University of Alaska Fairbanks
2011 Annual Unit Plan

The information collected in the Annual Unit Plan (AUP) is used in a variety of required reports, including but not limited to institutional accreditation reporting, Performance Based Budgeting (PBB), Alaska Budget System (ABS), Missions and Measures (M&M), and the Annual Operating and Management Reviews. Submission of the AUP is required in August of each year.

Please complete the following information using the format provided, and submit it electronically by August 27, 2010 to Deb Horner, University Planner (dghorner@alaska.edu) with a copy to Ian Olson, PAIR (inolson@alaska.edu) as well as to Susan Henrichs, Provost (fyprov@uaf.edu).

A. General Information

A1. Unit Name: International Arctic Research Center

A2. Unit Mission Statement - The mission is a short (no more than one paragraph) statement that describes why the unit exists. Unit mission statements that have been formally approval by the UA Board of Regents should not be changed.

IARC's mission is to foster arctic research in an international setting to help the nation and the international community to understand, prepare for, and adapt to the pan-Arctic impacts of climate change. In accomplishing this mission, IARC serves as both mediator and driver to advance international collaboration aimed at comprehensive studies of the arctic system by integrating strengths unique to university, state, federal, and international support levels.

A3. Core Services - This section identifies the unit's major functions that support its mission. In the interests of brevity, links to websites with additional information on the unit may be included. This section should not exceed two brief paragraphs.

The International Arctic Research Center (IARC) was established in 1999 as a cooperative research institute supported by both the U.S. and Japanese governments. Funding comes from the National Science Foundation and the National Oceanic and Atmospheric Administration in the U.S., and from the Japan Agency for Marine-Earth Science and Technology Center and the Japan Aerospace Exploration Agency in Japan. IARC serves as a focal point of excellence for international collaboration and provides the arctic

research community with an unprecedented opportunity to share knowledge about science in the Arctic, with an emphasis on global change research. More than 20 international groups and more than 60 scientists are collaborating with IARC, allowing the institute to meet the UAF mission and goals in a concrete way. IARC conducts an internationally popular summer school for young researchers. It holds workshops on the integration and synthesis of research (e.g., on the attribution of polar climate change; on the arctic carbon cycle; and on arctic climate and hydrology). IARC facilitates international exchanges of data (e.g., with the Russians) and enables international field activities such as cruises and permafrost measurement networks. IARC also supports several K-12 outreach projects that reach schools in Alaska, nationwide, and worldwide. CDs produced on climate change and other arctic science topics are widely used in Alaskan schools.

Our primary functions are a combination of service, research, and outreach/education. Key service activities will include organization and development of a center for arctic data and information and international synthesis workshops. We will host project offices and secretariats, facilitate access to arctic research sites, and encourage international collaboration. Our scientific advances are achieved largely through partnerships with institutions in the United States, Japan, Russia, and Canada, as well as other international organizations. Our science activity includes a role in the implementation, oversight/coordination, and utilization of an Arctic System Model. Our national and international public service and outreach/education programs have been expanded to enhance IARC's visibility and impact. This is accomplished through a visitor program that targets postdoctoral scientists and senior scientists and through wide circulation of annual reports and newsletters. Education activities include teaching UAF graduate and undergraduate courses, entraining more graduate students, and coordinating K-12 learning opportunities. These efforts are targeted at urban and rural schools in Alaska and, where possible, at broader audiences of students in cities in the lower 48, where we hope to improve "Arctic Literacy."

B. Progress Report

B1. Major Accomplishments

List the significant unit accomplishments for AY09-10 in the areas indicated below. Please include the top three accomplishments in each area. Be brief; use web links to provide additional information if necessary.

- Teaching, research and public service:

  Teaching

  IARC has steadily increased our number of graduate and undergraduate students involvement in research. IARC is also doing a good job mentoring post-docs to become productive and professional researchers. We have developed a mentoring plan that is being used as a model by many departments across campus (see IARC Postdoctoral Handbook and Mentor Plan Revision 1. Sept 2009).

  Research

  IARC researchers Natalia Shakhova and Igor Semelitov, in partnership with scientists from the Far East Branch of the Russian Academy of Science demonstrated that the flux of methane from the Laptev Sea area just off the Lena Delta was as great in magnitude as the rest of the world's oceans combined. See http://www.uaf.edu/files/news/a_news/20100303192545.html

  Public Service

  IARC organized the arctic research community in writing a Science Plan to develop Arctic System Modeling. This required three international workshops and well over 100 contributors and reviewers, but the final plan has been widely and warmly welcomed by researchers and agency program managers. See http://www.iarc.uaf.edu/publications/reports/IARCTP10-0001.pdf

- Faculty, student and staff awards, competencies, regional/national/international recognition:

The Louis Agassiz Medal was awarded to Hajo Eicken for his outstanding contribution to the study of the physical and biological properties of sea ice through a combination of novel experimental techniques and theory.

IARC graduate student Oceana Francis was named Young Engineer of the Year by the Alaska Society of Professional Engineers. Oceana serves as VP for the Fairbanks Chapter of the American Society of Civil Engineers and is also involved with the American Indian Science and Engineering Society, and the Alaska Native Science and Engineering Program. She is actively involved in bringing science and engineering together.

IARC Director Larry Hinzman was selected to present the Nye Lecture at the 2009 American Geophysical Union meeting.

