USA 2015

Project title	Contact	Institution - lead	Institution - other	Country - Lead	Country - other	Project leader	Other participants	Project Period	Investigated area	Description/abstract
Collaborative Research: The Polaris Project II: Amplifying the Impact	snatali@whrc.org	Woods Hole Research Center	US Geological Survey, University of Texas and others	USA	UK, Netherlands, Russia	Susan Natali				The Polaris Project II (a continuation of a prior project) seeks to 1) train the next generation of arctic researchers, 2) advance scientific understanding of the Arctic, and 3) expand public awareness of the feedbacks between the Arctic and the global climate system. These objectives are being accomplished through a multi-faceted effort that includes a summer field course/research experience at Cherskii on the Kolyma River in the Siberian Arctic, a series of on-campus arctic-focused courses at participating US and Russian campuses, and a wide range of outreach activities. While undergraduate students remain the primary focus of Polaris II, participation in the annual field course is being expanded to include a primary teacher, graduate student, postdoctoral researcher, and visiting faculty member each year. Outreach activities will target primary students and teachers, undergraduate students and faculty, and a diverse public audience. The unifying scientific theme of the project is the transport and transformation of carbon, nutrients and energy across the arctic landscape, in the context of feed backs from permafrost thaw to climate change. Website: http://www.thepolarisproject.org/
Paleoclimate Analysis of a Miocene Arctic Forest from the Kolyma River Basin, Northeastern Russia	hopejahren@gmail.com	University of Hawaii	Bowdoin College, University of Louisiana, Lafayette	USA		Hope Jahren			Kolyma basin	This project is based upon a study of Tertiary (~65 Ma to ~3 Ma) forests that have thrived north of the Arctic Circle. These unique ecosystems were subject to prolonged periods of continuous darkness and light each year, yet managed to persist through the major climate transitions of the Eocene, Oligocene, and Miocene. While much is known about the fossil forests of Arctic North America, including Russian studies from the 1970s and 80s, which described the Miocene sediments of Siberia as temporally extensive and spectacularly rich in fossil forests, these fossils have not yet been examined using stable isotope techniques. We are collecting and analyzing Pinaceae (pine) and Taxodiaceae (redwoods and allied species) fossils from the Baekovo and Nekkeveem floras, located in the Kolyma River Basin of northeastern Siberia. The sediments being sampled are part of the Khapchan Formation, which is late Miocene in age (11.6 to 5.3 Ma); one season of fieldwork is being undertaken as part of the Polaris Project II (see entry above). Recent innovations in microanalysis of intra-ring $\delta^{13}C$ profiles are being used to determine the seasonal timing of precipitation for the Miocene Arctic forests of northeastern Siberia. A fundamental hypothesis being tested is whether Tertiary Arctic forests had a summer-dominated hydrologic regime where maximum light levels and maximum water availability coincide, similar to what has been observed for the Eocene forests of Arctic North America. An educational unit introducing students to the study of Tertiary Arctic forests including hands-on exercises to define simple stratigraphy and collection/identification of plant fossils is also being undertaken as part of the Polaris Project (see entry above or http://www.thepolarisproject.org/journals/blog/).
RCN-SEES: Building a Research Network for Promoting Arctic Urban Sustainability in Russia	rorttung@gmail.com	George Washington University		USA	Russia	Robert Orttung				This award is supporting a Research Coordination Network aimed at creating models for Arctic urban sustainability. It is a multi-disciplinary, international effort examining the interconnections among resource development, climate change, and evolving demographic patterns in an effort to provide advice to U.S., Russian, and other policy-makers on how to develop Arctic oil and natural gas deposits and their related infrastructure in a way that produces minimal impact on the environment. The five-year project is convening an annual meeting of scientists working on these issues in Washington and Russia (alternating yearly) in order to facilitate collaboration across disciplines and institutes and to spur better communication between the researchers and policy-making community. Between meetings, the network is engaging its participants through webinars hosted at George Washington University, place-based exercises to develop recommendations for specific cities, and coordinating on-going research projects. The project bridges disciplinary and national divides by bringing together geographers, political scientists, and sociologists to study the interaction of human and natural systems in the Arctic. Project personnel include researchers with a wide range of expertise, including knowledge of energy resource development; migration and employment patterns in Eurasia; and scientific measurement of permafrost thickness throughout Arctic regions. The project will provide additional enrichment for a) the graduate students and early career scholars who are involved in the networking activities, b) residents of Arctic urban developments who will receive area-specific advice on improving sustainability, c) and policy-makers who benefit from input on how infrastructure sites, resource exploitation, and social urban environments can be made more robust in light of forthcoming climate and socio-economic changes. The output of the project will be policy advice on how to improve Arctic sustainability in the crucial urban areas associated with energy resource development.
