

2011 University of Alaska Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

Alaska is recognized for its immense size and sparse population and its cultural, geographic and environmental diversity. The state represents a major region of renewable and nonrenewable natural resources in the United States. Its 365 million acres include the nation's largest oil reserves and coal deposits. The state also contains an array of mineral deposits, including gold, zinc, boron, and molybdenum. Alaska has a diverse geography that offers soils for production of food, fiber, and biomass fuels as well as a multitude of recreational and tourism activities. Waters surrounding Alaska's shoreline and riparian habitats contain large stocks of salmon, cod, pollock, halibut, and shellfish that support thriving commercial, sport and subsistence fisheries. Alaska's natural resources have historically been the foundation of the state's economy though resource industries have been predominantly extractive in nature. Thus, the use and management of these resources is a predominant force in the planning and delivery of any teaching, research, extension, and engagement programs.

The finite nature of the state's nonrenewable resources and local and national controversies surrounding resource extraction and related environmental concerns affect the activities of the School of Natural Resources and Agricultural Sciences and the Agricultural and Forestry Experiment Station (SNRAS/AFES) and the Cooperative Extension Service (CES). The University of Alaska Fairbanks in general and SNRAS/AFES and CES in particular, meet the challenges of increasing demands for research, education and outreach relevant to sustainable management of Alaska's resources and bring communities' ideas to the university for further development of the state's resources.

During the past 40 years, Alaska's economy has become dependent upon revenues related to petroleum development. To diversify its economy, the state is attempting to move toward nonpetroleum natural resources for economic opportunities that are cost-effective and sustainable. The programs of SNRAS/AFES and CES play a vital role in linking the knowledge generated to meet the needs and interests of Alaskans. Citizens are provided opportunities through engagement to influence future research and education priorities. CES is a critical partner for the university as a whole in providing a two-way engagement linkage between researchers and natural resource users to deliver the latest research findings and educational and outreach opportunities.

Alaska imports a high percentage of foods and other agricultural products consumed in the state. Growers in the agricultural sector produce products primarily for in-state consumption, including fresh market potatoes, vegetables and herbs; forages, grains, and manufactured livestock feeds; controlled environment products, which include bedding plants, florals, landscape ornamentals, short season vegetables; and a variety of niche market crops. Livestock enterprises include dairy, beef, goat, swine, reindeer, and nontraditional livestock species such as muskoxen, elk, and bison. Producers will require increasing information specific to northern latitudes as consumer demand increases due to changing preference and a growing population. Furthermore, as transport costs increase and Alaska population grows, more locally and regionally produced food will be needed to feed Alaskans.

The mission of SNRAS/AFES is to provide new information to manage renewable resources at high

latitudes, and to improve technology for enhancing the economic well-being and quality of life at these latitudes. While foresters, farmers, and land managers use our research results, all Alaskans benefit from the wise use of land resources. Our research projects are in response to requests from producers, industries, and state and federal agencies for information in plant, animal, and soil sciences; forest sciences; and resources management.

Experiment station scientists publish research in scientific journals, conference proceedings, books, and in experiment station bulletins, circulars, newsletters, research progress reports, and miscellaneous publications. Scientists also disseminate their findings through conferences, public presentations, workshops, and other public information programs.

Administratively, AFES is an integral part of the School of Natural Resources and Agricultural Sciences. This association provides a direct link between research and teaching. Scientists who conduct research at the experiment station also teach, sharing their expertise with both undergraduate and graduate students.

Cooperative Extension's mission is to educate, engage and support the people and communities of Alaska, connecting them with their university. It provides factual and practical information while bringing Alaskans' issues and challenges to the university. CES is committed to promoting the sustainability and economic security of individuals, families and communities by providing practical, nonformal education services that promote the wise use of natural resources, respecting cultural and ethnic diversity, and being responsive to emerging stakeholder needs and interests.

The elements of this report show strong linkages between CES and SNRAS/AFES supporting agriculture, horticulture, forestry, and rural and economic development. The units work cooperatively as well as separately with other units within UAF, the University of Alaska statewide system, federal and state agencies, nongovernmental organizations, private industry; and through multistate collaborations with other land-grant universities. They collectively and individually generate and disseminate knowledge to stakeholders who include K-12 students, higher education students, individuals, businesses, industry, government, nongovernmental organizations and families and communities throughout Alaska and the circumpolar North and the nation. CES brings the university to Alaskans while bringing community concerns and issues back to the university.

Planned programs for purposes of this report include Agriculture and Horticulture; Natural Resources and Community Development; Sustainable Individuals, Families and Communities; Youth Development; Climate Change, Global Food Security; Sustainable Energy; Childhood Obesity; and Food Safety.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	33.0	0.0	35.3	0.0
Actual	42.0	0.0	24.9	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- Combined External and Internal University Panel
- Combined External and Internal University External Non-University Panel
- Expert Peer Review

2. Brief Explanation

The School of Natural Resources and Agricultural Sciences and the Agricultural and Forestry Experiment Station use an established scientific peer review process to review and evaluate proposals, publications, and specific annual reports that could include the annual narratives that are required to report activities related to the POW. Extension uses the merit review process and the general review process for this joint annual report and Plan of Work.

The Agricultural and Forestry Experiment Station (AFES) complies with sections 3(c)(1) and (2) of the Hatch Act and section 1445 of NARETPA (Hatch Regular Capacity Funds) and the amendment to the Hatch Act of 1887 to Section 104 by AREERA for programs funded under section 3(c)(3) of the Hatch Act (Hatch Multistate Research Funds) by using its established scientific review process for all proposals, publications, and specific annual reports that could include annual progress of work accomplished under this Plan of Work. All new and revised Hatch (and McIntire-Stennis) project proposals within the Agricultural and Forestry Experiment Station undergo scientific peer review. All proposals are submitted for director approval. The blind peer review panel is composed of a minimum of three members invited by the Director. The panel consists of competent authorities in the discipline of the proposal/publication/annual report or related disciplines. Each reviewer completes a Peer Review Form that includes specific criteria, provides for other comments and suggestions, and makes a recommendation to the Director. Reviews are returned to the Director for transmittal to the author(s). The author(s) review all comments and recommendations of the reviewers and make adjustments or explanations in the document. The Director reviews all comments and recommendations from the reviewers along with the revised proposal/publication/report. The signature of the Director on form AD 416 submitted to USDA NIFA will indicate approval of the project by the Director and will certify that the proposal has been recommended for approval by a majority of the members of the Peer Review Panel. Scientific peer review of multistate research projects are carried out for individual projects under the aegis of the Multistate Review Committee (MRC- formerly RCIC). The specific review process can be found in the Section I.G. "Summary of the Western Review Process" in the Supplementary Manual of Procedures for Western Regional Research and also found at <http://www.colostate.edu/Orgs/WAAESD/>. All faculty in SNRAS/AFES who are participants in Hatch multistate projects are usually required to have an approved Hatch General project that is related to the field of study of the Hatch multi-state project in which they are a member. The Associate Director of AFES is a member of the MRC. Peer review of the Extension components of the POW consist of internal and external reviews. Internal review of the Extension components of the POW is achieved by a panel of University of Alaska Fairbanks faculty and administrators. Extension's State Advisory Council conducted external reviews of programs. The different review panels assess how well the activities and resources proposed in the plan contribute to achieving the proposed goals and established emphasis on climate change, health issues, food security and safety, economic development, positive youth development and renewable energy as priorities for the future. Collective feedback from reviews is incorporated into the future iterations of the Extension components of the Plan of Work. Extension developed metrics in 2010 for the 2011 accreditation of the university by the Northwest Accreditation Commission. The accreditation covers Extension's research, teaching and outreach process, indicators and outcomes. The next round in the accreditation process is developing a strategic plan for the university, where ENGAGE is a major theme. Extension research, teaching and outreach processes and measurements will be embedded in the new strategic plan.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Survey specifically with non-traditional groups
- Survey specifically with non-traditional individuals
- Survey of selected individuals from the general public
- Other (SNRAS Website, Newsletter & Blog)

Brief explanation.

SNRAS/AFES has traditionally met with regional audiences around the state in both formal and informal settings each year. Examples of these include:

- Regional and Statewide Farm Bureau
- Alaska Produce Growers
- Delta Farm Forum
- Alaska Greenhouse Growers
- Reindeer Herders Association
- Alaska Northern Forest Cooperative
- Alaska Livestock Producers
- Association of Peony Growers
- Alaska Community Agriculture Association
- Georgeson Botanical Garden Society
- On-demand meetings at the request of stakeholders

These traditional meetings are focal points for listening to and receiving input from stakeholders. As required by the AREERA of 1998, and in cooperation with the Cooperative Extension Service, these are advertised as broadly as possible and identified as points of contact for public input into research and extension program development.

Since much of Alaska land is under federal and state agency control, natural resource stakeholders include land managers from:

- National Park Service
- US Forest Service
- USDA/NRCS
- USDA/ARS

- Bureau of Land Management
- Bureau of Indian Affairs
- US Fish and Wildlife
- US Geological Survey

State stakeholders include:

- Fairbanks North Star Borough,
- Matanuska-Susitna Borough
- Fairbanks Economic Development Corporation
- Juneau Economic Development Corporation
- Matanuska Susitna Health Association
- Matanuska Susitna Regional Hospital
- Division of Agriculture
- Department of Fish and Game
- Department of Natural Resources

Extension sponsors many agricultural and horticultural conferences and outreach activities with SNRAS/AFES involvement and gathers formal and informal stakeholder input. Outreach events in 2011 included the Delta Farm Forum, Harvest Wrap-up, Alaska Produce Growers Conference, Alaska Greenhouse and Nursery Conference, Sustainable Agriculture Conference and invasive species conferences. For the second year, Extension hosted the Alaska Peony Growers Association conference. Extension also relies on advisory groups as an important stakeholder needs assessment process. Extension has a Statewide Advisory Council and faculty in districts across the state use local advisory committees to provide them with community input related to local program stakeholder needs and interests. The State Advisory Council met in person twice and conducted five audio conference meetings throughout the fall, winter and spring. The Natural Resource and Community Development area sought direction from its forestry advisory group regarding a new staff forestry position. In addition, Extension faculty members gathered stakeholder input as part of their program planning and development process as well as surveys following instructional activities. Faculty, staff and administrators within Extension are also members of the advisory committees and boards of organizations that are stakeholders of the organization. This service on committees and boards provides another venue for stakeholders to provide input to Extension. We invite stakeholder participation through several Facebook pages, for 4-H, military youth and overall Extension.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief explanation.

Survey information was collected using formal survey preparation and analysis techniques. Meetings and workshops were scheduled around themes and to gather specific information in

meeting minutes and transcripts, which was used in strategic planning of research and Extension programs. The feedback loop provided information to research and outreach programs and from research and outreach programs to stakeholders and individuals.

Extension agents use advisory or focus groups to collect stakeholder input. Specialists also have specific groups they rely on for information. For example, the housing specialist works closely with the Alaska Building Science Network and the Alaska Housing Finance Corporation for additional input.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of the general public
- Meeting with invited selected individuals from the general public

Brief explanation.

SNRAS/AFES relies on stakeholder input from agricultural advisory groups, collaborators, federal and state agencies, colleagues, faculty and students for assistance in establishing priorities and developing program direction in consultation with appropriate constituencies. Major stakeholders include the Fairbanks North Star Borough, Matanuska-Susitna Borough, Alaska Northern Forest Cooperative, USDA/NRCS, USDA/ARS, US Forest Service, Fairbanks Economic Development Corporation, and industries involved in food, fiber, and fuel/energy production. Members from the public who have participated in or who have an interest in Extension's program offerings represent one segment of the organization's stakeholders. Stakeholders often identify themselves by e-mailing or calling Extension faculty or staff. Advisory groups lead us to stakeholders. Another significant stakeholder group is public and private agencies and organizations that have professional and programmatic relationships with Extension or direct interest in Extension programming. Some of Extension's major stakeholder organizations include, but are not limited to, the Alaska State Legislature, Farm Bureau, Grange, Reindeer Herders Association, Greenhouse Growers, Food Banks of Alaska, Department of Natural Resources (Alaska), Forest Service, Boys and Girls Clubs, school districts, electric cooperatives, the Alaska Municipal League, and research service units of the university.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities
- Other (Underserved populations identified)

Brief explanation.

SNRAS/AFES and CES joint research and outreach planned programs are directly related to the SNRAS/AFES and CES Strategic Plan produced by faculty. The Plan reflects ideas and advice given by client user groups, students, the board of advisors, expert advisors, state and national peers and cooperators, and UAF administration. During the 2011 reporting period, the four focus areas of energy, climate change, local and regional food production and food safety, and the need for adult and youth education and training to fill Alaskan job and career demands began to emerge. These focuses were used to set priorities in meeting the many needs for knowledge about Alaska and circumpolar resources and geography. Input was considered in the budget process. Capacity funds were used in response to research needs based on the four emerging focus areas.

Needs assessments helped Extension faculty identify emerging issues in five planned programs, generating plans based on logic models. The faculty used this information to generate their individual work plans. Based upon information generated by the needs assessments, future programming needs related to hiring have been affected. Stakeholder needs will continue to be a driving factor in determining Extension priorities and programming. Cooperative Extension is a grass roots-driven program. Agents use the stakeholder input to identify programming needs and work to offer programs and information that meet those needs. Stakeholder input in 2011 led to increased programming in rural energy options, energy-efficient home construction, climate change, health programming, food security and positive youth development.

