Welcome and Introduction

Pacific Arctic Group (PAG)

Sung-Ho Kang
Chair, Pacific Arctic Group
Director, Division of Polar Ocean Sciences
Korea Polar Research Institute (KOPRI), Incheon, Republic of Korea

ASSW

25 April 2015

Toyama, Japan

http://pag.arcticportal.org/

Pacific Arctic Group

- The Pacific Arctic Group (PAG) is an informal group of organizations and individuals having a Pacific perspective on Arctic science. Originally organized under the International Arctic Science Committee (IASC), the PAG is now an independent affiliate of the IASC and has as its mission to serve as a Pacific Arctic regional partnership to plan, coordinate and collaborate on science activities of mutual interest. The PAG has established five objectives:

- To identify gaps in knowledge and priority research needs across the Pacific Arctic Region and seek means to implement programs and activities that address them.

- To facilitate and coordinate science operations among PAG member countries.

- To promote and facilitate data accessibility and integrated data bases for the region.

- To serve as a forum for information exchange on Pacific Arctic Region (PAR) science programs.

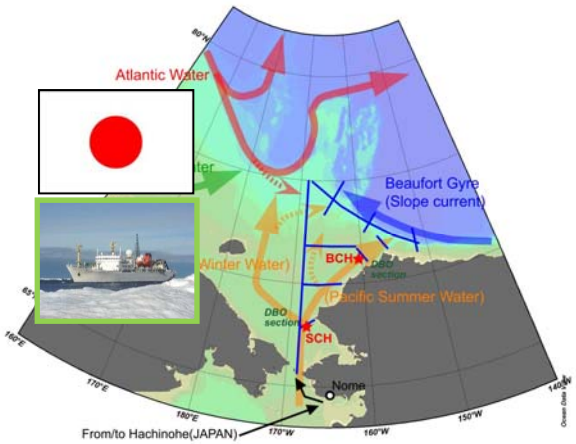
- To establish and maintain a direct link between PAG and other relevant science organisations.

Pacific Arctic Group

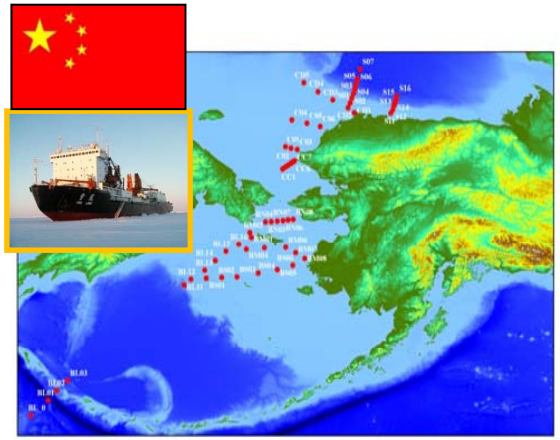
- Sharing information on annual field activities in the Pacific Arctic region
- Continued development and implementation of long-term monitoring activity such as the Distributed Biological Observatory (DBO) and Pacific Arctic Climate-Ecosystem Observing Network
- Undertake a Pacific Arctic regional, multidisciplinary synthesis of scientific findings in the marine region relevant to ongoing scientific objectives at the core of the PAG
- Project development and sampling in the Pacific Arctic region to investigate climate, oceanography, air-sea ice interactions, physical oceanography, and modeling

PAG research cruises in Pacific Arctic Region

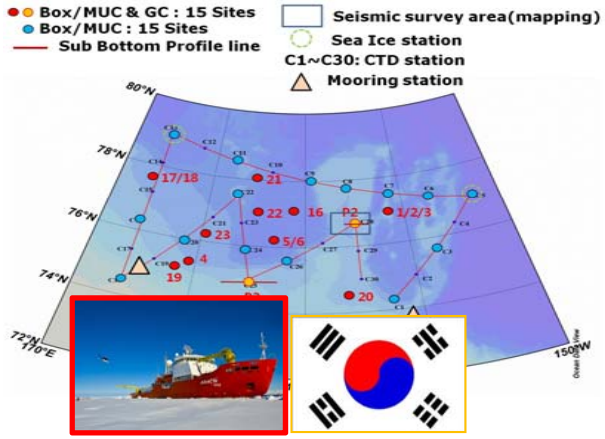
Japan: RV Mirai



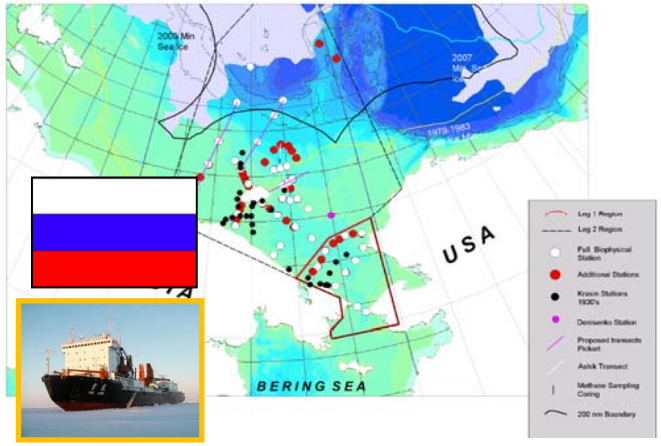
China: RV Xuelong



Korea: RV Araon

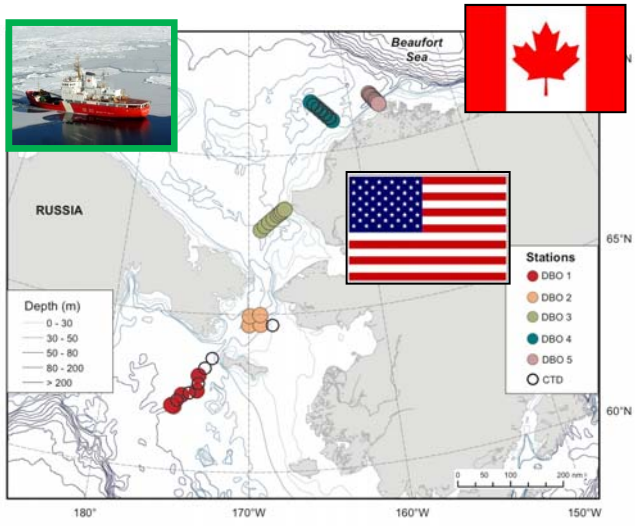


Russia-USA: RV Khromov



Canada: CCGS Sir Wilfrid Laurier, Louis St. Laurent

USA: Healy, RV Aquila, Brown etc.



