AICC Chair Report

Lee Cooper

Chesapeake Biological Lab

University of Maryland Center for Environmental Science, Solomons Maryland

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
* Karen Frey/Clark- 10/2009 to 10/2012 & 10/2012 to 10/2015
* Bob Campbell/URI-1/2010 to 1/2013& 1/2013 to 1/2016
* Larry Mayer/UNH-11/2009 to 11/2012 & 11/2012 to 11/2015
* Luc Rainville/UW-11/2009 to 11/2012 & 11/2012 to 11/2015
* 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
* Robin Muench/ ESR- Immediate Past Chair 1/2007-12/2009 & 12/2009-1/2013
* 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 CH2MHILL Polar Services
* *R/V Sikuliaq Update*- Steve Hartz/UAF

Arctic GEOTRACES Program & Cruise – Dave Kadko- by telephone

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

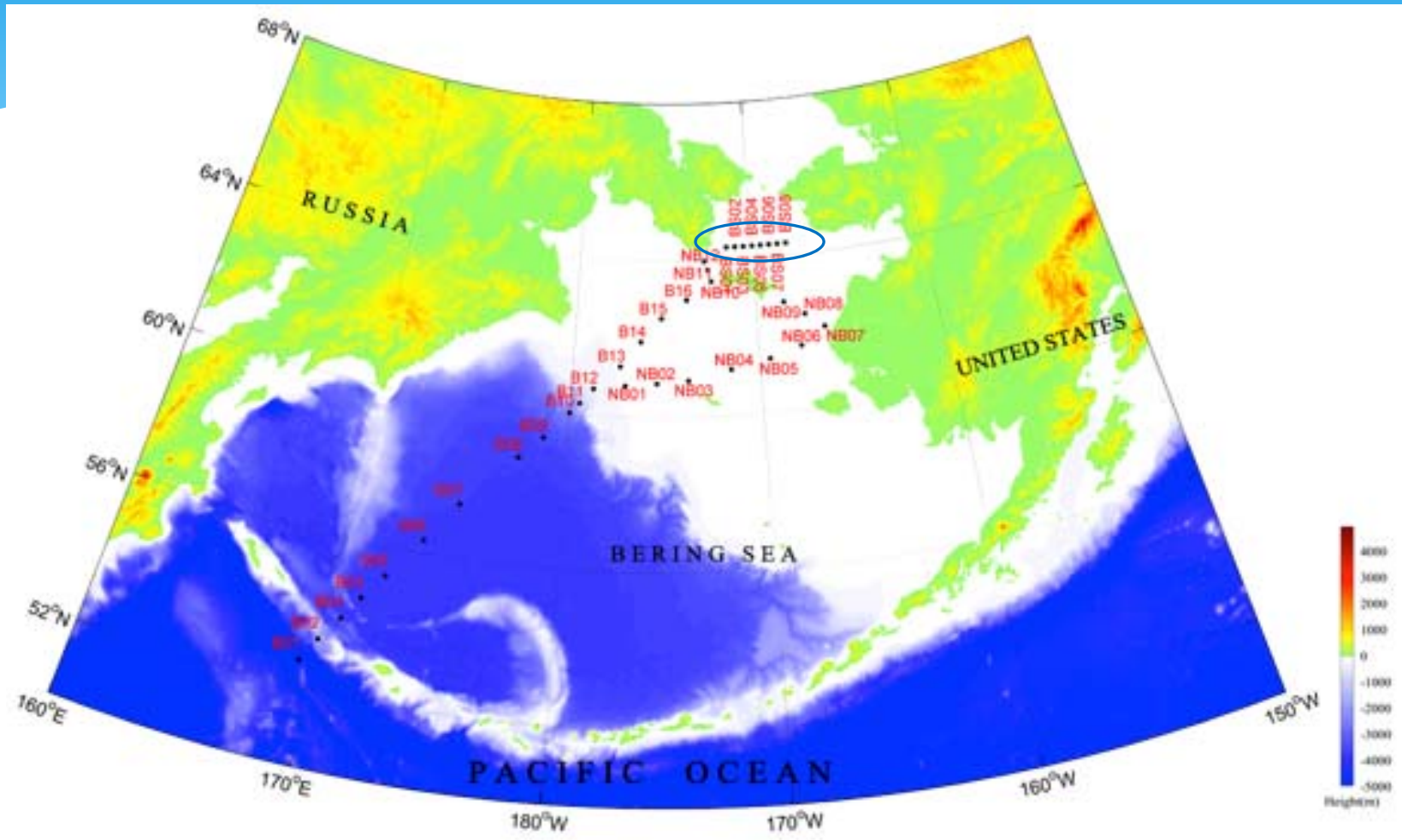
Healy 14-01

* 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

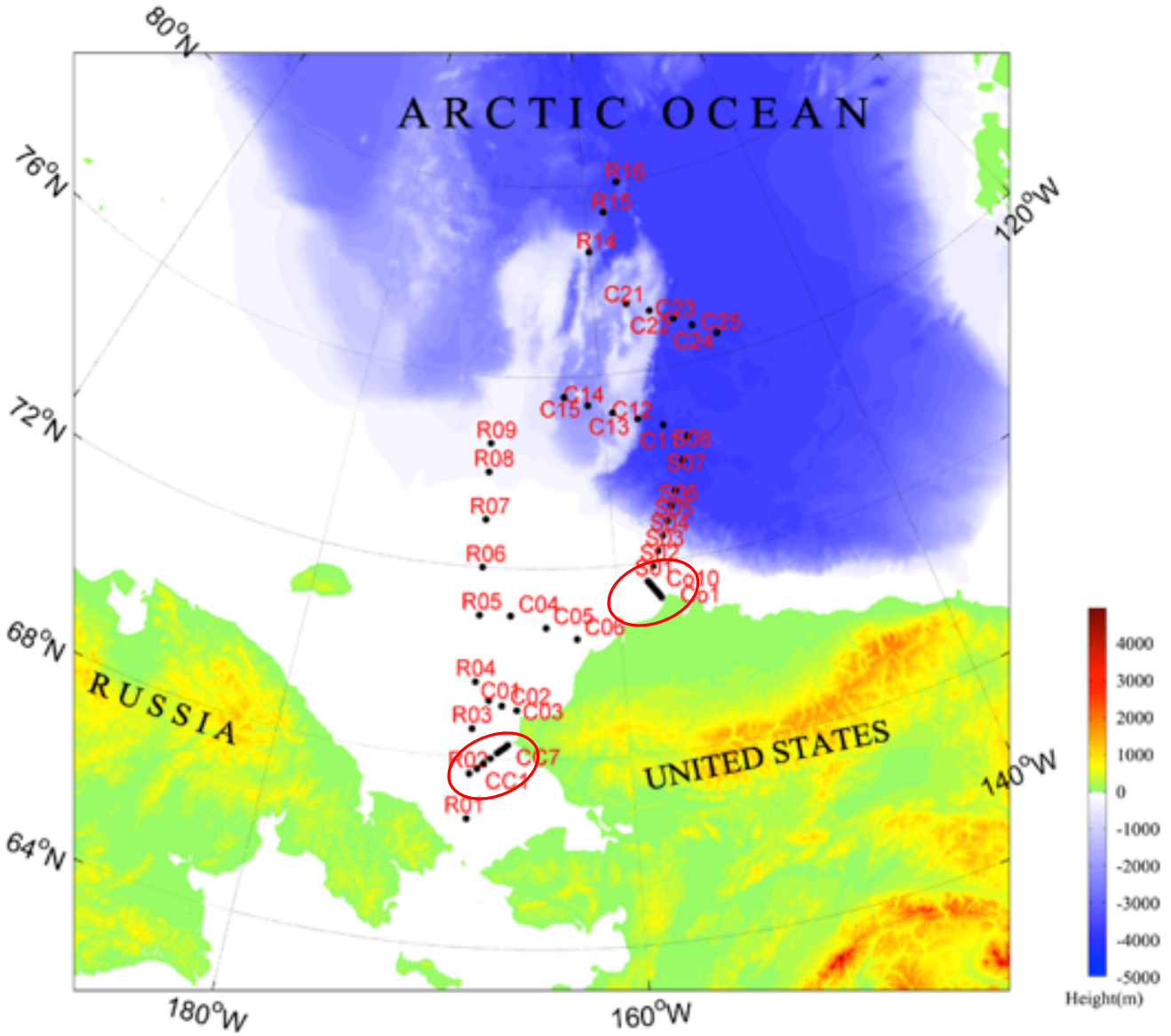

Xue Long
CHINARE

CHINARE Cruise 2014

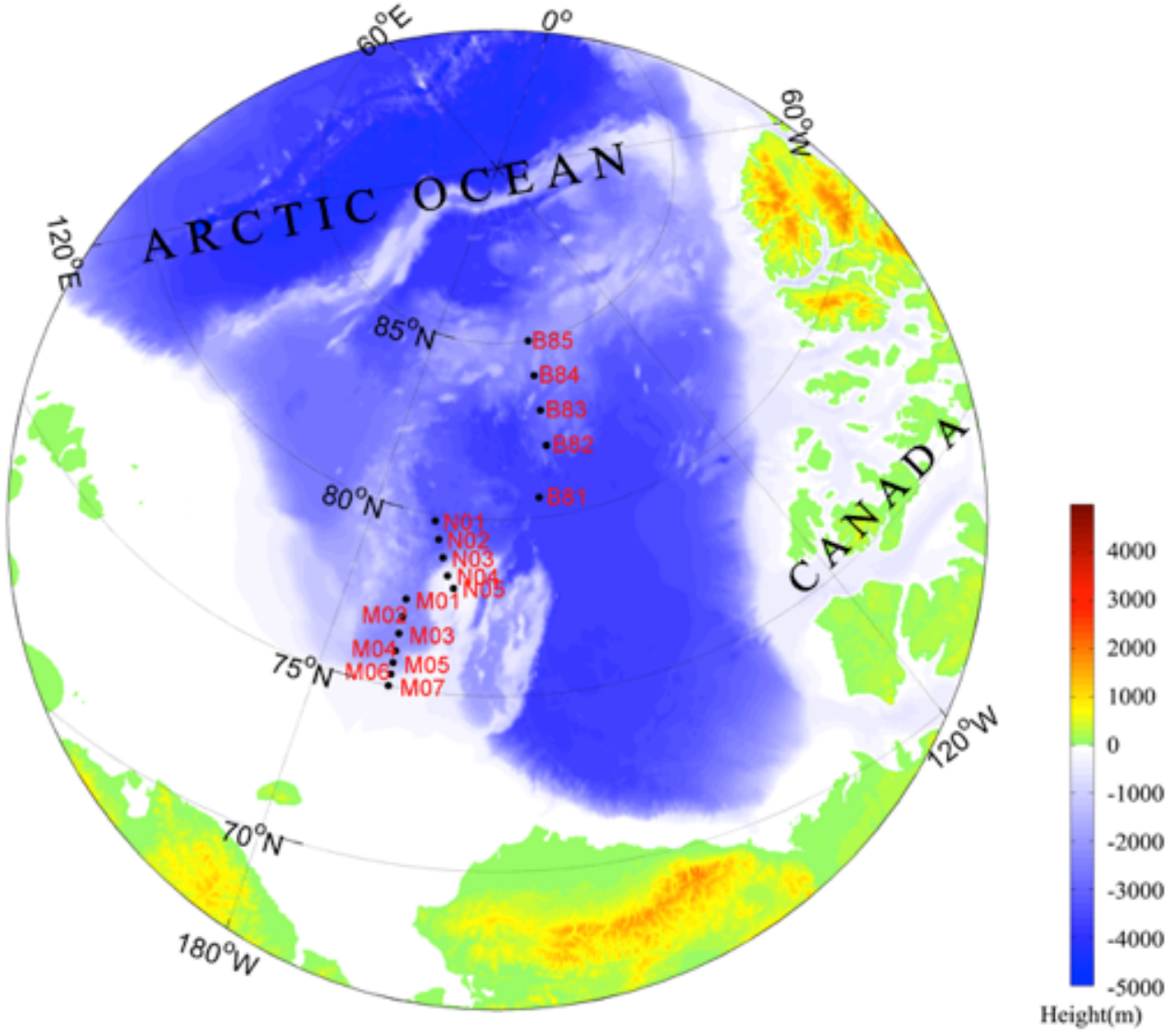
- 75 days (July 11~Sept.24)
- Investigation area: Bering Sea, Chukchi Sea, Canadian Basin, central Arctic Ocean
- Stations: 82+17(flexible)+9(ice stations)



