



Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Grants Program

Impact Report 2001-2007



University of Hawai'i



Cooperative State
Research, Education, and Extension Service



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Introduction – Alaska

The University of Alaska has a number of community campuses located in rural and remote areas of the State. The University of Alaska Fairbanks (UAF) College of Rural and Community Development (CRCDC) serves the vast majority of the rural villages of the state from extended campuses located in Kotzebue (Chukchi Campus); Nome (Northwest Campus); Bethel (Kuskokwim Campus); Dillingham (Bristol Bay Campus) and the Interior of the state from Eagle to Unalaska (Interior-Aleutians Campus) in cooperation with the UAF-based Cooperative Extension Service. In addition to the CRCDC campuses there are Alaska Native Serving Institutions (ANSI) designated at University of Alaska Southeast at Sitka, Prince William Sound Community College and the unique Tribal College in the state, Ilisagvik College in Barrow.

The USDA/CSREES Alaska Native/ Native Hawaiian Serving Institutions program has been instrumental in improving the availability of math and science education in rural Alaska at these ANSI campuses while helping students to succeed in these subjects from kindergarten through the Associates level and beyond. The ultimate goal is to retain local talent and natural leaders in their respective communities in rural Alaska, slowing the exodus of residents seeking greater educational and employment opportunity in urban centers. These efforts will lead to opportunities for local employment which will lead, in turn, to improved infrastructure and quality of life in rural Alaska.

Lessons learned and results achieved with the assistance of this federal funding over the past four years have provided a firm foundation for the development of four place-based, science-related certificate programs and an Associate of Science degree program housed at the five rural UAF campuses. The certificate programs chosen for development are in the disciplines of Environmental Science (Bristol Bay Campus), High Latitude Range Management (Northwest Campus), Ethnobotany (Kuskokwim Campus) and Veterinary Science (Chukchi and Interior-Aleutians Campuses). A major component of this effort was a comprehensive needs assessment of the educational, health, and economic development needs of the people in each region. The findings of these needs assessments contributed significantly to the choice of emphasis area for the place-based, science-related certificate programs and the Associate degree programs that are now approved or being developed by the UAF rural extended campuses.

With the assistance of USDA/CSREES, ANSIs are strengthening the science programs of rural extended campuses by increasing staff resources in the sciences. Moreover, the content of place-based, science certificate programs combine western empirically-derived science principles and concepts with the indigenous knowledge base and practices of Alaska's Native population. An expected progression is that students who complete these programs will seek further education or gain employment in vocational fields associated with the focus of their science-based education.

The long range intent of these programs is to strengthen place- and science-based education in an effort to empower local people in rural Alaska. This improved capacity will, in turn, provide opportunities for local residents to develop and use their innate leadership abilities to cope effectively with the social, cultural, and economic environment of their region in order to respond effectively to local issues of concern.

The Alaska Native Serving Institutions of our state thank the USDA/CSREES Alaska Native/ Native Hawaiian Serving Institutions program for their support!

On behalf of the Alaska Native Serving Institutions of Alaska,

Bernice Joseph
Vice-Chancellor for Rural, Community and Native Education
College of Rural and Community Development
University of Alaska Fairbanks

Introduction – Hawaii

The primary goals of the University of Hawaii (UH) Agribusiness Education, Training and Incubator Project (AETI) project, sponsored by the USDA, CSREES, Alaska Native/Native Hawaiian-Serving Institutions Education Grant Program, are to enhance the University's educational and workforce development and agribusiness incubation capacities. This project is being implemented with a collaborative effort between the nine UH campuses and the associated Cooperative Extension Services, the Agricultural Incubator Program, local agriculture producers and business communities. The AETI consortium is striving to create an atmosphere in which faculty, specialists and incubator personnel can engage and interact with local farmers, existing enterprises and entrepreneurs to enable them to thrive economically while maintaining a commitment to environmental sustainable and culturally appropriate development. Throughout this project, emphasis is focused on building capacity and ownership among Hawaii's many rural agriculture communities, including a large number of Native Hawaiian and other traditionally underserved minority populations.

The specific AETI Program objectives are to: 1) develop needed work force through upgraded agriculture, agribusiness and entrepreneurship education and training programs, and 2) develop agricultural entrepreneurs and agribusinesses in Hawaii's rural communities. Consortium wide methods for achieving these objectives includes: a) a collaborative, statewide, multi-island effort, b) transferable education and training at multiple UH campuses, c) a coordinated agribusiness workforce development plan (integrated training and retraining), d) providing community focused business oriented support, and e) leveraging public-private partnerships to advance agribusiness development. To further increase the synergy between the consortium members, all consortium projects are focused on one or more of the following four thematic areas: 1) Biotechnology and bioproducts, 2) sustainable agriculture and ecosystems, 3) nutrition and culinary arts, and 4) agribusiness and entrepreneurship.

This nine-campus UH consortium project represents a substantial partnership effort and coordination between the UH's two baccalaureate and seven two-year community colleges and the Agricultural Incubator Program. Communication and collaborations are further increased by frequent meetings, common websites for information exchange and shared leadership among the campuses.

The Hawaii Consortium of projects benefitting from the Alaska Native/ Native Hawaiian Serving Institutions grant sincerely hopes that this report conveys some of the tremendous impact the grant has had on Hawaii. We would also like to thank Senator Daniel Inouye, Senator Ted Stevens, and CSREES for their support and the Alaska Project Directors for their encouragement and collaboration. We look forward to the opportunity to produce another report in the future with even greater results.

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Nurturing Hawaii's Agribusiness

Agribusiness Incubator Program

Once dominated by large-scale sugarcane and pineapple production, Hawaii's agriculture is branching out in new directions. Diversified crops currently account for 70 percent of the state's farm revenues. To help fledgling agricultural ventures get started and existing businesses flourish, the Agribusiness Incubator Program (AIP) was developed under the grant.