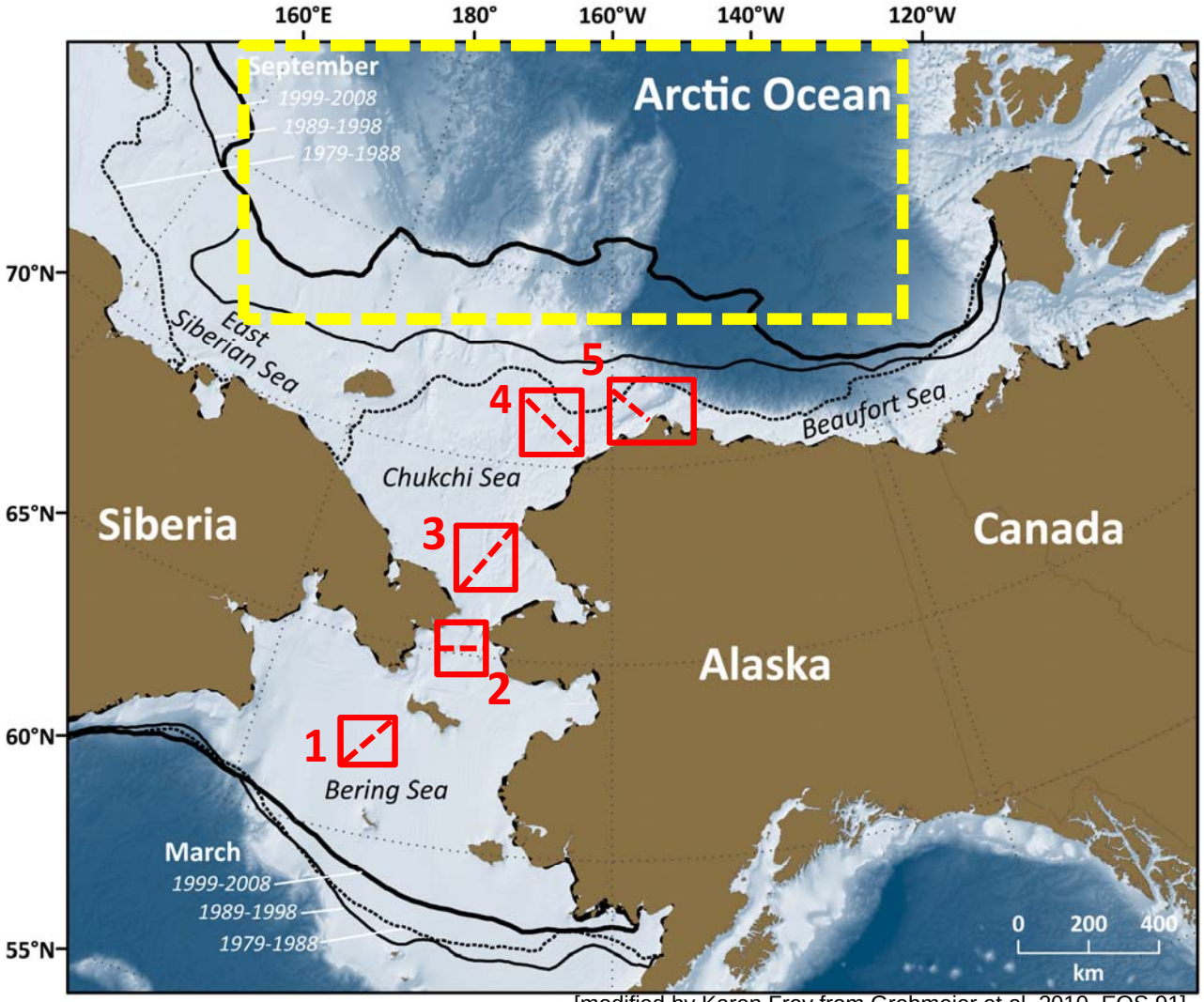
Sharing information on annual field activities

2015 PAG and DBO Field Season: Sampling Contributors (as of April 17, 2015)

Region Key: DBO1=So. St. Lawrence Is., DBO2=Chirikov Basin, DBO3=So Chukchi Sea, DBO4=NE Chukchi Sea, DBO5=Barrow Canyon.

Dates (Port calls)	Ship	DBO Region	Projects	PAG contact	Chief Scientist
May 13-June 19 (Dutch-Dutch)	Healy	---	Under-ice and open water blooms in the Chukchi Sea	Robert Pickart rpickart@whoi.edu	Kevin Arrigo arrigo@stanford.edu
June 30-July 8 (Nome-Nome)	Norseman 2	3	Bering Strait Mooring Project/AON	Rebecca Woodgate woodgate@apl.washington.edu	Rebecca Woodgate woodgate@apl.washington.edu
June-July	Norseman 2	-	Walrus tagging	Chad Jay cjay@usgs.gov	Chad Jay cjay@usgs.gov
July 8-17 (Anadyr-Anadyr)	Khromov	3	RUSALCA Bering Strait mooring	Kathy.Crane@noaa.gov Phyllis.Stabeno@noaa.gov	Kathy.Crane@noaa.gov
July 4-29-August 15 (Dutch-Barrow)	Healy	5	AON	Robert Pickart rpickart@whoi.edu	Robert Pickart rpickart@whoi.edu
July 4-23 (Victoria, BC-Barrow)	Sir Wilfrid Laurier	1,2,3,4,5	C30/DBO	Jackie Grebmeier jgrebmei@umces.edu;	Svein.Vagle@dfo-mpo.gc.ca
July 18-Sept 18 (Shanghai-return)	Xuelong	(1-2 partial), 3,5	Chinese Arctic Research Expedition	Jianfeng He jhe@pric.org.cn	Jianfeng He jhe@pric.org.cn
August 1-23 (Nome-Barrow) August 25- Sept 10 (Barrow-Nome)	Araon	3	ARA05, Korean Arctic Ocean Expedition (KOPRI)	Sung-Ho Kang shkang@kopri.re.kr	Leg 1 Eun Jin Yang ejyang@kopri.re.kr Leg 2 Seung Il Nam sinam@kopri.re.kr
August 9-30 (Barrow-Tromso)	Oden	-	SEWUS-C3	Martin Jakobsson martin.jakobsson@geo.su.se	Martin Jakobsson martin.jakobsson@geo.su.se
August 18-Sept 8 (Barrow-Barrow)	Annika Marie	5	AON	Carin Ashjian cashjian@whoi.edu	Carin Ashjian cashjian@whoi.edu
August-October	Westward Wind	4* (modified)	CSESP	Tom Weingartner weingart@ims.uaf.edu	Bob Day bday@abrinc.com John Burns jburnssr@gci.net
Aug 30-Sept 12 (Dutch-Nome)	Alaska Endeavor	2	BASIS	Ed.Farley@noaa.gov	jim.murphy@noaa.gov
Aug 25-Oct 6 (Japan-Dutch)	Mirai	-	JAMSTEC	Takashi Kikuchi takashik@jamstec.go.jp	Shigeto Nishino nishinos@jamstec.go.jp
Aug 6 – Sep 4 (Kodiak-Dutch)	Brown	4,5	ARCWEST/CHAOZ-X	Sue.Moore@noaa.gov Catherine.Berchok@noaa.gov	Phyllis.stabeno@noaaa.gov
Sept 6-Sep26 TENTATIVE!! (Nome-Dutch)	R/V Aquila	1,2,3,4,5 PAM moor + vis/PAM survey; 1,4,5 biophys. moor.	ARCWEST/CHAOZ-X	Sue.Moore@noaa.gov Catherine.Berchok@noaa.gov	Catherine.Berchok@noaa.gov
Sept 21-Oct 14 (Dutch-Kodiak)	Oscar Dyson	1	BASIS	Ed Farley : ed.farley@noaa.gov	Lisa Eisner : lisa.eisner@noaa.gov
September-October	Louis S St-Laurent	-	JOIS	Bill.Williams@dfo-mpo.gc.ca	Bill.Williams@dfo-mpo.gc.ca