Collaborative Research on Carbon, Water, and Energy Balance of the Arctic Landscape at Flagship Observatories in Alaska and Siberia	gwk@umich.edu, msbrethar te@alaska.edu, gshaver@mbl.edu	University of Michigan Ann Arbor	University of Alaska Fairbanks, Marine Biological Laboratory, Northeast Science Center	USA	Russia	George Kling, Marion Brel-Harte, Gaius Shaver			Kolyma basin	The arctic landscape interacts with the global and regional climate by exchanging carbon dioxide, methane, water, and energy with the atmosphere. The first goal of this work is year round monitoring of carbon, water, and energy balance at two arctic sites, Imnavait Creek in Alaska and Cherskii in Siberia. The work is a collaboration among researchers from the Marine Biological Laboratory, the University of Alaska Fairbanks, Northeast Science Station, Russia, and the University of Michigan. The second goal is the development of these two sites as Flagship observatories for research on arctic lands and freshwaters. The main task here is to integrate the new carbon, water, and energy balance data with the already large, diverse, and growing data bases from other research done at these sites. A third aim is to promote pan-Arctic comparisons and development of pan-Arctic data bases.
Surface Energy Budgets at Arctic Terrestrial Sites: Quantifying Energy and Momentum Fluxes and their Associated Physical Processes	Andrey.Grachev@colorado.edu	University of Colorado at Boulder		USA		Andrey Grachev			Tiksi (Lena Delta)	This project performs diagnostic analyses of the processes modulating the surface radiative, turbulent, and conductive fluxes at several Study of Environmental Arctic Change (SEARCH) climate observatories located around the Arctic Ocean in Canada, Alaska, and Siberia to investigate the annual cycle of the surface energy budget (SEB) and its coupling to atmospheric and surface processes. Where necessary, existing observations will be augmented to complete the suite of SEB measurements. Data exist or will be obtained to focus on the following scientific questions: (i) What processes govern the SEB at Arctic terrestrial sites? What role do local effects such as terrain or coastlines play? How large is the local spatial SEB heterogeneity? How do the physical processes affecting the SEB differ among the various sites? How do these SEB climatologies compare with a sea-ice regime as represented by the SHEBA site, or with that of Greenland? Which SEB terms might be impacted by climate change and how? (ii) What is the relative contribution from classical Monin-Obukhov similarity (MOS) and non-MOS processes to heat and momentum fluxes at Arctic terrestrial sites? Are existing bulk algorithms for surface turbulent fluxes in models applicable at Arctic sites or is the development of new ones necessary? (iii) Which SEB terms determine the soil temperatures and the active layer depth? What mechanisms force variability in those terms? How does the annual cycle of snow cover at each site influence the SEB and thus temperature regimes? Comparisons of key processes at these terrestrial sites will be made to those done by other researchers over Arctic sea ice and on Greenland. These coordinated observations and analyses, which provide process understanding of atmospheric-soil interactions in the Arctic, are rare and will be of interest to a broad spectrum of the scientific community, including the remote sensing and modeling communities. The resulting data and analyses will likely be key data sources for future model studies in a variety of disciplines. Physical understanding of the modulation of energy fluxes to permafrost should provide enhanced understanding of the potential for the greenhouse gas release process in climate-change scenarios. The project takes advantage of interagency and international collaborations with investigators located around the Arctic (USA, Canada, and Russia) and will contribute to education on Arctic climate systems through partnership with the CIRES Education and Outreach group, leading to teacher development and classroom implementation of new climate topics. Project website at: http://aon.iab.uaf.edu/
Developing Indigenous Research Methodologies in the Arctic (IRM-A): Examining the Impacts of Settlement on Socialization and Youth Experience in Siberia and Alaska	smrasmus@alaska.edu	University of Alaska Fairbanks	University of Cambridge	USA	UK	Stacy Rasmus	Olga Ulturgasheva		Eveny communities, Siberia	This comparative ethnographic project is a study of arctic indigenous youth with special focus on the local impacts of settlement on socialization practices and experiences in growing up in two arctic Indigenous communities: one in Siberia and one in Alaska. Principal Investigator Stacy Rasmus works closely with Olga Ulturgasheva, co-PI of the project and a fellow social scientist and post-doctorate researcher at the University of Cambridge, to interview people in remote Yup'ik Alaska Native communities and Eveny community members in Siberia to document the complex roles of indigenous social scientists and to test research methodologies. The involvement of the two native Alaskan and Siberian social scientists is crucial for introduction of anthropological peer observation in each community to document and address the complexities of conducting Native research as a Native person. This participatory study is addressing the following questions: What are the key characteristics of Indigenous research methodologies? How are Indigenous research methodologies applied in arctic Indigenous contexts and with youth? How can Indigenous research methods impact critically upon important social issues in the communities? What are the benefits and challenges of utilizing an Indigenous approach to research, and how can Indigenous research methods apply more generally across cultural and academic contexts? This study aims to impact the international Indigenous and scientific communities by providing critical information on research process, methods and outcomes from both the Indigenous community perspective as well as from the Indigenous researcher perspectives.
