USA 2014

Project title	Contact	Institution - lead	Institution - other	Country - Lead	Country - other	Project leader	Other participants	Investigated and	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.
Paleoclimate Analysis of a Miocene Arctic Forest from the Kolyma River Basin, Northeastern Russia	hopejahren@gmail.com	University of Hawaii	Bowdoin College	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 Nekkeiveem 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 d13C 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/curriculum.htm).
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.
Assessing Knowledge, Resilience & Adaptation and Policy Needs in Northern Russian Villages Experiencing Unprecedented Climate Change	scrate1@gmu.edu	George Mason University		USA	Russia	Susan Crate		Viliui Sakha	This project's primary objective is to assess the knowledge, resilience and adaptation, and policy needs of rural Viliui Sakha communities in northeastern Siberia, Russia, communities which face an uncertain future due to the unprecedented local effects of global climate change. The project aims to fulfill that objective by partnering with communities to explore local perceptions and -responses. This project is a four-village, three year collaborative effort with participation of village residents, native specialists and field assistants, and in-country research community and international collaborators. Prior work has shown that Viliui Sakha inhabitants consider the local effects of climate change to be their most substantial barrier to continued subsistence and residency. The project is continuing to assess knowledge about the local impacts of climate change on the community, regional and Republic levels in order to decipher what is known and what needs to be known to fill knowledge gaps and positively inform community life. The project objectives are to: 1) Develop community-levels rosters of past and present knowledge of and adaptation to climate change; 2) Use those roster data to develop measures and gauge the resilience and adaptive capacity of households and communities; 3) Document local elders' knowledge about climate change that is both applicable and pragmatic for use in contemporary village-level adaptive schemes; 4) Survey the relevant western science on climate change (beginning in-country and moving to international) in order to fill in gaps in local knowledge, and to facilitate community-level adaptation and understanding; 5) Appraise policy efforts at the local, regional, Republic and national levels for their utility and make recommendations accordingly. Methods to be employed include: focus groups, semi-structured interviews, surveys and secondary data analysis. By working at the local, regional and Republic levels and through collaborating with the in-country research institute and other partners on climate issues, the project will enhance the infrastructure for research and education networks and partnerships.
Collaborative Research on Carbon, Water, and Energy Balance of the Arctic Landscape at Flagship Observatories in Alaska and Siberia	gwk@umich.edu, msbretharte@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 Bret-Harte, Galus 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			This project will perform 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.
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	Evenу 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 Evenу 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.

Collaborative Research: Sensitivity of Circum-Arctic Peatland Carbon to Holocene Warm Climates and Climate Seasonality	zly2@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		USA		Michael Loranty			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.
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 Anchorage	USA	Russia	Victoria Gofman,	Lillian 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.
AON: Thermal State of Permafrost (TSP) in North America and Northern Eurasia: The US Contribution to the International network of Permafrost Observatories (INPO	veromanovsky@alaska.edu	University of Alaska Fairbanks		USA		Vladimir Romanovsky			There exists no global database that defines the thermal state of permafrost within a specific time interval. Internationally, reported or unpublished temperature measurements have been obtained at various depths and periods over the past five or more decades, and it is known that these temperatures have changed at different rates in different regions. Analysis of temperature measurements obtained in these boreholes provides historical records of secular surface climate changes (deep holes) and interannual to decadal changes in surface boundary layer (intermediate depths). The Global Terrestrial Network for Permafrost (GTN-P) is a metadata based system established in the late 1990s under the World Meteorological Organization (WMO) which currently contains access to more than 425 documented borehole and 165 active layer sites across both polar regions. In Alaska, two major series of boreholes exist within the GTN-P with observations dating back to the 1970s; the US Geological Survey deep boreholes (>125 m) and the University of Alaska's intermediate boreholes (<100m). This effort will link approximately 80 Alaskan boreholes with sites of observations in other countries in Northern Eurasia, and in so doing will initiate the International Network of Permafrost Observatories (INPO). This work will coordinate data collection using standard equipment and protocols at the Alaskan borehole sites and at a selected 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.
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.