B2. End Results and Strategies

List end results, strategies, targets, etc, in the table below for the period July 1, 2009 to June 30, 2010, based on the 2010 AUP. Add rows as needed.

End Result:	Strategies to Achieve End Result	Target(s):	Measure(s)/Assessment(s):	Status:	Budget Impact
Develop a framework for a model of the integrated Arctic System.	Entrain a diverse group of collaborative researchers to advance arctic system science. Secure necessary funding to support their efforts.	Publish an ASM Implementation Plan. Promote establishment of an NSF program to support Arctic System Modeling.	IARC expects to serve in a coordinating role to help advance the science and promote program development and proposal submission. Success will be determined by the number of projects funded and the number of papers published.	We have published the ASM Science Plan and have rigorously promoted it with various federal agencies. http://www.iarc.uaf.edu/publications/reports/IARCTP10-0001.pdf	We expect this to be a source of funding through individual PI driven research proposals.

Secure appropriate levels of University financial support in order to obtain continued funding from NSF for ASM development.	We endeavor to secure an adequate proportion of Fund 1 budget to allow some level of security in periods of grant instability.	We would like to receive an equitable proportion of fund 1 as compared to other research institutes. We would like to receive $1 of Fund 1 for every $7 of research funding.	Our support from UAF has decreased in the past year.		
Diversify our funding base through PI-driven individual research projects.	We are looking for opportunities to support industry and civil needs in the changing Arctic	Every researcher should have their own independent funding as well as benefit from institutional support	We have lost several senior researchers. Although our proposal submissions are increasing, our success is decreasing.	Most of our researchers do have at least one independent funded project.	This should reduce vulnerability associated with a narrow funding base.
Help State of Alaska and other stakeholders assess environmental and socio-economic changes over next decade through synthesis activities of North by 2020 Forum	Workshops, collaborative work on a synthesis book, seminar series	Synthesis volume to be published by 2011; Lecture series and related products (white paper etc.) during fall and spring semester 2010/11	External review of synthesis book, input from other stakeholders in the State (government, local organizations, industry, NGOs)	Work on book is near-complete, contributions to first workshop and lecture series solicited/planned	0.25 FTE; this position will help bring in additional funding support through external grants
Characterize the role of the permafrost dynamics in the context of interactions with the hydrological cycle in arctic climate, particularly with respect to those mechanisms associated with complex linkages, thresholds, and feedbacks.					

Characterize impacts of oceanic heat on arctic ice.	A joint analysis of various oceanic measurements with satellite-based data.	Publish peer-reviewed manuscripts and improve understanding of the role of ocean thermodynamics on the state of the Arctic ice.	Success will be determined by the number and quality of the publications.	Active NASA grant	We expect this to be a source of funding through individual PI driven research proposals.
Provide demonstrative contributions to a narrowing of the range of model-derived predictions of Arctic change.					
Attempt to quantify the relative current and possible future influences of arctic terrestrial and marine ecosystems on the global climate system.	Partner with global climate modeling centers. Secure necessary funding to support partnership project(s).	Publish peer-reviewed manuscripts and improve community model(s).	Success will be determined by number of papers published and the acceptance of model improvements by the Community Climate System Model (CCSM) community.	Active DOE EPSCoR State/National Laboratory Partnership grant for model development.	Source of funding through individual PI-driven research proposal.
Process studies for improving climate models presentation in the polar regions	Partner with climate model centers (NCAR, LANL, GFDL), and including a group of observers and modelers	Publish peer-reviewed manuscripts and improve the accuracy of community models.	Success will be determined by number of papers published and the improvements to the climate models	Active NSF and NOAA funded Climate Process Team (CPT) project with National Laboratory Partnership	Source of funding through individual PI-driven research proposal.
Quantify how key features and processes in the Arctic interact with and influence the global climate system.					

Serve as a focal point for synthesizing arctic research efforts addressing climate change and also for communicating the results among the global climate research community.					
Help to advance the community's understanding of the Arctic as a system and apply this enhanced understanding to the challenge of prediction of the system’s evolution.					
Coordinate a synthesis of information on arctic processes by convening a series of workshops and international conferences.	We hosted 12 workshops in the past year, all with the intent of compiling and synthesizing knowledge to more rapidly advance understanding of arctic processes.	We hope to continue the intensive schedule of 1 workshop per month. We encourage one publication evolve from every workshop.	Workshops that produce a published document are the most valuable and produce the broadest impact.	Our workshop funding will end in June 2011. We are attempting to find additional workshop funds to be used in coming months.	This will exert a major blow to our ability to generate new proposal ideas and generate new revenue.
Promote additional collaborative opportunities by hosting visiting scientists and students			Success will be determined by number of joint papers published.	Hosted numerous researchers from around the world, particularly increasing collaborations with China and Japan	