Community Adaptation and Knowledge Sharing in Alaska and Siberia		University of Alaska Fairbanks	University of Manchester	USA	UK	Stacy Rasmus	Olga Ulturgasheva		Eveny communities, Siberia	This study is an international comparative, collaborative study of adaptation strategies and resilience patterns among Alaskan Yupik and Siberian Eveny. The study aims to provide new insights on the human capacity to navigate through the latest dynamic associated with climate change and environmental transformations in the Arctic.
A Comparative Study of the Medical Ethnobotany of the Chukchi and Naukan Yupik of Siberia and the Central Alaskan Yup'ik	kjernigan@alaska.edu	University of Alaska Fairbanks		USA		Kevin Jernigan				This project supports research comparing the ethnomedical knowledge and language of the Chukchi and Naukan Yupik in eastern Siberia and the Central Alaskan Yup'ik in Alaska. The basic research project is to test basic anthropological epistemologies about the relationship between culture and language, and seeks to understand the relationship between language and culture under conditions of linguistic and social change. The research will test this idea by examining whether there are more similarities in medical beliefs between two societies speaking similar languages and sharing a deep historical root (Naukan Yupik and Central Alaskan Yup'ik), or between two societies speaking unrelated languages, but sharing the more recent influence of the dominant Russian culture (Naukan and Chukchi). The comparison will focus on beliefs about the effects that plants have on the body, including species believed to have medicinal, nutritional and toxic properties. The research will be based on standard anthropological methods, including semi-structured interviews in each region regarding uses of plants that affect health and explanatory models of health conditions, as well as field collection of relevant botanical species.
Investigation of Ultra-18O Depleted "Slushball" Earth Rocks from Karelia, Russia and the Timing of Paleoproterozoic Glaciations and the Great Oxidation Event	bindeman@uoregon.edu	University of Oregon		USA		Ilya Bindeman				This proposal is investigating and interpreingt Paleoproterozoic rocks from Karelia, Russia, which are extraordinarily depleted with respect to oxygen 18 (these rocks have the world's lowest known values). Rocks with such depleted 18O require derivation from interaction with glacial meltwaters during panglobal glaciation. These depletions now characterize 11 localities along a 450 km long belt and are spatially associated with the 2.45-2.2 Ga mafic intrusions formed in subglacial rifting environment zones. Since Karelia was located near equatorial latitudes throughout the Paleoproterozoic, these rocks provide isotopic evidence of ice at low latitudes, and a robust hydrologic cycle, in which low latitude oceans remained unfrozen (a "Slushball" climate state). As there were three panglobal glaciations between 2.45 and 2.2 Ga, precise determination of age of the mafic intrusions with the subglacial ultra-depleted meteoric hydrothermal features in Karelia will provide the most direct constraints on the timing of these global glaciations. Furthermore, this research may constrain which of the glaciations preceded the rise of atmospheric oxygen and disappearance of mass-independent fractionation of sulfur isotopes. The scope of this project will include mapping and sample collection in the field at the anomalously depleted areas, subsequent isotope analysis to identify the characteristic bulls-eyes meteoric hydrothermal features, dating the timing of such depletion by in situ and solution geochronology, geochemical modeling of these unique hydrothermal alteration trends, and investigation of the unmetamorphosed coeval early Paleoproterozoic Sariolian, and Sumian volcanic and sedimentary sequences of the Vetreny Belt in the context of the global oxidation event.
Correlating Infrasound Signals with Volcanic Emissions at Karymsky Volcano, Kamchatka, Russia	dfee@gi.alaska.edu	University of Alaska Fairbanks		USA		Pavel Izbekov			Kamchatka	This project is mitigating volcanic eruption hazardsby promoting the understanding of eruption dynamics by 1) identifying the different types of volcanic emissions and 2) quantifying the relative proportions, amounts, and location of these volcanic emissions. However, the difficulty of obtaining accurate, real-time, and continuous volcanic emissions measurements is well known. Relating infrasound, or low frequency sound, to volcanic emissions shows particular promise towards quantifying and understanding volcanic emissions, suggesting that infrasound may provide a tool to indirectly quantify and characterize volcanic emissions. In this project we will perform a detailed, quantitative analysis of the diverse infrasound signals from Karymsky Volcano, Kamchatka, Russia with corresponding measurements of volcanic emissions. The primary objectives are to 1) identify and characterize the infrasound signals from the diverse activity at Karymsky, 2) collect detailed volcanic emissions data (both gas and tephra), 3) identify infrasound signals characteristic of certain types of emissions; and 4) quantitatively correlate temporal trends in infrasound signals with the mass flux of volcanic emissions. We aim to develop quantitative relationships between volcanic emissions and infrasound based both on theoretical and empirical analysis. An additional goal of this project is to validate a multi-spectral infrared camera technique for measuring volcanic emissions with established tephra sampling and ultraviolet remote sensing SO2 measurement techniques.
