

2017 University of Alaska Combined Research and Extension Plan of Work

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I. Plan Overview

1. Brief Summary about Plan Of Work

Alaska is recognized for its immense size and sparse population and its cultural, geographic and environmental diversity. The state represents a major region of renewable and nonrenewable natural resources in the United States. Its 365 million acres include the nation's largest oil reserves, coal deposits and the 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 any teaching, research, Extension and engagement programs.

The July 1, 2014 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 called the School of Natural Resources and Extension (SNRE). All elements have successfully worked together as partners at UAF for many years. While CES and AFES are integral parts of SNRE, both also maintain an identity based on purpose, CES as the outreach and engagement arm and AFES as the research arm of the new unit. This formal association provides a direct link between faculty involved in teaching, research and outreach under a single SNRE leadership. The finite nature of the state's nonrenewable resources and local and national controversies surrounding resource extraction and related environmental concerns affect the activities of the newly formed unit. UAF in general and SNRE, in particular, meet the challenges of increasing demands for research, education, outreach and community engagement that are relevant to sustainable management of Alaska's resources and bring communities' ideas to the university for further development of the state's resources.

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

Planned programs for purposes of this report will 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.

Livestock enterprises will include dairy, beef, goat, swine, reindeer, poultry and nontraditional livestock

species such as muskoxen, elk and wood bison. Producers need information specific to northern latitudes that will protect the environment and ensure an abundant and safe food supply. As the population grows, 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 fish and game meat. Alaska also has a large military population, and most have not previously preserved game meat or fish. Alaska has one of the nation's highest rates of botulism, so it is 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, where fuel oil runs \$8 or \$9 a gallon. Research and outreach has focused on new and alternative sources of energy, wood and biomass and energy conservation.

The mission of AFES 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 will be 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 will publish research in scientific journals, conference proceedings, books, and in experiment station bulletins, circulars, newsletters, research progress reports and miscellaneous publications. Scientists will also disseminate their findings through conferences, public presentations, workshops and other public information programs like websites and blogs.

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, nonformal education, including conferences, workshops and cooperative work with community, regional and tribal partners. Outreach is also provided through numbered publications, faculty consultations, newsletters, blogs and Facebook pages dedicated to district information and subject matter such as gardening and food preservation.

CES priorities address national priorities by helping families, youth and individuals be physically, mentally and emotionally healthy; enhancing workforce preparation and life skills; strengthening food security; 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, 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 UAF, 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.

STRATEGIC PLANNING PROCESS

State-defined planned programs address in more specific and concrete terms the different aspects of our mission to allow the concentration of resources (money and people) that will promote high-quality work. Planned programs will be used to provide guidance for faculty and administrators to direct new and current programs and find or retain faculty expertise. The identification of planned programs also represents a decision about topics that will not be emphasized. This POW provides assumptions that justify the adoption of each planned program and provides knowledge areas, specific long- and short-term goals, and measurements to assess success in meeting these goals.

Planned programs include Agriculture and Food Security, Natural Resources and Community Development, Healthy Individuals, Families and Communities, Youth Development, Climate Change and Management of Ecosystems and Sustainable Energy. Three planned programs listed in our previous Plans of Work have been combined with other planned programs for this report. Food Safety and Childhood Obesity are now part of the Healthy Individuals, Families and Communities planned program. Work in our former Agriculture and Horticulture and Global Food Security planned programs will be reported under the Agriculture and Food Security planned program.

The plan reflects ideas and advice given by client user groups, students, state advisory councils, state and national peers and cooperators, and UAF administration. The partnership with CES will strengthen the outreach component of AFES to meet the many needs for knowledge about Alaska and circumpolar resources and geography as opportunities for expansion present themselves.

The Plan of Work will strengthen the working relationship between the school, station and Extension. Strong and growing relationships are essential to the success of our newly merged unit. We share goals and missions in our commitment to excellence in research, education, extension and outreach. With finite resources, we will achieve more by working together.

The School of Natural Resources and Extension began the process of strategic planning in FY15 to more closely define and align its joint mission.

PLANNED PROGRAMS

Agriculture and Food Security

Alaska imports as much as 90 percent of foods and other agricultural products consumed in the state. Growers' products are primarily for in-state consumption and use, including fresh market potatoes and vegetables, forages, grains and other livestock feeds, greenhouse flowers and vegetables and a variety of "niche market" crops and products. Commercial horticulture includes ornamentals, greenhouse operations, turf management, lawn maintenance and sod production. Proper knowledge and planning of soil-disturbing activities can prevent major impacts on other resources. Animal enterprises include dairy, beef, swine, reindeer, poultry and alternative nontraditional livestock such as muskox, elk and bison.

Agriculture research and outreach address areas of animal agriculture, home animal production, agronomic crops including cereal grains and forages, and home and commercial vegetable production. Agricultural soils, fertilizer and compost research and outreach are also part of this program area. Our statewide IPM education program has operated since 1981 assisting individuals to understand invasive pests and control options. Agriculture outreach includes the primary areas of animal agriculture, animal health, horticulture, soil science and agroforestry.

As Alaska expands its in-state consumption and export markets, producers will require increasing access to research-derived information specific to northern latitude environments and knowledge derived from research in other states.

Natural Resources and Community Development

Communities will increasingly depend on Alaska's natural resources for viable economic development. Policies to sustain this growth that mirror sociological and technological change will be critical. Major Alaska resource development activities are now centered in the oil and gas industries. Headquarters for these industries are located in the urban centers where there is access to various transportation and advanced communication systems. However, urban communities lack infrastructure to engage in value-added activities that would enhance development of nonpetroleum industry. Most rural communities are off the road/rail system and communication is still somewhat limited. Some rural communities lack basic amenities such as adequate sanitation and efficient energy sources that would attract resource developers. Research is needed that will afford both urban and rural communities the opportunity to

diversify their economies. Additionally, these efforts should provide underserved populations in rural areas real options for economic development and improved quality of life. Outreach addresses stakeholders' need for unbiased, science-based information about natural resource management issues in forestry, mining, water and community development.

The reduction of sea ice has generated great interest in marine shipping in the Arctic. The potential for community and economic development has initiated research assessments in the areas of safety, shipping trends, shipping lanes and regulations and climate trends. The goal will be to define global market demand, needed infrastructure development, navigation safety and affordable energy.

Healthy Individuals, Families, and Communities

The Healthy Individuals, Families and Communities program includes exercise and fitness, healthy lifestyle choices, nutrition, and diet and nutrition issues. Food safety programming will encompass food preservation, safety, preparation and product development. Food safety will utilize various resources and strategies to ensure that all types of foods are properly stored, prepared and preserved so that food is safe for consumption. Programming involves safety, preparation and preservation, including Alaska indigenous foods. In the area of human development, activities include lifespan development, transitions, grief and loss, and caregiver training. Consumer resource management includes areas such as estate planning, budgeting, transitions, financial management, time management and stress reduction. Home and energy Extension programming addresses indoor air quality, home maintenance and repair, building science and energy use and conservation. Emergency preparedness impacts such areas as families and communities responding to natural and man-made disasters.

Increases in obesity have occurred rapidly. Changes in weight that have occurred over the past 15 years will have lasting impacts on the health of individuals and of the health-care system for decades to come. Outreach will address childhood obesity with nutrition education in the schools and nutritional and food budget programs in community venues as well as cooking programs that emphasize preparing healthy foods. Partnering with the Center for Alaska Native Health Research (CANHR), we will continue to address the challenge with a program that focuses on making healthy food choices and increasing physical activity. Other Extension programs address nutrition education and physical activity. Training is conducted with youth, teachers, 4-H leaders, youth group organizers, parents and community partners to provide techniques for working directly with youth in the area of obesity. The outreach focuses on risk and protective factors influencing health of youth and adults. A program funded by NIFA, Childhood Healthy Living (CHL) in cooperation with Hawaii and the American Pacific Islands, connects Alaska issues with those of indigenous people of the island nations who face similar issues. To provide youth and adults with the technology to produce healthy foods for healthy eating, we will prepare students for careers in agriculture and related fields such as economics, horticulture, marketing and nutrition with awareness of the conditions and demands required for sustainable high latitude food production. It will provide academic training in community-based food production and nutrition by building upon existing UAF degree programs in natural resources management and sustainability. A new course will be developed which will prepare students to work directly with families with young children in home, subsistence harvest and local food production settings.

Youth Development

This program promotes positive youth development through education with a focus on leadership skills, using 4-H Mission Mandates: Science, Engineering, and Technology; Healthy Lifestyles; and Citizenship. Organized 4-H clubs, school enrichment programs, after-school activities and summer camps will achieve youth development goals. The goal of Alaska's 4-H program is to support the maturation of youth from childhood to adulthood. Training throughout the state, using the Essential Elements of youth development, will be the foundation of all youth development programming. FFA is a large youth organization in the United States with diverse interests in the food, fiber and natural resource industries, encompassing science, business and technology in addition to production agriculture.

Climate Change and Ecosystem Management

Alaskans live in an environment that is unlike any other in the United States with unique features such as permafrost, the boreal forest and continuous summer daylight alternating with sustained winter darkness. Alaska's resources must be properly managed and cared for so its people can survive socially and

economically in this harsh environment, and for the long-term health of its living systems. The soils, forests, tundra, grasslands and animals of Alaska have long been valued by its people, who have lived close to these resources for many generations and now face the need to adapt to a changing environment.

Alaska's resources offer many opportunities, but also many natural limitations that must be known and respected if they are to be developed and used successfully and in a way that can be sustained over the long term. This planned program will play a pivotal role in teaching and providing information about management of Alaska and northern ecosystems. Knowledge of permafrost soils will be essential to maintain existing ground transportation corridors, plan for new corridors and determine appropriate building technologies as the climate changes and permafrost-laden soils become more discontinuous.