Continued development and implementation of long-term monitoring activity - the Distributed Biological Observatory (DBO)



[modified by Karen Frey from Grebmeier et al. 2010, EOS 91]

- DBO sites (red boxes) are regional "hotspot" transect lines and stations located along a latitudinal gradient
- DBO sites are considered to exhibit high productivity, biodiversity, and overall rates of change
- DBO sites will serve as a change detection array for the identification and consistent monitoring of biophysical responses
- Sites occuppied by national and international entities with shared data plan

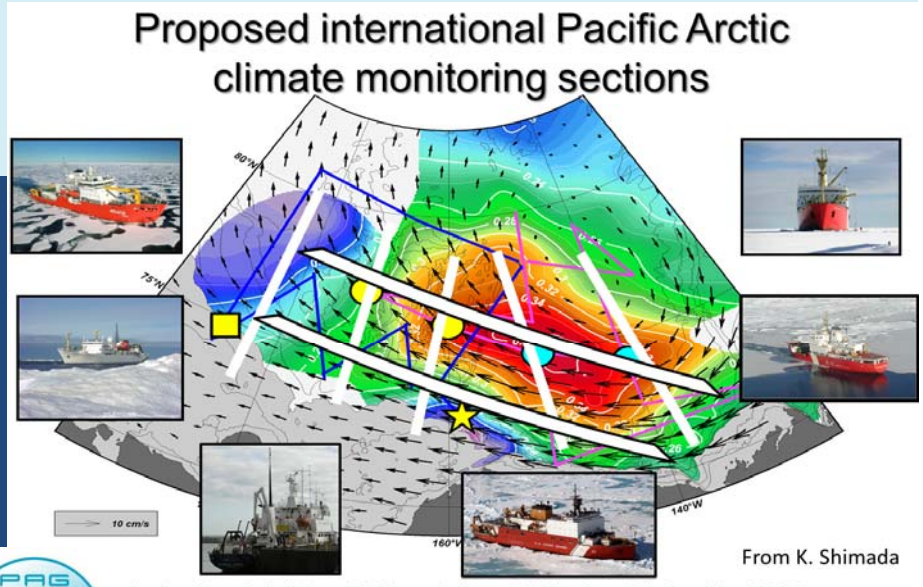
Photo credit: Aleksey Ostrovskiy

THE PACIFIC ARCTIC GROUP (PAG) MEETING

October 28-29, 2014
Seattle, Washington

Citation: Grebmeier, J.M, A. Bayard, L.S. Guy, and J. Lee (eds). 2015. The Pacific Arctic Group (PAG) Fall 2014 Meeting Report. CBL/UMCES, 24 pp.

- In October, 2014, the Pacific Arctic Group fall meeting focused on **a review of accomplishments during the previous summer and outlooks for the future research plans**.
- One major outcome of the meeting was **to engage in an expert-level discussion of observing needs in the higher Pacific Arctic** that could provide **valuable data to forecasters and modelers of climate change impacts on and surrounding the Arctic reaching to the mid-latitudes.**
- The area of observing interest includes the outer shelf of the East Siberian and Chukchi Seas northwards to 80°N and extending from the Makarov Basin in the West to the Canada Basin in the East.



From K. Shimada

nd color: dynamic height at 100dbar relative to 800dbar from Mirai and Louis S. St-Laurent
ses (Oceanic Beaufort Gyre)
tors: average sea ice motion vectors for Nov. 2007- Apr. 2008 (Sea Ice Beaufort Gyre)
Mooring array in 2012-2013 (TUMSAT/KOPRI/NIPR & WHOI)

JOINT STATEMENT

Letter of Intent
Cooperation of the Pacific Arctic Group Members on:
Developing a Pacific Arctic Climate-Ecosystem Observing Network

The Pacific Arctic Group (PAG) is an informal group of organizations and individuals having a Pacific perspective on Arctic science. Originally organized under the International Arctic Science Committee (IASC), the PAG is now an independent affiliate of the IASC and has as its mission to serve as a Pacific Arctic regional partnership to plan, coordinate and collaborate on science activities of mutual interest. The PAG has established five objectives:

- To identify gaps in knowledge and priority research needs across the Pacific Arctic Region and seek means to implement programs and activities that address them.
- To facilitate and coordinate science operations among PAG member countries.
- To promote and facilitate data accessibility and integrated data bases for the region.
- To serve as a forum for information exchange on Pacific Arctic Region (PAR) science programs.
- To establish and maintain a direct link between PAG and other relevant science organisations.

In October, 2014, the Pacific Arctic Group fall meeting focused on a review of accomplishments during the previous summer and outlooks for the future research plans.