Provide Education and Outreach by promoting teaching, training, and learning while advancing discovery and understanding about the Arctic, changes in the Arctic and their implications	1) Hold IARC Summer Schools for upper undergrad and graduate students 2) provide professional development workshops to K-12 teachers on Earth system science 3) provide mentoring to students including early career scientists	1) conduct at least one summer school a year; 2) conduct at least two professional development workshops a year 3) IARC faculty participate in mentoring panels for young scientists in addition to being advisors or committee members on graduate student committees	1) attendance, participation and mini projects conducted by students; during the summer course and feedback about the course; 2) number if workshops conducted and the number teachers who participated and are implementing in their classrooms 3) number of mentoring opportunities and number of grad students	1) Thirty Graduate students and early career scientists participated in the June-July, 2009 IARC Summer school "Global-to-Local Interactions: Social-Ecological Resilience in a Rapidly Changing North" In May-June 2010, "Arctic in a changing climate: Physical and biological linkages to permafrost" Mini projects were conducted and positive feedback given 2) Conducted 5 professional development workshops for more than 110 teachers; teachers have submitted implementation plans 3) IARC currently has 10? grad students and ? of postdoctoral fellows	1) We submitted a proposal to NSF to fund future yearly summer schools (2011-2014) 2) These PD workshops are being conducted through individual PI NSF funding as well as from collaborations wih other science education programs at UAF 3) Graduate students and postdoctoral fellows are supported by different sources of funding

Provide Education and Outreach by promoting collaborations with U.S. and international research institutions as well as educational institutions.	1) Host visiting scientists and students from other U.S. states and international institutions 2) Host high school students from other countries 2) conduct PD workshops for teachers in Alaska, the US. And other countries involving schools and	1)) Collaborations with Scientists and researchers; mentoring of students 2) host high school students 3) conduct at least one international workshop a year	1) Collaborative projects and publications for the researchers; student participation and feedback; 2) participation and feedback from students 3) number of workshops conducted and teachers served; feedback through assessments	1) and 2) Continuing effort; Hosted numerous researchers from around the world, particularly increasing collaborations with China and Japan, including 28 high school students from Super Science School in Japan 3) an international workshop held in Tanzania for 59 teachers and educators in Sep 2009 and for 20 teachers in Australia in June 2009; and increase in content knowledge, form pre-/post tests	1) & 2) 28 high school students and their teachers from Japan and some visiting scientists have been funded by their home institutions; 3) We expect this to be funded through individual PI driven education outreach grant funding and through collaborations with other funded science education projects

Provide Education and Outreach by actively participating in the fourth International Polar Year (IPY, 2007-2009) education and outreach activities, in addition to the IPY research activities.	1) participate in the international IPY Education Outreach and Communication (EOC) subcommittee meetings and activities 2) participate in Polar Week 3) Contribute to the polar resource book 4) Conduct professional development workshops for K-12 teachers for the IPY GLOBE Seasons and Biomes project	1) organize EOC sessions for the Polar Teachers Science Conference and the Oslo IPY Science conference 2) preparation and conduct of Polar Weeks 3) Completion of the book on *Polar Science and Global Climate: An International Resource for Education & Outreach,* 4) Teachers and students teach and learn about science through Earth System Science Studies	1) Numbers of teachers who participated and presented at the Oslo IPY Science Conference 2) Attendance and participation during the UAF campus/community –wide presentation 3) completion of writing, editing and publishing of the book 4) pre-post tests, surveys, students work to assess content and skills knowledge of students	120 teachers and other educators participated at the June OSLO IPY Science Conference as well as the Polar Science Teacher Conference; 20 took the conference for continuing education credits from UAF; 2) Seminar room was packed and folks at Yukon College, Canada also participated; 3) the book came out in print June 2010 and was distributed at the Oslo IPY Science conference 4) Seasons and Biomes project continues on	1) funding came from collaboration with a PI's project, as well as from IARC EO funding and other science education programs at UAF 2) no funding needed 3) funding for the book publication came from a variety of sources and individuals including the UArctic , IPY program office; 4) Proposal for Supplemental funding for the Seasons and Biomes project has been submitted.; a one-year no cost extension has already been granted.

B3. Analysis of Performance Metrics and Supporting Data

Unit data will be provided by the UAF Office of Planning, Analysis and Institutional Research (PAIR). Respective data reports will be available at http://www.uaf.edu/pair/performance-data/ for your use by July 30, 2010. Units may also include additional unit-specific performance data at the end of the section. Please use the same format in reporting unit-specific performance data. Please write a brief data analysis that incorporates the following aspects, where applicable:

Data Review

- Evaluate the differences in final numbers as compared to your unit targets. Did your unit meet its stated goal? Why or why not?
- Discuss data trends, both positive and negative.
- Indicate whether or not the targets should be adjusted for future years in light of trends.

IARC has traditionally been supported by major funding sources, all of which appear to be on the wane.

We have benefited greatly from the support of Senator Stevens and Senator Murkowski, and their loss will impact our finances. The senators have directed major research funding to IARC via earmarks through NOAA and DoE. We do not expect additional support through federal legislation.

IARC had 12 years of very stable and generous support from the US National Science Foundation through a Cooperative Agreement. NSF decided that our CA amounted to support for an Arctic Center of Excellence, and their standard rule is no more than 10 years of support for a CoE. So, this funding stream will end June 30, 2011.

