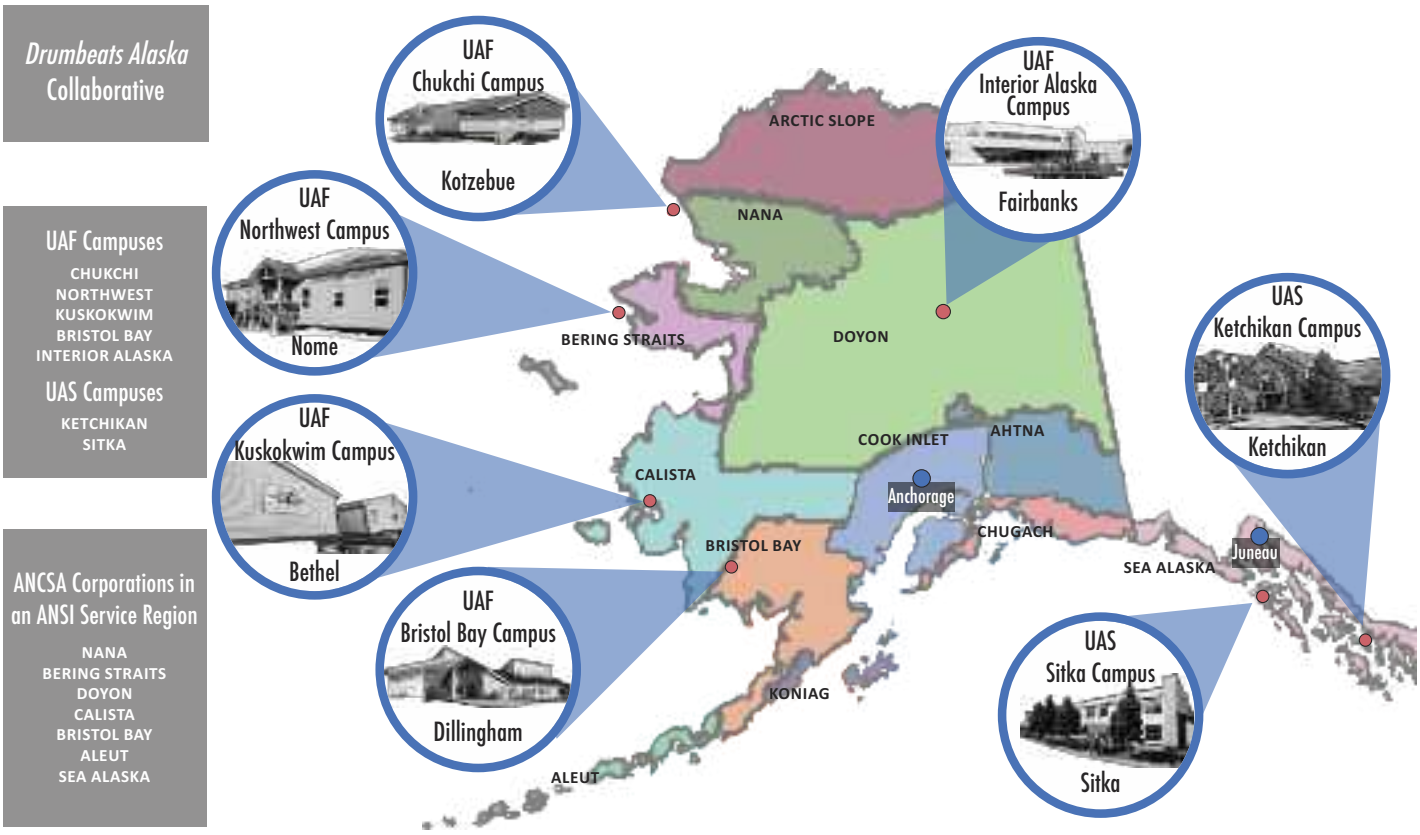
A Collaboration of Seven Alaska Native Serving Institutions

Drumbeats Alaska

Evaluation Report

2014-2018



Alaska Native-Serving and Native Hawai'ian-Serving Institutions Competitive Grant Program (ANNH)
U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA)
Award # 2017-38426-27151

Evaluation Research Associates

NIFA requests applications for the Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Competitive Grants Program (ANNH) for fiscal year (FY) 2017...to support the activities of collaborative membership of Alaska Native-Serving or Native Hawaiian-Serving Institutions to enhance educational equity for under-represented students. *2017 Request for Applications*

Cover map: A graphic showing the Alaska Native Claims Settlement Act (ANCSA) corporation regions (sea boundaries not included) and the location of the seven Alaska Native Serving Institutions of the University of Alaska System by name and campus location. Bristol Bay Campus also provides educational services in the Aleut region. Map modified from http://ancsaregional.com/ancsa-map.

Report Organization

The *Drumbeats Alaska* Collaborative project is implemented in two distinct contexts: in a university climate and in rural and Alaska Native communities. This background information is to round out the 'story' - provided both for the reader to better understand the funded programs and to provide insights on the largest state in the country for the new staff at USDA NIFA.

The report begins with a description of both contexts, details on the University of Alaska (UA) system and the Collaborative programs in the university context and a brief explanatory narrative of the political, social (subsistence lifestyle), demographic and educational history. A map of Alaska Native cultures is included. Rural Alaska is where the programs operate and most students live.

Following are emerging evaluation tenets on new directions for Culturally Responsive Indigenous Evaluation (CRIE), that are gaining international recognition. Failure to understand how cultural context interacts with program implementation and impact jeopardize the validity of the evaluation.[1]

Next are the outcomes of the seven *Drumbeats Alaska* programs by objective organized by the generic NIFA logic model outcome terms of **knowledge, actions and conditions**. These outcomes are defined by NIFA and presented in the sidebar box along with indicators that show change. At various levels, all Drumbeats Alaska programs address food and energy security, some directly, others through foundational education in the sciences. Consequently, outcomes reported could fit under more than one objective.