Korean Polar Research Institute, Korea

Arctic Research Program, NOAA, USA

Japan Agency for Marine-Earth Science And Technology

National Institute of Polar Research, Japan

Polar Research Institute of China, China

Department of Fisheries and Oceans, Canada

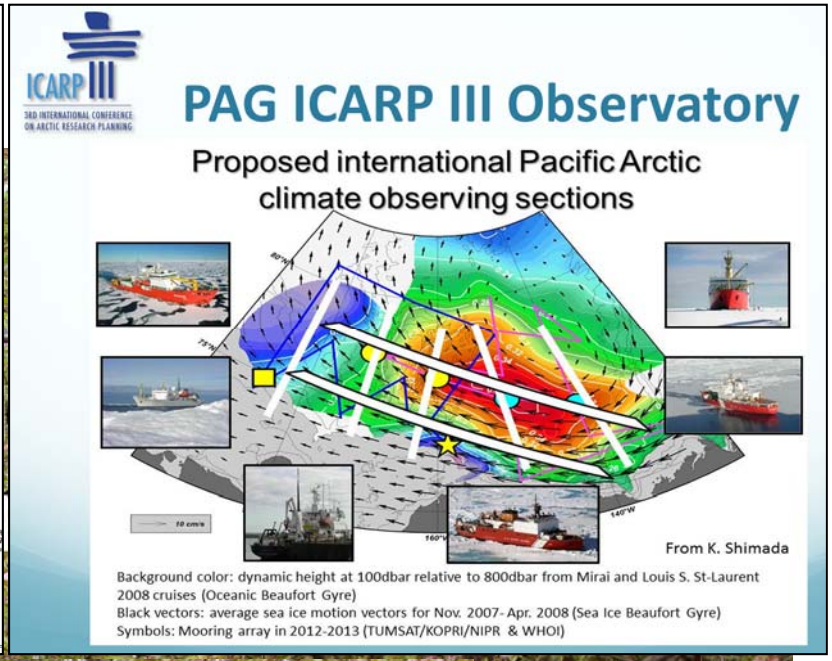
Arctic and Antarctic Research Institute, Russian Federation

Fisheries and Oceans Canada

Korea Polar Research Institute

NiPR

JAMSTEC



Pacific Arctic Group

- The Spring PAG meeting is held during Arctic Science Summit Week and are focused on "business" issues and an update on research plans for the coming field season.
- The Fall PAG meeting is hosted at various locations in alternating PAG countries after the field season and is focused on review of accomplishments during the previous summer and outlooks for the future. These discussions are useful in developing scientific exchanges and other types of collaborations during and after field operations.

Pacific Arctic Group (PAG) Spring Meeting Agenda

Arctic Science Summit Week, Toyama, Japan
April 25 2015, (9:00 – 17:30, Lunch 12:30 – 14:00,
Coffee Break 10:30 – 10:50 and 15:00 – 15:30)
Toyama International Conference Center

Introduction and Welcome (Sung-Ho Kang)
Agenda items

1. Update plans for 2015 field season
   - Canada: Bill Williams
   - China: Jianfeng He, Jinping Zhao
   - Japan: Takashi Kikuchi, Koji Shimada
   - Korea: Eun Jin Yang, Sung-Ho Kang
   - Russia: TBD
   - United States: Kathy Crane, Jackie Grebmeier

2. Updates for planning of PAG joint field and modeling activities
   - Update Chukchi Borderland/Arctic Basin joint activities in relation to developing international "Pacific Climate Line" for Canada Basin and shelf-basin lines (Kathy Crane, Koji Shimada)
   - RUSALCA program (Aleksey Ostrovskiy)
   - NABOS (Matthew Alkire)
   - Sea ice and atmosphere topic (Joo-Hong Kim)
   - Modeling activities (Jia Wang)
   - Coordination of Mooring Locations (Phyllis Stabeno)
   - Other updates or proposals for new activities?

3. Status report on PAG-endorsed DBO ongoing and planned future activities (Jackie Grebmeier-lead, with results from others beyond presented in country reports)

- Brief highlight of science findings from the DBO pilot program, examples of results 2010-2014
- Plan for 2015 field activities (highlighted from country updates)
- Plans for future DBO data meetings; data management and policy; DBO publication

4. Data sharing issues (Jackie Grebmeier)
   - Discuss IASC data policy and final DBO data policy in relation to PAG activities (Jackie Grebmeier)

5. PAG Synthesis activities
   - DSR ARAON Special Issue- update (Sang Lee)
   - Biogeosciences – Special Issue Update (Takashi Kikuchi)
   - Other plans?

6. Interactions with other organizations
   - ICARPIII update (Kathy Crane)
   - PAG and EPB, IASC Council and MWG, FARO, SAON (Jackie Grebmeier)
   - ART (Arctic in Rapid Transition) update (Sanna Majaneva, Monika Kedra)
   - Others?

7. PAG structure
    - Executive committee composed of PAG Chair, Vice-Chairs, and leads from each of PAG activities
    - Current rotation plan: Chair and Secretariat
        - 2012-2014 – US (Jackie Grebmeier, UMCES)-rotate off as Chair fall 2014 PAG meeting in USA, Secretariat moved to KOPRI
        - 2014-2016 – Korea (Sung-Ho Kang, KOPRI)
        - 2016-2018 – Japan (TBD)
        - 2018-2020 – Russia, China, Canada?

8. Review of PAG operating procedures, MOA with IASC, and Secretariat-open discussion
    - Do we need science subgroups to meet related to PAG projects?
    - PAG and interactions with IASC MWG (Jackie Grebmeier)

9. Future PAG meetings
    - **Fall 2015 – Incheon, Korea**
    - **ASSW 2016 – Fairbanks, Alaska, US**
    - **Fall 2016 – Qingdao, China**
    - **ASSW 2017 – Prague, Czech Republic**
    - Fall 2017 – Japan? Canada? Russia?
    - **ASSW 2018 – Davos, Switzerland**
    - Fall 2018 – Japan? Canada? Russia?

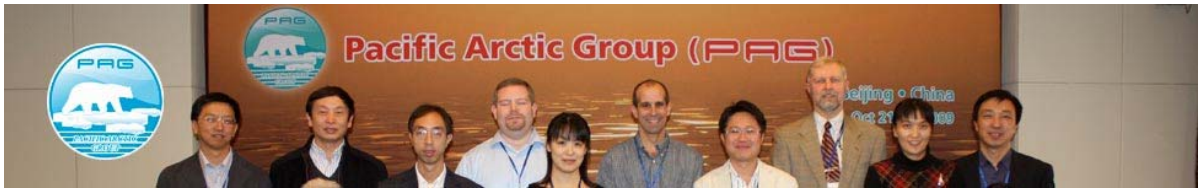
10. End of meeting by dinner

http://pag.arcticportal.org

All the ppts and documents associated with the PAG meetings available at the PAG website: **http://pag.arcticportal.org/, under "documents".**

Thank you for your attention.

