



Keeping the public safe...

- by identifying causes and timing of natural hazards, such as floods, avalanches, landslides and wildfires.
- by connecting people across the state to monitor ice conditions for safe winter travel.
- by communicating hazards to local and state governments and the public.

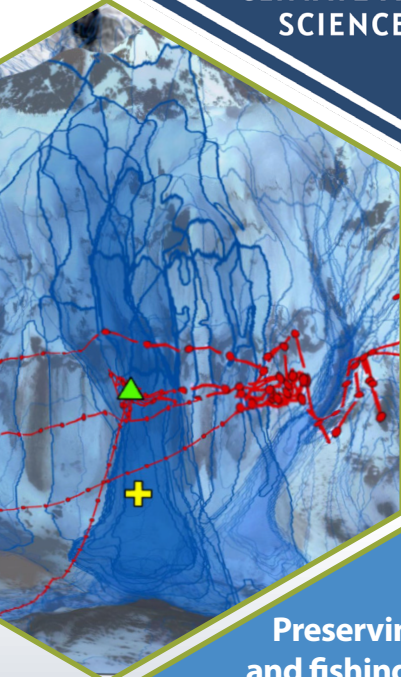
We protect Alaskans.



Securing infrastructure...

- by providing data-based predictions to optimize longevity and safety of new and existing infrastructure.
- by integrating information about weather extremes into construction planning.
- by developing localized climate models to support decision-makers.

We provide the necessary data.



Serving Federally Recognized Tribes...

- by facilitating a collaborative network to share climate adaptation challenges, strategies and resources.
- by partnering to protect fish and wildlife resources.
- by providing information and training to community leaders.

We help the state adapt.

Preserving hunting and fishing resources...

- by monitoring wildlife health and migration to understand climate driven changes in patterns.
- by investigating the health of rivers and salmon fisheries across the state.
- by creating ecosystem models to predict population booms and busts.

We support food security.



Developing a workforce...

- of scientists equipped to partner with agencies and Tribes to address their science needs.
- of science communication experts who translate data and research for decision-makers and the public.

We are Alaska's source for climate science.



AK CASC HISTORY HIGHLIGHTS

By investing in students, we invest in the state.

One of the program's first graduate research assistants, Rick Lader is now research faculty and has continued to produce downscaled climate projections for the state of Alaska over the last 15 years, including high resolution downscaled climate models for Southeast Alaska. Working with other modellers and Juneau-based ecologist Allison Bidlack, Lader created his dataset using downscaling techniques that modeled more complex environmental factors like snow depth and cover, albedo, sea-level pressure and surface winds.

By listening we improve our work.

The Northern Climate Report is a data tool that makes climate data easily accessible and interpretable for communities across Alaska. In response to user requests, the tool was adapted to include traditional place names, ethnolinguistic regions, corporation lands, First Nations traditional territories and protected areas. With this added information, the tool better provides information summaries over areas important to Tribal groups.



Visit the Northern Climate Reports web tool

15 years of climate adaptation in Alaska

Alaska and the Arctic have been facing climate changes at a more rapid rate than the rest of the country and globe. These changes, while experienced and deeply felt by Alaska's populations, were poorly understood due to the region's data scarcity and relatively small population size. Established in 2010, the Alaska Climate Adaptation Science Center began working to fill that information gap and provide resources for regional, actionable science.

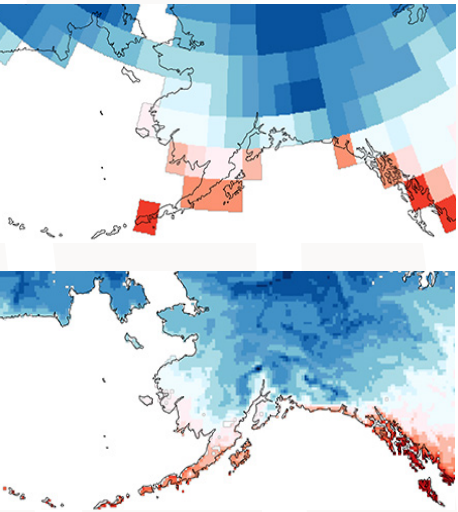
Understanding Needs

The core of our mission is to provide actionable science that directly addresses the adaptation needs of Alaskans. From it's inception, the Alaska CASC has provided the capacity to identify those diverse needs and communicate our findings back to communities, a process that requires extended collaborative efforts.