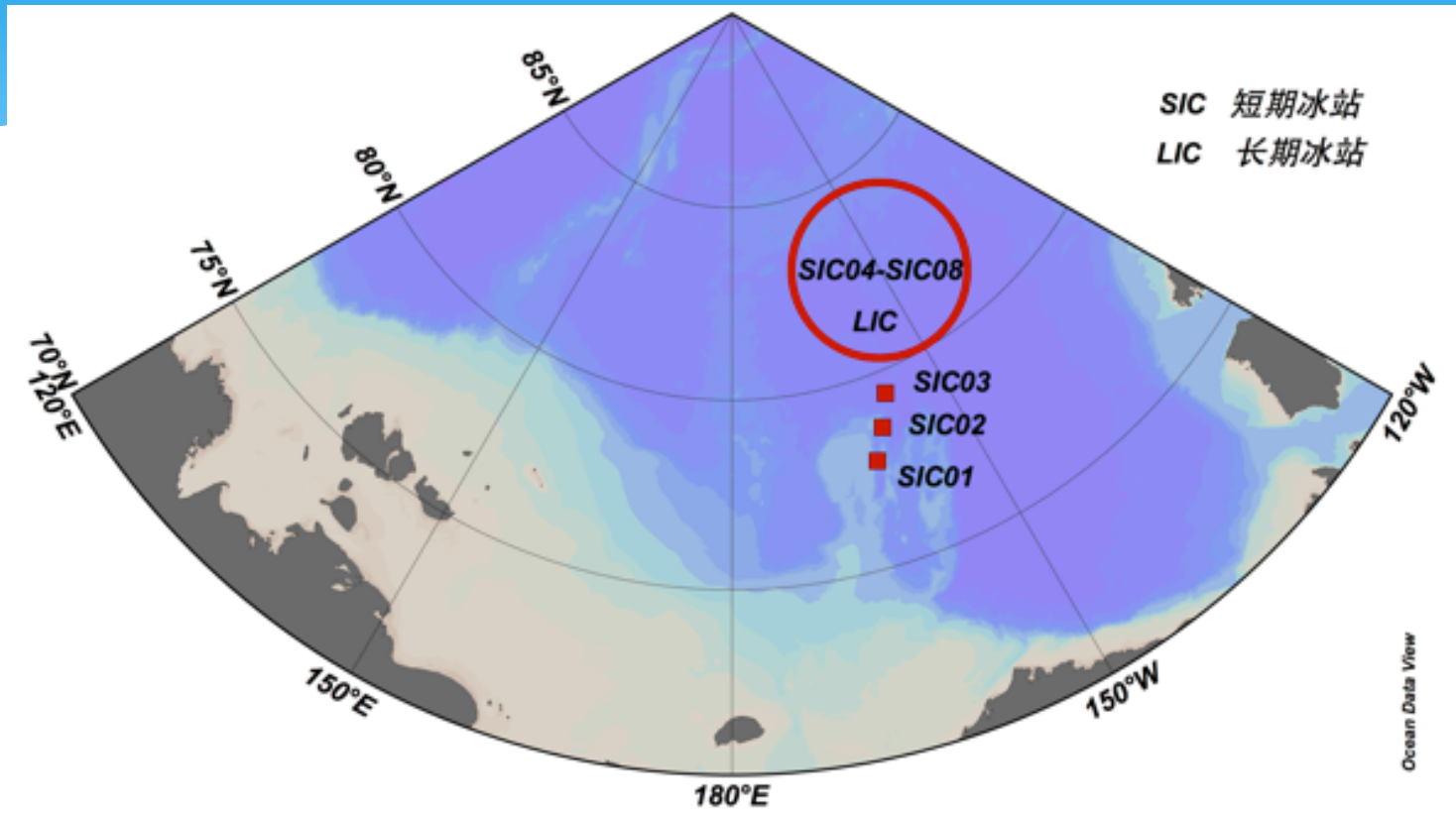
36 investigation stations



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?

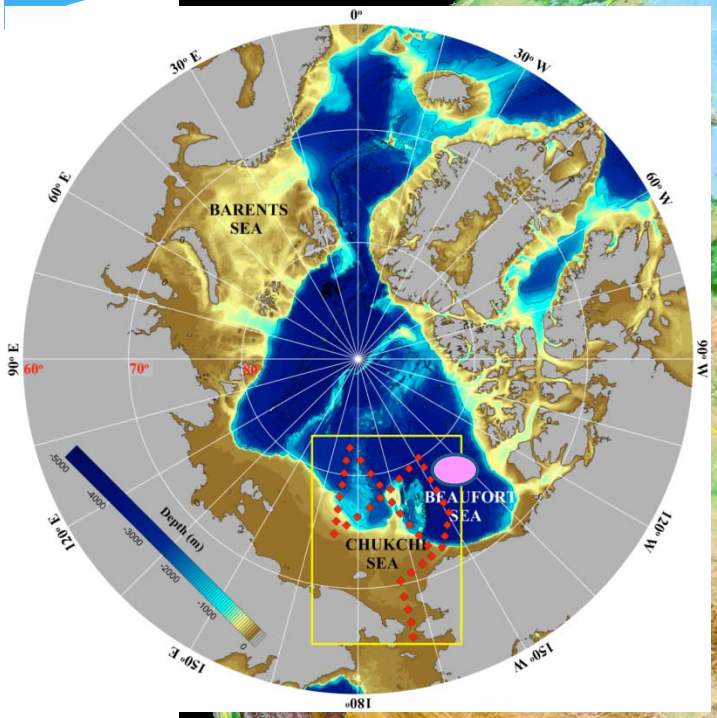
Update of 2014 field activities & preliminary 2015 plans : Republic of Korea

Sung-Ho Kang
Division of Polar Ocean Sciences
KOPRI

28-29 Oct. 2014
Pacific Marine Environmental Laboratory (PMEL), NOAA
Pacific Arctic Group Fall Meeting