Questions?



- Home
- About PAG
- News & Events
- Documents
- Research Projects
- Contact us
- Related Links
- Login/Logout

What is PAG?

The Pacific Arctic Group (PAG) is a group of institutes and individuals having a Pacific perspective on Arctic science. Organized under the International Arctic Science Committee (IASC), the PAG has as its mission to serve as a Pacific Arctic regional partnership to plan, coordinate, and collaborate on science activities of mutual interest. The four PAG principle science themes are climate, contaminants, human dimensions and structure and function of Arctic ecosystems.

READ MORE »

LATEST PAG DOCUMENTS

final pagchina2012 mtg reportv2
[Nov 27 2012]
7aos call for white papers unsolicitedv4
[Nov 13 2012]
6intro_essas2013_hakodate
[Nov 13 2012]
5jingping zhao development for the arcti...
[Nov 13 2012]
4artworkshop_kedra
[Nov 13 2012]

ARCHIVE

NEWS AND EVENTS

2013 Pacific Arctic Group (PAG) Spring...

Pacific Arctic Group (PAG) Spring Meeting Sunday, April 14, 2013 during Arctic Science Summit Week (ASSW 2013) in Krakow, Poland. Link t...
More

Arctic Science Summit Week 2013

MORE NEWS

RESEARCH AND PROJECTS

2011 Research Projects have now been published.

To learn more, please follow this LINK

Download document HERE

MORE

Pacific Arctic Group (PAG) of the International Arctic Science Committee

Sponsored by NOAA's Arctic Research Office
Designed and hosted by Arctic Portal

A workshop held in Tokyo to investigate and refine the following key future observing goals and to develop an implementation plan for action.

- The goals are:

*** To study the evolution, structure, variability of Pacific Arctic upper ocean water masses, including heat transport of Atlantic Water and its interaction with northward flowing Pacific Water.**

*** To carry out atmospheric, sea ice and upper ocean observations to understand the rapid sea ice loss in the region and its impact on the local and global climate and regional ecosystems. This effort will also incorporate atmospheric observations to support the WMO's Polar Prediction Project (PPP).**

*** To carry out a repeat census of the trophic components of the ecosystem, identify key species, their relationship to physical forcing and biogeochemical conditions including their changes through time and space.**

*** To carry out time-series observations from long-term moorings to reveal annual and inter-annual variability..**

*** To coordinate this work with the vessels of our respective countries from 2015-2020 and beyond, which will provide a unique suite of synoptically collected data made available for joint analysis and assessment via the mechanisms already set up within the Pacific Arctic Group.** www.pag.arcticportal.org

The PAG participants agree to collaborate on the development and implementation of this Pacific Arctic climate integrated-

B2: Current and Future Observing Strategies for Understanding the Evolving Arctic Climate and Ecological System

*** To contribute to the critical elements defined above**

April 28, 2015 (Tuesday), Room 203

10:45-12:15

Chair: Leif Anderson, Terry Callaghan

10:45-11:03	B02-O11	ARCTIC OCEAN BOUNDARY ARRAY: CORNERSTONE OF ARCTIC MONITORING S. Bacon*, T. Tsubouchi, Y. Aksenov
11:03-11:21	B02-O12	THE DISTRIBUTED BIOLOGICAL OBSERVATORY: A LATITUDINAL DETECTION ARRAY FOR TRACKING ECOSYSTEM CHANGE IN THE PACIFIC ARCTIC J. M. Grebmeier*, L. W. Cooper, K. E. Frey, T. Kikuchi, S. E. Moore, S. Vagle
11:21-11:39	B02-O13	THE PACIFIC ARCTIC GROUP CLIMATE OBSERVING SYSTEM: AN INTERNATIONAL EFFORT TO UNDERSTAND THE CAUSES AND CONSEQUENCES OF SEA ICE LOSS IN THE 'HOT SPOT' OF THE ARCTIC OCEAN K. H. Cho, J. He, S. H. Kang, J. H. Kim, H. Melling, A. Ostrovskiy, G. Panteleev, R. Pickart, I. Polyakov, K. Shimada, T. Uttal, W. Williams, H. Yamaguchi, J. Zhao, J. Wang, K. Crane
1139-11:57	B02-O14	YEAR-LONG, DAILY-SCALE ECOSYSTEM OBSERVATIONS UNDER PERENNIAL ICE COVER IN THE ARCTIC OCEAN S. Laney*, J. Toole, R. Krishfield, M. L. Timmermans
11:57-12:15	B02-O15	SIZONET: MULTI-PURPOSE, MULTI-PLATFORM OBSERVATIONS TO INFORM RESPONSES TO AN ARCTIC SEA ICE COVER IN TRANSFORMATION H. Eicken*, A. R. Mahoney, D. O. Dammann, J. Jones, S. Hendricks, Y. Fukamachi, K. I. Ohshima, C. Haas, S. Gerland, A. Makshtas

