Alaska Native-Serving Institutions
University of Alaska Fairbanks

USDA AN/NH Education Grants Program

2009-2012 Report
Integrating Traditional Knowledge of Plants with Western Science

Ethnobotany Certificate Program, University of Alaska Fairbanks Kuskokwim Campus

Indigenous plants play a major role in the everyday lives of Alaska’s rural residents. The western term “ethnobotany” may not be recognized by many traditionalists, but the importance of indigenous plants in food, medicine, and community well-being are recognized by all. The Ethnobotany Certificate (EBOT) Program builds upon an existing substantial base of knowledge within rural Alaska. EBOT instructors draw upon the copious local and traditional knowledge, regionally-recognized traditional ethnobotanists, and healers who have committed their lives to this science.

The EBOT program at Kuskokwim Campus (KuC) UAF involves interdisciplinary study of the role of native plants in indigenous cultures. Students learn about native plants, their uses and ecology in the context of their cultural, social and economic importance by combining scientific and anthropological concepts and methods. The program emphasizes culturally relevant, place-based courses that highlight the ways this information contributes to other fields, such as cultural and natural resource management, community development, adaptive resilience, and human health. It also serves as a bridge to a variety of associate and baccalaureate programs in natural sciences and liberal arts, including the Bachelor of Arts in Yup’ik Languages and Culture.

Intensive Summer Field Course Opportunities
The EBOT program has offered summer opportunities to study Alaska’s native plants since 2006 in two-week intensives. In summer 2010, we began offering two courses per summer, and in 2012 we piloted a new, follow-up course in Intermediate Ethnobotany. Additionally, in 2012 we included internship opportunities for advanced students in teaching assistantship, the EBOT garden and herbarium, and elder interviews.

Alaska/Hawaii Student Exchange Opportunities
Working with colleagues in the University of Hawaii system, we have successfully completed four student exchanges (19 credits earned). Native populations in these two climatically-diverse states have a surprisingly similar approach to their home lands and natural resources, and students from both places gain an invaluable appreciation of how their studies add to the strength of all cultures.

Ethnobotany Garden and Herbarium
Through establishment of the EBOT garden and herbarium at KuC in Bethel AK, this program is providing a foundation for understanding native plant use in the region and beyond. These provide the campus and Bethel community schools and residents with invaluable educational tools to teach about how native plants were and still are being used to supplement their nutritional and medicinal needs while maintaining and strengthening the cultural ties to the land. They also provide an opportunity to learn about the importance of both a living and preserved archive for ethnobotanical studies.

Project: Introduction to Ethnobotany Summer course
Location: Various communities
Purpose: To gain a basic understanding of plant biology and taxonomy, as well as the use of native Alaska plants for food and medicines.

Project: AK/HI Student exchange
Locations: University of Hawaii Windward Community College, Quinhagak AK, Nash Harbor AK, University of Hawaii Maui College
Purpose: To foster inter-cultural understanding of native plant uses in Alaska and Hawaii.

Project: Ethnobotany Garden
Dates of Project: Spring 2012 - ongoing
Location: Kuskokwim Campus
Purpose: To provide place-based and hands-on opportunities to learn about traditionally-used plants in the subarctic region.
**Student Projects and Internships**

An excellent example of an advanced EBOT student project is on natural dyes by Darla Brown. In addition to her full time duties at work and home, Darla is learning about all types of natural dyes in her local landscape around Kotzebue AK. Her goal of cataloguing and creating a reference booklet of all dye-relevant plants on a range of natural fibers provides not only a record of her work and passion for natural dyes, but a teaching tool for others to learn the traditional art of natural dyeing. The EBOT coursework she completed has helped to make this booklet better informed and more useful. Another student who participated in the AK/HI student exchange, Alix Chartier, is working on a research project for EBOT 220 (Ethnobotanical Techniques) comparing uses of plants to treat illnesses including cancer in both places.

**Gaining National and International Recognition for EBOT**

EBOT is a member of the international consortium of ethnobiology programs in the National Science Foundation’s Open Science Network in Ethnobiology; it provides a clearinghouse of ethnobiology curriculum, drafting of standards for curriculum and program content. This invaluable membership informs our course and program development along tracts that align with international standards and provides international visibility.