Korea Polar Research Institute

2014 RV ARAON cruise track, study area, period



Chukchi, E. Siberian Seas

Beaufort Sea

Barrow

Bering Sea

Nome

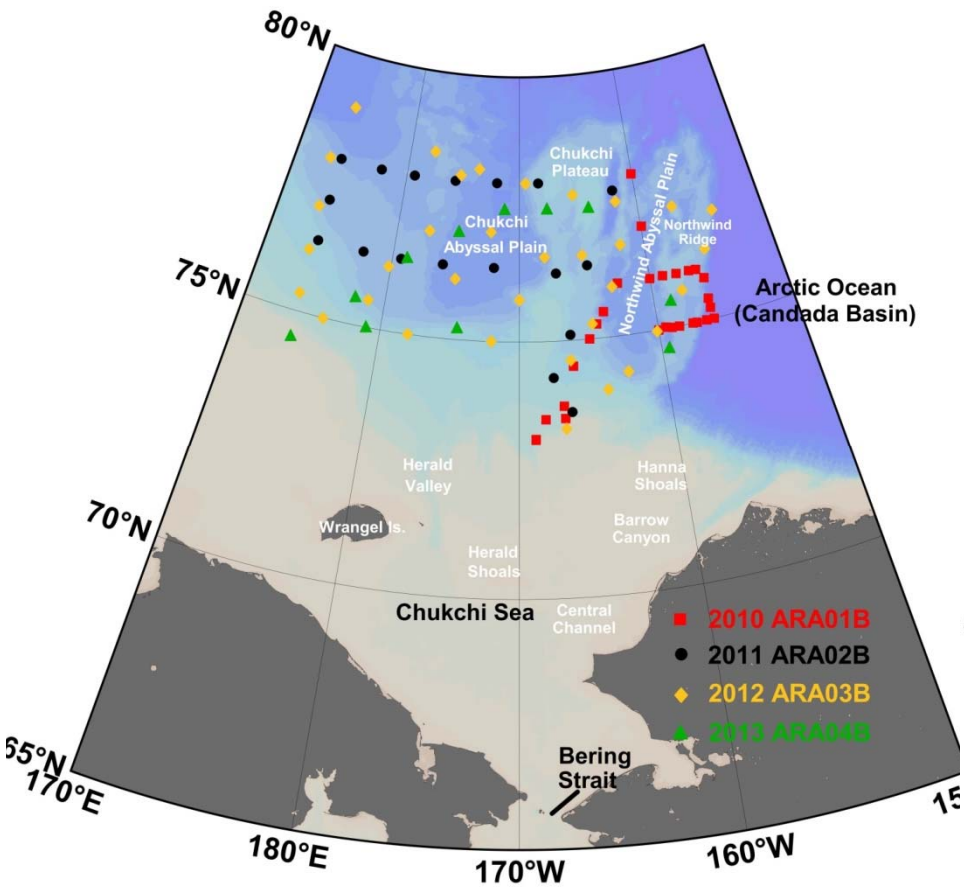
Incheon

N65°

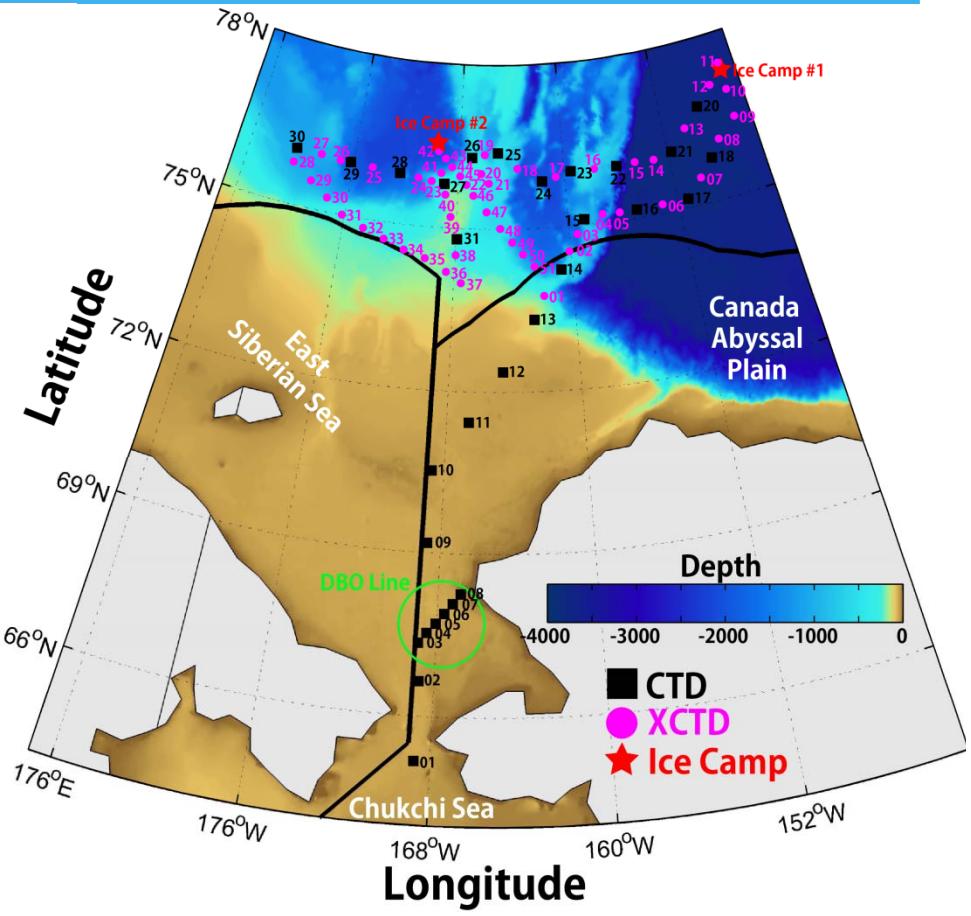
E170°

2014. 7. 16 ~ 10.03 (Total 79 days)

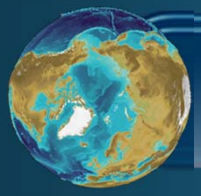
Past Araon Research Stations



2010~2013



2014



2014 KOPRI Arctic Cruise

- **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)

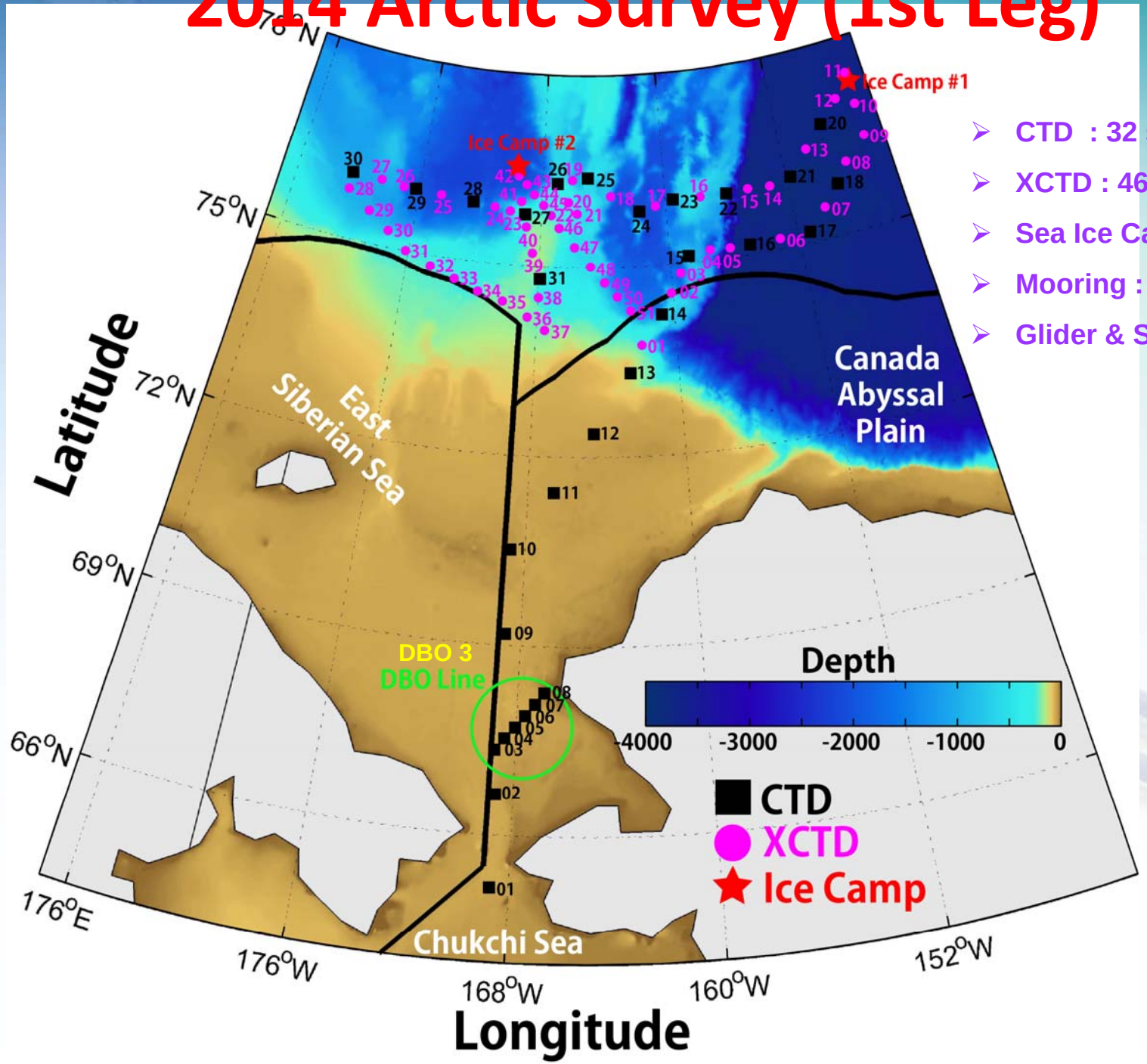
  - Leg 2: 2014. 8.27 ~ 9.19 -> Marine geophysics