gy

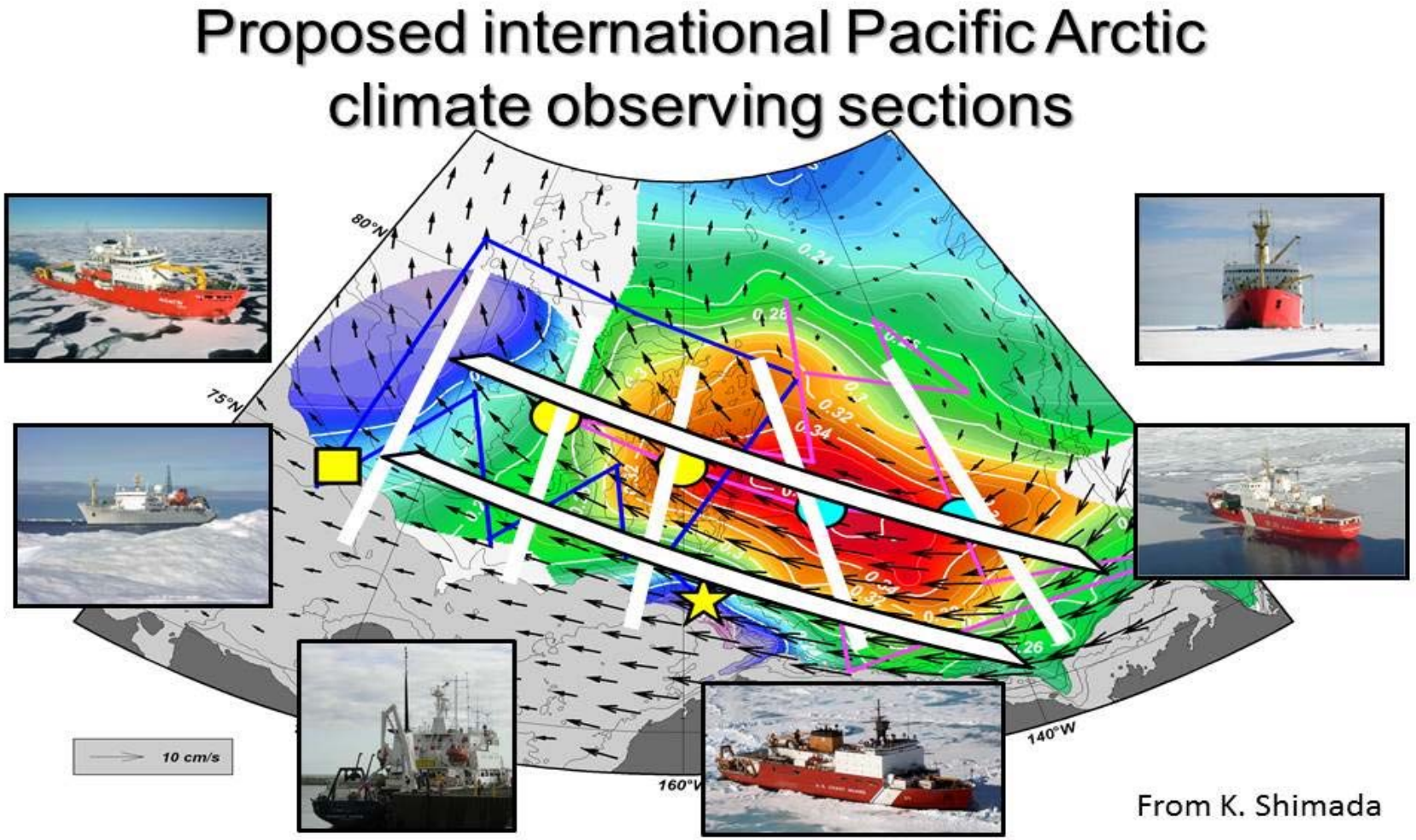
th

of

ze

shared data and publish the results

PAG ICARP III Observatory



Background color: dynamic height at 100dbar relative to 800dbar from Mirai and Louis S. St-Laurent 2008 cruises (Oceanic Beaufort Gyre)
Black vectors: average sea ice motion vectors for Nov. 2007- Apr. 2008 (Sea Ice Beaufort Gyre)
Symbols: Mooring array in 2012-2013 (TUMSAT/KOPRI/NIPR & WHOI)

JOINT STATEMENT

Letter of Intent
Cooperation of the Pacific Arctic Group Members on:
Developing a Pacific Arctic Climate-Ecosystem Observing Network

The Pacific Arctic Group (PAG) is an informal group of organizations and individuals having a Pacific perspective on Arctic science. Originally organized under the International Arctic Science Committee (IASC), the PAG is now an independent affiliate of the IASC and has as its mission to serve as a Pacific Arctic regional partnership to plan, coordinate and collaborate on science activities of mutual interest. The PAG has established five objectives:

- To identify gaps in knowledge and priority research needs across the Pacific Arctic Region and seek means to implement programs and activities that address them.
- To facilitate and coordinate science operations among PAG member countries.
- To promote and facilitate data accessibility and integrated data bases for the region.
- To serve as a forum for information exchange on Pacific Arctic Region (PAR) science programs.
- To establish and maintain a direct link between PAG and other relevant science organisations.

In October, 2014, the Pacific Arctic Group fall meeting focused on a review of accomplishments during the previous summer and outlooks for the future research plans.

Korean Polar Research Institute, Korea

Arctic Research Program, NOAA, USA

Japan Agency for Marine-Earth Science
And Technology

National Institute of Polar Research, Japan

Polar Research Institute of China, China

Department of Fisheries and Oceans, Canada

Arctic and Antarctic Research Institute,
Russian Federation

Overview of PAG

- The Pacific Arctic Group (PAG) is a consortium of institutes and individuals having a Pacific perspective on Arctic science
- PAG serves as a Pacific Arctic regional partnership to plan, coordinate, and collaborate on science activities
- The four PAG principal science themes are climate, contaminants, human dimensions and structure and function of Arctic ecosystems
- The PAG membership is led by an Executive Committee consisting of a Chair, two Vice Chairs, and the Project leads from ongoing PAG activities from Canada, China, Japan, Korea, Russia, USA.

Photo credit: Aleksey Ostrovskiy

THE PACIFIC ARCTIC GROUP (PAG) MEETING

Meeting Minutes

October 28-29, 2014
Seattle, Washington

Citation: Grebmeier, J.M, A. Bayard, L.S. Guy, and J. Lee (eds). 2015. The Pacific Arctic Group (PAG) Fall 2014 Meeting Report. CBL/UMCES, 24 pp.

Meeting report available and presentations available on the PAG website:

http://pag.arcticportal.org/

- **Overview:** The Fall PAG meeting is hosted at various locations in alternating PAG countries after the field season and is focused on review of accomplishments during the previous summer and outlooks for the future. These discussions are useful in developing scientific exchanges and other types of collaborations during and after field operations. The Spring PAG meetings are held during Arctic Science Summit Week and are focused on "business" issues and an update on research plans for the coming field season.

- Main objectives of the session to:
(1) introduce and discuss new research focus areas that would be appropriate for joint and/or coordinated efforts by PAG participants,
(2) confirm the identity of potential participants and coordinators for each focus area, and
(3) identify next steps toward implementation.

- Points to consider included:
1. What is the overarching rational of the proposed activities?
2. What are the specific outcomes of the proposed activities?
3. Should testable hypotheses be stated to guide activities?
4. Should specific space-time coordinates for stations and moorings be defined in advance?

to develop a white paper for the "Pacific Climate Line."

The workshop will focus on the Chukchi Borderland/Arctic Basin joint activities in relation to developing international "Pacific Climate Line" for the Canada Basin and shelf-basin lines.