Management of the boreal and Southeast Alaska forests will play an increasing role in fire disturbance and adaptation to climate change. Their understory and tree species will be instrumental in providing market products developed from botanicals. Alaska's forests will have an important role in Alaska's energy future. Geographical Information Systems (GIS) and climate change modeling assist natural resource managers and a broad array of stakeholders, who need to understand the concepts and practice of creating, analyzing and displaying spatially referenced natural resource and human community data and plan for new dynamics in ecosystems, both physical and human as well as climate change.

The unique nature of Alaska's natural resource and the relationship Alaskans also create unique policy and management questions requiring sound legal basis. Scientists in AFES work to address concerns of managing lands and resources for economic development while maintaining or enhancing esthetic value to Alaskans and the 14,000,000 tourists that visit our state annually

Sustainable Energy

Alaska's forest and agricultural resource potential for bioenergy production is immense but being researched. The economic potential of Alaska's forests is under-realized in timber and nontimber products. The potential for Alaska to develop new agricultural land is also under-realized. The forest ecosystem and agricultural lands can play a role in diversifying the economy of Alaska.

State leaders are developing both renewable and nonrenewable natural resources to contribute to the economic well-being of their citizens without compromising ecological integrity and biodiversity. To be sustainable, any development activities require production practices that balance technologies and economic necessity with environmental imperatives. Concern for the health and survival of resource biodiversity will continue to be a central issue in resources management in Alaska and elsewhere.

As energy continues to become a growing concern throughout the world, the boreal forest has the potential to provide products for the production of fuel alternatives to petroleum and coal. Economic development efforts continue with the goal to offset high energy costs and provide local alternatives to petroleum products, especially for rural communities.

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2017	45.0	0.0	15.0	0.0
2018	45.0	0.0	15.0	0.0
2019	45.0	0.0	15.0	0.0
2020	45.0	0.0	15.0	0.0

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2021	45.0	0.0	15.0	0.0

II. Merit Review Process

1. The Merit Review Process that will be Employed during the 5-Year POW Cycle

- 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 scientific peer review to review and evaluate proposals, publications and specific annual reports. 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 and works 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. Evaluation of Multis & Joint Activities

1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?

AFES and CES are centric to carrying out the land-grant mission for the University of Alaska. AFES has a statewide mission and operates major facilities in Fairbanks and Palmer, has three research sites in Delta Junction, Nome and Bonanza Creek along with research projects throughout Alaska. CES operates nine district offices around the state along with six affiliated service centers. Planned programs were developed based on needs expressed by stakeholder groups.

AFES is funded by state funds that include appropriations, indirect cost recovery and tuition, federal land grant program dollars, competitive research grants and income from sales and leases. Research is carried out in response to identified needs for fundamental and practical knowledge. Some indications of the demand for AFES research are: 1) topics consistently found in calls for research proposals, 2) research considered especially important in the natural resources field by society at large, and 3) research problems identified by many different funding sources as important over the long term. Some of the sponsors and partners that define research priorities are the stakeholders: the Alaska Legislature, the Alaska Department of Natural Resources, which includes the Divisions of Agriculture and Forestry, and natural resource industries. Federal stakeholders include the U.S. Forest Service, the National Institute of Food and Agriculture, Bureau of Land Management, Bureau of Indian Affairs, U.S. Geological Survey and National Park Service. The new SNRE unit will develop a strategic plan that reflects research and outreach priorities. The current strategic plan continues to emphasize sustainable agriculture, energy, climate change, and community and workforce development. It will incorporate work in ecosystem management, high latitude agriculture and soils, community development and recreation.

Extension outreach programming is conducted in response to identified stakeholder needs and interests. On a statewide level, the CES State Advisory Council is an important mechanism for gathering stakeholder input. Faculty and staff also routinely conduct formal and informal stakeholder needs assessments within their local communities to determine appropriate program priorities. The strategic plans of the University of Alaska Fairbanks were developed with extensive public input and provide guidance for CES. While developing a new five-year strategic plan in 2010, Extension surveyed stakeholders, conducted an online survey and commissioned a statewide random telephone poll. These needs assessments provide direction for Extension programs through 2015. Areas of focus include food safety and security; health; climate change; energy; youth, family and community; and economic development. These priorities must be addressed in faculty workloads.

The NIFA priorities of climate change, sustainable energy, childhood obesity, food safety and global food security are incorporated into our Plan of Work. Other important organizational stakeholders that influence CES programming include the Alaska Legislature, and state and federal agencies. Many community partners guide Extension's work.

2. How will the planned programs address the needs of under-served and under-represented populations of the State(s)?

Agricultural projects bring research and outreach to rural residents who are transitioning from hunter gatherers to subsistence producers and consumers, as well as developing

agricultural industries. Indigenous people make up about 16 percent of Alaska's population. Despite urbanization, many Alaska Natives live in isolated rural villages that are often inaccessible by surface transportation. Videoconference networks allow us to reach clients in many underserved communities. A whole or partial subsistence lifestyle is practiced by many Alaska Natives as well as many rural residents. CES's resources related to safe food preparation and preservation supplement traditional methods. The Alaska 4-H Program works with the rural communities to provide mentoring and positive youth development programs. 4-H works with volunteers in rural villages to provide youth programming and provides programs to Title 1 schools in Fairbanks and Anchorage, The Expanded Food and Nutrition Education Program (EFNEP) and Supplemental Nutrition Assistance Program-Education (SNAP-Ed) are successful. 4-H works with rural schools on a salmon incubation project that aims to improve math and science literacy. A refugee gardening program in Anchorage teaches immigrants how to garden in a new environment and sell their produce at farmers markets. Rural residents participate in online Master Gardening training and distance-delivered farming and gardening instruction. Instruction in most CES areas is offered by videoconference.

All agents strive to work with underserved populations, with agents in Nome and Bethel, serving a large Native constituency. Alaska Natives serve on CES State Advisory Council and on the AFES Advisory Council.

The Reindeer Research Program partners with the Kawerek Native Association's Reindeer Herder's Association and the Northwest College in Nome, as well as the Reindeer Owners and Breeders Association (ROBA). A mobile slaughterhouse will continue to be used to develop a meat industry and continue the research, education and outreach programs in Northwest Alaska.

The partnership with the National Park Service continues concerning the effect of a new road into a rural community currently off the road system. Collaborative work will continue with federal and state partners, universities, both domestic and international, Native corporations and private landowners to address climate change issues related to agriculture and forestry.

An AFES/CES forester will serve on a Western Development Committee to coordinate Western region Extension forestry activities. The AFES/CES forester advises individuals and organizations on forestry issues and provides wood energy and wood products outreach to underserved communities. The Federally Recognized Tribes Extension Program, (FRTEP) serves over 40 Interior Alaska Native villages, and a second FRTEP agent serves Dillingham and the Bristol Bay Native Association clients. 4-H is also involved with a multistate effort regarding culturally responsive programs for youth and a national mentoring network with other institutions that offer programs to Native Americans.

3. How will the planned programs describe the expected outcomes and impacts?

Within each planned program we have listed individual research projects that will represent our Hatch general and multistate portfolio. The planned programs will then list outcomes we expect to accomplish over the next five-year period in those specific projects. We will document yearly progress in our annual report of accomplishments. We would expect some projects to have immediate impacts while others may take three to five years to reach a documented impact. These projects are usually long-term research not fundable through the competitive processes.

CES is committed to greater program accountability, particularly measuring outcomes and impacts. Extension's past experience has focused on measuring outputs (number of workshops offered, number of workshop participants, number of publications distributed, etc.) versus measuring outcomes and impacts. The NIFA plan of work requirement to increase measurement of outcomes and impacts has provided the impetus for CES to strengthen its program evaluation. It will be an evolutionary process in which faculty gain experience and comfort with outcome and impact assessment as well as including planning for evaluation during the program planning phase. The evaluation specialist will help faculty measure the

impacts and outcomes of their programs. Starting July 1, 2016, each CES faculty member will be required to evaluate at least two programs annually.

4. How will the planned programs result in improved program effectiveness and/or

The University of Alaska Fairbanks, in general, and AFES, in particular, have a limited number of faculty and limited funds to meet the diverse research and educational needs in Alaska. The strategic plan of 2013 reconfirmed high-priority natural resource-related problems based primarily on stakeholder input. We used these priorities, combined with current faculty expertise, available physical facilities and funding opportunities, to develop planned programs in four areas of emphasis. The areas of concentration are sustainable agriculture, energy, climate change, and community and workforce development. We are committed to:

- Improving efficiency of resource management in Alaska through improved transfer of critical information to resource users and the public.
- Hiring only new faculty who specifically have expertise to meet the educational and research goals in the strategic plan, thereby increasing capabilities to meet these goals.
- Enhancing distance delivery capabilities.
- Continuing to seek ways to enhance stakeholder input to help identify priority research and education areas, especially as needs shift.
- Enhancing research partnerships with public agencies and private entities.

The POW process that stresses outcomes and impacts is encouraging CES faculty to devote more effort to planning for program evaluation and conducting additional and more thorough post-program assessments. With reliable and valid program assessment information, CES will be better able to determine program effectiveness, social benefit and cost-effectiveness of programs, which is critical information for future resource allocation decisions. The NIFA POW requirement to generate outcome and impact-oriented objectives with related accountability expectations has led CES faculty to focus resources on fewer high priority issues.

CES faculty are charged with developing the logic models for each of the CES-focused POW planned programs. Faculty ownership of the planned programs and responsibility for achieving the planned outcomes and impacts goes beyond reporting outputs. CES administration will provide faculty with guidance and support to assist them in their efforts to become better program planners and evaluators to ensure that programming responds to organizational priorities and that programs offered are assessed in relation to expected outcomes and impacts.

Due to limited travel dollars, CES will emphasize distance delivery of programs via the videoconferencing systems operated by the university and by libraries around the state. Training that have been offered to clients by videoconference include Master Gardener and gardener training, risk management for farmers, food safety, pesticide safety certification, certified food protection manager, meal planning, a series on operating a small food business and more. The CES director communicates to all of Alaska Extension using the videoconference network several times a year. The videoconference network is also used for faculty training, and faculty and staff in specific program areas regularly communicate by audio conference.