  (Barrow to Nome)

- **Chief Scientists:** 1st leg: Dr. Sung-Ho Kang,

  2nd leg: Dr. Young Keun Jin

2014 Arctic Survey (1st Leg)

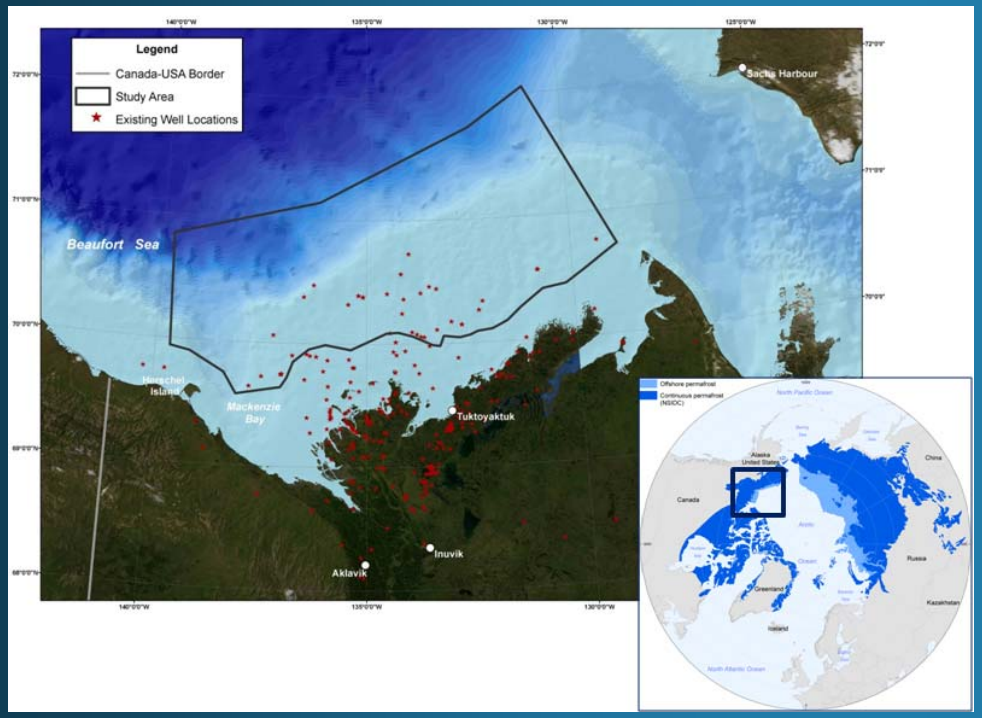


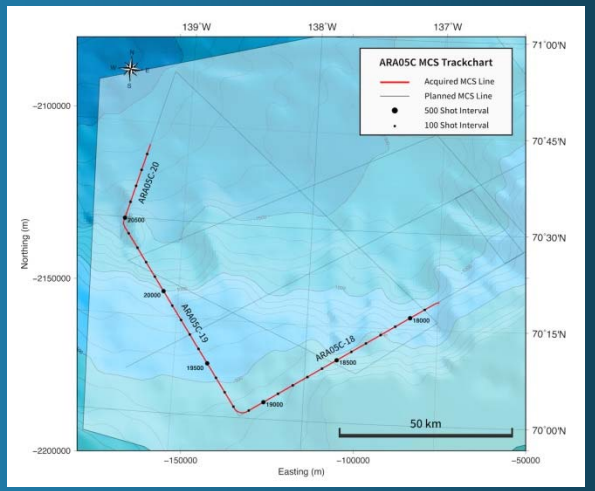
- CTD : 32 stations
- XCTD : 46 stations
- Sea Ice Camp : 2 sites
- Mooring : 2 sites
- Glider & SWFT array

Leg 2

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





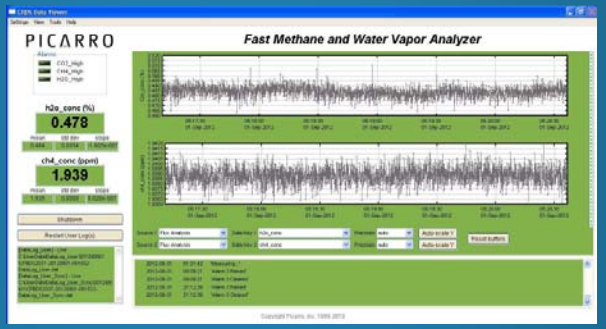
- Research items;
  - Multichannel seismic
  - Sub-bottom profiling
  - Hydroacoustic monitoring
  - Sediment coring

Polar Bear guards arranged through Gay Sheffield UAF (Northwest Campus in Nome)