The Alaska CASC works with federal agencies, land managers and Tribal partners to ensure climate research is both useful and actionable. Partnerships with Department of Interior agencies such as the USGS, NPS, USFWS and BLM as well as other agencies like NOAA and the US Forest Service help align science with management needs across Alaska's lands and waters. The Alaska CASC also engages directly with Tribal governments and communities through the Tribal Resilience Learning Network, a community of learning, sharing and technical support, and through its Catalysts program, which fosters long-term relationships with Tribal organizations and communities in Southeast and Interior Alaska. These partnerships connect ongoing projects and emerging needs with scientific expertise, building trust and continuity that lead to stronger science, more effective adaptation strategies, and lasting resilience across the state.

The Information Gap

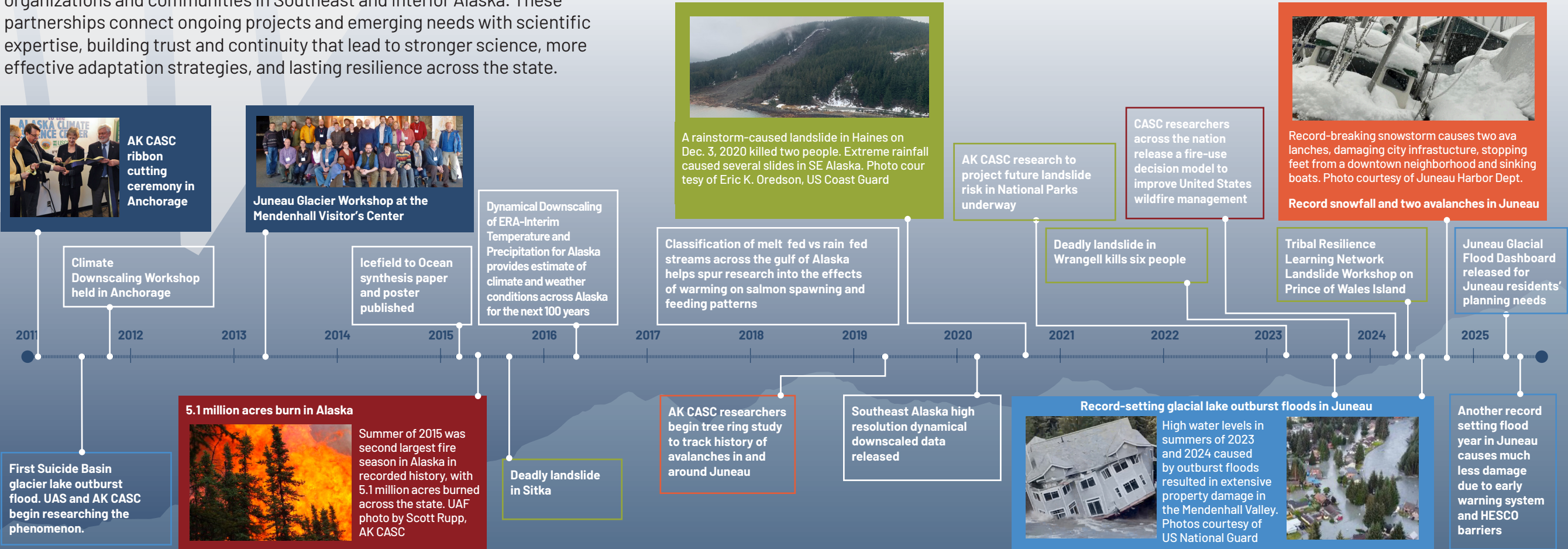
One of the Alaska CASC's longest running efforts has been to provide high quality and high resolution downscaled climate projections for the state. Alaska's complex topography, with its extensive coastlines, thousands of islands, and mountain ranges that contain the tallest peaks in North America have a strong influence on temperature and precipitation. Downscaling, the process of increasing the resolution of globally available climate data to adequately detect local landscape features (demonstrated left), can improve the quality of simulations of past and future climate conditions.