**Significant metrics include:**

* Student and faculty presentations:
  - American Association for the Advancement of Science Arctic Science Division
  - Western Alaska Interdisciplinary Science Conference
  - Society for Ethnobiology
  - Alaska Forum on the Environment
  - Alaska Native Science and Engineering Program
  - Alaska Native Tribal Health Consortium’s *Plants as Food and Medicine* Inaugural meeting
  - Annual Meeting of the Society for Applied Anthropology
* Student exchange program with University of Hawaii campuses
* Student internship opportunities in various areas: course instruction, ethnobotany garden, ethnobotany herbarium, Elder interviews
* Dissemination of Alaska native plant ethnobotany information:
  - University of Alaska’s Summer *Discover Alaska* lecture series
  - Girls in Science Day
  - Girl Scouts
  - Bethel community Brown Bag lunch series
  - UAF Campus celebration of National Food Day
  - KYUK and KCBF Radio interviews
* Representation of University of Alaska in the National Science Foundation’s *Open Science Network in Ethnobiology*
* Collaboration with authors to publish ethnobotanical books: A. Jones’ *Plants That We Eat* (published by UA Press, 2010) and L. Ainana and I. Zagrebin’s *Chukotka Ethnobotany* (working title, in review now)
* Establishment of the Ethnobotany Garden and Herbarium at KuC
* Continued work with Yup’ik EBOT Elder Council to integrate traditional knowledge of plants into EBOT

**Student Project: Native AK Plants as Natural Dyes**

**Dates of Project:** 2009-present  
**Location:** Kotzebue AK  
**Purpose:** To create a reference book containing a range of fibers dyed with selected Alaska native plants, and to make voucher specimens of all plants used.

![EBOT student, Darla Brown, gathering local flora around Kotzebue AK for natural dye project.](image1)

**Project: EBOT intern assists with Introduction to Elder interviews**

**Dates of Project:** July 2012  
**Location:** Bethel and Chevak AK  
**Purpose:** To provide service learning opportunities for our advanced EBOT students while preserving and increasing our knowledge of traditional native plant use.

![EBOT intern, Memmi Rasmussen, assists Elders harvesting native plants in Bethel AK.](image2)

**Project: EBOT Elder Council**

**Dates of Project:** 2006 - 2011  
**Location:** Bethel AK  
**Purpose:** To continue integrating our knowledge of native uses of plants in Alaska, using Yup’ik, English, and scientific terminology.

![Participants at the 2011 EBOT Elder Council in Bethel AK.](image3)
There is a need for more rural residents trained in environmental studies including ecosystem health and sustainable energy. Local environmental specialists are needed to promote research and policy making. Even though the population of Alaska is small, changing climate and global markets are threatening the region’s social, economic, and environmental health. To better understand this change, rural residents are undertaking local environmental monitoring and sustainable energy projects to promote environmental stewardship. This place-based Environmental Studies program combines contemporary scientific studies with traditional knowledge to better prepare graduates for rural entry-level jobs. Students gain an academic base to continue formal education in environmental studies or in natural science. Funding for projects through USDA has allowed the UAF Bristol Bay Campus to develop an Occupational Endorsement in Sustainable Energy and a Certificate in Environmental Studies. Since the program was piloted in 2006, the Environmental Studies Certificate and its elective courses have provided educational opportunities for the region’s residents, particularly Alaska Natives. Further, this has empowered many students and their communities to adapt to the overwhelming outside social, ecological, and economic pressures. The Program is also actively working with numerous state-wide entities to strengthen our educational offerings to students in Bristol Bay and throughout Alaska.

**Ecosystem Health**

The natural landscapes of rural Alaska provide abundant resources to the state through its resilient ecosystems and the important functions they provide. This component allows students to enter academic programs or the workforce by teaching technical skills and giving hands-on experience for careers in environmental studies. A healthy environment is vital to rural Alaskans and their subsistence way of life. A society that works with nature will support ecosystems by providing more ecological services. For example, the rivers and estuaries of the Bristol Bay must be healthy if they are to continue to support the world’s great wild sockeye salmon fishery. Nature is the foundation of rural Alaska’s wealth, which includes a vibrant subsistence culture and the harvesting of renewable resources.

