INTERAGENCY ARCTIC RESEARCH POLICY COMMITTEE

5-YEAR PLAN COLLABORATION TEAMS

2014 SUMMARY OF ACCOMPLISHMENTS AND 2015 PRIORITIES

(In order of appearance in the 5-Year Plan)

The summaries of accomplishments provided in this document are 2014 highlights for each IARPC collaboration team. Additionally, each team has also produced a milestone update report for 2014. Milestone updates can be obtained from the secretariat and are available online on the member-side of the IARPC website.

IARPC Sea Ice Collaboration Team (SICT)

Accomplishments in 2014

A major accomplishment in 2014 was the completion of a set of coordinated intensive observation and process studies to investigate sea ice characteristics and processes, and atmosphere-ice-ocean interactions and feedbacks. These efforts will improve our knowledge and understanding of the changing sea ice cover, and contribute to improved sea ice forecasting capability.

In early October 2014, ONR investigators completed a marginal ice zone field experiment that began in March with the deployment of an initial array of instruments and platforms on, in and under the pack ice of the eastern Beaufort Sea. The array then drifted westward, as expected, and was supplemented twice during the summer with additional assets. By late August, the array comprised almost 100 instruments and platforms, including automatic weather stations, ice mass balance buoys, wave buoys and floats, ocean flux buoys, ice-tethered profilers, an acoustic communication and navigation system, polar profiling floats, seagliders, wavegliders, and moored wave and current meters. The *in situ* autonomous observation program was supplemented by remote sensing from space, which included an unprecedented collaboration with the intelligence community to collect and declassify high resolution, visible band images with National Technical Means. The Korea Polar Research Institute (KOPRI) was also a key collaborator, providing berths aboard the R/V *Araon* in July for ONR investigators to deploy a final cluster of instruments in the pack ice.

The ONR operation in March 2014 included two small ice camps, which were also used by NASA Operation IceBridge and ESA (European Space Agency) CryoVex investigators. While they measured snow depth, ice freeboard and ice thickness along transects on ice floes, aircraft flew overhead and measured the same variables with lidars and radars. Operation IceBridge flew a total of 30,642 km during 15 missions over the Arctic Ocean in March and April 2014, repeating its annual sea ice thickness measurement program at the time of the sea ice extent maximum. The Quicklook data were available at the National Snow and Ice Data Center in June 2014.

NASA returned to the Arctic Ocean in September 2014, when the ARISE (Arctic Radiation - Icebridge Sea&Ice Experiment) project used a C-130 aircraft to measure sea ice properties, radiative fluxes and atmospheric variables, particularly clouds, near the end of the Arctic sea ice melt season. The end of the ARISE mission overlapped with the beginning of a NOAA-ONR project that used a NOAA P-3 aircraft to make meteorological measurements over the open and ice-covered Beaufort and Chukchi seas. The aim was determine heat flow from ocean to atmosphere during freeze-up and the impact on regional atmospheric temperature and pressure, and far-field effects at mid-latitudes.

Priorities for 2015

NASA Operation IceBridge will conduct further sea ice missions over the Arctic Ocean in March 2015. The main field experiment of the ONR "Sea State and Boundary Layer Physics" Department Research Initiative will take place in autumn 2015, provisionally aboard the R.V. *Sikuliaq* in the Beaufort and Chukchi seas. The purpose of the experiment is to investigate waves and swell and their impact on the advancing sea ice cover and the flux of heat and mass from the ocean to the atmosphere during freeze-up. The results of the field experiment will also contribute to improved wave forecasting for open and ice-covered seas in the Arctic.

IARPC Distributed Biological Observatory Collaboration Team (DBOCT)

Accomplishments in 2014

A major accomplishment in 2014 was the completion of year-5 of the DBO pilot study, with field-sampling contributed by colleagues from 11 projects representing 6 countries. The DBO has provided a framework to focus and coordinate sampling and analytical efforts that link biological changes to physical drivers in a rapidly changing Arctic. A *key science achievement* of this format has been the ability to track shifts in benthic community biomass and structure concomitant with measures of annual sea ice persistence in the 5 DBO regions. In addition, we are observing an east to west gradient in zooplankton populations that vary with water mass type through the season, and more frequent occurrence of temperate whale species in DBO region 3. An important *physical oceanographic achievement* through occupation of the DBO5 (Barrow Canyon) line has been to observe the seasonal seawater freshening and warming of water transiting northward on the eastern and surface layers of the Chukchi Sea, with the maximum temperature observed in September. All of these accomplishments were presented at the 2014 AGU/ASLO Ocean Science Meeting and at various other national and international science venues.