Atmospheric Observation

- **Direct measurements of Air-Sea Greenhouse Gas Fluxes (CO_2 and CH_4)**

Open-path eddy covariance at the foremast of ARAON

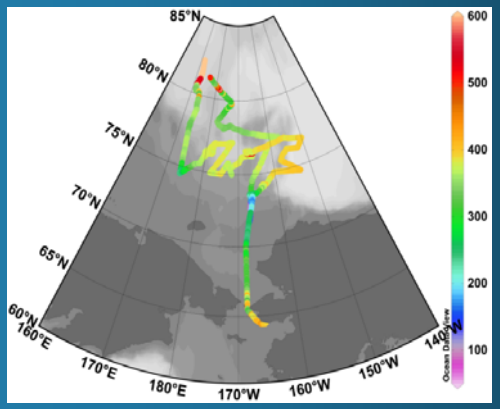


Real time variation of CH_4 and H_2O in flux mode

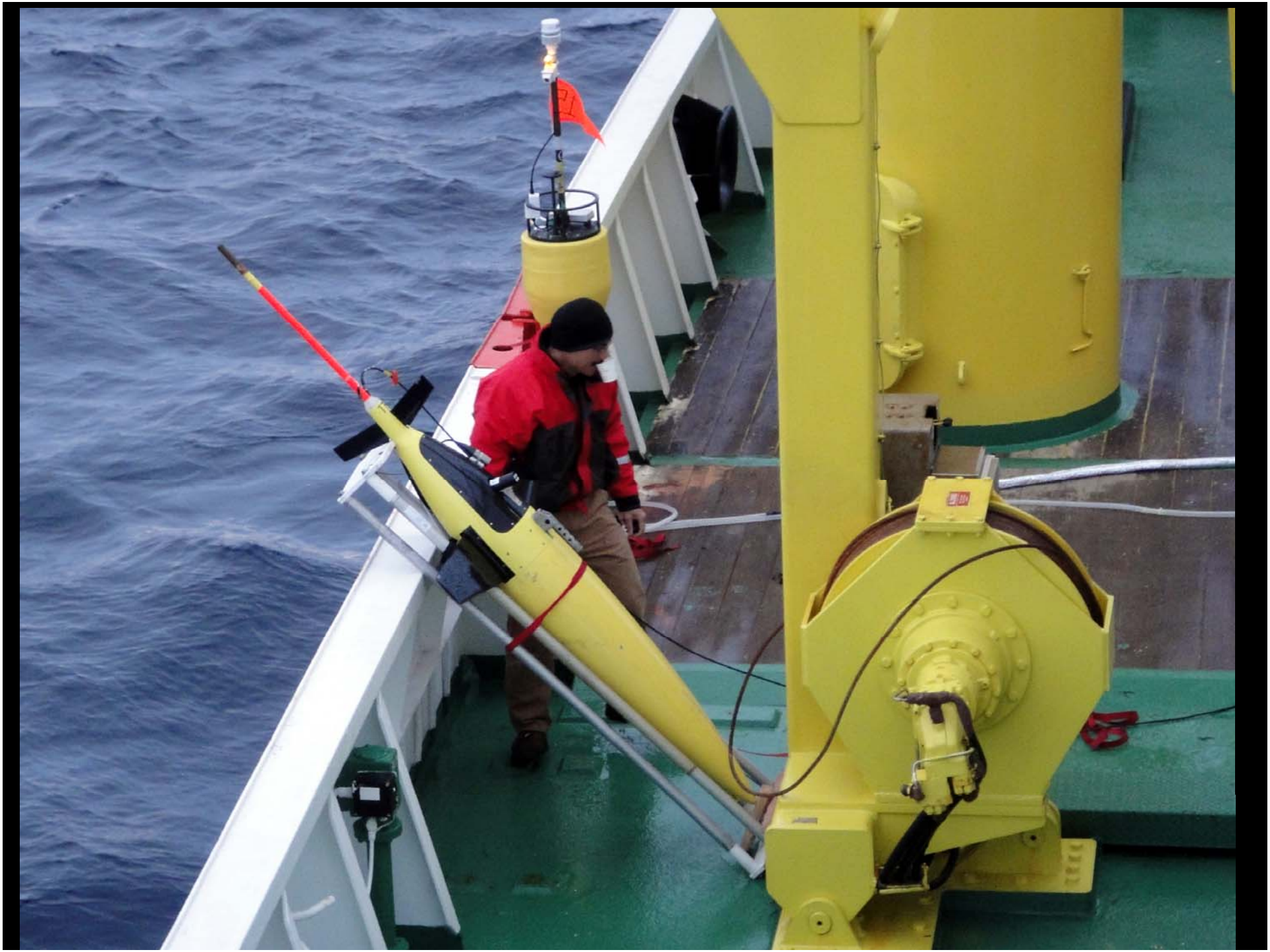
CO_2 system in water column

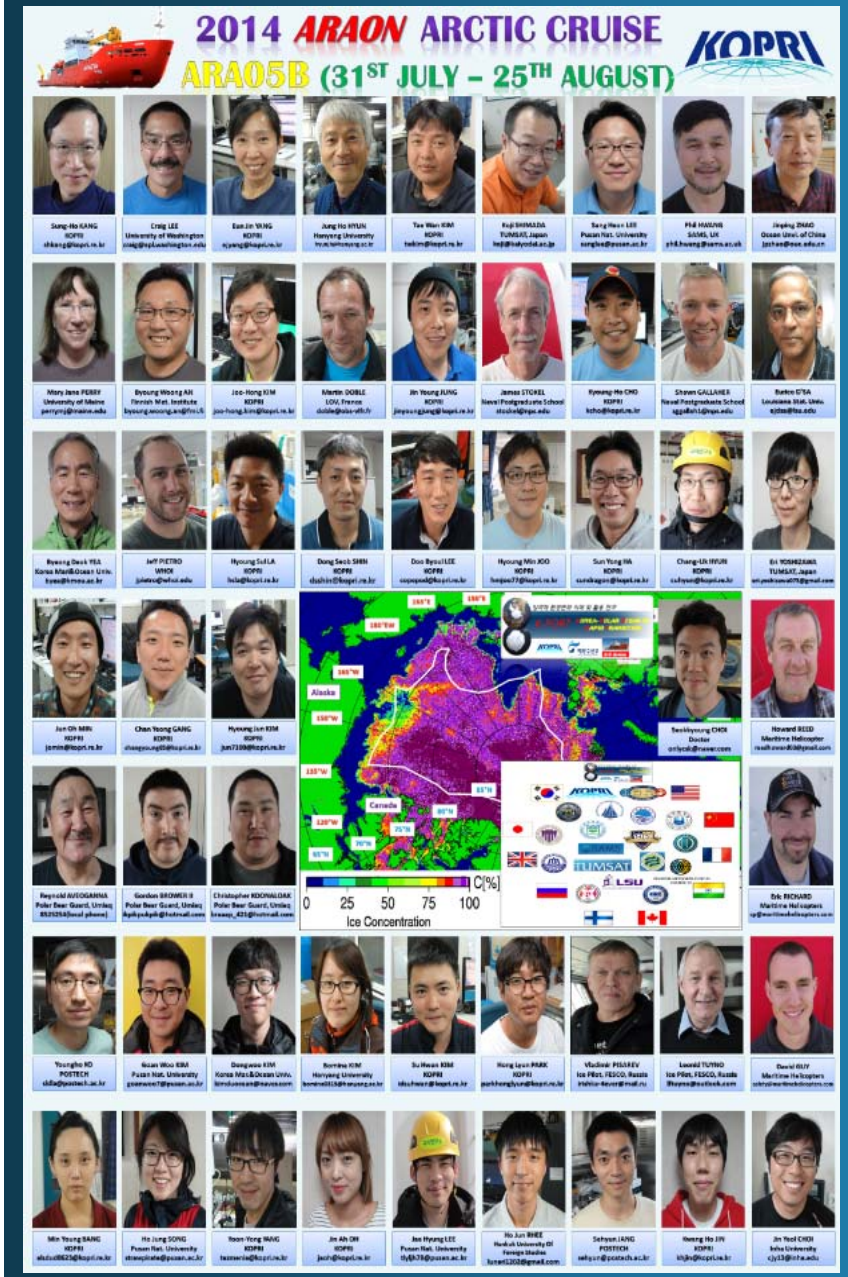
- **Pursuing spatial and temporal variation of CO_2 system in the Arctic Ocean**