Last is the summary and conclusions.

NIFA Logic Model Outcomes

Knowledge – a short-term change in knowledge occurs when participants actually LEARN. Participants show changes in knowledge through opinions, skills, decision-making and positive life choices as well as knowledge of policy and new methods.

Actions – a mid-term change in action occurs when there is a change in behavior and the PARTICIPANTS ACT upon what they have learned. Participants show changes in action when they apply improved knowledge, adopt and use new methods, use new plant and animal varieties, show increased skill in making informed life choices and actively apply policy and decision making knowledege.

Conditions – a long-term change in conditions occur when a SOCIETAL CONDITION is improved due to a program outcome and/or a student's or participant's continued use. Examples of changes in conditions are safer or more accessible food supplies, higher water quality and a cleaner environment, increased market opportunities, better quality of life for youth and adults in rural communities.

Dr. Aruskevich, of Evaluation Research Associates in Fairbanks, conducted the evaluation of the five UAF programs and authored the Collaborative report. Dr. Madden, of Madden and Associates of Juneau, conducted the evaluation of the UAS Sitka and Ketchikan program. This data is integrated.

Drumbeats Alaska Collaborative

Drumbeats Alaska Collaborative 2017-18 Goal and Objectives

Goal: Strengthen the sustainability and development of Rural Alaska communities.

Objective 1 - Enhance local food and energy security

Objective 2 - Enhance formal, informal and/or indigenous knowledge and its application to rural and subsistence living

Objective 3 - Increase rural leadership in resource stewardship

Objective 4 - Increase collaborations to strengthen subsistence knowledge and practice

For the past four years, 2014-2018, a statewide collaborative of the seven federally designated Alaska Native Serving Institutions (ANSI) of the University of Alaska System have operated programs through USDA NIFA funding. Five campuses are under the University of Alaska Fairbanks (UAF) and two campuses are under the University of Alaska Southeast (UAS).

University of Alaska

The University of Alaska is a system of three 'major academic institutions, each separately accredited with camupuses in Juneau, Anchorage, and Fairbanks. The University of Alaska is a land-, sea- and space-grant system. UA acquired land through acts of Congress in 1915 and 1929 and through land settlements with the State of Alaska in the 1980s.

University of Alaska Southeast Programs

The Ketchikan and Sitka campuses of the University of Alaska Southeast share an overall regional mission: Student learning enhanced by faculty scholarship, undergraduate research and creative activities, community engagement, and the cultures and environment of Southeast Alaska. The two ANSI provide academic and career/technical education from occupational endorsements through bachelor degrees. Both academic and career programs take advantage of the unique maritime location of the campuses and most are delivered throughout the state via distance delivery. *Coastal Resources* provides learning opportunities to increase the number of people with knowledge of contemporary and traditional uses of coastal resources and potential threats to these resources. The project includes educational materials for K-12 teachers, workshops and field trips, college courses on the anthropology and biology of coastal resources, and public awareness about traditional and contemporary uses of coastal resources. This program is housed at the Ketchikan Campus and began delivery in 2004.

Through a collaboration with the Sitka Sound Science Center, *Getting Rural Alaskans into Science Professions* (GRASP) is a network of programs in place that support and reinforce each other while providing outreach and science education: Scientist in the Schools places a scientist in elementary through postsecondary classrooms; and the annual WhaleFest symposium for high school students from Sitka and school districts and a course on the Federal Subsistence Board. GRASP is housed at the Sitka Campus and began delivery 2004.

University of Alaska Fairbanks Programs

The University of Alaska Fairbanks' College of Rural and Human Development (CRCD) serves the community college mission for UAF with a focus on workforce development, career and technical education and academic preparation for college through five Alaska Native Serving Institutions (ANSI) located in rural transportation hubs. CRCD's community campuses reach 160 communities statewide. *From the CRCD Website*

The *Environmental Studies* (ENVI) program aims to improve technical knowledge and skills necessary for individuals to take an active role in the management of the natural resources in their communities. Awards available: a Certificate in Environmental Studies and Occupational Endorsements in Rural Surface Water Quality Testing and Rural Waste Management and Spill Response. This program is housed at the Bristol Bay Campus in Dillingham, approved in 2007.

The *Ethnobotany* (EBOT) program delivers for-credit courses through the Kuskokwim Campus in Bethel and science-related outreach activities to youth and community members through Chukchi Campus in Kotzebue. Awards available: a Certificate and a minor in Ethnobotany in the UAF Department of Alaska Native Studies and Rural Development. This program is housed at the Kuskokwim Campus in Bethel, approved in 2007.

High Latitude Range Management (HLRM) students learn field-based techniques to inventory and monitor plant and animal populations and to sustain yield through management. Students also learn to create reindeer by-products with hides, bone, antler and hoofs. Awards available: Certificate. This program is housed at the Northwest Campus in Nome, approved in 2007.

Sustainable Energy courses taught include topics such as renewable energy technology, energy storage, weatherization, building science, lighting and appliances and basic physics related to electricity and heat. Awards available: Occupation Endorsement in Sustainable Energy. This program is housed at the Bristol Bay Campus in Dillingham, approved in 2011.

Tribal Stewardship is a series of courses under the Tribal Management (TM) academic program that aims to protect food security for Alaska Native Tribes through mapping traditional territories, customary land use and developing a resource management plan. Tribal Stewardship courses have over 90% Alaska Native participation. Award available: TM Certificate and Associate Degree. This program is housed at the Interior Alaska Campus in Fairbanks began delivery in 2013.

Figure 1. Map of the university of Alaska System over the continental United States. Source: University of Alaska System website at http://www.alaska.edu.

