Alaska Native-Serving and Native Hawaiian-Serving Institutions
USDA Education Grants Program
2007-2009 Report
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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 (CRCD) 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 CRCD campuses there are Alaska Native Serving Institutions (ANSI) designated at University of Alaska Southeast at Sitka, University of Alaska Southeast at Ketchikan, and Prince William Sound Community College in Valdez.

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.

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 combines 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 Education Grants 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.

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.

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Going to the Dogs

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

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

Animal care is a 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 and Chukchi Campuses have developed a Veterinary Science certificate program. In addition to emergency and preventative care for animals, participants 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 animal health 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:

- **VTS Certificate Program approved Spring 2007 by Board of Regents.**
- **A distance delivered Associates of Science degree was approved Spring of 2008 and allows Veterinary Science program students to progress to higher level science degrees while remaining in their home communities.**
- **4 new VTS courses were developed and approved in 2009.**
- **The VTS Certificate Program had its first graduate May 2009. Another student is expected to graduate Fall 2009.**
- **Partnerships with local veterinary clinics allowed students internship opportunities at various locations.**
- **A student was hired for a paid position by her internship site.**
- **Continued use of innovative distance delivery methods provide access to students across Alaska and promote high level science instruction.**
- **The VTS program continues to support K-12 outreach by going to high schools to present on the VTS program and science options in college.**

**Dates of Project:** 2006 – Ongoing

**Location:** Fairbanks and Kotzebue, Alaska

**Purpose:**
The purpose of the Veterinary Science program is to improve the availability of animal health care knowledge in rural Alaska.
Reindeer Ecology and Science Education in Northwestern Alaska

High Latitude Range Management Certificate Program, Northwest Campus, UAF

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.

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. Two summer courses, Research Field Logistics and High Latitude Range Management were offered in 2008. Nine students from western Alaska villages attended each weeklong course. The students in the summer intensive survived and thrived in extremely inclement weather and a bear encounter during field work. The bear encounter was a hands-on experience since bear safety training was part of the summer course content.

A Mobile Slaughter Unit was designed and built in 2009 to support the teaching of HLRM meat production courses. Students will learn through hands on experience how to slaughter and process reindeer meat according to USDA standards. Training will also emphasize retail meat cutting to prepare students for entry into the food production work force. HLRM 160 Meat Production was offered in 2008. Seven students from western Alaska villages attended the weeklong course. Although many students had extensive meat processing experience from living a subsistence lifestyle they learned the differences in quality and marketability of commercial cuts of meat.

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.”
- “I didn't know reindeer meat could be so valuable.”

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.
Investigating Ecosystem Health in Rural Alaska

Environmental Studies* Certificate Program, Bristol Bay Campus, UAF

Rural Alaskans depend on healthy ecosystems to support their subsistence way of life but climate change and globalization along with regional development are all threatening the economic, social, and environmental health of the region. For example, Bristol Bay with its watersheds and estuaries supports one of the world’s last great sustainable salmon fisheries; however, recent ecosystem level changes as a result of global and regional influences are threatening the sustainability of the region. Understanding the scope and causes of such broad scale change is important when meeting the challenge of defining and sustaining healthy ecosystems. The UAF Bristol Bay Campus (BBC) is using USDA funding to develop a proposed Environmental Studies* (ENVI) Certificate to address issues of ecosystem health. The certificate* trains rural Alaskans in the essentials of monitoring and maintaining ecosystem health while promoting sustainable energy development.

The unspoiled landscape of rural Alaska provides the backdrop for students learning technical environmental skills through both field and course work. Further, this place-based program combines contemporary scientific studies with traditional knowledge to both prepare graduates for entry-level jobs and provide the base for continued education in environmental studies or natural sciences.

Since the program was piloted in 2006, it has provided educational opportunities for Alaska rural residents, particularly Alaska Natives. Further, it is helping to empower many students and their communities to adapt to the overwhelming outside social, ecological, and economic pressures on resources.

The ENVI* program works closely with the Bristol Bay Environmental Science Lab (BBESL) at the BBC in Dillingham. The BBESL was established in 2006 and serves the Bristol Bay region with its sustainable communities programs under the direction of Dr. Todd Radenbaugh (Environmental Science) and Dr. Tomas Marsik (Sustainable Energy).

Significant milestones include:
- BBESL works with students and interns to conduct environmental research.
- Summer field courses offered in rural Alaska villages of Port Heiden and Aleknagik.
- In 2008, 11 interns presented their data at science conferences including Western Alaskan Interdisciplinary Science Conference, American Association for the Advancement of Science Arctic Division and ACUNS’ Student Conference on Northern Studies.
- ENVI* students built an electric car and made bio-diesel fuel from fish oil.
- BBESL works with local school districts to develop environmental studies curriculum.

*The Environmental Studies Certificate Program is proposed and is pending final approval from the UA Board of Regents and the Northwest Commission on Colleges and Universities.
Ethnobotany* Certificate Program in Alaska – First in the State

Kuskokwim Campus, University of Alaska Fairbanks

The Ethnobotany* (EBOT) Certificate Program, currently up for Board of Regents’ approval at the University of Alaska Fairbanks (UAF)–Kuskokwim Campus (KuC), 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.

