

# Alaska (University of Alaska Fairbanks) Annual Report - FY2025

## Report Status: Approved as of 06/22/2026

### Contributing Organizations

---

University of Alaska Fairbanks

### Executive Summary

---

#### Overview

Alaska is recognized for its immense size and diffuse population. It's a state with unique cultural, geographic and environmental elements. The state represents a major region of renewable and nonrenewable natural resources in the United States. Its 365 million acres include the nation's largest oil reserves, coal deposits and the two largest national forests. Alaska has a multifaceted geography that offers soils for production of food, fiber and biomass fuels as well as a multitude of recreational and tourism activities. The vast stretches of boreal forest offer insight into arctic ecology, tree growth trends and the effects of extreme weather.

Alaska's natural resources have historically been the foundation of the state's economy, though resource industries have been mostly extractive in nature. The use and management of these resources is a predominant force in the planning and delivery of any teaching, research, extension and engagement programs. The University of Alaska Fairbanks (UAF) in general and its Agricultural and Forestry Experiment Station (AFES) and Cooperative Extension Service (CES), in particular, meet the challenges of increasing demands for research, education, outreach and community engagement relevant to sustainable management of Alaska's resources. AFES and CES bring community ideas to the university for further development of the state's resources.

The Alaska Department of Labor and Workforce Development projects that Alaska's population will increase by almost 25,000 people by 2050. As the population grows, more locally and regionally produced food will be needed to provide greater food security. Many Alaskans live a subsistence lifestyle or supplement their diets with fish, game meat, berries, herbs and other local foods. Alaska also has a large military population, and many have not previously preserved game meat or fish. Alaska has one of the nation's highest rates of botulism, so it is imperative to provide much-needed information on safe preservation of dietary staples.

Alaska also has one of the fastest-growing senior populations, which faces the challenge of remaining active and healthy in a demanding environment. Other concerns that define health and nutrition programming are the high rates of child and adult obesity and diabetes. Due to high levels of fine particulate matter that occur during Alaska's cold winters, and high levels of radon detected in some areas, indoor air quality has remained a particular Alaska concern.

High energy costs remained a critical issue in FY25, particularly in rural Alaska, where fuel oil runs \$8 or \$9 a gallon. Research and outreach focused on new and alternative sources of energy, energy conservation and biomass. AFES worked to provide new information to manage renewable resources and to improve technology for enhancing the economic well-being and quality of life at high latitudes. When foresters, farmers and land managers use research results, all Alaskans benefit from the wise use of land resources. Research projects responded to requests from producers, industries, and state and federal agencies for information on plant, animal and soil sciences, forest sciences and resource management.

AFES priorities, like national priorities, are to enhance sustainability of food and agricultural systems; adapt to and mitigate the impacts of climate change; support energy security through the development of renewable natural resources; ensure a safe, secure and abundant food supply; improve human health, nutrition and wellness; support environmental stewardship through the development of sustainable management practices; and strengthen individual, family and community development and resilience. Experiment station researchers will continue to publish research in scientific journals, conference

proceedings, books, and in newsletters, research progress reports and other miscellaneous publications. Scientists will also disseminate their findings through conferences, public presentations, workshops, field days and mediated platforms like websites and blogs.

The mission of CES, on the other hand, is to use research-based knowledge to educate, engage and support the people and communities of Alaska, connecting them with their university. CES provided factual and practical information while bringing Alaskans' issues and challenges to the university. CES is committed to promoting the sustainability and economic security of individuals, families and communities by providing practical, non-formal education, including conferences, workshops and cooperative work with community, regional and tribal partners. Outreach was also provided through numbered publications, faculty consultations, newsletters, blogs and social media platforms like Facebook and Instagram pages and YouTube channels.

CES priorities addressed national priorities by helping families, youth and individuals be physically, mentally and emotionally healthy; enhancing workforce preparation and life skills; strengthening food safety and security; and fostering greater energy independence. Programming incorporates cultural relevance and is responsive to emerging stakeholder needs and interests. Programs result from client requests, various regional and subject matter advisory groups, surveys and needs assessments. Collaborations continued with other universities and with other units within UAF, the University of Alaska statewide system, federal and state agencies, nongovernmental organizations and private industry.

Stakeholders included K-12 students, higher education students, researchers, individuals, businesses, industry, government, nongovernmental organizations, and families and communities throughout Alaska, the circumpolar North and the nation. The combined efforts of AFES and CES brought the university to Alaskans while bringing community concerns and issues back to the university. State-defined critical issues linked specific public needs with our broad mission in order to allow the concentration of resources (money and people) that promoted high-quality work. Critical issues were used to provide guidance for faculty, staff and administrators to direct current and new programs and find or retain faculty expertise.

The next section of this summary explains the rationale driving a five-year focus on four critical issues: 4-H & Youth Development; Agriculture & Food Security; Healthy Individuals, Families & Communities; and Natural Resources Management.

#### **Critical Issue: 4-H & Youth Development**

Research shows that youth need sustained, healthy relationships with adults in order to thrive. CES continued to promote positive youth development through education with a focus on leadership skills, using the 4-H mission mandates of science, citizenship and healthy living. Organized 4-H clubs, school enrichment programs, after-school activities and summer camps continued to achieve youth development goals.

Alaska's 4-H program focuses on supporting the healthy maturation of youth from childhood to adulthood. Training throughout the state, promoting life skills, and using national 4-H models of youth development were the foundations of all youth development programming.

#### **Critical Issue: Agriculture & Food Security**

Alaska imports over 90 percent of foods and other agricultural products consumed in the state. Growers' products are primarily for in-state consumption and use, including fresh market potatoes, forages, grains and other livestock feeds, greenhouse flowers and vegetables and a variety of "niche market" crops and products. Commercial horticulture includes cut flower and peony production, greenhouse operations, turf management, lawn maintenance and sod production. Proper knowledge and planning of soil-disturbing activities can prevent major impacts on other resources. Peonies are a high-value specialty crop, and both CES and AFES faculty worked with Alaskan growers to develop best practices.

Extension continued to reach out to all Alaskans to provide community-based support for food security. Partnerships were leveraged with the Alaska Food Policy Council, the Alaska Farmers Market Association, and the State of Alaska Division of Public Health to deliver food security outreach throughout Alaska.

Animal enterprises in Alaska include dairy, beef, swine, reindeer, poultry and nontraditional livestock such as muskox, yak and bison. Agriculture research addressed areas of animal agriculture, home animal production, agronomic crops including oil seeds and cover crops, and home and commercial vegetable production. Agricultural soils, fertilizer and compost research

and outreach were also part of this program area. We provided pesticide applicator certification courses and Master Gardener courses. Our statewide Integrated Pest Management (IPM) education program has operated since 1981 and assisted individuals in understanding invasive pests and control options.

Agriculture outreach included the primary areas of animal agriculture, animal health, horticulture, soil science and agroforestry. As Alaska expands its in-state consumption and export markets, producers will require increasing access to research-derived information specific to northern latitude environments and knowledge applied from research in other states.

#### **Critical Issue: Healthy Individuals, Families & Communities**

Concerns for Alaskans included high rates of obesity and recurring food safety issues such as botulism. Food safety programming encompassed food preservation, safety and preparation. Food safety education utilized various resources and strategies to ensure that all types of foods are properly stored, prepared and preserved so that food is safe for consumption.

CES offered programming both virtually and face-to-face across the state to meet stakeholders in their communities. CES offered cottage food courses as well as workshops on preservation methods, from canning or fermenting to freezing. Rural locations were supported by the continued maritime Extension program that brought canner gauge testing and preservation education to remote communities by boat.

