AICC Chair Report

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AICC Meeting,
November 13, 2014, Seattle, Washington
Expected Meeting Highlights, November 13-14, 2014
Coast Guard Base, Seattle

- Debrief planned for two Healy cruises in 2014
- Mapserver challenges and ice imagery
- Pre-brief for Arctic GeoTRACES cruise 2015
- Habitability improvements to Healy berthing
- Icefloe website improvements
- Local Alaska community relations
- Continuous samplers
- Agency, STARC and Coast Guard reports
  - Early planning new Coast Guard icebreaker
- Long-term committee leadership
Current AICC Membership

* Lee Cooper/U. Maryland- AICC Chair - 9/2008 to 1/2013 to 1/2016
* Bob Campbell/URI-1/2010 to 1/2013 & 1/2013 to 1/2016
* Jeremy Mathis/NOAA-10/2009 to 10/2012, & 10/2012 to 10/2015
* Mike Lomas/Bigelow- 8/2014 to 8/2017
* Chris Polashenski/USACE – CRREL- 8/2014 to 8/2017
* Steve Hartz/UAK- RVTEC Rep- 05/2007 to xxxx
* Doug Russell/UW-RVOC Rep-9/2010 to xxxx
* Bernie Coakley/UAF Sikuliaq Ship Committee
  * (This is tentative---- funding mechanism has to be developed)
Agenda

- **Welcome and Introductions**
- **General business & reports**
- **Agency Reports**
- **Special Reports**
  - 2014 Barrow Support and 2015 Barrow Logistics Karl Newyear and Anna Schemper CH2MILL Polar Services
  - R/V Sikuliaq Update- Steve Hartz/UAF
Agenda (cont’d)

* **Scheduling, and planning for 2014-2015 and beyond**
* **Interactions with others - clearances, permits, native communities**
* **NOAA Marine Mammal Formal Consultation for USCG/ Mike Dombkowski/USCG**
* **1530 AICC Debriefs of 2014 Cruises**
* **1630-1800 - AICC Executive Session**
* **Dinner**
Agenda (tomorrow)

* **STARC Support, Science mods, infrastructure and equipment**
  * **Science operations and technical support**
  * Ongoing services
  * ● ESU report, science data net – Dave Cohoe by telephone
  * ● Icefloe.net – Woody Sutherland
  * ● Ice imagery - Dave Forcucci
* **Open/ Need Agenda Item**
* Schedule our next meeting and adjourn
Three Healy cruises in 2014

* Early season cruise (May-June) Under-ice blooms (NSF)
* Mooring recovery (July) so challenging ice conditions (NSF)
* Coast Guard/Homeland Security/Bureau of Safety and Environmental Enforcement/NOAA Ocean Service
  * Oil spill technology demonstration including UAS use

Recovery of PUMA UAS
Reconfiguration of Main Lab Space on Healy
Early season cruise (May-June)
Same time as bowhead whale migration and hunting
Perception that scientists did not respect community concerns or explain cruise plans well
Phone consultations, AICC chair, Alaska Eskimo Whaling Commission (Price Leavitt, Sr.), chief scientist, local interested community residents
Community representative boarded ship, problems resolved
CHINARE Cruise 2014

- 75 days (July 11~Sept. 24)
- Investigation area: Bering Sea, Chukchi Sea, Canadian Basin, central Arctic Ocean
- Stations: 82+17(flexible)+9(ice stations)
36 investigation stations
46 investigation stations
17 flexible stations
9 ice stations, in which one will last 10 days
* ~8,000 T → 14,000 T

* Basin design to be approved by the government at end of this year?
Update of 2014 field activities & preliminary 2015 plans: Republic of Korea

Sung-Ho Kang
Division of Polar Ocean Sciences
KOPRI

28-29 Oct. 2014
Pacific Marine Environmental Laboratory (PMEL), NOAA
Pacific Arctic Group Fall Meeting
2014 RV ARAON cruise track, study area, period