Other key accomplishments include the creation of DBO-focused satellite sea ice, SST, SSH and ocean color products by NASA colleagues, and the initiation of a DBO Data Workspace on the Alaska Ocean Observing System website, with technical support from Axiom. Both of these products provide a foundation for data sharing among DBO contributors and collaborators. The Data Workspace also functions as the first-link to the DBO Data Archive, under development at the Earth Observing Laboratory (EOL) as part of the ACADIS. A draft DBO Data Policy describing anticipated metadata standards and the means to contribute DBO data were discussed at the 1st DBO Data Workshop in 2013, and will also be a topic of discussion at the 2nd Data Workshop in October 2014.

Internationally, the DBO continues to benefit from the organizational capability of the Pacific Arctic Group (PAG), especially with regard to sampling in Russian arctic waters via the RUSALCA program. Expansion of DBO sampling to new regions in the northern Chukchi was a topic of discussion at the international RUSALCA conference held in St Petersburg in May 2013. The expansion of DBO sampling sites to regions of the Beaufort Sea is also under active discussion with DBO colleagues from the BOEM and international colleagues from Japan, Korea and Canada. It is anticipated that new regions will be discussed and (potentially) agreed upon at the 2nd DBO Data Workshop.

Priorities for 2015

Priorities for 2015 include the development of an updated DBO concept and national /international plan for decadal-scale implementation. The plan will include the goal of preparing periodic assessments on the physical and ecological state of the Pacific Arctic marine environment using not only DBO data, but also data from BOEM, NPRB and other sources. Specifically, linkages to pan-Arctic DBO-type sampling will be sought, including transects identified in the Arctic Council CAFF/Circumpolar Biodiversity Monitoring Program (CBMP). The updated DBO decadal plan will also outline the DBO Data Policy, wherein it is anticipated that the AOOS will play a data-sharing and visualization role and EOL will be the primary data archive for DBO with links to marine data repositories in partner countries.

IARPC Chukchi & Beaufort Seas Ecosystem Collaboration Team Accomplishments Summary

Accomplishments in 2014

The Chukchi and Beaufort Seas Ecosystem Collaboration Team (CBCT) focus is on the marine ecosystem in general, and on an increased understanding of its functioning, structure, and sensitivities to changes in physical and chemical environmental conditions. The goal is for this information to improve model prediction capabilities and to better inform management decisions. This scientific information has societal implications in key areas, e.g. ecosystem services, climate change research and biodiversity. The CBCT made significant progress in terms of addressing its milestones in 2014.

A report titled "*Developing a Conceptual Model of the Arctic Marine Ecosystem*" was published in 2014 that detailed the results of a workshop organized by the CBCT in spring 2013. The workshop involved ecologists, social scientists and Arctic experts who provided advice about the development of an Arctic conceptual model. The report is available on the IARPC website.

A number of synthesis projects are in progress and are close to completion. The Pacific Marine Arctic Regional Synthesis (PacMARS http://pacmars.cbl.umces.edu/) final report will be available in early 2015. Special issue publications are in progress that will report the results of the Synthesis of Arctic Research (SOAR http://www.arctic.noaa.gov/soar/) and the Russian-American Long-Term Census of the Arctic (RUSALCA http://www.arctic.noaa.gov/aro/russian-american/).

The CBCT authored a framework document that identified two overarching goals and five interlocking science themes that members agreed should be prioritized for future funding. The document recommended better coordinating research in the Chukchi and Beaufort Seas and discussed mechanisms for facilitating coordination and collaboration among funding partners. The document and a brochure advertising the highlights will be available on the IARPC website shortly. The preparation of policy paper based on the framework document has been initiated.

Priorities for 2015

CBCT members are building on a previous effort to develop a Gantt chart illustrating the temporal overlap of projects in the Chukchi and Beaufort Seas and are creating a detailed inventory of projects that includes spatial extent, research objectives, sampling plans, and contact information. The team intends the inventory to become a public document that will serve as a source of information for those interested in opportunities to collaborate or leverage resources.

Submission of a policy paper to the Marine Policy journal is expected to occur during 2015.