Analytical system for DIC and TA



Dissolved pCO_2 along the track





- 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 particiapants

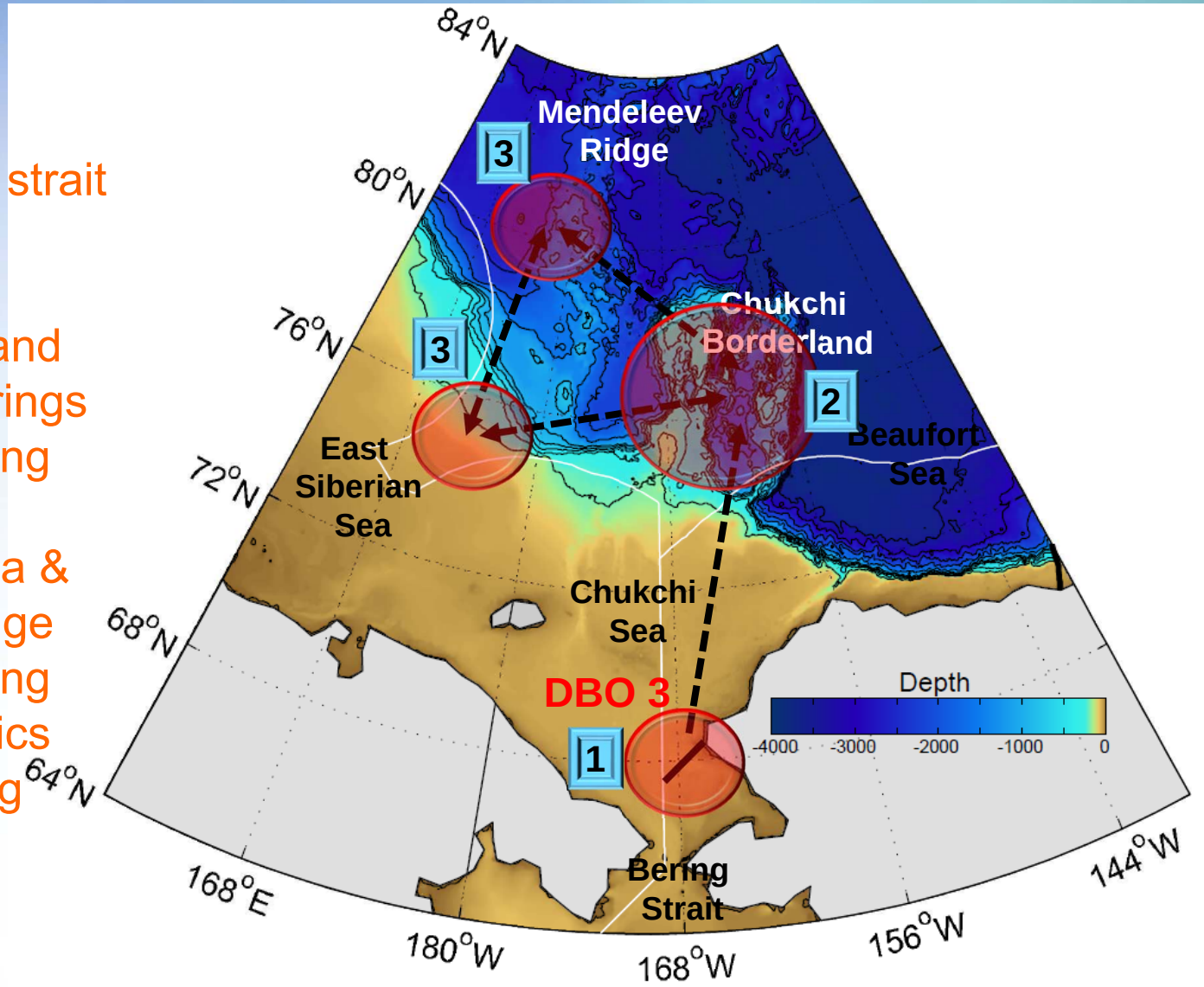
Plan of 2015 Araon Arctic Cruise

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
- Satellite remote sensing
- Microbes & plankton ecology
- Sea ice dynamics & ecosystem
- Paleoocenography (Sediment coring)
- CO_2 systems in water column
- Hydrographic survey
- Marine geophysics
- KOPRI mooring stations (2 sites)

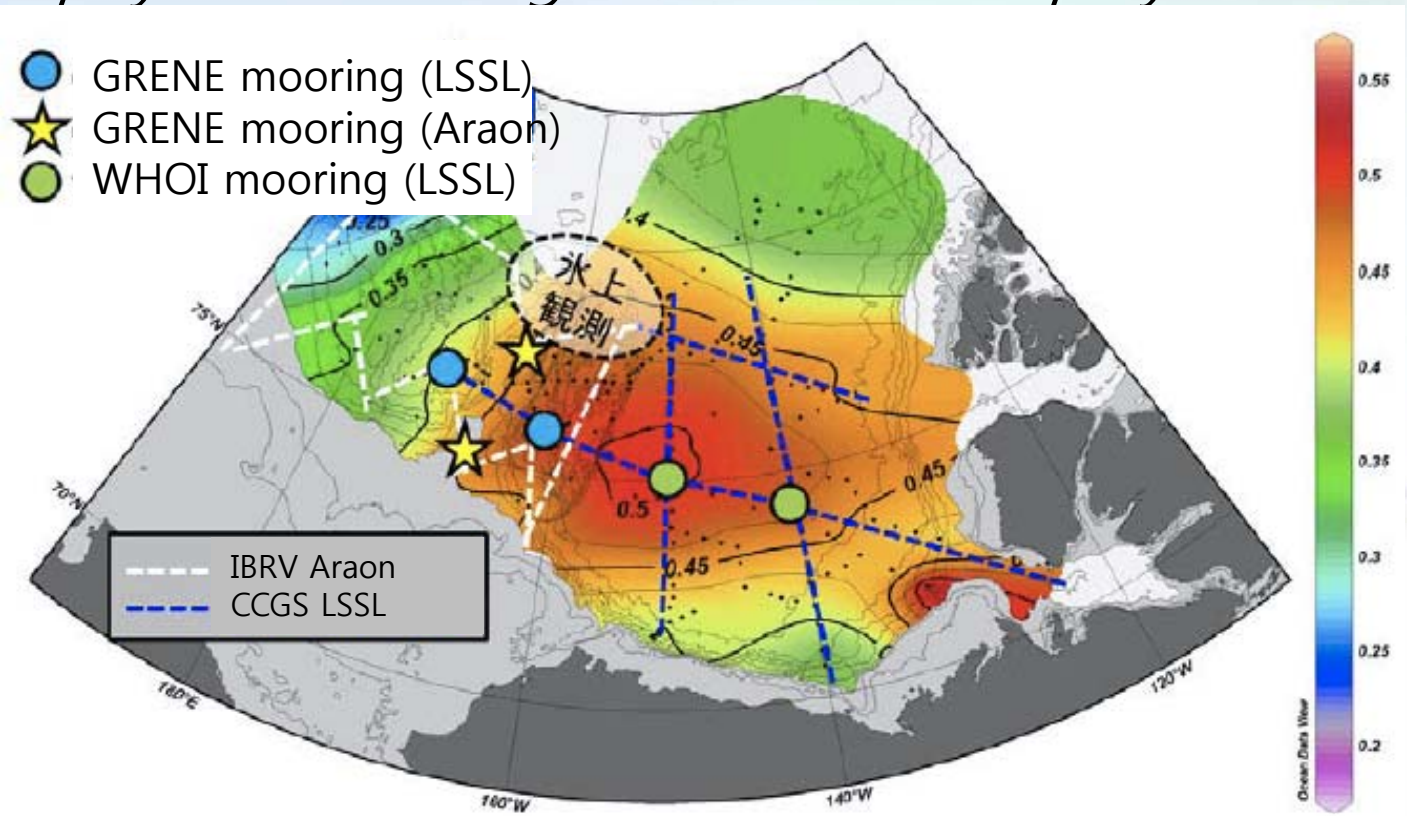
Participation in ice breaker cruise in 2014