**Sustainable Energy**

The Sustainable Energy component was created in 2009 as a response to community concerns of rising energy costs associated with reliance on diesel-generated energy. Its mission is to help reduce fossil fuel consumption and lower the cost of energy throughout the Bristol Bay region. Students are provided with valuable skills and knowledge necessary to adapt to threats to community sustainability. Educational opportunities include courses covering a wide range of subjects related to energy efficiency and renewable energy, as well as the Occupational Endorsement in Sustainable Energy. In addition, local students are provided with hands-on instruction in construction trades technology with a heavy emphasis on energy efficient, cold climate building techniques. Community and K-12 outreach activities include helping community members and business owners gain access to resources that help make buildings more efficient. Other activities include organizing educational events and working directly with local K-12 teachers and students on energy issues.
**ENVI Internships and Citizen Science Projects**
The ENVI program encourages students to complete Internships and citizen science projects that promote environmental stewardship in their home town or village.

Past ENVI internship partners include: Bristol Bay Native Association, Bristol Bay Environmental Science Lab, City of Dillingham Municipal, Seven Ponds Nature Center, Sutherland Nature Center, US Fish and Wildlife Service, Togiak Wildlife Refuge, Alaska Department of Fish and Game, USKH, Environmental Division

Examples of citizen science projects:
- Jennifer Robinette: Anchorage's influence on invasive species in Bristol Bay
- Kellen Halford: Solar photovoltaic potential in Dillingham
- Erin Walsh: Squaw Creek water quality monitoring
- Devin Lisac: Salmon habitat remediation, fish weir at Squaw Creek
- Tina Tinker: Tidal energy potential of Nushagak Bay
- Sid Nelson: Wind energy potential in Dillingham

**Significant metrics include:**
- Student, faculty, and staff presentations at conferences including:
  - Western Alaska Interdisciplinary Science Conference
  - American Association for the Advancement of Science both at national and regional Arctic Division meetings
  - Alaska Forum on the Environment
  - Rural Energy Conference
  - Alaska Wood Energy Conference
  - SouthWest Alaska Interagency Meeting
  - Bristol Bay Energy Summit
  - Business of Clean Energy in Alaska Conference
- Hiring of a UAF College of Rural and Community Development lab coordinator for Drumbeats Consortium-wide distance science labs.
- Operation of an internship program since 2006 that has provided local youth with paid opportunities to learn environmental studies and energy efficient construction techniques.
- Development of educational tools, such as the Passive Office, portable Solar/Wind hybrid system, 4 kW grid-tied photovoltaic system, electric vehicle, bicycle generator, tree ring samples and a variety of experiments.
- Significant residential energy savings as measured by students who took sustainable energy classes.
- Disseminating environmental information to wider audience:
  - Tri-annual Bristol Bay Environmental Science Newsletter
  - Bristol Bay Times articles
  - Articles in Ruralite magazine
  - Alaska Building Science Newsletter
  - KDLG radio interviews
  - Energy Savers Tips for Alaska booklet
  - Alaska EPSCoR Newsletters
- As the 2011 host of the Arctic AAAS conference, the UAF Bristol Bay Campus received national media coverage including:
  - SCIENCE Magazine - News and Notes [http://www.sciencemag.org/content/334/6055/469.full.pdf?sid=21a3f890-d5eb-4773-99a3-14f82f604bd](http://www.sciencemag.org/content/334/6055/469.full.pdf?sid=21a3f890-d5eb-4773-99a3-14f82f604bd)
Going to the Dogs

Veterinary Science Certificate Program, Interior-Aleutians and Chukchi Campuses, UAF

With the generous support of the USDA/NIFA Alaska Native/Native Hawaiian Serving Institutions grants program, the Interior-Aleutians and Chukchi Campuses have continued to deliver the Veterinary Science (VTS) program to students in rural Alaska since 2007.

Animal care is a critical area of need in rural Alaska where many rural residents have companion dogs and cats that need emergency or preventative care. The lack of veterinary services in rural Alaska impacts not just pet owners but the large numbers of people who still use sled dogs to perform many essential tasks such as hauling wood or water and traveling along trap lines. Dog racing is a popular sport and the level of care that a race team needs means good knowledge of animal care is essential.