Students enrolled in the EBOT* 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. These skills will prepare Alaska Native students for employment in wildlife and cultural management agencies, education, and other rural-based jobs; as well as further college milestones such as the Associates and Bachelor’s of Science degrees.

As part of the (proposed) EBOT* program, Alaska Native students participated in the first-ever Summer Ethnobotany Field Camp in July 2008 in the coastal village of Quinhagak, Alaska. In July 2009 the second annual EBOT* Field Camp was held on Nunivak Island, off the west coast of Alaska. Students put in long days under the midnight sun for this two-week, three credit course. In addition to learning basic botanical concepts such as plant collection and identification methods, students also are introduced to traditional uses for the plants growing locally in this region. This course has already been accepted by the UAF Biology department as one of their science electives – a strong endorsement for the EBOT* program from the life science faculty.

During Spring Semester 2008 we were very excited to be able to support the first Alaska Native exchange student to Hawaii’s Windward Community College (WCC) in Kaneohe, Oahu. Gloria Simeon successfully completed 13 credits of coursework toward her Ethnobotany* Certificate at KuC, including a research project entitled, Bioassay and vitamin analysis of sweet potato leaves and potential uses of bioproducts. More information on Gloria and her accomplishment is online at: http://kaohana.windward.hawaii.edu/story.php?ID=221. Ikaika Dilliner became the first Hawaiian Native exchange student to successfully complete the EBOT* Summer Course that was described above.

In May 2009, we sponsored the third EBOT* Yup’ik Elder Council at KuC. During this meeting fifteen elders discussed, in their native Yup’ik language, the local plants and their uses that they felt were most important for their home regions of Alaska. The information generated from these meetings is being compiled into a bilingual publication, the Yup’ik Manual of Ethnobotany.

A total of five new EBOT* courses have now been added to the UAF Course Catalogue, as will the Ethnobotany* Certificate Program, once it is approved by the UA Board of Regents in June 2009.

*The Ethnobotany Certificate Program is proposed and is pending final approval from the UA Board of Regents and the Northwest Commission on Colleges and Universities.

Dates of Project: 2006 – Ongoing

Location: Quinhagak and Bethel, Alaska
WCC, Kaneohe, Oahu

Purpose:
EBOT Summer Field Camp is offered to encourage Alaska Native students to consider education and careers in Science and Technology. EBOT Alaska Native exchange program provides students with the opportunity to learn about Hawaiian plants and culture. EBOT Yup’ik Elder Council convened to share traditional plant use knowledge with faculty, students, and communities in rural Alaska.

Two students, Kristi Newell and Nicky Nick (both from Bethel AK), studying the local native plants during the July 2009 Ethnobotany summer field camp held at scenic Nash Harbor on Nunivak, a remote island off the western coast of Alaska.

Alaska Native Ethnobotany exchange student, Gloria Simeon, and Ikaika Dilliner in Dr. White’s lab at WCC, Spring semester 2008.

The University of Alaska Southeast Sitka Campus is using CSREES funding to create a teaching and experiential learning program for underrepresented advanced high school and undergraduate students interested in pursuing a scientific career. The goals of this program are to: 1) Increase retention of underrepresented Alaska Native-Native Hawaiian (ANNH) students in the sciences, 2) Develop a science based experiential learning and mentoring program and 3) Promote a cultural and scientific exchange.

Students gain knowledge of the migration patterns and biology of humpback whales by studying humpback whales in Alaska and traveling to Hawai‘i to observe the same whales on their breeding grounds. In Hawai‘i, students learn how to track whales from an established shore station using to understand how whale distribution patterns change over time. Students experience a cultural exchange by participating in field trips with students and faculty from the University of Hawai‘i at Hilo. These same Hawaiian students visit Alaska to attend Sitka WhaleFest and participate in a Molecular Ecology and Fish Culture workshop with Alaskan students. This exchange connects Alaskan students with Hawaiian students, Native Hawaiian interns and university faculty. Students and faculty gain an understanding of each other’s culture, language and resource issues.

CSREES funding also enhanced and expanded a Molecular Ecology course offered at Mt. Edgecumbe High School. The students conduct original scientific research using microbiology laboratory techniques to answer ecological questions. Students gain practical experience in developing and testing hypotheses and in research techniques. Emphasis is placed on documentation of the data collection and in analysis of the results. Students engage in research projects studying the microorganisms found in the root zone of muskegs. The broader focus of their research is the understanding of the role of microbes in the overall ecosystem and forest watershed health, with implications to global climate change that address management questions of concern to the U.S.D.A. Forest Service. Projects include studying root zone fungi, bacteria and Archaea involved in carbon and other nutrient cycles. Little microbial research has been done in southeastern Alaska and students are contributing to the scientific understanding of globally important scientific questions. The culmination of the project is a paper and presentation of their research at science fairs and symposia. The Molecular Ecology Program is also funded by the Alaska Rural Research Partnership education outreach of the Alaska EbSCOR Program.