Doctoral Dissertation Research: Discovering Patterns of Language Change through the study of the Koryak Language and its Dialects	mithun@linguistics.ucsb.edu	University of California, Santa Barbara		USA		Marianne Mithun	Dibella Wdzenczny		Kamchatka	This project is documenting several dialects of Koryak, a severely endangered Chukotko-Kamchatkan language spoken in the Kamchatka Peninsula, Russia by 1,670 speakers spread across at least eight dialects. Data that will greatly enhance our understanding of the Chukotko-Kamchatkan family and lead to cross-dialect and cross-linguistic comparison are immediate objectives. The Chukotko-Kamchatkan language family is of interest because it shares features with languages on either side of the Bering Strait, which bridges the Old and New Worlds.

Collaborative Research: Interactions between air temperature, permafrost and hydrology in the high latitudes of Eurasia.	strelets@gwu.edu	George Washington University	Northeast Science Station, Cherskiy	USA	Russia	Nikolay Shiklomanov				This project seeks to address two interrelated hypotheses aimed at improved understanding of the Arctic system at various time and space scales. The first hypothesis will explore the seasonal relationship between air temperature, river ice thickness, and winter runoff, while the second will investigate the contribution of thawing permafrost to river discharge. Research will focus on several river basins and feeder streams within the Russian Arctic and sub-Arctic where hydrometeorological measurements have been collected since 1950 and climate data are available from a number of global data archives. These data sets will be augmented by new field data collected by the PI team, focusing on permafrost, isotopic, hydrochemical, and higher time and spatial resolution hydrologic sampling. This suite of measurements will be used to test the hypotheses using watershed scale models and the Geophysical Institute Permafrost Lab model coupled to the Water Balance and Discharge Transformation Model (WBMplus). Graduate students and an undergraduate will receive training in fieldwork and modeling, and the grant will support an early career principal investigator. Results and methodology will also be incorporated into courses taught at the awardee institutions as well as through minority high school outreach programs. During fieldwork, an ongoing collaboration with residents near Igarka will be maintained and materials provided for their local permafrost museum.
Collaborative Research: Sensitivity of Circum-Arctic Peatland Carbon to Holocene Warm Climates and Climate Seasonality	ziy2@lehigh.edu	Lehigh University	Bowdoin College University of Hawaii	USA		Zicheng Yu			Kamchatka	Recent accelerated Arctic warming has caused widespread changes in terrestrial ecosystems, including carbon dynamics. Past climate warming and documented ecosystem responses provide crucial insights from Earth's history for understanding and projecting possible responses to future climate change. In this project, researchers from Lehigh University, University of Hawaii and Bowdoin College are evaluating the outcomes of natural climatic warming that have occurred across the Arctic during the Holocene. The project focus is on two warm climate intervals: (1) the Holocene Thermal Maximum between 10,000 and 6000 years ago, and (2) the warm Medieval Climate Anomaly around 1000 years ago. Fieldwork is collecting new samples from carbon-rich peatlands from several critical regions (including Alaska, Mackenzie Basin, Hudson Bay Lowlands, Labrador, and Kamchatka). Additional work will integrate and synthesize available data, and development of climate-carbon modeling experiments. The idea that both temperature and climate seasonality are dominant controls of carbon balances in carbon-rich Arctic ecosystems has important implications for projecting the fate of Arctic carbon in the future, as future warming is expected mainly in the winter season.
RUI: Collaborative Research: Fire regime influences on carbon dynamics of Siberian boreal forests	mloranty@colgate.edu	Colgate University	Woods Hole Research Center, University of Florida	USA		Michael Loranty	Susan Natali, Scott Goetz, Heather Alexander, Michelle Mack			The primary objective of this research is to increase understanding of post-fire organic carbon dynamics in boreal forests of the Siberian arctic by elucidating the ecological mechanisms by which increased fire severity could influence organic carbon accumulation and storage over successional intervals. The overarching hypothesis is that post-fire soil organic layer depth regulates net ecosystem carbon balance through indirect impacts on forest regrowth and permafrost stability because of its role as a barrier to seed germination and thermal regulator. The team involved in this project is: 1) studying near term fire effects on soil organic layer depth to changes in larch recruitment and permafrost characteristics in experimental burn plots created in 2012, 2) determining the relationship between post-fire stand structure and above- and belowground carbon pools at the local and landscape level across stands of varying age and topographic positions, and 3) testing via experimental manipulations and field observations the mechanisms by which fire-driven changes in stand density indirectly affect moss growth, soil organic layer development, and susceptibility of deeper carbon pools to warming, decomposition, and release into the atmosphere.
Collaborative Research: Vegetation And Ecosystem Impacts On Permafrost Vulnerability	akholodov@gi.alaska.edu	University of Alaska Fairbanks	Colgate University, Woods Hole Research Center	USA	Cherskiy	Alexander Kholodov	Michael Loranty, Susan Natali,			
RCN-SEES Arctic-FROST: Arctic Frontiers Of SusTainability: Resources, Societies, Environments and Development in the Changing North	andrey.petrov@uni.edu	University of Northern Iowa		USA		Andrey Petrov	network			Arctic-FROST is an international interdisciplinary collaborative network that teams together environmental and social scientists, local educators and community members from all circumpolar countries to enable and mobilize research on sustainable Arctic development, specifically aimed at improving health, human development and well-being of Arctic communities while conserving ecosystem structures, functions and resources. The purpose of the project is to contribute to conceptual, applied and educational aspects of sustainability science about the Arctic and beyond.