With all this demand, however, the lack of veterinarians practicing in rural villages means there is a pressing need for locally available animal care. Moreover, there is always concern about zoonotic diseases, particularly rabies, due to the close relationship between wild animal populations and rural communities.

In response to this need, the Interior-Aleutians and Chukchi Campuses developed a Veterinary Science certificate program. Many students in the program have reported being better able to identify issues with their animals and provide appropriate care. Students share knowledge with others in the community resulting in widespread impacts that better the health of animals. As a result of support through this program students gain confidence in their ability to be successful in college and are moving on to higher degrees. This confidence is so significant to the lives of students who are continuing to achieve success with educational goals as a result of this support.

Significant impacts include:

- VTS certificate program graduate currently attending WSU College of Veterinary Medicine with goal of returning to Alaska upon graduation to practice in rural Alaska
- First students to move from VTS certificate on to the Associate of Science degree will graduate in Spring 2013
- Partnerships with veterinary practices in Fairbanks and Anchorage are supporting veterinarians to travel to villages where students can assist with clinic procedures
- Partnerships with veterinary clinics allowed students internship opportunities at various locations around the state
- Students continue to be hired for paid positions by internship sites
- Faculty participate in conferences such as AAAS, WAISC and NACTA
- Continued use of innovative distance delivery methods provide access to students across Alaska and promote high level science instruction.
- The VTS program continues to engage in K-12 outreach by:
  - supporting science fairs
  - giving presentations at school sites
  - participating in ‘I’m Going to College’ events at UAF

Fall 2011 VTS 101 Laboratory session. A student works with models that show various disease processes. Video conference trainings help expose students to specific topics.

2011 American Indian Science and Engineering Society science fair for Interior Alaskan communities held in Fairbanks.

Dr. Monetti uses the overhead camera during the heart dissection for the Spring 2012 VTS 130 A&P lab.

During the Fall 2012 VTS 140 Animal Husbandry Lab the students visited a variety of sites to gain knowledge about: the UAF Large Animal Research Station, the procedures in USDA inspected meat processing, home meat sheep production, and various boarding/training facilities including an equine center and many more community members opened their homes and businesses to share with the students.
The Northwest Campus of the University of Alaska Fairbanks is located in Nome, Alaska, on the Seward Peninsula some 600 miles northwest of Anchorage. Viable populations of reindeer, caribou, muskoxen and moose inhabit the landscape surrounding Nome. The production from the local land resources has some of the greatest potential in the circumpolar North. Local people need to have a substantial personal investment in use of the local resource base. However, most individuals do not have the formal training required to acquire state and federal positions to manage the abundant local natural resources on public and private lands or to develop these resources for food production.

Subsistence harvest provides a critical food source, but because of shrinking resources and expanding populations substantial food is imported to sustain local communities. Because rural Alaska is at the end of a very long and tenuous transportation chain, food security is fragile and vulnerable to a number of disruptions. A primary focus of the High Latitude Range Management (HLRM) program is to strengthen sustainable local food production to promote rural self reliance and ensure a higher quality of life.

In the 30-credit HLRM program, students are trained across several disciplines for entry-level positions in the natural and food sciences. Developing expertise in managing local natural resources is the primary focus of the certificate program. Emphasis is placed on developing the skills to identify, inventory, exploit and monitor the local natural resources. In addition, students learn how to generate and promote local food production using the surrounding range resources.

A variety of teaching methods are used including traditional lectures, experiential methods, field trips and laboratory sessions. Five courses; HLRM 120 History of Domesticated Alaskan Ungulates, HLRM 140 High Latitude Range Management, HLRM 150 Alaskan Ungulate Husbandry, HLRM 160 Meat Production and HLRM 170 Health Issues in Domesticated Ungulates were taught during the 2011/12 academic year. Ten to 18 students from western Alaska villages attended each course. The students and instructors gave it their all to cover a large amount of material and country in aptly termed "intensives" during full, weeklong courses. Most of the HLRM students agree that they now have a greater understanding and appreciation of the unique ecosystem in which they live. HLRM students become particularly engaged in the courses and create a unique, positive synergy among students, teachers, and HLRM staff.
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