Through field and laboratory work, and the presentation of their research, the students gain understanding of both the process and value of scientific research in the understanding of real world questions. Outcomes include increased participation of students in activities related to science (research, scientific conferences, course enrollment), in preparation for careers as scientists, professionals, and technicians. The collaboration between UHH and UAS faculty and students is multidisciplinary, where the combination of expertise expands research opportunities to explore the complex nature of connectedness between land and ocean.

**Dates of Project:** 2006 – Ongoing
**Location:** Sitka, Alaska and Hilo, Hawaii
**Purpose:** To strengthen experiential learning programs in science for ANNH students through a cooperative initiative between UAS Sitka and University of Hawai‘i Hilo to increase participation in scientific careers.

* Students from Hilo work with students in Sitka to experience a scientific and cultural exchange.

* Alaska Molecular Ecology students earn awards and scholarships at state and regional science fairs. Three students qualified to compete nationally and internationally in 2008.

* Alaska and Hawai‘i students assist Hawai‘i Marine Mammal Consortium biologists to track humpback whales from shore using a theodolite off the Kohala Coast, Hawai‘i.

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**Strengthening Alaska and Hawai‘i Student and Faculty Partnerships through Experiential Learning**
**University of Alaska Southeast, Sitka Campus**
**Fisheries Technology Program**

*University of Alaska Southeast – Ketchikan Campus*

With USDA/CSREES Alaska Native/Native Hawaiian Serving Institutions support, the Fisheries Technology (FT) program at the University of Alaska Southeast Ketchikan has greatly expanded its program capacity. Specifically with this support, the FT Program developed more effective outreach activities to rural and Native Alaska secondary schools, expanded training and support for the emerging aquatic farm industry, migrated the AAS and certificate to a fully distance delivered format, and created career pathways from secondary to post secondary degrees within the state of Alaska.

The fishing industry is a core economic sector in all Southeast Alaska communities. Commercial, recreational, subsistence and personal use fisheries provide stability and economic activity to the region. Private non-profit salmon enhancement entities and state and federal management agencies are significant employers in the region and contribute to this economic sector. The need to train Alaskans for positions in agencies and salmon enhancement entities has been identified as a critical need in the state; these positions have been identified by the Alaska Department of Labor and Workforce Development as high demand occupations.

The aquatic farm industry is another economic sector of growing importance to the region. The Fisheries Technology program began collaborative projects with the industry in 2006, offering week-long industry specific training with nationally recognized experts, resources for shellfish growers, and research initiatives designed to prolong the shelf life of growers’ product.

The FT program has built a reputation of providing students with a well-rounded fisheries education, allowing them to enter the workforce as knowledgeable, highly skilled employees in fisheries management agencies and salmon production facilities. During the past three years of this program and USDA supported activities, enrollment in the program has more than doubled, with over one-half of those enrolled employed by agencies or hatchery facilities across the state. The fisheries technology program is guided by an active advisory committee.

Significant impacts of the Fisheries Technology Program include:
- Increased tech-prep and dual enrollment opportunities for students across Alaska.
- Formal articulation agreement between UAS AAS in Fish Tech and UAF BS in Fisheries.
- Distance delivery of the AAS and Certificate programs, allowing students to remain in their communities while achieving a college education in fisheries.
- Graduates of the program work in fisheries related fields and/or are pursuing BS degrees in fisheries and biology.
- Outreach to rural and Native Alaskan schools, exposing over 700 students to fisheries related activities since 2007.
- The program has numerous federal, state, native and private partners, many of whom house FT students as interns or employees.

**Dates of Project:** 2006 – Ongoing  
**Location:** Ketchikan and Southeast Alaska  
**Purpose:** Expand Fisheries Technology (FT) program educational and outreach opportunities in Southeast Alaska

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**Phytoplankton Workshop at Ketchikan, AK, May 2008 taught aquatic farmers and agency folks about beneficial and harmful algae.**

**Students from UAS FT program and Ketchikan High-school aboard the FV Jack Coutant April 2009.**

**UA FT students learn how to take herring otoliths from Sitka Tribe biologist Heather Woody March 2009 during the FT 210 field session.**

**Angoon high-school students tour Hidden Falls hatchery in May 2009 as one component of a fisheries education outreach project to this native community.**
Nutrition & Wellness:
From College to Community

Prince William Sound Community
College, Valdez, AK

With the generous support of the USDA/CSREES Alaska Native/Native Hawaiian Serving Institutions grants program, Prince William Sound Community College (PWSCC) has had the opportunity to have an impact on the lives and well-being of rural students from many Alaskan communities.

Significant impacts include:
- The addition of HS 203 Normal Nutrition as a course offered on regular rotation (rather than sporadically).
- 15 Alaska Native and rural Alaskan students were offered scholarships to attend PWSCC.
- 11 of these students completed at least one full semester.
- 1 of these students (the only 2nd year student awarded a scholarship) graduated with an A.A. degree and received the President’s Cup Award.
- 7 of these students completed the year and will return to PWSCC in the fall.
- 6 of these students completed the year with cumulative grades of “C” or higher, while 7 completed their nutrition class with a “C” or higher.
- Students represented five rural towns/villages (Gakona, Chitina, Delta, Glennallen, and Valdez).

