2014 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, 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, coal deposits and two largest national forests. The state also contains an array of mineral deposits, including gold, zinc, boron, molybdenum and rare earth minerals. 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, herring, crab and shrimp 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 mostly extractive in nature. The use and management of these resources is a predominant force in the planning and delivery of teaching, research, Extension and engagement programs.

During the past 40 years, Alaska's economy has become dependent upon revenues related to petroleum development. To diversify its economy, the state is moving toward nonpetroleum natural resources for economic opportunities that are cost-effective and sustainable.

On July 1, 2014, the formal merger of the School of Natural Resources and Agricultural Sciences (SNRAS) and the Agricultural and Forestry Experiment Station (AFES) with the Cooperative Extension Service CES) resulted in a new combined unit named the School of Natural Resources and Extension (SNRE).

The programs of AFES and CES play a vital role in linking the knowledge generated at the university 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, providing a two-way linkage (engagement) between researchers and natural resource users to deliver the latest research findings, educational and outreach opportunities.

Planned programs for purposes of this report include Agriculture and Food Security; Natural Resources and Community Development; Healthy Individuals, Families and Communities; Youth Development; Climate Change and Ecosystem Management; and Sustainable Energy. Climate change, while addressed primarily in one planned program, affects all the program areas.

While Alaska imports a high percentage of foods and other agricultural products, growers in the agricultural sector produce fresh market potatoes, vegetables and herbs; forages, grains and manufactured livestock feeds; controlled environment products, which include bedding plants, florals, landscape ornamentals, and short season vegetables; and a variety of niche market crops. One such crop, peonies, is one of our success stories and Rhodiola rosea also shows potential as a new crop.

Livestock enterprises include dairy, beef, goat, swine, reindeer, poultry and nontraditional livestock species such as muskoxen, elk and bison. Producers need information specific to northern latitudes as consumer

demand increases due to changing preferences. As the population grows and transportation costs increase, more locally and regionally produced food will be needed to provide greater food security.

Many Alaskans live a subsistence lifestyle or supplement their diets with local fish and game meat. Alaska also has a large military population, and most have not previously preserved game meat or fish. Our state has one of the nation's highest rates of botulism, making it imperative to provide much needed information on safe preservation of these staples.

Alaska also has one of the fastest growing senior populations, who face the challenge of remaining active and healthy in a demanding environment. Other concerns that define health and nutrition programming are the high rates of child and adult obesity and diabetes. Indoor air quality is a particular Alaska concern.

High energy costs remain a critical issue, particularly in rural Alaska. Research and outreach have focused on new and alternative sources of energy, wood and biomass and energy conservation.

The mission of SNRE is to provide new information to manage renewable resources and to improve technology for enhancing the economic well-being and quality of life at high 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.

AFES priorities, like national priorities, are to enhance sustainability of food and agricultural systems; adapt to and mitigate the impacts of climate change; support energy security through the development of renewable natural resources; ensure a safe, secure, and abundant food supply; improve human health, nutrition and wellness; support environmental stewardship through the development of sustainable management practices; and strengthen individual, family, and community development and resilience. Experiment station scientists publish their 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 like websites and blogs.
Administratively, AFES is an integral part of SNRE. This association provides a direct link between research, teaching and outreach. Scientists who conduct research at the experiment station also teach, sharing their expertise with both undergraduate and graduate students, adult learners and Extension faculty.

Cooperative Extension's mission is to educate, engage and support the people and communities of Alaska, connecting them with their university. Extension 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, non-formal education, including conferences, workshops and cooperative work with community, regional and tribal partners. Outreach is also provided through publications, faculty consultations, newsletters and Facebook pages dedicated to district information and locally useful subject matter.

CES priorities address national priorities by helping families, youth and individuals be physically, mentally and emotionally healthy; enhancing workforce preparation and life skills; strengthening the profitability of animal and plant production systems; protecting our rich natural resources and environment; ensuring an abundant and safe food supply through horticulture and food preservation education; preparing for and responding to economic and natural disasters; and fostering greater energy independence.

Programming respects cultural and ethnic diversity and is responsive to emerging stakeholder needs and interests. Programs result from client requests, an active state advisory council, various regional and

subject matter advisory groups, surveys and needs assessments.

With the merger SNRE provides more unified support for agriculture, horticulture, forestry, and rural and economic development. Collaborations with other universities and with other units within the University of Alaska Fairbanks, the University of Alaska statewide system, federal and state agencies, nongovernmental organizations and private industry continue. Stakeholders include K-12 students, higher education students, researchers, individuals, businesses, industry, government, nongovernmental organizations, and families and communities throughout Alaska, the circumpolar North and the nation. SNRE brings the university to Alaskans while bringing community concerns and issues back to the university.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	40.8	0.0	24.9	0.0
Actual	49.6	0.0	20.4	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 Agricultural and Forestry Experiment Station uses the scientific peer review process to review and evaluate proposals, publications and specific annual reports that 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.

All new and revised Hatch (and McIntire-Stennis) project proposals undergo scientific peer review. The blind peer review panel is composed of a minimum of three members and 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 author(s) for revision if needed. The director reviews all comments and recommendations from the reviewers along with the revised proposal/publication/report. 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 associate director of research is a member of the MRC. All faculty who are participants in Hatch multistate projects are required to have an approved Hatch General project that is related to the field of study of the multistate project.

Extension has an evaluation specialist who conducts program outcome and impact evaluations, working

with faculty to evaluate individual programs. Many workshops and all conferences are evaluated.

Peer review of the Extension components of the POW consist of internal and external reviews by a panel of faculty and administrators. Extension's State Advisory Council conducts external reviews of programs. The different review panels assessed how well the activities and resources proposed in the plan contribute to achieving the proposed goals and established emphasis on climate change, chronic health issues, food security and safety, economic development, positive youth development and energy as priorities for the future. Collective feedback is incorporated into the Plan of Work.

Extension developed metrics for accreditation of the university by the Northwest Accreditation Commission. The accreditation covers Extension's outreach process, indicators and outcomes. The next round in the accreditation process is developing a strategic plan for the university, where engagement is a major theme. Extension research, teaching and outreach processes and measurements will be embedded in the new strategic plan. CES provides information to the university annually as part of its accreditation process.

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 (SNRE websites, newsletters, blogs and Facebook pages)

Brief explanation.

AFES's Advisory Council has nine members drawn from agriculture, natural resources, forestry, mine engineering and economic development. SNRE interacts 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
- Kawerak Inc., nonprofit Native association
- Reindeer Herders Association
- Alaska Northern Forest Cooperative
- Alaska Livestock Producers
- Association of Peonies Growers
- Alaska Food Policy Council

- On-demand meetings at the request of stakeholders
- Delta Harvest Wrap-Up

Since much of Alaska land is under federal and state agency control, natural resource stakeholders include government land managers.
Federal stakeholders for SNRE include:

- National Park Service
- USDA/NRCS, ARS, Forest Service
- Bureau of Land Management
- Bureau of Indian Affairs
- U.S. Fish and Wildlife
- U.S. Geological Survey

State stakeholders include:

- Fairbanks North Star Borough
- Matanuska-Susitna Borough
- North Slope Borough
- Alaska Northern Forest Cooperative
- Fairbanks Economic Development Corporation
- Department of Natural Resources
- Department of Environmental Conservation
- Division of Forestry
- School districts around the state

Extension sponsors agricultural and horticultural conferences and outreach activities. Formal and informal stakeholder input is gathered there. Stakeholders are also invited to serve on various conference planning committees. Outreach events in 2014 included the Delta Farm Forum, Alaska Produce Growers Conference, the Alaska Invasive Species Conference and the Harvest Wrap-Up. Extension coordinates the Alaska Wood Energy Conference each year.

Extension has a 13-member Statewide Advisory Council, which provides guidance about programming across the state. Representatives are drawn from all regions of the state. The State Advisory Council meets face to face once a year as well as through four audio conferences. Local advisory committees provide community input related to local program needs and interests. Additionally, advisory councils provide guidance on forestry, mining and 4-H programming.

Extension faculty members gather 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. 4-H has several programmatic audios with stakeholders that generate suggestions. CES also invites stakeholder participation through 21 district, 4-H and subject matter Facebook pages as well as an overall Facebook page. Forestry, 4-H, home economics, agricultural and Master Gardener newsletters also provide outlets for stakeholders.

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.

Stakeholders include individuals and groups who would logically benefit from Extension's services. Other stakeholders are partner agencies organizations and related stakeholder organizations. Examples include the Farm Bureau, Grange and Farmers Union, as well as Master Gardener associations and food banks. Additional stakeholder groups are Alaska Native tribal organizations, school districts and village governments who request services to help build community educational and development capacity. A number of stakeholders identify themselves by calling or e-mailing Extension faculty or staff. Individuals and groups have been identified through advisory committees, working with agencies that have similar missions, work with community, religious and workforce groups and other units of the university. Subject area advisory groups, 4-H leaders' organization and the State CES Advisory Council provide stakeholder input.

AFES stakeholders are research collaborators, partners in federal or state agencies who approach us with funding or needs, the public who often call and solicit assistance, graduate and undergraduate students, public schools that connect through reindeer programs or the OneTree program, K-12 teachers, and agriculturalists, forest land owners, entrepreneurs and other end user groups.

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

Brief explanation.

SNRE relies on stakeholder input from 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. Current major stakeholders include the Fairbanks North Star Borough, Matanuska-Susitna Borough, Reindeer Herders Association, Northern Forest Cooperative, Peony Growers Association, Fairbanks Economic Development Corporation, and industries involved in food, fiber and fuel/energy production. Feedback from the Georgeson Botanical Garden Society, local community supported agriculture groups, local

restaurants and resorts provide research direction.

Other significant stakeholder groups include state and federal and private organizations that have professional and programmatic relationships or direct interest in the unit's programming. Some of Extension's major stakeholder organizations include but are not limited to the Farm Bureau, Grange, Alaska Energy Authority, greenhouse growers, food banks, Boys and Girls Clubs, school districts and research service units of the university. Additional stakeholder groups are Alaska Native tribal organizations, school districts and village governments that request services to help build community, educational and development capacity. Input is collected from workshop participants and surveys following conferences, classes and workshops, by email or mail-in surveys. Input is also collected individually by agents who work with stakeholders and through programmatic advisory groups.

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.

SNRE joint research and outreach planned programs are directly related to the strategic plans produced by faculty as well as the direction set by administrative leadership. The AFES plan reflects ideas and advice given by client user groups, students, expert advisors, state and national peers and cooperators, and UAF administration. During the 2014 reporting period, the focus areas of climate change, local and regional food production and food safety, and the need for adult and youth education and training to fill Alaska job and career demands were addressed. These focus areas were used to set priorities in meeting the need for knowledge about Alaska and circumpolar resources. Input was considered in the budget process. Capacity funds were used in response to research needs based on the emerging focus areas.

The Extension strategic plan was developed with input from stakeholders, its advisory council and the public. Its focus areas include food safety and security, health, climate, energy, youth, families and communities, and economic development. Agents' work reflects the strategic plan. Stakeholder needs will continue to be a driving factor in determining Extension priorities and programming. Agents use stakeholder input to identify programming needs and work to offer programs and information that meet those needs. Stakeholder input in 2014 continues to support the need for youth outreach in rural Alaska, health and nutrition programming and programs on biomass and responsible wood burning. Interest in locally raised agricultural animals and food production continues to be high. Stakeholder involvement on conference planning committees and input at conferences led to specific topics and speakers at subsequent conferences. Interest continues for grazing management strategies in addition to animal reproduction and quality meat production techniques.