For many years, we have been the fortunate recipients of stable research investment from the Japanese government both through JAMSTEC and JAXA. Although both agencies are very pleased with our partnership and productivity, they are also facing *"jigyo shiwake"* or the current government's program to shift spending to clear-cut, short-term social benefits. The long-term vision needed to support fundamental research may not fare well in this environment. JAMSTEC took a severe blow to the budget last year. They were forced to pass on a 9% cut, plus $1M cut; however, they asked JAXA to cover the $1M decrease, which they did. JAMSTEC has informed their budget division they do not intend to impose the $1M cut on IARC again this year, but we will face some cut, probably on the order of 4 to 10%. It appears our JAXA funding is secure again next year.
Our final source of revenue is via PI driven research projects. IARC has lost several senior faculty in recent years and this has impacted our productivity. Several of these researchers were particularly successful in writing successful proposals, so our external funding is down somewhat. The numbers of proposals submitted has increased somewhat as we are engaging our younger faculty and post-docs in proposal writing. Unfortunately, new researchers have a lower success rate in proposal submissions, but we are working with them to improve that success rate. Our publication rate is stable, as our young researchers are in a very prolific phase of their careers, publishing the post-thesis research

papers. We anticipate that the number of successful proposals and the number of publications will increase as our young researchers become more experienced. We do expect that it will take some years for our new hires to compete successfully for support from the funding agencies and we expect that research funds will become somewhat less available due to the general economic situation, so we have revised our future targets somewhat downward.

Strategies

- Reflect upon key unit strategies initiated over the last year – which ones worked and which ones returned results that did not meet your expectations. Please explain. Take careful note of this critical piece as it plays an important role in the university's overall PBB evaluation.
- If there is a formal plan (e.g., Enrollment Management Plan) that is strongly related to a particular performance criteria, discuss any evidence that the plan is or is not achieving its objectives, and if not, any changes implemented or planned.

Our substantial loss in senior faculty was offset by extensive hiring of young post-doctor fellows. We believe this will provide increased productivity for IARC and UAF as a whole in the coming years, but in the short-term, we do expect to see decreased productivity in our metrics. We are providing extensive mentoring and encouragement to our young faculty to help them become successful.

We have initiated development of an Arctic Climate Data Archive, which we believe will help maintain IARC as a strategic player in arctic research. We have received broad scale interest and support from across the university and across the state to initiate this facility. We believe this will enhance the university's role in meeting the state's need to respond to a changing climate.

We are still moving forward on developing an Arctic System Model. We published the science plan (http://www.iarc.uaf.edu/publications/reports/IARCTP10-0001.pdf) and have distributed it broadly and have received broad-scale and nearly unanimous positive response. We are rigorously promoting it within NSF, NASA, DoE, USGS, ONR, and through the Inter-Agency Arctic Research Policy Committee (IARPC) which is hosted in the White House Office of Science and Technology Policy.

We did fail in our effort to establish IARC as a virtual center to lead Arctic Research as funded through the development of an Arctic Collaboratory under the NSF OPERA program. We are presently restructuring our proposal and plan to re-submit with a smaller, more focused approach. This is a major loss to IARC as we hoped this would be the mechanism to provide continued service to the arctic research community.

Resources and Reallocation

- Were there any resources allocated or reallocated to support achievement of your unit's targets and strategies? If so, please explain.
- Are any areas of achievement suffering from a resource (re)allocation that additionally impacts other metrics?
- Of all your strategies, which is your most critical for unit success and is it in need of additional resources in order to make it successful?

Like all units, we were encouraged to spend our Fund 1 carry forward this year. This impacted our perceived stability in light of decreasing external funding and also limits our ability to cover shortfalls for research faculty who are not successful in securing grants. We did invest these funds in development of the new climate data center with the expectations that will make us more competitive in future funding opportunities.

We are striving to improve the status of research faculty. It seems some feel that are treated unfairly compared to academic faculty. They do only receive annual contracts, are not eligible for sabbatical, and must work much harder to secure their own salary, so the perception is not unwarranted. We will work to increase salaries of productive research faculty to lessen the perceived inequities.

Money however is not always the most effective motivational tool. Recognition by UAF that research faculty are also core to the university function would improve morale and our ability to retain highly productive research faculty. We believe establishing a PhD program at IARC, and thus enabling our faculty to teach and recruit graduate students. We would like to create a PhD program in Climate Change or Arctic System Science. We believe this will generate more graduate students for UAF, will improve the visibility and vitality of IARC and UAF and will greatly improve the morale of our scientists.

Fairbanks Academic Unit-Level Historical Performance and Targets

▼ No.	*Performance Metrics and Supporting Data* Reporting Period: FY10 (July 1, 2009 to June 30, 2010)	*Historical Performance*					*FY11 Target*		*FY12 Target*
		FY06	FY07	FY08	FY09	FY10	Current	New	
1	Student Credit Hours Generated (ex. 500-level)								
2	Grant-Funded Research Expenditures (M$)								
3	High Demand Job Academic Awards								
4	Undergraduate Student Retention								
5	Undergraduate Enrollment								
6	UA Scholar Enrollment								
7	Graduate Enrollment								
8	Unit Enrollment Management Plan								
9	Student Learning Outcomes Assessment								