IV. Stakeholder Input

1. Actions taken to seek stakeholder input that encourages 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 Website, Newsletter & Blog, Facebook pages)

Brief explanation.

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

- Regional and Statewide Farm Bureau
- Alaska Community Agriculture Association
- Delta Farm Forum
- Alaska greenhouse growers
- Kawerak Inc., Reindeer Herders Association
- Alaska Diversified Livestock Association
- Alaska Peony Growers Association
- Economic development associations/corporations in Fairbanks, Juneau and Anchorage
- Soil and water conservation districts
- Borough and city governments
- Alaska Native village and regional corporations and tribal organizations
- On-demand meetings at the request of stakeholders

Traditional meetings will continue to be focal points for listening to and receiving input from stakeholders. As required by the AREERA of 1998 and in cooperation with CES, these will be advertised as broadly as possible and identified as points of contact for public input into research and outreach program development.

CES sponsors agricultural and horticultural conferences and outreach activities with AFES participation where the units gather formal and informal stakeholder input. CES also relies on advisory groups as an important stakeholder needs assessment process. CES has a Statewide Advisory Council and faculty in districts across the state use local advisory boards to provide them with community input related to local programming. The CES advisory council meets face to face twice each year and holds audio conferences several times a year. CES faculty also conduct formal needs assessments within their district as a part of program planning and development.

2(A). A brief statement of the process that will be 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.

AFES relies on stakeholder input from the advisory council, agricultural advisory groups, collaborators, federal and state agencies, colleagues, faculty and students for assistance in establishing priorities and developing program direction in consultation with appropriate constituencies. Major stakeholders include the Fairbanks North Star Borough, Matanuska-Susitna Borough, USDA/NRCS, U.S. Forest Service, Fairbanks Economic Development Corporation, Soil and Water Conservation Subdistricts, Alaska Department of Natural Resources and industries involved in food, fiber and fuel/energy production.

Members from the public who have participated in or who have an interest in CES program offerings represent one segment of the organization's stakeholders. Stakeholders often identify themselves by emailing or calling Extension faculty or staff. Advisory groups also lead us to stakeholders. Another significant stakeholder group is public and private agencies and organizations that have professional and programmatic relationships with Extension or direct interest in Extension programming. Some of CES's major stakeholder organizations include but are not limited to the Alaska State Legislature, Farm Bureau, Grange, greenhouse growers, food banks, schools, Alaska Department of Natural Resources, U.S. Forest Service and Alaska Boys and Girls Clubs.

The 12-member CES State Advisory Council is elected by the council. The council selects candidates from individuals who apply for membership based upon a call for applications advertised to the public and from recommendations from CES employees in all regions. Regional representation is sought.

2(B). A brief statement of the process that will be 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.

Survey information will be collected using formal survey preparation and analysis techniques. Conferences, meetings and workshops are scheduled around themes and to gather specific information. The information generated is collected in meeting minutes and transcripts and is used in strategic planning of research and Extension programs. The objective is to generate a feedback loop that provides information to research and outreach programs and from research and outreach programs to stakeholders and individuals.

Extension collects stakeholder input through surveys following conferences and workshops, by email surveys, and through public presentations made to a variety of groups and agencies. Input is also collected individually by agents who work with stakeholders and

through advisory groups. More than 20 Facebook pages and blogs also provide stakeholder input.

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.

While still operating with the NIFA priorities, SNRE is undergoing a reorganization and strategic reassessment as the merger transition proceeds. SNRE began the process of strategic planning in FY15 to more closely define and align its joint mission. During this process the School of Natural Resources and Extension will continue to serve the needs of the citizens of the state of Alaska. Input will reflect ideas and advice given by client user groups, students, expert advisors, state and national peers and cooperators and UAF administration. The four focus areas of energy, climate change, local and regional food production and food safety will continue to be high priorities. The need for adult and youth education and training to fill Alaskan job and career demands continues to be more apparent.

The current strategic plan for CES was completed in 2010 and incorporated suggestions from stakeholders. Needs assessments help CES faculty identify emerging issues. Individual work plans are generated by faculty using this information and the strategic plan. Based upon information generated by the needs assessments, future programming needs related to hiring have been affected. Stakeholder needs will continue to be a driving factor in determining CES priorities for programming. Requests for specific speakers and topics at conferences guide the conference agenda and requests for programming help shape what is offered.

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Agriculture and Food Security
2	Natural Resources and Community Development
3	Healthy Individuals, Families and Communities
4	Climate Change
5	Youth Development
6	Sustainable Energy

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Agriculture and Food Security

2. Brief summary about Planned Program

The Agriculture, Horticulture and Food Security Planned Program provides information about high latitude agriculture and horticulture and is increasingly sought by urban Alaskans, those in traditional farming areas, rural communities and new agriculture-based businesses, primarily in horticulture and landscaping. These are also areas of close collaboration between the Agricultural and Forestry Experiment Station and the Cooperative Extension Service. Areas of emphasis are agronomic practices of crops, landscape and turf materials, and controlled environment/extended season and field horticulture, including bedding plants and floral crops. Home and community gardening outreach is another important area of emphasis. The concentration of research and outreach is in best management practices for production during the short subarctic growing season and resilience and adaptation to impacts of climate change. Agriculture and horticulture outreach includes the areas of animal agriculture, agronomy, agroforestry and horticulture. Agroforestry includes tree production for windbreaks, biofuels and other nontimber forest products. Horticulture includes commercial and consumer horticulture. Commercial horticulture includes commercial floriculture production, nursery production of woody and herbaceous ornamentals, greenhouse production of bedding plants, hanging baskets and potted plants, as well as turf for golf courses, sports fields and runways, and commercial lawn management and maintenance.

Consumer horticulture includes home and community gardening, landscaping and lawn maintenance by the homeowner. Another important focus in outreach is pest management for community forestry, home and commercial horticulture, invasive plants, greenhouse production, structural pests, and turf, tree and ornamental plant producers. Integrated pest management (IPM) is the primary approach, in collaboration with other agencies, to assist its stakeholders when providing pest management information and educational outreach. The IPM team will work closely with Master Gardeners and Community Tree Stewards to increase pest management education. Collaboration includes IPM, Pesticide Safety Education Program, Western Region IPM (WRIPM), Western Plants Diagnostics Network (WPDN), Natural Resources Conservation Service (NRCS), USDA Farm Service Agency (FSA), Rural Development, Western Rural Development Center (WRDC) and Pacific Land Grant Association (PLGA).

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%		10%	
205	Plant Management Systems	25%		40%	
213	Weeds Affecting Plants	15%		0%	
216	Integrated Pest Management Systems	28%		5%	
301	Reproductive Performance of Animals	5%		5%	
302	Nutrient Utilization in Animals	5%		5%	
305	Animal Physiological Processes	2%		5%	
315	Animal Welfare/Well-Being and Protection	0%		5%	
401	Structures, Facilities, and General Purpose Farm Supplies	5%		10%	
405	Drainage and Irrigation Systems and Facilities	0%		10%	
601	Economics of Agricultural Production and Farm Management	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Alaska has minimal agricultural infrastructure and servicing capability. Agricultural lands in Alaska include both continental and maritime zones. On average the growing season is 100 days, soils are cool, the day length is approximately 22 hours in some areas and the sun angle is low. Bedding plants and landscape materials are produced in structures that extend the growing season and dominate the farm-gate value of horticultural crops. Hanging baskets and other floriculture may occupy these structures after the bedding-plant season. Horticultural produce moves to the consumer through the wholesale/retail chain. All other products go directly to retail markets that include grocery chains. Organic farming presents challenges to research and outreach. Horticulture is a high-demand workforce industry and there currently is not a trained labor force in the state. Controlled environment agriculture (CEA) research aims to increase horticulture crop production in Alaska. The horse owner market is believed to be the largest consumer of Alaska-grown hay. Resilience to climate change with potential changes in season length and water supply are critical additions to new research and outreach. There is a growing interest in hardy varieties of landscape crops that respond to low fertilizer, water and pesticide uses, including native species. Sports turf is an economic opportunity with work continuing on golf greens and fairways and for ball fields. Sustainability of sports turf is an important consideration as energy and input costs rise. Home garden production, including home floral production and sales through farmers markets, is increasing. Outreach to these producers concerning best varieties and best-management practices are critical. There are many horses and dogs in Alaska and interest in raising chickens has increased in many areas. Appropriate outreach information from research centers outside Alaska is provided. There is a demand for veterinary practitioners/technicians throughout the state and a new vet med program has been added to

UAF. We will support the program through pre-vet academic classes and formal outreach. Agronomic research on barley will continue to provide best management practices and research trials will begin on a northern wheat variety.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Limited food and feed resources are a challenge for a large state with a small population that is concentrated in the road/Railbelt and scattered in the remainder of the state among remote rural and village communities. This makes support for research, education and outreach in food security difficult. The challenges are more similar to Pacific Island communities than more traditional operations in the contiguous United States.

Possible changes in the status of Conservation Reserve Program lands in Alaska may precipitate assistance to landowners. If producers desire to move into new food or feed crops or potential energy crops, this will be a good time.

Regional food supply in the face of rising transportation costs and from the aspect of food safety will be important in Alaska, a state where imports are estimated at over 90% of its food supplies and local processing is still in its infancy. Interest in locally grown and processed foods is increasing. To support these new directions, education and training of youth and adults will be critical to supply a newly shaped workforce. A challenge for the large number of horse owners is limited locally produced feed and high transportation costs. Energy will be a growing concern in food, feed and fuel production.

2. Ultimate goal(s) of this Program

It is critical to communicate awareness of the food security problem to the entire population of Alaska, including individuals, families and communities, as well as state and federal entities and nonprofit organizations that provide food for their clients such as school systems, hospitals, military bases and food banks. Challenges exist for the State of Alaska as a government that would be called upon to assist in case of a disaster and eventually for the federal government that would also be called on for assistance. It is a wide-reaching problem, the breadth and depth of which is beginning to be understood by Alaskans.