AIP provides consulting services to agriculture-related businesses that might not otherwise have access to such assistance. The incubator's staff members offer their clients help with financial assessment, strategy and planning, process improvement, and marketing. These services complement the technical expertise available to farmers and food processors through the University's other agriculture extension services. AIP also participates in community-based efforts to promote diversified agriculture.

Since its inception just three years ago, AIP has greatly impacted the agribusiness clients they serve and has earned recognition for its efforts. Significant metrics include:

- Served over 60 agribusinesses and related organizations located throughout the State,
- Served 11 agribusinesses with direct Native Hawaiian benefit
- Assisted with the startup of 18 new agribusinesses
- Assisted with bringing 5 value-added product lines to market
- Increased average annual client revenue by over 70%*
- Increase average annual client profitability by over 173%*
- Increased average client employee count by over 16%*

* Does not include startup clients with no prior year statistics as doing so would greatly inflate the numbers reported.

In addition to assisting clients directly, AIP has worked to promote the state of agriculture and agribusiness assistance by:

- Meeting with over 30 other resources/agencies/programs to promote collaboration and increase awareness of AIP services in order to better serve agribusinesses in Hawaii
- Supporting the establishment of a new tea industry in Hawaii by producing the report "*Developing a Hawaii Tea Industry: Recommendations for CTAHR-Grown Tea*"
- Strengthening the Consortium of grant project partners, including Alaska, through facilitation of Consortium administration and development and maintenance of collaboration website
- Providing outreach through a variety of venues in order to reach agribusinesses that may need assistance
- Directly contributing to the success of an organic farmer cooperative and regional agricultural planning group

Dates of Project:
10/2004-Ongoing

Location:
University of Hawaii (statewide)

Purpose: The objective of the Agribusiness Incubator Program is to increase the success of local agribusinesses by providing the agribusiness incubation capacity for the AETI Consortium statewide. Emphasis is on providing business incubation services for startup and existing agribusinesses from Hawaii's rural agriculture communities, especially those with high numbers of Native Hawaiians.



Conducting a tasting focus group for a value-added product (salad dressing)



AIP consultants (l) help local vegetable farmers (r) with business planning



At a nursery discussing operations

Integrated Education and Workforce Development

University of Hawaii at Manoa (CTAHR)

The Integrated Education and Workforce Development component of the University of Hawaii's Agribusiness Education, Training and Incubator program was established using USDA-CSREES funds to strengthen Hawaii's workforce in agriculture and natural resource management.

In May 2006, students, educators and community members participated in Hawaii island's first-ever Agricultural and Environmental Awareness Day at CTAHR's Komohana Research Station. Fifth graders from local grade schools had the opportunity to participate in lectures on exotic tropical fruits, forestry and the natural environment, invasive insects, hydroponics, tea production, and plant care, and to interact with hands-on displays presented by various non-profit organizations, government agencies, and colleges throughout the state, including consortium institutions on Hawaii island: UH Hilo, Hawaii Community College, and CTAHR's extension office. The Awareness Day exposed students to important issues surrounding agriculture, land use, and natural resources, and helped youth become better stewards of Hawaii's resources and raised their awareness of the diversity of careers in agricultural and environmental sciences. In light of the success of the Hawaii island event, we now are planning to hold the first ever Oahu island Agricultural and Environment Awareness Day in April 2007.

In summer 2006, funding from this grant helped five students test-drive their prospective careers by interning with Kauai agribusinesses. Timothy Rodenberger and Meagan Suzuki spent six weeks at Guava Kai Plantation, performing field research on fruit growth rate and fruit loss, which will help Guava Kai predict the optimal time to harvest. Erik Rook and Jennifer Tadina interned at Syngenta Seeds, Inc. Jenn compiled research data and assisted the nursery produce and maintain field crops and sample corn traits and genes. Erik helped to develop a new geographical information system tool. Clesson Higashi assisted CTAHR alumnus Dr. Mike Austin of Pioneer Hi-Bred International, Inc., in experiments to improve crop management techniques and seed production efficiency. Clesson also implemented the release of parasitoid wasps as a biological measure against corn earworm. He presented his work and related findings by his mentor, CTAHR's Dr. Mark Wright, at the Hawaii Crop Improvement Association's annual meeting.

Housing and transportation were provided for the interns using funds from this grant, and weekends gave the students a chance to get acquainted with each other and with a sixth student, Whitney Haraguchi, who interned with USDA's Natural Resources Conservation Service through an NRCS scholarship. In the wake of the success of last year's internships, we are coordinating with employers on Kauai and Maui islands to sponsor greater numbers of summer internships on both islands, which involve students from UH Manoa and the consortium colleges on those islands.

Dates of Project:
10/2004-Ongoing

Location:
University of Hawaii at Manoa

Purpose:
The integrated Education and Workforce Development project is intended to enhance academic programs, improve educational equity and strengthen the consortium to provide high-quality programs for Hawaii students, residents and businesses.



Agricultural and Environmental Awareness Day exposes fifth graders to agriculture through interactive, hands-on sessions.



Internships on Kauai give students valuable real-world work experiences and opportunities to network with other interns.

Strengthening the Forest TEAM, Hawaiian Lifestyles, and Agriculture Programs

Hawaii Community College

The AN/NH grant at Hawaii Community College is aimed at strengthening and expanding three workforce development programs: Forest TEAM, Hawaiian Lifestyles (Taro Culture and Hula) , and Agriculture.