Brief Explanation of what you learned from your Stakeholders

Alaskans continue to desire information necessary to make decisions related to a healthy lifestyle and a healthy economy. Food security, energy, climate change, obesity, chronic health issues and youth development have risen to the forefront as areas of particular importance and are therefore leading to development of research and Extension programming particularly in subsistence, small farm agriculture and energy. There is also strong interest in local food production, health and nutrition programming, additional classes for parents and child care workers, and programs that focus on reducing violence, reducing energy consumption, and family finance, budgeting and estate planning.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1180481	0	1275263	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	2096787	0	549660	0
Actual Matching	980517	0	575107	0
Actual All Other	6841295	0	711912	0
Total Actual Expended	9918599	0	1836679	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	920525	0	0	0

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Agriculture and Food Security

☑ Reporting on this Program

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%		20%	
205	Plant Management Systems	25%		30%	
213	Weeds Affecting Plants	15%		0%	
216	Integrated Pest Management Systems	28%		0%	
301	Reproductive Performance of Animals	5%		10%	
302	Nutrient Utilization in Animals	5%		5%	
305	Animal Physiological Processes	2%		10%	
401	Structures, Facilities, and General Purpose Farm Supplies	5%		5%	
405	Drainage and Irrigation Systems and Facilities	0%		5%	
601	Economics of Agricultural Production and Farm Management	5%		0%	
903	Communication, Education, and Information Delivery	0%		15%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	3.1	0.0
Actual Paid	8.0	0.0	14.1	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**
681969	0	529813	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
318908	0	483055	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
2225096	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research and outreach were integrated to assure that best management practices appropriate to Alaska were provided to target audiences. Work continued in 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 agricultural production. An emphasis was placed on educating and training youth and adults for 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 provided individuals and businesses with important information. Increased reliance on the Internet and distance technology enhance delivery to more people. Partnerships assist in developing strategies to keep pest species below threshold levels. Outreach was provided through publications, Facebook, forums, tours, response to emails and phone calls and to walk-in stakeholders.

2. Brief description of the target audience

The target audiences include producers and consumers, communities, entrepreneurs, agribusinesses, industry leaders, 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. Others include arborists, farmers, garden and plant associations, public and commercial greenhouses, homeowner associations, landscapers, state and federal park employees, gardeners, museums, military base personnel, boroughs and urban municipalities, pest control operators, property managers, public health organizations, public and private schools, recreational facilities, resorts and hotels, rural residents, youth groups and school districts. Advisors and the target audience include: 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.

3. How was eXtension used?

Some agents said they did not use it. One agent said the eXtension biopesticides information was provided to PSEP participants statewide and she gave the eXtension URL for gardens and landscapes to her Master Gardener class. Another used the eXtension search engine for resources.

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	18587	137394	3325	7231

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

Patent Applications Submitted

Year:	2014
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	5	12	17

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

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

Year	Actual
2014	169

Output #2

Output Measure

- Output 2: Faculty will provide agricultural, horticultural and pest management information through one-on-one consultations and consultations with other organizations. Output measure will be contact hours.

Year	Actual
2014	5205

Output #3

Output Measure

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

appropriate to Alaska. Publications and presentations are the output measures.

Year	Actual
2014	17

Output #4

Output Measure

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

Year	Actual
2014	2

Output #5

Output Measure

- Output 5. Focus will be on best management practices for livestock management and production. Output measures will be publications and presentations.

Year	Actual
2014	21

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Outcome 1: Increase agronomic crop producers' ability to understand and assess best management practices of crop production. Measure will be workshops and publications.
2	Outcome 2: Increase livestock producers' ability to understand and assess optimum production practices.
3	Outcome 3: Increase participants' commercial and home horticulture best management practices.
4	Outcome 4: Increase the number of adopters of new technology and management practices.
5	Outcome 5: Increase the number of activities that monitor and control invasive species and pests.
6	Outcome 6. Improve and support horticultural producers' ability to understand and assess optimum production practices of promising new crops. Measure will be the number of producers assisted.
7	Outcome 7: Increase agronomic crop producers' ability to understand and assess best management practices of crop production. Measure will be number of individuals who adopted improved production techniques.
8	Outcome 8: Increase recognition of the value of weed-free forage and train individuals who are certified to become weed-free forage inspectors. Measure will be the number of inspectors trained and certified weed-free field inspections.
9	Outcome 9: Increase the number of individuals who are trained to safely apply pesticides. Measure will be the number of individuals trained for pesticide application.
10	Outcome 10: Multistate collaboration between researchers and producers could lead to new knowledge.
11	Outcome 11: Increase participants' commercial and home horticulture optimum food crop growing techniques and improve management practices. Measure will be the number of individuals who adopt improved practices.
12	Outcome 12: Increase producers knowledge of home and commercial production of poultry in Alaska. Measure will be the number of individuals who attend poultry educational activities.

Outcome #1

1. Outcome Measures

Outcome 1: Increase agronomic crop producers' ability to understand and assess best management practices of crop production. Measure will be workshops and publications.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
A success story: The Alaska Flour Company grows and mills Sunshine hulless barley, a variety developed at the Fairbanks Experiment Farm. The owners, Bryce and Jan Wrigley, recognize that Alaska needs to create a food system that requires resources, market opportunity and a favorable business climate. He said Alaska's food insecurity is daunting, with 95 percent of our food imported, but they saw this as an opportunity.

What has been done
The Wrigleys were already grain farmers, but in 2010 they switched to growing 200 acres of Sunshine barley. The family analyzed the market, visiting other flour mills in Idaho, such as Pendleton Mills and Lehi Mills. They contacted an equipment broker, built a grain-cleaning building, bought packaging and purchased a truck. They had to get building, truck, content, product liability and commercial insurance policies. Five years later, they have built a new successful small industry.

Results
Products started with barley flour and now include whole barley, cream of barley cereal, roasted barley tea, barley couscous, two pancake mixes, whole cracked barley, barley brownie mix and a chocolate chip cookie mix. Marketing is done through presentations, Facebook (https://www.facebook.com/AlaskaFlourCompany) and their online store located at http://alaskaflourcompany.com/store.html. Their products are also being sold in Delta Junction, three stores in Fairbanks and two stores in Anchorage.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
213	Weeds Affecting Plants
216	Integrated Pest Management Systems

Outcome #2

1. Outcome Measures

Outcome 2: Increase livestock 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
2014	67

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 agritourism 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.

What has been done
The livestock specialist taught workshops on environmental physiology and hay quality at three communities where livestock is raised. He also presented information about sustainable livestock practices and production and Alaska's red meat industry at the Circumpolar Agriculture Conference. The Extension veterinarian worked with other animal scientists to develop a survey for producers to determine what their needs are. The new veterinarian also began development of three YouTube videos aimed at producer education. Both consulted with livestock producers.

Results
The producers survey will be distributed in FY15 and guide future educational programming for producers. The YouTube videos on judging livestock condition, medicating livestock and identifying sick livestock will be released in FY15. As a result of a consultation with the livestock specialist, a producer has obtained Alaska-bred cattle with the goal of raising cattle for in-state

use and export to the Asian market.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
401	Structures, Facilities, and General Purpose Farm Supplies
601	Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures

Outcome 3: Increase participants' commercial and home horticulture best management practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	83

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Commercial and home growers produce flower, landscape and vegetable bedding plants. They face many of the same growing challenges as other producers, including a short growing season, cold soils and limited soil fertility. Research, education and outreach help them face these challenges and support new markets. Commercial peony production has begun to be profitable for growers.

What has been done
Seventy-four Alaskans have planted peony roots for cut flower production; 51 of these growers have achieved commercial status (> 500 plants in the ground). The remaining members of the peony association are preparing ground for future plantings. Research and outreach supported production. Agents provided support to 67 potential and existing peony growers with site visits, soil analysis, weed management presentations and grower consultations. Two workshops reached 51 individuals interested in growing peonies in home gardens or commercial operations. The AFES peony expert presented peony growing information to a gardening symposium and a

soil scientist presented research findings at a peony growers conference.

Results
Growers harvested 75,264 fresh-cut peony stems in 2014, more than double the yield in 2013. Alaska-grown flowers were shipped to 34 states and to markets in Alaska and Canada. Stems sold for $2 to $7 per stem. With an estimated yield of 10 stems per plant, we estimate the harvested yield of fresh-cut peonies will exceed one million stems by 2017. Although the outlook is positive, statewide yields are not sufficient to meet the demands of international markets at this time. The peony market is a direct result of AFES research and AFES/CES grower support. Evaluations from 16 participants in one peony workshop indicated they learned skills relating to preparing soil for peonies, peony diseases, pests and fertilizing.

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
405	Drainage and Irrigation Systems and Facilities
601	Economics of Agricultural Production and Farm Management

Outcome #4

1. Outcome Measures

Outcome 4: Increase the number of adopters of new technology and management practices.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
With Alaska still importing most of its food, the ability to grow wheat would greatly improve its food security. Wheat varieties were developed long ago with no recent improvements for Alaska conditions.

What has been done
An AFES researcher and a graduate student at Washington State University have crossed several types of wheat to achieve a hard red spring variety that matures early and is shatter resistant. Evaluations are continuing of the three crosses to include non-shatter seed when ripe; early maturity; and high yields, no lodging. All will be compared to the same qualities of the parent, Ingal, and the three Canadian wheat varieties.

Results
The graduate student earned her Ph.D. in crop science from WSU and credits Glen Franklin of Delta Junction for helping fund her research. Franklin, retired from the Alaska Division of Agriculture, established an endowed graduate fellowship in crops and soils at WSU, stipulating that the research should benefit Alaska and Washington. One farmer in Palmer grew the new wheat and sold all his products in Anchorage markets.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #5

1. Outcome Measures

Outcome 5: Increase the number of activities that monitor and control invasive species and pests.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	5

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 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 integrated pest management staff hosted 89 workshops and presentations and worked with producers, agencies and individuals to identify 739 insect, plant and disease specimens. Development began on a phone app individuals will be able to use to identify invasive plants. A webinar series on invasive species management issues continued with presentations on weed seedling identification, trees and bird vetch, sweetclover and knotweed control. Pest technicians placed 243 insect-monitoring traps for species of concern, including the gypsy moth and nun moths. An invasive species conference was hosted in Fairbanks.

Results
IPM staff reported 6,624 contacts. The program serves as a proactive first detector for monitoring and outreach. No gypsy, nun, Siberian silk or rosy gypsy moths were detected with trapping efforts. The webinar series involved participants with affiliations ranging from the Department of Transportation and the Alaska Railroad to various landscape businesses, farmers and government land managers. The annual invasive species conference brought agencies and individuals together to coordinate invasive species response and research, especially regarding elodea and sweet clover. Following the Fairbanks conference, 70 percent of individuals who filled out evaluations indicated they had applied knowledge gained from past conferences. Ninty-five percent of respondents indicated they would use information gained from this conference. Continuing education credit was offered to certified pesticide applicators who attended.

4. Associated Knowledge Areas

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

Outcome #6

1. Outcome Measures

Outcome 6. Improve and support horticultural producers' ability to understand and assess optimum production practices of promising new crops. Measure will be the number of producers assisted.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	55

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Rhodiola rosea is a medicinal plant that is native to Siberia and other cold regions. Since Alaska has cold soils, a short growing season but long day-length, rhodiola could be an ideal new horticultural crop. Information is still needed on growing conditions and protocols for harvesting and processing the roots, which are ready for harvest in four to five years.