Research Unit-Level Historical Performance and Targets

▼	*Performance Metrics and Supporting Data* Reporting Period: FY10 (July 1, 2009 to June 30, 2010)	*Historical Performance*					*FY11 Target*		*FY12 Target*
		FY06	FY07	FY08	FY09	FY10	Current	New	
1	Grant-Funded Research Expenditures	9,256,038	9,504,898	8,401,083	9,309,324	7,594,722	8,400,000	7,500,000	7,500,000
2	Indirect-Cost Recovery	1,074,291	1,096,587	1,158,967	940,845	1,077,606	788,000	1,000,000	1,000,000
3	Non-General Fund (NGF) Revenue	11,686,443	14,072,526	11,933,118	14,724,001	14,401,059	9,000,000	12,000,000	12,000,000
4	Ratio of NGF Revenue to GF Revenue	6% or 1:16.3	6% or 1:16.2	9% or 1:11.3	8% or 1:12.7	9% or 1:11.1	12% or 1:8.2	14% or 1:7	14% or 1:7
5	TA/RA Positions in IARC	3	4	4	9	13	15	15	17
5	Graduate Students Supported (both in and outside of IARC)	5	6	9	13	14	16	16	18
6	General Fund Support	714,980	869,992	1,052,918	1,206,297	1,295,509	1,213,800		
7	IARC Building Bond Debt Payments	369,665	368,630	363,333	253,988	254,167	253,651		252,868
8	General Fund Support Directed to CGC	233,303	240,540	245,366	257,328	273,558	276,829		
9	GF less Bond and CGC Support (Adjusted GF Revenue)	112,012	260,822	444,219	694,981	767,784	683,320		
10	Ratio of Adjusted NGF Revenue to Adjusted GF Revenue	1% or 1:104	2% or 1:54.0	4% or 1:26.9	5% or 1:21.2	5% or 1:18.8	7% or 1:15.3		

Additional Unit-Specific Metrics

	Baseline Data (Actual)					Projections						
UAF Metrics with Indirect yet Significant Impact on UA Metrics: Indicate CY or FY (Optional or where applicable)	**FY04 or CY04**	**FY05 or CY05**	**FY06 or CY06**	**FY07 or CY07**	**FY08 or CY08**	**FY09 or CY09**	**FY10 or CY10**		**FY10 or CY10 Target**	**FY11 or CY11 Target**	**FY12 or CY12 Target**	**FY13 or CY13 Target**
Number of Publications (CY)	56	70	62	108	99	109	83		110	121	133	146
Number of Workshops (CY)	4	5	15	12	11	15	17		17	12	12	12
Number of WS Participants (CY)	206	112	410	770	360	598	490		500	500	500	500
Number of Visiting Scientists (CY)	14	10	10	37	27	26	51		60	66	73	80
Number of Graduate Students (CY)	7	5	5	6	10	14	14		15	17	18	20
Number of Post-docs (CY)	6	7	9	8	4	10	10		11	12	13	15
Number of Proposals submitted (FY)	25	36	36	51	46	48	55		55	57	59	62
Number of Proposals funded (FY)	12	11	17	12	14	15	12		18	19	20	20
Number of Proposals pending (FY)					18	1	28					

Red text implies projected numbers
Publications, visitors and students are projected to increase by 10% per year
Proposals include those submitted by IARC PI and/or Co-PI
Submitted proposals are projected to increase by 4% per year
Proposal funding success is expected to be sustained at 33%

B4. Publications in refereed journals/periodicals

Please use EndNote to report publications for CY2008. The download is available at: http://www.alaska.edu/keys/#Windows%20installers, or http://www.alaska.edu/keys/#Macintosh%20Installers. Include the information as an attachment when you submit the AUP.

B5. Occurrences of applied research benefiting Alaska

School, College or Institute	Project Title	Project Status (complete, active, awarded, proposed)	Description of contribution to the state of Alaska	Indicate if project is collaborative w/ AK Native or rural groups and/or involves traditional knowledge*
IARC	Developing seasonal statistical forecast models for sea ice in the Beaufort and Chukchi Seas	active	Seasonal forecasts for September 2010 ice concentration were generated for the Beaufort and Chukchi seas in May 2010, the forecasts were made available to the public through the ARCUS SEARCH sea ice outlook.	
IARC	Biogeochemical observational studies in the Arctic Ocean	active	Examining the micronutrient limitations on marine ecosystem productivity	Interface with Alaska Eskimo Whaling Commission and Barrow Whalers Association
IARC	Ocean mixing processes associated with high spatial heterogeneity in sea ice and the implications for climate models	active	Improved climate model prediction of the Arctic environment will help Alaskans better understand and adapt to climate changes	
IARC	Monitoring Seasons Through Global Learning Communities or IPY GLOBE Seasons and Biomes Project	active	Provides Professional Development Workshops for more than 100 Alaskan K-12 teachers on research methods in conducting scientific investigations as well as best teaching practices in engaging teachers and students in Earth or environmental science research as a way of teaching and learning science, and contributing data to ongoing science investigations. More than 1000 Alaskan students have been reached	We have involved Alaska Native elders during the professional development workshops as well as visits to classrooms;

			through the teachers. The project is aligned with the states science education standards and helps teachers meet those standards in their teaching.	involves rural and urban schools
IARC	Ice e-Mysteries e-Polar Books: An Innovative Science and Literacy Education Project	complete	This project helped Alaskan teachers integrate science, language, arts and technology and earn UAF credits while collaborating with Australian teachers and their students in writing ten polar e-books and conducting Earth/environmental science research.	
IARC	Climate Change and Stakeholders	active	Enhances communication about climate change between researchers and rural community members so that the perspectives of each are shared; In the Stakeholders and Climate Change IARC project, fieldwork, meetings and a total of 15 interviews have been conducted with Tanana, Ft. Yukon, and Chalkyitsik elders and middle-aged travelers and subsistence users.	Collaborative with AK Native and rural groups
IARC	Alaska Lake Ice and Snow Observatory Network	active	This project engages K-12 teachers and their students in winter science research to determine heat flow in Alaskan lakes by making a number of measurements that can be used to calculate heat transfer from the water to the atmosphere. Data are entered on the ALISON website and available to the students, scientists and the general public. It teaches children about winter environment and safety.	Involves AK Native and rural groups
IARC	COLLABORATIVE RESEARCH: Spatial and Temporal Influences of Thermokarst Failures on Surface Processes in Arctic Landscapes	active	This project is using a systems approach to determine how thermokarst failures influence the structure and function of the arctic landscape, focusing on vegetation composition, distribution and processing of soil nutrients, and exports of sediments and nutrients to stream and lake ecosystems. Native Alaskan' perceptions of thermokarst failures in their landscape and education outreach to K-20 students, teachers and the general public are also key components of this project.	Involves rural and AK Native groups
IARC	Polar Learning And Responding (POLAR) Climate Partnership	awarded	IARC is a collaborator with Columbia University as well as Teachers College, Barnard College, the University of New Hampshire and the American Museum of Natural History on the Phase I Climate Change Education Partnership (CCEP) to establish a coordinated national	Will involve rural and AK Native groups