The Forest TEAM program conducted two summer programs for high school students: Hawaiian Natural History and Geographic Information Systems. Following these classes, a Junior Forest TEAM club was established to get prospective students involved in service learning activities with the NPS, Hakalau NWR, Kapapala Koa Canoe Forest---

Seven Forest TEAM students (Kathy Rodriguez, Mikie Turner, David Gangano, Rena Isabel, Linda Sweinhart, Jaime Enoka and Mokihana Kane) completed internships with the State Department of Forestry and Wildlife, supported by the AN/NH grant. They conducted a detailed inventory of the koa trees in the newly established Koa Canoe forest at Kapapala on the Big Island. They surveyed a total of 328 acres, or about 30 percent of the entire area using Global Positioning Systems to locate the large koa trees and measuring the diameters and bole heights. Vans purchased through the AN/NH grant were used to provide transportation to the forest

As part of their internship experience, five of the students attended the Hawai`i Conservation Conference in Honolulu in 2006 and eight in 2007. These students presented a poster explaining the purpose of the Kapapala Koa Canoe Forest, and detailing the work done on the survey.

The Hawaiian Lifestyles program was able to present stipends to a total of six learners whose summer projects focused on establishing native Hawaiian occupational plants and food plants for their immediate communities. Having the use of the vans enabled Hawaiian Lifestyles learners to experience traditional natural resources activities island wide. In collaboration with the Edith Kanaka`ole Foundation, students were able to access Nāpo`opo`o's ancient taro terraces and wetland taro patches otherwise inaccessible to students.

The Agriculture Program completed a greenhouse at the University of Hawaii Panaewa Farm. The greenhouse was renovated with funds from the grant and will be used as part of the Agribusiness Incubator program as well as for teaching horticulture courses.

Dates of Project:
10/2004-Ongoing

Location:
UH - Hawaii Community College

Purpose:
The AN/NH grant at Hawaii Community College is aimed at strengthening and expanding three workforce development programs: Forest TEAM, Hawaiian Lifestyles (Taro Culture and Hula), and Agriculture.



Forest TEAM students measuring the diameter of a large koa tree in the Kapapala Koa Canoe Forest



Hawaiian Lifestyles Taro Culture students reconstructing a traditional Taro lo'i



Agriculture Program's Orchid Culture Incubator Greenhouse

Marine and Environmental Science Education Program

Honolulu Community College

As an island state, expansion of educational opportunities in marine and environmental science is a vital necessity to protect, manage, and utilize the ocean's natural resources on a sustained basis. The grant enabled Honolulu Community College to launch strong curricula in oceanography, marine biology, aquaculture, and environmental science. The College now has an excellent classroom and laboratory facility, providing education to over 200 students per semester. Maximum enrollments with strong retention and higher levels of student success rates are measurable outcomes of the project. The College developed a new laboratory course in oceanography and a course-based website (<http://honolulu.hawaii.edu/instruct/gopalakrishnan>).

Internship opportunities provided by the grant enabled the College to develop and expand partnership with community business sectors and entrepreneurs for providing practical training to students. The grant strengthened the University of Hawaii's Marine Option Program, which aids students to enter a career and/or higher education pathway in marine and environmental science. Educational opportunities of the grant attracted more students into this program and also enabled some to enter graduate schools. Forty-three percent of the students who joined the Marine Option Program of the College are of Native Hawaiian ethnicity. The project has greatly impacted the College's recruitment efforts by providing orientation session in marine science to high school students.

The Honolulu Community College Library now provides adequate supporting materials for both instructional enhancement and improvement in student learning. The impact of the grant on the effectiveness of the Library in providing support to students is discernible in a recent communication from the Head Librarian of the College who wrote, "*We and the students are fortunate to be the recipients of your vision!*".

The grant has definitely taken the marine and environmental science educational program of the College to a higher level of success. Its impact in strengthening the educational mission of the college has been significant, as evidenced by the increase course demand, student success rate, and the wide publicity the program has been receiving recently. As an example, a recent publication of the University of Hawaii's, Marine Option Program had an article titled, "Grant Provides Waves of Opportunity at HCC" highlighting the accomplishments of the grant. (*Seawords*, Volume XX, Number 6, Summer 2006). A photo of the College's marine science classroom was selected by CSREES-USDA for inclusion in a recently published brochure (January 2006). The project has definitely impacted the instructional delivery capability as well as student learning ability and this higher level of success is expected to continue for many years to come.

Dates of Project:

2001-Ongoing

Location:

UH - Honolulu Community College

Purpose:

The main goal of the project has been to enhance the existing academic curricula in marine and environmental science at Honolulu Community College (Hon CC) and to provide experiential educational opportunities to students, Native Hawaiian students in particular.



Marine Science Wet-Lab Facility at Hon CC is often visited by a large number of students from high schools.



Marine Science Classroom at HCC

Hawaii's Culinary – Agribusiness Partnerships

Kapi'olani Community College

Issue: With the high demand for land and the ever increasing cost of doing business in Hawai'i, the future of agriculture will depend on its ability to make the major paradigm leap away from growing subsidized commodity crops towards the new models for sustainable agriculture. Partnership with the culinary industry is needed to educate both restaurant professionals and customers alike on the higher perceived value of locally-grown agriculture products, which will be crucial for the farmer's success.

What has been done: To help sustain the viability of commercial agriculture within the State of Hawai'i and to increase the success rate of students who embark upon careers in culinary arts, Kapi'olani Community College program has:

- Providing tutorial services in English and Mathematics to low and moderate income, limited English speaking, native Hawaiian and other at-risk students
- Establishing a lab-top computer lab so that all incoming culinary students are able to take a skills inventory and then participate in a hands-on self-directed remedial program to bring their basic skills up to the level necessary for success
- Producing and distribute marketing collateral to increase student perception of pursuing a career within culinary arts and agribusiness and agri-science fields
- Created a state-wide model for a partnership between Hawai'i farms and their local community college's non-credit departments for education based culinary-ag tours

Impact of providing supplemental Instruction:

- 33 students in the Fall 2006 Hospitality Cost Control classes were provided with the opportunity for this tutorial service

Impact of providing Keytrain skills assessment & remediation:

- 91 students in the Fall 2006 Introduction to Culinary Arts classes have been given the online skills assessment

Impact of producing and distributing marketing collateral:

- 50,000 hotel rack cards marketing the HFB/KCC Farmer's market were printed and distributed throughout Waikiki hotels resulting in increased attendance at Saturday FM

Impact of developing a model for educational culinary-ag tours:

- Contract negotiations begun with two major wholesalers
- Four familiarization tours conducted for 40 potential agents, resulting in positive guest satisfaction ratings
- Seven culinary-ag tours were conducted for 112 residents with 100% noting that it increased their awareness of local agriculture products

Dates of Project:
10/2004-Ongoing

Location:
UH - Kapiolani Community College

Purpose:
The objective of Kapiolani Community College's initiative is to leverage the high perceived-value of high quality culinary education and products with farm-fresh ingredients resulting in value-added products that farmers can utilize to help them sustain their farms.



Kapiolani Community College & the Hawaii Farm Bureau Saturday Farmer's Market features Hawaii-grown products and food products produced by local entrepreneurs.



Students connect to agriculture by growing and harvesting herbs on campus and touring farms and other agribusinesses.

Revitalizing Kauai's Food Industry

Kaua'i Community College

The Food Industry Program at Kauai Community College (located in Lihue, Kauai, Hawaii) and features the following.

The Entrepreneurship Training Program -- Students learn business planning and management, ways of achieving growth and how to securing funding. They acquire the business skills and knowledge essential for successful careers in the food industry and related enterprises that comprise an economically viable rural economy. The Program trains approx. 25 students per year. The program features guided experience in the development of value-added food products. Leaders from Kauai's food industry participate as speakers and also sponsor field excursions to their agricultural enterprises.

Kauai CC Campus-Community Garden -- The Campus Garden at Kauai Community College offers a hands-on training program called the "Successful Farming Seminar." The garden is intended to serve as an agricultural incubator that provides a bridge for students to participate in locally profitable farming ventures. It is a pathway for students into commercial agriculture and thus supports the growth of farming on Kauai.

Community-Oriented Developments -- The College is the principal sponsor of the Kauai Food Industry Forum. Participants in the Forum are from several public and private organizations involved in agriculture and the food industry. Membership has grown from 70 to over 100 participants. The Forum examines problems facing Kauai's food industry and then seeks solutions. Action groups have been formed to develop plans to revitalize the entire Kauai Food Production Industry through training and better organization. Funding is being sought for these initiatives from local foundations and government sources. A planning grant has been received from Hawaii Community Foundation to support the efforts of the Forum.

Kauai Community College Partnerships -- Kauai CC has provided planning and technical support to the predominantly Hawaiian-origin community of Anahola. This has resulted in funding by HUD of an agriculture development and micro-enterprise project to increase agricultural production and to create a roadside stand to sell fruits, vegetables, craft products and snacks. A similar project is being developed with Kilohana Plantation to provide a market outlet for fresh locally grown produce and value-added food products. The market will be located at roadside near Lihue, and will operate 7 days a week to encourage participation from island farmers.

Dates of Project:
10/2004-Ongoing

Location:
UH - Kauai Community College

Purpose:
The four purposes of the Kauai Program are to:
1) Improve Entrepreneurship training to enrich the local economy with profitable new food related enterprises,
2) Provide hands-on training in successful farming practices
3) Increase the performance of the Kauai Food Industry Forum in revitalizing Kauai's food production capabilities and
4) Support the development of promising community-based enterprises that are contributing to food self-sufficiency for the island.



The Campus Garden at KCC is a training laboratory and pathway to employment in larger farming enterprises.



Kauai students visit the Gay & Robinson sugar refining plant.

Growing Natives: Nurturing People and Plants

Leeward Community College and MA'O Organic Farms

Leeward Community College sits on the edge of a large once sugar cane agricultural center of the island of Oahu. Today most of the land sits in fallow and is targeted by developers. Much of the population has a difficult commute to Honolulu or to other desirable job locations. Many are in need of work and food security. The area has one of the lowest levels of college or technical training and the largest population of Hawaiians on all islands.

Significant metrics include:

- Since spring 2003, 87 students completed the course, *Hawaiian Horticulture and Nutrition*, 45% of which are Hawaiian. The course is constructed to attract minority students into science by providing culturally appropriate context and hands-on activities.
- Native gardens on campus now preserve 130 species and subspecies of native Hawaiian plants, 30 of which are classified as endangered. Propagative material is provided for any serious grower that is generally difficult to obtain elsewhere.
- One horticulturist is employed full-time on college funds to manage the native gardens, shade house and provide training to schools, conservation groups and the public.
- 3 workshops have been given on *Using Native Plants in the Landscape* to professionals in the field, resulting in one landscape architectural firm of calling out for 800,000 native plants for their projects.
- Tours and training are offered to professionals in the fields of conservation, education and horticulture. In 2002-03, 39 individuals and 10 groups with total of 60 people were serviced. In 2003-04, 100 different of such events occurred.
- In the fall of 06, 18 Hawaiian students from the leeward Waianae district registered for Leeward CC's newly developed AA degree for *Community Food Systems: The MA'O Community Leadership Internship*, jointly developed by MA'O Organic Farms and Leeward CC. Funding by the grant provided students books, tuition and supplies. 10 students continue in spring 07.
- 2 students are serving as lab assistants for Leeward horticultural programs and are being trained in many aspects of the field.

In addition the following project is under way:

- 2 unique data bases is being developed jointly by Leeward CC and neighboring Kapiolani CC that allows growers of native plants and fresh produce on the islands to list their inventories and information about their businesses. It has capacity to be upgraded by the participating businesses as well as informational resource specialists about these products.