Solutions must be sought to expand of the agricultural system in Alaska for community security, including marketing, processing and transportation. Small-scale agriculture for home and professional growers will remain focus areas as will research in agricultural science and system development, which includes pesticide education, crop development and farming efficiencies for individuals, families, businesses, communities and the agricultural sector as a whole.

Sustainable practices for agriculture and horticulture will continue to be a high priority in the next five years. The IPM program will continue to provide up-to-date information to mitigate loss from native and invasive pest species, keeping pest species below economic threshold levels. Resilience and adaptability to climate change will be a focus in rural and urban areas as it affects Alaska's lands and forests. Finally, youth and adult continuing education will continue as an integrated component to fill an increasing demand

for the labor force in Alaska as workers retire and new opportunities become available.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	8.0	0.0	10.0	0.0
2018	8.0	0.0	10.0	0.0
2019	8.0	0.0	10.0	0.0
2020	8.0	0.0	10.0	0.0
2021	8.0	0.0	10.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research and outreach will continue to assure that best management practices appropriate to Alaska are provided to target audiences. There will be new directions in resilience and adaptability of crops and animals as changes in the subarctic and arctic climate occur with revitalization in research and Extension programs relevant to regional and local agricultural production. An emphasis will also be placed on educating and training youth and adults in new fields opening in the Alaska workforce. Group and one-on-one educational activities with specific sectors of the pest management industry, the agricultural community and the horticultural industry will provide individuals and businesses with important information. Increased reliance on the Internet and technology will enhance communication with more people. Increasing and maintaining partnerships will remain important strategies in keeping pest species below threshold levels. Outreach will include conferences, workshops, forums, tours and consultations with stakeholders.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (Consultations) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension ● Other 1 (Publications)

3. Description of targeted 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, and the USDA Natural Resource Conservation Service, the USDA Forest Service, the Alaska Department of Natural Resources, borough governments and Alaska Native corporations.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
 - Number of patents submitted
 - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Output 1: Faculty will provide agricultural and horticultural workshops, short courses, classes, field days and conferences, including IPM.
 - 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.
 - Output 3. Horticultural crop research will concentrate on home and commercial varieties appropriate to Alaska. Publications and presentations are the output measures.
 - 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.
 - Output 5. Focus will be on best management practices for livestock management and production. Output measures will be publications and presentations.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

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 number of producers who adopt practices.
2	Outcome 2: Increase livestock producers' ability to understand and assess optimum production practices. Measure will be number of producers.
3	Outcome 3: Increase participants' commercial and home horticulture best management practices. Measure will be number of individuals who adopt better 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. Measure will be the number of outreach activities and publications.
6	Outcome 6: Demonstrate effective collaboration between research and Extension to resolve agriculture and horticulture issues.

Outcome # 1

1. Outcome Target

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

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 213 - Weeds Affecting Plants
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Outcome 2: Increase livestock producers' ability to understand and assess optimum production practices. Measure will be number of producers.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 302 - Nutrient Utilization in Animals
- 301 - Reproductive Performance of Animals
- 315 - Animal Welfare/Well-Being and Protection
- 305 - Animal Physiological Processes

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Outcome 3: Increase participants' commercial and home horticulture best management practices. Measure will be number of individuals who adopt better management practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 216 - Integrated Pest Management Systems
- 315 - Animal Welfare/Well-Being and Protection
- 205 - Plant Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 305 - Animal Physiological Processes
- 301 - Reproductive Performance of Animals
- 405 - Drainage and Irrigation Systems and Facilities

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

Outcome 5: Increase the number of activities that monitor and control invasive species and pests. Measure will be the number of outreach activities and publications.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 213 - Weeds Affecting Plants
- 305 - Animal Physiological Processes
- 216 - Integrated Pest Management Systems
- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

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

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 315 - Animal Welfare/Well-Being and Protection
- 102 - Soil, Plant, Water, Nutrient Relationships
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 301 - Reproductive Performance of Animals
- 216 - Integrated Pest Management Systems
- 601 - Economics of Agricultural Production and Farm Management
- 213 - Weeds Affecting Plants
- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect 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.)

Description

In a state where oil production is the top priority and the highest income generator, agriculture is given a much lower priority by policymakers. Alaska has been severely impacted by the falling price of crude oil. The university has experienced budget cuts for the last seven years which has dramatically affected programs. SNRE, in particular, has been under the University administration's spotlight whose policy has been to prevent the rehire of research and teaching faculty on state funds. As can be seen by our falling FTE it is an increasing struggle to meet the needs of stakeholders through research and teaching. UAF policy rewards external grants but disparages land grant funds and its required state match. The merger between AFES and CES has helped fill some positions but both units have heavy workloads as we try to keep our productivity high in such demoralizing times.

At the same time Alaska is experiencing impacts of a changing climate and which will continue to affect agriculture in coming years. As climate changes water stress and increasing pests will affect crop production. Other challenges include the geographic distances between communities and high transportation costs involved in traveling to communities off the road system. Transportation costs continue to impact regional and local food production and processing. Economic factors will affect the experiment station as retiring faculty and staff and the inability to replace them affect research productivity.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The objective of SNRE is to provide information to our clientele and bring clientele input back to us, enabling continued adjustments to our work. Evaluations will follow major agricultural and invasive species conferences and many workshops to determine the effectiveness of presentations and whether clients have used information from past educational events.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Natural Resources and Community Development

2. Brief summary about Planned Program

Alaska is a state whose major resource development activities are headquartered in the urban centers with access to various transportation and advanced communication systems. These activities primarily focus on oil and gas exploration, development and export. Processing for in-state use provides gasoline, home-heating fuel and aviation fuels. Urban communities lack infrastructure to engage in value-added activities that would enhance development of resources not directly related to the petroleum industry. Most rural communities are off the road/rail system and communication infrastructure is still improving. Many smaller rural communities with populations under 500 may not have even the most basic amenities such as adequate sanitation and efficient energy sources that would attract appropriate resource developers. Many of these communities are working to enhance facilitation skills as a mechanism to translate local cultural values into the dominant cultural policy-making activities. Research is needed that will provide knowledge to give both urban and rural communities the opportunity to diversify their economies. Research and outreach provide underserved populations in rural areas real options for economic development and improved quality of life. Research and outreach priorities will be determined through joint collaboration with stakeholders in communities, industry, and state and federal agencies. Focus will be on identifying emerging natural resource issues in energy, climate change, food security, agriculture and horticulture, forestry, mining, water and community development for stakeholders. Research and the education and outreach growing from that research will provide Alaskans with unbiased, science-based information for both urban and rural populations to assist in understanding issues and making informed decisions. SNRE will continue to provide traditional programs in education and outreach, but will enhance these programs with a focus on energy, food security, positive youth development and a sustainable quality of life for individuals, families and communities. Our goal is to engage communities, bringing ideas back to the university to assist in establishing future research and education activities.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
111	Conservation and Efficient Use of Water	10%		0%	
112	Watershed Protection and Management	20%		0%	
122	Management and Control of Forest and Range Fires	10%		20%	
123	Management and Sustainability of Forest Resources	10%		25%	
131	Alternative Uses of Land	10%		5%	
134	Outdoor Recreation	5%		15%	
605	Natural Resource and Environmental Economics	15%		15%	
608	Community Resource Planning and Development	15%		10%	
610	Domestic Policy Analysis	5%		10%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Effectively addressing natural resources issues will depend on forming partnerships with credible, research-based organizations and other land-grant institutions as well as schools and colleges within UAF. Other units within the University of Alaska Fairbanks include the School of Management, School of Fisheries and Ocean Sciences, College of Natural Science and Mathematics, College of Rural and Community Development, the Institute of Arctic Biology and College of Engineering and Mines. Partnership interests include providing multi-resource planning and the process of determining public resource policy, resource economics and policy impact assessment, rural community culture and economic development analysis, environmental law and policy, and outdoor recreation. Research is multidisciplinary and includes the physical and social science arena, forestry and agricultural sciences, law and policy, land and resource planning, resource economics and outdoor recreation management. As Alaska matures there will be changes in the state's demographics, economy, social structure and land use. In planning public resource policy, most agencies tend to use methods of involving the public that were developed over 30 years ago such as public meetings, open houses and public hearings. The work being done in this planned program will increase the level of awareness of new public involvement techniques as well as their advantages and disadvantages. Federal land management policies are set by national priorities, which at times conflict with Alaskan interests on state-owned lands. Additionally, 44 million acres of Alaska's lands are owned by Alaska Native regional and village corporations and use of the resources on them is controlled by the corporations. Including the Native lands, approximately 10% of Alaska's total land mass is in private ownership. The Natural Resources and Community Development planned program will provide information for stakeholders on issues related to forest and land resources, mineral and nonpetroleum energy, water resources and rural communities. It will provide skill training in topics such as agriculture, horticulture, alternative energy, water quality monitoring, management of local water resources, identification of rocks and minerals of economic importance, and use of Global Positioning

Systems and Geographic Information Systems to locate, inventory and monitor important resources. Economic analysis information will assist in planning and managing natural resources, evaluating economic options for rural communities, and use of natural resource microbusiness opportunities for rural and urban communities.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Resource management in Alaska will continue to be constrained by expectations and perceptions of the public. Despite public opinion, these desires must follow processes that meet the substantive requirement of state and federal law and policy. Costs of extracting, harvesting and processing Alaska resources must be evaluated in the context of global markets. Energy sources are a major concern in extracting, harvesting and processing Alaska resources and must be considered in remote communities that will require a local source of energy supply. Multiple uses of Alaska's lands are necessary for a diversified economy but its infrastructure is minimal to support this goal. Global competitiveness will remain an issue and Alaska must exploit its competitive advantage in transportation routes and raw natural resources. Conflict resolution will continue to be necessary in a state whose land is primarily federal parks, reserves or preserves and where urban versus rural needs continue to conflict. World markets for mineral resources have spurred mineral exploration and mine development in Alaska. Resource extraction and population growth will affect Alaska's water resources, also influenced by other regions' increased need for water. Rural communities will increasingly look to nearby forest and land resources for economic and personal use. Recreation opportunities exist in all regions of Alaska's northern forests and tundra lands and sustainable development of those tourism and recreation resources will benefit the state. Melting sea ice will influence shipping routes, commerce and natural resources will be impacted.