Project Context

In 1971, the U.S. Congress passed the Alaska Native Claims Settlement Act (ANCSA). ANCSA divided Alaska into 12 geographic regions. Alaska Natives then organized Regional Corporation for each region which also contains numerous smaller rural Village Corporations, about 225 in all. "Rural" refers to communities outside the non-subsistence areas defined by the Joint Board of Fisheries and Game (5 AAC 99.015). Large areas of Alaska Native traditionally used land was claimed by the State of Alaska or the federal government.

Figure 2 is a map that shows traditional territories by culture. There are distinct Alaska Native cultures speaking 20 different languages (Alaska Native Language Center). Table 1 below shows the population and the percent Alaska Native by census area in the campus' service region.

Much like their ancestors, many Alaska Natives continue to maintain a close relationship to the land. Residents depend upon the harvesting of moose, caribou, fish, berries, seal, beluga, whale and other traditional foods (varying by geographical location) for the majority of their diets. This activity is traditional and necessary given the cost for food for a family of four with two children in rural Alaska. According to Alaska Economic Trends (June 2018), food costs in the regional hubs are 131% (or $360 in Nome) to 169% (or $463 in Kotzebue) over the average cost of $267 in Anchorage for a week of groceries The study does not have estimates for the much higher costs of food in villages.

Table 1. ANSI service region population by census area with percent Alaska Native.

UA ANSI Campus	Census areas	Population/%AKN
Chukchi	Northwest Arctic	7,523 / 80%
Northwest	Nome	9,492 / 76%
Kuskokwim	Kusilvak, Bethel	31.931 / 93-84%
Bristol Bay	Dillingham, Bristol Bay	6,560 / 72%-33% /
Interior Alaska*	Yukon-Koyukuk SE Fairbanks GASH villages (see note) McGrath Yukon Flats villages	5,558 / 14% 7,029 / 12% 540 / 90% 346 / 37% 2043 9/ 90%
Sitka & Ketchikan	6 rural census areas Total pop/median AKN %	36,251 / 15.5%

Figure 2. Map of Alaska Native cultures. Source: Alaska Native Heritage Center, accessed at http://www.alaskanative.net.

Most Alaska Native families participate in a mixed subsistence-cash economy, relying heavily on the hunting and fishing in combination with cash income from a handful of local full-time, part-time or seasonal jobs. Balancing a traditional lifestyle with the need to provide for food and the cost of heating oil and food in rural communities is a challenge. Statistics from the same Alaska Economic Trends edition show heating costs can range from $4.52 per gallon per the regional hub of Kotzebue, to $11.00 per gallon in Arctic Village which is off the road and waterway system in Northeast Alaska.

Alaska Natives have historically been under represented in education generally and in post-secondary education especially. Education of Alaska Natives began with segregated schools, evolved to include boarding schools, then this scenario changed in 1976 with the Molly Hootch court case that mandated the State of Alaska to establish high schools in 126 villages across the state. Access to local post-secondary education has been fairly consistent since ANSI status was created by the Federal Government in 1998 under the Higher Education Act. While a large number of village-based students entering college are first generation college students, due to a variety of federally funded programs, more Alaska Natives of all ages are enrolling in college courses and earning degrees in greater numbers than ever before.

Source: Census 2010
*Does not include Fairbanks
Note: Grayling, Anvik, Shageluk, Holy Cross

Evaluation Tenents

There are multiple ways of thinking, processing and applying evaluation methods. In the evaluation of *Drumbeats Alaska*, there are two cultures to consider, the western university culture along with federal program requirements and measures of success, and the Alaska Native culture of the population served. While the *Drumbeats Alaska* programs operate from an accredited university culture, under fiscal and personnel policies and procedures with degree granting privileges, it is implemented in Rural Alaska communities, many with 80% or more of the population Alaska Native. During the four-year project 46% of students enrolled in program courses are Alaska Native.

Indigenous Evaluation attends to context, including how historical and contemporary conditions influence the community in which programs are situated. In past, when evaluating a special populations grant, the context program implementation and lifestyles of the people who live there have been described.

With the growth and expansion of Indigenous Evaluation (IE – conducted by Indigenous persons) and Culturally Responsive Indigenous Evaluation (CRIE) - the inclusion of indigenous traditions, culture, language, community and context goes beyond these simple frames to include inherent legal and political rights afforded to no other racial or ethnic group in the United States as Indigenous peoples are sovereign nations.[3] IE warns against hasty classifications and constraining evaluations to narrow interpretations limited to small numbers of variables,[4] to do less is to marginalize Indigenous people and Tribal nations and demonstrate the technical deficiencies of the evaluation profession.[5]

In light of the newest peer reviewed articles on IE and CRIE cited here, the American Evaluation Association's Evaluator's Ethical Guiding Principles and Statement on Cultural Competence in Evaluation,[6] consideration will be given to Alaska Native context and culture in presenting outcomes and impacts of *Drumbeats Alaska*.

To collect data on program outcomes and impacts, a variety of qualitative and quantitative methods were used, which together document participant changes in knowledge, actions and conditions.

Qualitative data collection methods used include the review of technical documents and student work, grant reports, student surveys and interviews, and in-depth faculty interviews.

Quantitative data collection methods include student enrollment figures for the Collaborative are from UAF Institutional Research and Planning,[2] and others as cited, with use of measures of central tendency, a science assessment and attitude survey for Sitka K-12 students, post-secondary student enrollment and completion analysis, the number of workshops presented and participants attending. Upon further inquiry, data from REEport produced significant current and future quantitative impacts.

The data is presented with a primary focus on the 2017-18 project year. However, for mid term outcomes of action, the data may extend back to 2014, the first year of the four-year collaboration. Long-term impacts may have roots in activities implemented in prior AN/NH funding cycles now coming to fruition, and include current and future anticipated changes in conditions.

Food Security

Objective 1 - Enhance local food and energy security

The Tribal Stewardship class that testified before Alaska Board of Game and inflenced the outcome on three rulings.