2014. 7. 16 ～ 10.03 (Total 79 days)
Past Araon Research Stations

- 2010 ARA01B
- 2011 ARA02B
- 2012 ARA03B
- 2013 ARA04B

2010~2013

2014
Aims of the cruise:
- To investigate the structure and processes in the water column & sediments around the northern Bering Sea, Chukchi/East Siberian/Beaufort Seas in rapid transition.
- To understand sea ice dynamics and sea ice ecosystem

Period:
- Leg 1: 2014. 7.31 ~ 8.25 -> Water column and Sea ice (Nome to Barrow)
- Leg 2: 2014. 8.27 ~ 9.19 -> Marine geophysics (Barrow to Nome)

Chief Scientists: 1st leg: Dr. Sung-Ho Kang,
2nd leg: Dr. Young Keun Jin
2014 Arctic Survey (1st Leg)

- CTD: 32 stations
- XCTD: 46 stations
- Sea Ice Camp: 2 sites
- Mooring: 2 sites
- Glider & SWFT array
Beaufort Sea: Geophysics & Gas hydrate study

- To study on geological structures of the permafrost and gas bearing layers
- To understand geohazard by gas hydrates
- Korea/Canada/US Joint Program

Research items:
- Multichannel seismic
- Sub-bottom profiling
- Hydroacoustic monitoring
- Sediment coring
Polar Bear guards arranged through Gay Sheffield UAF (Northwest Campus in Nome)
**Atmospheric Observation**

- Direct measurements of Air-Sea Greenhouse Gas Fluxes (CO₂ and CH₄)

  - Open-path eddy covariance at the foremast of ARAON
  - Real time variation of CH₄ and H₂O in flux mode

**CO₂ system in water column**

- Pursuing spatial and temporal variation of CO₂ system in the Arctic Ocean

  - Analytical system for DIC and TA
  - Dissolved pCO₂ along the track
2014 ARAON ARCTIC CRUISE
ARA05B (31ST JULY - 25TH AUGUST)

Korea Polar Research Institute –
Hanyang University
Pusan National University
Korea Maritime & Ocean University
Pohang Institute of Science and Technology
Hankuk University of Foreign Studies
Inha University

- University of Washington
- Tokyo University of Marine Science and Technology (TUMSAT), Japan
- The Scottish Association for Marine Science (SAMS),
- Ocean University of China (OUC), China
- University of Maine
- Finnish Meteorological Institute
- Laboratoire d'Océanographie de Villefranche, France
- Naval Postgraduate School
- Louisiana State University
- Woods Hole Institute of Oceanography (WHOI)
- Russia (Ice Pilots)
- US Helicopter pilots
- Scientists from Canada, India, UK Nationality

Total 10 Nations, 83 participants
Plan of 2015 Araon Arctic Cruise

Target areas

1. Northern Bering strait → DBO line3

2. Chukchi Borderland → 2 TUMST Moorings → 1 KOPRI Mooring

3. East Siberian Sea & Mendeleev Ridge → 1 KOPRI Mooring → Sea ice dynamics → Sediment coring
2015 Arctic cruise plan (Tentative)

- **Study area**: Bering Sea (DBO line3), Chukchi Borderland, East Siberian Sea & Mendeleev Ridge

- **Period**: 2015. 8.15 ~ 9.10 (ca. 25 days)

- **Chief Scientist**: Sung-Ho Kang

- **Participating nations**: Korea, USA, Japan, China, Canada, Russia, Germany, 

- **Research fields**:
  - Atmospheric observation
  - CO₂ systems in water column
  - Satellite remote sensing
  - Hydrographic survey
  - Microbes & plankton ecology
  - Marine geophysics
  - Sea ice dynamics & ecosystem
  - KOPRI mooring stations (2 sites)
  - Paleoocenography (Sediment coring)
Participation in ice breaker cruise in 2014

**CCGS Louis S. St.- Laurent cruises** (Sept.22~ Oct. 17??);
*Sea ice observation, hydrography & water sampling, and mooring deployments*

**IBRV Araon Arctic cruise** (July ~ Sept.);
*Hydrography and mooring recoveries & deployments*

After “FY2014 plan of GRENE Arctic Climate Change Research Project” by Dr. Shimada
Japanese research vessel cruise in 2014