2. Ultimate goal(s) of this Program

- Develop regional economic models for Alaska resource development impact on communities
 - Develop and examine public involvement processes that meet public expectations
 - Determine the effectiveness of natural resource and environmental laws
 - Create and develop long-term partnerships both in and outside Alaska. Assist stakeholders in making informed decisions regarding utilization of valued natural resources
 - Increase number of Alaska youth receiving basic natural resource skill training for early entry into natural resource management jobs and assist youth in choosing careers managing Alaska's natural resources
 - Facilitate product development of timber and forest management for fuel production
 - Assist stakeholders in realizing the connection between recreation and human well-being
 - Establish CES as a clearinghouse of unbiased, research-based and consumer-friendly information.
- This will include the areas of climate change, food security, agriculture and horticulture, alternate energy

and energy conservation, water quality, mineral resources, GIS climate modeling, economic analysis, small business start-ups and options for facilitation training for rural communities based on community interest with an emphasis on transferring Alaskan-developed information.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	3.0	0.0	3.0	0.0
2018	3.0	0.0	3.0	0.0
2019	3.0	0.0	3.0	0.0
2020	3.0	0.0	3.0	0.0
2021	3.0	0.0	3.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research products will provide science-based information in resource planning, 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.

Multi-institution and interdisciplinary activities will continue in research, education and outreach. 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 involve partners from other UAF units to assure engagement that will continue to make the information provided to stakeholders relevant to their needs.

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

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

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension	
Direct Methods	Indirect Methods

<ul style="list-style-type: none">● Education Class● Workshop● Group Discussion● One-on-One Intervention● Demonstrations● Other 1 (Youth and natural resource camps)● Other 2 (Consulting)	<ul style="list-style-type: none">● Public Service Announcement● Newsletters● TV Media Programs● Web sites other than eXtension● Other 1 (Publications)
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3. Description of targeted audience

This program will focus on industry and entrepreneurs including communities, families, and newly forming cooperatives and businesses, nonprofit and for-profit development corporations. Efforts will be made to address problems of the traditionally underserved rural populations within the limit of resources available. Stakeholders are those directly impacted by contemporary natural resource issues related to forest and land resources, mining resources, 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.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
 - Number of patents submitted
 - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Output 1: Active partnerships with other land grant institutions, government agencies, stakeholder groups and organizations.
- Output 2: Develop and deliver public issues education workshops and classes for stakeholders on locally relevant natural resources and related issues.
- 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.
- Output 4: Conduct needs assessments of natural resource management stakeholders.

- Output 5. Develop regional economic models for Alaska resource management scenarios. Output will be models, presentations and publications.
- Output 6. Develop and implement public involvement in natural resource issues. Output measure will be public input sessions and publications.
- Output 7. Provide analysis of natural resource and environmental laws. Output measure will be presentations, workshops and publications.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

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. Measure will be number of partnerships.
2	Outcome 2: Increase and maintain the number of integrated and multistate research-Extension activities. Measure will be number of activities.
3	Outcome 3: Increase the recruitment and retention of youth and college-age students appreciating and considering natural resource management careers. Measure will be number of graduate and undergraduate students enrolled and number of youth participating in natural resource management activities.
4	Outcome 4. Increase public involvement in natural resource and community development issues. Outcome measure will be the number of participants.
5	Outcome Measure #5: Demonstrate effective collaboration between research and Extension to resolve issues.

Outcome # 1

1. Outcome Target

Outcome 1: Increase and maintain partnerships with stakeholder groups, government agencies and other institutions that will enhance the land-grant mission. Measure will be number of partnerships.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 111 - Conservation and Efficient Use of Water
- 134 - Outdoor Recreation
- 122 - Management and Control of Forest and Range Fires
- 112 - Watershed Protection and Management
- 605 - Natural Resource and Environmental Economics
- 123 - Management and Sustainability of Forest Resources
- 610 - Domestic Policy Analysis

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Outcome 2: Increase and maintain the number of integrated and multistate research-Extension activities. Measure will be number of activities.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 605 - Natural Resource and Environmental Economics
- 122 - Management and Control of Forest and Range Fires
- 111 - Conservation and Efficient Use of Water
- 134 - Outdoor Recreation
- 610 - Domestic Policy Analysis
- 131 - Alternative Uses of Land
- 123 - Management and Sustainability of Forest Resources
- 112 - Watershed Protection and Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Outcome 3: Increase the recruitment and retention of youth and college-age students appreciating and considering natural resource management careers. Measure will be number of graduate and undergraduate students enrolled and number of youth participating in natural resource management activities.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 610 - Domestic Policy Analysis
- 608 - Community Resource Planning and Development
- 134 - Outdoor Recreation
- 605 - Natural Resource and Environmental Economics
- 111 - Conservation and Efficient Use of Water
- 122 - Management and Control of Forest and Range Fires
- 131 - Alternative Uses of Land
- 123 - Management and Sustainability of Forest Resources
- 112 - Watershed Protection and Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

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

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land

- 122 - Management and Control of Forest and Range Fires
- 134 - Outdoor Recreation
- 610 - Domestic Policy Analysis
- 605 - Natural Resource and Environmental Economics
- 111 - Conservation and Efficient Use of Water
- 608 - Community Resource Planning and Development
- 123 - Management and Sustainability of Forest Resources
- 112 - Watershed Protection and Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

Outcome Measure #5: Demonstrate effective collaboration between research and Extension to resolve issues.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 111 - Conservation and Efficient Use of Water
- 610 - Domestic Policy Analysis
- 122 - Management and Control of Forest and Range Fires
- 605 - Natural Resource and Environmental Economics
- 134 - Outdoor Recreation
- 123 - Management and Sustainability of Forest Resources
- 608 - Community Resource Planning and Development
- 131 - Alternative Uses of Land

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect 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.)

Description

Continuing state and university budget cuts will severely impact research and education. Changes in state and federal policy and regulation and reductions will affect appropriations to the university and the economy of the state of Alaska. Current energy dialogue in the state centers on oil and gas with increasing discussions of alternate energy, particularly biomass. Should a successful proposal for a gas line be announced, this will inject jobs and dollars into Alaska and could change priorities from an increasing focus on using alternative forms of energy that are regionally produced to, once again, export of a raw product.

Alaska shows many effects of climate change that continue to influence the thrust of the Natural Resource and Community Development program in coming years. Policy and regulation and competing public priorities affect land use and resource use for community development. Despite the potential effect of external factors, there will be a need for continuing adult education and higher education to fill workforce vacancies or new positions that are created to meet demands in energy and community development, and a continuing need for processes that improve the quality of life and economic well-being of communities.

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. SNRE will work to increase economic and community development, particularly in rural areas.

Oil production is the top Alaskan priority and the highest income generator, and university funding has been severely impacted by the falling price of crude oil. The university has experienced budget cuts for the last seven years which has dramatically affected programs. SNRE, in particular, has been under the University administration's spotlight given its policy of preventing the rehire of research and teaching faculty on state funds. As can be seen by our falling FTE it is an increasing struggle to meet the needs of stakeholders through research and teaching. UAF policy rewards external grants but disparages land grant funds and its required state match. The merger between AFES and CES has helped fill some positions but both units have heavy workloads as we try to keep our productivity high in such demoralizing times.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The objective of AFES and CES is to continue the communication that provides information to our clientele and bring clientele input back to us to meet the needs of the people of Alaska. Outreach events and workshops will be evaluated for effectiveness and knowledge gains and in regard to changed practices as a result of educational events.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Healthy Individuals, Families and Communities

2. Brief summary about Planned Program

The Healthy Individuals, Families and Communities Program includes the following seven outreach areas of emphasis: 1) health, nutrition, exercise and fitness, healthy lifestyle choices, nutrition, and diet and nutrition issues, 2) food safety and food preservation, 3) human development activities focus on lifespan development, transitions, grief and loss, and caregiver training, 4) childhood and adult obesity, 5) consumer resource management includes estate planning, budgeting, transitions, financial management, time management and stress reduction, 6) emergency preparedness includes areas such as families and communities responding to natural and man-made disasters, and 7) homes and energy provides education on indoor air quality, home maintenance and repair, building science and energy use. This last area is experiencing a rapid growth in interest and resource allocation.

Foodborne diseases and threats to food safety constitute a growing public health problem. Cooperative Extension's mission is to help consumers improve the safety of food all the way from production to final consumption. Practicing food safety not only helps to maintain good health, but can also help save money. Food safety programming education involves safety and preparation, Alaska indigenous foods and safe food preservation. Alaska has highly nutritious, seasonal production of wild and homegrown food ranging from wild berries to vegetables from gardening and from homegrown beef and pork to wild game.

Proper preservation of these foods once collected or harvested is of utmost priority to the health of Alaska.