Brief Explanation of what you learned from your Stakeholders

Alaskans desire information necessary to make decisions related to a healthy lifestyle and a healthy economy. Issues pertinent to subsistence and small agriculture carry particular impact for our stakeholders. Food security, energy, climate change, chronic health issues and youth development have risen to the forefront as areas of particular importance for our Alaskan stakeholders and are therefore leading to development of research and extension programming in those particular areas.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1119965	0	1244493	0

2. Totaled Actual dollars from Planned Programs Inputs				
Extension			Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	978531	0	1488424	0
Actual Matching	1131187	0	1922822	0
Actual All Other	6674134	0	1862854	0
Total Actual Expended	8783852	0	5274100	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover				
	596858	0	292987	0

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Agriculture and Horticulture
2	Natural Resources and Community Development
3	Sustainable Individuals, Families and Communities
4	Youth Development
5	Climate Change
6	Global Food Security and Hunger
7	Sustainable Energy
8	Childhood Obesity
9	Food Safety

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Agriculture and Horticulture

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%		10%	
205	Plant Management Systems	25%		50%	
213	Weeds Affecting Plants	15%		0%	
216	Integrated Pest Management Systems	33%		0%	
305	Animal Physiological Processes	2%		0%	
401	Structures, Facilities, and General Purpose Farm Supplies	5%		10%	
402	Engineering Systems and Equipment	0%		10%	
404	Instrumentation and Control Systems	0%		10%	
405	Drainage and Irrigation Systems and Facilities	5%		10%	
601	Economics of Agricultural Production and Farm Management	5%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	1.5	0.0
Actual Paid Professional	2.4	0.0	3.1	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
63605	0	244522	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
73332	0	425342	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
433819	0	486919	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research and outreach will be integrated to assure that best management practices appropriate and tailored to Alaska are provided to the target audiences. There will be new directions in energy crops, resilience and adaptability of crops and animals to changes in the subarctic and arctic climate, and revitalization in research and extension programs relevant to regional and local nonfood agricultural production. An emphasis will also be placed on educating and training youth and adults in new fields opening in the Alaska workforce and continuing education and training programs that emphasize current needs as an aging workforce retires. Group and one-on-one educational activities with specific sectors of the pest management industry, the agricultural community, and the horticultural industry will provide individuals and businesses with important information. Increased reliance on the Internet and distance technology will enhance delivery to more people. Increasing partnerships will become important strategies in maintaining pest species below threshold levels. Outreach will also include forums, tours, response to emails, phone calls and walk-in stakeholders.

2. Brief description of the target audience

Arborists, botanical garden volunteers, child care centers, farmers, garden and plant associations, public and commercial greenhouses, homeowner associations, landscapers, state and federal park employees, master gardeners, museums, military base personnel, boroughs and urban municipalities, pest control operators, property managers, public and private schools, recreational facilities, resorts and hotels, rural residents, youth groups, and school districts.

3. How was eXtension used?

Two agents and the range management researcher use eXtension. One uses the gardens, lawns and landscapes pages to find answers to horticulture questions and puts it on her handouts as a useful horticulture website. She also refers clients to the site. A second agent uses it on a daily basis for reference and to develop curricula. He uses the Land Grant University search engine feature. The range management researcher uses it in conjunction with the Rangelands West Partnership and Rangelands Community of Practice.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	7869	34660	2097	1824

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	1	4	5

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Output Target 1: Faculty will provide non-food agricultural and horticultural workshops, short courses, classes, field days, and conferences including IPM.

Year	Actual
2011	111

Output #2

Output Measure

- Output Target 2: Faculty will provide non-food agricultural, horticultural and pest management information through one-on-one consultations and consultations with other organizations (in contact hours).

Year	Actual
2011	1350

Output #3

Output Measure

- Output Target 3. Horticultural crop research will concentrate on home and commercial varieties

appropriate to Alaska. Publications are the output measures.

Year	Actual
2011	4

Output #4

Output Measure

- Output Target 4. Controlled environment horticulture will focus on controlled environment technology and technology transfer and appropriate non-food crops and best management practices for crop production in specific environments. Output measures will be publications.

Year	Actual
2011	4

Output #5

Output Measure

- Output Target 5. Turf research will continue including variety selection and expansion into multiple use. Output measure will be publications and public and commercial adoption of technology.

Year	Actual
2011	38

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Outcome Target 1: Increase non-food agricultural and horticultural producers' ability to understand and assess optimum production practices.
2	Outcome Target 2: Increase non-food livestock producers' ability to understand and assess optimum production practices.
3	Outcome Target 3: Increase the number of activities that monitor and control invasive species.

Outcome #1

1. Outcome Measures

Outcome Target 1: Increase non-food agricultural and horticultural producers' ability to understand and assess optimum production practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	59

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Growers in the agricultural nonfood sector produce bedding plants, flowers, landscape ornamentals, sports turf and forage. They face many of the same growing challenges as food producers, including a short growing season. Research and outreach education help growers meet challenges and support new markets.

What has been done

Greenhouse and Nursery conference participants received information about greenhouse heating and production, flower production and varieties, and production of *Rhodiola rosea*, a high-value medicinal plant. CES-hosted Alaska Peony Growers Conference provided information on AFES variety trials, growing strategies and other production information. Agents provided support to 15 new peony growers with site visits, soil analysis interpretation, weed management and grower consultations. Agent also worked with 25 potential rhodiola growers. CES/AFES provided a three-part series on forage management for three dozen hay growers and provided EQIP nutrient and pest management plans to 17 growers. Low maintenance and low input turf grasses for sport field application are being tested for durability and winter kill.

Results

Rhodiola grower meetings and conference presentations have contributed to modest beginnings of a new Alaska crop. Five acres are under cultivation and a growers' cooperative estimates that 100 acres will be under production in the next few years. As a direct result of AFES research and CES grower support, there are an estimated 50,000 peony roots in the ground and two dozen commercial growers. The peony growers association reports that in 2011, 10,000 cut stems worth \$40,000 were sold and shipped to 10 states, Canada and Japan. Peony production is estimated at between \$1 million and \$2 million by 2015. Peonies mature here from July-September, a time they are not available elsewhere in the world. All 38 growers in the first forage class said they

would change their growing practices, including soil sampling, using IPM practices for weed control and improving rates of fertilization. A soccer field at the Matanuska Experiment Farm is completed and athletic competitions will begin Fall 2012. Turf tested for Alaska conditions is now being used on runways.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
213	Weeds Affecting Plants
216	Integrated Pest Management Systems
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
404	Instrumentation and Control Systems
405	Drainage and Irrigation Systems and Facilities

Outcome #2

1. Outcome Measures

Outcome Target 2: Increase non-food livestock producers' ability to understand and assess optimum production practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Livestock growers raising animals for purposes other than food source animals face the same challenges as growers that produce livestock primarily for food. Research and outreach education help these growers provide quality animals for fiber, fur and recreation purposes.

What has been done

A presentation at the Sustainable Agriculture Conference addressed diseases of sheep and goats for fiber and stock selection. Animal science workshops provide valuable information on animal management including grazing management, genetic and animal breeding and reproductive biology of ruminant animals. The program goal is to facilitate the development of management

strategies to support sustainable, high-latitude livestock production.

Results

Workshops on animal nutrition, breeding and lactation were taught in five Alaska communities and the livestock specialist logged 180 hours consulting with livestock producers and organizations. CES and AFES organized the Sustainable Livestock Production Conference. Also served at this conference were nonfood/fiber animal producers such as yak, llamas, muskoxen and horses.

4. Associated Knowledge Areas

KA Code	Knowledge Area
305	Animal Physiological Processes

Outcome #3

1. Outcome Measures

Outcome Target 3: Increase the number of activities that monitor and control invasive species.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Alaska imports many horticultural and agricultural products, so it remains vulnerable to imported pests. Retail sales of plant and seed materials contaminated with a variety of pests continue to challenge the state. Invasive weed infestation can reduce land values and negatively impact recreation and tourism. Improving citizen, farmer and land manager ability to assess pest management practices is critical.

What has been done

Agents and IPM staff hosted 101 workshops and presentations and worked with producers and agencies to identify pests and reduce impacts. Two CES-hosted invasive species conferences bring together researchers, agencies and citizens statewide to discuss research and prevention efforts. Pest technicians trap for invasive species of concern, including the gypsy moth and

emerald ash borer. Gypsy moths are ranked in the top three insect threats to Alaska's forests. CES provides certification training for pesticide applicators and inspectors doing noxious weed-free forage and straw inspections.

Results

The weed-free forage program has been successful in allowing farmers the ability to produce and market (ideally at a premium price) weed-free forage and straw to in-state consumers therefore decreasing the spread of noxious/invasive weeds. This success is a result of the herbicide and crop management recommendations provided by AFES and Extension. In the past 10 years, three gypsy moths have been trapped in Alaska, but none in 2011. IPM placed approximately 316 moth traps in 14 census districts last year. Additionally, 64 traps for emerald ash borers were placed in trees in six census districts but none was detected.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
213	Weeds Affecting Plants
216	Integrated Pest Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

The high cost of petroleum products and fertilizers impacted the productivity and the economic viability of horticultural and agricultural operations in the state. The small number of agricultural staff working for Extension and the limited number of researchers involved in horticulture and agriculture in AFES, the geographic distances between communities and high transportation costs involved in traveling to communities off the road system all present challenges to providing a supporting role for horticultural and agricultural production in the state. The Fairbanks and Kenai area districts have been without a full-time agent for more than a year so programming has decreased in both areas.

The cool, rainy summer led to poor growing conditions, and smoky summers restricted photosynthesis.

Alaska is a state still in desperate need of basic research. At a time when food

security is a national priority and Alaska imports more than 90% of its food, it is hard to comprehend the decision to remove USDA's Agricultural Research Service entirely from the state. The decision to close 12 Agricultural Research Service stations was made at the highest levels by the Department of Agriculture and approved by Congress. USDA Agricultural Research service will close in Alaska Spring 2012. The loss of ARS will shut a door on a long history of research that won't be easily picked up by anyone else. From utilizing seafood waste to grasshoppers to controlling weeds and invasive plants, the work of ARS in Alaska is unmatched.

According to ARS spokeswoman Sandy Miller-Hays in Washington, DC, for every dollar spent on agricultural research the country sees a return on investment of \$10. UAF graduate students will feel the pinch, as many have worked their way through school interning and researching for ARS.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

CES used surveys after our major conferences and agents surveyed following individual classes. Several agents conducted surveys to learn what had been learned from previous presentations. We are learning through surveys what areas interest clients for future programming. Comments on the 2011 Sustainable Agriculture Conference evaluation led to programming for the 2012 conference, including sessions on farm business planning, the history of plant varieties developed in Alaska and commercial kitchens. Evaluation of forage workshop showed an intent by the participants to change their practices.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Natural Resources and Community Development

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
111	Conservation and Efficient Use of Water	10%		0%	
112	Watershed Protection and Management	20%		0%	
122	Management and Control of Forest and Range Fires	10%		0%	
123	Management and Sustainability of Forest Resources	10%		10%	
131	Alternative Uses of Land	10%		0%	
134	Outdoor Recreation	5%		20%	
403	Waste Disposal, Recycling, and Reuse	0%		10%	
605	Natural Resource and Environmental Economics	15%		20%	
608	Community Resource Planning and Development	15%		10%	
610	Domestic Policy Analysis	5%		20%	
805	Community Institutions, Health, and Social Services	0%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	6.2	0.0
Actual Paid Professional	5.4	0.0	1.9	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
140908	0	182020	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
162459	0	125674	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
961075	0	88457	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research products will provide science-based information in resource planning, economic and environmental impact of natural resource use, market and non-market value of resources, and conflict resolution in rural communities and villages along with basic information in climate change issues, food security, agriculture and horticulture, forest sciences, and soil sciences for use by planners, economists, and policy makers. Measurable outcomes will include peer-reviewed publications, lay publications, rural community business/development plans, and citizen participation. Extension activities involve partners from other UAF units as well as AFES to assure that there is a feedback loop that will continue to make the information provided to stakeholders relevant to their needs. These activities will develop integrated and/or multistate projects concerning natural resources stewardship within the University of Alaska Fairbanks and with other land-grant institutions; develop criteria to broadly define the temporal natural resource interests of stakeholders so the program's activities address the needs of those Alaskans most directly impacted by specific natural resource matters; develop partnerships with government agencies to identify and address stakeholder needs; regularly assess stakeholder needs and emerging natural resources issues impacting stakeholders; conduct literature reviews and review contemporary research relevant to this program; develop culturally and educationally relevant publications (including fact sheets, bulletins, and newsletters) that provide unbiased, scientific information about natural resource issues; develop, review, and revise a website to be the electronic portal for UAF CES information on natural resources stewardship matters of concern to stakeholders; develop, plan, deliver, evaluate and revise as needed workshops, demonstrations and basic skill trainings; facilitate discussions and other meetings that address stakeholder needs in or near their communities; develop, conduct and review 4-H and FFA projects related to the natural resource stewardship program; develop, plan, conduct, evaluate and revise as needed young adult stakeholder workforce readiness trainings that prepare youth for entry-level positions in natural resource management positions; develop, deliver, facilitate and evaluate natural resource stewardship informational discussions with urban populations to increase their awareness of natural resource issues and the values and needs of stakeholders relative to natural resources; coordinate and assist the UAF School of Natural Resources and Agricultural Sciences and other units of the University of Alaska in recruiting and graduating young Alaskans with endorsements, certificates and degrees that result in careers in managing, using and protecting natural resources.

Product development activities includes:

- Providing standards for Alaska woods.
- Developing non-timber forest products with business entrepreneurs.
- Investigating the fuel potential of Alaska's forests.
- Investigating recreation opportunities and impacts in Alaska's ecosystems.

2. Brief description of the target audience

This program will focus on industry and entrepreneurs including communities, families, and newly forming cooperatives and businesses, nonprofit and for-profit development corporations. Efforts will be made to address problems of the traditionally underserved rural populations within the limit of resources available. Stakeholders are those directly impacted by contemporary natural resource issues related to forest and land resources, mining resources, and water resources, young adults wanting entry level skills needed for employment in natural resource related businesses, agencies or organizations, and persons in natural resource related occupations who wish to increase their skill and/or knowledge level, federal and state agencies.