Nutrition outreach addressed childhood obesity with nutrition education in after-school programs and nutritional programs in community venues as well as cooking programs that emphasize preparing healthy foods. Extension's EFNEP and SNAP-Ed educators helped improve fruit and vegetable consumption and increase physical activity for Alaskan families. The CES SNAP-Ed program continued as the sole implementing agency for the State of Alaska through its conclusion in 2025.

Extension's home and energy programming addressed indoor air quality, home maintenance and repair, energy use and conservation. Emergency preparedness impacts such areas as families and communities responding to natural and human-made disasters. The state records frequent earthquakes, flooding and other natural disasters which underscores a need for periodic radon testing related to ground shifts.

Training was conducted with youth, teachers, 4-H leaders, parents and community partners to provide techniques for working directly with youth in the areas of nutrition and physical activity. StrongPeople groups and diabetes education helped Alaskans increase their physical activity and manage chronic illness.

#### **Critical Issue: Natural Resources Management**

Communities increasingly depend on Alaska's natural resources for viable economic development. Policies to sustain this growth that mirror sociological and technological change remained critical. Major Alaska resource development activities are now centered in the oil and gas industries. Headquarters for these industries are located in the urban centers where there is access to various transportation and advanced communication systems. However, urban communities still need to build infrastructure to engage in value-added activities that would enhance the development of non-petroleum industry.

The economic potential of Alaska's forests is under-realized in timber and non-timber products. The forest ecosystem and agricultural lands can play a role in diversifying the economy of Alaska. Concern for the health and survival of resource biodiversity continued to be a central issue in resources management in Alaska and elsewhere. As energy continues to become a growing concern throughout the world, the boreal forest has the potential to provide products necessary for fuel alternatives to petroleum and coal.

IANRE continued to educate the public on energy alternatives like biomass. Natural resource outreach was conducted through Alaska's Renewable Resources in Extension Act (RREA) programming and Lumber Grading Program. On the research side, information dissemination addressed stakeholder needs for unbiased, science-based information about natural resource management issues in forestry, recreation and alternative, sustainable energy sources.

### **Merit and Scientific Peer Review Processes**

---

#### **Updates**

No significant changes.

## Stakeholder Input

---

### **Actions to seek stakeholder input that encouraged their participation with a brief explanation**

IANRE continued to host a variety of events to solicit stakeholder input, such as the Delta Junction Harvest Wrap-Up and Annual Field Days at the Fairbanks AFES and MEFEC farms.

IANRE educators and researchers also reached out to community members in a variety of ways. For example, we reached out to Interior Alaska specialty producers and held a stakeholder meeting asking for input on a farm forum specifically for Interior producers in January 2024. We subsequently recruited producers for the planning committee. IANRE employees checked in with stakeholders using methods such as face to face consultations, phone calls, emails, group meetings, social media interaction on Facebook, and interest surveys.

Agents also partnered with local and statewide organizations to leverage shared interest in agricultural topics. Examples include the Alaska Invasive Species Partnership and work with the Western Plant Diagnostic Network, Anchorage Cooperative Invasive Species Management Area, Kenai Cooperative Invasive Species Management Area, and Alaska Weed Free Products Committee.

### **Methods to identify individuals and groups and brief explanation**

IANRE made connections with a circumpolar agriculture group and hosted expert lectures from researchers in Alaska and beyond throughout 2025. Alaska will be hosting a circumpolar agriculture conference in 2028 with international partners.

### **Methods for collecting stakeholder input and brief explanation**

IANRE continued to host a variety of events to solicit stakeholder input, such as the Delta Junction Harvest Wrap-Up and Annual Field Days at the Fairbanks AFES and MEFEC farms.

IANRE educators and researchers also reached out to community members in a variety of ways. For example, we reached out to Interior Alaska specialty producers and held a stakeholder meeting asking for input on a farm forum specifically for Interior producers in January 2024. We subsequently recruited producers for the planning committee. IANRE employees checked in with stakeholders using methods such as face to face consultations, phone calls, emails, group meetings, social media interaction on Facebook, and interest surveys.

Agents also partnered with local and statewide organizations to leverage shared interest in agricultural topics. Examples include the Alaska Invasive Species Partnership and work with the Western Plant Diagnostic Network, Anchorage Cooperative Invasive Species Management Area, Kenai Cooperative Invasive Species Management Area, and Alaska Weed Free Products Committee.

### **A statement of how the input will be considered and brief explanation of what you learned from your stakeholders**

In FY25, stakeholder requests for specific speakers and topics at workshops and conferences continued to guide event agendas. AFES and CES continued to serve the needs of the people of Alaska. Program plans reflected ideas and advice given by client user groups, students, advisors, state and national peers, collaborators and UAF administration. The four critical issues identified for Alaska continued to reflect the concerns of major stakeholder groups, and were prioritized in workload planning and resource allocation. Stakeholder needs continued to be a driving factor in determining AFES priorities for research and CES priorities for programming.

## Highlighted Results by Project or Program

---

Critical Issue

### **4-H & Youth Development**

---

**Fostering positive youth development through mentoring and culturally relevant education in healthy living, STEM, civic engagement and leadership for Alaskan youth**



## 4-H pH Program in Southeast Alaska Teaches Youth, Communities to Monitor Ocean Acidification

---

### **In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

Ocean acidification, the gradual decline in seawater pH, is a concern for coastal communities in Southeast Alaska, many of which have economies that depend on fishing and mariculture.

It is caused by rising atmospheric carbon dioxide and is occurring globally. However, the waters around Lingít Aaní, Southeast Alaska and home to Sheet'ká, Sitka, are acidifying faster than the global average, according to research by University of Alaska Fairbanks scientists. Increased acidity makes it harder for shellfish, corals and other calcifying organisms to build shells, threatening subsistence and commercial fisheries.

### **Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

This rapid change has prompted several organizations to monitor the changing chemistry. This monitoring has included work through 4-H pH, an ocean education project based in Sitka, led by scientists at the University of Alaska Fairbanks. The project is primarily funded by the NOAA Ocean Acidification Program, and is part of a citizen science program called Global Learning & Observations to Benefit the Environment Program, or GLOBE. The National Science Foundation, National Oceanic and Atmospheric Administration and U.S. Department of State are also part of GLOBE. Extension leveraged Smith-Lever funding to allow the Sitka 4-H program manager to collaborate on pilot testing curricula from the project.

The goal of the project is to create a curriculum designed for elementary school-age students that anyone can use, not just 4-H, to teach about ocean acidification: "Everything you find online is more middle school and high school geared. The purpose was to be able to teach it to a younger group of folks through place-based approaches that are relevant to a community."

To that end, about a dozen 4-H youths participated in the after-school program, 4-H pH, from January to May 2025. They learned to measure pH, temperature and dissolved oxygen. These measurements were uploaded to the GLOBE program's open-source database. During spring break, youth involved in 4-H pH assisted the Sheet'ká K̄wáan Tribe on its weekly ocean-monitoring trip and learned about pH in the kitchen with a guest chef. They also created artworks as part of the program and looked at future career opportunities.

Youth worked on data visualization by using [CODAP](#), an online data learning tool, to compare their observations to a 2022 NOAA OAP-funded ocean acidification ([RC0083](#)) survey in the region. The 4-H pH program concluded by developing a virtual tour on the [Infiniscope](#) platform to share with peers. The curriculum was used in camps in the Southeast Alaska communities of Angoon and Petersburg during the summer of 2025.

### **Briefly describe how your target audience benefited from your project's activities.**

The 4-H pH project demonstrates that students as young as elementary school can conduct ocean chemistry monitoring with high-quality data alongside Tribal monitoring professionals and research scientists.

"In some of these communities in Southeast, they are monitoring ocean acidification, and in some they might not be. So the idea is also for community awareness," the Sitka 4-H program manager said.