As is the case nationally, the number of overweight and obese individuals in Alaska is increasing. Increases in obesity have occurred rapidly, and changes in weight that have occurred over the past 15 years will have lasting impacts on the health of individuals and of the health-care system for decades to come. AFES will work with CANHR specifically to target 3- and 7-year-olds with its new NIFA-funded Children's Healthy Living (CHL) in cooperation with Hawaii and the American Pacific Islands. CES will address the problem with a program that focuses on making healthy food choices and increasing physical activity. AFES will prepare students for careers in agriculture related fields such as economics, horticulture, marketing and nutrition with awareness of the conditions and demands required for sustainable high latitude food production. It will provide academic training in community-based food production and nutrition by building upon existing UAF degree programs in natural resources management and sustainability.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

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	18%		0%	
703	Nutrition Education and Behavior	15%		0%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	2%		0%	
723	Hazards to Human Health and Safety	5%		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%	
	Total	100%		0%	

V(C). Planned Program (Situation and Scope)**1. Situation and priorities**

One of Alaska's major challenges, given its large geographic area and limited infrastructure, is the rapid growth of the incidence of youth and adult obesity and associated chronic health-related problems. This can be diminished with better nutritional choices and exercise. 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. Student nutrition and physical activity have a direct link with academic performance as evidenced by academic test scores, improved daily attendance and better class participation. Although individual weight status is determined by many factors, the primary causes of excess weight and obesity in most individuals is an imbalance between nutrition and physical activity. Lack of access to local grocery stores and full service restaurants contributes to poor dietary patterns and obesity. Disparities in food access are greatest in lower income, minority, urbanized neighborhoods, as well as less populated rural areas. Access to healthy food in local stores is judged to be difficult or impossible for 15% of Alaskans. Data suggests that most Alaskans do not recognize that they are overweight.

Alaska has an abundance of nutritious seasonal, wild and homegrown foods that require proper development and preservation methods. With the variety, quantity, season and location of indigenous food sources, adequate information on preservation is essential in maximizing the value and shelf life of nutrition sources. Alaskans need information of proper development and preservation of these foods. New food products will be developed using Alaska-produced ingredients, both wild harvested and those produced from homegrown sources. Home and small business food safety remains a critical issue for families and consumers, particularly of locally grown foods. More than 30 percent of the suspected cases of foodborne illness occur at home. Home food safety concerns revolve around three main functions: food

storage, food handling and cooking.

Training is provided to youth on financial literacy and nutrition. Family training includes classes and other outreach on parenting, communication, child and elder care, military deployment issues, health and retirement. Community participation will continue to assist research to find answers that help people cope with stress and changing demands on Alaskans. Cost of living and energy issues, property taxes and rural unemployment place burdens on sustainability at many levels. Families in rural areas of Alaska tend to be larger and younger and have lower incomes than urban counterparts. Population shifts, especially outmigration from villages, impact the changing demographics across the state. Indoor air quality is an issue as more time is spent inside during the long winter and homes are "tightened" to encourage energy conservation. Natural disasters are exacerbated by the isolation of many Alaskan communities as well.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Alaskans' health can be improved through healthier lifestyle choices related to food, exercise and self or family care. CES obesity prevention will focus on risk and protective factors influencing health of youth and adults. Health of youth and families can be improved through increased knowledge and resources provided by CES and AFES. Youth and their families need to be involved in meaningful learning experiences because healthy behaviors are complex. Youth and families have the ability to reach optimal health and well-being and research and education will continue to inform healthy living practices.

With transportation, food and energy costs being prohibitive, especially in rural regions, families require easily accessible training in safe food preparation. Developing and improving Alaska food products is critical in supporting sustainable communities, especially as the demand for information increases.

Human development content areas are taught via distance education due to the expense of traveling to hundreds of small communities, however, the application of interpersonal skills is still critical to program success. With transportation, food and energy costs becoming prohibitive, especially in rural regions, families require consumer resource management education to avoid bankruptcy and related legal and social issues. These costs will continue to rise. Energy conservation of built stock inventories of buildings requires investment in weatherization, improved construction techniques and good science for healthy, efficient and durable housing and commerce. Renewable energy will become a major topic of interest and concern that will drive future outreach education.

2. Ultimate goal(s) of this Program

Education will improve citizens' lives in making healthier lifestyle choices, strengthen sense of family through individual action and improve community. With a better understanding of economic and financial issues, citizens have what they need to participate successfully in a complex, global environment, regardless of how rural the setting. Programming will increase access to and sustainability of healthy, affordable housing through renewable energy and conservation. Emergency preparedness will help

communities become self-reliant as disaster strikes, allowing for a stronger infrastructure for better response and shorter recovery.

Goals relating to childhood obesity:

- Reduce the incidence of overweight and obese Alaska youth
- Increase the number of youth making healthy food choices
- Help youth engage in more physical activity
- Train leaders and community contacts in methods to increase healthy food choices and physical activity in youth
- Develop new academic courses for leadership training in this field

Food safety goals:

- Reduce the incidence of foodborne illness
- Provide a safer food supply by increasing awareness of food safety in preservation and preparation
- Address and eliminate causes of microbial resistance to contaminants
- Educate consumer and food safety professionals
- Develop food processing technologies to improve safety

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	7.9	0.0	0.0	0.0
2018	7.9	0.0	0.0	0.0
2019	7.9	0.0	0.0	0.0
2020	7.9	0.0	0.0	0.0
2021	0.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- 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. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (Distance Delivery) ● Other 2 (Phone and email) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension ● Other 1 (Publications)

3. Description of targeted 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

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Output 1: Extension faculty will offer workshops in a wide range of home economics and family and consumer science topics. Measure will be the number of workshops.
- Output 2: Extension district offices will update emergency planning for internal operations and constituent communities. Measure will be the number of offices and constituent communities who have updated plans.
- 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. Measure will be the number of workshops and conferences.
- Output 4: Field faculty will provide physical activity and nutrition programming for teachers and parents. Measure will be the number of teachers and parents who are trained.
- Output 5: Field faculty will provide physical activity and nutrition programming through one-on-one consultations and consultations with other organizations. Measure will be the number of consultations.
- Output 6: Extension faculty will offer workshops in harvesting and food preservation techniques. Measure will be the number of workshops.
- Output 7: New food products will be developed using Alaska-produced ingredients. Measure will be the number of food products developed.
- Output 8: Extension faculty will offer workshops in food safety. Counting number of workshops.

- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Outcome 1: Participants in healthy lifestyle classes and workshops will adopt knowledge gained to <u>maintain healthy lifestyle practices one year after participation.</u>
2	Outcome 2: Increase consumer knowledge about home energy efficiencies.
3	Outcome 3: Participants in food preservation and food safety classes will improve their food <u>preservation and food safety practices.</u>
4	Outcome 4: New varieties and new uses of animal and plant products will result in increased <u>production of Alaska-based products. Counting number of products and publications.</u>
5	Outcome 5: Increase youth and parents' understanding of healthy food choices. <u>Counting contacts with youth and parents.</u>
6	Outcome 6: Youth and families have a more positive attitude toward healthful foods and/or willing to <u>try new foods. Counting number of families.</u>
7	Outcome 7: Increase knowledge, attitudes, skills and aspirations to increase physical activity habits. <u>Counting number of youth.</u>

Outcome # 1

1. Outcome Target

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

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Outcome 2: Increase consumer knowledge about home energy efficiencies.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Outcome 3: Participants in food preservation and food safety classes will improve their food preservation and food safety practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 502 - New and Improved Food Products
- 504 - Home and Commercial Food Service

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Outcome 4: 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. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 502 - New and Improved Food Products
- 504 - Home and Commercial Food Service

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Outcome 5: Increase youth and parents' understanding of healthy food choices. Counting contacts with youth and parents.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

1. Outcome Target

Outcome 6: Youth and families have a more positive attitude toward healthful foods and/or willing to try new foods. Counting number of families.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management
- 504 - Home and Commercial Food Service

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 7

1. Outcome Target

Outcome 7: Increase knowledge, attitudes, skills and aspirations to increase physical activity habits. Counting number of youth.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Seven agents in district offices must cover a large geographic area and many agents who travel beyond their district offices must travel by air. Though agents have been very successful in partnering with other governmental and private entities to make each travel dollar go farther, they are still are unable to travel

as often as requested. A emphasis towards energy efficiency and related funding from state and federal agencies are expected to bring more resources to bear on the energy extension programming. Appropriation changes, policy and regulation and competing public priorities affect program creation and delivery.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Newly developed food preservation DVDs contain evaluations that have guided editing of additional DVDs in this series. Several of our workshops are evaluated for knowledge learned and post-evaluations demonstrate changed practices. Faculty will work with an evaluation expert to better evaluate the value and impact of their programs.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Climate Change

2. Brief summary about Planned Program

The arctic and subarctic zones are experiencing major impacts in the wake of global climate change. AFES and CES will play a pivotal role in research, teaching and outreach to provide information about adaptation to climate change in Alaska and northern ecosystems. Management of Alaska's boreal forest and of Southeast Alaska's temperate rainforests will play a role of increasing importance in insect and disease disturbance and adaptation. Fire management strategies, permafrost degradation and the slow rate of boreal forest growth will be taken into account. As energy continues to become a growing concern throughout the world, the boreal forest has the potential to provide products for the production of fuels alternative to petroleum and coal. The USFS Forest Inventory and Analysis Unit (FIA) for Alaska is incomplete. The economic potential of Alaska's forests is under-realized in timber and nontimber products. The forest ecosystem can play a role in diversifying the economy of Alaska. AFES will continue to provide long-term data on the characteristics of soils associated with Alaska's forests and for soils information baseline for modeling climate change, boreal forest management and temperate rain forest management. Soils are a fundamental resource, and knowledge about the cold-climate soils of Alaska is crucial for most Alaska resource management. Proper knowledge and planning of soil-disturbing activities can prevent major impacts on other resources. Under current Alaska climate variability, cold soils are experiencing significant changes that are, in turn, causing changes in natural and managed ecosystems. Proper knowledge and planning of soil-disturbing activities can prevent major impacts on other resources. Natural resource managers and other stakeholders need to understand the concepts and practices of creating, analyzing and displaying spatially referenced natural resource and human community data. Nearly all maps and most data about natural resources are now stored, shared and analyzed as digital spatial files. A critical missing component to data mapping of Alaska's forests and agricultural lands is a ground-based data connection to modeling efforts. Signatures of forest and soil types have yet to be established to allow remote data collection technology to provide accurate information of existing ground cover that ranges from the northern rain forest in Southeast Alaska, to the boreal forest of Interior Alaska, to the tundra of Northern Alaska. Basic research proposed in the Boreal Alaska: Learning, Adaptation, and Production (BAK-LAP) is wrapping up but the outreach will continue to K-12 learning, through investigations of the changing characteristics of the boreal forest. Another critical component of ecosystem management is remote sensed data applying ground-truthed measurements to create GIS mapping and climate models. Creating and interpreting models is a necessary component of today's resource planners and managers toolkit, particularly at the regional level.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