Students who accepted scholarships were required to:
- Take a class in human nutrition and pass with a “C” or better.
- Complete a personal fitness program.
- Attend regular meetings with the Native Student Services Coordinator.
- Participate in the Multicultural Club.
- Produce a brochure demonstrating nutrition knowledge as a result of this program; brochures are distributed on all 3 PWSCC campuses, as well as in students’ home communities.

In addition to completing required activities, students funded through the USDA program helped to educate community members and peers by:
- Participating in the Halloween trick-or-treat for the Valdez Food Bank.
- Preparing healthy snacks for student events.
- Hosting a Valdez water vs. bottled water taste test as part of Solution Earth, a community forum focused on environmental issues.

Dates of Project:

Location:
Valdez and Glennallen, Alaska

Purpose: To positively impact nutrition and wellness in Alaska Native students and their families.

Students identifying serving sizes of a variety of foods.

Students looking up nutritional content of various foods.

USDA scholarship student after receiving the PWSCC President’s Cup Award.
Thanks to the USDA/CSREES Alaska Native/Native Hawaiian Serving Institutions grants program, the Hawai‘i Community College Forest TEAM and Hawaiian Lifestyles programs have been able to instruct native Hawaiians and other members of the Big Island Community in understanding the natural and cultural importance of forest and agro-forest ecosystems. Upon completion from our programs they are ready to enter the work force as forestry technicians, land stewards and farmers of important Hawaiian crops.

On the Big Island of Hawaii, there are many employers of forest technicians such as Volcanoes National Park, the US Forest Service, Dept. of Land and Natural Resources and several non-government organizations. However, due to a lack of locally trained technicians, most of the needed labor has been brought to the island from overseas. The focus of the Forest TEAM program is to provide local students with the needed training for these positions. This has been done by enhancing the existing academic programs by providing computer classrooms, distance education, laboratories, greenhouses and vans for field-based learning. The program also conducts internship programs to assist students in developing job skills.

The Big Island has by far more land covered with native forests and a higher percentage of native Hawaiians than any other island, however, the supply of native plants used in hula is declining and there is a limitation of taro on the Island. To improve this situation, the Hawaiian Lifestyles program aims to enhance cultural awareness and knowledge of the Hawaiian environment. Specifically teaching students how to establish traditional Hawaiian agro-forestry systems and sustainably harvest native plants for cultural practices.

The two programs actively recruit minority students through school visits, attendance at career fairs, and activities involving the Hawaiian community. As a result, eighty percent of the Hawaiian Lifestyles students and forty percent of the Forest TEAM students are ethnic Hawaiians.

**Significant impacts include:**

- FTP and HLS have established a new collaboration with the Department of Hawaiian Homelands to restore native forests on Mauna Kea. And existing collaborations with DLNR, USFS, Forest Solutions and NPS have been strengthened.
- The TEAM program is collaborating with the USFS to teach three FTP courses to visiting forest technicians from the Federated States of Micronesia and American Samoa in the spring 2009 semester.
- Five FTP and three HLS students completed summer internships with potential employers.
- The grant supported an HLS instructor during the summer to teach two bridge courses that focused on the cultural uses of plants in the Hawaiian environment.
- A total of 5 TEAM and 16 HLS students graduated.
- Number of declared majors: TEAM 32, HLS 36

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**Dates of Project:** 2002 – Ongoing

**Location:**
Hilo, Hawai‘i Island

**Purpose:**
To train natural resource technicians and cultural specialists to enter to work force or continue on with a 4 year college education.
Integrating Culture, Science, & Technology
University of Hawaii at Hilo

**Sustainable Tourism** provides project-based opportunities for students to develop research, communication, video graphic/graphic design, interpretation and presentation skills in a summer intensive on principles of tourism sustainability; Student-planned display provide public education on agri-tourism linkages.
- Virtual nursery tours for website marketing and marketing surveys developed by eleven student team (4 students were Native Hawaiian or Pacific Islander) for Hawaii Export Nursery Association and Hawaii Tropical Flower Council (2009)
- Native tropical woods exhibit design and implementation and holua sled display completed for USDA Institute for Pacific Islands Forestry; one Native Hawaiian student started Native Hawaiian art business (2007, 2008)
- Over 125 students, 22% Native Hawaiian, completed course experience

**Cultural and Scientific Investigations – Kalo**, a culture based collegiate summer institute for high school students, integrates secondary standards in science and mathematics with collegiate curriculum, with the goal of increasing the number and quality of people who enter science, agriculture and cultural-related careers.
- 10 high school students (8 Native Hawaiian) completed inaugural CSI-Kalo course, earning 1 high school and 3 college science credits
- Students explore perspectives of culture and science for production and use of the Native Hawaiian kalo

[HawaiianAgriculturalProducts.com website](http://www.HawaiianAgriculturalProducts.com) helps farmers and students to market online and to expand the presence of Hawaiian products worldwide; website also provides interactive feasibility models: orchids, tea, anthuriums, kalo, and coffee.
- Over 100 Hawaii businesses listed in the database
- Interactive feasibility function successfully used by Kona Coffee Industry producers to negotiate lease renewals favorable to continuing coffee production
- 21st Pacific Science Conference and National Association of State Universities and Land Grant Colleges 9th Annual Exhibition for Congress were venues for the interactive feasibility models

**Greenhouse Incubator**. Over 80 students learned principles of operating an agribusiness using AN/NH funded incubator; six students operated an agribusiness through course (Student Managed Farm Enterprise, Ag 290).