What has been done
Agents provided support to 32 potential and existing Rhodiola rosea growers with site visits, soil analysis, weed management presentations and grower consultations. An agent assisted with the second commercial harvest of rhodiola and continued developing the protocols for processing the medicinal plant. He taught a workshop to 24 potential rhodiola growers. A specialty crop grant written by CES paid for a researcher to analyze chemical markers during the 2014 season.

Results
Rhodiola presentations and grower meetings have contributed to the beginnings of a new Alaska crop. According to the rhodiola cooperative, 12 farmers had 1,000 or more plants in the ground in the summer of 2014 and four producers had planted commercial quantities. One had 25,000 seedlings. Two farmers had their first harvest in 2014. A rhodiola cooperative processed one farmer's harvest with volunteers, which resulted in 150 pounds of dried root, which has been sold to individual buyers and a neutraceutical company. A third farmer's crop resulted in 380 pounds. Buyers have indicated an interest in buying a larger volume, according to the cooperative, which is selling the root for $18 to $30 a pound. The biochemical analysis provided information about root chemistry that is important to marketing and the ideal conditions for harvest. Protocols were developed for harvesting the plants to increase rosavin content.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
213	Weeds Affecting Plants
601	Economics of Agricultural Production and Farm Management

Outcome #7

1. Outcome Measures

Outcome 7: Increase agronomic crop producers' ability to understand and assess best management practices of crop production. Measure will be number of individuals who adopted improved production techniques.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	40

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
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
Several educational events were targeted to increase growers' knowledge and ability to raise agronomic crops. The Delta Farm Forum offered information about crop insurance and farm agency updates. The Produce Growers Conference included presentations on potato disease and growth numbers and on EQIP programs relating to nutrient management, and the Sustainable Agriculture Conference featured presentations on no-tillage grain production, potato diseases and organic seed potato production. An agent also presented information about growing grains at high latitudes. Nutrient and pest management plans were provided to agronomic producers associated with EQIP long-term contracts.

Results
Through the EQIP program in Delta and Kenai, 28 producers applied pesticides and nutrients at the specified rates and were educated in weed scouting and identification and soil sampling. Produce Growers Conference evaluations showed that participants of previous conferences used information on potato production, including varieties, disease concerns, fertility recommendations and soil testing. They also suggested topics for the 2015 conference. Nine participants in the farm forum indicated that they would use information about farm management, invasive plant control and future planting options.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
213	Weeds Affecting Plants
601	Economics of Agricultural Production and Farm Management
903	Communication, Education, and Information Delivery

Outcome #8

1. Outcome Measures

Outcome 8: Increase recognition of the value of weed-free forage and train individuals who are certified to become weed-free forage inspectors. Measure will be the number of inspectors trained and certified weed-free field inspections.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	56

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
State and federal agencies may require individuals who cross their lands to use certified weed-free straw and hay. Demand for the premium-priced certified hay and straw is increasing due to more stringent requirements by federal and state agencies, as well as informed consumers. Federal refuges require the use of certified weed-free gravel.

What has been done
The Certified Noxious Weed-Free Forage Program educates grain and hay growers on management of particular invasive weeds in their crops. The Delta agent regularly receives inquiries from the Bureau of Land Management and from organizers of the two long-distance sled dog races, the Yukon Quest and the Iditarod, about the availability of certified straw. Agents also trained certified weed-free forage and gravel inspectors. During 2014, Extension provided 22 field inspections to certify weed-free forage and four inspections of gravel pits and consulted with 42 producers and inspectors.

Results
Field inspections of more than 1,800 acres of straw and hay led to weed-free forage certification of 800 acres and a higher price per bale for growers. The program encourages the in-state production of an inspected certified commodity for purchase and use by folks accessing the back country. The gravel and forage inspections will limit the spread of noxious weeds to natural ecosystems. Agents and staff trained 32 certified weed-free forage and gravel inspectors, many associated with state and federal land management. Because of an increased number of inspectors, the acreage of forage inspected in the Kenai area increased from 61 acres in 2013 to 202 acres in 2014. The first four gravel pit inspections occurred, covering 15 acres.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems
903	Communication, Education, and Information Delivery

Outcome #9

1. Outcome Measures

Outcome 9: Increase the number of individuals who are trained to safely apply pesticides. Measure will be the number of individuals trained for pesticide application.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	162

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Pesticides can be important tools, but they can pose risks if improperly used. Alaska regulations require that anyone who engages in the custom, commercial or contract use of a pesticide or acts as a pesticide consultant must first become a certified pesticide applicator and must recertify every three years.

What has been done
Extension provided pesticide applicator training and the certification exam to individuals in Delta Junction, Anchorage, Palmer and Soldotna and eight rural locations via distance delivery. Because of the difficulty individuals had completing the challenging math on the certification exam, two agents developed problems similar to the ones on the test and posted them on YouTube so individuals could practice beforehand. Continuing education credit required for recertification was offered at several conferences and webinars.

Results
Eighty-nine individuals were trained to safely apply pesticides at the three-day trainings and 73 applicators received continuing education. The Alaska Department of Environmental Conservation's most recent information reported an 89 percent exam pass rate for individuals trained by CES. Evaluations of two of the three-day pesticide application classes show that all 12 individuals increased their knowledge about pesticide labels, how speed, pressure and nozzle size affect application, product formulations, and state and federal regulations. Participants said they intend to read labels more than once, wear protective clothing, tank mix pesticides where possible and wash pesticide-soiled clothing separately. Individuals who were trained on aquatic

applications applied herbicide on three bodies of water on the Kenai Peninsula to help initiate eradication of the waterweed elodea.

4. Associated Knowledge Areas

KA Code	Knowledge Area
213	Weeds Affecting Plants
216	Integrated Pest Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #10

1. Outcome Measures

Outcome 10: Multistate collaboration between researchers and producers could lead to new knowledge.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Research on good nutrition, which is crucial to maintain healthy reindeer herds in Alaska, is one of the key components of the Reindeer Research Program at the University of Alaska Fairbanks. In a new collaboration with the Reindeer Owners and Breeders Association, RRP has launched a study of "super willows" to determine if they could be beneficial for the reindeer diet.

What has been done
A shipment of 92 hybrid willow saplings from New York was planted at the Fairbanks Experiment Farm, in one plot that is naturally wet and one that is drier. Advice and assistance came from UAF horticulturists about best planting strategies. A moose fence was built around the plots to prevent browsing. RRP researchers will conduct nutritional studies and compare the "super willow" to other types of willow. Eventually, there will be a feed trial protocol.

Results
Free range system reindeer are highly dependent on the high protein of willows for muscle development. Willows are high in protein and reindeer utilize that in their muscles. Calves grow so

fast the amount of protein and energy they require is quite high. Free range reindeer are well adapted to the arctic environment and have learned how to use forage. For producers raising them behind fences, nutrition research is imperative.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
213	Weeds Affecting Plants
302	Nutrient Utilization in Animals

Outcome #11

1. Outcome Measures

Outcome 11: Increase participants' commercial and home horticulture optimum food crop growing techniques and improve management practices. Measure will be the number of individuals who adopt improved practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	425

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. The Sustainable Agriculture Conference provided home and commercial horticulture information about vegetable plant breeding, attracting beneficial insects and pollinators, soil fertility and establishing a farm. Nutrient and pest management plans were provided to horticulturalists associated with EQIP

long-term contracts. An agent has provided garden assistance to refugees from Bhutan who raised and sold produce at farmers markets.

Results

One hundred sixty-four Master Gardeners were trained and practiced the techniques they were taught. Nine months after the basic Master Gardener class in Anchorage, all 12 participants who responded to a survey said they had used course information, including growing new varieties or plants, fertilizer practices and pest management techniques. Thirty-eight participants of Sustainable Agriculture conference made changes in use of root cellars, fertilization, weed management, marketing and soil testing as a result of previous conferences. Agents worked with 168 high tunnel growers and other horticultural growers who were educated in weed identification and soil sampling and improved soil conservation. The refugee gardeners raised and sold produce valued at $10,300. Eight of 15 gardeners had not gardened previously.

4. Associated Knowledge Areas

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

Outcome #12

1. Outcome Measures

Outcome 12: Increase producers knowledge of home and commercial production of poultry in Alaska. Measure will be the number of individuals who attend poultry educational activities.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	198

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Raising poultry is challenging in Alaska conditions. Alaskans have expressed interest in raising chickens because of a greater interest in growing local foods and more lenient urban rules about raising poultry. Raising chickens increases Alaska food security through egg and meat production.

What has been done

Three agents taught seven classes to 198 individuals in four communities, providing information about raising chickens, coop design and safe egg production. A DVD was developed on raising chickens from chicks to full-grown laying hens, with information about varieties, equipment and tips for becoming an egg producer.

Results

Participants in chicken classes learned how to provide their own meat and eggs safely. Participants indicated that they would select appropriate breeds and build coops for cold climates, change perch design and wash eggs in water that is 90 degree or hotter to prevent E. coli and salmonella. Home and farm visits have shown that Alaska flocks are experiencing a much lower incidence of cold weather injury. Following a poultry processing practicum at the Juneau Chicken Summit, two participants expressed interest in broiler chicken production and others indicated that information would improve their current operations. As a result of evaluations from the 2013 Chicken Summit, the 2014 summit included the practicum and spread lectures and coop tours over two days to allow more people to participate. As a result of the 2014 evaluations, tracks for beginning and advanced growers were planned for the 2015 summit.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
305	Animal Physiological Processes
401	Structures, Facilities, and General Purpose Farm Supplies
601	Economics of Agricultural Production and Farm Management

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, fertilizers and other inputs impacts the productivity and the economic viability of horticultural and agricultural operations in the state. The small number of agricultural faculty and staff presents a challenge to providing a supporting role for horticultural and agricultural production. In a state where oil production is a top priority, agriculture is relegated to a much lower priority by policymakers**.** Other challenges include the geographic distances between communities and high transportation costs involved in traveling to communities off the road system. IPM contact numbers remained lower than usual in 2014 because of an unfilled full-time position for the entire year. Economic factors will affect the experiment station as retiring faculty and staff and the inability to replace them affects research productivity.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

CES agents used surveys after major conferences and many agents surveyed following individual classes. We are learning through surveys what areas interest clients for future programming and what they have used from previous workshops.
Comments on the 2013 Chicken Summit led to additional programming in 2014, including a chicken processing workshop and coop tours spread over two days.
Comments on the 2014 Sustainable Agriculture Conference evaluation indicated that 38 people have used information from past conferences, including information about cover crops, soil fertility, composting, weed management and rainwater collection.
Nine months after the basic Master Gardener class in Anchorage, all 12 participants who responded to a survey said they had used course information, including information about how to grow new varieties or plants, fertilizer practices and pest management techniques**.**
Produce Growers Conference evaluations showed that participants of previous conferences used information on potato production, including varieties, disease concerns, fertility recommendations and soil testing. They also suggested topics for the 2015 conference.
Chicken Summit evaluations by five individuals indicated that all considered the summit to be either good or excellent. They particularly liked presentations on coop designs and materials and specific breed characteristics, and a chicken experts panel.
Evaluations from 16 participants in one peony workshop indicated they learned about skills relating to preparing soil for peonies, peony diseases, pests and fertilizing.
Participants were surveyed five months after completing an herb workshop and 65 percent of the 17 respondents said they had grown herbs they had never grown before, and 40 percent changed their production practices for basil or cilantro.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Natural Resources and Community Development

☑ Reporting on this Program

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	0%		20%	
111	Conservation and Efficient Use of Water	10%		0%	
112	Watershed Protection and Management	15%		0%	
122	Management and Control of Forest and Range Fires	10%		0%	
123	Management and Sustainability of Forest Resources	10%		30%	
131	Alternative Uses of Land	10%		0%	
134	Outdoor Recreation	5%		20%	
404	Instrumentation and Control Systems	5%		0%	
605	Natural Resource and Environmental Economics	15%		10%	
608	Community Resource Planning and Development	15%		10%	
610	Domestic Policy Analysis	5%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	1.9	0.0
Actual Paid	3.0	0.0	0.8	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**
135142	0	19847	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
63196	0	51250	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
440933	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research products will provide science-based information on resource planning, the economic and environmental impact of natural resource use involving market and nonmarket value of resources, and land planning issues in urban and rural communities.