Dates of Project:
10/2001-Ongoing

Location:
UH - Leeward Community College

Purpose:
The objectives of the programs are to provide education and workforce training for students to succeed in Hawaii's agribiotechnology job market, to assist students transferring to higher degree institutions majoring in biosciences and to stimulate agribusiness entrepreneurship by enhancing conservation of native plants in landscape application.



Student Interns at MA'O Farms in the Hawaiian Wai'anae district are learning agricultural skills and are enrolled in Leeward Community College Associate of Arts degree in *Community Food Systems: The MA'O Community Leadership Internship* program.



Minority community college students involved in molecular genetic research, in summer workshops directed by University of Hawaii Dr. D. Christopher and LCC Dr. K. Neupane

Focus on Value Added Food Products

Maui Culinary Academy Research & Development Center

Over the past three and a half years since our center's inception, we have successfully launched eight student and chef innovated food products to market including a Raspberry Wine Jelly, Roasted Pineapple Jam, Mochachino Scone Mix, Thai Basil Sea Salt, 100% Maui Coffee, Mango and Vanilla Macadamia Nut Sugars, and a Sugar Free Oat Cake. We anticipate the release of our ninth food product a Coffee Spice Rub in February of 2007. All our products are manufactured on site by our student staff. While participating in our program our students receive a variety of training, education, and skills in food product research and development, food manufacturing, process management, food product marketing and sales, entrepreneurship and business management.

Revenues from our retail products are returned directly to our program to support the ongoing education of our students, future curriculum development and the long term sustainability of our program as a self managing, profit generating entity. We continue to serve as a community-based resource in food product research and development to a variety of local farmers as one of the few innovations kitchen on Maui. Our core competency is helping local farmers convert surplus and culls into value added retail food products through our consultation services. Maui Culinary Academy Research and Development Center's long-term goal is to become the first two-year institution in the state of Hawaii to provide a degree in Culinology and Food Science. Partnership with the emerging non-profit Maui Food Technology Center will provide internship and long-term employment opportunities for our students and be an integral part of this plan.

- Our retail food product and consultation service revenues increased threefold in 2006 with estimated revenue constituting 30% of gross revenue or \$21,000.00
- We were successful in launching our eight food product into the market place in June of 2006 a 100% Maui Coffee.
- Recipe development and labeling for our ninth food product a Maui Coffee Spice Rub will be complete in December of 2006. Anticipated release to the market place in scheduled for February of 2007.
- Developed and implemented value added food products for a variety of producers including Yee's Orchard, Hana Farms, Scott's Country Cookie, Maui Lavender, Oils of Aloha, Sandwich Island Distillers and Surfing Goat Dairy

Dates of Project:
2004 - 2006

Location:
UH - Maui Community College

Purpose:
The mission of the Maui Culinary Academy Research and Development Center (MCARD) at Maui Community College is to provide education and on the job training resources in Food Product Research, Development and Manufacturing to help students, entrepreneurs and local agribusiness achieve greater employment opportunities, business growth and financial success.



Consulting with R & D Students



R & D Students making Roasted Pineapple Jam



Students mixing product

Educating Hawaii's New Generation of Agriculturalists

The UH-Hilo Agriculture Development Program

With the decline in plantation agriculture in Hawaii there is a need to educate a new generation of agriculturalists to power the change to production of new diversified agricultural crops. The Agriculture Development Program (ADP) is a 4-year program that supports Native Hawaiian and other under-represented minority students at the baccalaureate level. It operates under the assumption that the keys to the future of agriculture in the 21st century are: quality agriculture education and strong agricultural leadership by children of Hawaii's farm families.

To help more students, ADP first focused on informing more students about the University of Hawaii at Hilo College of Agriculture, Forestry and Natural Resource Management (UHH-CAFNRM). From Spring 2002 to Spring 2003 informational presentations were made to 17 Hawaii State High Schools on the islands of Hawaii, Maui, Lanai, Oahu and Kauai, focusing on high schools with agriculture education programs such as 4-H and FFA. Enrollment in the College rose from 146 in Fall 2001 to 158 in Fall 2003. Thirty four of these students were Native Hawaiian.

Since the ADP program is very diverse in need, a committee was formed with faculty, staff and student representatives. A special ADP Admissions Policy was created to meet the minimum guidelines for admissions into the University of Hawaii System and provide flexibility in the overall combined SAT and cumulative grade point average weighting system. Special consideration for admission is also provided to all students recommended by their agriculture teachers and FFA advisors. All applicants are asked to reflect upon two essay questions that are used for final acceptance. These are: "Why do you want to earn a college degree?" and "Why is agriculture important to you?" The ADP student's answers form the basis of retention - student commitment to completing a BS degree.

The ADP student is also required to take the classes mutually agreed upon with their advisor. A list of courses for each semester over four years has been developed for each of the College's areas of Specialization. Cohort registration in the student's areas of interest places the students into a cohort or "Class of ----" group with college friends rather than high school friends and facilitates the formation of cohort study groups and tutoring.

Today, College enrollment stands at 164. Thirty three are Native Hawaiian. Eleven Native Hawaiian students graduated with B.S. degrees in Agriculture in 2005-6. The ADP and UH Hilo continue to admit and provide support services to Hawaiian and other under-represented students with great potential for earning a 4-year degree in agriculture.

The State P-20 program and the Career Pathways Program of the State DOE and the University of Hawaii has been developed to allow for an articulated pathway from intermediate school through graduate school. UHH participation in the Natural Resources Career Pathway resulted in the articulation of the entry level course in Agriculture throughout the UH System. Dual credit UH and DOE classes are also being developed. A new recruiting DVD "Hawaii Pathways to Careers in Food and Agriculture" has been developed and is available for distribution on request.