"We met with scientists at the Tribe who measure ocean acidification here in Sitka, so that the kids could see it as a career pathway. Also, they could see what we're measuring is the same thing as what these adults are

measuring, and why it matters.”

The resulting curriculum may also be shared as an example beyond Alaska, thus building awareness of the importance of culture- and place-based approaches to environmental monitoring and science.

**Briefly describe how the broader public benefited from your project's activities.**

By teaching elementary-age 4-H students how to measure and chart the pH of ocean water near their homes in Southeast Alaska, 4-H pH made youth aware of their changing environment, how to measure that change, communicate their findings to their communities and why the changes matter to them and their families. They also contributed to large-scale research projects and databases exploring the same topic.

**Comments**

<https://www.kcaw.org/2025/07/17/4-h-pilot-project-immerses-sitka-youth-in-the-world-of-ocean-science/>



**Alaska 4-H 3D workshop gives youth skills to create own tools, explore career paths**

---

**In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

3D printing is a valuable tool with numerous applications. This technology is particularly helpful in creating items that are unavailable in Alaska’s roadless communities, such as Sitka in Southeast Alaska, which is only accessible by boat or plane.

**Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

The 4-H program in Sitka partnered with the Alaska STEAM Hub to create a workshop for Sitka youth to learn about 3D printing. The curriculum and goal were to teach youth how to design their own products using Tinkercard, a free software program. A STEAM Hub grant enabled two instructors to transport a new 3D printer to Sitka for a three-day workshop.

The response was overwhelming. The workshop filled up quickly with youth from grades 3-12 from five schools. The youth were challenged to think of a problem in their life or community and how they could solve it with 3D printing. Over the course of three days, youth created objects that had meaning for them, such as a nutcracker, couples’ rings, a culturally significant necklace and a cellphone stand.

**Briefly describe how your target audience benefited from your project's activities.**

The group-based developmental context allowed youth to make progress on becoming Beyond Ready. Participants explored challenges related to advanced technology. Youth set goals, built confidence, and collaborated for success. The youth helped each other resolve design issues. An older participant helped one of the younger youth who wanted to print a 3D lizard but couldn't figure out how to make the tail move by coaching her on how to add rings between the different tail sections.

One of the elementary school students designed a box to hold his GoPro batteries and camera, which resulted in a precise fit. Another elementary school child made a baseball cap holder for her dad. Another youth designed and printed a mini prototype of an idea for hydropower he had for the city.

One of the high schoolers had been using a credit card to scrape the ice off his car's windshield, so he designed and 3D-printed an ice scraper. Some of the high schoolers asked the instructors about their training, career paths in 3D design, what classes and degrees to pursue in college and what jobs are available in the field.

Overall, youth learned they could design and create tools and objects that benefit them, their families and communities. They learned to create innovative products and solutions without relying on outside sources. The

organization plans a follow-up workshop with a local expert who will lead a workshop on techniques like photogrammetry (part of model generation) and retopology (part of model optimization) to make and print lifelike 3D scans.

**Briefly describe how the broader public benefited from your project's activities.**

Introducing youth to relatively new 3D technology gives them the opportunity to explore how they can creatively solve problems and create solutions without relying on outside resources. It also opened a window on future education, job and career opportunities.

**Comments**

<https://sitkasentinel.com/stories/3-days-of-3-d-printing-on-tap,92247>

Critical Issue

## Agriculture & Food Security

---

### Identifying ecotype-specific performance of Alaska's farmed kelp in response to variation in temperature and light

Project Director

AMANDA KELLEY

Organization

University of Alaska Fairbanks

Accession Number

7007707

### ★ Identifying ecotype-specific performance of Alaska's farmed kelp in response to variation in temperature and light

---

**In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

This research project aims to document degrees of natural variation in growth and performance of farmed kelp sampled from disparate regions across the Gulf of Alaska. Restrictions on seed production in a hatchery setting currently constitute a significant hurdle in the establishment of new farms, as there is limited information regarding the basic biology of kelp species in Alaska; as such, it is critical to characterize the growth and performance of this nascent mariculture crop. Our research examines specific temperature and light conditions that optimize kelp growth and whether these conditions vary among subpopulations of three species of farmed kelp.

**Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

In year one, we successfully carried out the laboratory variety trial of *Saccharina latissima*, sugar kelp, sampled from two regions, Cordova and Kachemak Bay, Alaska. Kelp seed lines were difficult to get last year due to multiple seed line cultivation failures, which resulted in a late deployment of the seed lines by the kelp farmers. Nevertheless, we were able to bring outplanted kelp to the wetlab at the Alutiiq Pride Marine Institute in Seward, Alaska. Sugar kelp was grown in the lab at multiple temperature and light treatment conditions. We measured growth: mass, length, width, perimeter and area. We measured net photosynthetic activity: oxygen production and dissolved inorganic carbon drawdown. Finally, we quantified carbon and nitrogen concentration in the kelp tissue. These data have been collected and we are currently in the early stages of data analysis.

**Briefly describe how your target audience benefited from your project's activities.**

Since we are in the early stages of data analysis, we have yet to share the information gathered from this study with stakeholders. Nonetheless, there is significant interest in the results of this study through conversations that PI Kelley has had with kelp farmers across the state. Our project partner, Alutiiq Pride Marine Institute, will share the results of this study with their members through outreach activities. The research will ultimately serve as a master's thesis for graduate student Hayden Crumb, and the results will be shared at the Alaska Mariculture Conference and the Alaska Marine Science Symposium. Both conferences attract mariculture farmers, academics, agency personnel and members of the general public, ensuring the results will be disseminated broadly.

**Briefly describe how the broader public benefited from your project's activities.**

Again, we just completed year one of the project, and the data analysis is ongoing. Once we've completed this task, we will share this information by giving public talks to share the results of this work. PI Kelley works in collaboration with the Kachemak Bay National Estuarine Research Reserve and has given public talks in Homer, Alaska, which has generated a great deal of local interest in applied marine research.

**Soil depth and agricultural potential in Alaska: Characterizing soil profile function at northern latitudes and anticipating change in a warming world**

Project Director

Caley Gasch

Organization

University of Alaska Fairbanks

Accession Number

7005634



**AK Soil Depth**

---

**In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

This project seeks to explore relationships between soil climate, biological activity, and biogeochemical processes, and to develop a mechanistic understanding of how soil warming will influence plant rooting depth and associated soil communities and nutrient dynamics. The specific objectives of this work are: (1) To investigate the ecology of frigid agricultural soils by conducting an inventory of thermal regimes, root growth, soil food webs, and soil nutrient pools in deep mineral profiles. (2) To evaluate temperature controls on soil communities, biogeochemistry, and agricultural potential by manipulating soil thermal regimes and measuring responses of soil ecosystem components.

**Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

The proposed work will fill empirical knowledge gaps on: Where in the soil profile are roots and organisms distributed? Which trophic groups are present within soil food webs and in what quantities? When during the growing season are roots and soil organisms active? How quickly does organic matter decompose at different locations within the profile? How large are soil nutrient pools during the growing season? How do these community members, processes, and soil profile functions respond to warming?

To meet objective 1, in the 2025 growing season, I installed 3 soil monitoring stations at each UAF AFES Experiment Farm (Palmer, Fairbanks, Delta Junction). At each of the nine monitoring stations, I fully described the soil profile to 0.5 m, installed soil moisture and temperature sensors at 5 depths (10, 20, 30, 40, 50 cm), installed litterbags at five depths, and collected soil samples for lab analysis in 10 cm increments from the surface to 0.5 m. I collected data on vegetation productivity (above and belowground biomass, stratified by depth), soil chemical, physical, and biological properties, and soil seedbanks. The data has not been analyzed yet.