Measurable outcomes will include peer-reviewed and lay publications, rural community business development plans and citizen participation. Extension activities involve partners from other UAF units as well as AFES to make sure that the information provided to stakeholders is relevant to their needs.

Integrated and/or multistate projects concerning natural resources stewardship will provide collaboration and engagement with other land-grant institutions, Extension and federal partners.

Activities will address the needs of Alaskans most directly impacted by specific natural resource matters. Partnerships will be developed and/or maintained that address emerging natural resources issues.

Specific activities will include literature reviews; reviews of contemporary research relevant to the program; lay publications that provide unbiased, scientific information about natural resources issues; website development for natural resources issues; Extension workshops, demonstrations and basic skill trainings; public meetings and discussions; 4-H and FFA projects; and young adult stakeholder workforce readiness trainings. AFES and CES will continue to pursue joint appointments and collaborative activities.

2. Brief description of the target audience

This program will focus on industry and entrepreneurs, including communities, families newly forming cooperatives and businesses, and 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 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; persons in natural resource-related occupations who wish to increase their skill and/or knowledge level; and federal and state agencies.

3. How was eXtension used?

An agent answered eXtension Ask an Expert wood energy questions. Two agents regularly used eXtension's search engine. Another agent is developing content for the Climate, Forests and Woodlands Community of Practice.

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	2329	26772	681	1409

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

Patent Applications Submitted

Year:	2014
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	1	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

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

Year	Actual
2014	77

Output #2

Output Measure

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

Year	Actual
2014	27

Output #3

Output Measure

- Output 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
2014	5

Output #4

Output Measure

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

Year	Actual
2014	3

Output #5

Output Measure

- Output 5. Develop regional economic models for Alaska resource management scenarios. Output will be models, presentations and publications.

Year	Actual
2014	5

Output #6

Output Measure

- Output 6. Develop and implement public involvement in natural resource issues. Output measure will be public input sessions and publications.

Year	Actual
2014	12

Output #7

Output Measure

- Output 7. Provide analysis of natural resource and environmental laws. Output measure will be presentations, workshops and publications.

Year	Actual
2014	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Outcome 1: Increase and maintain partnerships with stakeholder groups, government agencies and other institutions that will enhance the land-grant mission.
2	Outcome 2: Increase the number of integrated and multistate research-extension activities.
3	Outcome 3: Increase the recruitment and retention of youth appreciating and considering natural resource management careers.
4	Outcome 4. Increase public involvement in natural resource and community development issues. Outcome measure will be the increase in number of communities.
5	Outcome 5: Increase public knowledge about the use of firewood to heat homes while addressing air quality concerns. The measure will be the number of individuals who participate in wood energy educational outreach events.
6	Outcome 6: Increase familiarity with GPS and GIS software to improve the use of the navigation and land planning software. The measure will be the number of individuals who participate in the hands-on geospatial outreach events.
7	Outcome 7: Increase and maintain partnerships with outdoor recreation stakeholder groups, government agencies and other institutions that will enhance the land-grant mission. Measure is presentations and publications.

Outcome #1

1. Outcome Measures

Outcome 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
2014	0

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, about 100 million acres are state lands and 218 million are federally managed. AFES provides 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 research. CES promotes economic development and meets other community and rural needs. Partnerships are critical to assuring this happens. Our partners work with us, often assisting in the research and outreach efforts.

What has been done
Important partnerships included the Alaska Energy Authority, the U.S. Forest Service, Alaska Division of Forestry, Alaska Department of Fish and Game and the Cold Climate Housing Research Center. CES organized the 2014 Alaska Wood Energy Conference for the energy authority and coordinates its Wood Energy Development Task Group. The Division of Forestry supports CES forest stewardship outreach and coordination of Project Learning Tree program. Fish and Game funded forest grouse survey research. The National Park Service collaboration has proved invaluable.

Results
The wood energy task group evaluated requests for pre-feasibility studies to increase the utilization of wood for energy in public facilities. The wood energy conference brought multiple agencies, individuals and industry together to consider rural energy and Interior heating concerns. Work with the Division of Forestry and the Cold Climate Housing Research center extended knowledge about wood heat, biomass, firewood, forest stewardship and woodstove safety, which is important because of high energy costs in rural and urban Alaska. Ongoing research on forest grouse surveys helped Fish and Game and state forestry determine timber harvest and habitat effectiveness programs. The collaboration between the National Park Service and a researcher

has resulted in the NPS contact teaching a course to undergraduates. The researcher continues to develop tools that are being adopted nationwide, and student internships are available.

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
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 2: Increase the number of integrated and multistate research-extension activities.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	12

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Alaska's geographic isolation and the high cost of travel from the state present challenges to maintaining multistate relationships. At the same time, many issues, particularly natural resources, energy and climate change, have implications that extend well beyond our borders. Tapping into other states' experiences and research will strengthen our ability to assist Alaskans. Integrated activity between researchers and Extension provides the best possible information for stakeholders.

What has been done

A CES/AFES agent has worked to extend Alaska's forestry markets and provide wood energy, emergency preparedness and forest education outreach. As a member of the ANREP initiative on climate change, the agent was trained to deliver climate change adaptation workshops and participated in emergency preparedness workshops related to natural disasters. Agents have collaborated with Extension in other states on tourism resources and on GIS activities.

Results
Forest outreach included workshops and clases on birch tapping, log construction class, harvesting and weaving birch bark, other forest products and youth outreach. An agent co-presented a module on risk and vulnerability at the ANREP National Extension Climate Science Initiative Conference and an in-service workshop. An outreach event included forestry research information on estimating wood usage.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

Outcome #3

1. Outcome Measures

Outcome 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 Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Youth who are introduced to natural resource issues though an organization or agency in their community are more likely to consider natural resource careers. Youth and students want to

participate in field and classroom activities relating to natural resources.

What has been done
4-H offered a number of activities that introduce youth to or foster an appreciation of science, including natural resources. These include workshops, special activities such as a service and natural resource camp in Seward, a harvest camp in Juneau and a spirit camp in Prince William Sound that provided lessons in marine biology. Other activities included coaching an Envirothon team and programs with partners, including the Anchorage Museum and Campbell Creek Science Center. Teachers were trained on outdoor forest education activities and other outdoor education.

Results
Of recently graduated Alaska 4-H seniors, 78 percent are attending college and a few study natural resources at the university. Twenty-six college students who were elementary school or middle school student teachers were trained in the forest outreach education in Fairbanks and 47 teachers were trained in Anchorage. Through hands-on activities, the program trained educators to show students to how to think about complex environmental issues. Evaluations of 22 participants in Fairbanks showed that 16 rated the workshop a 4 or 5 (on scale of 5) on whether the workshop prepared them to use materials. Most thought they could use them several times a year.

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 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 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Alaska communities, large and small, seek to broaden economic opportunities. Tourism in Alaska is dominated by large tour companies from Outside but there are community development opportunities for small tour operators and for beneficial local tourism based on the culture, aesthetics, heritage and environment of the communities.

What has been done
A group of smaller Alaska tour operators and communities have developed a charter for a geotourism group to develop tourism opportunities. Extension worked with the Bristol Bay Native Association to help deliver workshops in Naknek and Dillingham about geotourism and hosted a familiarization tour for three small tour operators in Naknek and King Salmon. Based on the life of a Japanese immigrant, geotourism events and performances are being planned in several communities in FY15.

Results
Two rural tourism projects have been initiated by regional stakeholder groups. Several communities have become interested in the life of Jujiro Wada, who helped pioneer the Iditarod Trail and was a marathon athlete, adventurer and dog musher. Memorial groups have developed in Japan, Alaska and the Yukon Territory. A 100-plus group from Japan will be touring to these communities and putting on a musical about Wada's life, called "The Samurai Musher," in Seward, Wasilla, Fairbanks and Anchorage. Participants on the tour are cultural tourists interested in seeing where Wada lived in Alaska. The Bristol Bay Native Association and several residents have begun to explore a geotourism site on Naknek Lake, which would include the entire Bristol Bay region, and are considering other possibilities for the culturally curious traveler.

4. Associated Knowledge Areas

KA Code	Knowledge Area
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

Outcome #5

1. Outcome Measures

Outcome 5: Increase public knowledge about the use of firewood to heat homes while addressing air quality concerns. The measure will be the number of individuals who participate in wood energy educational outreach events.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	258

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Heating costs are high in Interior and rural Alaska and heating with wood is a viable solution for many communities. The increased use of wood stoves and outdoor wood boilers in some communities has contributed to poor air quality. Burning seasoned firewood in an efficient stove is critical to holding down energy costs and reducing air pollution.

What has been done
CES coordinated the Alaska Wood Energy conference in April 2014. Participants included community and tribal leaders, industry representatives, agency representatives from the state and federal government, and the public. The three-day conference highlighted rural energy and Interior heating concerns, including the sustainable harvest of wood and air quality. Free evening workshops were aimed at residential wood users. Other outreach efforts have emphasized the importance of seasoning firewood and burning responsibly to reduce air quality problems. A consumer wood energy website is maintained at www.alaskawoodheating.com.

Results
The Alaska Wood Energy website maintained by Extension had more than 53,000 hits from wood users looking for information about wood stove safety and wood heating options. Eight workshops taught to 127 individuals have focused on the importance of cutting, stacking and curing firewood to reduce burn efficiently and reducing pollution from firewood. Participants at the wood energy conference were introduced to different heating options and technologies and techniques to manage particulate matter. Of the 32 individuals who completed conference evaluations, most said that sessions were useful to them. They indicated that the most useful sessions included forestry practices to produce fuel, a pellet presentation and new technologies. The evaluation also provided presentation ideas for the 2016 conference.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
608	Community Resource Planning and Development

Outcome #6

1. Outcome Measures

Outcome 6: Increase familiarity with GPS and GIS software to improve the use of the navigation and land planning software. The measure will be the number of individuals who participate in the hands-on geospatial outreach events.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	386

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
GPS is a crucial navigational technology used by hunters, boaters, hikers, etc. Most users do not know the potentially life-threatening technological pitfalls behind GPS. GPS data displayed through GIS helps individuals analyze topographic, environmental and land use data.

What has been done
Agents taught 10 geospatial classes introducing individuals to GPS and also explained the different coordinate systems. Audiences included hikers, hunters, boaters and youth. An agent also developed a portable 10-station geospatial technology lab that he began using to teach non-formal short courses in GIS and GPS. He used the lab to train on site in rural communities, including a three-day training with federal and tribal land managers in Nome.