			network of regionally- or thematically-based partnerships devoted to increasing the adoption of effective, high quality educational programs and resources related to the science of climate change and its impacts.	
IARC, AER, UMass	Collaborative Research: Analysis and attribution of changes in Siberian hydroclimate and implications for the future	active	Present day hydroclimatological conditions in Siberia and Alaska are analyzed and compared. Potential implications of future climate changes on water cycle will help land managers make more informed management decisions	
IARC	Storm activity and atmosphere-sea ice-ocean interaction	active	Provides a better understanding of the dynamics and predictability of arctic storms	
IARC, Geography, INE	SNAP and ACCAP	active	IARC is a partner in activities to create projections of future climate on site specific scales. This information is needed for land managers or industry planners that have a 30 year planning horizon.	
IARC, UW-Madison, NOAA	Collaborative Research: Impact of Storm Activity on Recent Changes in Arctic Sea Ice Mass Balance	active	This project is to investigate impacts of changes in storm track dynamics on the recent rapid reduction in Arctic sea ice extent and volume through examining synoptic-scale atmosphere-sea ice-ocean interactions associated with changes in storm track dynamics.	IARC, UW-Madison, NOAA
IARC	Beaufort and Chukchi Sea Mesoscale Meteorology Modeling study	active	This project is to investigate spatial and temporal structures of mesoscale wind fields over the Beaufort and Chukchi seas and the north slope areas in a changing climate, and develop a 30-year high-resolution wind field database.	IARC
IARC	North Pacific Storm Activity and its Responsive and Active Connections with Large-scale Atmosphere-Ocean Interactions and Global Warming	active	This project is to investigate large-scale atmosphere-ocean interactions in the North Pacific from storm track perspectives. The project outcome helps understanding North Pacific decadal climate variability and improve climate predictability.	IARC
IARC/INE	Southeast Alaska Hydropower: impacts of climate change and variability on planned and existing infrastructure	Active	Historical data are analyzed and changes in temperature, precipitation, discharge, and hydropower resources are quantified. Attribution of change to long-term forcing and natural variability is explored. Results are being disseminated directly to hydropower operators at their request. Funded by NOAA-NMFS.	Hydropower customers in Southeast AK include Native Alaskans
IARC/INE	Satellite Proving Ground for Next	Active	Joint project with NOAA-NESDIS, and GINA to improve delivery of	NWS, RFC, and

	Generation		satellite products to the National Weather Service Forecast Offices in Alaska, Alaska/Pacific River Forecast Center (RFC), and Alaska Aviation Weather Unit (AAWU). Products include snow cover, low fog, aircraft icing potential, and volcanic ash. Funded by NOAA-NESDIS Proving Ground Program.	AAWU customers statewide include Native Alaskans
IARC/INE	Use of Remote Sensing for Water Resource Management in the National Petroleum Reserve-Alaska	Active	Analysis of Satellite and Airborne Synthetic Aperture Radar and other data products for use in managing water withdrawal from lakes, including identification of fish overwintering habitat. Funded by BLM.	
IARC/INE	Evolution of the shoulder-season atmospheric inversion layer in Fairbanks	Complete	Weather balloon releases and aircraft sampling were used to identify mechanisms that dissipate the atmospheric inversion layer in Fairbanks, during spring and fall. This has important implications for the air quality forecasts in the Borough. Funded by NOAA's COMET outreach program.	Borough residents include Native Alaskans.
IARC/INE	North Slope Oil and Gas Transportation Networks	Active	Snow models are being tested for use in management models for ice road construction and transportation safety. Funded by DOE's NETL program with in-kind support from BP and Conoco-Phillips.	
IARC/INE	Testing of a Hydro-Kinetic Power Generating Device for Rural Alaska	Active	Testing of a prototype low-velocity, hydro-kinetic power generator as well as computational modeling. Collaboration with the Patent-holder, the Arctic Region Supercomputing Center and the Alaska Center for Energy and Power.	Low-cost, rural power solutions have the potential to benefit Native Alaskans.
IARC	The consequences of permafrost degradation on plant water use strategies	Active	Ecosystem water relations are being explored relative to permafrost 'status'. Potential implications of permafrost degradation on ecosystem water efflux could potentially help with predictions of local rainfall recycling and ecosystem function.	
IARC	Compensatory responses of evaporation vs. transpiration with shrub expansion	Proposed	Quantifying how shrub expansion will affect the relative contribution of evaporation and transpiration to ecosystem water flux and energy balance was proposed. Potential implications of changes in vegetation regime and water fluxes could affect ecosystem productivity, which is important for wildlife and ecosystem carbon gain.	
IARC	North by 2020 – Forum for Local	On-going	This project will translate in-state and international research findings into	IARC

	and Global Perspectives on the North		information that can help inform policy, regulations and responses to a changing North at the state-level.	
IARC	North by 2020 – Forum for Local and Global Perspectives on the North	On-going	This project will translate in-state and international research findings into information that can help inform policy, regulations and responses to a changing North at the state-level.	IARC

*This information is being collected as an *Indicator* for UAF's NWCCU accreditation reporting.