3. How was eXtension used?

Water quality expert has chaired the national Drinking Water and Human Health eXtension Community of Practice, which is developing content. Another agent uses eXtension to reply to Ask an Expert questions forwarded to him and to interact with communities of practice. His most recent use of eXtension is the search function which leads to Extension publications from around the country on various topics. "That is a tremendous resource," he says.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	6126	0	797	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	12	12

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Output Target 1: Active partnerships with other land grant institutions, government agencies, stakeholder groups and organizations.

Year	Actual
2011	62

Output #2

Output Measure

- Output Target 2: Develop and deliver public issues education workshops and classes for stakeholders on locally relevant natural resources and related issues.

Year	Actual
2011	35

Output #3

Output Measure

- Output Target 3: Develop and maintain a web-based platform for discourse and information sharing on relevant areas of interest in natural resource issues that connect people to information.

Year	Actual
2011	23

Output #4

Output Measure

- Output Target 4: Conduct needs assessments of natural resource management stakeholders.

Year	Actual
2011	11

Output #5

Output Measure

- Output Target 5. Regional economic models Alaska resource management scenarios. Output will be electronic and written publications.

Year	Actual
2011	3

Output #6

Output Measure

- Output Target 6. Develop and implement public involvement in natural resource issues. Output

measure will be public input sessions and publications.

Year	Actual
2011	17

Output #7

Output Measure

- Output Target 7. Provide analyses of natural resource and environmental laws. Output measure will be publications.
Not reporting on this Output for this Annual Report

Output #8

Output Measure

- Output Target #8: Students choosing natural resource careers. Output measure will be M.S. or Ph.D. students graduated.

Year	Actual
2011	5

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Outcome Target 1: Increase and maintain partnerships with stakeholder groups, government agencies, and other institutions that will enhance the land grant mission.
2	Outcome Target 2: Increase the number of integrated and multi-state research-extension activities.
3	Outcome Target 3: Increase the recruitment and retention of youth appreciating and considering natural resource management careers.
4	Outcome Target 4: Increase public involvement in natural resource and community development issues. Outcome measure will be the increase in number of communities.
5	Outcome Target 5: Increase community development and economic diversification through tourism. Outcome measure will be number of tourism opportunities and communities impacted.
6	Outcome Measure #6: University knowledge is strengthened through international partnerships.
7	Outcome Measure#7: Increase collaborations between K-12 teachers, students and university educators through outreach.
8	Outcome #8: Improve natural resource management of outdoor recreation. Measurement is publications.

Outcome #1

1. Outcome Measures

Outcome Target 1: Increase and maintain partnerships with stakeholder groups, government agencies, and other institutions that will enhance the land grant mission.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	62

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Of the 375 million acres of land in Alaska, 44 million are Native lands, 3.2 million are state parks, and federal land totals 54 million acres. Sixty-five percent of Alaska is federally managed. AFES seeks to provide research that meets the needs of the private, state and federal stakeholders and with CES assures that stakeholders are engaged with UAF in the application of that research. Partnerships are critical to assuring this happens. Our partners work with us, often assisting in the research and outreach efforts.

What has been done

Collaborations have begun with USDA Forest Service to conduct a survey of all businesses related to forest products in Alaska which will result in a Forest Products Directory. A website was developed for the Alaska Public Lands Information Center that provides information on public lands in Alaska. CES coordinated the Alaska Energy Authority's Wood Energy Task Group. CES and Marine Advisory Program agents presented GPS/GIS training in Southwest Alaska village. Alaska Forum on the Environment included wood energy and conservation displays and a panel discussion on the National Environmental Protection Act.

Results

Partnerships this year also include the US Army Corps of Engineers, Fairbanks North Star Borough, Chena Flats Greenbelt, Natural Resource Conservation Service, US Forest Service Forest Health Division, Tanana Watershed Association, Kenai Watershed Association, US Environmental Protection Agency, US Dept of Housing & Urban Development-Office of Sustainable Housing & Communities, International City Managers Association, National Association of Counties, American Planning Association, University of Idaho- Inland Empire, University of Washington- CINTRAFOR, University of Minnesota Duluth NRR, Missouri Botanical Garden, and Korea Softwood Export Council. The Alaska Public Lands website educates visitors

and allows them to plan activities in Alaska's public lands. The user friendly website will provide information that visitors can access increasing safety & enjoyment of Alaska's public lands. CES/MAP training helped participant's document archeological sites, the river channel and erosion. Sea Grant's Alaska Center for Ocean Science Education Excellence (COSEE) supported CES salmon and science literacy training to 18 educators. More than 1,300 people attended the Alaska Forum on the Environment and many viewed CES displays on efficient use of wood heat and biomass, water quality and a panel discussion about resource development and the National Environmental Protection Act. A cooperative development workshop grew out of partnership with UA Center for Economic Development.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
134	Outdoor Recreation
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development
610	Domestic Policy Analysis

Outcome #2

1. Outcome Measures

Outcome Target 2: Increase the number of integrated and multi-state research-extension activities.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Alaska's geographic isolation and the expense of traveling elsewhere present challenges to maintaining multistate relationships. At the same time, many issues, particularly natural resource, energy and climate change, have implications that extend well beyond our borders. Tapping into

other state's experiences and research will strengthen our ability to assist Alaskans. Integrated activity between researchers and extension personnel provides the best possible information for stakeholders in the unique environments of our state.

What has been done

Research participation continues in the multistate project NE1037 Wood Utilization Research: Biofuels, Bioproducts, Hybrid Biomaterials Composites Production, and Traditional Forest Products. AFES/CES work is ongoing to extend Alaska's forestry markets, and provide wood energy and forest education outreach. Forest specialist participated in the Consortium for Renewable Energy in the West meeting to discuss research/Extension collaboration. Research participation continues in NECC1011 Balancing Natural Resource Recreation Management, Human Well-Being, and Community Resilience. CES water quality coordinator chaired the National Drinking Water and Human Health eXtension Community of Practice and participated in regional water quality group.

Results

Forestry researcher agent became more aware of research/Extension opportunities in the region as a result of the CREW meeting. CES assisted WSU and Oregon State as part of a forestry climate change stakeholder assessment. The published needs assessment in 2011 provided direction for Extension programming directed toward private landowners. Water quality coordination work shares work and information among participating Western states and the public.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
122	Management and Control of Forest and Range Fires
123	Management and Sustainability of Forest Resources
134	Outdoor Recreation

Outcome #3

1. Outcome Measures

Outcome Target 3: Increase the recruitment and retention of youth appreciating and considering natural resource management careers.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	26

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

As professionals retire, employers are concerned about the quality of new employees. SNRAS provides graduate and undergraduate degrees in Natural Resources Management including a Ph.D. in Natural Resources and Sustainability and a professional Masters in Natural Resource Management and in Geography to educate future resource managers and policy makers. Faculty member appointments require teaching, research and community service commitments. Youth who are introduced to natural resource issues through an organization or agency in their community are more likely to consider natural resource careers. Agencies offer internships or other opportunities to engage youth successfully and find youth can be real assets and problem solvers.

What has been done

SNRAS recruits new students, connects them with faculty advisors and broadens the reach of the university in Alaska communities. Internships provide students with hands-on experience and contact with federal and state agencies. The NRM 290 field trip has been instrumental in introducing and interesting students in resource management careers. A 4-H youth trip went to Mongolia with an environmental focus offered through University of Wyoming.

Results

Faculty served as the university FFA advisor, Ag in the Classroom participant, and science fair judges. Youth can gain information on natural resource careers through the SNRAS blog, newspaper articles, pamphlets, brochures and campus activities. Forums highlight existing internships or study opportunities or other programs that foster youth leadership. Youth and young adult participants interacted with potential mentors and learned about resources and individual agencies. Representatives of a variety of agencies gained an understanding of the value of involving youth and suggestions on how to build a successful youth-adult partnership. Participants in the 4-H/BLM Science Saturday events in Anchorage do hands-on science and learn about natural science careers. Twenty-six undergraduates received diplomas with resource type degrees from SNRAS.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
134	Outdoor Recreation
608	Community Resource Planning and Development

Outcome #4

1. Outcome Measures

Outcome Target 4. Increase public involvement in natural resource and community development issues. Outcome measure will be the increase in number of communities.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Community decision makers and the citizenry need research and outreach that provides guidance for development. In a state where community needs have to balance city, borough, state and federal concerns, it is helpful to have resources to assist in possibly divisive issues.

What has been done

A research study is underway to determine which types of wetlands are used by 15 boreal wetland birds of concern in Interior Alaska. These are species that are low in number and/or depend entirely on these habitats for survival. A research project determined the ecological effects of discharging seafood processing wastes in two locations along Alaska's coast.

Results

The Fairbanks Borough Planning Department, the Fish and Wildlife Service, and the Corps of Engineers are using the Wetland Bird Study to determine which wetlands can be developed and which should remain pristine. Local land trusts are also using the results to set priorities for land acquisition. The EPA will use the study on seafood processing waste to establish new discharge requirements for seafood processing plants.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development
610	Domestic Policy Analysis

Outcome #5

1. Outcome Measures

Outcome Target 5: Increase community development and economic diversification through tourism. Outcome measure will be number of tourism opportunities and communities impacted.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Alaska's diverse communities, urban and rural, are seeking ways to broaden their economic base. The natural beauty of Alaska, its diverse cultural groups and its rich history contribute to the future growth of Alaska's visitor industry. Tourism can have significant impacts on community life and culture, particularly in small communities.

What has been done

CES program staff and agent worked with a Prince of Wales Island visitors committee and assisted with hosting and moderating a tourism summit in 2011. Program staff primarily organized the first summit, in 2009. CES worked with four communities, along with underserved populations to develop strategies to promote business/trade and cultural exchanges between Alaska and Pacific Rim peoples and to recognize cultural properties.

Results

A past tourism summit succeeded in attracting two small cruise lines to the Prince of Wales Island. One cruise line began once-a-week stops in Klawock and at El Capitan in 2011, and the second cruise line plans to make stops in three more communities in 2012. The cruise line additions, along with indirect economic benefits to the community, provided for five guiding jobs in Klawock and El Capitan Cave. One unexpected result of the Japanese cultural efforts was to assist in the organization formation and activities of the Japan Relief Fund of Alaska Foundation in response to the 2011 Japan Earth/Tsunami Disaster.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #6

1. Outcome Measures

Outcome Measure #6: University knowledge is strengthened through international partnerships.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

International collaborations enrich the university experience for faculty and students providing opportunities for shared learning.

What has been done

Our Fulbright Scholar, now in Namibia, is building on a partnership with Ghana concerning water wells and the effect on community life. The goal in Namibia was to determine if there are factors that may predict the financial success of conservancies.

Results

The Ghana Water Project is of interest to people around the world who are working to provide safe drinking water as well as those interested in improving the lot of the world's poorest women and children. The impact of water projects in Ghana is already helping NGOs design better water projects that benefit the lives of the poorest people. The wildlife conservancies of Namibia have been called one of the most significant innovations in conservation in the last 100 years. They enable indigenous people to benefit from the dangerous wildlife populations they live with on a daily basis. This study will help those in other countries to implement similar programs by knowing what factors are most likely to make them successful.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
610	Domestic Policy Analysis
805	Community Institutions, Health, and Social Services

Outcome #7

1. Outcome Measures

Outcome Measure#7: Increase collaborations between K-12 teachers, students and university educators through outreach.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In a natural resource-rich state it is important to familiarize students and educators about environmental issues.

What has been done

OneTree and Project Learning Tree presentations use the Alaska boreal forest as the basis for learning. Teens are reached through OneTree experiences with science and art education; summer employment in gardening; and university tours of gardens, greenhouses, and reindeer corrals. A series of newspaper articles and TV and radio news articles/interviews featuring OneTree were generated during the program's active two-year period. This work, spearheaded by SNRAS' public relations officer is responsible for how well known the project became throughout the community. Extension hosted a classroom salmon incubation project inservice for 18 rural teachers that provided science curriculum and training to run the classroom project.

Results

OneTree Project impacts were produced by consistent, relationship building with individual K-12 teachers. These individuals, each a stellar educator, spread the word so that the project has grown each year. The upper 40 feet or more of each stem, plus smaller limbs and canopy from trees harvested for birch study was used for the OneTree project. All materials were archived to establish chain of custody back to the original tree. There are now 20 schools, 35 teachers and over 900 students involved in OneTree projects. Another significant output was created by three public OneTree science/art exhibits, at which over 750 project brochures were distributed. An estimated 1600 people viewed the work of over 20 local artists, 22 teachers from 11 schools and 600 students. Project Learning Tree teacher education resulted in classroom presentations. Thirty-five to 40 schools participate annually in the classroom salmon incubation program, which provides a culturally relevant science curriculum to more than 1,200 students. Faculty act as

science fair judges and teach Ag in the Classroom sessions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
122	Management and Control of Forest and Range Fires
123	Management and Sustainability of Forest Resources
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

Outcome #8

1. Outcome Measures

Outcome #8: Improve natural resource management of outdoor recreation. Measurement is publications.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Research exploring the link between recreation and human well-being has resulted in many advances in recreation management. While our understanding of this has evolved substantially in recent years and management frameworks such as OFM can guide agencies in managing for human well-being, there is still a need to refine our understanding of the relationship between recreation and human well-being and for region-specific studies regarding the benefits of recreation to guide management efforts.

What has been done

This graduate student project, in collaboration with BLM and the US Forest Service, analyzed open-ended data from the Alaska Residents Statistics Program (ARSP) and the longitudinal approach to understanding how recreation contributes to human well-being and resilience. The study team created 25 metacodes from the initial codes and grouped several of the metacodes

together, resulting in 12 broad themes. The frequencies of the broad themes were compared across the five regions of Alaska included in the study and respondents' length of residency in Alaska, education level, and population of area of previous residence.

Results

Analysis has revealed that education is a much stronger predictor of natural resource management perspectives than length of residency. With regard to the longitudinal approach to understanding how recreation contributes to human well-being and resilience, a change in knowledge has occurred.