Changes in Conditions

On January 18, 2019, the Fairbanks Daily News Miner reported on the effect Tribal Stewardship students had on the Alaska Board of Game as they reached three outcomes the students wanted:

- a rule expanding meat salvage requirements for swans, geese and cranes was approved by the board;
- a rule that sought to limit hunting of bears in dens was defeated; and
- a rule that would have changed permit requirements for Alaska Native religious ceremony hunts was also defeated

As defined by the U.S. Department of Agriculture, food security is *access by all people at all times to enough food for an active, healthy life*.[7] Compared to other states, Alaska faces unique food security challenges because of its remoteness, high costs of transportation, limited agricultural production, and high reliance on imported food.[8]

Most of the Alaska wild food harvest, about 34.3 million pounds in 2014, is produced by the 17% of the Alaska population living in rural areas (about 125,000 people). This is an average harvest of 275 pounds of wild foods per person annually. Wild foods provide 175% of daily protein requirements and 25% of caloric requirements in rural Alaska.[9]

Non-subsistence areas are areas or communities where subsistence harvests of fish and wildlife are not a principal characteristic of the economy, culture, and way of life (Alaska Statute 16.05.258(c)).

Meeting the objective to enhance food and energy security through education could be a challenge, given rural Alaska's remoteness, extreme climate and the diverse social, political and cultural settings. Nevertheless, four *Drumbeats Alaska* programs discussed under Objective 1 provide education that is changing student's knowledge, actions and ultimately, societal conditions as shown by Tribal Stewardship students, above.

Coastal Resources and Ethnobotany teach about local food sources and Tribal Stewardship educates students to ensure access to traditional wild food resources. All three programs teach to plan for the future to protect those resources and access to them.

Examples of short, medium and long-term outcomes for programs follow:

Changes in Knowledge

Tribal Stewardship student: My class opened my eyes to the authority and right Indigenous people have to set our own priorities and maintain Tribal sovereignty. It's all about learning terminology and how to speak in front of boards.

EBOT student: Knowledge is being lost on traditional ways to harvest, preserve, and prepare these natural foods, thus making them unavailable for generations to come.

EBOT 4H instructor: Trips to the local grocery store teach budgeting, cost comparisons, choosing substitutions, making group decisions to stay within budget and reading labels for nutritional value and ingredients. This leads to discussions on personal finance and healthy diets. Through everyday activities, young people learn fundamental life skills in a safe and positive environment.

Coastal Resources students reported an increased knowledge about local resources and their usages, as well as Indigenous traditions concerning these resources.

EBOT student: I have become more knowledgeable about identifying local resources and ways to process and use them for food, medicine, and craft. I have a deeper understanding of the ethical issues around harvesting local resources and using ancestral knowledge.

Changes in Actions

Coastal Resources Faculty, P. Schulte: Our students have an increased awareness of what the resources are and how they can be harvested in a way that does not deplete the supply but allows for renewability by only harvesting what they will use. Students practiced these sustainable harvesting methods as they gathered plants and beach foods, prepared using contemporary food preparation techniques that are documented in a cookbook, *A Taste of Southeast Alaska*, developed under the grant.

Tribal Stewardship Faculty: Two of the first students in the Tribal Stewardship program are now on the Alaska Board of Game and Federal Subsistence Board. Others seek seats on Tribal and regional advisory committees. One student who is a principal is so impassioned by the program, she uses the curriculum in regional Hydaburg high schools.

Tribal Stewardship student: I see more emphasis on our traditional way of life and consuming more traditional native food, growing more local food. It's slow going, but it is moving in that direction.

EBOT faculty, L. Strecker: A student who is also a teacher said: I incorporate all that I'm learning into presentations for my students.

EBOT student: I am wildcrafting abundant plants (nettle, plantain, dandelion) and have a better understanding of how important "weeds" are to us.

EBOT student: Since taking this course I've become a member of United Plant Savers Botanical Network Sanctuary to protect at-risk plants. I am a steward for plants.

Changes in Conditions

The Tribal Management student of the year : I think the strongest part of your program is that you validate people, and you give them confidence to be who they are to speak out. This is as important, if not more important than any of the technical and academic aspects of the program.

EBOT published a book by faculty K. Jernigan, anthropologists and regional elders, *A Guide to Ethnobotany of the Yukon-Kuskokwim Region*. This book makes available to the

Energy Security

Objective 1 - Enhance local food and energy security

Energy Security: Renewable energy resources are natural resources that can be replenished on a human timescale. Some examples for the Bristol Bay region includes river, wind, solar, biomass, geothermal, and tidal resources. Some energy resources are renewable, the devices needed for the conversion of these resources into a useful form are not (e.g. wind turbines require copper and other finite resource to capture wind energy). Energy efficiency as used here refers to measures resulted from the decreased use of energy such as more efficient lighting or human behavior turning off lights when not needed. Energy efficiency itself is not a natural resource, but its use has the same effects as the use of renewable energy by reducing the consumption of fossil fuels.[10]

One of the biggest ways Sustainable Energy courses enhance the level of energy sustainability is by educating people with the practical abilities to make changes. Sustainable energy literacy enables people in rural Alaska to make educated decisions regarding their energy practices. Students learn, for example, if they replace an incandescent light bulb for an LED light bulb they will get a return on investment in the order of hundreds of percents.

Changes in Knowledge

Students of the Sustainabilty Energy program comment on how the courses broadened their perspectives:

I am more aware of how the outside world affects our rural environment and how to decrease our footprint by looking to alternative energy to decrease energy costs.

I think our Inupiat people need wind and/or solar power energy because up here on the North Slope we have constant winds with no trees or mountains to block the wind, and during many months of the year we have nearly twenty-four hour sunlight.

It is great to understand how to measure, calculate and determine energy efficiency.

Local food resources and energy efficiency shouldn't be luxurious, high cost lifestyles.