A number of interdisciplinary marine science programs are being organized in the Chukchi and Beaufort Seas, due in large part to the activities of the CBCT. All of these will be funded by consortia of entities, many of which include federal and private partners. The Marine Arctic Ecosystem Study (MARES) led by the Bureau of Ocean Energy Management (BOEM) is centered in the Beaufort Sea and includes international collaborations and public-private partnerships. The North Pacific Research Board (NPRB) is currently organizing an ecosystem program centered in the Chukchi Sea

that will include the Bering Strait region. NPRB plans to collaborate with the Arctic Marine Biodiversity Observing Network (AMBON) led by the National Oceanic and Atmospheric Administration (NOAA) and which is centered in the northeast Chukchi Sea. The CBCT will play a central role in coordinating the activities of these programs.

The Alaska Ocean Observing System recently joined the CBCT and will participate in the milestone that deals with developing cyber-infrastructure tools to enhance data integration and application and sharing of technology and tools among interagency partners.

Work on milestones related to oil spills and ecological effects of spills are in the early stages of development. Specific milestones from the IARPC 5-Year Plan include 1) conduct environmental and integrated risk assessments to evaluate the potential impacts of oil/natural gas production on ecosystems in the Beaufort Sea and 2) evaluate ecosystem impacts of oil and gas development and the potential for oil spills and especially the effects of oil, dispersants used in response to an oil spill, and to a mixture of oil and dispersants on the early life history stages of Arctic cod.

IARPC Glaciers and Fjords Collaboration Team (GFCT)

Accomplishments in 2014

Publication of the international workshop report entitled "Understanding the Response of Greenland's Marine-Terminating Glaciers to Oceanic and Atmospheric Forcing" defines the essential variables to be observed for process studies and "megasites" where the community would coordinate the simultaneous collection of the full range of glaciological, oceanographic, and atmospheric observations necessary to characterize and understand the intrinsically coupled ice-ocean-atmosphere system. The report defines the components of a Greenland Ice-Ocean Observing System (GrIOOS). This satisfies milestone 3.2.1.a. Partial implementation of these activities is being undertaken by various member agencies, as indicated on the team's funding spreadsheet. The report stresses the importance of access to a comprehensive and freely accessible international data archive related to Greenland glacier-fjord processes thru an appropriate portal. Process study results are being fed into Earth system models and an auspicious recent event was an international workshop to initiate a model intercomparison project on ice sheet models. We are slowly increasing our understanding of and interactions with related international activities. While we continue to seek the appropriate mechanism for developing a living document concerning an Arctic land ice monitoring system, such monitoring activities continue at a healthy level. Long-term monitoring of ice sheet and glacier variability is enabled by the many satellites managed by NASA and its international counterparts. NASA also continues its airborne monitoring of Greenland through IceBridge. The decade-long CReSIS Science and Technology Center is drawing to a close after many years of successful radar development and application to the Greenland Ice Sheet. The international (US, Denmark, Luxemburg) GNET system continues to monitor ice accretion and loss on time scales finer than the annual cycle.

Priorities for 2015

2015 will see an expansion of participation in the GFCT monthly meeting, largely through broadened inclusion of members of the non-federal scientific community. Long-term monitoring of the Greenland Ice Sheet and its glaciers will continue through NASA's Operation Ice Bridge. A new NSF-funded study of long term glacier-fjord interactions, as recorded in the paleo record, near Petermann Glacier, Greenland, will perform field work in late summer. This project entrains significant international collaboration and will help place results from ongoing process studies in context. The glacier-fjord collaboration team will endeavor to expand its international linkages, both directly and through synergies with the newly formed SEARCH Land Ice/Sea Level Rise Action Team and the expanding activities of the Greenland Ice Sheet-Ocean Interactions Working Group.

IARPC Terrestrial Ecosystems Collaboration Team (TECT)

Accomplishments in 2014

In 2014 two milestones were completed. The first concerned the creation of standardized syntax for project metadata (information about projects) currently maintained by NSSI, NSF, USGS, the Arctic LCC, and non-governmental groups. Multiple agencies and organizations have adopted a common project metadata standard. Alaska Data Integration Working Group (ADIwg) (http://www.adiwg.org/about/) has developed a set of flexible, open source tools that organizations can integrate into their existing workflows and computer systems to generate International Organization for Standardization (ISO) metadata without the necessity of mastering the complex ISO standard.