4. Associated Knowledge Areas

KA Code	Knowledge Area
134	Outdoor Recreation

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

The high cost of petroleum products continues to impact the productivity and the economic viability in the state.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluations followed a renewable energy fair in Anchorage. Twenty-three people at the renewable energy fair responded to an evaluation of a display about energy conservation and use of renewable energy.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Sustainable Individuals, Families and Communities

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
502	New and Improved Food Products	5%		0%	
504	Home and Commercial Food Service	20%		0%	
703	Nutrition Education and Behavior	15%		0%	
724	Healthy Lifestyle	20%		0%	
801	Individual and Family Resource Management	10%		0%	
802	Human Development and Family Well-Being	15%		0%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	10%		0%	
805	Community Institutions, Health, and Social Services	5%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	6.5	0.0	0.0	0.0
Actual Paid Professional	5.3	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
137973	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
159074	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
941053	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Field faculty will conduct workshops and meetings, deliver educational services, provide training, and conduct consultations with clientele. Researchers will develop products, curricula and resources, provide training and conduct consultations with clientele.

Educators and researchers will conduct needs assessments, work with the media, partner with other agencies and organizations, write articles, publications and fact sheets, and facilitate events, activities and teachable moments.

2. Brief description of the target audience

The Sustainable Individuals, Families and Communities programming involves parents, caregivers of children, school children (public and private), school teachers (public and private), home and building owners, individuals interested in healthy lifestyles, individuals and families needing assistance managing their finances, low- income individuals and families, especially women with young children, individuals interested in a subsistence lifestyle, individuals and professionals interested in emergency preparedness, and human development and social work professionals.

Institutional cooperation will include food banks, housing and energy authorities and organizations, and individuals or families experiencing life transitions.

3. How was eXtension used?

Our agents use eXtension as an occasional additional resource to answer questions and to develop curriculum in this area. One agent used eXtension "Just in Time" parenting information for daycare classes. Our overall Facebook page links to blog posts and articles posted on eXtension, including one on the Extension Disaster Education Network about tornados. eXtension is linked from our home page for the public as a resource.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	4031	794181	475	41799

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	1	0	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Output Target 1: Extension faculty will offer workshops in a wide range of home economics and family and consumer science topics.

Year	Actual
2011	92

Output #2

Output Measure

- Output Target 2: Extension district offices will updated emergency planning for internal operations and constituent communities.

Year	Actual
2011	6

Output #3

Output Measure

- Output Target 3: Home energy extension workshops and conferences will provide individuals and families with immediate and long-term actions they can implement for energy conservation.

Year	Actual
2011	20

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Outcome Target 1: Participants in healthy lifestyle classes and workshops will adopt knowledge gained to maintain healthy lifestyle practices one year after participation.
2	Outcome Target 2: Participants will use knowledge gained in parent education classes to increase their application of developmentally appropriate practices.
3	Outcome Target 3: Awareness gained in workshops and will result in active energy conservation efforts by 20% each year over 2007 levels.
4	Outcome Target 4: Energy efficiency awareness will result in an increase in collaborations for energy conservation by 25% per year over five years.

Outcome #1

1. Outcome Measures

Outcome Target 1: Participants in healthy lifestyle classes and workshops will adopt knowledge gained to maintain healthy lifestyle practices one year after participation.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	384

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Alaska faces the challenge of our senior population remaining active and healthy in a difficult environment. Alaska, per capita, has the fastest-growing population of seniors in the nation. All of Alaska is considered medically underserved and costs to individuals for medical care are higher than the national average. It is imperative for Alaskans to focus on prevention and health self-management strategies to maintain health and independence throughout life.

What has been done

Since 2005, an agent has trained 171 StrongWomen instructors. During the past year, 26 new instructors were trained. Three agents led StrongWomen classes or hosted groups and another agent led a class that combines nutrition and healthy lifestyle information. Our Anchorage agent trained 32 new instructors of Living Well Alaska, which teaches individuals how to manage chronic health conditions. Two agents also taught StrongWomen Healthy Hearts, a 12-week program that combines aerobic exercise, cooking activities and nutrition education.

Results

Most StrongWomen participants report feeling stronger and lead more active lives. Many who participated for a year or more reported increased bone density and better balance. Sponsoring volunteer peer StrongWoman leader courses has helped establish many community programs. According to a recent survey, 300 participants attended 21 StrongWomen community sites and 303 participants continued a year or longer. Since 2007, 250 Living Well leaders have been trained, reaching more than 2,000 seniors and others with chronic health conditions. Participants nationally report fewer medical office visits and reduced hospital stays. Long-term follow-up in Alaska has not been done; however, post-workshop surveys indicate similar benefits. Participants in the Healthy Hearts program in one community lost an average of 4.5 pounds during the 12-week session. Participants in both communities reported that they were eating better. We do not

have one-year information yet on this program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle
802	Human Development and Family Well-Being

Outcome #2

1. Outcome Measures

Outcome Target 2: Participants will use knowledge gained in parent education classes to increase their application of developmentally appropriate practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	99

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Opportunities for parent education and training for child-care providers are lacking in many communities, particularly in rural Alaska, where many communities are accessible only by air. Transportation costs to deliver programs also limit what is offered. Statistics on child obesity and youth suicide suggest the need for enhanced early interventions through supportive family and youth education.

What has been done

Our Nome agent encouraged a Kotzebue day care center to adopt a staff training plan. She provided training on brain research and on language and literacy development and the next day participants developed a training plan. On another visit, she taught discipline for toddlers and twos and pretend play. The Nome agent also offered a class on making baby food. The Palmer agent offered classes on infant development and play to a dozen Wasilla child-care providers. Also, Anchorage and Kenai personnel provided training to parents and child-care providers on a physical education and nutrition program.

Results

Evaluations conducted with 10 out of the 11 participants in the Kotzebue day-care training showed nine participants had improved understanding of topics covered. All participants used what they learned in the class to put together activities to increase childrens language skills. They planned to use these activities in the classroom in the weeks following the training. Seven participants in the baby food class practiced making baby foods that they brought home, so they learned a new skill. Pre- and post-tests of the Palmer infant development class showed an increase in knowledge and participants planned to respond gently and quickly when needed and to talk to and hold babies frequently.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
802	Human Development and Family Well-Being

Outcome #3

1. Outcome Measures

Outcome Target 3: Awareness gained in workshops and will result in active energy conservation efforts by 20% each year over 2007 levels.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	566

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Alaska historically has had some of the highest energy prices. Interest in energy conservation remains high. It is a pocketbook issue, particularly in rural areas, where energy costs are the highest and heating oil can run upwards of \$7 or \$8 a gallon. Fuel oil and gasoline prices climbed all year. State programs and our education work are focused on these continuing burdens and using building science and outreach to help people cope with them.

What has been done

Sustainability coordinator has promoted energy conservation through a newsletter aimed at home builders that is e-mailed quarterly to about 500 people. The agent also taught 15 solar design, housing retrofit and cold climate home-building classes and gave three related lectures to 566

residents in seven communities. The agent recorded his cold climate course, which has been produced and edited to make it available on the web. The agent trained in a Swedish sustainability initiative.

Results

The solar design class this year was expanded and improved this year and taught in four communities to large attendance, using the fourth edition of A Solar Design Manual for Alaska. This was the most sought-after class and led to new collaborations with builders and homeowners in educational efforts and public lectures. A Fairbanks lecture with sustainability agent and a local builder interested in working toward home energy efficiency drew 120 participants. The agent is using information and resources from the sustainability initiative to improve workshop content.

4. Associated Knowledge Areas

KA Code	Knowledge Area
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

Outcome #4

1. Outcome Measures

Outcome Target 4: Energy efficiency awareness will result in an increase in collaborations for energy conservation by 25% per year over five years.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	8

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

New collaborations with organizations that can help spread knowledge about energy conservation and sustainability will help improve the energy security of Alaska.

What has been done

The sustainability coordinator was asked to give the keynote address to a Manitoba Native housing corporation conference. As a result of a another new collaboration, the sustainability coordinator delivered a seminar in Homer and visited three high school classes in Homer in

January, with three collaborators. Bethel has some of the highest electricity and heating oil costs in the state and the agent there has established an energy advisory committee to help him determine the direction of energy programming Extension provides. He also chairs the City of Bethel Energy Committee.

Results

The Manitoba housing corporation, which serves all of Manitoba First Nations, decided to use CES Alaska Residential Housing Manual for its housing education efforts. As a result of the Homer collaboration, the agent has been invited back to deliver programs to the area. As a result of a collaboration with an Interior weatherizing service, the agent, for the first time, offered an intensive week-long training involving his three energy courses to 38 attendees, a successful new outreach. The Bethel agent developed a home energy audit publication with input from his energy advisory committee. The publication was published in the 2012 federal year.

4. Associated Knowledge Areas

KA Code	Knowledge Area
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

The Home, Health and Family Development Program staff in Alaska is small with five agents in district offices and a specialist at the state office. This translates into agents covering large geographic areas. The Tanana District in the Interior includes an area the size of the state of Montana with one agent on staff to cover the entire area. Travel dollars are an issue because air travel is necessary for most agents to travel beyond their district office. Though agents have been successful in partnering with other governmental and private entities to make each travel dollar go farther, they are still unable to travel as often as requested. Staff vacancies have been an issue. The position in Juneau has been vacant for nearly two years. The energy specialist position was empty for FY11 but the former agent has been filling in while balancing another Extension job as sustainability coordinator. Staff vacancies have also been a factor in the Alaska Nutrition Education Program (formerly FSNE). We have had difficulties in replacing nutrition aides that were willing to work 20 hours a week at the pay rate. Even when we have been successful in rehiring, the time for recruiting and filling positions has left positions open in Alaska Nutrition Education Program (ANEP) and EFNEP and has pulled HHFD agents away from their normal duties to complete the process. We have been able to fill some of the positions this past year. In September of 2011, we had five of six ANEP nutrition aide positions filled. The

State Housing Finance Corporation cut funds in 2010 for delivery of the building science newsletter, so it now reaches only one quarter of the subscribers that received it in the past.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

We have made strides this year to evaluate our programs better. Agents have done a better job of doing pre- and post-tests and evaluations following classes. As new programs are created, evaluations for outcomes are planned with the program. Evaluations with a StrongWomen Healthy Hearts program were part of a research project so follow-up evaluations were built into the program. Through surveys completed by 13 out of the 15 Healthy Hearts participants in Nome, we found various improvements in lifestyle. Eleven of the participants reported that they have become more active and 13 reported that they are eating more healthfully. Not all of the participants qualified to be part of the study. The data for the 10 women who did qualify showed that they lost an average of 1 pound over the 12 weeks, with the greatest weight loss being 7.5 pounds. During the 4 months after the program, one participant lost 30 pounds and said it was due to all she had learned in the class. She said she just needed to get serious about recording what she eats and regular exercise. An agent is trying to assess the long-term impact of a physical activity and nutrition program, with evaluations of two classes done a year later.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Youth Development

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
607	Consumer Economics	5%		0%	
801	Individual and Family Resource Management	5%		0%	
806	Youth Development	90%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	8.5	0.0	0.0	0.0
Actual Paid Professional	9.0	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
235826	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
274893	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1608466	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

With the use of a 4-H Volunteer Leaders Training Manual, CDs and accompanying web-based tutorials that incorporate Essential Elements training, various methods of delivery will be developed including district workshops, the development of digital learning platforms, teleconference trainings, highlights for newsletters and web-based tutorials. In addition to redefining the Alaska State 4-H Leaders Training Manual, portions of 4-H 101 will also be added to the training.

Many youth enter the workforce without the key skills needed to succeed in the workplace. By creating collaborations with local district schools, area businesses, federal, state and tribal agencies and other civic organizations, training programs will be made available for youth and opportunities for employment can be achieved.

Ideals of entrepreneurship will be presented at the 4-H club level by conducting trainings with local volunteer leaders, junior leaders, and youth of the 4-H clubs. District agents will assist in promoting the ideals of youth-based enterprises through additional leader and junior leader trainings, providing entrepreneurial opportunities, and collaboration with organizations that can aid such opportunities.

Collaborations with local schools and other youth programs across the state will lead to new volunteer opportunities for 11-18 year olds. Though there are many opportunities for youth of this age, a key to success in this program will be through developing collaborations with local schools, other youth programs, and area University of Alaska campuses.

2. Brief description of the target audience

Grades k-12

Parents of school-age children

Adults interested in positive youth development

4-H Extension educators

Other Extension educators

4-H Adult volunteers

Military youth educators

Community leaders

Federal and state agency representatives

Native corporations and tribal representatives

Youth-serving organizations, including FFA

3. How was eXtension used?

Few agents use eXtension in this area. One said she used it to browse for horse-related topics.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	7571	118826	19620	50925

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Output Target 1: 4-H educators will train volunteer organizational leaders in the Essential Elements of Youth Development

Year	Actual
2011	186

Output #2

Output Measure

- Output Target 2: Extension will offer relevant workforce skill development projects for youth 15-18.

Year	Actual
2011	17

Output #3

Output Measure

- Output Target 3: 4-H will offer opportunities for membership or involvement for underserved and minority youth.

Year	Actual
2011	23

Output #4

Output Measure

- Output Target 4: Youth Development will offer initiative programming in science, engineering and technology.

Year	Actual
2011	17

Output #5

Output Measure

- Output Target 5: 4-H educators will offer inter and intra-district educational and service collaborations.

Year	Actual
2011	11

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Outcome Target 1: 100% of faculty and staff associated within the program area will understand the Essential Elements of Youth Development
2	Outcome Target 2: After receiving training in the Essential Elements of Youth Development, volunteer leaders and youth will apply at least two of the Essential Elements in their interactions during programming.
3	Outcome Target 3: 4-H educators will expand programming to underserved and minority youth by 5% in each year of the five-year plan of work.