ENVI Student

Changes in Actions

Students of Sustainabilty Energy comment on their changed practices:

It'll help me give correct advice when doing my work in a healthy homes program.

I will use this knowledge personally to save energy and have more efficient facilities.

Faculty T. Marsik: All the research we do at the Cold Climate Housing research Center is incorporated into the Sustainable Energy classes we teach.

Changes in Conditions

Faculty T. Marsik conducted research monitoring the performance of a combined heating and ventilation system (BrHEAThe) and evaluated its suitability for Rural Alaskan homes. The anticipated future impact will affect over 1,000 homes in Rural Alaska.

Another project for T. Marsik is researching air-source heat pumps as a possible heat source for buildings. The anticipated future impact will affect over 10,000 homes in rural Alaska.

Objective 2 - Enhance formal, informal and/or indigenous knowledge and its application to rural and subsistence living

The educational courses and activities provided by Getting Rural Students into Science Program through the WhaleFest, Scientists in Schools (SIS) and Environmental Studies' Occupational Endorsements provide foundational educatioal experiences for **sustainability** or maintenance and management of natural resources.

High Latitude Range Management provides economic **development** in Rural Alaska through the production of reindeer products for the commercial market.

While all programs meet Objective 2, the programs in this section provide education and educational opportunities that meet the Collaborative goal *to strengthen the sustainability and development of Alaskan communities.*

A definition of Indigenous knowledge and comments follow.

Changes in Knowledge

Each of the 60 students who participated in the **WhaleFes**t courses reported that they had acquired new knowledge about science content and the process of science. Fifteen students reported changing their opinion about how science actually operated. Ten students reported that their participation had either inspired them to consider a career in science or had reaffirmed their career choice.

WhaleFest student: I hadn't considered research in the collaborative and communal way that these scientists practice.

The Tribal Government Symposium: *Land Water Life,* a forum to build understanding, relationships and knowledge for the advancement of Tribal Governments and Tribal Stewardship in Alaska, was co-sponsored in Fairbanks in November 2017 with First Alaskans. This forum brought over 150 participants from across the state and included representatives from Tribal Governments, ANCSA Corporations, State and Federal agencies, and multiple Universities staff.

The **Biology and ENVI** courses discuss natural resources and sustainability. Sustainability can have a variety of definitions. In the environment, sustainability generally means supporting the long-term ecological balance of the environment by not causing harm to or depleting natural resources.

ENVI students comment:

This course has opened my eyes to how delicate our natural resources are when we don't treat them properly.

An obvious indicator of a change in students' knowledge is the successful completion of a university course and earning a university credential. Over the past four Collaborative project years, the enrollment of students has risen steadily over the past 10 years (for UAF programs, the first students enrolled in courses in the 2007-08 academic year (AY)). An unduplicated count of 137 students in AY2007-08 to 777 distinct students in AY2017-18 across all programs[2] as shown in Table 2 on the following page. All programs have at least 30% Alaska Native students enrolled (other races and unknown races make up the total). Table 2 enrollment figures include students enrolled in 1, 2, or 3 credit courses.

Enhance & Apply Knowledge

Objective 2 - Enhance formal, informal and/or indigenous knowledge and its application to rural and subsistence living

Table 2. Four-year Drumbeats Alaska student enrollment; unduplicated detail, unduplicated and duplicated totals, four-year project totals, with Alaska Native (AKN) totals and percent enrollment.

Unduplicated Enrollment	2014-15	2015-16	2016-17	2017-18	4 Year Total	4 Years AKN	% AKN
Coastal Resources	35	34	40	19	**128**	**52**	**41%**
Biology		44	71	175	**290**	**99**	**34%**
Environmental Studies	133	190	190	165	**678**	**331**	**49%**
Ethnobotany	32	48	47	24	**151**	**45**	**30%**
High Latitude Range Mgmt	33	6		10	**49**	**32**	**65%**
Sustainable Energy	83	65	180	122	**450**	**193**	**43%**
Tribal Stewardship	68	111	117	154	**450**	**393**	**87%**
Unduplicated Totals	374	476	613	653			
Duplicated Totals	553	758	885	898			

Notes: Unduplicated student enrollment counts enrolled in multiple semester in a year only once in that year. A duplicated student enrollment counts a student enrolled in multiple semesters in a year multiple times in that year. These figures cannot be totaled for an accurate count. Source: UA Banner closing extracts by UAF Institutional Research and Planning.

Eighty-four credentials were awarded were during the four-year project. Fourteen 30-credit Certificates and 70 - 9 to 18 credit Occupational Endorsements. Forty-nine percent (or 41) of the 84 credentials were earned by Alaska Native students

If we do our part to take care of the environment we can sustain the necessary food sources.

Changes in Actions

As foundational courses in science, environment and natural resources, many students surveyed told of personal actions to keep land and water clean such as picking up trash when they see it lying around and encouraging others to do the same.

ENVI student: Stewardship of resources is fostered when we learn to conserve water (not leave it running), compost our food (veg/fruit) waste; reuse paper towels to wipe up spills, etc.; not use plastic cutlery or disposable plates, cups (we wash and reuse), ration our snacks so we have some for the next time, take care of our gardens so we have plants for food and medicine.

ENVI student: The choices I make each day affect generations to come. Making wise choices to be a part of my community and providing service to others can and will make a positive difference.

A GRASP student in the Federal Subsistence **course** was moved by his new interest in policy issues to attend a State Board of Fisheries meeting.

Changes in Conditions

ENVI Facutly, T. Radenbaugh: There is just so much garbage that we generate now because of the way we use commodities. We don't recycle, we just throw things away. Garbage has become a major problem because there are so many different types of plastics, and metals and knowing which can be recycled is a very complicated issue and needs training. ENVI's two OE's work to this end.

