of Tribal Communities: Context for working in Rural Alaska," provides a roadmap for researchers, state, and federal agencies, or other organizations working in rural Alaska to navigate that complex landscape. Those living in rural Alaska can use it to inform others.

A community wildfire resilience and workforce coordinator with the Alaska Venture Fund commented, *"regarding the Tribal Landscapes brochure, I find it to be an invaluable resource. I frequently use it to provide a baseline understanding of Tribal communities for partners and individuals who have not lived in one. It is an essential tool for our discussions and collaborations, as it helps foster a much deeper understanding of life in much of Alaska."*



Biologists return to the R/V Tiglax from Umnak Island.
Image by USFWS

Five-year external evaluation summary of findings

- ACCAP has become one of Alaska's most trusted climate and weather communication hubs. But ACCAP is not just a communicator — it is an essential element of the infrastructure for preparedness literacy in Alaska.
- ACCAP advanced local resilience through meaningful partnerships and capacity building, and as such is becoming a trusted bridge between university-based science and local knowledge.
- ACCAP has strengthened Alaska's extreme events understanding, preparedness and forecasting capability and frequently functions as a force multiplier for federal agencies and other entities responding to accelerating environmental change and extremes.
- ACCAP launched a catalytic Small Grants Program, which demonstrated that small, flexible investments can produce outsized preparedness gains.
- Through all of its ongoing work over the past five years and its two-decade-long existence, ACCAP has built a distinct regional identity as communicator, innovator, collaborator, and capacity builder.

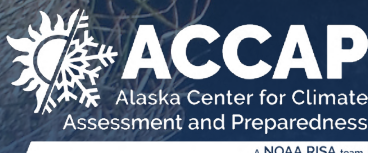
Conclusion

ACCAP's work this year highlights the value of extreme events research and outreach, support for community resilience, and accessible resources on a changing environment. Our experts are a trusted source of information with deep local and lived experience, and strong relationships within communities. ACCAP remains committed to producing actionable science and usable products that communities, leaders, and researchers can use in preparedness and decision-making.



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Contact ACCAP at uaf-accap@alaska.edu



International
Arctic Research
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