Dates:
10/2001 - Ongoing

Location:
University of Hawaii at Hilo

Purpose: The UH-Hilo Agriculture Development Program (ADP) was developed as a recruitment, admission and retention program focusing on Native Hawaiian and other under-represented minority students from rural communities. It has now evolved to include persistence to graduation, e-commerce and business education for graduates and the agriculture community and education in research for application in agribusinesses or in preparation for graduate school.



Taro "Kalo" signifies the concept of 'ohana. This crop was planted in Fall 2002 by the "Class of 2006"



Students aboard the "Keeloa" sailing canoe ready to launch into Hilo Bay. One question the students discuss is "What plants would you bring along with you if you are sailing thousands of miles to a new home?"

ASC in Bio-Resources and Technology

Windward Community College

According to EMSI data—Current and Projected Positions in Related Occupations, there were 461 positions open in 2006 for biotechnologists in the State of Hawaii, with 124 new positions projected annually. Windward Community College has recently established a Plant Biotechnology Program and offers an Academic Subject Certificate in Bio-Resources and Technology – Plant Biotechnology (BRT-PB). The program and facilities (Tissue Culture and Plant Biotechnology Lab.; Kuhi La’au-Tropical Plant and Orchid Identification Facility; Climate-controlled greenhouse; and Bioprocessing Medicinal Garden Complex) have been supported primarily through USDA-CSREES (Cooperative State Research, Education and Extension Service) grants from 2001 to the present, and partially supported by the MWDI (Millennium Workforce Development Initiative) in 2000 and 2001, PCATT (Pacific Center for Advanced Technology Training) in 2001, HS-BRIN (Hawaii State-Biomedical Research Infrastructure Network) in 2002 and 2003, EPSCoR (Experimental Program to Stimulate Competitive Research) from 2003 – 2005, and USDA-SPEC (Secondary and Two-Year Post Secondary Agriculture Education Challenge Grants) from 2005 – 2007.

Courses listed in the ASC in BRT-PB also provide diversity in the college’s academic programs such as the AA in Liberal Arts, CC in Agriculture Technology and ASC in Hawaiian Studies. Impact of the program: 33.3% of ASC in BRT-PB graduates have been immediately employed at biotech companies in Hawaii (Pioneer Hi-Bred International, HARC, Hawaiian Sunshine Nursery). 66.7% of graduates have transferred to four-year degree institutions, and today some of these graduates have received B.Sc and M.Sc degrees in various biosciences. 22 % of ASC graduates have become successful agri-bioprocessing entrepreneurs. The total percentages above exceed 100% because some graduates accomplished multiple tasks.

Partnerships have been established with faculty and researchers from the College of Tropical Agriculture and Human Resources (CI’AHR) and the College of Art and Natural Sciences at UHM; the College of Agriculture, Forestry and Natural Resource Management, and the Department of Biology at UH-Hilo for course articulation agreement and mentoring; The Hawaii Agriculture Research Center (HARC) for research mentoring and on-the-job training; The Pfizer Lab. at New York Botanical Gardens, and the Jodrell Lab. at Kew Gardens, England for collaborative research in molecular systematic of Orchidaceae. The biotech companies such as Pioneer HI-Bred International Inc., Syngenta Seeds, Inc., Mera Pharmaceuticals, Hamakua Mushroom co., Hoku International LLC, H&R Nursery, Diamond Head Plants, and Kosaki Orchids for providing on-the-job training and potential employment.

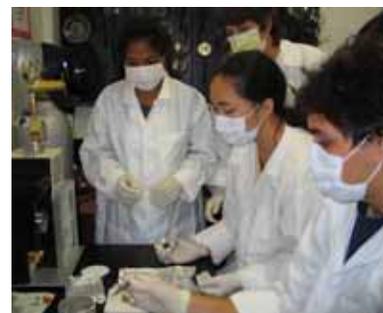
Dates of Project:
10/2001-Ongoing

Location:
UH - Windward Community College

Purpose:
The objectives of the programs are to provide education and workforce training for students to succeed in Hawaii’s agribiotechnology job market, to assist students transferring to higher degree institutions majoring in biosciences and to stimulate bioprocessing agribusiness entrepreneurship



Program level map for the ASC in Bio-Resources and Technology – Plant Biotechnology at Windward Community College.



ASC in BRT-PB graduates perform gene bombardment using PDS 1000/He System. Front, from L to R: Waiete Williams (is employed at HARC and pursuing B.Sc in TPSS at UHM), Jaime Iwamoto (pursuing B.Sc in MBBE at UHM), Shane Chambers (pursuing B.Sc in Forensic Studies at Chaminade University). Back: Pamela Gribbins (Manager at the Hawaiian Sunshine Nursery).

Capacity Building in Rural Alaska – For the Earth

Environmental Science Program, University of Alaska Fairbanks - Bristol Bay Campus

Sustaining Salmon for a subsistence culture - In Southwest Alaska, the land and sea has given residents daily gifts for as long as anyone can remember. The Bristol Bay region sustains the world's largest salmon runs and some of the most important cultural activities include fishing, hunting, and berry picking. Thus, for people of Bristol Bay a healthy natural environment is critical to its people and their way of life. However, the forces of climate change and globalization are combining to threaten the region's economic, social, and environmental health. To counter this threat, residents wish to conduct extensive environmental monitoring and sampling as early warnings to potential hazards. To meet this need, the UAF Bristol Bay Campus has used USDA funding to develop an Environmental Science Certificate.

More science students - The unspoiled landscape of Southwest Alaska provides the backdrop for students learning the academic agility, technical skills, and hands-on experience for careers in environmental science. This place-based program combines contemporary scientific studies with traditional knowledge to better prepare graduates for rural entry-level natural resource jobs statewide or to continue their formal education in the natural sciences or in natural resource management. Through required research projects and internships, students learn the essential knowledge and skills required for communities to monitor changes in the environment. Since the program was piloted in 2006, the Environmental Science 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 on resources.