Results
In all, 386 individuals attended GPS or GIS training courses, including 241 youth. The GPS training taught individuals how to navigate using the device. Participants learned to identify the four major coordinate formats and the appropriate map datum (mathematical earth surface model) for the type of topographical map they are using. The geospatial lab is important because there are few private consulting firms that can provide GIS and GPS training. Those that do provide the service often charge more than $1,000 a day per person for a program. The lab allowed an agent to offer the training in Nome at a reduced rate. The lab can also be dispatched anywhere in the state where there is a need for a large-scale emergency response. The National Park Service has requested use of the lab in case there is a devastating earthquake or other natural disaster.

4. Associated Knowledge Areas

KA Code	Knowledge Area

134	Outdoor Recreation
404	Instrumentation and Control Systems

Outcome #7

1. Outcome Measures

Outcome 7: Increase and maintain partnerships with outdoor recreation stakeholder groups, government agencies and other institutions that will enhance the land-grant mission. Measure is presentations and publications.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The beneficial outcomes associated with outdoor recreation are supported by a large emerging body of evidence. Physiological benefits of physical activity include the positive impacts on longevity and mitigation of the onset of conditions including heart disease, diabetes, and colon and breast cancer. Reduced systolic blood pressure and increased immune function is also indicated. Psychological benefits as well as economic benefits have been documented.

What has been done
To assess the benefits of recreation and to improve management of park systems, surveys have been developed. These were tested on recreational visitors in Alaska. Findings show that previous methodologies employed in the United States were too general. Results were published and shared with the Bureau of Land Management and researchers at other universities.

Results
Results were presented to a BLM discussion group. This increased understanding of the BLM staff's knowledge and understanding of measures of recreation benefits, especially how those measures relate to management plans the BLM must complete for lands they manage. The new model proposed will advance our understanding of the recreational experience and after OMB review and approval will be applied nationwide.

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

External factors affecting Alaska natural resources include extreme weather events such as abnormal warm winter temperatures, which cause rain and ice storms in the subarctic winter. These high temperatures have resulted in unfrozen seas in Western Alaska, which buffet the coast causing massive coastal erosion, hurricane force wind storms that blow down acres of trees and drought, which has reduced tree growth and made the forests susceptible to insect predation and forest fire. Although Alaska is an oil-producing state, the petroleum-refining facilities are limited. Most petroleum used in Alaska comes from West Coast refineries, which significantly increases gasoline, diesel and heating fuel costs in rural Alaska communities. Likewise, much of the state's vast natural gas deposits are located far from population centers and pipelines. Meanwhile, state government wrestles with a burgeoning budget and the drop in oil production. Long distances between rural communities that are not on a road system and accessible only by plane or boat affect development and our ability to offer programs. Health and education of rural residents is slowly improving but is not on par with rural towns in the rest of the country.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Of the 32 individuals who completed Alaska Wood Energy Conference evaluations, 26 said the conference met their expectations and most said that sessions were useful to them. They indicated that most useful to them were forestry practices to produce fuel, a pellet presentation and new technologies. The evaluation also provided presentation ideas for the 2016 conference. Evaluations of 22 participants in the Project Learning Tree training showed that 16 rated the workshop a 4 or 5 (on scale of 5) on the question of whether the workshop prepared them to use materials in their classrooms. Most thought they could use them several times a year.

Key Items of Evaluation

A change of action has resulted from the development of a survey tool for outdoor recreation, which is in the process of adoption nationwide by the National Park Service. It will assist them in designing better management plans.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Healthy Individuals, Families and Communities

☑ Reporting on this Program

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 and Social Services	5%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	7.6	0.0	0.0	0.0
Actual Paid	6.9	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**
516895	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
241715	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
1686499	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct workshops, meetings
- Develop and deliver curriculum
- Consult with clients
- Provide training
- Develop products
- Partner with other agencies and organizations
- Write numbered publications, fact sheets, articles
- Work with media
- Facilitate events, activities and teachable moments

2. Brief description of the target audience

- Parents and caregivers of children
- Schoolchildren
- School teachers
- Individuals interested in healthy lifestyles
- Low income individuals and families
- Women with young children
- Clients interested in food preservation and a subsistence lifestyle
- Clients who need assistance with finances
- Human development and social work professionals
- Individuals and professions interested in emergency preparedness
- Food banks
- Housing and energy authorities and organizations
- Home and building owners
- Individuals interested in emergency preparedness

3. How was eXtension used?

Three agents said they looked up information on the site several times last year. Five agents attended Terry Meisenbach's training in Anchorage and Fairbanks and an agent referred two new moms to the Just in Time parenting program.

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	10844	850170	929	44745

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

Patent Applications Submitted

Year: 2014

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	2	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

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

Year	Actual
2014	290

Output #2

Output Measure

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

Year	Actual
2014	10

Output #3

Output Measure

- Output 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
2014	27

Output #4

Output Measure

- Output Target 4: 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
2014	3017

Output #5

Output Measure

- Output Target 5: Field faculty will provide physical activity and nutrition programming through one-on-one consultations and consultations with other organizations.

Year	Actual
2014	229

Output #6

Output Measure

- Output Target 6: Extension faculty will offer workshops in harvesting and food preservation techniques. Counting number of workshops.

Year	Actual
2014	89

Output #7

Output Measure

- Output Target 7: New food products will be developed using Alaska-produced ingredients.

Year	Actual
2014	6

Output #8

Output Measure

- Output Target 8: Extension faculty will offer workshops in food safety. Counting number of workshops.

Year	Actual
2014	99

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Outcome 1: Participants in healthy lifestyle classes and workshops will adopt knowledge gained to maintain healthy lifestyle practices one year after participation.
2	Outcome 2: Participants will use knowledge gained in parent education classes to increase their application of developmentally appropriate practices.
3	Outcome 3: Increase consumer knowledge about energy conservation.
4	Outcome 4: Awareness gained in workshops will result in increased knowledge of energy conservation.
5	Outcome Target 5: Participants in food preservation and food safety classes will improve their food preservation and food safety practices.
6	Outcome Target 6: New varieties and new uses of animal and plant products will result in increased production of Alaska-based products. Counting number of products and publications.
7	Outcome Target 7: Increase youth and parents' understanding of healthy food choices. Counting contacts with youth and parents.
8	Outcome Target 8: Youth and families have a more positive attitude toward healthful foods and/or willing to try new foods. Counting number of families.
9	Outcome Target 9: Increase knowledge, attitudes, skills and aspirations to increase physical activity habits. Counting number of youth.
10	Outcome 10: Increase knowledge about improving healthy home conditions, including indoor air quality. Counting number of individuals in healthy homes workshops.
11	Outcome 11: Prepare small food producers in Alaska for the marketplace and improve regulatory compliance. Counting individuals who attend training or receive technical assistance on starting a small food business.

Outcome #1

1. Outcome Measures

Outcome 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
2014	535

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Alaska's senior population must remain active and healthy in a difficult environment. Alaska, per capita, has one of the fastest-growing populations of seniors in the nation, and the state expects the number of seniors to double in the next 30 years. All of Alaska is considered medically underserved, and costs to individuals for medical care are higher than the national average. It is imperative that Alaskans focus on health strategies to maintain health and independence throughout life.

What has been done
Since 2005, an agent has trained 293 StrongWomen instructors, including 30 in the past year. Three agents led or hosted StrongWomen classes in their districts. Our agents trained 29 new instructors of Living Well Alaska, a Stanford University program that teaches individuals how to manage chronic health conditions. The Anchorage agent provided mentoring and training in the curriculum for 10 others, and two agents taught four six-week community sessions. One agent also taught StrongWomen Healthy Hearts, a 12-week program that combines aerobic exercise, hands-on cooking activities and nutrition education.

Results
StrongWomen leader courses have helped establish many community programs. More than 500 participants attended 30 groups and 380 participants have continued a year or longer. Participants report feeling stronger and they lead more active lives. Participants for a year or more reported increased bone density and better balance. Since 2007, 386 Living Well leaders have been trained and have reached more than 2,000 seniors and others with chronic health conditions. Fifty-nine of the trained leaders offered workshops during the past year in 10 communities. National evaluations also show benefits such as better pain management, increased physical activity, less time in emergency rooms and less depression. A small follow-up study in Alaska showed that individuals with diabetes who participated in Living Well Alaska

showed improvements several clinical measures, including BMI, blood pressure, and hemoglobin A1C, when compared to a control group.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Outcome 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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	211

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. Many Alaska communities also suffer from high rates of substance abuse and violence.

What has been done
Our Nome agent has been presenting Green Dot violence prevention training to a variety of audiences in Northwest Alaska. The program teaches skills to prevent child abuse, domestic violence, dating violence, sexual assault and bullying. She taught staff of a children's home that provides overnight respite care to youth during a family crisis; residents of a halfway house; a conference; a group of teens; and other Extension agents. She also trained individuals to teach Knowing Who You Are, a curriculum that trains personnel who work with foster children or serve their families.

Results
Outcomes from the Green Dot classes include a variety of solutions participants have shared. They have used the skills in situations within their families and communities to prevent violence. One woman stated that it has been almost 12 months since police were called to her home for an

incidence of domestic violence. Police were often at her home in the past. Of 12 people surveyed following two classes, six gave the class high marks for usefulness and all rated it at least satisfactory. In the process of teaching the Knowing Who You Are curriculum to other facilitators and offering it in Nome, the agent and these new teachers updated the curriculum to make it work well in rural areas. This cultural awareness program is designed to address some of the issues with the state's social services, including the high number of Native youth in foster care and the need for foster children to understand and connect to their culture. Evaluations show that it has helped participants in their work with families and youth.

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 3: Increase consumer knowledge about energy conservation.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	239

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Alaska historically has some of the highest energy prices in the country, and interest in energy conservation remains high. It is a pocketbook issue, particularly in rural areas, where energy costs are the highest.

What has been done
The energy specialist offered eight remote-energy courses aimed at helping individuals who spend time at camps for hunting and subsistence activities or recreation. The course helps individuals evaluate potential sources of energy to heat hot water or operate heaters, lights and radios. Courses were offered in three communities and by videoconference in six other communities. Sources of energy include solar cells, small windmills, hydro props, battery banks and rocket stoves. He also developed courses in the use of solar and wind to power and heat cabins.

Results
Participants learned about what potential sources of energy they might use to lower traditional oil or wood heating costs. Evaluations of five remote energy, solar and energy conservation classes showed that 35 of 37 individuals who completed surveys intended to use the information. They intend to consider solar hot water heaters and panels, wind energy and other camp alternatives, such as rocket stoves. As an outgrowth of this course, a publication was developed about considering the best source of energy for cabins or camps. Another outgrowth was a hands-on course in building rocket stoves, which was developed and delivered in FY15.

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 4: Awareness gained in workshops will result in increased knowledge of energy conservation.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Outcome Target 5: 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
2014	825

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Many 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 preserved game meat

or fish. Our state has one of the nation's highest rates of botulism, which 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. An estimated 90 to 95 percent of Alaska's food is imported, so food preservation training increases Alaska's food security.

What has been done
Agents taught 99 food preservation and food safety classes at two military installations and 32 communities, and four other communities by videoconference. Of those, 75 were hands-on classes in which 825 participants practiced food preservation/safety skills. Extension offers a series of 23 online food preservation modules and 10 DVDs about preserving local foods, ranging from canning fish in jars and cans to drying herbs. Agents also tested 800 pressure canner gauges used by community members. Food safety instruction was offered through certified food protection manager training in eight communities.