To meet objective 2, during the fall of 2025, I designed and built a soil temperature control system to manipulate soil monoliths in the lab. The system is currently in final construction stages.

**Briefly describe how your target audience benefited from your project's activities.**

This project started to generate soil sensor and lab data in 2025. It has not yet been disseminated to a target audience.

**Briefly describe how the broader public benefited from your project's activities.**

This project has not yet produced data or knowledge that has been shared with the broader public.

**Breeding small grain crop cultivars for Alaska**

Project Director

Muhammad Hasan

Organization

University of Alaska Fairbanks

Accession Number

7003500



**Enhancing Small Grain Breeding Capacity in Alaska**

---

**In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

This project addresses the challenge of developing barley, oat, and wheat varieties adapted to Alaska's subarctic climate, where environmental constraints limit crop productivity and stability. By generating foundational agronomic data from diverse germplasm and advancing targeted public breeding efforts, the project strengthens long-term breeding capacity and supports the development of locally adapted small grain cultivars for Alaska. During FY2025, the primary outcome was the development of new barley and wheat breeding lines, establishing a pipeline for future evaluation, selection, and variety release.

**Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

During FY2025, major project activities directly advanced the goal of strengthening Alaska's public small grain breeding capacity and accelerating the development of locally adapted varieties. A diverse set of oat, barley, and wheat varieties and breeding lines were tested across three Alaska locations, allowing identification of high-performing and stable lines under real production conditions. Based on these results, the highest-performing entries were selected for advancement to regional variety testing in 2026, moving them closer to potential release and producer adoption.

Concurrently, the breeding pipeline was expanded and advanced through targeted crossing and selection. Selected wheat cultivars were used in crossing blocks to generate 110 new first-generation breeding lines, increasing genetic diversity and supporting future selection. In addition, early- to intermediate-generation wheat and barley breeding lines were evaluated in breeding nurseries, enabling the identification and advancement of lines with improved yield potential and regional adaptation. Collectively, these activities strengthened the breeding pipeline, accelerated genetic gain, and contributed to the long-term capacity of Alaska's public small grain breeding program.

**Briefly describe how your target audience benefited from your project's activities.**

Plant breeders and geneticists will benefit from this project by gaining access to multi-location performance data, newly developed breeding populations, and advanced breeding lines suited to Alaska's subarctic conditions. The

project will improve public breeding infrastructure by expanding germplasm resources, boosting selection efficiency, and providing practical field-based data to support breeding decisions and collaborative research across programs.

**Briefly describe how the broader public benefited from your project's activities.**

The broader public benefits from this project through increased availability of locally produced grain that supports Alaska's communities and food systems. By improving the reliability and adaptability of small grain crops, the project helps stabilize local food and feed supplies, supports rural economies, and reduces dependence on imported grain, contributing to greater food security and community resilience across Alaska.

**Increasing knowledge and adoption of agriculture and horticulture best practices for northern climates**

Project Director

Alda Norris

Organization

University of Alaska Fairbanks

Accession Number

7000199



**Alaska IPM Jumps into Action When Honey Bee Pest Found in Alaska for First Time**

---

**In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

Apiculture is a growing agricultural industry in Alaska. The small hive beetle (*Aethina tumida*), an economically significant pest of domestic honey bees (*Apis mellifera*), was detected for the first time in Alaska in 2025 at an apiary located in the Copper River Census Area.

The pest was introduced on packaged bees imported from Mississippi and was detected by Alaska Department of Agriculture staff during an inspection for the USDA National Honey Bee Disease Survey. The small hive beetle negatively impacts honey bee colonies by consuming brood and fouling honey stores, which can result in financial losses for the beekeeper through colony loss and reduced honey production.

**Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

University of Alaska Fairbanks Cooperative Extension Service Integrated Pest Management Program is committed to investigating emerging pests, promoting awareness and educating beekeepers on effective, research-based management strategies.

IPM Technician Alex Wenninger and the Alaska Division of Agriculture's Cooperative Agricultural Pest Survey State Coordinator, Ramsey Sullivan, quickly worked to prepare a pest alert to inform Alaska beekeepers of the presence of the small hive beetle in the state, as well as how to detect, control and report it, with the goal of eradicating the pest before it can become established. The alert also covered state requirements for keeping bees and importing bees, designed to prevent the import and spread of pests and diseases.

Along with the publication of the pest alert, Wenninger and Sullivan spread awareness of this emerging pest issue by doing radio interviews and presenting their findings at the 2025 Alaska Invasive Species Workshop.

**Briefly describe how your target audience benefited from your project's activities.**

Due to the swift publication and dissemination of the pest alert, beekeepers around the state were quickly informed about monitoring for the small hive beetle and steps to take if the beetle is detected. With support from the Alaska Farm Bureau, local beekeepers organized the first statewide Alaska Apicultural Advisory Committee to shape statewide priorities regarding beekeeping, make policy recommendations and educate members.

With beekeeper awareness, the novel pest can be eradicated before it spreads more widely. Raising awareness of bee registration and import requirements, which serve to protect Alaska's growing apicultural industry from novel pests and diseases, will decrease the likelihood of more pest introductions.

**Briefly describe how the broader public benefited from your project's activities.**

Healthy honey bee colonies provide locally made honey to Alaskan communities. Every contribution that strengthens the food system benefits all Alaskans. Results were disseminated to the broader public through the following methods:

Pest alert: <https://dnr.alaska.gov/ag/Inspection/2025/Pest%20Alert-Small%20Hive%20Beetle.pdf>

Radio interview: <https://fm.kuac.org/2025-10-07/ag-officials-detected-this-pest-for-the-first-time-in-alaska-it-has-a-master-beekeeper-concerned>

**Comments**

This work leveraged Extension funds and was also supported by funds from the USDA Animal Plant Health Inspection Service's Plant Protection & Quarantine Program & USDA National Institute of Food and Agriculture's Crop Protection and Pest Management Program (grant no. 2024-70006-43668).



**Community Science Collaboration Enhances Understanding of Previously Unrecorded Insect in Alaska**

---

**In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

Fireweed (*Chamaenerion angustifolium*) is a well-loved native perennial in Alaska with many traditional uses; the young shoots can be harvested for food, the leaves can be steeped into a tea and the flower petals can be used in jellies and syrups. Fireweed is also an important food source for many of our native pollinators. Any noticeable changes to the general health of these wild plants warrant investigation.

**Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

University of Alaska Fairbanks Cooperative Extension Service's Integrated Pest Management Program (AK IPM) is committed to investigating and educating the public on emerging pest issues, so when IPM Technician Alex Wenninger noticed swollen flower buds of fireweed and dwarf fireweed containing small, orange larvae, she set to work determining the identity and impact of the larvae.

AK IPM collected and reared specimens for identification. With help from collaborators at the National Museum of Natural History and USDA APHIS Plant Protection and Quarantine's National Identification Services, genetic and morphological examination of specimens confirmed the identity of the causal organism to be the fireweed flower gall midge (*Dasineura epilobii*), a species previously only formally known from Europe. Despite evading the scientific record, this insect is likely a native species that has been here for a long time.

Additionally, AK IPM engaged the public in an effort to map the distribution of the fireweed flower gall midge in Alaska. Altogether, 86 members of the public submitted 103 observations, capturing data from a third of Alaska boroughs and census areas, an impressive representation given Alaska's large size and limited road access.

**Briefly describe how your target audience benefited from your project's activities.**

Participants in the community science project that mapped the distribution of the fireweed flower gall midge, as well as those who learned about it later, were appreciative to know that someone was looking into the insect forming galls on a beloved native plant. Messages received about this project included, "I greatly appreciate your

hard work regarding the identification of this insect and how it affects the beautiful fireweed,” and “really nice [work], both in science and in assessing the usefulness of community science collaboration.”