The second completed milestone involves the Wildlife Potential Habitat Forecasting Framework (WILDCAST) project, providing projections of potential land cover and habitat changes in Northern Alaska. This project was a combined effort of the USGS, NPS, and USFS, and also included a private consulting firm resulting in three formal publications (two more in review), and multiple presentations. A subgroup was formed to deal with the complexities of milestone 3.2.3.a, which involves the identification of local traditional knowledge on village subsistence and food security and its incorporation into GIS systems. This information would then be matched with integrated climate models layers to help understand the relationships among climate, land use changes, and important native ecosystem services. This milestone is fairly complex because of the proprietary nature of local known food gathering areas. A new milestone was proposed and accepted. This milestone will attempt to conduct a pan-arctic analysis of permafrost dominated Arctic and boreal regions to: 1) identify gaps in our understanding of the magnitude and distribution of permafrost carbon stores; and 2) identify areas of permafrost that are potentially most vulnerable to carbon loss with continued warming. Current leads for this milestone are DOE, DOI, NASA with a target date of 2015.

Priorities for 2015

Within the next year, the Terrestrial Ecosystem Collaboration Team (TECT) will continue to work through the remaining milestones. In particular, the TECT will continue to promote the acquisition of radar data to produce updated digital elevation models for Alaska and promote the continued involvement in ADIwg activities and the use of its open source tools to generate ISO metadata of their data holdings. Of particular focus, during the next year the TECT will reach out to the Modeling team to help complete milestone 3.2.3.d (assessing tools and methods for measuring and mapping the effects on cryosphere change on Arctic systems); encourage members (both IARPC and outside contributors) to be active in the 3.2.3.a subgroub (described above) to discuss issues of traditional knowledge data access; and begin work on the pan-arctic analysis of knowledge gaps in our understanding of magnitude of carbon stores and areas that are potentially most vulnerable to carbon loss in a warming environment. In addition, the TECT will offer presentations from internal and external individuals on subject areas of special interest to the team members and of specific use to achieve the milestones.

IARPC Wildfires Collaboration Team (WCT)

Accomplishments in 2014

During the past year, the Wildfires Collaboration Team has held nine monthly meetings. The May meeting included a webinar on modelling by Breen and Hewitt titled "Effects of plant-fungal interactions on Alaska treeline dynamics in a warming climate".

The Team built a publicly available site for the team to post accomplishments and information, hosted on the Alaska Fire Science Consortium (AFSC) website. It continued to make progress on milestones. An inventory and gap analysis was completed (lead by Miller and Jandt) and has been posted on the AFSC and now the IARPC website. The team developed an inventory to identify existing knowledge and quality of data on wildfire frequency, extent and severity in the Arctic. The inventory is on the AFSC and IARPC websites and will be updated and maintained. Finally the team develop an inventory of NASA fire sensors which is now available on the IARPC website.

Priorities for 2015

Continue with monthly teleconferences, moving toward more webinars. Initially will focus on ongoing work on remote sensing of fires and fire effects on Alaska's North Slope as well as modeling efforts.

Planned work on milestones includes:
3.2.4.b – Consult with local communities and indigenous groups on science needs pertaining to Arctic wildfires and their impacts on cultural and subsistence needs: The BLM will provide funding for a graduate student intern to do the initial consultation with the communities and develop a baseline understanding of their science understanding and needs.

3.4.2.c – Develop strategies/projects to identify succession stages of tundra communities following a wildfire. The team will work with AFSC members on refining the strategy for identifying topics and strategies for funding and accomplishments.

3.4.2.d – Develop a model that incorporates feedback from fire models with models of surface vegetation, organic layer properties, permafrost and soil conditions, incorporating hydrologic information as appropriate. This is underway with the USGS and SNAP program working on Generation 1, with Generation 2 planned.

IARPC Atmosphere Collaboration Team (ACT)

Accomplishments in 2014

One accomplishment in 2014 was the initiation of a set of coordinated intensive observation and process studies to investigate atmospheric processes along with increased observational capabilities. These efforts will improve our knowledge and understanding of the atmospheric processes specific to the Arctic.

The Arctic Radiation – Ice Bridge Sea & Ice Experiment (ARISE) by NASA completed 16 successful flights to a acquire well calibrated data sets using aircraft and surface-based sensors to support the use of NASA satellite and other assets for developing a quantitative process level understanding of the relationship between changes in Arctic ice and regional energy budgets as influenced by clouds. DOE completed the Biogenic Aerosols – Effects on Clouds and Climate (BAECC) field campaign in Hyytiala, Finland, to investigate the formation and evolution of organic aerosols from northern boreal forests. In addition to short-term campaigns, DOE, NOAA, and NSF have maintained and are expanding as available long-term observatories for clouds, aerosols, and short-lived climate forcers. These sites include Barrow (NOAA, DOE), Eureka (Canada and NOAA), Alert Canada (Canada and NOAA), Tiksi (Russia, NSF, and NOAA), and Summit (NSF, NOAA and DOE), as well as the new site at Oliktok, AK (DOE).