The Alaska CASC in conjunction with the Scenarios Network for Alaska + Arctic Planning, has been engaged in downscaling efforts since our inception in 2010. Among the first goals of the emerging Alaska CASC was to help train a workforce of modellers and scientists who could advance regional climate understanding. Higher resolution projections and added layers of environmental variables have allowed scientists and managers to study extreme weather occurrences like atmospheric rivers, floods and drought, which all contribute to the rapid changes and increasing hazards facing Southeast Alaskans.

Meeting Needs: Geohazards & Infrastructure

Extreme events like landslides, avalanches, floods and fires are becoming more frequent in regions of the state due to climatic changes. As climate warming continues, there is an expectation of an increase in Alaska's vulnerability to these events. Over the last 15 years, the Alaska CASC has been working to understand and predict these changes, as well as compile the network necessary to respond by cooperating across Tribal organizations, universities, State and Federal agencies, and local governments. Alaska CASC research and collaborations have helped create hazard maps, critical communications and planning tools .



Meeting Needs: Hunting, Fishing & Subsistence



Field researchers measure the length of a young salmonid as part of a project that monitors movement between streams at various life stages. UAF photo by Lia Ferguson, AK CASC

In Alaska, food security is closely tied to healthy ecosystems and reliable access to subsistence resources such as fish, marine mammals, caribou and berries. Alaska CASC-funded research helps us understand how climate-driven changes including extreme events, shifting species ranges, permafrost thaw and altered wildfire regimes affect the availability, quality and timing of these foods. Projects combine ecological science with Indigenous Knowledge to provide a larger picture of how climate change impacts local food systems.

- Projects monitoring berries, a key nutritional and cultural food, track how changes in temperature, precipitation and wildfire alter berry abundance and availability.
- Research on fisheries explores how warming oceans, changing streamflows and shifting habitats affect salmon and other fish species that are central to diets, economies and cultural practices across the state.
- Studies of caribou examine how altered migration routes, forage availability and increased insect harassment under warmer conditions impact access to this vital subsistence resource.

AK CASC & SNAP DATA TOOLS

By going the last mile, we bring our science to Alaskans.



Juneau Glacial Flood Dashboard



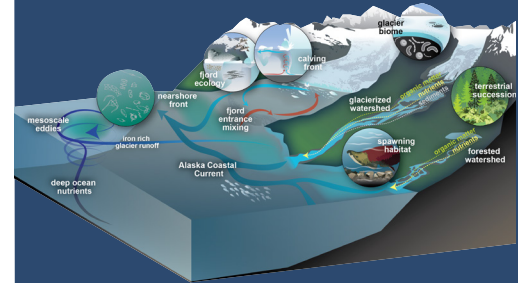
Alaska Wildfire Explorer



Arctic Data Collaborative

AK CASC HISTORY HIGHLIGHTS

By collaborating we make our research more applicable.



Icefield to Ocean was an interdisciplinary research project that started in 2013 and resulted in a widely read synthesis paper and award-winning poster (diagram pictured above). The project focused on understanding how climate-driven changes in Alaska's coastal and glacial systems affect ecosystems, communities and the broader Earth system.

Glaciers, rivers, estuaries and oceans don't operate in isolation and require the connection of expertise across scales, from molecules in meltwater to fisheries that sustain communities. By collaborating, we were better able to address community needs through an understanding of the bigger picture.