**Heʻeia Wetlands Restoration/ Heʻeia ahupuaʻa** partnership project of nine independent community organizations, including Kakoʻo ʻOiwi, the Koʻolaupoko Hawaiian Civic Club and UH Hilo, has the goal of re-creating an Hawaiian wetland system with loʻi and sustainable kalo farming and fishpond aquaculture that will also serve the community as an outdoor classroom.
- Demonstration loʻi established with community youth (2008)

**K-12 Garden Projects** is a partnership with area youth organizations and schools with the goal of providing youth with the experience of growing nutritive foods.
- Over 100 children experienced collaborative mentorship training, and immersion in a working/educational/agricultural environment

Available internet sites: [www.HawaiianAgriculturalProducts.com](http://www.HawaiianAgriculturalProducts.com); [youtube.com/watch?v=pftg8fOzYA](https://www.youtube.com/watch?v=pftg8fOzYA)
Promoting Healthy Hawaiian Cuisine & Lifestyles

Kapiolani Community College – Culinary Arts Dept.

Due to the conversion of pineapple and sugar cane fields into diversified agriculture, there has been an increasing supply of quality fresh agricultural products available in the local market. However in spite of this, the rate of obesity in Hawaii has continued to rise and for certain minorities, the childhood obesity rate is now over twice the national average. A recent survey of our non-credit culinary class participants reveals that many local residents are uneducated about the diversity of available products and their culinary use. There is also an absence of culturally-appropriate educational material that provides guidance on healthy eating for Hawaii’s Asian & Pacific Islander populations. To help address this problem, Kapiolani Community College (KCC) has developed a number of initiatives funded by the USDA/CSREE grant. Significant impacts of these projects include:

- The “Living off the Land” farm-to-table culinary education classes that were developed by the grant are in strong demand.
- The “A DASH of Aloha Healthy Hawaii Cuisine and Lifestyle” book, based on the Dietary Approaches to Stop Hypertension and developed through the USDA grant, has maintained steady sales in bookstores 15 months after launch. Close to 7,000 copies have been sold to bookstores and 4,000 have been distributed free to schools, health organizations and medical centers clinics on Oahu, Maui, Molokai, Big Island, and Kauai for nutrition education, patients counseling and dietary intervention.
- The adjunct programs created by the “DASH of Aloha” book have also been in demand, including public cooking demonstrations, hands-on cooking classes, seminars for health professionals, edible garden school projects, and training for school food service professionals.
- As a result of the “DASH of Aloha” initiatives, KCC was invited to join the statewide Nutrition and Physical Activity Coalition as well as the Hawaii Initiative for Childhood Obesity Research and Education to promote healthy eating and create obesity prevention programs. KCC’s programs are the previous “missing link” for translating the relevant nutrition knowledge into realistic daily activities that are practical and affordable, across different age groups.
- KCC used the proceeds from the “A DASH of Aloha” book to sponsor a nutrition forum in November that brought together key stakeholders in the private and public sectors to formulate strategies for addressing nutrition-related health issues. That forum resulted in the Nutrition Task Force for the County of Honolulu deciding to initiate an “Eat the Rainbow” campaign for healthy eating through the use of local products.
- The DASH of Aloha recipes are now being used as an intervention and research tool by the Hawaii Kaiser Center for Health Research in a childhood obesity program.
As the major institution of higher education on the island of Kauai, the College has a long tradition of dedicated service to the needs of the community. In recent years as the island’s economy shifted from a major focus on sugar plantations to a rapid rise of tourism, the college responded with training programs that supported these significant changes in employment. During this era of affluence, the food imports grew to 90% of the island’s daily diet but local diversified agriculture declined. Most recently, however, both sugar and tourism have experienced a sharp decline and the employment options they provided have also diminished. Kauai has therefore been challenged to address the issue of food self-sufficiency and the accompanying need for greater diversification of the local job market. Today, with rising transportation costs and the threat of worldwide food shortages, the new challenge is to become increasingly food self-sufficient.

The College has responded to this challenge by recruiting the island’s most successful farmers and working with them to develop programs that train the local residents to grow food in home gardens, community gardens and small commercial enterprises. In the past two years, these efforts have produced a growing network of gardens and a substantial group of successful gardeners.