B6. Comparative scores of students who take professional exams

List examination scores:

School, College or Institute	Examination Type	Test Date	# of UAF Students Tested	UAF Pass Rate	National Pass Rate

C. End Results and Strategies – FY 2011

C1. End Results Table

Complete the table below for the period July 1, 2010 to June 30, 2011. Add rows as needed. For each end result, identify the applicable core theme(s) listed below.

A. Educate: Undergraduate and Graduate students
B. Discover: Through Research, Scholarship, and Creative Activity, including an Emphasis on the North and its Peoples
C. Prepare: Alaska's Career, Technical, and Professional Workforce
D. Connect: Alaska Native, Rural, and Urban Communities through Contemporary and Traditional Knowledge
E. Engage: Alaskans via Lifelong Learning, Outreach, and Community and Economic Development

End Result:	Theme	Strategies to Achieve End Result	Target(s):	Measure(s):	Status:	Budget Impact
Graduate Student participation in research	Educate	We are providing ½ of graduate student stipend and tuition	Each faculty member has at least one graduate student	Total number of students	Presently, we have 17 faculty and 13 graduate students, but there are some faculty with more than one student.	½ of total cost In-state M.S. $44,150 Out-of State M.S. $51,210 In-state Ph.D. $46,741 Out-of State Ph.D. $53,801
Undergraduate Student participation in research	Educate	We are providing full salary of undergraduate students who participate in post-doc research	Each post-doc should supervise one undergraduate student	Total number of students	Presently, we have seven post-docs with only two supervising an undergrad	One undergrad student costs about $8000/year
Synthesize understanding of arctic processes	Discover	We have hosted 12 workshops in the past 12 months, bring specialists from around the world to UAF to address topics of urgent importance.	One workshop per month is a good target and the most we can reasonable handle	Total number of workshops	We have several workshops in planning now.	Depending upon size, workshops cost between $10K and $50K

Professional and competent graduates	Prepare	We are investing heavily into North x 2020 to address contemporary issues of primary concern to the state	The short term goal is 5 departing graduate students and post-docs per year	Number of students accepting positions with Alaska State government	We try to maintain a high flux of well-trained researchers through our doors.	Providing experience and training to students and post-docs requires a substantial investment, particularly in travel support
Sharing results, gaining insight, avoiding conflict	Connect	We have met with the Alaska Eskimo Whaling Commission and we are scheduled to meet with the Barrow Whalers Association	Establish positive working relationship between JAMSTEC research cruise and Barrow whalers	Lack of opposition	We have altered our planned expedition to avoid potential conflict with Barrow whaling activities.	Although the cruise will be substantially more expensive because of greater length, that cost is borne by JAMSTEC
Public Presentations	Engage	Our faculty make numerous invited presentations to conferences unrelated to climate change and the Arctic	Through these presentations to non-specialists, we broaden the understanding of the role of the Arctic to the general populace	A more informed and engaged population	Presently, we are engaged to speak before the Extension Agents, National Park Service, Aircraft Owners Assn.	This is more of a burden on our time, which also carries a budgetary cost

D. Long Range End Results and Strategies – FY 2012 and Beyond

D1. Long Range End Results Table

Complete the table below. For End Results with an anticipated start date of 2012, the results should be in line with budget requests for FY2012. Add rows as needed. For each end result, identify the applicable core theme(s) listed below.

A. Educate: Undergraduate and Graduate students
B. Discover: Through Research, Scholarship, and Creative Activity, including an Emphasis on the North and its Peoples
C. Prepare: Alaska's Career, Technical, and Professional Workforce
D. Connect: Alaska Native, Rural, and Urban Communities through Contemporary and Traditional Knowledge
E. Engage: Alaskans via Lifelong Learning, Outreach, and Community and Economic Development

End Result:	Theme	Strategies to Achieve End Result	Target(s):	Measure(s):	Budget Impact	Anticipated start date
Prepare students who are fully engaged in system science and see the complexities and interdependent interactions of physical, biological, and social processes	Educate	Most of our primary research endeavors will be focused towards contributing to a more holistic understanding of seeing the Arctic and all its interactions, operating as a system	We will strive to instill in our students the importance of understanding the complete system, in all its complexities	Number of graduates	Having students graduate means providing support, which is about $50K/year	On-going
Achieving a quantitative understanding of the Arctic, as a system	Discover	Most of our primary research endeavors will be focused towards contributing to a more holistic understanding of seeing the Arctic and all its interactions, operating as a system	We will strive to understand the interactions between sea ice and ocean processes, and atmosphere and land surface processes	Publications and proposals funded	This is our primary revenue source	On-going