R/V Hakuho-maru cruise in July-August 2014

June 23: Tokyo
July 15: Honolulu
July 25 ~ 31: Bering and Chukchi Sea observation (CTD/water sampling, biogeochemical analysis)
August 11: Tokyo

Courtesy from Dr. Kondo (NIPR/U. Tokyo)
Sediment trap in the Canada Basin
CAP-12t; 75d 12.371m N, 172d 32.919m W, 447m dep
NAP-12t; 75d 00.171m N, 162d 00.182m W, 1971m dep
NAP-13t; 74d 31.361m N, 161d 55.592m W, 1681m dep
→ Recovered

At the mouth of Barrow Canyon
BCW-14; 71d 47.742m N, 155d 20.750m W, 170m dep.
BCC-14; 71d 43.585m N, 155d 11.108m W, 283m dep.
BCE-14; 71d 40.353m N, 154d 59.742m W, 106m dep.
→ Recovered and Re-deployed

Barrow Canyon close to DBO-5 line
BCH-14; 71d 18.920m N, 157d 08.802m W, 62m dep.
→ Recovered and Re-deployed

Hope Valley in the southern Chukchi Sea (DBO-3)
SCH-14; 68d 02.002m N, 168d 50.028m W, 60m dep.
SCH-14w; 68d 03.006m N, 168d 50.003m W, 60m dep.
→ Recovered and Re-deployed
Participation in ice breaker cruise in 2014

CCGS S. W. Laurier July cruise

- July 11 Dutch Harbor
  - DBO-1,2,3
  - SCH-13 recovery & SCH-14 deployment
  - DBO-4, 5
  - BCH-13 recovery & BCH-14 deployment
- July 23 Barrow

CTD stations during SWL July cruise in 2014

CCGS S. W. Laurier

[ Mooring diagram of SCH-14 & SCH-14]

AZFP
- T, S, DO, Chl-a
- Turbidity

U, V

Acoustic Monitoring System

Acoustic Release

Anchor

Acoustic Release

Anchor
Participation in ice breaker cruise in 2014

CCGS Amundsen cruise (in collaboration with ArcticNet)

- September 9 Barrow
  - DBO-5 CTD/water sampling
  - BC mooring recoveries & deployments
  - Sediment trap mooring recoveries
  - Across-Canada basin CTD/ws
  - Sea ice mission in the Canada Basin
- September 25 Kugluktuk

Courtesy from Dr. Mizobata
(Tokyo University of Marine Science and Technology)
Ocean acidification and freshening
Impact on ecosystem?

Schematics of 2015 R/V Mirai observational studies

- Numerical model
- Satellite
- Ship

Siberian side:
Collaborative observations

Alaskan side:
Intensive observations of eddy & shelf-break jet

Sea ice reduction
Changes in ocean circulation
Impact on ecosystem
Oasis or Desert?

Changes in ocean circulation
Increase or decrease in primary production?

Changes in phytoplankton species and distributions?

CO₂
Enhancement or reduction of biological pump?

Impact on ecosystem?
Japanese research vessel cruise in 2015

R/V Mirai Arctic cruise in September-October 2015
“Observational Studies on the Arctic Ocean Climate and Ecosystem Variability”

PI: Dr. S. Nishino (JAMSTEC)

[ Tentative cruise plan ]

August 25: Hachinohe (JAPAN)
September 4: Bering Str.
October 3: Bering Str.
October 6: Dutch Harbor (in)
October 9: Dutch Harbor (out)
October 21: Hachinohe (JAPAN)

Large warm-core eddy & its impact to marine ecosystem
Kawaguchi et al. [2012]
Nishino et al. [2011b]

Intensive obs. of eddy & shelf-break jet by CTD/LADCP/ water sampling and TurboMAP

Impact from Siberian shelf water & the inter-annual variability
Nishino et al. [2008, 2013]

Revisit obs.

Observations in the Arctic Ocean

Pacific Arctic Group Fall Meeting
October 28-29, 2014
@ PMEL/NOAA, Seattle
CCGS Amundsen
Potential Habitability Improvements for Healy

CCGS Amundsen
September 2014