This discovery precipitated a re-description of the species, which is now recognized as Holarctic in distribution (Gagné et al., 2024). Gall-forming organisms and their ecological interactions have long been understudied, which likely contributed to this species’ evasion of the scientific record in North America for so long.

Overall, this work demonstrates one of the ways that community collaboration can enhance scientific knowledge while engaging the public. Incorporating citizen science into discoveries such as this increases scientific literacy and engagement, allows for more robust data collection, and connects research to the public.

### **Briefly describe how the broader public benefited from your project's activities.**

By leveraging citizen science, maps of a previously unrecorded insect were created in Alaska, contributing to the ecological knowledge of the state while empowering the public to engage in research.

### **Comments**

<https://www.kbbi.org/show/kachemak-currents/2025-05-12/fireweed-galls>

[https://www.akentsoc.org/doc/AKES\\_newsletter\\_2025\\_n1\\_a05.html](https://www.akentsoc.org/doc/AKES_newsletter_2025_n1_a05.html)

<https://bioone.org/journals/proceedings-of-the-entomological-society-of-washington/volume-126/issue-3/0013-8797.126.3.292/Redescription-of-Dasineura-epilobii-L%c3%b6w-a-Holarctic-Gall-Midge-Diptera/10.4289/0013-8797.126.3.292.full>

This work was also supported by funds from the Western Region of the National Plant Diagnostic Network and from the Crop Protection and Pest Management Program of the USDA National Institute of Food and Agriculture (grant numbers 2021-70006-35561 & 2024-70006-43668).



## **Cooperative Extension Entomologist Helps Identify New Apple Pest in Alaska**

---

### **In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

Alaska’s short growing season and cold climate make edible crabapples and their hybrids a popular choice for apple growers in Alaska. Their fruit is used to make applesauce, cider, jelly, apple butter and more. In Alaska, fruit-growing is a growing area of agriculture and pests affecting fruit trees are often new to the state and not well understood.

### **Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

In 2025, an apple grower in Wasilla, Alaska, reached out to the University of Alaska Fairbanks Cooperative Extension Service Integrated Pest Management program with questions about the cause of their misshapen apples. The IPM program, committed to investigating emerging pests and educating growers on management strategies, requested samples to diagnose the issue.

Samples of the misshapen crabapples were dissected, revealing swollen seeds that contained small, white larvae inside. With help from chalcid taxonomist Dr. Petr Janšta, IPM technician Alex Wenninger identified the insect as apple seed chalcid (*Torymus druparum*).

Searching available literature, IPM staff and faculty confirmed that this was the first record of this pest in Alaska and identified effective management strategies for farmers. They published an article identifying the pest and describing its life cycle, impacts on apple production and strategies for managing damage in April 2025 in the Newsletter of the Alaska Entomological Society.

**Briefly describe how your target audience benefited from your project's activities.**

This work improved the broader understanding of insect pest issues that affect apple growers in Alaska. While the apple seed chalcid is generally not considered to be a pest of economic importance in the Lower 48, crabapples — a popular choice in Alaska due to their cold-hardiness — may be more prone to heavy infestation than other, larger apples. Identification of the pest enables farmers to adopt recommended management strategies and minimize crop loss due to pests.

**Briefly describe how the broader public benefited from your project's activities.**

Every step that strengthens the food system benefits all Alaskans. Pests have the potential to cause significant losses, affecting farmers' economic stability and community members' access to locally grown food. Identifying and understanding these pests is a critical first step in managing them.

**Comments**

[https://www.akentsoc.org/doc/AKES\\_newsletter\\_2025\\_n1\\_a04.html](https://www.akentsoc.org/doc/AKES_newsletter_2025_n1_a04.html)



---

**From Magic Molly to Yukon Gold: Palmer potato harvest tests varieties, feeds community**

**In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

Potatoes have been grown in the Far North for centuries and are the economic backbone of Alaska agriculture. Historically, farmers would save a portion of the crop to use as seed for the following season, but replanting tubers from year to year can result in disease-causing organisms. This was the scenario in the late 1970s when Alaska potato farmers were plowing under rotting fields. A seed potato program was started at the Alaska Division of Agriculture's Plant Materials Center in 1984 to provide pathogen-free seed stock, and today more than 300 varieties are grown and tested annually, including varieties developed for Alaska's growing conditions. However, few were available to the general public.

**Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

In 2019, the University of Alaska Fairbanks Matanuska Experiment Farm in Palmer started potato variety tests, growing 143 varieties in a demonstration plot. Over the growing season, the farm invited the community to learn about the potatoes. In the fall, the farm opened the harvest to the community to teach kids about growing, harvesting and eating their own food, and for adults to sample new varieties of potatoes.

In 2022, the farm began testing Indigenous Tlingit and Haida potatoes in a partnership with the Alaska Native Tribal Health Consortium (ANTHC) Alaska Native Medical Center. The medical center's then-executive chef, Amy Foote, said the potatoes are served to patients to help them heal while they are staying at the hospital. "We can't buy these potatoes anywhere," Foote said. "So, the goal was to see how many we could grow."

In 2025, the seventh growing season for the potato variety trials, more than 130 varieties of potatoes were planted at the Experiment Farm, including Tlingit and Haida potatoes.

The potato harvest is a much-anticipated event in the area, with harvest slots filling up almost immediately.

**Briefly describe how your target audience benefited from your project's activities.**

In late September 2025, 270 pounds of the Tlingit and Haida potatoes were harvested for patients at the Alaska Native Medical Center, local Pioneer Homes and assisted living facilities.

Another 1,328.74 pounds of potatoes were harvested during the community harvest, many of which were donated to local nonprofit Kids Kupboard, an organization that prepares and provides fresh, healthy meals free to children who have been identified as food insecure.

**Briefly describe how the broader public benefited from your project's activities.**

An annual community potato harvest at the Matanuska Experiment Station and Extension Center in Palmer, Alaska, allows the farm to test more than 130 varieties of potatoes and share the harvest with community members and local nonprofits. It also grows specific potato varieties for local health organizations, which create familiar meals for patients from rural areas.

**Comments**

The Matanuska Experiment Farm and Extension Center in Palmer, Alaska, conducts an annual community potato harvest, which sees how well 130 or more potato varieties grow each year, teaches the community about potatoes and helps feed community members who are food insecure.

<https://ces.open.uaf.edu/2025/10/09/2025-potato-harvest-at-the-matanuska-experiment-farm-and-extension-center-a-huge-success/>



**UAF Cooperative Extension Service Pesticide Safety Education Program reduces pesticide risk in Alaska**

---

**In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

Pesticides are used in Alaska's hotels, homes, hospitals, schools, stores, restaurants, roads and right of ways, parks, natural areas and agricultural systems, contributing to sustaining Alaska's economy and tourism. While pesticides can pose significant risks to people and the environment, they continue to play important roles in pest management programs. The Integrated Pest Management (IPM) research and outreach programs at the University of Alaska Fairbanks (UAF) are well-positioned to help minimize risks and reduce pesticide use in Alaska.

**Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

To reduce risks to people and the environment and address public concerns regarding pesticide use, the UAF IPM Pesticide Safety Education Program develops training programs and materials to teach pesticide handlers how to use pesticides effectively while continually seeking to minimize nontarget exposures to people, animals, soil, air and waterways.

These goals complement the regulatory efforts of the US Environmental Protection Agency and the Alaska Department of Environmental Conservation Pesticide Control Program to assure safe and responsible handling of all pesticides in our state.