Results
Clients who practiced hands-on food preservation skills gain confidence and the skills to continue to preserve foods safely. Much of Alaska is off the road system and the Flash modules reached users who may not have access to food preservation classes. One hundred twenty users have filled out surveys since 2009. Ninety-one percent said they planned to use the information and more than 35 percent of users felt more confident about using a boiler water canner or a pressure canner. Checking pressure canner gauges means that foods will be preserved safely within recommended ranges. Nearly 65 percent of tested gauges required adjustment and there was an average 20 percent failure rate. The State of Alaska requires that one person on every food establishment be trained as a certified food protection manager. The videoconferenced training to 65 individuals made this food safety training available in more communities. Ninety-one evaluations of food preservation workshops indicate that participants plan to use information about birch tapping, food preservation, making sausage, etc.

4. Associated Knowledge Areas

KA Code	Knowledge Area
504	Home and Commercial Food Service

Outcome #6

1. Outcome Measures

Outcome Target 6: New varieties and new uses of animal and plant products will result in increased production of Alaska-based products. Counting number of products and publications.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual

2014 7

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
A greater interest by Alaskans in eating local foods and state programs that encourage school districts to purchase foods harvested in Alaska have led to increased interest in recipes using Alaska-grown foods that school districts can use and that students like. This has led to new markets for local producers.

What has been done
A recipe publication for school districts was published as a result of the work in FY13 by a CES food research technician and her assistant. They developed and tested recipes with Alaska-grown ingredients in collaboration with the Alaska Farm to School Program. Each recipe makes from four to 100 servings that can be used at home or in school kitchens. The research technician participated in the Gateway School District's in-service of food service workers to demonstrate basic processing of Alaska grown vegetables. She also demonstrated how to make several recipes in the publication.

Results
School districts' ability to use Alaska-grown foods in their breakfast and lunch programs has increased. The multiple batch size recipe publication was distributed to school districts around the state and posted online. The publication includes recipes that use Alaska-grown barley, including breakfast muffins, hamburger buns and pizza crust, as well as kale chips, roasted squash and root vegetables, fish chowder and more. These recipes help schools use the Nutritional Alaska Foods in Schools Grant that is available to purchase Alaska foods for school breakfast and lunch programs. Testing these products in schools also increased students' knowledge of and interest in eating local foods. The in-service increased the knowledge of school food service workers in seven rural communities. They learned how to use raw Alaska-grown foods in their school meal service.

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Outcome Target 7: 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
2014	4997

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Childhood obesity is a major concern in Alaska, as elsewhere. In 2011, 65 percent of Alaskan adults were overweight or obese. A 2013 State of Alaska report says that 26 percent of Alaska high school students were overweight or obese. Helping parents and students learn about better nutrition and eating habits is essential to combating obesity in youth and in adults.

What has been done
Nutrition educators presented USDA-approved curricula and activities in single and multipart programs in 15 classrooms in Fairbanks, Bethel, Tok, Palmer and Anchorage. Adults in those communities also received nutrition education. Agents provided information on healthy eating to children's agencies, schools and other community audiences. Other programs emphasized adding vegetables, shopping and making healthy foods such as whole wheat bread and yogurt.

Results
Nutrition educators with the SNAP-Ed Program presented nutrition education programs that reached 2,246 youth and 2,117 adults. Of those youth, 289 completed a multipart series. Overall, 86 percent of the youth participating in the series (185 out of 214) showed that they improved their ability to choose foods according to federal dietary recommendations. Forty-five percent (94 of 210) used safe food handling practices more often, and 42 percent (87 of 209) improved their physical activity practices or gained knowledge. Of the 25 adults who graduated from the multipart program, 67 percent showed improvement in one or more nutrition practices. They planned meals, made healthy food choices, prepared food without adding salt, read nutrition labels or had children eat breakfast. Fifty-eight percent of participants showed improvement in one or more food resource management practices, such as comparing prices, using grocery lists or planning meals.

4. Associated Knowledge Areas

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

Outcome #8

1. Outcome Measures

Outcome Target 8: Youth and families have a more positive attitude toward healthful foods and/or 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
2014	17

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, 77 percent of Alaska elementary students eat breakfast every day. Families have an important influence on making healthy food choices available and enticing to youth.

What has been done
Agents provided training on healthy food choices and nutrition in hands-on food preparation classes. SNAP-Ed worked with 25 families on hands-on cooking skills on how to prepare nutritious meals on a lean budget. Our SNAP-Ed program teaches individuals and addresses policy, systems and environmental factors. Staff participate in Farm to School activities and serve on coalitions and wellness councils.

Results
Evaluations from the SNAP-Ed course showed that 67 percent of families who completed the course showed improvement in one or more nutrition skills, such as planning meals, making healthy food choices, reading nutrition labels or feeding their children breakfast. One participant told us, "It changed how I shop and eat. I am looking at the cereal, fruits and vegetables. It has shown me a better way to shop with less sugar. Providing healthier snacks for my kids." Working with Farm to School has proven fruitful as greenhouse-based education is now a regular part of one district's activities. Participation in the Mat-Su School Wellness Committee has also yielded the result that nutrition education is required for all middle school students.

4. Associated Knowledge Areas

KA Code	Knowledge Area

504	Home and Commercial Food Service
703	Nutrition Education and Behavior
801	Individual and Family Resource Management

Outcome #9

1. Outcome Measures

Outcome Target 9: 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
2014	1203

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Alaska youth spend a lot of time indoors during the long winters. According to a 2009 state health report, only 19 percent of high school students meet the U.S. Department of Social Services guidelines of 60 minutes of exercise a day. Lack of exercise is tied to higher rates of obesity. Increased physical activity relates to physical and emotional health.

What has been done
Nutrition educators discuss the importance of being active every day as well as lead physical activity demonstrations with school youth. Educators also work with teachers and staff to encourage activity among youth at eligible low income sites. Additionally, the Alaska 4-H program offered youth across the state a number of projects that emphasized physical activity, including fitness and sports skills and outdoor education. Activities included orienteering, hiking, skijoring, shooting sports, rock climbing, cross-country skiing, camping, martial arts and more.

Results
Based on surveys done before and after the nutrition education programs, 42 percent (87 of 209) of students improved their physical activity practices or gained knowledge about the importance of it. 4-H numbers indicate that 639 youth participated in fitness and sports and 477 participated in outdoor education activities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #10

1. Outcome Measures

Outcome 10: Increase knowledge about improving healthy home conditions, including indoor air quality. Counting number of individuals in healthy homes workshops.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	437

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Radon is a colorless, odorless, radioactive gas that is present in Alaska, particularly in Interior Alaska uplands and parts of the Matanuska and Susitna valleys. The Environmental Protection Agency says that radon is the second leading cause of lung cancer. Awareness of radon, radon testing and mitigation are important health issues to Alaskans. Poorly ventilated homes and negative pressure inside homes can worsen radon levels and also lead to respiratory problems.

What has been done
Agents offered more than 20 workshops in seven communities that addressed radon prevention, testing and mitigation, and kits were made available statewide for radon testing. A 23-minute radon DVD and YouTube video was developed to explain what radon is and what steps to take to mitigate it. A University of Colorado radon expert taught Extension's radon coordinator and school district personnel how to test for radon in public schools. Nearly a dozen additional workshops addressed "healthy homes" and the importance of ventilation, indoor air quality and carbon monoxide testing.

Results
Nearly 400 individuals received healthy homes or radon testing and mitigation education through workshops. Extension distributed or sold 383 long-term radon detection kits to people. Using the kits or other devices to detect radon levels is the only way of telling whether homeowners have radon in their homes. Forty-six homeowners who completed the testing (115 total) learned their homes had radon levels above EPA's recommended action level. The radon coordinator responded to 115 questions about radon over the radon hotline. As a result of a training offered

by the radon expert and Alaska's radon coordinator, Alaska school districts have tested 15 schools for radon. One classroom had a radon level at which mitigation was recommended. Through the healthy homes and indoor air quality presentations, homeowners and housing/environmental health workers have received tools to identify and address the primary air quality concerns in their communities.

4. Associated Knowledge Areas

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

Outcome #11

1. Outcome Measures

Outcome 11: Prepare small food producers in Alaska for the marketplace and improve regulatory compliance. Counting individuals who attend training or receive technical assistance on starting a small food business.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	79

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Small food producers in Alaska do not have access to technical assistance when starting their food businesses. Many are out of regulatory compliance because they do not know the requirements, and the Alaska Department of Environmental Conservation is not able to provide public outreach and education on the rules.

What has been done
Our food research technician and a Marine Advisory Program marketing specialist taught two four-part workshops about starting and operating a specialty food business in Alaska. Sixty-one individuals from nine communities participated by videoconference. Topics included marketing, developing business plans, creating nutrition labels and making facilities meet health and safety guidelines. Additionally, the technician provided pH testing for product safety, water activity testing for product safety and technical assistance. CES and the Department of Environmental Conservation also developed a guide about regulations for individuals who wish to operate a

home-based food business.

Results
All 32 participants who filled out a workshop evaluation reported an increase in knowledge in at least two areas, including making informed business decisions, conducting feasibility analysis for products, marketing, making an FDA-compliant label and understanding regulatory requirements to start a specialty food business. The guide was published and made available to individuals considering a small food business. The technician offered water bath testing to four clients, pH testing for product safety for seven clients and provided technical assistance to 36 individuals.

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

- Natural Disasters (drought, weather extremes, etc.)
- 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 six agents and a program assistant in district offices and two specialists. This means agents cover large geographic areas. Travel dollars are an issue because air and long-distance ship travel is necessary, along with travel accommodation, 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. Travel is also hampered by time constraints as traveling in rural Alaska takes time. Distance delivery has been used more and sometimes there have been technical issues. Staff vacancies and funding fluctuations have also been issues. Staff vacancies have also been a factor in the Alaska Nutrition Education Program (formerly FSNE). We have had difficulties finding nutrition aides who 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 the Alaska Nutrition Education Program (SNAP-Ed) and EFNEP and has pulled agents away from their normal duties to complete the process. We did not fill some ANEP positions in FY14 because the continued funding was uncertain. In FY14, we had three of six ANEP nutrition aide positions filled.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluations completed by 91 individuals who took five food preservation classes indicate that individuals learned food preservation practices, from using wild berries to tapping birch trees and making sausage. In the largest class, 60 individuals rated the instructors 4.52 on a scale of 5.00 for providing clear, understandable information about selecting and tapping birch trees and making the syrup. Anecdotal comments on the survey indicated that people intended to tap trees and make birch syrup.

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). More than 120 individuals have filled out online surveys for the modules, giving us an idea of how effective the modules are. Ninety-one percent said they planned to use the information and 81 percent intended to share it with others. More than 35 percent of users felt more confident about using a boiler water canner or a pressure canner.

Evaluations of a powerhouse vegetable workshop indicated that people learned how and when to plant vegetables and how to use them.

Of 12 people surveyed following two Green Dot violence prevention classes, six gave the class high marks for usefulness and all rated it at least satisfactory. Respondents said that intended to recognize escalating situations more and not hesitate to act.

Evaluations of five remote energy, solar and energy conservation classes show that 35 of 37 individuals who completed surveys intend to use the information. They intend to consider solar hot water heaters and panels, wind energy and other camp alternatives, such as rocket stoves.

Key Items of Evaluation

The Nome agent says that in her region violence is a concern and that area residents support programs like the Green Dot violence prevention.