Outcome #1

1. Outcome Measures

Outcome Target 1: 100% of faculty and staff associated within the program area will understand the Essential Elements of Youth Development

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	11

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Positive youth development through 4-H is made possible through a strong cadre of caring adult leaders. Creating supportive environments in which youth have a sense of belonging, experience independence, master skills, and give back to others and the community through generosity becomes more complex each year with changing environments and demographics. It is essential that faculty and staff increase their knowledge and understanding of positive youth development and the Essential Elements of 4-H in order to deliver quality programs and train volunteer leaders.

What has been done

All Alaska 4-H agents and others with 4-H responsibilities have been trained in Essential Elements. The Alaska 4-H program uses four primary delivery modes in fostering positive youth development: clubs, special interest classes, school enrichment and camping. All are designed using the Essential Elements. Agents and leaders participate in district trainings that emphasize delivery of the subject matter within the context of the Essential Elements. A biennial state volunteer leader forum and audio conferences on various issues include Essential Elements.

Results

All of the 4-H staff in the Alaska program trained and presented information to their constituents about the Essential Elements of 4-H. Training has been given in these areas and they are part of everyday 4-H language. All 4-H activities are grounded in the Essential Elements. As a result of her commitment to 4-H within its framework of the Essential Elements, a Tanana District club leader received the National 4-H Salute to Excellence Award in October 2010, the second Alaska leader in two years to be recognized with this award. She has made a difference in the lives of youth in her community and has been recognized among her peers and Extension staff across the nation for her leadership. A retired, longtime 4-H agent from Juneau also was inducted into

the 4-H Hall of Fame.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2

1. Outcome Measures

Outcome Target 2: After receiving training in the Essential Elements of Youth Development, volunteer leaders and youth will apply at least two of the Essential Elements in their interactions during programming.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	212

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Applying the Essential Elements in program development and delivery is what makes 4-H unique from other youth programs. These four elements define volunteer roles in the lives of 4-H members as mentors, role models and coaches.

What has been done

Leaders are asked to provide information on events throughout the 4-H year for their clubs and also to show how activities will incorporate at least two Essential Elements. Evaluation tools have been used at the beginning and end of a project to see whether projects incorporate Essential Elements. A step in the club chartering form includes the identification of Essential Elements in club activity planning, making it an intentional step in the planning of club activities. This process is being done all across the state as well as on military installations.

Results

We know youth are benefiting from the intentional application of the Essential Elements. Examples abound. A participant in the legislative program to Juneau (Youth in Governance) has decided to study political science in college. Another 4-H alum writes how her public speaking

experience and livestock marketing has helped her with her post-college career. An Anchorage 4-H member has seen her participation grow from being in a horse club to attending the Youth in Governance program two years, hosting a Japanese LABO youth, working as a camp counselor and being one of two Alaska youth accepted for a Mongolian exchange. Overall, more than 1,400 adult volunteers in 2011 helped provide a positive relationship with a caring adult and opportunities for engagement of all kinds, from gardening to science programming. 4-H also reported more than 500 youth volunteers. Partnerships and trained adult volunteers are offering shooting sports, sport fishing and outdoor skills for youth and their families.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

Outcome Target 3: 4-H educators will expand programming to underserved and minority youth by 5% in each year of the five-year plan of work.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	22

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In many rural communities, activities for youth are limited. Special opportunities are also needed for minority youth. Many schools, urban and rural, are ethnically diverse. Fifty-two percent of the Anchorage School District students are minorities, including Asian and Pacific Rim populations. In order to keep the program viable and current, 4-H must reach out to these populations.

What has been done

Agents are making connections in rural Interior and Southeast communities and developed mentoring programs in two Interior villages.

Also, an in-service training co-hosted by Extension trained 22 rural teachers on a classroom salmon incubation project. 4-H and the City of Bethel operate a youth center, which offers a variety of hands-on opportunities. A 4-H agent instructed teachers in low-income Anchorage

schools how to use 4-H curriculum for cooking and theater arts.

Results

4-H agents have built relationships with adults in rural Alaska that has led to more programming for youth. One-fifth of 4-H participants lived in remote, rural Alaska, and more than 20 percent were Alaska Native or American Indian, an increase of 4 percent over the 2010 year.

The salmon incubation project shows teachers how to raise salmon in their classrooms and improve math and science literacy with culturally relevant lessons. The result is relevant education that incorporates real world research. More than 35 schools and 1,200 students participate in the program annually. Youth attending the Bethel 4-H Youth Center program have a safe haven, something to eat and drink, and caring youth and adults interact with them. In all, 1,700 students in low-income 21st Century Learning Center schools in Anchorage were reached with 4-H curriculum.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Outreach activities)

Brief Explanation

Vast geographic distances between communities and communities that are available only by air or boat are a challenge for program delivery and development and maintenance of relationships between club leaders and 4-H staff. It also presents challenges for groups of 4-H youth from different communities getting together. Travel time is a factor in being able to meet face to face also. Many communities lack resources and capacity for youth opportunities. At the same time, we see increasing need for out-of-school time activities, especially for teens. Many areas of the state lack sufficient job opportunities for youth to demonstrate job readiness skills. Internet resources for the training of leaders and links to curriculum available through other states have improved training, as has audioconferencing.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

In response to an identified need to collect and analyze data more effectively to package program outcomes for stakeholders, we have purchased an online evaluation system from Washington State University and are incorporating this component in programming. An evaluation of the 2011 Youth in Governance legislative trip showed that afterward participants felt more confident stating their thoughts, speaking publicly and exhibiting leadership skills. All participants felt that they have a voice in government and know the governmental process.

4-H offers post-activity surveys for almost all of our programs. For example, the Tanana District periodically conducts evaluations on programs with the public, such as buyers in the market livestock program. Buyers are asked to evaluate the meat quality they are buying and their interaction with the youth. The club chartering process can also be an evaluation tool. 4-H has attempted to implement some of the recommendations based on a 2006 program review. Communication has been improved between agents in different communities. Agents participate in a weekly audio for coordination. An increase in the number of activities involving multiple districts reflects increasing interchange between the districts. Preliminary results of interviews provide direction in culturally relevant delivery of 4-H from the perspective of Alaska Native adults and youth.

Key Items of Evaluation

Kids want opportunities to be able to meet each other across the state. Alaska 4-H has difficulty participating in multistate programs because of the sheer cost of travel but 4-H'ers participated in exchanges to Japan and Mongolia. Travel is also expensive in state but two dozen teens have traveled to Juneau in the past four years with the Youth in Governance program to attend legislative committee meetings, be pages for the day and meet with legislators. Teams attending the state horse contest, which was held in Kodiak, spent \$3,000 to attend it. Two teams participated in the Western National Roundup and two youth attended the National 4-H Conference. All of the above paid for their own way by fundraising, scholarships or personal funds. The Cordova 4-H Music Camp is held every summer and approximately 65 youth from across the state attended in July 2011. Youth who attend need to find their own accommodations. Often parents will travel from far locations in Alaska, get on the ferry to Cordova and then either stay in a hotel, RV or camp during the week in order for their children to attend this valuable music camp.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Climate Change

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	10%		17%	
112	Watershed Protection and Management	0%		16%	
122	Management and Control of Forest and Range Fires	15%		17%	
123	Management and Sustainability of Forest Resources	50%		50%	
132	Weather and Climate	15%		0%	
605	Natural Resource and Environmental Economics	10%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	12.3	0.0
Actual Paid Professional	0.5	0.0	10.1	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
13700	0	163780	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
15795	0	668459	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
93438	0	489507	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research and outreach strategies will include a data base and data management system necessary for:

- Forest stand characterization of the Alaska boreal and coastal rain forest.
 - Long-term ecosystem monitoring and GIS modeling of the Taiga forest dynamics.
 - Discovery of and complete predictive relationships between weather factors and growth of climate sensitive forest species in Alaska.
 - Remote sensing to investigate landscape level responses in response to burn severity within black spruce ecosystems in Alaska.
 - Explorations of evaporation process in the boreal forest hydrologic environment.
 - Soil carbon balance and nitrogen dynamics following disturbance by wildfire and logging.
 - Soil respiration following wildfire in lowland black spruce, upland black spruce and mixed hardwoods.
 - Evaluation of the relationship between local climate and soil carbon balance.
- Research, education and outreach activities include:

- Correlating land-based information with remotely sensed images for forestry
- Geographic Information Systems
- Maps and spatial data sets of long-term value
- Climate change adaptation as it relates to communities

2. Brief description of the target audience

The target audiences include producers and consumers, communities and small business entrepreneurs, individuals and groups concerned about the quality of the Alaska environment, public resource agencies, public and private resource managers, other faculty and researchers, and undergraduate and graduate students. Our efforts will be directed toward environmentally and economically sustainable development and conservation of our natural resources that will benefit all citizens and help them adapt and become resilient as the climate changes. Advisors and the target audience include: Statewide Board of Advisors, Alaska Forest Association, Society of American Foresters, and the Alaska Northern Forest Cooperative. Specifically, this program will provide new information on soil properties and classification to the USDA Natural Resource Conservation Service, the USDA Forest Service, the Alaska Department of Natural Resources, borough governments, and Alaska Native Corporations. Information on impact of fires on soil organic matter will assist the Department of Natural Resources Division of Forestry and private land owners and managers.

3. How was eXtension used?

eXtension was not used

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	12	12

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Output Target 1. Soils research will concentrate on the classification of permafrost soils, soil carbon properties in relation to climate change, and soil disturbance dynamics in upland and lowland forest ecosystems. Publications are output measures.

Year	Actual
2011	3

Output #2

Output Measure

- Output Target 2. Long-term forest productivity data sets will be converted to formats compatible with existing megadata systems for compatibility with long term ecological research, fire management, and forest disturbance dynamics. Outputs measured will be publications and data sets converted.

Year	Actual
2011	3

Output #3

Output Measure

- Output Target 3. Development of data sets providing information on wildlife and domestic (traditional and alternative) livestock impact on rangelands will continue. Output measures will be data sets developed and publications.

Year	Actual
2011	0

Output #4

Output Measure

- Output target 4. Curricula that train future and present land managers in ecosystem stability and geospatial technology will be developed and implemented. Output measure will be curricula implemented.

Year	Actual
2011	2

Output #5

Output Measure

- Output Target 5. Climate change will affect northern forest ecosystems that will impact economic development of communities and will have cultural implications as well on communities and individuals. Causes and effects of change on ecosystems and reverberations felt by communities and individuals will be investigated. The measured output will be publications.

Year	Actual
2011	3

Output #6

Output Measure

- Output Target 6. Research related to product development to include timber products and non-timber products including energy will continue. Forest management specific to fuel/energy demand will be initiated. Measureable outputs will be publications and business starts. Not reporting on this Output for this Annual Report

Output #7

Output Measure

- Output Target 7. Recreation opportunities are important in urban and rural forests and are a part of ecosystem services. Recreation management in northern ecosystems is a part of management of ecosystems research. Measurable outputs are publications.

Year	Actual
2011	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Outcome Target 1. Increase knowledge of arctic and subarctic soils and forest productivity among peer scientists, managers, and governments. Knowledge outcome measures will be publications, conferences, and workshops.
2	Outcome Target 2. Increase animal producer and wildlife manager knowledge on range use and animal impact. Measurable outcomes are publications, workshops, and conferences.
3	Outcome Target 3. Increase knowledge through classroom and field course delivery. The outcome measures will be curricula delivered and number of students reached.
4	Outcome Target 4. Increase community and individual knowledge on the impact of climate change in northern ecosystems and affects on cultural lifeways, economies, and individual well-being. Outcome measures will be publications, workshops, and conferences.
5	Outcome Target 5. Provide research information that leads to product development and recreational opportunities. Outcome measures will be publications, business starts, conferences, and workshops.

Outcome #1

1. Outcome Measures

Outcome Target 1. Increase knowledge of arctic and subarctic soils and forest productivity among peer scientists, managers, and governments. Knowledge outcome measures will be publications, conferences, and workshops.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	10

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The USDA-NRCS Alaska State Office of USGS is interested in the soils data, especially in terms of hydric soils indicators in some problem areas.

What has been done

Soils formed in deep volcanic ash under mixed forest in the Upper Susitna Valley showed morphology of subsurface flow that removed the reduced iron thus there is only marginal morphological indicator of hydric soils. In the upper Susitna Valley sites, no iron reduction was detected after buried over a year and less than 10% reduction from MRIS tubes buried 3 months. In the Aleutians, the gray color is due to parent material which came as fresh ash deposit in 2008, thus not hydric soil. Soils from the Adak Island showed strong redoximorphic features that meet the hydric soil indicators; histic epipedon, iron concentrations and reduced matrix. The monitored site had soil saturation within 10 cm to the surface during the growing season for two consecutive years. The site has hydrophytic vegetation. Thus the site on Adak Island meets the wetland definition.

Results

The USGS is also interested in geochemical data and soil characterization data. The use of IRIS and MRIS tubes proved effective in determining hydric soils in remote sites such as the Aleutian Islands. The study sites for this project in the boreal forest were used to train the students in soil morphological properties, profile description and sampling technique. There were one undergraduate from UAF, 2 graduate students, one faculty from Louisiana State University, 2 federal employees, and one environmental consultant involved in the site review and characterization sampling.

4. Associated Knowledge Areas

KA Code **Knowledge Area**
101 Appraisal of Soil Resources

Outcome #2

1. Outcome Measures

Outcome Target 2. Increase animal producer and wildlife manager knowledge on range use and animal impact. Measurable outcomes are publications, workshops, and conferences.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The concentration of animals on a small acreage demands good management techniques especially since a maximum stocking density of greater than one animal per acre is often maintained. Without good management, the land base suffers extreme degradation. Alaska Cooperative Extension has a series of publications dealing with livestock; cattle, horses, sheep and goats. While these are excellent publications, they often rely on extension publications, recommendations or research from other states or Canada on which to base recommendations for Alaska.