Study of Environmental Arctic Change" (SEARCH)	hajo.eicken@gi.alaska.edu	University of Alaska Fairbanks, Chair, Science Steering Committee	many participating	USA		Hajo Eicken	research framework with many participants			SEARCH is conceived as a broad, interdisciplinary, multi-scale program with support from a number of U.S. agencies. A core aim is understanding recent Arctic environmental change and its relationship to hemispheric phenomena. Science plans for SEARCH were developed and are available from the SEARCH website.
Climate-Ecosystem Interactions and Ocean Exploration	kathy.crane@noaa.gov	NOAA, Climate Obsevations Office	numerous US and Russian	USA-Russia		Kathy Crane			Chukchi Sea	Several U.S. National Oceanic and Atmospheric Administration (NOAA) programs include support for work in the Arctic. In particular, the Arctic Research Office supported joint U.S. – Russian research (RUSALCA) cruises in the Bering and Chukchi Seas in 2004, 2009, and 2012 (interdisciplinary), and annually since 2005 for mooring deployment and recovery across the international boundary in Bering Strait between the U.S. and Russia. The long-term project goal is to detect and evaluate physical climate change and biotic responses. Individual studies that are funded by NOAA directly or through a Cooperative Institute arrangement with universities include a broad spectrum of physical, biological and chemical studies on the Bering and Chukchi shelves in cooperation with Russian scientists from several institutes affiliated with the Russian Academy of Science and also with Roshydromet. In addition, this NOAA program leads U.S. participation in the Pacific Arctic Group (PAG), a multinational working group with Russian, U.S. Canadian, Korean, Chinese and Japanese participation, with facilitation provided by the International Arctic Science Committee. It has an interest in strengthening research collaborations in the Pacific-influenced sector of the Arctic Ocean that is guiding science planning efforts.
Tiksi International Hydrometeorological Observatory	maksh@aari.nw.ru, Taneil.Uttal@noaa.gov	Arctic and Antarctic Institute, NOAA		Russia	USA	Alexander Makshtas, Taneil Uttal			Tiksi (Lena Delta)	The Tiksi Observatory is located on the Arctic Ocean on the coast of the Laptev Sear near the Lena River delta. The site is occupied by the Polyarka weather and science station operated by Russia since 1932 that provide a long continuous historical record of atmospheric and adjacent oceanographic measurements. Through a partnership between Roshydromet, NOAA and the Finnish Meteorological Institute, the facilities (a new observatory/weather station building, a clean air facility, a 20 meter tower, various racks and distributed field sites) and observing capacity (radiation, aerosols, surface fluxes, chemistry, black carbon, climate grade weather observations, active layer temperatures , and clouds) have been significantly enhanced. The main goal of the Tiksi Observatory is to serve as a long-term Arctic observatory site that will contribute atmospheric measurements to the Global Atmosphere Watch (GAW), Baseline Surface Radiation Network (BSRN), and the Atmospheric Radiation Measurement programs. The cooperating Russian agency is the Russian Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet)
Collaborative Research: IPY: Arctic Great Rivers Observatory (Arctic-GRO	rspencer@whrc.org	Woods Hole Research Center		USA		Robert Spencer				The Arctic Great Rivers Observatory (Arctic-GRO) project is assessing river constituent (chemistry, isotopes, nutrients) fluxes and discharge in the Ob', Yenisey, Lena, Kolyma, Yukon and Mackenzie Rivers. The overarching scientific rationale for the Arctic Great Rivers Observatory (Arctic-GRO) is that large river hydrology and chemistry can be used to assess changes in fluxes that signal regional and pan-arctic change on the continents and that subsequently impact coastal and ocean chemistry, biology, and circulation. The watersheds of the six Arctic-GRO rivers are among the largest on Earth and combined cover 11,400,000 km2, more than half of the area that drains into the Arctic Ocean. Given that the biogeochemistry of rivers integrates processes occurring throughout their watersheds, Arctic-GRO's systematic sampling of the downstream reaches of the Ob, Yenisey, Lena, and Kolyma rivers in Siberia, and the Yukon and Mackenzie rivers in North America, provides a superb means for assessing environmental change in the Arctic.