Significant metrics include:

- Trained 15 tribal village EPA environmental coordinators who advanced in their entry-level positions.
- Assisted with 5 environmental baseline studies by local, federal, and state agencies.
- Two Environmental Science students are employed as educators in a Water Quality Monitoring Program conducted by an Alaska business (women owned), which trains over 30 tribal members in science.
- Four Environmental Science interns trained in experimental design, collect data and analysis and have presented research findings at international scientific conferences.
- Conducted two regional environmental workshops that promote environmental literacy and involve communities in the National Environmental Policy Act process.

This program ensures that community knowledge and community expertise are respected and that experiential learning is valued while maintaining responsible development that meets the local environmental needs.

Project: Squaw Creek Monitoring
Dates of Project: 2006-Ongoing
Location: Dillingham, Alaska
Purpose: To monitor salmon migration and document biodiversity and water quality.



Student intern Angela Chingliak working with U.S. Fish and Wildlife Service

Project: Nushagak Bay Biodiversity Project
Date of Project: 2007-Ongoing
Location: UAF, Bristol Bay
Purpose: To document biodiversity and energy content of species in Nushagak Bay.



Student intern working on a bomb calorimeter to measure energy content of tissue.

Project: Nushagak/Mulchatna Watershed Monitoring
Date of Project: 2006-Ongoing
Location: UAF, Bristol Bay
Purpose: To collect baseline water quality data.



Daniel Chythlook measuring nitrates at a water quality workshop

Going to the Dogs

Veterinary Science Program, Interior Aleutians and Chukchi Campuses, U of Alaska Fairbanks

With the generous support of the USDA/ CSREES Alaska Native/Native Hawaiian Serving Institutions grants program, the Interior-Aleutians Campus and the Chukchi Campus have developed the first and only Veterinary Science (VTS) program in the state of Alaska!

Animal care is critical area of need in rural Alaska where dog teams are still an important practical necessity for hunting, trapping, wood gathering and visiting. Moreover, dog racing remains a passionate pastime for rural residents and professional and semi-professional racers can earn a not-insignificant portion of their annual income from races and dog breeding. An increasing concern with local food security and self-sufficiency has also led to growing interest in domestic food animals and in reindeer herding among rural Alaskans. Of course, many rural residents have companion dogs and cats that also need emergency or preventative care.

With all this demand, however, the dearth of veterinarians practicing in rural villages means there is a pressing need for locally available animal care. Moreover, there is growing concern about zoonotic diseases, particularly rabies, due to the large population of wild animals in Alaska.

In response to this need, the Interior-Aleutians Campus (serving Interior Alaska and the Aleutian Chain) in conjunction with the Chukchi Campus (located in Kotzebue) have embarked on the development of a Veterinary Science certificate program. In addition to emergency and preventative care for animals, practitioners will provide critically needed community services including basic animal care, identification of diseased animals, birds and fish and water quality testing to help protect the health of residents. This program will fill a need for veterinary care in local communities, add to local self-sufficiency and create employment for local people. Furthermore, the program will provide the first step in a career pathway toward higher degrees in the veterinary sciences, including opportunities for students as veterinary technicians or as doctors of veterinary medicine. Significant impacts include:

- The Veterinary Science program is the first and only veterinary science program available in the state of Alaska
- VTS program offers first step in a career pathway for Alaska Native students into a veterinary technician track or veterinary school
- Innovative methods for distance-delivery of science content include use of CD-ROMs, E-Live courses, learning intensives and “lab-in-a-bucket”
- Since program inception, 79 students have enrolled in VTS coursework
- 16 students supported through USDA funding between SP 06 and SP 2007
- USDA-supported students have completed a total of 148 credits toward their VTS degree

Dates of Project:

9/2006- 8/2008

Location:

Fairbanks and Kotzebue, Alaska

Purpose:

The purpose of the Veterinary Science program is to improve the availability of veterinary care in rural Alaska.



Sarah Love provides outreach to potential VTS students at an “I’m Going to College” event on the main UAF campus.



Musher Lester Erhart races across the finish line at the Open North American Dog Race in Fairbanks.



Sarah Love, DVM, palpates a dog during a demonstration in Holy Cross, Alaska.

Ethnobotany Certificate Program in Alaska - First for the State

University of Alaska Kuskokwim Campus – Ethnobotany Certificate Program

The Ethnobotany Certificate Program being developed at the University of Alaska Fairbanks–Kuskokwim Campus will be the first such program in this state and only one of a handful that are currently being offered in the entire United States. Ethnobotany is integral to life in Alaska because it recognizes cultural knowledge and deepens our connection with the expansive and exceptional natural world at our doorstep. Our unique flora represents a bountiful and currently underutilized source of health and well being for rural Alaskans.

Students enrolled in this program will learn: basic plant biology & floral ecology of Alaska, economic applications of Ethnobotany, basic applied chemistry of plants, research methods for local specific projects, as well as traditional and new uses of Alaska native plants. The Ethnobotany program will provide the educational pathway for those interested in the working toward any of the following goals:

- Establishing a foraging-based home business
- Continuation and expansion of Elder knowledge base
- Earning an Associates and/or a Bachelor of Science degree(s)
- Becoming a local liaison with agencies, schools, and universities
- Home gardening of wild and domestic crops
- Ecotourism guiding

As part of the proposed Ethnobotany Certificate Program, Alaska Native students have been participating in field-based Summer Science Camps for the past three years. Based in Nunivak Island's wilderness, core curriculum is a blend of western academic and traditional subsistence sciences. Field projects are designed around both community and US Fish and Wildlife Service 'real-time' needs with data collected as part of ongoing long-term scientific efforts for the Yukon Delta National Wildlife Refuge and the Nunivak Island Wilderness. Over the course of the past three years more than students have successfully completed the Summer Field Camps at Nunivak Island.