Evaluation for outcomes is an ongoing challenge, but the evaluation specialist has been helping more agents complete evaluations.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Climate Change and Ecosystem Management

☑ Reporting on this Program

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%		10%	
102	Soil, Plant, Water, Nutrient Relationships	0%		10%	
122	Management and Control of Forest and Range Fires	15%		10%	
123	Management and Sustainability of Forest Resources	50%		50%	
132	Weather and Climate	15%		0%	
605	Natural Resource and Environmental Economics	10%		10%	
903	Communication, Education, and Information Delivery	0%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	1.0	0.0	8.0	0.0
Actual Paid	0.7	0.0	5.2	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**
39156	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
18311	0	32758	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
127758	0	704051	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research and outreach strategies will include a database 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
- Model 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
- Land-based data sets to correlate animal distributions on the landscape with remote images
- Precipitation control on soil moisture and its effect on boreal forest growth and carbon balance
- Agricultural land characterization including soils and crop types
- Compilation of a database on agricultural production of crops and crop residues

High latitude soil research over the next five years will center on the following research topics and activities:

- Characterization of northern forest soils in boreal regions of Alaska in terms of the organic carbon pool and relationship with forest management practices
- 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:

- Land-based information correlation with remotely sensed images for forestry and agriculture
- 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 audience includes 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: Alaska Board of Forestry, 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 the impact of fires on soil organic matter will assist the Department of Natural Resources Division of Forestry and private landowners and managers.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	442	0	39	0

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

Patent Applications Submitted

Year:	2014
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	4	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Output 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

2014	3

Output #2

Output Measure

- Output 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
2014	14

Output #3

Output Measure

- Output 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.
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Output 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
2014	2

Output #5

Output Measure

- Output 5. Research related to product development to include timber products and nontimber products including energy will continue. Forest management specific to fuel/energy demand will be initiated. Measurable outputs will be publications and business starts.

Year	Actual
2014	0

Output #6

Output Measure

- Output 6. 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

2014 2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Outcome 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 2. Increase animal producer and wildlife manager knowledge on range use and animal impact. Measurable outcomes are publications, workshops and conferences.
3	Outcome 3. Increase knowledge through classroom and field course delivery. The outcome measures will be curricula delivered and number of students reached.
4	Outcome 4. Increase community and individual knowledge on the impact of climate change in northern ecosystems and effects on cultural lifeways, economies and individual well-being. Outcome measures will be publications, workshops and conferences.
5	Outcome 5. Provide research information that leads to product development and recreational opportunities. Outcome measures will be publications, business starts, conferences and workshops.
6	Outcome 6: Demonstrate effective collaboration between research and Extension to resolve issues.
7	Outcome 7: Increase knowledge of the impact of climate change in northern ecosystems that will affect economies and individual well-being. Outcome measures will be publications, workshops and conferences.

Outcome #1

1. Outcome Measures

Outcome 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
2014	6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Subarctic and Arctic climates are warming at a more rapid rate than climates in the lower 48 states. In Alaska, temperatures including both low air and soil temperatures are the most limiting factor to agronomic crops.

What has been done
In order to redefine soil temperature regimes and soil temperature classes in "Soil Taxonomy," which is necessary to better differentiate subarctic and arctic soils, climate parameters were collected from NOAA annual reports from 20 sites across the arctic and subarctic regions of Alaska. Two farms were visited in central Alaska to gather information about the farming history of the area and to assess soil quality after 30 years of land clearing.

Results
This research provides the mean monthly air temperature, mean annual air temperature, growing degree days, frost-free days, mean annual soil temperature, mean summer soil temperature, mean winter soil temperature, mean annual precipitation, annual snow depth, and mean July growing degree days based on 30 years of climatic records. This data will be important if air and soil temperatures continue to warm as projected. This could result in an increase in growing degree days as well as increase the diversity of crops that can be grown.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships

Outcome #2

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Outcome 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
2014	44

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Field courses take UAF students beyond the textbook to delve into the grit, grime and glory of the world of Alaska's resources. Hands-on experiences enrich the learning process and create lasting impact on students.

What has been done
The Issues in High Latitude Management course covers over 1,000 road miles in 10 days, providing students better understanding of resources in Alaska and how they are managed from agriculture to fishing to mining and management of public lands. Speakers talk about their jobs and issues and controversies in their fields. The Permafrost Soils field course is also a 10-day trip that goes in the other direction, traveling from the boreal forest in Fairbanks north into the arctic tundra. It attracts students and researchers from national and international universities for the purpose of reviewing soil-forming factors of the subarctic and arctic regions of Alaska with a leading expert in northern soils.

Results
The impact of field courses is reflected in student evaluations and comments. Of the management course, one student said, "This was the best class I ever had. I recommend it to everyone. I

wouldn't change a thing." Another stated, "Honestly, I didn't stop learning day and night for 10 days, not only about the environment but the people. I made a ton of friends." Of the soils course, one of the 31 visiting Chinese students said, "This was a rare opportunity. I learned so much from this journey. The professor's teaching was so good and I appreciate it so much. I hope more Chinese students will come."

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	13

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Over the past 50 years, Alaska has warmed at more than twice the rate of the rest of the United States. Climate changes affect our residents in many ways. Changes in temperature and moisture can trigger changes such as sea level rise, modified patterns of storms, flooding or fire and changes to migration routes, breeding behavior or survival of fish and game. It is important that Alaskans become informed about potential changes due to climate change and to prepare for severe weather events.

What has been done
Agents have presented workshops on climate change and emergency preparedness and what to do after flooding in 13 communities, including communities affected by there Yukon River flooding in 2014 or threatened by flooding. Additionally, they met with local emergency planning representatives in two communities. Altogether, presentations reached 244 Alaskans, including

85 teenagers at camps and schools. Three publications were developed on responses to wind events, flooding, wildfires and tsunamis. An agent also coordinated events in Homer and Seward that emphasized community preparedness and prepared a "disaster cookout" to demonstrate food storage and preparation during a disaster.

Results
Alaskans received information about resources to respond to extreme weather events as a result of climate change and natural disasters. Resources were developed to make available to help communities respond in the case of future emergencies. Both enhanced citizen preparedness. Community emergency planning representatives were advised of resources.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
132	Weather and Climate
903	Communication, Education, and Information Delivery

Outcome #5

1. Outcome Measures

Outcome 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 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources

Outcome #6

1. Outcome Measures

Outcome 6: Demonstrate effective collaboration between research and Extension to resolve issues.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The university chancellor called a forestry researcher and an Extension agent in for consultation about dying trees. Noting that the tops of trees were affected, they explained that warming temperatures were probably causing the trees to experience dieback. Most boreal trees lack the ability to function at high temperatures. Birch and white spruce are adapted to cold climate and become stressed when the temperature sizzles. Physiologically, boreal trees have a switch that turns off when it gets hot. The foresters suspected that last summer's record number of 80-degree and warmer days and below normal precipitation could have caused a caving in of the xylem in the trees.

What has been done
Birch trees get water to their upper crowns through evapotranspiration, a process in which molecules stick together in a column flowing through tube-like xylem cells. The force tugging the water column up from the soil through the tree and out into the air can be enormous, especially on a hot day. Stressed trees can get substantial relief if extensive watering is done during times of excessive heat.

Results
This was an excellent opportunity to demonstrate to the campus AFES research and Extension in action. After consultation and diagnosis, the recommendation in this case was that the ailing 60- to 100-year-old birches needed to be cut down and replaced with Siberian fir, Siberian larch or Siberian pine, species that grow well in full sunlight at this latitude. Deep watering during warmer

days was recommended to prevent early dieback in other trees on campus.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
123	Management and Sustainability of Forest Resources

Outcome #7

1. Outcome Measures

Outcome 7: Increase knowledge of the impact of climate change in northern ecosystems that will affect economies and individual well-being. Outcome measures will be publications, workshops and conferences.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	14

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Due to concern about the increasing demand for wood for firewood and pellet stoves and the slowing of the growth of the boreal forest, the State of Alaska has partnered with AFES researchers to reassess biomass potential in the boreal forest. The boreal forest is the largest biome in the world, with only six species of trees. One research site contains 8,600 acres. It is the site of the greatest concentration of forestry research in Alaska. The lowest rates of growth in 2,000 years are occurring in the Fairbanks area due to heat and dryness while in western Alaska trees are growing rapidly.

What has been done
Doctoral student Miho Morimoto studied the harvest activities and reforestation in the Fairbanks, Tok and Delta Junction areas by first thoroughly examining existing databases. She then sampled 27 harvest units to study regeneration over the long term comparing techniques and observing that scarification increased stem numbers.

Results
These findings will be used by the state Division of Forestry, which now has a better understanding of forest growth and will be able to create best management practices for a

sustained yield program. Miho Morimoto will defend her Ph.D. thesis this spring.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

Alaska is experiencing impacts of the changing climate in the degradation of sea ice, the ecology of the boreal forest and its ice-impregnated northern soils. This influences the focus of ecosystem management in coming years. Policy and regulation and competing public priorities affect land use and 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 effecting regional and local management for energy and other local wood products. Finally, as demographics of the population change and the forest industry moves toward management with a specific product objective, as well as an objective of sustainable and resilient northern ecosystems, the demand for continuing adult education and higher education to fill workforce vacancies or new positions is increasing. In this program area, AFES has lost two faculty positions and anticipated retirements will not be replaced in the near future. This severely impacts research and education. Continuing budget cuts as a result of the reduction in oil revenues have also resulted in the loss of funding for faculty and staff salaries.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluations for research are conducted through peer reviewed publications, work load assessments and university oversight.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Youth Development

☑ Reporting on this Program

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: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	8.5	0.0	0.0	0.0
Actual Paid	10.3	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**
658440	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
307905	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
2148327	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Collaborate with other youth-serving agencies and organizations
- Collaborate with Alaska Native associations
- Train volunteers, teachers and after-school providers
- Collaborate with military installations, National Guard and Reserve
- Conduct workshops, contests, forums and camps
- Utilize distance technology and social media
- Support life skill development of youth through experiential learning in science, healthy living and citizenship
- Offer experiential learning activities at the local, state, regional and national levels

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?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	13993	101673	22206	7269

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

Patent Applications Submitted

Year:	2014
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

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

Year	Actual
2014	308

Output #2

Output Measure

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

Year	Actual
2014	26

Output #3

Output Measure

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

Year	Actual
2014	40

Output #4

Output Measure

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

Year	Actual
2014	46

Output #5

Output Measure

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

Year	Actual
2014	17

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Outcome 1: 100% of faculty and staff associated within the program area will understand the Essential Elements of Youth Development
2	Outcome 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 3: 4-H educators will expand programming to underserved and minority youth by 5% in each year of the five-year plan of work.
4	Outcome 4: Increase participation in international exchange programs. Counting number of youth who participate in exchanges or host international students.
5	Outcome 5: 4-H educators will work with school districts to expand programming to underserved and minority youth.

Outcome #1

1. Outcome Measures

Outcome 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
2014	14

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Positive youth development through 4-H is made possible through a cadre of caring adult leaders. Creating environments in which youth have a sense of belonging, experience independence, master skills and give back to the community through generosity becomes more complex each year with changing environments and demographics. Faculty and staff must increase their 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, staff and leaders participate in trainings that emphasize delivery of the subject matter within the context of the Essential Elements. An annual state volunteer forum and audio conferences also 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.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2

1. Outcome Measures

Outcome 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
2014	295

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. The 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. A number of service projects reflect this application, including an event in Anchorage at which participants sew pillowcases for foster children and a conservation project in the Box Canyon public use area. After a number of Native youth suicides, a village 4-H group created an anti-suicide pledge, which is recited at many public events. This group shared its personal stories about abuse and suicide with the largest Native gathering in the state. 4-H members volunteer in many ways that build responsibility and a sense of belonging in their community and state. Overall, 601 adult volunteers and 32 youth volunteers in 2014 provided opportunities for engagement of all kinds, from gardening to science programming.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

Outcome 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
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In many rural communities, activities for youth are limited. Youth suicide rates are high in many rural villages. It is important for youth to feel connected to and supported by caring adults and peers, have hope for the future and see themselves as active participants in their future.