Bering Sea Sub Network: A Distributed Human Sensor Array to Detect Arctic Environmental Change	victoriag@alaska.net, afla@uaa.alaska.edu	Aleut International Association	University of Alaska Anchorage	USA	Russia	Victoria Gofman,	Lilian Alessa		Beringia	This project is implementing a Bering Sea Sub-Network (BSSN), which is a regional initiative of community-based organizations observing network consisting of eight villages in Western Alaska and Northeast Russia. The distributed network gathers local observations in surveys, interviewing hunters and fishermen who are regarded as employs people as individual, coordinated sensors for local environmental observations of socio-ecological change. BSSN is addressing the following questions: (1) how have economically significant species changed over the past century and what strategies have residents used to cope with these changes; (2) what key biophysical variables and indicators may be correlated to changes in distribution and properties of ecologically significant species; (3) how well do indigenous and traditional knowledge and Western science show spatial/temporal convergence and statistical correlation at local and regional scales; and, (4) what are the major trends, patterns and constraints in individual and community adaptation to changes? BSSN is perceived designed to serve as a means for remote indigenous villages around the Bering Sea to communicate their observations on the environment and subsistence harvests. Website: http://bssn.net/
AON: Development of Sustainable Observations of Thermal State of Permafrost in North America and Russia: The U.S. Contribution to the Global Terrestrial Network for Permafrost	veromanovsky@alaska.edu	University of Alaska Fairbanks		USA		Vladimir Romanovsky				This work is coordinating data collection using standard equipment and protocols at Alaskan borehole sites and at a selected and comparable number of sites in Russia. The Alaskan and Eurasian borehole temperature data sets will provide the baseline to reconstruct past surface temperatures, to assess the future rates of change in near-surface permafrost temperatures and permafrost boundaries, and to provide spatial data for validation of climate scenario models and temperature reanalysis approaches. This proposal provides the US contribution to the ongoing activities of Global Terrestrial Network for Permafrost that obtains temperatures in a large number of globally distributed boreholes in order to provide a "snapshot" of permafrost temperatures in both time and space. The project continues to provide opportunities for field experience and educational participation at levels ranging from elementary school (e.g., K-12) through postdoctoral internships both in Alaska and in Russia. A technical manual on methods for permafrost temperature measurements and reporting data provides others with the procedures to conduct independent observations. Data obtained from the project is freely available soon after quality assurance is completed.
Nansen and Amundsen Basin Observational System (NABOS-II)	igor@iarc.uaf.edu	University of Alaska Fairbanks		USA	Russia	Igor Polyakov				This study aims to compile a cohesive picture of the climatic changes in the Eurasian and Makarov basins (EMB) of the Arctic Ocean, with particular focus on understanding three major observational targets: (1) Along-slope Atlantic Water transport by the boundary currents, (2) Interaction of Atlantic Water branches with shelf waters, deep basin interior and upper ocean and (3) EMB indications of changes in the upper ocean circulation. The goal of the project is to both answer fundamental questions about circulation and transformation of Atlantic Water (AW), and to provide context for the oceanographic, biological, and chemical sampling programs. As part of this study there are year-round platforms for multidisciplinary mooring measurements along with three August-September cruises every two years (2013, 2015 and 2017), with repeated oceanographic sections and deployment of Lagrangian drifters. Extensive measurements are planned reaching from Svalbard to the Lomonosov Ridge and eastward into the Makarov Basin. This cruise track involves entering the Russian Exclusive Economic Zone (EEZ) and therefore requires coordinating permissions with Russian authorities. Website: http://nabos.iarc.uaf.edu/
Northern Eurasia Earth Science Partnership Initiative (NEESPI)	Pasha.Groisman@noaa.gov	NOAA		USA	many others	Pavel Ya. Groisman				NEESPI is a research framework supporting earth system science research in northern Eurasia, including participation from Russia, Ukraine, Finland and many other countries. In the U.S., the National Aeronautics and Space Administration (NASA) has provided project funding through the NASA Land Cover Land Use and NASA Carbon Cycle Science programs, and other projects supporting the science plan have been funded through NSF and NOAA. U.S. and international projects, including completed projects are tabulated on the NEESPI website at http://neespi.org/
The Circumpolar Active Layer Monitoring Network-CALM IV (2014-2018): Long-term Observations on the Climate-Active Layer-Permafrost System	shiklom@udel.edu	George Washington University		USA	Russia	Nikolay Shiklomanov	Dmitry Streletskiy			This project is supporting the continuation of the Circumpolar Active Layer Monitoring (CALM) program. The active-layer network of more than 200 sites represents the only coordinated and standardized program of observations using standard measurement protocols designed to observe and detect decadal changes in the dynamics of seasonal thawing and freezing in high-latitude soils. The project fills a need for long-term time series of active layer thickness, ground temperature, and thaw settlement measurements at the same locations and across diverse terrain types and regions in order to identify scales of spatial variation, establish trends, and validate models. The data contributes to detailed process studies, and validating and developing climate change, ecology, hydrology and geocryology models. The project alsol provides opportunities for field experience and educational participation at levels ranging from elementary school through postdoctoral. Local, predominantly indigenous people, are also assisting with the observations at remote sites. CALM will continue to incorporate data into its Web-based database.