What has been done

Initial tests with cattle were made with two different prototypes of GPS collars for rapid-interval collection. One prototype failed to provide useable data because of intermittent battery failure which erased data from volatile memory in the system. The second prototype (4 collars) worked successfully providing an average of 74,860 positions per day on a one-second collection rate. Collars were successful in collecting positional fixes 87 percent of the time. The metal roof loafing shed interfered with collection of GPS data but these points could be adequately filtered using fix quality and number of satellites information contained in the recorded data. Battery power (4 D-cell batteries) was adequate for at least 4.5 days of data collection with one collar collecting data for 5.5 days.

Results

The main impact from this project has been the adoption of the prototype GPS collar for similar studies in Oregon and other states. This research indicated that the collars will be able to collect

data for cattle distribution runs planned for next summer.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
132	Weather and Climate

Outcome #3

1. Outcome Measures

Outcome Target 3. Increase knowledge through classroom and field course delivery. The outcome measures will be curricula delivered and number of students reached.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	117

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In a state with 375 million acres of which 3.2 million acres are in state parks, and federal land comprises 5 national parks, preserves, and monuments covering a total of 54 million acres land management issues are in the forefront. The School of Natural Resources & Agricultural Sciences (SNRAS) along with the Agricultural & Forestry Experiment Station offers a world-class learning and research environment to both undergraduate and graduate students. Remote rural communities often lack the expertise to document loss due to climate changes. High travel costs make it difficult to import experts.

What has been done

Undergraduate courses are augmented by such learning experiences as the field course in resource management, internships, and the senior thesis project. The school provides leadership in research, education and outreach emphasizing natural resources management to benefit Alaskans and their environment. Our research, education, and outreach programs reflect the interest of our diverse clientele: Native people, rural communities, industry, environmental organizations, state and federal agencies, farmers, foresters, tourists, fishers, and sports enthusiasts. CES and Sea Grant agents collaborated on a training to teach youth and adults in a

southwest Alaska Yupik village how to use a GPS to map archaeological sites and other eroded areas and then to use a GIS to interpret and display the information.

Results

In the 2011 academic year, faculty taught 30 credited courses in resource or forestry-related classes. One example of knowledge transferred is through the field course Resources Management Issues at High Latitudes, NRM 290, a required course for Natural Resources Management majors. This gives students a close-up look at specific natural resources in Alaska during a 10-day field course around the state, with stops and activities at significant resource locales. During their stops, students participate in on-site analysis of resource management needs, opportunities, and conflicts in various industries: agriculture, forestry, mining, seafood, petroleum, recreation and tourism. Participants in the GPS/GIS workshop mapped former village sites. Artifacts from 700-year-old sites are falling onto the beach so the survey helped the village document their old sites and artifacts. They also mapped airport erosion and a river channel, which help barges get in with supplies without getting stuck on sandbars.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
112	Watershed Protection and Management
122	Management and Control of Forest and Range Fires
123	Management and Sustainability of Forest Resources
132	Weather and Climate
605	Natural Resource and Environmental Economics

Outcome #4

1. Outcome Measures

Outcome Target 4. Increase community and individual knowledge on the impact of climate change in northern ecosystems and affects on cultural lifeways, economies, and individual well-being. Outcome measures will be publications, workshops, and conferences.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

It has long been expected that the Earth's high latitudes, but especially the Arctic and Subarctic regions, would experience climate warming from greenhouse gas processes. Recent syntheses confirm widespread, although not universal, warming effects across the Arctic and Subarctic in the last 30 years. But change in Alaska is happening at a rapid rate, and coherent and consistent evidence of warming is seen in changes in hydrology, permafrost, forests, disturbances, and other features. In recent decades, the Arctic and Subarctic regions have experienced the greatest warming on earth. Everyone--from engineers to wildlife managers to farmers--will need to take economic change, social change, and climate change into account when planning for the future, as well as take advantage of potential opportunities, in order to avoid costly mistakes.

What has been done

In cooperation with the USGS and the Global Institute for Sustainable Forestry we described and synthesized the results from two long-term projects, (1) reference stand monitoring, and (2) assisted tree regeneration, both in Bonanza Creek Experimental Forest (BCEF). We synthesized information about the influence of recent climate change on snow as it affects forest health in the global boreal forest as part of the Arctic Council's project in snow, water, ice, permafrost in the Arctic (SWIPA).

Results

The SWIPA scientific document was released as a book and multimedia web portal, synthesizing trends in the water environment in one of the most rapidly changing regions on Earth. Several aspects of changes in snow have increased the risk of insect attack on boreal trees. Growth of aspen on the sampled sites is under strong climate control, with warm summer temperatures a negative predictor of growth and precipitation in specific months a positive factor. In the early stages of the analysis of possible climate change effects on Alaska forests, aspen, with its adaptation to the warmest and driest sites, was identified as a species that might expand its distribution and experience relatively less growth reduction than other tree species as temperatures increased. Our results suggest that scenario is highly unlikely on low elevation, permafrost-free sites in central and eastern Interior Alaska.

4. Associated Knowledge Areas

KA Code	Knowledge Area
122	Management and Control of Forest and Range Fires
123	Management and Sustainability of Forest Resources
132	Weather and Climate

Outcome #5

1. Outcome Measures

Outcome Target 5. Provide research information that leads to product development and recreational opportunities. Outcome measures will be publications, business starts, conferences, and workshops.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Forest Products Research (FPP) and Education program in Alaska conducts research and outreach to assist with the restructuring of the forest products industry in Alaska.

What has been done

Wood-Plastic Composites (WPC) from Low-value Alaska Biomass and Blends of Recycled Thermoplastics project Rheological behavior of blended recycled polymers (polyethylene and polypropylene) and wood flour produced from fire-killed black spruce were examined to assist with determining WPC extrusion processing parameters. Thermal transitions of polymers and thermal degradation of wood flour were evaluated. Using design of experiments (DOE) several WPC formulations (varying plastic blends) were extruded using 35mm twin-screw extruder. Physical and mechanical properties of WPCs of different formulations were evaluated and meet the current industry expectations (industry currently uses mixed pine wood flour).

Results

Research has demonstrated the potential for utilizing low-value fire-killed black spruce wood flour for production of commercially viable wood-plastic composites in Alaska. This work is one of the few that shows that it is feasible to use blends of recycled polymers in WPC production. Other wood product development involved teaching improved techniques for cabin building through workshops and knitting needles produced through OneTree classes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
132	Weather and Climate

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (The loss of research faculty positions.)

Brief Explanation

Alaska is already seeing impacts of the changing climate in its sea ice degradation, the ecology of the boreal forest, and its ice-impregnated northern soils. This will influence the thrust of ecosystem management in coming years. Policy and regulation and competing public priorities are already coming to the fore as endangered species affect land use and hence management of forests and rangelands. Programmatic challenges will occur as consideration is given to the management of the forests for fuels to mitigate demands on petroleum and coal supplies. A continuing rise in transportation costs is already drawing attention to regional and local management for energy and other local wood products. Finally, as demographics of the population change and demographics of the forest industry change toward management with a specific product objective as well as an objective of sustainable and resilient northern ecosystems, there will be a need for continuing adult education and higher education to fill workforce vacancies or new positions that are created to meet demands in energy and ecosystem management fields.

We have lost the Forest Measurement research faculty through transfer, although the research is continuing. Also lost through retirement is the Forest Hydrologist position. Replacement of these positions is uncertain.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Basic and applied research will soon be leading to methods of climate change adaptation and mitigation for the benefit of society living in northern ecosystems.

Key Items of Evaluation

V(A). Planned Program (Summary)**Program # 6****1. Name of the Planned Program**

Global Food Security and Hunger

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	5%		0%	
102	Soil, Plant, Water, Nutrient Relationships	10%		10%	
205	Plant Management Systems	40%		35%	
212	Pathogens and Nematodes Affecting Plants	0%		5%	
213	Weeds Affecting Plants	5%		0%	
216	Integrated Pest Management Systems	5%		0%	
301	Reproductive Performance of Animals	5%		10%	
302	Nutrient Utilization in Animals	10%		5%	
307	Animal Management Systems	10%		5%	
308	Improved Animal Products (Before Harvest)	5%		0%	
401	Structures, Facilities, and General Purpose Farm Supplies	0%		10%	
402	Engineering Systems and Equipment	0%		10%	
405	Drainage and Irrigation Systems and Facilities	0%		10%	
601	Economics of Agricultural Production and Farm Management	5%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of FTE/SYs expended this Program**

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	7.0	0.0	13.3	0.0
Actual Paid Professional	7.0	0.0	7.6	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
183963	0	733082	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
212099	0	483154	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1254737	0	234182	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research and outreach will be integrated to assure that best management practices appropriate to Alaska and tailored to Alaska are provided to the target audience. Resilience and adaptability of crops and animals to changes in the subarctic and arctic climate, and revitalization in research and extension programs relevant to regional and local food production and the safety of the foods produced and processed are critical to the food security of Alaska and will be an emphasis of this planned program. An emphasis will also be placed on educating and training youth and adults in new fields opening in the Alaska workforce and continuing education and training programs that emphasize current needs as an aging workforce retires. Group and one-on-one educational activities with specific sectors of the pest management industry, the agricultural community, and the horticultural industry will provide individuals and businesses with important information. Increased reliance on the Internet and distance education technology enhanced delivery to more people. Traditional interactions included forums, tours, response to emails, phone calls and contact with clients. Increasing partnerships with the agribusiness community is an important strategy for assuring a secure food supply for Alaska.

2. Brief description of the target audience

The target audience includes: producers and consumers, communities, entrepreneurs, agribusinesses, industry leaders, and individuals and groups concerned about the quality of the Alaska environment, public resource agencies, public and private resource managers, Alaska Farm Bureau, the USDA Natural Resource Conservation Service, the USDA Forest Service, the Alaska Department of Natural Resources, borough governments, and Alaska Native Corporations, other faculty and researchers, and undergraduate and graduate students.

3. How was eXtension used?

Two agents and the range management researcher use eXtension. One uses the garden section to find answers to horticulture questions and puts the link on her handouts as a useful horticulture website. She also refers clients to the site. A second agent uses it on a daily basis for reference and to develop curricula. He uses the Land Grant University search engine feature. The range management researcher uses it in conjunction with the Rangelands West Partnership and Rangelands Community of Practice.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	9424	19248	1002	1013

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2011

Actual: 1

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	3	11	11

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Output target 1. Field faculty will provide agricultural and horticultural workshops, short courses, classes, field days, and conferences aimed at improving food production and best management practices.

Year	Actual
2011	129

Output #2

Output Measure

- Output Target 2: Field faculty will provide agricultural and horticultural information through one-on-one consultations and consultations with other organizations to provide information on best management practices of food production (in contact hours).

Year	Actual
2011	2973

Output #3

Output Measure

- Output Target 3. Horticultural crop research will concentrate on home and commercial varieties appropriate as Alaska food crops. Publications are the output measures.

Year	Actual
2011	10

Output #4

Output Measure

- Output Target 4. Controlled environment horticulture will focus on technology and technology transfer concerning appropriate food crops and best management practices for crop production in specific environments. Output measures will be publications.

Year	Actual
2011	2

Output #5

Output Measure

- Output Target 5. Focus will be on best management practices for food crops and variety evaluation. Output measures will be publications.

Year	Actual
2011	3

Output #6

Output Measure

- Output Target 6. Focus will be on best management practices for livestock management and production for food. Output measures will be publications.

Year	Actual
2011	3

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Outcome Target 1: Increase agronomic crop producers' ability to understand and assess best management practices of food crop production.
2	Outcome Target 2: Increase traditional and alternative livestock producers' ability to understand and assess optimum production practices for food animal production.
3	Outcome Target 3: Increase participants' commercial and home horticulture optimum food crop growing techniques and improve management practices.
4	Outcome Target 4: Increase the number of activities that monitor and control invasive species.
5	Outcome #5: Effects of irrigation on agronomic crops. Outcome measure: number of varieties tested
6	Outcome Measure #6: Invasive plant identification and assessment used as a tool for management.

Outcome #1

1. Outcome Measures

Outcome Target 1: Increase agronomic crop producers' ability to understand and assess best management practices of food crop production.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	29

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Alaska imports at least 90 percent of its food supply. Educational opportunities and research-based practical advice offered to producers will help new producers enter the market and improve the economic viability of existing operations. The management of farm nutrients, pest scouting and pesticides also will improve financial sustainability of farm operations while making producers cognizant of environmental concerns.

What has been done

Delta CES hosted two annual events to improve production practices of hay and grain farmers. The Delta Farm Forum offered information about canola production, barley marketing, as well as fertilizer trial information. The Harvest Wrap-Up brought agricultural researchers together with farmers to discuss the past crop season and current and future research. Produce Growers Conference included AFES update on potato research, pests and production. CES provided nutrient and pest management plans to producers associated with EQIP long-term contracts.

Results

Events that bring producers, researchers and agencies together encourage an exchange of information and provide opportunities to prioritize research needs. Past presentations about a hullless barley variety developed by AFES and recipes developed by CES have led to a greater production of barley for human consumption and a new milling operation in Delta. Through the EQIP program in Delta, 17 participants applied pesticides and nutrients at the specified rates and were educated in weed identification and soil sampling. Participants improved soil and water conservation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
212	Pathogens and Nematodes Affecting Plants

Outcome #2

1. Outcome Measures

Outcome Target 2: Increase traditional and alternative livestock producers' ability to understand and assess optimum production practices for food animal production.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Livestock production enterprises in Alaska provide meat and dairy products for commercial markets as well as agrotourism enterprises in this state. Educating livestock producers will improve their ability to assess production practices. The program goal is to facilitate the development of management strategies to support sustainable, high-latitude livestock production in species ranging from poultry to ruminant animals.

What has been done

Information was provided on reindeer meat production to the public and 4-H members. Demonstrations of the mobile slaughter plant in Nome assisted herders in marketing. Workshops on animal nutrition, breeding and lactation were taught in five Alaska communities and the livestock specialist consulted with livestock producers and organizations. CES and AFES organized the Sustainable Livestock Production Conference to increase in-state red meat production. Agent taught four classes with information about raising chickens and egg production. The Sustainable Agriculture Conference provided information on goat and small dairy production, cheese and meat regulations and poultry.