The College in cooperation with several of the key agencies involved in agriculture, farming, community development and economic planning, has developed a network of community garden sites in the regions of the island that correspond to the early Hawaiian Ahupuaa system of wedge-shaped agricultural areas that ran from the mountain to the sea. Each region has somewhat unique soil and weather characteristics but in combination they can produce an abundant supply of food year-round. The goal is to create a cooperative system of food production that will benefit the entire island in a truly sustainable manner.

The results to date include the following:

- Training programs in agriculture and farm-business management are now offered at the College and at four satellite sites on the island
- More than 20 experienced farmers have joined the instructional team and are providing training in these KCC-sponsored programs
- A Training Resources Manual has been developed comprised of reference materials drawn from web-based publications provided by UH College of Tropical Agriculture, University of California at Santa Cruz and several organizations supported by the US Department of Agriculture. Copies are provided to trainers and also to consultants who are providing on-going technical assistance.
- In excess of 200 students have been trained in these programs and are participating in home gardening, community gardening and small commercial farming programs.

The program continues to grow as new land is being provided by the County of Kauai, private land-owners, churches and schools.
Plant Biotechnology
Academic Subject Certificate

Windward Community College

Agribiotech companies in Hawaii need highly trained and skilled biotechnologists. Windward Community College has developed and has offered an Academic Subject Certificate in Plant Biotechnology (ASC-PB) since 2002. The program is supported through USDA-CSREES-SERD grants. A total of 26 credits is required to receive the certificate. The graduates are prepared for careers in biotechnology, bioprocessing entrepreneurship, and transfer to higher degree institutions, majoring in disciplines such as agribiotechnology, horticulture, ethnobotany, biology, pharmacy and pre-medicine.

Hands-on learning and research training are accommodated through campus biotech facilities: the Tissue Culture and Plant Biotech Facility, the Kuhi La’au – Tropical Plant and Orchid Identification Facility, the climate–controlled greenhouse, and the Bioprocessing Medicinal Garden Complex (BMGC). The BMGC, which was dedicated in June 2007 has accommodated more than 800 students to cultivate medicinal/nutritious plants and to participate in research projects for bioproduct manufacturing. The complex has also drawn wide interest from community members desiring to participate in growing medicinal and nutritious plants for health benefits. Collaborative research, training, and mentorship have also been established with research institutions and biotech companies to facilitate immediate employment.

An average of seven ASC-PB graduates is produced per year. There have been a total of 39 Plant Biotech graduates through Fall 2009. Thirty eight percent of graduates have entered the plant biotech workforce, 72% have transferred to higher degree institutions, and 26% have become bioprocessing entrepreneurs. The total number reflected is higher than 100% due to graduates engaging in multiple roles, e.g. being student as well as biotech employee. The program has also educated 4000 students in classes offered for ASC-PB.

One student presented a scientific poster titled: “Agrobacterium - Mediated Transformation of Brassolaeliocattleya Raye Holmes ‘Mendenhall’ Protocorm-Like Bodies to Confer Resistance to Cymbidium Mosaic Virus” at the Third Scientific Conference on Andean Orchids in Ecuador, February 2009. Six undergraduate student research papers have been published in scientific journals. In addition, the first in a series of Ethnopharmacognosy booklets containing student research projects has been published.

Dates of Project: 2001 – Ongoing
Location:
University of Hawaii – 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 entrepreneurship.

Ethnopharmacognosy Series 1: Pharmaceutical and Nutraceutical Values of Sweet Potato Leaves - Recipes and Bioproducts

BOT 205 (Ethnobotanical Pharmacognosy) performing blood coagulation test with honohono grass.

BOT 299 (Independent Study) student presented a scientific poster at the Third Scientific Conference on Andean Orchids in Ecuador, February 2009.
Growing the Growers
Agribusiness Incubator Program,
University of Hawai‘i

Once dominated by large-scale sugarcane and pineapple production, Hawaii’s agriculture is now characterized by a large number of smaller, diversified agricultural operations. In recognition of the need for these agribusinesses (new and existing) to have access to business expertise, the Agribusiness Incubator Program (AIP) was created under this grant.

AIP provides business consulting services designed to improve the viability and success of agribusinesses, especially those in the startup phase. Core services include financial assessment and systems implementation, strategic and business planning, process improvement, marketing plan development, and project management. These services complement the education and training provided by consortium partners and the technical expertise of the University’s agriculture extension services.

In the 2008-2009 grant period, AIP continued to improve the strength of agribusinesses in Hawaii. Significant activities and impacts include:

- Served 35 agribusinesses and related organizations, including 16 with direct Native Hawaiian benefit.
- Assisted with the startup of 15 new agribusinesses
- Assisted with development of 12 value-added products

<table>
<thead>
<tr>
<th>Average annual client improvement in:</th>
<th>FY2008*</th>
<th>3 year average*</th>
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</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>51.5%</td>
<td>64.4%</td>
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<tr>
<td>Net income (profit)</td>
<td>604.5%</td>
<td>315.7%</td>
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<tr>
<td>Acres in production</td>
<td>138.4%</td>
<td>74.6%</td>
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<tr>
<td>Employment</td>
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<td>17.2%</td>
</tr>
</tbody>
</table>

* Does not include startup clients without comparative prior year statistics.