Land-cover and Land-use Changes on the Yamal Peninsula, Russia	dawalker@alaska.edu	University of Alaska Fairbanks		USA		Donald Walker			Yamal Peninsula and Franz Josef Land	The overarching goals of the NASA Land-Cover and Land-Use Change (LCLUC) project are to establish a research transect along the Eurasia Arctic bioclimate gradient to examine the interactions between sea-ice, climate, permafrost and the social ecological systems of the region. The project is using remote-sensing technologies to examine how the terrain and anthropogenic factors of reindeer herding and resource development, combined with the climate variations on the Yamal Peninsula, affect the spatial and temporal patterns of permafrost and vegetation change and how those changes are in turn affecting traditional herding by indigenous people of the region. The Eurasia Arctic Transect traverses the five Arctic bioclimate subzones of the Yamal Peninsula and Franz Josef Land of Russia and offers a maritime comparison to the the more continental North America Arctic Transect. The work is also part of the Northern Eurasia Earth Science Partnership Initiative (NEESPI). It addresses the NEESPI science questions regarding local and hemispheric effects of anthropogenic changes to land use and climate in northern Eurasia. Website: http://www.geobotany.uaf.edu/yamal/

The Japan-Kamchatka-Alaska Subduction Processes (JKASP)"	pavel@gi.alaska.edu, gordeev@kscnet.ru, chebr@emsd.iks.ru, hiroaki@mail.sci.hokudai.ac.jp, mnakagawa@mail.sci.hokudai.ac.jp	USGS Volcano Hazards Program, University of Alaska, Fairbanks, University	Institute of Volcanology and Seismology, Kamchatkan Branch of Geophysical Survey, Hokkaido University, University of Alaska Fairbanks	USA-Russia	Japan	John Eichelberger, Pavel Izbekov. Evgeny Gordeev, Victor Chebrov, Hiroaki Takahashi, Mitsuhiro Nakagawa				JKSAP is a broad, multidisciplinary consortium led by the University of Alaska Fairbanks (USA), Institute of Volcanology and Seismology (Russia), and Hokkaido University (Japan). The Kurile-Kamchatka-Aleutian volcanic arcs are among the least understood in the world. Yet, their high level of activity and continuity across continental and oceanic lithosphere provide an exceptional opportunity to understand the linkages among tectonism, magma genesis, and eruption that characterize subduction zones. A continuing series of meetings is helping to build a vital international geoscience community in the North Pacific, while at the same time drawing upon insights from workers in other areas. A special emphasis is on identifying the hazards posed by arc volcanism and great subduction zone earthquakes (including tsunamis). The intent of the effort is to nurture productive collaborations in monitoring of and research into subduction zone processes, both between geoscientists in Alaska and in the remainder of the United States, and between those of the US and its North Pacific neighbors.tectonism, magma genesis, and eruption that characterize subduction zones. Through a continuing series of meetings, the project seeks to build a vital international geoscience community in the North Pacific, while at the same time drawing upon insights from workers in other areas. A special emphasis of our meetings is on identifying the hazards posed by arc volcanism and great subduction zone earthquakes (including tsunamis). Our intent is toThe intent of the effort is to nurture productive collaborations in Alaska and in the remainder of the United States, and between those of the US and its
Shared Beringian Heritage Program	janis_kozlowski@nps.gov	National Park Service		USA		Janis Kozlowski				The U.S. National Park Service funds projects of scientific and community importance in the Beringia Region of western Alaska and Chukotka. The projects are typically local community-based, and relatively small in scope. A complete list of current projects is available at the program web site, www.nps.gov/akso/beringia/
The Alaska Volcano Observatory	steve@giseis.alaska.edu	University of Alaska Fairbanks, Geophysical Institute, US Geological Survey		USA		Steve McNutt				The Alaska Volcano Observatory is operated by the U. S. Geological Survey, the Geophysical Institute of the University of Alaska Fairbanks, and the State of Alaska Division of Geological and Geophysical Surveys. In its international efforts, the Observatory interacts with the Kamchatka Volcanic Eruption Response Team, which is a unit of the Institute of Volcanology and Seismology and the Kamchatka Branch of Geophysical Survey, both based in Petropavlovsk-Kamchatsky. A coordinated research program monitors volcanic activity along the breadth of the Aleutian-Kamchatkan-Kurile Arcs. Goals include monitoring and other scientific investigations in order to assess the nature, timing, and likelihood of volcanic activity; assessing volcanic hazards associated with anticipated activity, including kinds of events, their effects, and areas at risk; and providing timely and accurate information on volcanic hazards, and warnings of impending dangerous activity, to local, state, and federal officials and the public.
The U.S. Fish and Wildlife Service	Steven_Kohl@fws.gov	Russia-East Asia Branch, Division of International Conservation, U.S. Fish and Wildlife Service		USA	various Russian agencies	Steven Kohl				The U.S. Fish and Wildlife Service (USFWS) oversees transnational wildlife management and conservation issues, including migratory birds, marine mammals, salmon, wildlife refuges/nature reserves, and ecosystem studies of the Bering and Chukchi Seas. Bilateral activities are carried out under the U.S.-Russia Environmental Agreement (1972; 1994); U.S.-Russia Migratory Bird Convention (1976); and U.S.-Russia Agreement on Conservation and Management of the Alaska-Chukotka Polar Bear Population (2000). There are regular exchanges of information and scientists, as well as periodic joint research cruises for wildlife surveys and physical oceanography studies.