The IARPC Atmosphere Team conducted two black carbon webinars in 2014. The March 28th webinar focused on Arctic black carbon mitigation initiative with the Russian Federation organized by the Department of State. The April 18 webinar focused on in-situ ground sensing, remote sensing and transport modeling. Both were well attended with diverse audiences.

The International Arctic Systems for Observing the Atmosphere (IASOA) (milestone 3.3.1.b) was able to use a highly leveraged approach to design and populate a data access portal based on harvesting the relevant metadata from existing collections. Most IASOA observatories are already active partners in global networks with robust data management capabilities such as Global Atmosphere Watch (GAW) and the Baseline Surface Radiation Network (BSRN). IASOA observatories are also funded and maintained by sponsor agencies with their own long-term repositories. U.S. agencies sponsoring these ground-based observations include NOAA, NSF, DOE and NASA.

Priorities for 2015

The coordinated observations priority will be continued in 2015 with planning for aerial field measurements with both manned aircraft (DOE G-1) and Unmanned Aerial Systems in FY2015 and planning for multiagency out-year campaigns such as the Multi-disciplinary Drifting Observatory for the Study of the Arctic Climate (MOSAiC) study. Data synthesis and assessment activities on observations of clouds, aerosols, and short-lived climate forcers will continue. The team is considering additional topical webinars on arctic- relevant atmospheric topics.

IARPC Arctic Observing Systems Collaboration Team (AOCT)

Accomplishments in 2014

In the past year of collaboration amongst Arctic observing funders, coordinators, and implementers, significant discussion and progress has been made to meet the milestones. The year began with a high level meeting organized by OSTP that focused on observing assets and metrics for measuring success relevant to agency and national priorities. Several evaluation models were demonstrated, and from that meeting a longer-term discussion within the IARPC AOCT and with the broader observing community was borne that resulted in the commission of an Arctic Observing Assessment. The assessment builds off of lessons learned with the US Group on Earth Observation (US GEO) and NOAA Technology, Planning and Integration for Observation (TPIO) assessments of observing priorities and products to provide connectivity between the various approaches to Arctic information and the scientific needs that underlie high-level priorities. With input from IARPC, the international Sustaining Arctic Observing Networks, the Group on Earth Observations, and the broader community, the AOCT is now in the process of creating a relational database and visualization package to trace through documents and databases the path from strategic priority to user needs to product and information stream delivery. The 13 priorities range from food security to environmental safety and sustainable economic development, representing key areas where scientific observing information is needed to assess the current state and inform future decisions. The metadata and hierarchical structure developed for this effort will be fronted by a user interface on the ArcticHub (http://www.arctichub.net) that will allow searches, data exports, and graphical interpretation to highlight the connectivity, inform about gaps, and demonstrate the broad applicability of many observational data sets and products about the Arctic environment, health and well-being, and socio-economics. These tools will allow funders, implementers, and the public to explore and communicate their interests in Arctic observing.

To set the stage for this large-scale effort and also increase awareness amongst the AOCT itself, we have held monthly presentations on the diversity of approaches to observing and available relevant tools. We invite other collaboration teams to join us when there is a shared interest, and the process of sharing our strengths and innovations has grown understanding amongst the team about the different perspectives on Arctic observations. Past webinars have highlighted the contributions of Shell Oil, the Alaska Department of Environmental Conservation, the Department of Energy's Atmospheric Radiation Measurement Program, the Alaska Native Health Consortium's Local Environmental Observatory, as well as tools that highlight efforts in co-development of adaptive capacity indices and best practices in community-based monitoring.

Interagency co-funding and interorganizational collaboration on observing and assessment activities has continued and expanded to include international partners, taking advantage of mechanisms such as the Belmont Forum to encourage circum-Arctic coordination of observing activities. Interaction and leadership within Arctic Council bodies, including several observing-related programs within Arctic Council Committee on Arctic Flora and Fauna (CAFF), by AOCT members have increased during the lead up to US chairmanship of the Arctic Council. An exploration of best practices and governance for long-term observing has led to more active discussion at the international, national, and state level into standards for observing, common metadata, and accessibility of information. The exchange on these topics swings both ways, with international standards being embraced more at regional levels and national requirements for timely data access influencing considerations abroad for revised data policies. US leadership has recently been confirmed for the Sustaining Arctic Observing Networks (SAON) Committee on Data and Information Services.