AIP also strengthens the business skills of agribusinesses who are not clients of the consulting services through outreach, training, and development of educational and informational material. Notable outputs include:

- Provided formal agribusiness training for 58 agri-entrepreneurs.
- Performed five presentations on agribusiness topics to agribusiness operators and high school agriculture students and teachers.
- Developed educational curricula (for):
  - Manual Record Keeping System (FSA)
  - Agribusiness Training Manual (Oahu RC&D)
- Authored industry studies/reports/papers (for):
  - Agripreneur Incubation: An evolved approach to facilitating the viability of agribusiness entrepreneurs (Asian Productivity Organization).
  - Cost of Production and Market Opportunity for Vetiver Grass (NRCS)
  - Feasibility of a Hawaii Organic Food Center (HICOF)
  - Hawaii Bioenergy Master Plan: Business Partnering (Hawaii State Legislature)
  - Interisland Distribution of Organic Produce (Hawaii Cooperative of Organic Farmers)

Dates of Project: 2004 – Ongoing
Location: University of Hawai‘i (Statewide)
Purpose: The objective of the Agribusiness Incubator Program is to enhance the positive contributions of the agriculture industry to the State 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, in order to promote their greater success and viability.
Support from the USDA/CSREES Alaska-Native-Serving and Native Hawaiian-Serving institutions Education grants program enabled the Honolulu Community College (HonCC), University of Hawaii to successfully launch a strong curricula in oceanography, marine biology aquaculture, biology and environmental science. The science department is now capable of offering many courses in live sciences using state-of-the-art technology in the classroom and laboratory facilities. The grant activity supports the mission of the college in providing education to people of Hawaii including students of native Hawaiian ancestry. A course-based website developed with support from the grant continues to serve over 200 students a semester.

Website: [http://www.hcc.hawaii.edu/instruct/gopalakrishnan](http://www.hcc.hawaii.edu/instruct/gopalakrishnan)

The Marine Option Program of the college is a gateway for interested students to enter into either academic or career pathways in marine and environmental science fields. Recruitment efforts continue by providing student workshops and visitation to various schools. The internship opportunities enable students to receive on-site training in aquaculture and aquaponics. The grant has provided students financial assistance through internships, tuition awards and the college’s federal work-study program. The grant also enabled the college library to acquire both instructional support and educational resources to enhance student learning. The project has definitely impacted the instructional delivery capability as well as student learning ability and the level of success achieved in increased enrollment, retention and completion rates are expected to continue for years to come.

Outcome and impacts during 2008-2009 year:

Upgraded instructional and laboratory facilities. Diversified course offerings of the science department. Four of these courses have laboratory components (BIO171(Biology), BIO172 (Biology), OCN201(Oceanography) and ZOO200 (Marine Biology). Made additions to library resources by adding more textbooks and audiovisual resources. Facilitated effective field studies and student training.

College was able to launch successful recruitment efforts to attract high school students into the program. Financially disadvantaged students could participate in college’s federal work-study program enabling them to spend more time in studies. By collaborating with other institutions, students received on-site training in aquaculture, aquaponics, aquarium management. Tuition awards and paid internships enabled students to focus on their studies. Grant activities had a major impact on 377 students during 2008-2009 academic year; 22% of the enrolled were native Hawaiian students with a success rate of 75% (grades C or better). Sixteen students joined the Marine Option Program; 50% of the enrolled were of Native Hawaiian ancestry. One native Hawaiian student secured admission to graduate program in Natural Resource Management at Washington State University and another native Hawaiian student succeeded in receiving three internship awards from NSF and is currently undergoing undergraduate research internship at the Massachusetts’s Biomedical school in Boston.
Thanks to the support of the USDA/CSREES Alaska Native/Native Hawaiian Serving Institutions grants program, the Mālama Ahupua’a program has brought Maui Community College one step closer to offering a new Associate in Science degree in Cultural and Natural Resource Management.

The overall goal of the degree is to create a workforce of cultural and natural resource professionals that will expand the current efforts in the county of Maui and the state of Hawai‘i to preserve and protect the Hawaiian culture and the unique natural ecosystems of Hawai‘i. This degree is an interdisciplinary course of study with a strong core curriculum which integrates Hawaiian studies courses with science, math, technology and economics.

The ahupua’a land sections and land use therein existed within a philosophical framework, as referenced in the vision statement, of the Hawaiians’ reverence and caring for the sacred source of their resources. The Hawaiian language used for those concepts is mālama ‘āina; caring for the land. ‘Āina (land) can be more clearly interpreted, from a cultural perspective, as “that which feeds and nourishes.” It is a compelling argument, in the 21st century, for the ethical and moral imperatives for creating a Cultural and Natural Resource Management degree.