Stanford University	elmiller@pangea.stanford.edu	Stanford University		USA		Elizabeth Miller				Researchers based at Stanford University have carried out extensive field geologic research in the Russian Far East over many years, with funding sources. Research has been in collaboration with Russian geologists, including those from the from varied Geological Institute of the Russian Academy of Sciences (GINRAS) in Moscow as well as geologists from the Northeast Interdisciplinary Scientific Research Institute (NEISRI), Magadan and from the Diamond and Precious Metals Institute, Yakutsk. Two recent projects that are ongoing involve Arctic Ocean work (National Science Foundation EAR 098673, Origin and evolution of the Amerasian Basin of the Arctic and a US Geogical Survey-Stanford Collaboration of Analysis of rock material dredged from the Chukchi Plateau-Alpha Ridge System, Arctic Ocean). A third project that is in the process of being awarded forinvolves work in the Russian Far East through CRDF. Principal investigators are P.I Akinin, V. V. and Miller, E.L. CRDF Collaboration Stanford University with NEISRI, Far-East Branch National Academy of Sciences, Magadan: Age and compositions of magmas across Arctic Chukotka: Constraints on the evolution of the Alaska-Chukotka plate and opening of Amerasian Basin
The International Arctic Research Center (IARC)	ihinzman@iarc.uaf.edu	University of Alaska Fairbanks		USA	Japan	Larry Hinzman				The International Arctic Research Center (IARC), located at the University of AlaskaFairbanks (UAF), is jointly supported by U.S. and Japanese government funds and conducts research throughout the Arctic. Several IARC-led projects include work in the Russia Arctic, including those unded by NSF and under the NEESPI framework.
International Volcanological School	pavel@gi.alaska.edu, jeichelberger@usgs.gov	University of Alaska Fairbanks		USA		Pavel Izbekov, John Eichelberger				The Department of Geology and Geophysics of the University of Alaska Fairbanks offers a two-week field class in volcanology in cooperation with the Kamchatka State University (KSU) and the Institute of Volcanology and Seismology (IVS) in Petropavlovsk-Kamchatsky, Russia. The course is summer both in Katmai National Park, Alaska, site of the largest eruption on Earth of the offered every 20th century and on Gorely and Mutnovsky Volcanoes, south of Petropavlovsk-Kamchatsky. Students explore and discuss the full range of phenomena that constitutes volcanoes, using some of the best examples in the world. The course is co-taught at both the undergraduate and graduate level by John Eichelberger of the Volcano Hazards Program, USGS, Pavel Izbekov of UAF, as well as by guest scientists from Russia, the US, and Japan. Students come from across the US, Russia, and Japan, and occasionally from other countries.
Bilateral Cooperation on Black Carbon Emission in the Russian Arctic	kuklinski.teresa@epa.gov	US Environmental Protection Agency		USA-Russia	Russia	Teresa Kuklinski				Under the Black Carbon Diesel Initiative,the Enviornmental Protection Agency (EPA) is partnering with government agencies; US Arctic and Russian NGOs; Russian and Arctic stakeholders; indigenous communities and observer groups to assess diesel sources of black carbon in the Arctic and develop emission inventories, demonstration projects, policy recommendations and financing options to address the environmental and public health challenges caused by black carbon in the Arctic. Website: http://www2.epa.gov/international-cooperation/black-carbon-diesel-initiative-russian-arctic
Arctic Contaminants Action Program (ACAP)		US Environmental Protection Agency		USA						EPA works in the Russian Arctic region through the Arctic Contaminants Action Program (ACAP), a program of the Arctic Council. As part of ACAP, EPA plays a leadership role in the Black Carbon and Short-Lived Climate Forcers Project Steering Group (BCSCF/PSG), through which EPA works on the reduction of black carbon from diesel sources in the Russian Arctic. In addition, EPA also works to reduce mercury use and exposure in the Russian Arctic through the Mercury Project Steering Group, and works to improve environmental and public health conditions of indigenous peoples in the Russian Arctic through the Indigenous Peoples Contaminants Action Program Project Steering Group.
National Plan of Action for the Protection of the Arctic Marine Environment		US Environmental Protection Agency		USA						EPA is working with the United Nations Environment Program (UNEP) and the Global Environment Facility (GEF) on the UNEP/GEF project, "Russian Federation - Support to the National Plan of Action for the Protection of the Arctic Marine Environment." This project has resulted in the development of the Strategic Action Programme (SAP), the first integrated programmatic document on the protection of the Arctic marine environment in Russia. The SAP, adopted by the Russian Maritime Board, established priorities for environmental protection in the Arctic and identified achievable environmental targets.