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%	
122	Management and Control of Forest and Range Fires	15%		10%	
123	Management and Sustainability of Forest Resources	50%		70%	
132	Weather and Climate	15%		0%	
605	Natural Resource and Environmental Economics	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

The arctic and subarctic zones are expected to sustain the greatest impacts is tied to global climate change, which may result in warmer and drier conditions in boreal forest and coastal forest regions. The large expanse of public land in Alaska will require skilled and knowledgeable management of natural landscapes into the indefinite future. We will maintain a leadership role in examining the sensitivity of northern resources to climate variability and change and will contribute to integrated assessments of the effects of climate change to Alaska's ecosystems. In this role, ground database information will continue to be amassed and used as the basis to persuade remote sensing specialists of the need to establish indicator links for ground to remote-sensed information. This link is necessary to assure accurate information for more precise predictions of future change and impacts. State leaders will be targeted as they plan to develop both renewable and nonrenewable natural resources to contribute to the economic well-being of its citizens without compromising ecological integrity and biodiversity. To be sustainable, any development activities require knowledge of desirable practices that balance technologies and economic necessity with environmental imperatives. Concern for the health and survival of resource biodiversity will continue to be a central issue in resources management in Alaska and elsewhere. Geographic information and a link to ground data is critical to the management of vast natural resource areas. Professionals who will be future land managers will need to be conversant in technology and methodology to obtain both land and remotely sensed information. An excellent training base for these future managers is curricula that incorporate visual learning through electronic media. In view of the vast acreage in Alaska and the potentially high carbon storage capacity in the boreal forest and the potentially high release of carbon into the atmosphere as arctic soils warm, it is critical that there be an understanding of the balance of the boreal forest and tundra soils if ecological modeling is to enhance the capabilities of land managers. As the effects of climate change become more apparent, Alaskans will need to know about successful adaptation to these changes and emergency preparedness to respond to extreme weather events.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research

- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

The condition and productivity of Alaska's forest and wild land resources is strongly influenced by climate, which is highly variable in Alaska. Interest in climate change will remain strong and national assessments of climate and resources will be a national and international priority. We assume that in Alaska's and the circumpolar North's future knowledge of ecosystem resources, a database and data management system will be critical to allow us to:

- Evaluate and manage disturbance
- Recommend sustainable best management practices for recovery
- Develop ground-based signatures correlated to remotely sensed images
- Incorporate ground-based signatures into climate models
- Enhance product production and use
- Encourage sustainable economic development

Outreach and education are a part of AFES's and Extension's mission to assist clients in sustainable use of natural resources and ecosystem management. The teams we have and will assemble include scientists in key program knowledge areas in forest and ecosystem sciences, forest products, range management, recreation, policy and law and community development. Funding sources are becoming more available through competitive grants and community, state and federal support. Geographic information is critical to the management of vast natural resource areas. Increasingly, geographic information is derived from and transmitted using remote images. Professionals who will be future land managers will need to be conversant in technology and methodology to obtain both land and remotely sensed information. AFES will maintain programs in soil science, GIS, and ecosystem modeling that will be supported by these assumptions:

- Global climate will not remain constant and current models predict increases that will impact northern latitudes first and hardest.
- Warming climates will increase incidence and magnitude of forest fires, diseases and insect infestations in the boreal forest of Interior Alaska.
- Resource extraction of petroleum and minerals will continue and without proper management will impact Alaska's soil resources in a negative way.
- Forest management will increasingly include multiple forest products including timber, nontimber products and fuels for energy production.

Integration of this work will deliver information to managers and users of natural resources and will in turn bring information back for further program development.

2. Ultimate goal(s) of this Program

The goal of this program is the management of the biological, physical and human ecosystem to produce, conserve and enhance harvestable products and biodiversity in Alaska and the North, increase understanding about the effects of climate change adaptation as it relates to communities and ecosystems, and to improve understanding of the effects of natural resource policies and regulations on the management and health of Alaska's ecosystems. This includes:

- Sustainable biodiversity in undeveloped areas
- Long-term monitoring programs
- Data management systems to support sustainable ecosystems and communities
- Sustainable community growth

- Development of a diversity of forest products
- Development of ground-based data with indices that correlate to remotely sensed data
- Use of the indices in models that reflect the biological, physical and cultural impacts of climate change

To attain these goals it will be necessary to develop a knowledge base that will address interactions between global warming, wild land fire, forest diseases and insect infestation, soil properties and characteristics in a forest ecosystem regime, soil carbon bioavailability, forest product development, nonextractive forest uses and community development. Work will focus on:

- Soil properties of northern forests
- Origin, formation, and classification of high-latitude soils
- Soil responses to climate change
- Long-term forest productivity data conversion and incorporation into mega data systems for compatibility with long-term ecological research, fire management, forest health, and forest ecosystem data sets
 - Curricula that train future land managers in ecosystem stability and geospatial technology
 - Climate change effects on northern forest ecosystems
 - Federal, state, and community government policy and regulation concerning ecosystem management
 - Development of a ground-based data set incorporating soils and forest types with specifics related to remotely sensed data

This work combined with effective education and outreach will play a vital role in resource management and learning, adaptation and productivity in the face of climate change in Alaska and the circumpolar North.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	1.0	0.0	4.0	0.0
2018	1.0	0.0	4.0	0.0
2019	1.0	0.0	4.0	0.0
2020	1.0	0.0	4.0	0.0
2021	1.0	0.0	2.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

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 of 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
 - 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. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • Group Discussion • One-on-One Intervention • Demonstrations 	<ul style="list-style-type: none"> • Public Service Announcement • Newsletters • TV Media Programs • Web sites other than eXtension • Other 1 (Publications)

3. Description of targeted 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 includes: Alaska Board of Forestry, Society of American Foresters, 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.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Output 1. Soils research will concentrate on the soil carbon properties in relation to climate change and soil disturbance dynamics in upland and lowland forest ecosystems. Publications and presentations are output measures.
 - 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.
 - 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.
 - 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 and updated.
 - Output 5. Research providing base line data for modeling timber availability will continue. Forest management specific to fuel/energy demand drives the research. Measurable outputs will be publications and presentations.
 - Output 6. Recreation opportunities are important in urban and rural forests. Recreation management in Alaska are primarily tied to national and state parks and forest. Measurable outputs are publications and presentations.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

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 knowledge through classroom and field course delivery. The outcome measures will be curricula delivered and number of students reached.
3	Outcome 3. Respond to community and individual knowledge needs 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.
4	Outcome Measure #4: Demonstrate effective collaboration between research and Extension to resolve issues.

Outcome # 1

1. Outcome Target

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 Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources

4. Associated Institute Type(s)

- 1862 Research

Outcome # 2

1. Outcome Target

Outcome 2. Increase knowledge through classroom and field course delivery. The outcome measures will be curricula delivered and number of students reached.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources
- 122 - Management and Control of Forest and Range Fires

4. Associated Institute Type(s)

- 1862 Research

Outcome # 3

1. Outcome Target

Outcome 3. Respond to community and individual knowledge needs 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. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources
- 122 - Management and Control of Forest and Range Fires

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

Outcome Measure #4: Demonstrate effective collaboration between research and Extension to resolve issues.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 123 - Management and Sustainability of Forest Resources
- 132 - Weather and Climate
- 122 - Management and Control of Forest and Range Fires
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect 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.)

Description

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. Transportation costs continue to effect 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 three faculty positions and positions lost to anticipated retirements will not be replaced in the near future. This severely impacts research and education. The university has experienced budget cuts as a result of the reduction in oil revenues for the last seven years which has dramatically affected programs. UAF policy rewards external grants but disparages land grant funds and its required state match.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The evaluation specialist will be available for program evaluation and survey assistance.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Youth Development

2. Brief summary about Planned Program

Extension will promote youth development through education with a focus on skills and knowledge targeting individual learners with the goals of developing competency in various knowledge skills and a content approach using the 4-H follow Mission Mandates: Science, Engineering and Technology; Healthy Lifestyles; and Citizenship. Clubs, school enrichment programs, after-school activities and summer camps will be conducted across Alaska to achieve youth development goals. Training throughout the state, using the Essential Elements of Youth Development, will be the foundation of all youth development programming within this contextual framework that include generosity, belonging, independence and mastery.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

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%	
608	Community Resource Planning and Development	0%		100%	
801	Individual and Family Resource Management	5%		0%	
806	Youth Development	90%		0%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Of the nearly 100,000 youth who could benefit from positive youth development programming, currently only about 15% of that target population of youth are served by the program. The number of agent/field faculty is small in contrast to the distances between communities. Transportation off the limited road system requires expensive air or limited sea access. Such geographic extremes, combined with a high latitude climate, restrict what programs can be offered. Alaska is also facing increased urbanization and rural outmigration. Military deployment continues to be a major source of stress on a significant percentage of families. Without an equivalent to county agents, we will continue to develop partnerships

with Native corporations, nonprofit agencies, and local, regional and state organizations involved in youth programming to strengthen ownership in programming. Increased administrative function support has improved our ability to reach underserved and minority population activities. The university system strongly supports workforce development, with attention to youth, as a priority in outreach. The number of youth who participate in 4-H programming drops off in adolescence.

2. Scope of the Program

- In-State Extension
- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

When environments include sustained opportunities for youth to gain a sense of belonging, independence, mastery and generosity, youth make positive life choices. Their contribution in leadership and civic engagement productively influence their communities and their futures. Positive youth development relies on science-based program competencies that promote workforce development and personal goal attainment through long-term, caring interactions with mentors, peer support and experiential learning. Improvements in risk management and volunteer management for volunteer leaders will continue to enhance these youth assets. Increasing membership or involvement in programs has to incorporate new types of club and program activities that meet the relevant needs of single-head of household families, various learning styles and a wide range of socioeconomic strata in the state's diverse populations.