Significant impacts include:

- Built opportunities for Native Hawaiian students through offering cash stipends for internship and service learning projects that assisted federal, state, and local organizations.
- Created comprehensive curriculum to meet the requirement for training in areas such as native habitat restoration, agricultural sciences, and natural resources conservation: GIS 150 – Introduction to GPS/GIS, AJ 240 – Natural Resource Management and Enforcement, HWST 207 – Land Restoration. The USDA funds also to hire lecturers and faculty to help lead these courses.
- Partnerships with local conservation agencies.
- A student was hired to help grant objectives.
- Initiation of offering distance learning classes (towards proposed AS in Cultural and Natural Resource Management) to students on Moloka‘i and Lana‘i.
- Promote traditional and new applied research technologies as essential elements in workforce training.
- Develop the appropriate activities and materials to promote the career opportunities in the agriculture industry.
- Develop outreach and recruiting activities to draw students to an education with a focus on food and agricultural sciences.
Nurturing Students and Native Plants

Leeward Community College, O’ahu

With the generous support of the USDA/CSREES Alaska Native/Native Hawaiian Serving Institutions grant, LCC has developed several programs to help preserve rare native plants, make them available to the college and public, and provide courses and support for students who have interest in the plant sciences. We have the most endangered flora in the world. They protect our environment and are culturally valuable. Our district has the largest area of agriculture and it is undergoing transition from plantations to diverse forms of agriculture. Training and opportunities to increase our agriculture base are needed, as well as jobs in our district with the largest Hawaiian population on the island and high unemployment.

The school now maintains a garden of over 100 native plants (30 of which are endangered) and a shade house with a teaching classroom space and full time horticulturist. Much of these facilities and support initially came from the grant.

A website has been developed with cooperation with neighboring school, Kapiolani Community College. It provides horticultural information about native plants to landscape professionals, installers and home gardeners in order to increase use of native plants in the landscape. Any grower of native plants may have a business presentation on the website and information about their inventory.

A course, Hawaii Horticulture and Nutrition continues to be offered to provide a plant science for non-majors and a way for students to experience plant production.

Activities 2008-2009
- Soft launch of website: http://nativeplants.hawaii.edu
- Provided workshops and class tours in native plant gardens and plant propagation center.
- Presented to plant growers, landscapers and conservationist on two islands.
- Uploaded 2600 valuable native plant photos from collection of retired native plant expert to be shared on the web.
- Input 108 native plants grown by one nursery, working with two other nurseries.

Impacts 2008-2009
- ONGA – O’ahu Nursery Growers” Association gave $1,000 for scholarships to students interested in plant nursery careers. Additional $1,000 was given to two students showing promise in plant science careers from the grant.
- Dr. Kabi Neupane guided to two in participation of a research project involving cloning several genes from Anthurium and breadfruit cDNA libraries.
- Two high school students were assisted in science fair projects using native plants.
- Another high school student supported by the grant received University of Hawaii CTAHR top award plus $500.
- Over 500 LCC students benefited from native garden and propagation center resources.
- Botany and horticulture course continue to attract Hawaiian students at higher percentage than the percentage found in the campus.
- Ten plant exchanges and fourteen tours or plant consultations were provided.
The 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. Emphasis was placed on outreach, student recruitment, internships, and teacher training.

With contributions by approximately 90 private businesses, agencies, and consortium partners who set-up interactive displays and activities, more than 1,200 fifth grade students and teachers on the islands of Oahu, Maui, and Kauai improved their knowledge in science and careers in agriculture and natural resource management and became better stewards of the land by participating in our Agriculture and Environmental Awareness Day events.

Surveys of students transferring into CTAHR show that CTAHR’s Student Ambassadors have had increasing impact on recruiting students into the college. Two videos were produced to show prospective students career opportunities in agriculture and natural resource management (www.ctahr.hawaii.edu/AspNet/Prospective.aspx), with others in progress.

With support from and coordination by this program, CTAHR students (10 over the past three summers) have worked for agriculture companies on Kauai and Oahu. The students gained extensive knowledge and experience and developed valuable ties to potential employers. Weekend activities were arranged to expose the interns to other agribusinesses.

The current controversy surrounding genetic engineering provided a stimulating context for a place-based course for middle and high school science and agriculture teachers. With funding from this program, a newly developed course, Agricultural Biotechnology (AG 494), was team-taught by instructors from the University of Hawaii Manoa, University of Hawaii Hilo, and Kamehameha Schools, to seven secondary education teachers.

Significant impacts include:
- 1,200 fifth grade students and teachers improved their knowledge in science and careers in agriculture and natural resource management.
- Through videos created under this program, prospective students can view exciting opportunities available to them with consortium degrees.
- With joint sponsorship by UH Manoa and UA Fairbanks, one CTAHR student gained instruction credit and a lifelong experience in UAF’s Ethnobotany course, EBOT 195, on Alaska’s Nunivak Island.
- Students who completed summer internships reported dramatically improved outlook on the agriculture industry and future careers. Employers reported that the student interns were valuable workers and that the employers would hire the interns upon graduation.
- Two student interns have become full-time employees in a mentor agribusiness, and one student, now pursuing a graduate degree, has selected a thesis topic based on research performed during the internship.
- Seven middle and high school science and agriculture teachers completed AG 494 and obtained classroom material and knowledge to educate secondary education students on agricultural biotechnology, and gained professional development credit.
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