What has been done
The 4-H Connections to Life program offers Alaska Native youth healthy alternatives through physical activity and play, community service activities, leadership opportunities for older youth and increased awareness and knowledge of suicide prevention. Thirty community and external volunteers were recruited, screened and trained to work with youth and families in seven rural communities. Youth programs were also offered in association with Alaska Native organizations in Fairbanks and Bristol Bay and the City of Bethel.

Results
One quarter of 4-H participants lived in remote or rural Alaska and 31 percent were minorities. One hundred thirty-six youth participated in a variety of physical activities, including dance, skiing, martial arts, Native Olympics, etc., through the connections program. Support was provided through mentoring circles, and service projects included sled rides, participation in health fairs and a community effort to build a soccer field. One group addressed the largest gathering of Alaska Natives in the state with their personal stories about abuse and the effects of drugs on their families. They received a standing ovation. Data was collected through observation studies completed by mentors and site coordinators and self-reported surveys of youth. Youth

demonstrated increased project skills, confidence and social competence. Youth showed an interest in their local community and reported feeling good about helping others. The Alaska Experience Camp evaluation resulted in an ongoing club focused on Alaska activities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #4

1. Outcome Measures

Outcome 4: Increase participation in international exchange programs. Counting number of youth who participate in exchanges or host international students.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	24

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The U.S. Department of Education believes that to succeed in the 21st century workplace students must develop knowledge and understanding of other countries, cultures, languages and perspectives. Youth benefit by hosting international students in homestays and living with families in other countries to experience different cultures.

What has been done
A team of volunteers, leaders and Extension faculty was recruited in order to increase participation in the 4-H global citizenship and exchange program. Expanded partnership with the national exchange program allowed for the addition of Juneau and Valdez, which were previously excluded from participating as host communities, and eight placement homes were recruited in these communities. During 2014, the team recruited 20 summer program delegate placement homes, five chaperone homes and one yearlong placement home.

Results
The exchange program more than doubled in size. Twenty-one youth in Fairbanks, the Kenai Peninsula, Juneau, Valdez, the Palmer area and Anchorage hosted Japanese youth in their homes and learned about a new culture. They introduced the Japanese siblings to life in Alaska, including fishing, hiking, fairs, bike rides and kayaking. About half of the host family participants

were new to 4-H. Three 4-H youth traveled to Japan for a home stay in that country and experienced a new culture. The States 4-H International Exchange program recognized the lead agent for his program development with its Rookie of the Year Award.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #5

1. Outcome Measures

Outcome 5: 4-H educators will work with school districts to expand programming to underserved and minority youth.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Students at 21st Century Learning Center schools come from diverse cultures and income levels and some lack English skills and the background to be successful at school. According to the Afterschool Alliance, participants in 21st Century Learning Center programs show improvement in their grades, school attendance and standardized tests. Providing activities at these Title I schools helps engage students.

What has been done
Two agents and a program assistant offer after-school activities in 21st Century Learning Center schools in Fairbanks and Anchorage. The Anchorage agent trains teachers from these schools in two different 4-H curricula every year. She also offered hands-on activities to students at four schools. The Fairbanks agent offers after-school programs at four schools and was trained as a 21st Century Learning Center coordinator.

Results
Thirty teachers and staff in Anchorage Title I schools were trained how to use 4-H curriculum on visual arts and photography, and the agent led a six-week photography club as well as family night activities and a service project. Two boys in the photography club became very interested in

photography and continued after the program ended. The Fairbanks agent taught yoga and ran "girls circles" at three schools with time for homework and activities. Working with partners, the agent offered an eight-week photography workshop at a middle school. Girls built digital cameras and used them to define what science meant to them. The workshop ended with a showcase of the girls' work. Participants in all of these programs received enrichment activities that complement academics. The Fairbanks school district hired the Fairbanks agent to provide after-school programming. 4-H hired a staff member in Anchorage to offer programs to teach after-school programs focused on multiculturalism and diversity.

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

Communities are often separated by vast distances and/or are connected only by air or boat. This presents 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. There is also a notable lack of adults in many remote communities who are willing to serve as 4-H volunteers. Travel time is also a factor in being able to meet face to face. Some of our local offices lack adequate technology resources to effectively use distance delivery methods to offset geographic and travel barriers. Better tech, especially in form of videoconferencing, mobile computing and video equipment, would help with this problem. 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 audio conferencing.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

4-H offers post-activity surveys for many 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 quality of the meat they are buying and their interaction with the youth.
Through the 4-H Connections Program, data was collected through observation surveys completed by mentors and site coordinators and self-reported surveys of youth. Youth demonstrated increased project skills, confidence and social competence in life skill-building activities with mentors. Data indicates that youth feel connected to and supported by caring adults, feel good about who they are, and anticipate and plan from future activities together.

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. Despite the distances between districts, youth still participated in state livestock and horse contests.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Sustainable Energy

☑ Reporting on this Program

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%		0%	
125	Agroforestry	20%		0%	
131	Alternative Uses of Land	20%		0%	
205	Plant Management Systems	40%		50%	
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: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	1.0	0.0	2.1	0.0
Actual Paid	1.7	0.0	0.3	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**
65185	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
30482	0	8044	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
212682	0	7861	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

AFES researchers will concentrate primarily on yield potential of lignocellulosic crops and woody biomass and oilseed crops. 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 that 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 the use of biomass products and with producers to develop value-added forest products.

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

CES and AFES outreach will include working with communities and organizations regarding the use of biomass and with producers interested in biomass production.

2. Brief description of the target audience

The target audience includes 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 State Board of Forestry, 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 Resources Division of Forestry and private landowners and managers.

3. How was eXtension used?

Forestry specialist developed content for the Climate, Forests and Woodlands Community of Practice.

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	709	0	0	0

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

Patent Applications Submitted

Year:	2014
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	2	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Output 1: Workshops, demonstrations, short courses, classes, field days and conferences organized and conducted.

Year	Actual
2014	20

Output #2

Output Measure

- Output 2: Bioenergy crop varieties tested.
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Output 3: Bioenergy research projects conducted.

Year	Actual
2014	1

Output #4

Output Measure

- Output 4: Bioenergy crop and technology publications submitted.

Year	Actual
2014	0

Output #5

Output Measure

- Output 5: Community, organizations and one-on-one consultation concerning bio-based energy opportunities conducted.

Year	Actual
2014	20

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

Outcome #1

1. Outcome Measures

Outcome 1: Identify crops suitable for sustainable production of bio-based energy in Alaska.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Wood-fired biomass boilers are being put into municipal buildings in villages for heat and power, often saving those villages, organizations and school systems significant amounts of money spent on fuel oil. Local resources are necessary, which means that trees are being cut. A sustainable supply of biomass is needed as well as a fast-growing biomass crop that can be easily planted in the forest. Fast growing poplar can be cut on a 5- to 10-year (or less) rotation and they coppice (root sprout) after being cut. These sprouts will be the future crop.

What has been done
A team from AFES, CES and the Department of Natural Resources collected and stored poplar whips in 2014 for the second year of stooling bed research aimed at biomass utilization. In June, they soaked them in water for 4-7 days and then planted them in Palmer and Delta on previously logged state lands. They also planted some at the UAF research farms in Delta and Palmer. They also acquired 500 hybrid poplar from Canada and 200 natural balsam poplar from Alberta, which they planted and documented as a potential biomass source.

Results
This second year of the stooling bed project was more successful than 2013, when many cuttings died because of drought conditions. In 2014, researchers returned to the sites where poplar whips were planted to assess the results. The hybrid poplar and the poplar from Alberta had the greatest growth, surpassing the native trees. Researchers feel more research is needed to create an Alaska hybrid from balsam poplar trees in Canada and Alaska. With temperature zones shifting northward a quarter mile a year, researchers will have to look at species from lower latitudes. That's why Alberta trees are being studied in Alaska.

4. Associated Knowledge Areas

KA Code	Knowledge Area
125	Agroforestry
131	Alternative Uses of Land
205	Plant Management Systems

Outcome #2

1. **Outcome Measures**

Outcome 2: Identify new value-added by-products from bio-based energy crops and woody species.

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

Outcome 3: Compile a forestry biomass database.

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

Outcome 4: Monitor adoption of bioenergy technologies.

Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

Outcome 5: Increase community awareness about the use of biomass.

2. **Associated Institution Types**

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual

2014	131

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Energy costs remain high, particularly in rural communities. Biomass can offer a lower-cost source of heat in areas where the forest supply is plentiful. These communities want to know that their local resource can sustain harvest, be renewable, provide wildlife habitat, recreation and access to other resources and be compatible with their local lifestyles and traditions.

What has been done

CES coordinated the 2014 Alaska Wood Energy Conference, which included information about biomass, including woody biomass research, community evaluation of biomass options, barriers to biomass project development and new technologies. Participants included community officials considering wood heating options, individuals selling biomass product and others who were in the market for them. Forty participants toured a wood pellet mill in North Pole before the conference. A forester has also made many presentations and workshops to communities and public entities about biomass options.

Results

The conference was attended by 131 technical providers, facility managers, foresters and community leaders. The conference was essentially a professional development training but public awareness and interest increased as a result of media coverage. Participants who filled out evaluations cited the session content and networking as their top reasons for attending, and the "most useful" sessions, included presentations on biomass pellet use, forestry practices to produce fuel and economics of biomass projects. The conference evaluations also provided suggested topics for the next conference, in 2016. Conference and workshop presentation outreach has been well attended by stakeholders interested in biomass heat and power options, and now they are able to discuss the topic more knowledgeably with others in their communities.

4. Associated Knowledge Areas

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

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

Less than average moisture has stressed trees, which have become susceptible to insect infestation. An increased number of wildfires have also reduced the biomass harvest in some areas of the state. Interest in the use of biomass to heat public facilities has increased, but falling oil prices have made biomass a less attractive option.

The production of oil has decreased, the price of oil has fallen and the calculation of oil revenues to the state has changed, creating funding stream losses that are negatively affecting higher education. Until revenues are replaced, research support through the state will be less than previously enjoyed.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Wood energy conference participants who filled out evaluations cited the session content and networking as their top reasons for attending and the "most useful" sessions included presentations on biomass pellet use, forestry practices to produce fuel and economics of biomass projects. The conference evaluations also provided suggested topics for the next conference, in 2016.

Key Items of Evaluation

VI. National Outcomes and Indicators

1. NIFA Selected Outcomes and Indicators

Childhood Obesity (Outcome 1, Indicator 1.c)	
94	Number of children and youth who reported eating more of healthy foods.
Climate Change (Outcome 1, Indicator 4)	
3	Number of new crop varieties, animal breeds, and genotypes whit climate adaptive traits.
Global Food Security and Hunger (Outcome 1, Indicator 4.a)	
228	Number of participants adopting best practices and technologies resulting in increased yield, reduced inputs, increased efficiency, increased economic return, and/or conservation of resources.
Global Food Security and Hunger (Outcome 2, Indicator 1)	
0	Number of new or improved innovations developed for food enterprises.
Food Safety (Outcome 1, Indicator 1)	
0	Number of viable technologies developed or modified for the detection and
Sustainable Energy (Outcome 3, Indicator 2)	
0	Number of farmers who adopted a dedicated bioenergy crop
Sustainable Energy (Outcome 3, Indicator 4)	
0	Tons of feedstocks delivered.