Professional and competent graduates	Prepare	We involve post-docs and graduate students in design, planning, execution and analysis of research. They are also engaged in workshops, conferences and outreach activities.	Every alumni of IARC should be admirable in their ability and knowledge	The long term goal should be 10 departing graduate students and post-docs per year	We try to maintain a high flux of well-trained researchers through our doors.	On-going
Build a strong local and national reputation as the "go to" place for arctic research	Engage	Create outreach materials that convey important information and positive impressions of IARC as a local and national asset	Several new brochures each year, plus several outreach opportunities where the public engages the institute	Number of positive interactions with the public	IARC plays a prominent role in UAF public events, such as at the fair	
Building a broad international network of dedicated collaborators	Connect	Bringing top young researchers to IARC, and creating an environment where they are able to interact with our faculty and participate in an exceptional field experience	Maintain the existing connections and establish 25 new partnerships each year	Number of young participants each year	IARC has hosted between 1 and 3 summer schools/year for advanced graduate students and post-docs for the past seven years	
Sharing results and gaining insight	Connect	Our researchers meet with local community members while conducting field research as an opportunity to share findings and to better understand local perceptions	Every project with a local association should plan for annual presentations to community	Number of local community meetings	Community meetings have been under-valued in the past. We hope to improve here.	

D2. Top three challenges for FY2012

Identify the top three challenges confronting the unit for the period July 1, 2011 to June 30, 2012. These challenges must be directly related to the unit's FY2012 budget request.

Challenge 1:

The loss of senior staff members remains a serious threat to IARC. In the past three years, we lost Harper Simmons, Igor Dmitrenko, Vladimir Ivanov, Jia Wang, Bill Hibler, Jingfeng Wu, David Atkinson and Clara Deal. We have not been able to replace most of the staff members, but the loss of faculty has been partially offset by hiring post-docs. The loss of ability and experience is a major impediment to performance. This is directly related to budget issues, as faculty appointments do require some stable support to guarantee a position for several years until the researcher is able to become self-sustaining.

Challenge 2:

IARC is losing its large institutional grant support, which primarily funds its research faculty. IARC's NSF Cooperative Agreement will end June 30, 2011. Our JAXA agreement will likely continue at the present level for the next three years. Our JAMSTEC agreement will likely decrease from $3 million per year to $1 million per year over the next five years. We are vigorously pursuing other funding opportunities, but it is unlikely that we will find a program that will provide blanket support for our researchers.

Challenge 3:

We must develop new features of IARC that will cement our role in national and international arctic research communities. We believe the new data center will help greatly in placing IARC in a central service role to many programs. We also hope to secure the secretariat office of one or two major arctic research programs. Increasing the importance of our role and increasing our visibility on national and international levels is essential to helping our center flourish. We believe playing a leadership role in SEARCH and ISAC will help secure IARC future and bring prominence to UAF.

Challenge 4:

As with all of campus, space is an issue for us. Visitors to IARC often assume we have ample space because of the relatively open areas in Akasofu 415. However, that area is under lease to the Japanese and they have very tight restrictions on allowing such use. We have been able to move a few researchers into that space by designing research programs that tightly align with their research goals. We also have very little laboratory space. Most of the lab space in the Akasofu building is assigned to the GI Atmospheric Science program and they have refused to allow use by our researchers, even though it is very poorly used by GI researchers. We have increased the number of graduate students, undergraduate students and post-docs substantially and we are now at the point where we have no desks for additional graduate students. We pay the bond debt on the space occupied by the Geophysical Institute, and we always have. They receive all of the full overhead generated by the researchers occupying that space, while the space occupied by IARC researchers generates reduced overhead, resulting in less O/H recovery for IARC.

D3. Use of unanticipated funds
Specify what the unit would do with additional funds, should they be made available later in FY2012. Activities must support the FY2012 budget request.

Equipment We have established a new long-term monitoring station at Poker Flat Research Range. This is the only station in Interior Alaska that is capable of measuring CO_2 fluxes continuously throughout the year. Winter measurements have been notoriously difficult. This will be a major facility for UAF and one that we will be very proud to operate. We do need additional instrumentation added to this station, particularly sensors for eddy covariance and methane fluxes.

E. Additional Information

E1. Unit Unmet Needs
Identify unmet unit needs that could be supported through private, non-governmental funding, such as donors, foundations, etc.

We would like to have some permanent faculty that we can build a long-term program around. We feel that having one or two endowed chairs in climate change would make our institute much more stable and productive.

E2. Major Capital Investment Priorities and Space Needs

In order to better connect academic and research priorities with capital investment planning, identify the unit's highest priority facility needs, if any, for consideration in the six-year capital plan. Units should also describe any other significant facility or space management issues in this section. Be sure to show the linkages between facilities needs and unit End Results.

Improved storage space - We have a large room in the basement of IARC with a very high ceiling (estimated 20'). We are only able to use the bottom 10' because of safety considerations. We would like to undergo construction adaptations to install elevated storage shelves around the perimeter. Facility Services estimated such construction would cost $400 - $500K. Better use of this existing storage space would enable us to better protect and use existing equipment and samples.

Repair to air ventilation system The air handling system in rooms 401 and 501 were very poorly designed and are terribly noisy when operating. It makes it exceptionally difficult to hear when the ventilation is operating at full capacity, which usually happens on every warm day in spring and summer. We would like to replace the ventilation system with a low flow, quieter system. These rooms are used by almost every entity on campus, but when the fans are fully engaged, a loudspeaker system is required for meetings in this room. That is simply unacceptable.