Results

Cattle and bison producers adopted rotational grazing practices based in part on information on animal workshop. Eighty participants in the Sustainable Livestock Production Conference

included livestock producers, processors and retailers. Ideas were developed concerning how to raise more locally grown red meat. As a result a team was formed to consider better teaching, research and outreach efforts. Producers have requested another conference about grazing management for ruminant livestock, which is being planned for fall 2012. Development of 15 reindeer meat recipes with professional photos resulted from collaboration with chefs at the University of Hawaii. Chicken University participants learned how to prevent salmonella and E. coli contamination by washing eggs in 120-degree water. Remarkable interest in the goat workshop demonstrated the need for inclusion in the next livestock conference.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures

Outcome Target 3: Increase participants' commercial and home horticulture optimum food crop growing techniques and improve management practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	345

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Horticulture is the largest agricultural industry in Alaska amounting to more than 50 percent of cash receipts for all agricultural crops. Alaska imports most of its food and costs are high, particularly in rural areas. Dependence on imports poses a food-security risk if supply lines are interrupted. Teaching more residents how to garden or grow horticultural crops increases the quality of food available to consumers and lowers food security risk.

What has been done

Many composting and gardening classes include hands-on components, including a gardening project for Bhutanese refugees. Agents help communities develop community gardens. Three conferences target industry and home horticulturalists. Greenhouse and Nursery Conference participants received information about greenhouse heating and production, berry and small fruit production and invasive plants. Sustainable Agriculture Conference presentations included cost-share programs for organic farming and high tunnels, fish/hay composting and organic fertilizer research, rhubarb industry and small fruits and berries. CES provided nutrient and pest management plans to producers associated with EQIP long-term contracts. AFES partnerships with the local greenhouse operations at Chena Hot Springs Resort (CHSR) and Pike's Waterfront Lodge in Fairbanks, are used to reach large and diverse groups with information and education.

Results

206 Master Gardeners completed the course and practiced the techniques they were taught. The Bhutanese gardeners put in more than 1,000 hours at their garden and sold \$6,494 of produce at a farmers market. Forty-five Master Gardeners surveyed 10 months after the class said they used information they learned, concerning new plants and varieties, fertilizer and pest management practices and organic practices. Forty participants of greenhouse conference said past conferences had influenced their operations and 14 planned to start a horticulture business. Forty-five participants of Sustainable Agriculture conference made changes in fertilization, marketing, pest management, grant writing and weed management as a result of previous conferences. CES worked with 167 commercial high tunnel producers, who were educated in weed identification and soil sampling. AFES collaborations allow for interactions with the general public and visitors from various regions along with training and apprenticeship opportunities for students and interested individuals. Daily educational programs on greenhouse operation and management are conducted year round at CHSR. Pamphlets describing the greenhouse operations at CHSR and Pike's support the educational programs and are widely distributed. The participants in these events are of variable and diverse educational, financial and demographic backgrounds and may not be reached through conventional extension and outreach activities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
216	Integrated Pest Management Systems
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
405	Drainage and Irrigation Systems and Facilities
601	Economics of Agricultural Production and Farm Management

Outcome #4

1. Outcome Measures

Outcome Target 4: Increase the number of activities that monitor and control invasive species.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Alaska hosts thousands of visitors every year. The state also imports most of its food and many horticultural and agricultural products, so it remains vulnerable to imported pests. Retail sales of plant materials contaminated with a variety of pests continue to challenge the state. Invasive weed infestation can reduce land values and agricultural productivity, and negatively impact recreation, tourism and subsistence harvesting. Improving citizen, farmer and land manager ability to assess pest management practices is critical.

What has been done

Agents and IPM staff hosted 35 workshops and presentations and worked with producers, agencies and to identify pests and reduce impacts. Two invasive species conferences hosted by CES bring together researchers, agencies and citizens statewide to discuss research and prevention efforts. IPM program developed a Citizen Monitoring Portal website that Alaska residents may use to submit digital photos for identification of pests. CES trained 81 commercial pesticide applicators.

Results

CES and other agencies remain vigilant and monitor, detect and identify species. Raising the awareness of agencies and the public to the threat invasive species pose will help control the spread of invasive species. After the 2011 invasive species conferences, many participants agreed to increase efforts to manage and monitor invasive species. Evaluations showed that participants valued networking with representatives of other agencies and organizations. CES brings together diverse agencies and groups working to prevent, control and research invasive species. More than 9,100 contacts were reached by the IPM staff and additional contacts were made by faculty through educational workshops. It is too soon to talk about results from the

monitoring portal but portals elsewhere have resulted in early citizen reports of invasive species. Pesticide applicator certification, which is required by the state of Alaska, results in safer and more effective application of pesticides.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
216	Integrated Pest Management Systems

Outcome #5

1. Outcome Measures

Outcome #5: Effects of irrigation on agronomic crops. Outcome measure: number of varieties tested

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	14

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In dry growing seasons irrigation could help farmers increase crop production. No previous research has been done in the Delta Junction, Alaska area.

What has been done

Variety trials have been continued selecting varieties from northern Canadian, European and U.S. sources for testing against the standard Alaska varieties - Otal spring feed barley, Thual hulless barley, Ingal hard red spring wheat. A new variety trial/cultural practice study was begun with winter grains at the Fairbanks and Delta Junction locations. This year is also the first time to study irrigation impact on grain yield in Delta Junction area.

Results

Average yields for all spring grain and oilseed varieties at the Fairbanks and Delta Junction locations were slightly higher than standard test varieties. There was no survival on any winter grain on either cultural practice at the DJ location. Average yields for irrigated feed barley in Delta

doubled, while hulless barley, hard red spring wheat showed significant increase, but Polish canola increased slightly.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
205	Plant Management Systems

Outcome #6

1. Outcome Measures

Outcome Measure #6: Invasive plant identification and assessment used as a tool for management.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

A new and extremely invasive water plant, Elodea, which will affect fish habitat in waterways, was first detected in Fairbanks in the summer of 2010.

What has been done

An assessment was conducted in cooperation with the Fairbanks Soil and Water Conservation District.

Results

The inventory of Elodea in the Fairbanks river system will help agencies take steps to control it before it damages the waterways and the fish habitat.

4. Associated Knowledge Areas

KA Code	Knowledge Area
213	Weeds Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

The high cost of petroleum products and fertilizers impacted the productivity and the economic viability of horticultural and agricultural operations in the state. The small number of agricultural staff working for CES, the geographic distances between communities and high transportation costs involved in traveling to communities off the road system all present challenges. The Fairbanks and Kenai area districts have not had a full-time agent for more than a year so programming has decreased in both areas.

The cool, rainy summer led to poor growing conditions and contributed to prime conditions for potato pathogens, which affected some producers' ability to market their products.

Alaska is a state still in desperate need of basic research. At a time when food security is a national priority and Alaska imports more than 90% of its food, it is hard to comprehend the decision to remove USDA's Agricultural Research Service entirely from the state. The decision to close 12 Agricultural Research Service stations was made at the highest levels by the Department of Agriculture and approved by Congress. USDA Agricultural Research service will close in Alaska Spring 2012. The loss of ARS will shut a door on a long history of research that won't be easily picked up by anyone else. From utilizing seafood waste to grasshoppers to controlling weeds and invasive plants, the work of ARS in Alaska is unmatched.

According to ARS spokeswoman Sandy Miller-Hays in Washington, DC, for every dollar spent on agricultural research the country sees a return on investment of \$10. UAF graduate students will feel the pinch, as many have worked their way through school interning and researching for ARS.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

All of our Extension agents used surveys after our major conferences and many agents regularly surveyed following individual classes. Several agents survey participants of workshops or conferences to get participants' responses to particular presentations or overall what they have learned from previous presentations. We are learning through surveys what areas interest clients for future programming. Comments on the 2011

Sustainable Agriculture Conference evaluation led to programming for the 2012 conference, including sessions on farm business planning, the history of plant varieties developed in Alaska and commercial kitchens. Forty-five Master Gardeners surveyed 10 months after the class said they used information they learned, concerning new plants and varieties, fertilizer and pest management practices and organic practices. Forty participants of greenhouse conference said past conferences had influenced their operations and 14 planned to start a horticulture business. Forty-five participants of Sustainable Agriculture conference made changes in fertilization, marketing, pest management, grant writing and weed management as a result of previous conferences.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Sustainable Energy

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
123	Management and Sustainability of Forest Resources	20%		25%	
125	Agroforestry	20%		0%	
131	Alternative Uses of Land	20%		0%	
205	Plant Management Systems	40%		25%	
511	New and Improved Non-Food Products and Processes	0%		50%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	2.0	0.0
Actual Paid Professional	0.6	0.0	2.1	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
15657	0	165020	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
18051	0	220193	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
106786	0	534000	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

AFES researchers will concentrate primarily on yield potential of lignocellulosic crops as well as evaluate oilseed crops as bioenergy crops in Alaska. If successful, this research will lead to development of "best practices" management regimes and genetics of bioenergy crops. In the future, we intend to conduct research in remote locations in Alaska to determine the feasibility of various crops in small villages where people often have little experience in agriculture. For this purpose, we will concentrate on crops likely to be successful in these situations, especially woody crops, which will require little agricultural knowledge and simple technology.

AFES researchers are continuing to work on the utilization of low value biomass for fuels and chemicals, mostly through thermochemical means (gasification, pyrolysis, supercritical fluids). The chemical composition of alder, birch, hemlock, yellow cedar, Sitka spruce, red cedar, white spruce, and aspen will be evaluated for biofuel production via supercritical liquefaction. CES is working with communities on use of biomass products and with producers to develop value added forest products.

AFES researchers will seek to assimilate all existing information on the total forest and crop biomass available in Alaska into one database, determine the gaps in the database and the information needed to fill the gaps, and determine the biological, physical, and economic feasibility of using Alaska biomass as biofuels.

2. Brief description of the target audience

The target audiences include producers and consumers, communities, agriculture and forestry businesses, industry leaders, entrepreneurs, individuals and groups concerned about the quality of the Alaska environment, public resource agencies, public and private resource managers, other faculty and researchers, and undergraduate and graduate students. Our efforts will be directed toward environmentally and economically sustainable development and conservation of our natural resources that will benefit all citizens and help them adapt and become resilient as the climate changes. Advisors and the target audience include: Statewide Board of Advisors, Society of American Foresters, Alaska Farm Bureau, and the Alaska Northern Forest Cooperative. Specifically, this program will provide new information on soil properties and classification to the USDA natural Resource Conservation Service, the USDA Forest Service, the Alaska Department of Natural Resources, borough governments, and Alaska Native Corporations. Information on impact of fires on soil organic matter will assist the Department of Natural Resource's Division of Forestry and private land owners and managers.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	166	20946	157	1100

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2011
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	2	5	7

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Workshops, demonstrations, short courses, classes, field days, and conferences organized and conducted.

Year	Actual
2011	15

Output #2

Output Measure

- Bioenergy crop varieties tested.

Year	Actual
2011	5

Output #3

Output Measure

- Bioenergy research projects conducted.

Year	Actual
2011	10

Output #4

Output Measure

- Bioenergy crop and technology publications.

Year	Actual
------	--------

2011

7

Output #5

Output Measure

- Community, organizations, and one-on-one consultation concerning bio-based energy opportunities.

Year

Actual

2011

29

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Identify crops suitable for sustainable production of bio-based energy in Alaska.
2	Identify new value-added uses for by-product from bio-based energy crops and woody species.

Outcome #1

1. Outcome Measures

Identify crops suitable for sustainable production of bio-based energy in Alaska.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Sustainable energy work in CES and AFES endeavors to provide research, education and outreach for existing or potentially new small businesses in the wood product field. Research for alternatives to fossil fuels is urgent. Energy costs in most rural communities in Alaska are prohibitively expensive necessitating heart-wrenching choices between food and warmth. We are moving forward with research in biofuels and biomass with the goal to offset some of these high-energy costs.

What has been done

In three locations grass and woody species plots have been established: Fairbanks, Palmer and Delta Junction. Production of bio-oil was successfully completed and chemical analysis has been performed. Aspects of bio-oil quality (HHV, pH, GCMS and CHN) have been generated. The gasification work with alder has been completed, with this information serving as a baseline for a joint venture agreement with USDA ARS to introduce fish wastes to the alder. The quality of syngas was not sufficiently clean to maintain generator operations. The wood fired refrigerator was built as a class project for the mechanical engineering students of the University of Alaska Anchorage. The refrigerator was tested and evaluated for operations using gasification gas, and it performed very well for refrigeration but not as well for freezing.

Results

Grass species evaluated were smooth brome grass, hairgrass, wheatgrass, tufted hairgrass, slender wheatgrass, Siberian wildrye, and reed canarygrass. Woody species evaluated were Salix alaxensis, Populus balsamifera, S. alaxensis. Novel processing of native small diameter biomass by pyrolysis and gasification is helping guide the continuous development of second-generation technologies focused on undervalued wood resources in Alaska, with the broader impacts affecting the nation as a whole. This research is key to addressing fundamental questions with regards to uses of AK biomass in nontraditional value added products using small-

diameter trees. The study and demonstration of wood in refrigeration applications has significant importance for Alaska, as a high percentage of the rural population relies on subsistence fishing, hunting and gathering during the brief summer months.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
125	Agroforestry
205	Plant Management Systems
511	New and Improved Non-Food Products and Processes

Outcome #2

1. Outcome Measures

Identify new value-added uses for by-product from bio-based energy crops and woody species.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Forest lands, in Alaska, are an abundant yet underutilized natural resource. Forest inventory data indicates the state has 24.9 million acres of forested land. Of these, 4.3 million are considered commercial forests capable of growing 20 cubic feet per acre per year. With the closing of the large pulp mills in the 80's and 90's, a rebuilding effort was initiated to transition the state to a more stable economic base within the forest products industry.