Several planning efforts are in development to address future observing needs relevant to Federal (US GEO), regional (Arctic Ocean Observing System (AOOS)), and academic (AON Open Science Conference) interests. Increasingly, online collaborative workspaces, such as the ArcticHub, and social media are being used to source input for planning activities while also building capacity and connectivity for sharing of best practices and co-developed observing approaches. To capitalize on the growing interactivity of the observing community, several online tools have been developed to enhance awareness of available resources for visualizing and evaluating observing information and networks as well as connect researchers across disciplines and continents to collaborate on proposals, observing efforts, and community papers. Their input will also be a crucial part of the Assessment, as we use the ArcticHub to crowdsource relevant document and data streams into the relational database for a richer representation of observing activity, user needs, and gaps in information and products that can be addressed within AOCT and the broader IARPC collaborative universe.

Priorities for 2015

The upcoming year will see the build-out of the Arctic Observing Assessment, with demonstrations of its search and visualization capability planned for a variety of audiences, both virtually and at relevant Arctic meetings. A key venue for the Assessment demonstration will be a follow-up meeting to the one held by OSTP last January. If we time the meeting for late winter 2015, it will allow for interactive demonstration of the full capabilities of the Arctic Observing Assessment including visualizations potentially relevant to themes under consideration for the upcoming US chairmanship of the Arctic Council. By early 2015, multi-national and interagency awards from the Belmont Forum Arctic competition can be shared as well as the lessons learned from this funding platform. The best practices derived from the activity will be shared with the International Conference on Arctic Research Planning III (ICARP-III) committee prior to their transnational funding discussion at the Arctic Science Summit Week (ASSW). Parallel and complementary to this activity will be the continued interagency and interorganizational efforts to sustain valued existing observing arrays, co-develop integrated observing designs, and collaborate financially and scientifically at the local, regional, and international levels to catalog rapid ongoing changes, develop use-inspired observing products, and ensure return on investment of Arctic observing and information science efforts.

IARPC Arctic Data Collaboration Team (ADCT)
2014 Accomplishments Summary

Accomplishments in 2014

The attached milestone summary document summarizes the activities of the Arctic Data Collaboration Team (ADCT). The first step that was undertaken by the Team was to re-evaluate the milestones identified in the original IARPC document (Table 3, page 85). The rationale behind this decision was to have a better view of the landscape of the different Federal activities focusing on improving data access and update the table with that information and to prioritize some of the tasks based on this information. Some of the actions of the original milestones were also addressed and are reported in the attached, but the effort of identifying and prioritizing milestones based on the newly formed team lead to results and actions that were not originally anticipated and that are still in the formative phase.
The Team agreed that one thing that differentiates this team from other IARPC teams is that it cuts across all themes and regions. The two tables on cyberinfrastucture in the original IARPC document highlight how the issues of data permeate many of the thematic teams and many data needs. The challenge is to take a very large issue and start focusing on some activities that can be managed and accomplished by this team. In this regard, the Team agreed that it would be helpful to map the ongoing Arctic data activities of Federal agencies in order to understand the landscape of what is already going on and to identify holes. Such a mapping or inventory is not considered to be exhaustive but rather could serve as a starting point to identify common points and activities around Arctic data. This information was provided by the members of the Team, together with a list of PI funded on these activities.

The primary goals of the Arctic Data Collaboration Team that were discussed would be to provide summarized information about: 1) current data management practices conducted by various major federal agencies; 2) commonly used, agreed upon and adopted metadata standards; 3) short narratives of major existing data portals that would include ownership, content and frequency of updates; 4) information about data aggregation, locations of main data aggregators, and access restrictions; and 4) current capabilities and issues for data capture, transfer and storage from field sites to data servers

The Team largely discussed over several meetings whether it is necessary to build another portal or use existing ones. The existing data.gov effort (since early 2013) harvests all federal 'raw' and geospatial data using Federal Geographic Data Committee (FGDC), International Organization for Standardization (ISO), or json files and participates more broadly in the international GEO (Group on Earth Observation) for all global data - harvesting from Global Change Master Directory/International Directory Network (GCMD/IDN), national and international metadata collections of all types. Moreover, the Arctic Council-sponsored Arctic Spatial Data Infrastructure (ArcticSDI) has all circumpolar national mapping agencies serving a 1:250K digital basemap (e.g., web mapping service, WMS) in polar projections for use in arctic research as both an underlay and a cartographic data source. Integrating these basemaps with the data.gov/GEO catalogs of data would provide a potent ready-made portal framework for discovering and managing arctic assets.

