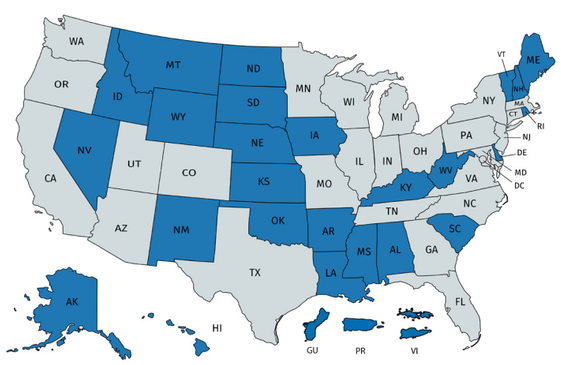
What is Alaska EPSCoR?

NSF EPSCoR

The National Science Foundation Established Program to Stimulate Competitive Research (NSF EPSCoR) is a nationwide research and outreach program established by Congress in 1978. Through EPSCoR, the NSF provides additional support to states and territories that receive smaller amounts of NSF funding. 28 states and territories currently meet this criteria. Funding programs (see timeline below) include:

Track-1 awards support large-scale, complex research and outreach programs within a single EPSCoR jurisdiction.



Current EPSCoR states and territories.

Track-2 awards go to teams of researchers from multiple EPSCoR jurisdictions working on a single project.

Track-3 awards were given to projects by EPSCoR jurisdictions to broaden participation of underrepresented groups in STEM.

Track-4 awards fund researchers in EPSCoR jurisdictions to undertake collaborations with major research centers.

RII-C2 awards funded cyberconnectivity improvements in EPSCoR jurisdictions.

Current Project

Our current Track-1 project, **Fire and Ice** (2018-23) examines the causes and impacts of changes to two key Alaskan ecological systems. A Boreal Fires team is identifying climate drivers relevant to fire weather, using hyperspectral sensing to better map and measure fuel condition and active fire behavior, and conducting research into fire management and impacts of fire to ecosystem services. A Coastal Margins team studies how climate change impacts physical and chemical conditions in the nearshore Gulf of Alaska, and how these changes in turn affect marine life and resource users.

Undergraduate researchers Emily Williamson and Brian Zhang conduct a beach seine in Kachemak Bay.

Alaska NSF EPSCoR is also implementing **Teaching Through Technologies** (2017-20), a nationwide program to excite high-schoolers about STEM using UAV's, 3-D printers and programmable digital devices. The award follows a 2014-17 Track-3 award.

In addition, seven University of Alaska researchers are currently implementing NSF EPSCoR **Track-4** awards, and another is implementing a **Track-2** award.

Impacts to Alaska

Funding: About $50 million in major NSF EPSCoR funding has leveraged about $160 million in funds from other sources.

Personnel: Alaska NSF EPSCoR has hired 33 UA faculty members; funded more than 600 graduate and undergraduate student reserachers; and supported hundreds of UA researchers.

Fire and Ice Project Director Pips Veazey leads a discussion in Vis Space, a UAF visualization room created with NSF EPSCoR support.

Infrastructure: Improvements include a "cold room" and climate- controlled laboratories, major lab instrumentation, sensor networks, and new UAF visualization and development spaces.

Institutional Culture: Alaska NSF EPSCoR has raised the profile of Univerity of Alaska research, catalyzed support for increased UA social-ecological and interdisciplinary science and outreach, and bolstered research capacity across the UA system.

Results: Alaska NSF EPSCoR researchers have authored more than 600 academic publications.

Timeline

2001 — 2005 — 2010 — 2015 — 2020 — 2023

2001-2004:

Phase I focused on:

- Cold regions engineering
- High-latitude environmental contaminants
- Environmental physiology
- Genome diversity

2004-2007:

Phase II focused on:

- Cold regions engineering
- Environmental physiology
- Arctic population genetics

2007-2012:

Phase III focused on resilience and vulnerability of northern environments through disciplinary components linked by an interdisciplinary Integration Core:

- Physical Science
- Biology
- Social Science

2009-2012:

A "Track-2" project, the Pacific Area Climate Monitoring and Analysis Network (PACMAN), partnered with Hawaii EPSCoR to improve climate monitoring and modeling.

2011-2013:

An "RII C2" cyberconnectivity award improved connectivity and visualization at UAA and UAF.

2012-2018:

Phase IV, "Alaskan Adapting to Changing Environments (Alaska ACE)," focused on the adaptation of Alaskan communities to landscape and hydrologic change and consisted of regional components linked by a statewide coordinating group:

- The Southeast Test Case
- The Southcentral Test Case
- The Northern Test Case

2014-2017:

A "Track-3" project, "The Modern Blanket Toss," used unmanned aerial vehicles (UAVs) to excite a group of rural Alaskan high-school students about STEM fields.

2017-2020:

A followup award to "The Modern Blanket Toss" expands the program nationwide and incorporates 3-D printers and programmable computers in addition to UAVs.

2017-2023:

Eight UA researchers are using "Track-4" awards (7) and "Track-2 awards (1) to partner with researchers at Lower 48 institutions.

2018-2023:

Phase V, "Fire and Ice," focuses on two crucial Alaskan ecosystems undergoing change:

- A Boreal Fires Team studies changes to fire risk and behavior in Alaska's boreal forest.
- A Coastal Margins team examines changes to nearshore biological communities in the Gulf of Alaska.

www.alaska.edu/epscor

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