- The Pacific Climate Line section would be important in identifying the ocean circulation that is affecting the receding ice in the Arctic (i.e. center of action on sea ice reduction). There are so many projects going on in the study area that our understanding has been improved; however, there is a gap in the northeastern Siberian region where a link between international projects would be extremely useful for understanding overall system change. The workshop will focus on the joint activities in relation to developing international "Pacific Climate Line" for north of the Chukchi Sea extending from the Makharov Basin in the West to the Canada Basin in the East.

B2: Current and Future Observing Strategies for Understanding the Evolving Arctic Climate and Ecological System

April 28, 2015 (Tuesday), Room 203

10:45-12:15

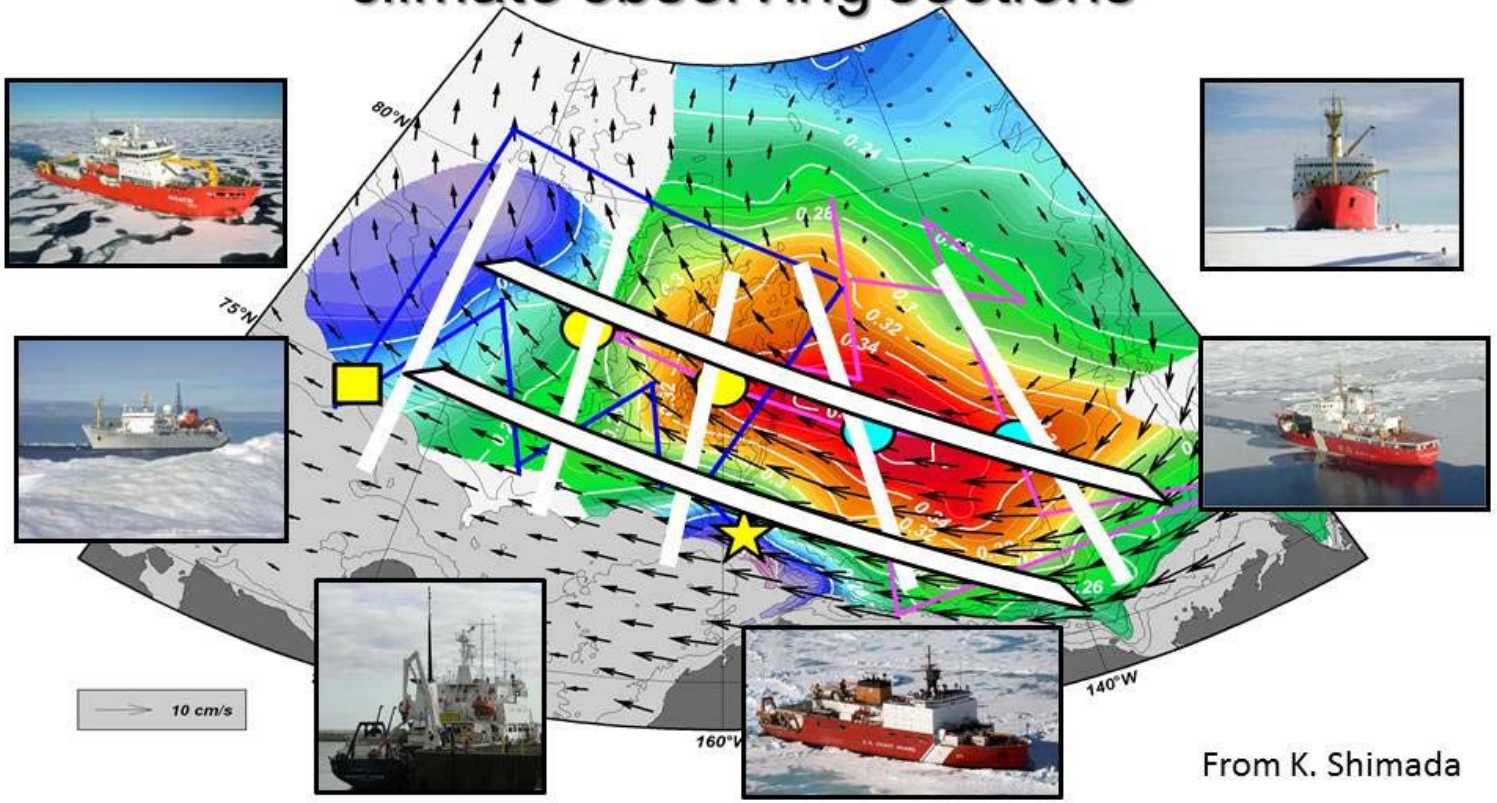
Chair: Leif Anderson, Terry Callaghan

10:45-11:03	B02-O11	ARCTIC OCEAN BOUNDARY ARRAY: CORNERSTONE OF ARCTIC MONITORING S. Bacon*, T. Tsubouchi, Y. Aksenov
11:03-11:21	B02-O12	THE DISTRIBUTED BIOLOGICAL OBSERVATORY: A LATITUDINAL DETECTION ARRAY FOR TRACKING ECOSYSTEM CHANGE IN THE PACIFIC ARCTIC J. M. Grebmeier*, L. W. Cooper, K. E. Frey, T. Kikuchi, S. E. Moore, S. Vagle
11:21-11:39	B02-O13	THE PACIFIC ARCTIC GROUP CLIMATE OBSERVING SYSTEM: AN INTERNATIONAL EFFORT TO UNDERSTAND THE CAUSES AND CONSEQUENCES OF SEA ICE LOSS IN THE 'HOT SPOT' OF THE ARCTIC OCEAN K. H. Cho, J. He, S. H. Kang, J. H. Kim, H. Melling, A. Ostrovskiy, G. Panteleev, R. Pickart, I. Polyakov, K. Shimada, T. Uttal, W. Williams, H. Yamaguchi, J. Zhao, J. Wang, K. Crane
1139-11:57	B02-O14	YEAR-LONG, DAILY-SCALE ECOSYSTEM OBSERVATIONS UNDER PERENNIAL ICE COVER IN THE ARCTIC OCEAN S. Laney*, J. Toole, R. Krishfield, M. L. Timmermans
11:57-12:15	B02-O15	SIZONET: MULTI-PURPOSE, MULTI-PLATFORM OBSERVATIONS TO INFORM RESPONSES TO AN ARCTIC SEA ICE COVER IN TRANSFORMATION H. Eicken*, A. R. Mahoney, D. O. Dammann, J. Jones, S. Hendricks, Y. Fukamachi, K. I. Ohshima, C. Haas, S. Gerland, A. Makshtas