Members of the Team suggested that the problem of Arctic data should be addressed from the user perspective and that the group should make a priority the creation of an interoperable data catalogue. In this regard, NSF is funding two projects: the first project consists of the development of a Polar Portal for discovering and accessing data through metadata catalogue discovery and harvesting. The project is

developing a geo-spatial platform for discovering and accessing polar data. The second is a Research Coordination Network to coordinate existing polar data repository centers, and provide a forum for discussion and proposal of standards and best practices.

Priorities for 2015

Priorities for 2015 include the identification of new milestones, identification of the tasks for the milestones and the coordination for the roles and responsibilities within the ADCT members for the implementation of the tasks. Other priorities include the expansion of stakeholders participating to the regular meetings to include representative of funded PIs, the reports from the currently NSF funded projects and the update of the matrix of projects funded throughout the different agencies to support data discovery and access.

IARPC Modeling Collaboration Team (MCT)

Accomplishments in 2014

Modeling provides two important benefits to scientific research and decision making: 1) it allows the community to capture and evaluate the state of the art in understanding processes and interrelationships, i.e., can our understanding of systems recreate the present or past in comparison to existing data/observations; 2) it provides the only mechanism whereby our current understanding can be projected into the future, i.e., it allows us to explore "what if" questions about potential futures. As such, modeling crosscuts or touches most, if not all, of the topics in the IARPC 5-year plan. In response to this broad area of interest, the Modeling Coordination Team (MCT) developed a long and diverse list of milestones for itself and has been working to categorize and address milestones in groups of similar topics. In addition, several of the other collaboration teams have identified topics that include aspects of modeling and it is clear that modeling should be connected to each of the other coordination teams.

The MCT began its activities by organizing itself and establishing relationships between the numerous interested Federal agencies/program managers and other Arctic stakeholders. More recent efforts have focused on establishing and expanding relationships among the MCT agency representatives, expanding connections to the interested stakeholder community and updating the group on scientific progress through presentations (webinars) from key scientists in this area. Most recently, the group has focused on the organization of milestones into logical groups managed by one or more MCT members with the goal of streaming and coordinating the milestone process and putting responsibility for advancing interagency activities into the hands of agency representatives with interest/responsibility for a given area or topic.

Examples of specific accomplishments for MCT in this reporting period:

FY 2013 Joint call for carbon cycle science proposals from NASA, DOE, USDA and NOAA that included a topic on Arctic as a "critical ecosystem" and encouraged closely coupled modeling and process research proposals.

Coordinating ongoing Federal research initiatives. Understanding and projecting Arctic ecosystem responses and societal implications in a changing world is a focus of several recent Federal initiatives that are being coordinated under the auspices of the IARPC and its sister CENRS subcommittee, the US Global Change Research Program (USGCRP).

Sea Ice Prediction Network (SIPN) - The SIPN activity highlight is shared by the MCT and the Sea Ice Collaboration Team.

Priorities for 2015

CMT's near-term goals include a more systematic approach to developing collaborative activities and accomplishing milestones through the grouping of milestones around areas of agency interest. The growing recognition of the role of modeling as a cross-cutting capability is expanding the MCT from an internal coordination effort to a larger activity touching most (or all) of the other coordination teams. The implications of this expansion and the mechanisms to carry it out are still being evaluated.

IARPC Arctic Communities Collaboration Team (ACCT)

Accomplishments in 2014

The Arctic Communities Coordination Team held 3 meetings during the past year, with participation ranging from 15 to 25 individuals. In addition to Federal agencies, the team includes members from universities, Alaska Native organizations, and independent scholars. It quickly became apparent that implementing our portion of the Arctic Plan would (1) focus largely in the area of communications, information sharing, outreach, and coordination rather than initiating or coordinating research projects or programs, and (2) require international as well as US- and Alaska-based participation. In addition to meetings, the team found that webinars served as a useful tool for outreach and communication beyond the regular teleconferences.