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. Not all projects would be considered arctic, but for convenience, the currently funded projects that are supported in part by NASA in Russia are outlined below, with U.S. contacts provided; other U.S. and international projects are tabulated on the NEESPI website
Changes of Land Cover and Land Use and Greenhouse Gas Emissions in Northern Eurasia: Impacts on Human Adaptation and Quality of Life at Regional and Global Scales	qzhuang@purdue.edu	Purdue University		USA		Quinlai Zhuang			NEESPI project
Assimilation of tower and satellite-based methane observations for improved estimation of methane fluxes over northern Eurasia	dennisl@u.washington.edu	University of Washington		USA		Dennis Lettenmaier			NEESPI project
Eurasian Railway Measurements of greenhouse, ozone-depleting, and air quality gases in TRans-Siberia Observations of the Chemistry Into the Chemistry of the Atmosphere (TROICA).	james.w.elkins@noaa.gov	NOAA/Earth System Research Laboratory, Boulder, Colorado		USA		James W. Elkins			NEESPI project
Boreal zone forest type and structure from EOS data sets	Jon.Ranson@nasa.gov	Goddard Space Flight Center, Greenbelt, Maryland		USA		Jon Ranson			NEESPI project
Wildfire, Ecosystems, and Climate: Examining the relationships between weather, extreme fire events, and fire-induced land -cover change in the changing climate of Siberia	a.j.soja@larc.nasa.gov	NASA Langley Research Center, Hampton, VA		USA		Amber Soja			NEESPI project
Wildfire Impacts on Carbon Stocks and Exchanges in Forests of Central Siberia: Quantifying Effects of Fire Intensity, Fire Severity, and Burning Conditions	sconard@fs.fed.us	USDA Forest Service		USA		Susan G. Conard			NEESPI project
Collaborative Research: Synthesis of Arctic system carbon cycle research through model-data fusion studies using atmospheric inversion and process-based approaches	qzhuang@purdue.edu	Purdue University		USA		Qianlai Zhuang			NEESPI project
Diagnosis and prognosis of changes in lake and wetland extent on the regional carbon balance of northern Eurasia	dennisl@u.washington.edu	University of Washington		USA		Dennis Lettenmaier			NEESPI project
Quantifying Changes in Northern High Latitude Ecosystems and Associated Feedbacks to the Climate System	sgoetz@whrc.org	Woods Hole Research Center		USA		Scott Goetz			NEESPI project: Using a combination of satellite observations and models, this projects uses a simple model of tundra NEE capable of accurately representing a broad range of plant functional types with a simplified parameterization scheme to quantify annual carbon budgets for the tundra biome. The model can be driven exclusively with satellite-derived inputs, and uses satellite observations to quantify the effects of changes in growing season length and vegetation stature on surface shortwave radiation budgets for the 2001 to 2010+ period. Our analyses quantify spatial and temporal variability in annual NEE and net radiation, and include measures of uncertainty. Using the resulting maps of NEE and net surface radiation we assess tradeoffs in the climate forcing effects of changes in CO_2 flux and albedo. The project also takes advantage of predictions of future tundra vegetation distribution to quantify changes in annual NEE and net radiation under realistic future climate scenarios. We compare our maps of current and future NEE and albedo with Earth System Model results publicly available via the CMIP5 archive in order to assess the accuracy of the terrestrial arctic carbon cycle and surface energy budgets in these models.
Collaborative Research: Degrading off-shore permafrost as a current and potential source of atmospheric methane	igorsm@iarc.uaf.edu	University of Alaska Fairbanks		USA		Igor Semiletov			NEESPI project
Collaborative Research: The East Siberian Arctic Shelf as a Source of Atmospheric Methane: First Approach to Quantitative Assessment	nshakhov@iarc.uaf.edu	University of Alaska Fairbanks		USA		Natalia Shakhova			NEESPI project
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.
CRDF Global	soswald@crdfglobal.org	CRDF Global	numerous US and Russian	USA		Siri Oswald, Director, Research Partnerships			CRDF Global is an independent nonprofit organization that promotes international scientific and technical collaboration through grants, technical resources, and training. CRDF Global is based in Arlington, Virginia with offices in Moscow, Russia; Kyiv, Ukraine; Almaty, Kazakhstan; and Amman, Jordan. CRDF Global currently implements science and technology activities in over 40 countries and has, over its lifetime, implemented activities involving more than 20,000 scientists and engineers. Most Russian projects are not explicitly Arctic in orientation, but several funded programs have had Arctic emphasis. See Stanford University entry for one example. Additionally, CRDF Global provides on-site logistical support in Russia to the National Science Foundation's (NSF) cooperative activities in geosciences and Arctic research and serves as a liaison between NSF, the Russian Academy of Sciences, and the Russian Foundation for Basic Research.
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 Kamchatkan 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 Geological 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 Alaska-Fairbanks (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 under 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	http://www.epa.gov/oia/regions/eurasia/russia.html - carbon	US Environmental Protection Agency		USA-Russia	Russia				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.
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 priority actions for environmental protection in the Arctic and identified achievable environmental targets.