All pesticide handlers and fieldworkers must receive training to learn how to avoid pesticide hazards. The Pesticide Safety and Education Program at UAF provides training, continuing education, and training materials across the largest state in the country, which requires resourcefulness and innovation. The staff and faculty of PSEP meet these challenges through both direct and indirect educational activities. Alaska has approximately 100 certified pesticide applicators in the state.

**Briefly describe how your target audience benefited from your project's activities.**

By developing resource materials and training workshops, the UAF IPM PSEP faculty and staff are directly involved in the education of pesticide handlers. Participants gain skills in areas like identifying registered products and running application calculations.

The trainings also build community capacity for safety education. PSEP collaborates with industry representatives and regulatory agencies to develop materials and conduct training programs. Many activities involve developing and testing new and innovative materials and training programs that bridge the distance and educational barriers found in Alaska.

Since 2023, 174 people have completed the training program to prepare them to take the Alaska Department of Environmental Conservation exam. A two-day certified pesticide educator workshop has provided continuing education certification for about 45 people each day over three years. These certifications keep Alaskans workforce-ready.

**Briefly describe how the broader public benefited from your project's activities.**

The University of Alaska Fairbanks Integrated Pest Management faculty and staff work with the State of Alaska to develop training materials and programs for pesticide handlers. These programs minimize the risks of using pesticides, as well as overall pesticide use in Alaska.

**Comments**

<https://www.uaf.edu/ces/agriculture/psep/>

Critical Issue

## Healthy Individuals, Families & Communities

---

### Supporting wellness, safe food handling and use of food preservation best practices in Alaskan communities

Project Director

Alda Norris

Organization

University of Alaska Fairbanks

Accession Number

7000201



### Alaska Extension Links Reindeer Program with Rural Health Center to Offer Safe, Healthy Activities for Clients

---

**In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

The community of Nome, Alaska, is located on the southern Seward Peninsula on the Norton Sound of the Bering Sea, and is home to just over 3,600 residents. The severe weather in the region coupled with long periods of limited daylight, makes living in the community difficult. As a state, Alaska experiences higher than average rates of alcoholism, domestic violence and child abuse. These factors increase the need for Nome community members to access effective and reliable behavioral health supports and opportunities for healthy and safe activities.

**Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

University of Alaska Fairbanks Extension faculty Jacqueline Hrabok partnered with Liitfik Behavioral Health at Norton Sound Health Corporation to connect her work with reindeer herders in the region to the Liitfik behavioral health clients, many of whom rely on the daily activities offered at the center as a safe and sober option to socialize and connect with others.

Nestled in the Liitfik Behavioral Health facility are classrooms equipped with sewing materials, a carving studio and a commercial kitchen. Hrabok, who spends half of her time managing UAF's High Latitude Range Management Program, connects the center with reindeer meat, hides and antler, and uses the materials to teach meat cutting and preservation, and supply the carving studio with antlers for making earrings and other value-added products. The result is engaged community members who develop skills they can use in daily life.

Community members also use UAF Cooperative Extension Service patterns to create warm mittens and winter caps. Hides and other products from local reindeer herding are used to enhance the warmth and durability of the

products.

### **Briefly describe how your target audience benefited from your project's activities.**

This partnership is generating positive behavioral change and providing important life skills for the participating rural communities. The local behavioral health center is able to expand the range of classes and skill-building opportunities available, thereby increasing the number of community members who wish to attend. A recent sewing room attendee reported that before she began attending, her only opportunities for socialization involved alcohol, which was negatively impacting her health and her relationships. She now spends her days visiting with sober friends and designing parkas for her grandchildren.

In June 2025, 11 clients attended a three-day meat processing workshop. Through a grant with a local telecommunications company, the director of Liitfik Wellness Center purchased meat processing equipment and one reindeer bull carcass from Savoonga, Alaska, a nearby community with an active reindeer herding industry. The 11 clients and their team of three medical professionals learned reindeer cutting and meat processing techniques from Hrabok.

### **Briefly describe how the broader public benefited from your project's activities.**

A collaboration between UAF Cooperative Extension faculty and Norton Sound Behavioral Health Services is working to increase the availability of safe and sober activities in rural Alaska.

### **Comments**

<https://www.nortonsoundhealth.org/bhs/>



### **Anchorage food stand provides healthy produce in neighborhoods facing access challenges**

---

#### **In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

Eating a varied diet high in fruits and vegetables is associated with a decreased risk of many chronic diseases. However, access to fruit and vegetables, especially fresh and affordable ones, can be a struggle for many in Alaska's largest city, Anchorage. The state relies heavily on imported produce, resulting in higher-than-average food prices. Additionally, the local growing season is short and intense, underscoring the need for food preservation knowledge to prevent harvest waste. The issue of food deserts and the repercussions they have in a community is a growing concern following the recent closure of the only grocery store in one of Anchorage's neighborhoods.

#### **Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

The University of Alaska Fairbanks Cooperative Extension Service Anchorage Outreach Center strives to improve access to affordable local produce and fight food waste through partnerships and by supporting community groups with expertise in food production and preservation.

In response to Anchorage's food insecurity, three local organizations, Alaska Neighbourhood Works, Alaska Community Action on Toxics, and Yarducopia came together to provide a Free Farm Stand twice a week for six weeks. The stands were strategically placed in two areas and known food deserts, next to food pantries during their open hours. The farm stand organizer collected more than 7,000 pounds of produce from farmers. Some of it came from farmers at farmers markets. They would collect leftover produce that would rot before the next market day, reducing harvest waste. Anchorage gardeners were also encouraged to drop off their excess harvest, resulting in an additional 1,000 pounds.

The fruit and vegetables were given away for free, as well as used for cooking at the stand to provide food for everyone. The Anchorage Outreach Center was invited to join the effort at three Free Farm Stand days to educate “shoppers” about nutrition and food preservation, ensuring the food would last as long as possible and not go to waste. Over the course of several weeks, the stand received over 650 visits.

**Briefly describe how your target audience benefited from your project's activities.**

Neighborhood Works, one of the organizers, surveyed attendees, who said the Free Farm Stand makes a meaningful difference for their household. Those surveyed said the stand served as encouragement for families to eat healthier, fresh vegetables, helped stretch tight grocery budgets, and inspired a healthier community. The farm stand became a celebration of food and community as community members increased their knowledge of nutrition and food preservation. Participants shared recipes, stories and cooking tips. The Cooperative Extension challenged attendees to try new vegetables, such as kohlrabi, and to explore turnip recipes. Extension staff and faculty offered information on making jam and how to freeze vegetables. Green vegetables, fresh herbs and snow apples were favored by participants.

Most people who came were single parents, seniors and working households, telling us that the stand “helps [them] eat healthier and provide fresh veggies for [their] family.” One attendee said, “every week I attend because it is close to home. Coming here reminds me and shows me that there are good and helpful people in the world. It is very uplifting to me in today’s world.”

The organizers are planning another stand next year, and Alaska Extension is evaluating how we can support the effort more and play a bigger part, and what partners we can bring in to expand the reach of Free Farm Stand 2026.

**Briefly describe how the broader public benefited from your project's activities.**

Using fresh, local produce that would otherwise be left to rot, the Free Farm Stand provides free, nutritious vegetables to communities without ready access to fresh produce. Extension helped Alaskans learn new ways to prepare fresh vegetables and preserve them. Anchorage residents were able to access nutritious food, stretch their grocery budget and enjoy a healthier community.

**Comments**

<https://ces.open.uaf.edu/2025/10/10/anchorage-ces-outreach-center-joins-free-farm-stand/>



**StrongPeople Classes Support Health for Alaska’s Aging Population**

---

**In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

Many midlife and senior individuals struggle to maintain muscle mass as a natural progression of aging. This can be especially challenging in Fairbanks, Alaska, where extreme weather during the winter months keeps residents indoors and makes participation in physical activity challenging. Icy sidewalks and cold temperatures are a barrier for participation. In addition, the number of seniors choosing to remain in Alaska during their elder years is increasing. Since 2010, the number of seniors aged 60 and over has increased 77%, more than doubling the population between 2010 and 2024.

**Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

UAF Extension faculty Leslie Shallcross has been offering StrongPeople classes in the Interior Alaska area for over 20 years. StrongPeople is a nationally recognized nutrition and moderately intensive physical activity program developed and tested by scientists and exercise physiologists. The low-impact, slow-motion StrongPeople workout is intended to build bone and muscle strength and improve balance among older adults.

In 2025, Shallcross trained 13 new instructors in three Alaska communities—Anchorage, Mat-Su and Fairbanks—two of Alaska’s largest population centers. In addition, Shallcross offered ongoing StrongPeople classes at the Tanana District Extension Office twice a week for a period of 11 weeks.

“People really do love it,” Shallcross said, noting that although there are multiple versions of the program, they have the same purpose, which is to increase muscle strength and bone density so older men and women can be more active and mobile and prevent falls.

“All our anecdotal reports from people who participated in the program say it’s highly successful at doing that,” Shallcross said. “I would talk to people and every year I would hear ‘this is the first winter I didn’t fall,’ or ‘I had a fall but I didn’t break a bone and that’s a first for me.’”

### **Briefly describe how your target audience benefited from your project's activities.**

The addition of new trainers increased the number of qualified instructors in Alaska significantly. Of the 13 individuals who completed the instructor training, 12 are already offering classes. These instructors can now ensure that more Alaskans have access to the program.

“People like it and you can see the changes after a few weeks: they’re all standing up straighter,” says Shallcross.

Of the 60 participants enrolled in the Tanana District StrongPeople classes, 100% reported that they increased the amount of weight they trained with from the first day of class to the last day. Increasing muscle mass leads to reduced risk of injury and improved overall health.

### **Briefly describe how the broader public benefited from your project's activities.**

Scientific research has demonstrated that exercise with weights (strength training) can increase strength, muscle mass and bone density in middle-aged or older women. Strength training has been shown to reduce depression, improve sleep and contribute to a sense of well-being for older adults. These exercises also reduce the risk of chronic diseases such as diabetes, heart disease, osteoporosis and arthritis, according to research.

This is especially important in Alaska’s communities, where extreme weather results in icy sidewalks and reduced visibility. As Alaska’s senior population continues to increase, Extension’s StrongPeople program provides a healthy, scientifically-designed program to increase strength and muscle mass in older adults. UAF Extension is training new instructors in communities across the state as well as offering classes in Alaska communities, to ensure seniors are able to access safe and reliable programs that increase health and extend independence.

### **Comments**

<https://www.uaf.edu/ces/healthy-individuals/strongpeople/index.php>



## **Teaching Processing Times and Testing Canner Dial Gauges Boosts Food Safety, Security in Rural Alaska**

---

### **In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

About 80 percent of Alaska communities are rural, unlinked to the state’s limited road system and accessible only by boat or air. Most are small, with populations of a few hundred or fewer residents, who rely on hunting, fishing, foraging and some gardening to put food on their tables. Groceries are limited and very expensive: a gallon of milk can cost \$12 to \$18.

Preserving food safely is key to food security in Alaska’s rural communities, but residents often depend on outdated preservation methods. Some Alaskans frequently using beloved, but outdated, community cookbooks and pass down techniques through word of mouth. Many of these communities also lack good internet access. Extension agents have spoken to multiple community residents who admit to putting salmon in pressure canners for insufficient lengths of processing time. In other Alaska communities, botulism outbreaks in past years have been linked to unsafe food preservation.

**Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

Alaska Extension continues to design innovative approaches to programming to overcome the difficulty and expense of agents reaching rural communities. Since 2021, one agent has been taking her family's boat to reach remote communities in Southeast Alaska during the summer. Another agent, who serves the Aleutian and Pribilof islands, works with a regional agency to fly into these communities — when the weather cooperates. Sometimes, they are the first Extension agents to visit a particular community.

These visits have enabled more hands-on workshops to promote food sovereignty and security by teaching residents to grow, cook and preserve more food at home using scientifically proven methods. They also host free canner gauge testing and make Extension publications available at information sessions.

**Briefly describe how your target audience benefited from your project's activities.**

Over just the past five years, Extension agents visiting rural communities have tested hundreds of canner gauges, some of which had not been tested in years, if at all. Some gauges were giving very inaccurate readings, with potentially unsafe results. Some needed to be replaced. Agents also taught workshops and disseminated information on correct processing times and methods so residents gained necessary, updated knowledge of how to preserve their food safely, protecting families and strengthening community resilience.

Since Alaska has only a handful of Extension agents, other staff are being trained to test canner gauges and conduct basic food preservation workshops. This has the potential to increase rural community capacity for using best practices in food safety backed by USDA research.

**Briefly describe how the broader public benefited from your project's activities.**

Extension makes continuous efforts to bring research-based information to Alaskans in all parts of the state. In rural areas, food safety information is often shared by workshop participants with family members and friends, increasing community-level awareness of best practices. The use of improved food safety practices helps decrease healthcare burdens in rural Alaska.

#### **Comments**

<https://www.uaf.edu/ces/food/canner-gauge/index.php>

Critical Issue

## **Natural Resources Management**

---

### **Spruce Response to Beetle Infestation in Alaska: An Evaluation of Tree Ecophysiology Using an Integrated Field and Modeling Approach**

Project Director

Jessica Robertson

Organization

University of Alaska Fairbanks

Accession Number

7001661



**Annual report FY25**

---

**In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

Similar to other regions in the U.S., Alaska has been experiencing a wide-scale bark beetle attack on white spruce, causing extensive tree mortality and changes to ecosystem structure and function. Vegetation indicators of the "green" (or early) attack phase that can be remotely sensed are not clear for the trees in this region, which is a significant knowledge gap the Alaska State Division of Forestry identified that limits widespread mitigation activities. This study addresses this problem by monitoring of tree physiology through weekly and continuous measurements, UAV flights with multispectral sensor twice per month, data modeling, and collaboration with a remote sensing expert at the UAF Geophysical Institute.

**Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

We maintained the 3 sites installed at the onset of the project. These sites measure tree physiological variables (water content, temperature, electrical conductivity, sap flux, growth), meteorological variables (air temperature, relative humidity, wind, precipitation, snow depth, solar radiation), and soil moisture and temperature to 0.5 m depth. Two sites are on Ahtna land and one is on State land. The intention of the site locations was to capture the beetle infestation as it was occurring, and we were able to do this. Two of the three sites were attacked in early July 2023 and reattacked in 2024 and 2025. We were able to observe the effect of both attacks in the tree water content, growth and other physiological data.

Drone flights with a multi-spectral camera were conducted twice. The data are still being analyzed.

Measurements of plant physiology (photosynthesis, transpiration, water stress, stem/needle water content, thermal condition using thermal infrared camera, chlorophyll content, fluorescence, spectra), and progression and severity of beetle attack (visual assessments) were conducted once a week. Pre-dawn water potentials and photosynthesis-CO<sub>2</sub> and light response curves were conducted twice over the summer. Bark beetles were trapped at four locations from the southern site to several miles north of our northern site.