During Fall 2007 we're excited to be able to offer the first Ethnobotany Seminar course at the University of Alaska. This course will provide students with an overview of ethnobotanical concepts and entice them to enroll in this new program. Another exciting opportunity for Ethnobotany students will occur during the winter of 2008, when one carefully-selected native Alaskan student will be chosen to work in Hawaii with one of our Hawaiian native-serving institution faculty in the first ever Alaska-Hawaii student exchange.

Dates of Project:
9/2006- Ongoing

Location:
Nunivak Island, Alaska

Purpose:
The Ellkarmiut Summer Science Field Camp is offered to encourage Alaska native students to consider education and careers in Science and Technology. The camp, located in a remarkable wilderness environment on the shores of the Bering Sea, provides a learning environment that is a hands-on and adventure-based.



Elder Nan instructs students about local flora, Nunivak Island, June 2007



Nunivak Island Summer Science Field Camp, University of Alaska Fairbanks, Kuskokwim Campus, June 2007

See also student-produced video of Nunivak-based plant research:
<http://alaskaexposedculture.blogspot.com/2005/10/nunivak-island.html>

Reindeer Ecology and Science Education in Northwestern Alaska

**Northwest Campus, University of Alaska
Fairbanks, Nome, Alaska**

Approach: 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 wilderness surrounding Nome. Local people have a substantial traditional ecological knowledge base. However, most individuals do not have the training in western science required to acquire and maintain positions with the state and federal governments.

Progress and Impact: The 30-credit High Latitude Range Management (HLRM) Certificate Program relies on traditional knowledge and western science. Students are trained across several disciplines for entry-level positions in the natural sciences. In addition, students have the option of pursuing an associate or bachelor's degree after their certificates have been earned.

A variety of teaching methods are used including traditional lectures, experiential methods, field trips and laboratory sessions. The curriculum was approved by the University of Alaska Fairbanks Provost in June 2007 and is currently awaiting Board of Regents approval in fall 2008.

Two summer courses, *Field Techniques in Natural Resources Management* and *Alaskan Ungulate Husbandry*, were offered in 2006 and 2007 respectively. Eleven students from western Alaska villages attended each weeklong course.

Examples of student comments:

- "I liked that fact that this class was mostly a hands-on class."
- "The classroom setting made learning fun and easy to grasp the course content."
- "Now I have a much higher understanding of reindeer and the habitat in which they live."

Collaborating Institutions: UAF Bristol Bay Campus; UAF Cooperative Extension Service; UAF Reindeer Research Program in the School of Natural Resources and Agricultural Sciences; Reindeer Herders Association, Kawerak, Inc.

Project dates:
2005 - ongoing

Purpose:

To increase the likelihood that local people will be employed in natural science-related positions by providing a science education program that incorporates traditional ecological knowledge in northwestern Alaska.



Handling reindeer in the village of Wales.



A reindeer herd on the tundra near the village of Teller.



Students learn to sample lichens in the Field Techniques in Natural Resources Management course

Animal Migration and Demographics

Southeast Sitka - An Experiential Learning Program for Alaskan Students

The University of Alaska Southeast Sitka Campus is using CSREES funding to create a teaching and experiential learning program for under-represented advanced high school and undergraduate students interested in pursuing a scientific career. This program allows Alaska Native high school and undergraduate students to experience scientific research focusing on humpback whales. Humpback whales migrate seasonally, feeding in summer in Alaska and migrating to Hawai'i in winter for mating and calving. The Alaska students learn field data collection methods, database management, analysis and report writing. Additionally, they are mentored by upper division university students, research faculty and researchers from the Hawai'i Marine Mammal Consortium (HMMC). This exchange allows the younger and more inexperienced students to learn from college students further along in their education and from scientists conducting research on humpback whale in Alaska and Hawai'i. Also, all students learn about current marine issues and research occurring in the North Pacific at the annual Sitka WhaleFest. Presentations and round table discussions are given by leading marine scientists in their fields. This experience provides students with a broader understanding of our marine environment in Alaska. This interaction and exchange between young aspiring marine scientists and established scientists is seldom achieved at regular scientific conferences. Directly linking with scientists actively engaged in marine research gave students the confidence and ability to see that becoming a scientist could be a reality for them.

Specifically, the students gain knowledge of the migration patterns and biology of humpback whales by studying Alaskan humpback whales and by traveling to Hawai'i to observe the same population of whales on their breeding grounds. This experience demonstrates to the students how the same whale can behave very differently at each end of their migration. The outcome of this experience is a paper written by the students describing a research project and the different methods they used to study humpback whales in Alaska and Hawai'i. Additionally, while in Hawai'i, the students also experience a cultural exchange by participating in field trips with students and faculty from the University of Hawai'i at Hilo (UHH). This exchange connects our Alaskan students with Hawaiian students (both graduate and undergraduate), Native Hawaiian interns and UHH faculty. Both groups of students gain an understanding of each other's culture, language and political issues.

Overall, this funding promotes Native Alaskan students to increase their scientific competency to further their educational goals. These students gain immensely from this experience by participating in all aspects of on-going research projects and all students to date have intentions to pursue a scientific career.

Dates of Project:
09/2006-Ongoing

Location: University of Alaska
Southeast Sitka Campus

Purpose: Through a partnership with research consortiums and minority serving institutions in Alaska and Hawai'i, this project has established a center for the study of animal migration patterns and demographics. This project enables students to develop scientific competency through experiential learning and provide opportunities to fully understand the scientific process through an interdisciplinary focus.



Students and researchers collect data on the distribution of humpback whales along the Kohala Coast, Hawai'i.



Alaskan students comparing acoustic data from humpbacks whale vocalizations collected in Alaska and Hawai'i.



Flukes of a humpback whale seen in Alaska and Hawai'i. Whales are identified by the black and white markings on the flukes. This enables researchers track the migration.

Acknowledgements and Contacts

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