ENVI long-term goal: To maintain negotiations with the Environmental Protection Agency (EPA) to make the curriculum of Water Quality Analysis and Rural Landfill Occupational Endorsements part of the EPA iGap program.

ENVI long-term goal: Bristol Bay has assumed oversight of the Aleutian Islands and is slowly working to deliver courses to the distant island communities. This will expand data collection to crab and other fisheries with work out of Unalaska and require different data from the primarily

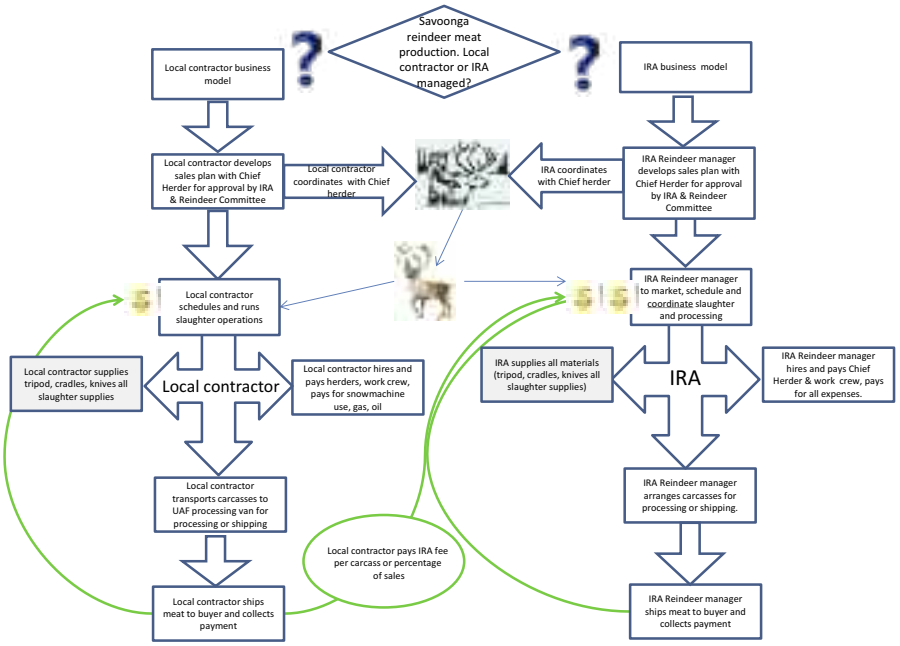


Figure 2. Flowchart depicting options for the Savoonga reindeer meat production business.

Development, as used in this report, means the improvement of the social well-being of people. In an Indigenous context well-being extends to self-determination and sovereignty. *Drumbeats Alaska* programs **develop** students and community members through education in the food, agricultural, natural resources and human sciences.

The High Latitude Range Management program is all about jobs and **economic development**. The reindeer industry has been in Alaska a long time, but historically it has been in subsistence context where people had to herd reindeer to eat. The program teaches animal husbandry as well as approved slaughter techniques.

Changes in Knowledge

In today's context, the HLRM program focuses on developing knowledge and skills for people in rural Alaska to create their own business selling reindeer meat. HLRM students learn how to slaughter and cut meat by USDA guidelines. The State of Alaska allows a field slaughter with certain constraints both on how the animal's slaughtered and how its marketed. Students are starting with a field slaughter then working their way into an inspected slaughter.

Faculty work with students and reindeer business owners to develop business skills, a business plan and to determine sales options that affect day-to-day operations to make the business developed remains a sustainable, viable business.

HLRM faculty, G. Finstad, is also working with Stevens Village to develop a reindeer business. As subsistence resources disappeared, Tribal members took action that was out of the traditional culture of hunting, to purchased land. This is a change from a hunter-gatherer subsistence people to farmers and ranchers.

Changes in Actions

Late last winter a reindeer business – *White Out Reindeer*, was started in Savoonga, on St. Lawrence Island in the Bering Sea. After two months in business, they sold out of all their product. The word got out about Alaska-based reindeer meat and the business is receiving numerous requests and now must choose between four newly developed reindeer enterprise price/slaughter scenarios for future business operation.

Changes in Condition

It may take a while for societal conditions to change where local residents can raise, slaughter and sell enough to make a viable living. However, the first steps have begun and the first revenues from reindeer production are in pocket.

Indigenous Knowledge

Objective 2 - Enhance formal, informal and/or indigenous knowledge and its application to rural and subsistence living

The United Nations Education Science and Cultural Organization (UNESCO) defines Local and Indigenous knowledge systems as the understandings, skills and philosophies developed by societies with long histories of interaction with their natural surroundings. For rural and indigenous peoples, local knowledge informs decision-making about fundamental aspects of day-to-day life. This knowledge is integral to a cultural complex that also encompasses language, systems of classification, resource use practices, social interactions, ritual and spirituality. These unique ways of knowing are important facets of the world's cultural diversity, and provide a foundation for locally-appropriate sustainable development.

Student surveys reveal what students think community sustainability means…

…enough resources for generations to come
…that there is enough for everyone, including the ecosystem to survive
…an awareness of and action toward preservation and protection of local resources

Indigenous students defined community sustainability as...

… the people of a community work together to make themselves and their resources sustainable. This means hunting and gathering for each other, taking care of each other and the land or animals they are harvesting from.
…the ability to increase our sovereignty over local issues to maintain our traditions, languages, resources and ways of life in perpetuity.

The *Drumbeats Alaska* programs are integrated into the communities. Every program has included participants and students from the Alaska Native Community, some more than others, often by the nature of the program. Indigenous knowledge integration into Western post-secondary education is often a challenge from ANSI to the main university campuses. Following are a few faculty comments:

Tribal Stewardship faculty, C. Stevens: Indigenous people largely have not felt welcome or at home within higher education institutions. So, we very much stress – we do a lot of sessions here at the Interior Alaska Campus, this physical location – that this is their university. UAF is their university, and they belong, and, in fact, we're proud to have them. And because our curriculum is all based on tribal requests, tribal needs, organizational partnerships, we serve probably the most under-represented population in Alaska, more than any other program, and that's Alaskan-Native males.