The bark beetle population was drastically reduced in the summer of 2025 by extremely cold winter temperatures (-50 degrees C) in 2024/2025. Thus, the attacks that occurred in 2025 were far less severe than the prior years. The few trees that were attacked were those that were attacked in prior years, indicating increased vulnerability of trees attacked in the prior year(s). Data are indicating that the trees may be influenced more by impacts of hydraulic failure than carbon starvation. There are two paces of death - fast and slow. The "fast" death occurs within one month of attack, and is first observed through declining water content. The tree continues to transpire and it effectively dries itself out and growth ceases. The tree water content hits a lower threshold, causing the needles to brown and quickly die. The "slow" death involves more than one year of attack; in the second or third year of attack, the tree starts the season with low water content, little to no growth, and low physiological activity; then the tree dies after the next attack. The process of death includes needles and stems drying, water stress increasing, and loss of photosynthesis. Browning occurs from the bottom of the tree and moves upward, and the browning occurs within a month of death. Severity of attack does not appear to impact whether a tree dies.

Thus, the process of tree death is clearly indicated by tree water content, sap flux, and growth.

Young-Robertson presented the findings at the American Geophysical Union 2024 annual meeting (Dec 2024).

Project collaborator Dr. Simon Zwieback (remote sensing, Geophysical Institute, UAF) maintained a network of soil temperature sensors and installed net radiation sensors to identify the impact of the infestation on soil temperatures and surface radiation input. He published a manuscript in FY24.

**Briefly describe how your target audience benefited from your project's activities.**

We have had regular meetings with one target audience (Jason Moan, Alaska State Division of Forestry). We included him on presentations. We have kept him up to date on our activities. We have also joined a discussion group of researchers from the University of Alaska, Denali National Park, and the Alaska Division of Forestry to identify future research needs.

**Briefly describe how the broader public benefited from your project's activities.**

We are not ready to provide results to the general public but we have generated interest in the project when the PI has shared it with other researchers and members of the wood energy community.

## Partnering to promote sustainable energies and responsible natural resources stewardship for Alaska

Project Director

Alda Norris

Organization

University of Alaska Fairbanks

Accession Number

7000200



### Alaska Extension publication shares research on optimal firewood harvesting and drying parameters

---

#### **In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

The Fairbanks North Star Borough community commonly uses wood-burning heating systems due to the long winter, extreme cold and high cost of heating oil. Smoke from burning wood contains harmful and potentially carcinogenic gases and particulate matter. Due to Fairbanks' geographic features and extreme temperatures, smoke and other pollutants can be trapped close to the ground by an inversion, creating a public health risk. Due to the inversion, FNSB was determined to be an EPA non-attainment area, with winter burning identified as a major contributor to this problem.

#### **Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

University of Alaska Fairbanks researchers designed a study to determine strategies for reducing firewood drying time. They found that drying time is determined primarily by the environmental conditions following the wood harvest. Firewood harvested before snowmelt (early April) and after green-up (late May) is exposed to hot and dry weather early in its drying process, drastically reducing drying time. Most moisture within the wood is driven off in these first few months, and the wood is sufficiently dry and ready to burn by the upcoming winter.

Results published in a Cooperative Extension publication were shared with interested parties, including businesses that sell or dry wood, members of different Alaska Tribal Corporations, state, federal and local officials, and individuals who heat with wood-burning stoves. It was also distributed at the Alaska Agricultural Conference as well as the Alaska Municipal League Conference in 2025.

#### **Briefly describe how your target audience benefited from your project's activities.**

Putting this research into a usable form for Alaskans informs the public and businesses that sell seasoned wood how to tell when the trees are at their driest, how long they should dry it before burning the firewood and clarifies common misconceptions that lead to individuals mistakenly burning wet wood.

By adopting the recommended harvesting schedules and burning properly dried wood, people can reduce wood drying times by 6+ months, burn wood more efficiently, thus saving time and money on harvesting or purchasing wood, and limit the amount of pollutants produced.

#### **Briefly describe how the broader public benefited from your project's activities.**

Burning properly dried wood can improve air quality for the entire Fairbanks community while saving time and money on harvesting or purchasing wood. Furthermore, burning dry wood helps achieve federal air quality standards set forward by the EPA.



## Alaska Extension supports invasive chokecherry quarantine

---

### **In 2-3 sentences, briefly describe the issue or problem that your project addresses.**

Invasive chokecherry trees in Alaska include European bird cherry (Mayday tree) and Canada red chokecherry, *Prunus padus* and *virginiana*, respectively. These tree species were first planted as ornamentals in Alaska during the 1950s. They reproduce by seed and roots, and even sprout new trees from branches still attached to the parent plant. Birds spreading seeds have resulted in infestations across a variety of habitats in Alaska, including river and stream corridors, subalpine areas and black spruce bogs.

Infestations exclude desirable vegetation by forming dense stands. Because it contains cyanide in the branch tips and fruit pits, chokecherry is toxic to moose. These trees, as found in UAF studies, also do not support the same quantity or quality of insects on which fish rely. Furthermore, chokecherry re-sprout after fire, similar to willow and aspen. Without moose as a key control, they may easily become dominant species replacing trees, shrubs and other vegetation that wildlife and people rely on. Chokecherry infestations also impede visibility and access to areas.

### **Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.**

For many years, evidence for the need to regulate invasive chokecherry, *Prunus padus* and *Prunus virginiana*, has been accumulating. A University of Alaska Fairbanks Cooperative Extension Service invasive species specialist began accumulating information through his programs and interactions with partners and the public.

He has worked to present information from research conducted by graduate students at UAF who discovered chokecherry do not support the same quantity or quality of insects that fish rely on. He also worked with the Alaska Department of Fish and Game in 2011 to identify the trees eaten by moose, which were responsible for three moose deaths from cyanide poisoning. Those trees included the two invasive chokecherry species. In 2022, he testified to the Anchorage Assembly about an ordinance to ban the sale of *Prunus padus* in Anchorage, and worked with the University of Alaska Anchorage and the US Forest Service to identify a disease new to Alaska that impacts the invasive chokecherry, but also has a high potential to impact other fruit trees grown in Alaska. This evidence of invasive tendencies resulted in widespread support of the tree's removal.

For many years, he has worked with communities and land managers interested in controlling invasive chokecherry to come up with strategies for removal in their areas. He has researched some of these specific control strategies to understand their efficacy, as well as impacts of herbicide residues. Disseminating this information to the public has led to the realization that control of invasive chokecherry is achievable with a long-term commitment. This work has resulted in more support from the public for control of the trees and has put pressure on the State of Alaska to regulate the species.

### **Briefly describe how your target audience benefited from your project's activities.**

In Fiscal Year 2025, the Alaska Division of Agriculture began the process of determining if they could quarantine invasive chokecherry in Alaska. They used information gathered from years of the Cooperative Extension's accumulated effort working with the public and partners and providing research-based evidence of invasiveness. As a result, the Alaska Division of Agriculture announced a statewide quarantine of invasive *Prunus padus* and *Prunus virginiana*. Other units within IANRE also have been trialing ornamental trees that can replace the invasive *Prunus* species, without the negative impacts.

### **Briefly describe how the broader public benefited from your project's activities.**

Chokecherry species *Prunus padus* and *Prunus virginiana* are pretty, but also pretty invasive in Alaska. Years of work and outreach by a University of Alaska Fairbanks invasive species specialist helped support the Division of Agriculture to impose a statewide quarantine on those species in fall 2025.

### Comments

<https://www.bigcabbageradio.org/2025/09/15/valley-edition-2025-9-12-gino-graziano/>

<https://afes.open.uaf.edu/2025/11/07/alaska-invasive-species-partnership-workshop-highlights-successes-and-challenges/>

<https://dnr.alaska.gov/commis/pic/releases/8.29.2025%20Quarantine%20on%20Mayday%20and%20Chokecherry%20Trees.pdf>

Funding from the USDA Forest Service also supported this outcome.

Type

**Projects / Programs without a Critical Issue**

**Not Provided**

Projects / Programs

**0**