2. Ultimate goal(s) of this Program

Borrowing from the vision of 4-H, Alaska youth will be productive citizens and catalysts for positive change to meet the needs of a diverse and changing society. 4-H youth development will be a highly respected resource recognized by the state as a leader in creating a sense of belonging, mastery, independence and generosity through club and project programming to any community with a desire to build youth assets.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	8.5	0.0	0.3	0.0
2018	8.5	0.0	0.0	0.0
2019	8.5	0.0	0.0	0.0
2020	8.5	0.0	0.0	0.0
2021	0.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- 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
 - Collaboration between CES nutritionist and AFES economist on obesity grant

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • Group Discussion • One-on-One Intervention • Demonstrations • Other 1 (Camps) 	<ul style="list-style-type: none"> • Public Service Announcement • Newsletters • Web sites other than eXtension • Other 1 (Facebook)

3. Description of targeted 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

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Output 1: Volunteers will complete positive youth development training. Measure will be the number of volunteers trained.
 - Output 2: Extension will offer relevant workforce skill development projects for youth. Measure will be the number of workforce and skill development projects.
 - Output 3: 4-H will offer opportunities for engagement with underserved and minority youth. Measure will be the number of opportunities offered in underserved areas and number of culturally responsive programs.
 - Output 4: Youth Development will offer programming in science, engineering and technology. Measure will be the number of programs offered in this area.
 - Output 5: 4-H educators will offer inter and intra-district educational and service collaborations. Measure will be the number of education and service collaborations.
 - Output 6. Integrated activity on childhood obesity will lead to new knowledge. Measure will be databases and publications.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

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 offer opportunities for membership or involvement for underserved and minority youth. Measure will be demographic parity.

Outcome # 1

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

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. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Outcome 3: 4-H educators will offer opportunities for membership or involvement for underserved and minority youth. Measure will be demographic parity.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect 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)

Description

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(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

4-H offers post-activity surveys for many of its programs. The club chartering process can also be an evaluation tool. Obesity grant is using surveys to collect data.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Sustainable Energy

2. Brief summary about Planned Program

Alaska's forest and agricultural resource potential for bioenergy production is immense. The economic potential of Alaska's forests is under-realized in biomass harvest, timber and nontimber products. The potential for Alaska to develop new agricultural land is also under-realized. Furthermore, agricultural lands that are currently in Conservation Reserve Program may lend themselves to sustainable production of biomass. The forest ecosystem and agricultural lands can play a role in diversifying the economy of Alaska. State leaders plan to develop both renewable and nonrenewable natural resources to contribute to the economic well-being of their citizens without compromising ecological integrity and biodiversity. To be sustainable, any development activities require production practices that balance technologies and economic necessity with environmental imperatives.

Research, teaching and outreach are needed to provide information about management of Alaska and northern ecosystems, the production of sustainable energy sources and new methodology for second generation energy systems. As energy continues to become a growing concern throughout the world, the boreal forest and agronomic crops of Alaska have the potential to provide fuel alternatives to petroleum and coal.

3. Program existence : Intermediate (One to five years)

4. Program duration : Medium Term (One to five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

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	10%		20%	
125	Agroforestry	10%		20%	
131	Alternative Uses of Land	10%		20%	
205	Plant Management Systems	30%		20%	
511	New and Improved Non-Food Products and Processes	40%		20%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Alaska contains vast forests and lands that have forest product and agricultural production capability. The priority is economic viability without negative impacts on existing agricultural and forestry enterprises. The USFS forest inventory analysis (FIA) for Alaska is incomplete at best. Agricultural land surveys exist for many locations but are not complete for the entire state of Alaska. Additionally, large masses of the productive forest and agricultural lands are not within reach of current transportation infrastructure and existing electrical or power supplies.

Agricultural land surveys for Alaska are published by the USDA Natural Resource Conservation Service (NRCS). It is estimated that within the road system there are 500,000 acres of cropable lands. Grain, grass and oilseed crops are likely candidates for energy use. The USDA National Agricultural Statistics Service (NASS) provides statistics for grain and hay. There are no statistics for oilseeds or crop residues, although amounts could be estimated. Woody biomass as a crop is also a potential energy source. There have been reasonable successes with these crops in other northern areas. Basic research is needed on grasses and woody species for biomass. Willow, poplar and small-diameter spruce are the species most frequently used and have been briefly addressed in previous research.

The Western Governors' Association in the review draft of "Biomass Electric Supply Sources for the Western States" (2005) estimated biomass resources in the Western states, including Alaska. The major categories included agricultural, forest and urban biomass resources. However, much of the information regarding crop residues, energy crops, unused logging slash, primary sawmill residues, bio-solids, waste water and landfill waste had to be estimated based on an average from selected Western states, calculated on a per capita or per acre basis as applicable, then extrapolated to obtain totals.

Much more information exists but, as stated above, is scattered and not organized in a manner specifically directed to give quantifiable answers to those with an interest in using biomass as a dedicated fuel stock. Research and subsequent education and outreach are priority concerns as we move from rough estimates to actual capabilities concerning Alaska potential for sustainable energy production.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Alaska's forest and agricultural resource potential is immense. There is a need for research on the availability, quality and feasibility of sustainable, economic use of agricultural and forestry biomass in Alaska. Communities that do not have access to the Southcentral natural gas distribution system rely heavily (75%+) on high cost petroleum-based fuels to satisfy their home/space heating. Most also use petroleum products or coal for their electrical generation needs. The negative aspects of this reliance are further compounded in relatively isolated rural and village communities by the high cost of transporting

these expensive fuels to point of use.

It is this high end-use fuel cost that is driving many individuals and communities to seek alternative fuel sources, especially in the critical realm of home/space heating. Sustainable biomass energy sources are attractive because of their apparent wide distribution, abundance, proximity to affected communities, easy availability and assumed low cost (when combusted in an appropriate technology) and are being strongly considered as a means of alleviating the fuel cost dilemma.

AFES has collected and archived meteorological data over a span of 100 years (the longest continuous weather record for the state) in Interior Alaska. In the Matanuska Valley wind speed and direction has been collected for over three years using a 30 m meteorological tower to accurately gauge the potential for energy generation. Data for solar applications was collected during 1980 - 1995. It was compiled and is available for this region from Extension. CES will provide outreach to communities about biomass heating opportunities and forest management relating to biomass and provide assistance to entrepreneurs involved with sustainable energy production.

2. Ultimate goal(s) of this Program

Our goal is to better qualify/quantify biomass resources and address the question of availability, quality and feasibility of biomass so that it might be used in Alaska as an economic, sustainable fuel source by:

- Updating the forestry biomass database which will help optimize forestry bioenergy production
- Helping communities learn about and assess biomass heating opportunities and forest management relating to biomass
- Providing assistance to entrepreneurs involved with sustainable energy production
- Seek new answers in the ever-challenging field of energy production.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	1.0	0.0	0.0	0.0
2018	1.0	0.0	0.0	0.0
2019	1.0	0.0	0.0	0.0
2020	1.0	0.0	0.0	0.0
2021	1.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

AFES will continue work on oilseed crops. If successful, this research will lead to development of "best practices" management regimes and genetics of bioenergy crops. CES is working with communities on use of biomass products and technologies 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. Type(s) of methods to be used to reach direct and indirect contacts

Extension	
Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs

3. Description of targeted audience

The target audiences include producers and consumers, communities, agriculture and forestry businesses, industry leaders, entrepreneurs, individuals and groups concerned about the quality of the Alaska environment, public resource agencies, public and private resource managers, other faculty and researchers, and undergraduate and graduate students. Our efforts will be directed toward environmentally and economically sustainable development and conservation of our natural resources that will benefit all citizens and help them adapt and become resilient as the climate changes. Advisors and the target audience include State Board of Forestry, Society of American Foresters, Alaska Farm Bureau, Alaska Energy Authority, USDA Forest Service, the Alaska Department of Natural Resources, borough governments and Alaska Native corporations. Information on impact of fires will assist the Department of Natural Resources Division of Forestry and private landowners and managers. Research and outreach efforts will address public education on the sustainability of biomass harvesting, new technologies and community planning.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Output 1: Workshops, demonstrations, short courses, classes, field days and conferences on sustainable energy issues organized and conducted.
- Output 2: Community, organizations and one-on-one consultation concerning bio-based energy opportunities conducted.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Outcome 1: Maintain a forestry biomass database.
2	Outcome 2: Monitor adoption of bioenergy technologies.

Outcome # 1

1. Outcome Target

Outcome 1: Maintain a forestry biomass database.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Outcome 2: Monitor adoption of bioenergy technologies.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 511 - New and Improved Non-Food Products and Processes

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect 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.)

Description

Alaska is experiencing impacts of the changing climate in the degradation of glaciers, the ecology of the boreal forest and its ice-impregnated northern soils. Moisture stress continues to lead to insect predation and tree death. These negative factors will influence the thrust 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.

Transportation costs draw attention to regional and local management for energy and other local wood products. Finally, as demographics of the population change and demographics of the forest industry change toward management with a specific product objective as well as an objective of sustainable and resilient northern ecosystems, there will be need for continuing adult education and higher education to fill workforce vacancies or new positions that are created to meet demands in energy and ecosystem management fields.

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. Continuing budget cuts as a result of the reduction in oil revenues will result in the loss of funding for faculty and staff salaries. AFES has lost two research position and no longer contributes research in this area except through oilseed research which is reported in the Ag & Hort planned program. It is not anticipated that these positions will be refilled in the near future. This will severely impact research and education.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The objective of the AFES and Extension is to set in place communication processes that bring information from our units to our clientele and provides feedback to adjust our programs, within the capabilities of our space and budgets, to meet the needs of the people of Alaska.