Coastal Resources Faculty, P. Schulte: I've actually had some of the tribal members come up and say, Y*ou know, nobody ever indicated they were interested in what we knew or thought before.* So, they felt like they knew stuff, but nobody had cared.

We have a very close connection with Ketchikan Indian Community. Some of their cultural teachers and language teachers regularly come to our classes and present information.We work with Haida and Smalgyax language teachers. An elder who is in his mid-90s now, comes with a cultural teacher and presents to us several times a year.

Student comment: Published works on Native American use of edible/medicinal plants should be verified, as I have definitely become more knowledgeable about about identifying local resources as well as different ways of processing and using them for food, medicine, and craft. In addition, I have a deeper understanding of the ethical issues around harvesting local resources and using ancestral knowledge and I am concerned that many texts may be influenced by colonization.

Federal Subsistence Board students with Gordon Brower, North Slope Regional Advisory Council Chair.

As leadership expert Warren Bennis once stated, *Leadership is the capacity to translate vision into reality*.[11] Leaders possess social intelligence, a zest for change and above all, a vision that allows them to set their sights on the things that truly merit attention. It is the job of leaders to develop a vision, establish what matters and articulate why, then set direction and inspire others. That is not a bad skill set for the rest of us either.

All *Drumbeats Alaska* programs work toward resource sustainability and through program faculty to develop leaders using eclectic methods. Through interviews, faculty saw students who gained confidence in content matter becoming a role model in small villages because of their increased knowledge which ultimately placed them in a grassroots leadership role. Some programs assign projects with presentations to community members and/or at conferences such as the Western Alaska Interdisciplinary Conference or the Alaska Forum on the Environment. This builds confidence in public speaking. Two programs specifically work on public speaking, Tribal Stewardship and Coastal Resources. Internships and practicums also provide leadership opportunities as they may lead to implementing a project in the community. Running a business engages many skills of leadership as individuals make and evaluate their decisions, deal with the public and their stature increases in the community. Last but very important, generally speaking, is how program faculty increase the public speaking ability of student and program participants.

Following are faculty statements that explain how their program specifically develops leadership skills:

Leadership

Objective 3 - Increase rural leadership in resource stewardship

Ethnobotany – Our students become plant specialists. They may be people known for their plant knowledge but the training in our program gives them even more authority in their communities. Through courses they identify what plant they want to study, put the research together and make a presentation. This way, they automatically become multipliers of plant knowledge. We stress and discuss the responsibility that comes with this role, e.g. regarding poisonous plants, ethical and respectful harvesting and long-term sustainability.

High Latitude Range Management: To be able to run your own business, you have to have leadership skills. You have employees. You have to deal with the public. And that's where I've seen real changes in people and how their stature in their community has grown. They make decisions they never had to make before and now have the tools to evaluate their decisions. We've empowered them to become leaders by running their own businesses.

Sustainable Energy: Our students and participants are more effective leaders by being able to decide what is sustainable - installing solar panels on their homes? Pursuing a project to replace light bulbs in their homes? Thanks to the knowledge of energy efficiency, they have a quantitative understanding knowing which project will make greater impact. Students also participate in self-identified projects to solve energy issues in their community. It builds their leadership skills either to evaluate or implement a project and has real impacts for the community.

Coastal Resources: Our Tribal Scholar students are quite shy. We often have them do presentations to the tribal elders during their luncheon and for most of them, it's the first time they've had to stand up and talk about something. The elders are so pleased to see the young people learning that I see that the students get a real sense of pride and excitement sharing their information. Those high school students are developing leadership skills.

Environmental Sciences: There are internships in the occupational endorsements, they could be anywhere in Alaska where the students are – however, they need someone in to lead the internship. So, working with communities across the State, I have been trying to identify individuals who are leaders themselves, who will take on an educational role and help students.

Tribal Stewardship – Courses cover public speaking. Students identify what they feel strongly about, prepare a talk, then practice speaking. In these practice sessions, they record one another, hear themselves speaking and hear others practicing. We set up rooms that resemble a public meeting and they practice testifying.

Another student is in a leadership role in her tribal nonprofit in Valdez and is starting an educational program to teach traditional practices, traditional hunting practices. She is also on her local advisory committee and is the chair. Many other students are seeking chairmanship in their local advisory committees, the Fish and Game Advisory Committees, and seeking seats and leadership roles on their tribal councils and governments.

Getting Rural Students into Science: Through SIS, GRASP is building leaders in science for the future by setting examples and interactions with real scientist at an early age. The program also supports a course

Objective 4 - Increase collaborations to strengthen subsistence knowledge and practice

Collaboration in this report is defined as authentic partnerships that provide support to *Drumbeats Alaska* curriculum, programs and/or students and participants. The data comes from comprehensive interviews with project faculty. While programs, activities and/or faculty may have multiple funding sources, detailing the myriad of federal and other funding sources that compliment ANNH *Drumbeats Alaska* programs is beyond the scope of this evaluation. Following are partnerships and collaboration of each program:

Tribal Stewardship all courses are organized with program partners which include:

- Tanana Chiefs Conference
- Ahtna Intertribal Resource Commission
- Bristol Bay Native Association
- First Alaskans Institute
- Yukon River Intertribal Fish Commission
- Kuskokwim Inter-Tribal Fish Commission

These organizations, participated in the developed of curriculum around salmon and moose and they provide access to students. Some partners contribute to a participant's travel. The organizations spend a great deal to make these training and workshops accessible to tribal membership in their region.