The general task of the ACCT is to assess strengths and vulnerabilities of Arctic communities facing the impacts of climate change and to assist in identifying adaptation strategies and tools to maximize sustainability, well-being, and cultural and linguistic heritage. In terms of 3.2.5, our goal of facilitating socio-economic research to understand the impact on eco-system services of warming climate was met by the publication of a major report by the Arctic Social Indicators Project that contained recommendations on ways to adapt and minimize impacts. Progress was also made on several milestones for 3.4.2a, determining local resident priorities for addressing change, by studies funded by the NSF. Several agencies (DOI, EPA, NSF, and SI) made progress engaging indigenous observers in the study of change (3.4.9). Community collaboration in assessing sustainability, resilience, and adaptation (3.6.1) saw progress with studies of past and current adaptation strategies by DOI, DOS, and SI. The identification of community vulnerabilities (3.6.2) was the subject of studies and reports by BOEM, EPA, NSF, USFW, and USGS, and by a forthcoming Arctic Social Indicators II project.

One of the Team's webinars addressed food security issues featured in 3.6.3: developing projections of future climate impact scenarios and demographic conditions to forecast potential strengths and weaknesses of human and ecological systems in the Arctic. But it was apparent that complications inherent in mounting such a large-scale international enterprise made this target largely unattainable with current resources. 3.6.3.c is being addressed by a Smithsonian study of past human and animal population changes when facing climate and environmental change. Support for indigenous languages and cultural heritage (3.6.4) was gained by the passage of a State native language bill (HB 216) and by education programs conducted by the NPS, NSF, SI, and other agencies; many new publications appeared in this area. However, the bulk of this work is being carried out by or in collaboration with Native organizations, universities, NGOs and others.

Priorities for 2015

Plans for future activities include webinars on language preservation and cultural heritage; reports from agency studies now underway; and new research on social indicators. The ACCT expects its work will expand receive more attention during the forthcoming US Arctic Council Chair era.

IARPC Human Health Collaboration Team (HHCT)

Accomplishments in 2014

The Human Health Collaboration Team has been meeting during 2014 to report on milestone progress. Individuals from the State, academic community, and other external partners have participated in the teleconferences. Significant progress has been made on all projects. Accomplishments include:

A study was completed to demonstrate the acceptability of fecal immunochemical test (FIT) for the early detection of colorectal cancer in Alaska Native people[1]. (3.7.1.l)

A paper was published that described the formation of a circumpolar working group to monitor and conduct research on climate sensitive infectious diseases[2]. (3.7.2.d)

The 4th Alaska Native Health Regional Conference was held 27, 28 March 2014. The Conference brought together people from the native communities interested in health to talk about health research initiatives. The theme was "Research for Healthier People" . (3.7.4.b)
Details and presentations can be found at: www.signup4.net/public/ap.aspx?EID=20133021E&OID=50

Priorities for 2015

Human Health Proposals for the upcoming US Chairmanship 2015-2017 are being developed in the areas of Behavioral, Mental Health and Suicide (3.7.3.a) and Water Sanitation and Health (3.7.1.g), and potentially Climate Change and Human Health (3,7.1.g, 3.7.2. a, b, c, d, e). Proposal will be presented to the Arctic Council Sustainable Development Working Group meeting in Yellowknife Canada October 17, 2014.

Implementation of a "One Health" strategy to monitor the impacts of climate/environmental change and environmental contaminants on human health in the Arctic (Research Activity 3.7.2). Elements of this highlight include: (1) Conducting community health assessments and initiate training and deployment of monitoring technology and the development of a web-based monitoring network to assess environmental and health impacts to provide feedback and adaption strategies to trial leaders, tribes and tribal organizations (3.3.2a); and (2) Developing, deploying, and assessing a surveillance and response Toolkit to promote community based adaptation planning for climate change (3.3.2.b).
Community based surveillance has been shown to be an effective method for assessing health outcomes from exposure to environmental effects of climate change and informing climate change adaptation planning. Assembling a US Arctic based "One Health" Group has been part of an ongoing NOAA-CDC memorandum of agreement that provides an exchange of scientific expertise and resources in the areas of climate, weather, water, and environmental, oceanographic, and atmospheric health as it relates to public health (3.7.2.e).

References cited:
1) Redwood DG, Provost E, Asay E, Roberts D, Haverkamp D, Perdue D, Bruce MG, Sacco F, Espey D. Comparison of guaiac-based and immunochemical fecal occult blood tests for colorectal cancer screening in an Alaska Native population with high prevalence of Helicobacter pylori infection. Prev Chronic Disease 2014;11:E56.

2) Parkinson A, Evengard B, etal Climate change and infectious diseases in the Arctic: establishment of a circumpolar working group. Citation: Int J Circumpolar Health 2014, 73: 25163 - http://dx.doi.org/10.3402/ijch.v73.25163