What has been done

Upgrading Pyrolytic Bio-oil with zeolite catalysts: Production of bio-oil was successfully carried out. Wood-Plastic Composites from Low-value Alaskan Biomass and Blends of Recycled Thermoplastics: Rheological behavior of blended recycled polymers (polyethylene and polypropylene) and wood flour produced from fire-killed black spruce were examined to assist with determining WPC extrusion processing parameters. Thermal transitions of polymers and thermal degradation of wood flour were evaluated. Using design of experiments (DOE) several

WPC formulations (varying plastic blends) were extruded using 35mm twin-screw extruder. Physical and mechanical properties of WPCs of different formulations were evaluated and meet the current industry expectations (industry currently uses mixed pine wood flour).

Results

Novel processing of native small-diameter biomass by pyrolysis and gasification is helping guide the continuous development of second- generation technologies focused on undervalued wood resources in Alaska, with the broader impacts affecting the nation as a whole. This research, in particular from small-diameter trees, is addressing fundamental questions with regards to uses of AK biomass in non-traditional value added products. Wood-Plastic Composites from Low-value Alaskan Biomass and Blends of Recycled Thermoplastics: Research has demonstrated the potential for utilizing low-value fire-killed black spruce wood flour for production of commercially viable wood-plastic composites in Alaska.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
125	Agroforestry
131	Alternative Uses of Land
205	Plant Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Two main research projects are underway. The first is developing a database of the chemical composition of timber forest biomass and nontimber forest product species in representative locations across the State of Alaska, and the development of a biofuels agenda in first and second generation technology with a focus on space heating and raw chemical feedstock production. The second is evaluating Alaska grown lignocellulosic crops and oilseed crops as a source for biomass. Evaluation conducted at the basic and applied research phase involves comparison of baseline data and testing of the pyrolysis unit.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Childhood Obesity

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
605	Natural Resource and Environmental Economics	0%		50%	
703	Nutrition Education and Behavior	30%		0%	
724	Healthy Lifestyle	45%		50%	
806	Youth Development	25%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	1.0	0.0	0.0	0.0
Actual Paid Professional	1.6	0.0	0.1	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
41098	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
47384	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
280314	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Collaborate with other organizations including Public Health, schools, day care facilities, 4-H, community organizations, tribal organizations, and youth groups to offer programming on childhood obesity focusing on physical activity and nutrition

- Programming will be conducted with parents in choosing nutritional foods and preparing meals for their families.

- Group and one-on-one educational activities with day care providers and parents will provide individuals with information necessary to increase physical activity of children.

2. Brief description of the target audience

- teachers and parents of youth
- caregivers

3. How was eXtension used?

Our agents occasionally use eXtension as an additional resource for programming.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	3289	44554	350	2345

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Field faculty will provide physical activity and nutrition programming for teachers and parents. Output is the number of teachers and parents who are trained.

Year	Actual
2011	145

Output #2

Output Measure

- Field faculty will provide physical activity and nutrition programming through one-on-one consultations and consultations with other organizations.

Year	Actual
2011	430

Output #3

Output Measure

- Faculty will develop educational resources on physical activity and nutrition.

Year	Actual
2011	11

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase physical activity during a school day. Counting number of classrooms participating.
2	Increase youth and parents' understanding of healthy food choices. Counting contacts with youth and parents.
3	Youth and families have a more positive attitude toward healthful foods and/or are willing to try new foods. Counting number of families.
4	Increase knowledge, attitudes, skills and aspirations to increase physical activity habits. Counting number of youth.

Outcome #1

1. Outcome Measures

Increase physical activity during a school day. Counting number of classrooms participating.

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Increase youth and parents' understanding of healthy food choices. Counting contacts with youth and parents.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2248

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Childhood obesity is a major concern in Alaska, as elsewhere. In 2008, one-third of students entering kindergarten or first grade in Anchorage were above a normal weight. A 2009 State of Alaska report says that 11 percent of Alaska high school students are obese. In rural areas, food from poorly stocked and expensive grocery stores, has replaced more nutritious traditional subsistence foods. Effective programs and education must incorporate culturally relevant local foods, traditions and values.

What has been done

Three agents offered a childhood obesity prevention program in 2010 to foster parents, parents and childcare providers and two agents offered it this past year. CES trained eight nutrition educators about how to teach children how to make healthier choices. Nutrition educators presented USDA nutrition curriculum in classroom programs in Palmer, Bethel, Fairbanks and Anchorage. A family meals presentation emphasized the importance of eating healthy foods. Presentations at farmers markets and health fairs in the Mat-Su area provided nutrition information.

Results

The Nome agent taught the physical activity and nutrition program to parents, foster parents and daycare providers in the spring of 2010 in Nome and Kotzebue and surveyed participants a year later, in FY 2011. Fourteen responded out of 37 participants and, of those, 10 said they increased the physical activity of children in their care. Half of the respondents said they increased nutrition education and 11 of 14 said they offered more nutritious foods. One wrote: We eat more vegetables and fresh fruit. Nearly all participants said they shared the information with other parents and made positive changes in their own lives. Nutrition educators with the Alaska Nutrition Education Program presented programs that reached 2,145 youth in 2011. Participants in the baby food classes practiced making baby foods that they brought home, so they learned a new skill.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle
806	Youth Development

Outcome #3

1. Outcome Measures

Youth and families have a more positive attitude toward healthful foods and/or are willing to try new foods. Counting number of families.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	38

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Aside from an increased likelihood of becoming overweight adults, children and adolescents who are overweight or obese are at increased risk for a variety of negative physical, social and emotional problems. According to one survey, 84 percent of Alaska high school students eat less than the recommended amounts of fruits and vegetables daily. Families have an important influence on making healthy food choices available and enticing to youth.

What has been done

An agent provided training to 38 individuals on the importance of eating as a family and providing healthy food choices. Our Alaska Nutrition Education Program provides educational programs to people eligible for food stamps to equip them with the information needed to make healthy eating affordable. Educators offer classes at the sites of partner agencies, local extension offices, libraries, schools, grocery stores, and other locations that are convenient and accessible to the target audience.

Results

Twenty-four teachers whose classrooms received nutrition education training through the Alaska Nutrition Education Program reported that 75 percent of their students were more willing to try new foods.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle
806	Youth Development

Outcome #4

1. Outcome Measures

Increase knowledge, attitudes, skills and aspirations to increase physical activity habits. Counting number of youth.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	17

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Although individual weight is determined by many factors, the primary cause of excess weight and obesity in most individuals is an imbalance between nutrition and physical activity. Outreach

efforts need to address ways to encourage better nutrition and more physical activity.

What has been done

Seven agents received training in 2010 on a childhood obesity prevention program that encourages better nutrition and increasing physical activity. Three agents provided the program to parents, foster parents and childcare providers in 2010 and two agents offered the training in 2011. Also, as part of a multistate Childrens Healthy Living Program grant, CES/AFES nutrition specialist and team designed research protocols, and are developing a pilot project measuring physical activity in 2-5-year-old children at a Fairbanks childcare facility that will be replicated in Anchorage, Kenai and the Matanuska Valley.

Results

The Nome agent taught the physical activity and nutrition program to in the spring of 2010 in Nome and Kotzebue and surveyed participants a year later, in FY 2011. Fourteen responded out of 37 participants, and of those, 10 said they increased the physical activity of children in their care. Participants in a Copper Center PAN program said they would make changes, to offer more outside play time and go on outside walks for one hour each day. It is too early for results for the Children's Healthy Living Program grant, but the goal is to build environments that will promote active play and promote healthy foods to prevent young child obesity.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

The small size of the CES Health, Home and Family Development Program staff in Alaska is a factor in the Childhood Obesity area. Travel costs are an issue because air travel is necessary for most agents to travel beyond their district office. Though agents have been successful in partnering with other governmental and private entities to make each travel dollar go further, they are still are unable to travel as often as requested. Staff vacancies have been an issue. The position in Juneau has been vacant for nearly two years. Extension currently has five agents that work in the Sustainable Individuals, Families and Communities, Food Safety and Childhood Obesity planned program areas.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluations following two physical activity and nutrition programs showed either improvement in diets or increased exercise or an intent to do that. The Alaska Nutrition Education Program asks teachers to note changes they see in students following a multipart nutrition education program. Faculty believe they need additional training on evaluation, a position Extension is considering for FY2013.

Key Items of Evaluation

V(A). Planned Program (Summary)**Program # 9****1. Name of the Planned Program**

Food Safety

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
502	New and Improved Food Products	10%		50%	
503	Quality Maintenance in Storing and Marketing Food Products	20%		50%	
504	Home and Commercial Food Service	60%		0%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	10%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	0.0	0.0
Actual Paid Professional	5.6	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
145801	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
168100	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
994446	0	29789	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Extension faculty will conduct food preservation and food safety workshops and meetings, deliver educational services, provide training, and conduct consultations with clientele. Researchers will develop products, curricula and resources, provide training and conduct consultations with clientele. Educators and researchers will conduct needs assessments, work with the media, partner with other agencies and organizations, write articles, publications and fact sheets, and facilitate events, activities and teachable moments.

The Reindeer Research Program has purchased a mobile slaughter facility for the teaching/research program at the Northwest College in Nome, Alaska. Three classes have been taught with full enrollment.

2. Brief description of the target audience

Food preparers in homes and schools, school teachers (public and private), individuals interested in healthy lifestyles, low-income individuals and families, especially women with young children, individuals interested in a subsistence lifestyle, individuals interested in food preservation, home food growers and hunters, reindeer herders and meat producers.

3. How was eXtension used?

Our agents use eXtension as an occasional additional resource to answer questions and to develop curriculum in this area. Our overall Facebook page links to blog posts and articles posted on eXtension, and eXtension is linked from our home page for the public as a resource.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	3464	119150	40	6271

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Extension faculty will offer workshops in harvesting and food preservation techniques.

Year	Actual
2011	64

Output #2

Output Measure

- New food products will be developed using Alaska-produced ingredients.

Year	Actual
2011	2

Output #3

Output Measure

- Extension faculty will offer workshops in food safety.

Year	Actual
2011	65

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Participants in food preservation and food safety classes will improve their food preservation and food safety practices.
2	New varieties and new uses of animal and plant products will result in increased production of Alaska-based products. Outcome is number of products and publications.

Outcome #1

1. Outcome Measures

Participants in food preservation and food safety classes will improve their food preservation and food safety practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	721

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

A sizeable percentage of Alaskans live a subsistence lifestyle or supplement their diets with fish and game meat. Alaska also has a large military population, and most have not previously canned or preserved game meat or fish. Our state has the nation's highest rate of botulism, a food-borne illness that occurs in low-acid foods such as fish and game meat. It is particularly important that we teach residents how to safely preserve these Alaska staples.

What has been done

Agents taught 65 food preservation classes in 20 communities. Fifty-six were hands-on classes in which participants practiced food preservation/safety skills. Agents and staff created three additional DVDs and six online modules for a how-to series about preserving local foods. Agents tested 783 pressure canner gauges with an average 15-20 percent failure rate. Nearly 65 percent of tested gauges required adjustment.

Results

Clients who practice hands-on food preservation skills will be able to continue to preserve foods safely. As more Alaskans learn the proper methods of preserving foods safely, the risk of botulism decreases. Clients who learn food preservation skills can be less dependent upon imported, high-cost food. An estimated 90 percent of Alaska food is imported, so food preservation training increases regional food security. Agents recommended that about 115 pressure canner gauges be replaced and about 500 required adjustment, resulting in safely canned foods. Our interactive food preservation Flash web modules and DVDs reach users who may not have access to food preservation classes. Sixty-four users have filled out surveys after viewing one or more modules and nearly all said they planned to use the information. One wrote: This is wonderfully simple to

use information and I am most pleased to have found it. Other Extensions use our food preservation resources.

4. Associated Knowledge Areas

KA Code	Knowledge Area
504	Home and Commercial Food Service
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #2

1. Outcome Measures

New varieties and new uses of animal and plant products will result in increased production of Alaska-based products. Outcome is number of products and publications.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Research conducted by through the UAF Agricultural and Forestry Experiment Station led to the development of a new variety of hullless barley in 2009 that matures early, grows well in Alaska and is low in gluten. Increased awareness of how this distinctive-tasting barley can be used will help create a demand for the grain and bolster agricultural production.

What has been done

CES food research technician worked at developing recipes for barley roll/hamburger bun and breakfast cookies for the Fairbanks North Star Borough School District central kitchen. The district School Nutrition Services expressed interest in locally grown foods through the Farm-to-School Program. Extension also developed nutrition labels requested by businesses for Alaska products. Plant Variety Protection (PVP) was placed on a new potato variety 29-6 developed at the Matanuska Experiment Farm.

Results

The Fairbanks school district has agreed to make the rolls for school lunches. When they do, they will purchase Alaska barley to do that. Nutrition labels were developed for three new Alaska barley products, including barley flour and barley bread. This helped producers meet USDA requirements. The PVP was transferred to a commercial grower to begin the first generation of seed production last summer.

4. Associated Knowledge Areas

KA Code	Knowledge Area
502	New and Improved Food Products
504	Home and Commercial Food Service

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Government Regulations
- Competing Programmatic Challenges

Brief Explanation

The small size of the Health, Home and Family Development Program staff in Alaska is a factor in the Food Safety area. Travel dollars are an issue because air travel is necessary for most agents to travel beyond their district office. Though agents have been successful in partnering with other governmental and private entities to make each travel dollar go farther, they are still unable to travel as often as requested. Staff vacancies have been an issue. The position in Juneau has been vacant for nearly two years. Extension currently has five agents that work in this area.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

A pop-up survey has yielded results for the online food preservation modules. The survey was created after staff brainstormed with an evaluation specialist. Respondents on the web module surveys reported that they found the modules very valuable (4 on a scale of 1 to 4). Sixty-four individuals have filled out online surveys for the modules, which have led to revisions. We also have gotten a better sense of what works in that format.

Key Items of Evaluation