High Latitude Range Management
It requires a lot of components to develop a reindeer industry: research and development as well as education and outreach.
HLRM program partners are:

- UAF Reindeer Research program with its associated budget
- Kawerak, Native Corporation and other NIFA funds to create business plans
- Tanana Chiefs Conference - to develop these reindeer commercial businesses
- Alaska Department of Environmental Conservation – work with the state veterinarian to ensure field slaughters produce a safe, wholesome product

Sustainable Energy

- Amazing synergies in partnerships with the Cold Climate Housing Research Center and the Alaska Center for Energy and Power for research and curriculum
- Alaska Pacific University (APU), negotiating to use our Sustainable Energy Occupational Endorsement curriculum as a stepping stone towards their bachelor's degree in Sustainability Studies at APU

Coastal Resources partnerships with:

- Ketchikan Indian Community – Haida, Smalgyax and Tlingit cultural and language teachers regularly come to our classes and present information; Tribal Scholars – an
- Ketchikan Gateway Borough School District alternative high school – partners on delivery of dual credit biology delivered to their Tribal Scholars
- Forest Service archeologists as presenters and at archeology/food gathering class at traditional resource gathering areas

Environmental Studies

- Zender Environmental – continued curriculum development on how to prevent modern plastic and metal waste from becoming a biohazard
- Fish and Wildlife Service in Fairbanks and Dillingham for research and analysis
- Alaska Forum on the Environment - for almost ten years as organizer of conference and for dissemination
- NOAA – data sharing

Program Collaborations

Objective 4 - Increase collaborations to strengthen subsistence knowledge and practice

Getting Rural Students into Science Programs

- Sitka School District - Scientists in the Schools (SIS)integrates practicing mid- career scientists from around the country into K-12 classrooms
- Sitka Sound Science Center – subcontractor that coordinates SIS and Whalefest activities
- Sitka Whalefest – a science symposium that blends local and scientific knowledge and inquiry of the northern marine environment, GRASP teaches Biology courses around the annual theme for high schoolers and college students and supports students in the annual OceanBowl academic decathlon

Ethnobotany

- Northwest Arctic Borough School District and 4H – summer gardens, afterschool program
- University of Alaska Southeast, Ketchikan Campus – assisting with additional curriculum
- Earlham College – provided ethnobotany field work experience in rural Alaska for their students
- Windward College, University of Hawai'i – student exchange

Looking back over the evaluation and accomplishments of the seven Drumbeats Alaska programs, four areas stand out:

1. The programs meet and exceed project objectives in the following ways:

- Enrollment in Drumbeat Alaska programs is steadily increasing over the past 10 years (for UAF programs, the first students enrolled in courses in the 2007-08 academic year (AY)). An unduplicated count of 137 students in AY2007-08 to 777 distinct students in AY2017-18 across all programs.
- *Drumbeats* programs have become more successful in reaching the target population of underserved students with relevant and timely educational content. This indicates the program directly contributes to meeting the USDA NIFA Strategic Plan Strategic Goal 1 Catalyze exemplary and relevant research, education and extension programs, and Sub-Goal 1.7 Ensure the development of human capital, communities, and a diverse workforce through research, education, extension and engagement programs in food and agricultural sciences to support a sustainable agricultural system.
- Each program has specific and relevant partnerships and collaborations that provide important contributions and build the stature, relevance and importance of these programs in the FANH sciences in the region and state. While most project faculty are only a percentage of FTE, the work for NIFA is extended and enhanced in their other duties.
- Programs develop leadership skills in students and community members.

2. While numbers of credentials earned are low, the impact of Drumbeats Alaska programs is solid in making a difference for many rural Alaskans.

Project faculty meet rural and Alaska Native village-based students where they are with place-based relevant learning, developing Occupational Endorsements, providing symposiums and workshops for community members, and bringing students together to share western science and Indigenous knowledge. This education, when embraced and practiced by students, leads to a change in knowledge, actions and in some cases a change in societal conditions.

3. Indigenous knowledge is included in programs at different levels – which often depend on the subject matter and course content.

While faculty are sensitive and inclusive of Indigenous students and participants, there are many areas, as non-Indigenous peoples, they may have limited understanding. For example, speaking in public for many Alaska Natives is often difficult. What may not be know is the underlying reason. As explained by the Tribal Stewardship faculty, C. Stevens, some issues are inappropriate to discuss in public due to cultural norms and spiritual beliefs. For instance, explaining the harvest of certain animals may greatly impact their ability to feed their families by discussing these issues in public. In addition, Alaska Native Elders attend and participate in every Tribal Stewardship course. Other faculty describe the importance of completing post-secondary educational courses often raises the status of that student to a role model in the community which in turn works to create a leader. Most *Drumbeats Alaska* faculty have lived in the rural communities they serve, this helps provide credibility to build trust, relationships and understanding between cultures.

The Culturally Responsive Indigenous Evaluation methods described in Evaluation Tenants, bring to light the knowledge that evaluation is not value free and is, by its nature, political. Success can be defined differently in rural and Tribal communities than by federal agencies. Credibility is important, and authenticity may be more important, leading

to the evidence of actions and impacts dependent on place that might otherwise be missed. As a ten-year non-Native practioner working with and evaluating Indigenous-based projects, I have learned to work with small numbers (its ok! Alaska's rural population is small compared to the Lower 48) and to listen and look for authenticity and evidence from the eyes of the student or community member.

4 Student and participant survey response rate was low.

Two sets of surveys were developed: online for semester long courses, and a paper survey for events and workshops and short or intensive courses. Faculty or staff were responsible to deploy the community/event surveys and the semester-based, online survey (Fall semester only). Online surveys were directly emailed to a student's preferred email during spring semester. Of the 201semester-based students, 44 completed the survey for a 22% response rate, primarily by EBOT students. Only two groups of students completed the paper surveys.

Although students complete a course review, the evalution surveys asked specific questions on sustainability, development and use of local resources. More faculty and staff participation is needed to ensure an adequate return across all programs.

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