The Pacific Arctic Group Climate Observing System: An international effort to understand the causes and consequences of sea ice loss in the 'Hot Spot' of the Arctic Ocean

- The nations of the Pacific Arctic Group are proposing to carry out a series of repeat observations in the Arctic Ocean, north of the Chukchi Sea extending from the Makharov Basin in the West to the Canada Basin in the East.
- This region has undergone the most extreme loss of sea ice extent and thickness within the Arctic Ocean and yet is very poorly observed. We propose to study the evolution, structure, variability, and heat transport of Atlantic Water in this region and its interaction with northward flowing warm Pacific Water from the Chukchi Sea, which accelerates the positive ice/ocean albedo feedback cycle, leading to rapid loss of summer sea ice.
- We also propose to carry out a census of the ecosystem in this region which is likely in rapid transition due to the extreme physical changes.
- Repeat observational transects and time-series records from moorings will be planned to reveal year-round the interplay between the amount of heat that is being lost into the atmosphere from this part of the Pacific Arctic Ocean, the enhanced mixing of both surface and intermediate waters in response to increased storms, increased ocean absorption of solar radiation and the consequent impacts on the changing weather and climate of the Northern Hemisphere.
- The observing period will also incorporate atmospheric observations to support the WMO's Year of Polar Prediction (YOPP).
- We propose to coordinate this work with the vessels of our respective countries from 2015-2020, which will provide a unique suite of synoptically collected data made available for joint analysis, assessment, and modeling/data assimilation via the mechanisms already set up within the Pacific Arctic Group. www.pag.arcticportal.org

Proposed international Pacific Arctic climate observing sections



Background color: dynamic height at 100dbar relative to 800dbar from Mirai and Louis S. St-Laurent 2008 cruises (Oceanic Beaufort Gyre)
Black vectors: average sea ice motion vectors for Nov. 2007- Apr. 2008 (Sea Ice Beaufort Gyre)
Symbols: Mooring array in 2012-2013 (TUMSAT/KOPRI/NIPR & WHOI)

Main contributions to ICARP III in terms of the ICARP III priorities

- PAG works with a pan-Arctic perspective to promote synergies across the Arctic Ocean.
- PAG recognizes the value of the ICARP III as a means to identify and prioritize overarching Arctic science issues, and to improve international coordination of research agendas.
- PAG's ICARP III contribution as data sharing and publications from results of the Distributed Biological Observatory (DBO), continued development of the Climate Observing System, and implementation of the project.
- PAG can provide a valuable dataset for ongoing research and development of cooperative synthesis in the Pacific and Atlantic marine sector.
- European research activity can complement PAG studies with its research in the Atlantic side of the Arctic.

PAG ICARP III Activities

- The nations of the Pacific Arctic Group are proposing to carry out a series of repeat observations in the Arctic Ocean, north of the Chukchi Sea extending from the Makharov Basin in the West to the Canada Basin in the East.

- This region has undergone the most extreme loss of sea ice extent and thickness within the Arctic Ocean and yet is very poorly observed. We propose to study the evolution, structure, variability, and heat transport of Atlantic Water in this region and its interaction with northward flowing warm Pacific Water from the Chukchi Sea, which accelerates the positive ice/ocean albedo feedback cycle, leading to rapid loss of summer sea ice.

- We also propose to carry out a census of the ecosystem in this region which is likely in rapid transition due to the extreme physical changes.

- Repeat observational transects and time-series records from moorings will be planned to reveal year-round the interplay between the amount of heat that is being lost into the atmosphere from this part of the Pacific Arctic Ocean, the enhanced mixing of both surface and intermediate waters in response to increased storms, increased ocean absorption of solar radiation and the consequent impacts on the changing weather and climate of the Northern Hemisphere.

- The observing period will also incorporate atmospheric observations to support the WMO's Year of Polar Prediction (YOPP).

- We propose to coordinate this work with the vessels of our respective countries from 2015-2020, which will provide a unique suite of synoptically collected data made available for joint analysis, assessment, and modeling/data assimilation via the mechanisms already set up within the Pacific Arctic Group.

PAG ICARP III Contribution

- PAG works with a pan-Arctic perspective to promote synergies across the Arctic Ocean.

- PAG recognizes the value of the ICARP III as a means to identify and prioritize overarching Arctic science issues, and to improve international coordination of research agendas.

- PAG's ICARP III contribution as data sharing and publications from results of the Distributed Biological Observatory (DBO) and continued development and implementation of the project.

- PAG can provide a valuable dataset for ongoing research and development of cooperative synthesis in the Pacific and Atlantic marine sector.

- European research activity can complement PAG studies with its research in the Atlantic side of the Arctic.

Coordinating Mooring Locations
Phyllis Stabeno (NOAA/PMEL) (ppt17a) will coordinate the PAG mooring location effort. The locations of known Arctic moorings were shown on a map. Phyllis aims to update all the known mooring sites on a map and build a list of the moorings with the contact person and upload them to the PAG website.

Dr. Jørgensen proposed a potential DBO line in the northern Barents Sea shelf/slope where there is a planned extension of annual ecosystem data in coordination with collections already being obtained annually with many partners in Germany and Poland.

The DBO AXIOM workspace and EOL DBO data archive. The team is finalizing a DBO and PAG data metadata policy for all participants in the program in order to allow the Pacific Arctic Group to share datasets and make them available to the public. There are national and international data sharing and metadata issues to consider. AXIOM is developing visualization tools and will transfer data to a long-term archive.

Data Sharing within PAG

- Jackie Grebmeier gave a brief update on data sharing topic (**ppt21**). PAG agreed to follow the IASC data policy that was approved by IASC Council in 2013. Data should be open and used as free data. There was discussion as to whether the group wanted a standard metadata site on the common PAG portal with links to national data portals. Since PAG and DBO are endorsed by IASC, we agree in principle that the data obtained should be shared. See the IASC Statement of Principles and Practices for Arctic Data Management here: http://www.iasc.info/home/iasc/data/.

Pacific Arctic Group (PAG)

Sung-Ho Kang

Division of Polar Ocean Sciences, Korea Polar Research Institute (KOPRI),
Incheon, Republic of Korea

Welcome and Introduction

25 April 2015

Arctic Science Summit Week

Toyama, Japan

http://pag.arcticportal.org/