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


CCGS Louis St. S-Laura
(From CCG web site)


RV ARAON
(From KOPRI web site)



After "FY2014 plan of GRENE Arctic Climate Change Research Project" by Dr. Shimada

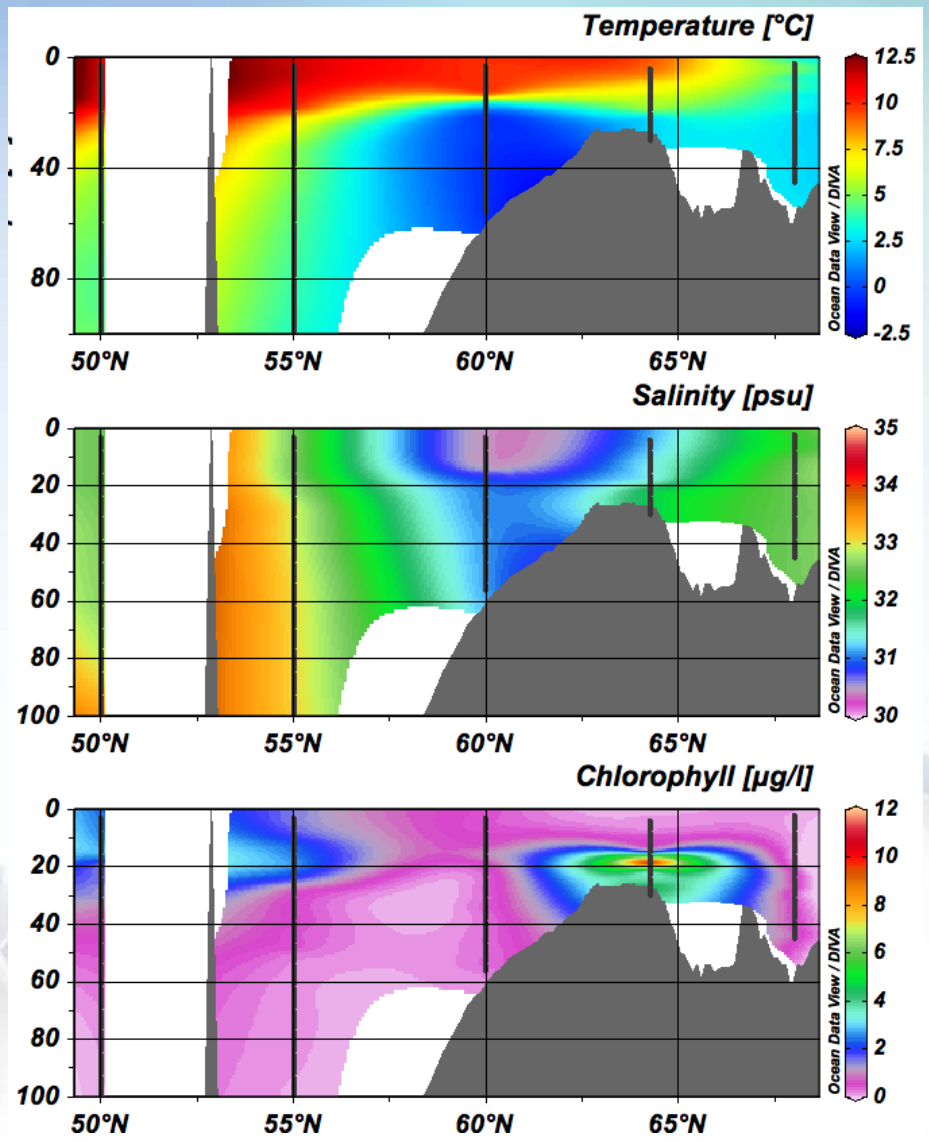
Japanese research vessel cruise in 2014

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, bio-geochemical analysis)

August 11: Tokyo



Courtesy from Dr. Kondo (NIPR/U. Tokyo)

JAMSTEC moorings in the Chukchi Sea and Canada Basin

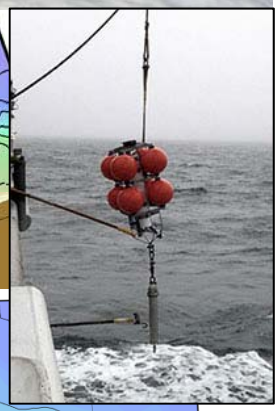
Sediment trap in the Canada Basin
CAP-12t; 75d 12.371m N, 172d 32.919m W, 447m dep
NAP-12t; 75d 00.171m N, 162d 00.182m W, 1971m dep
NAP-13t; 74d 31.361m N, 161d 55.592m W, 1681m dep
→ Recovered

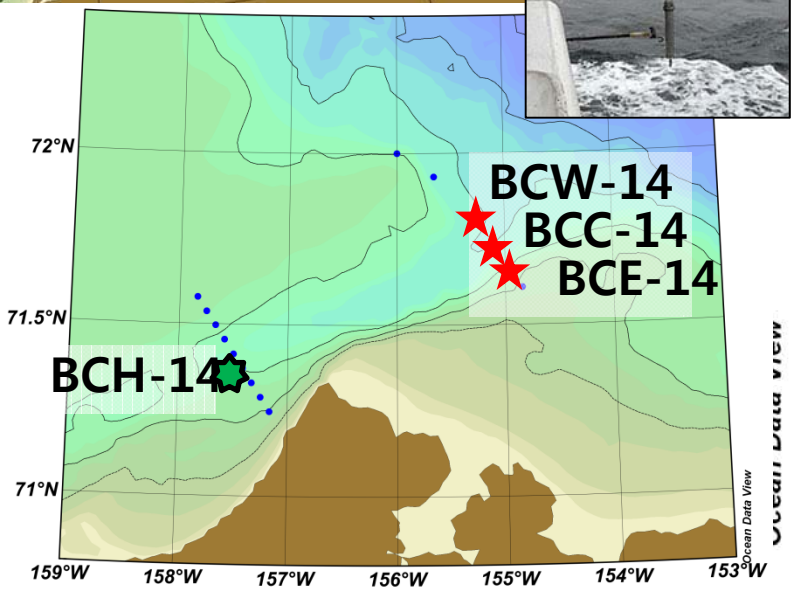
At the mouth of Barrow Canyon
BCW-14; 71d 47.742m N, 155d 20.750m W, 170m dep.
BCC-14; 71d 43,585m N, 155d 11.108m W, 283m dep.
BCE-14; 71d 40.353m N, 154d 59.742m W, 106m dep.
→ Recovered and Re-deployed

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

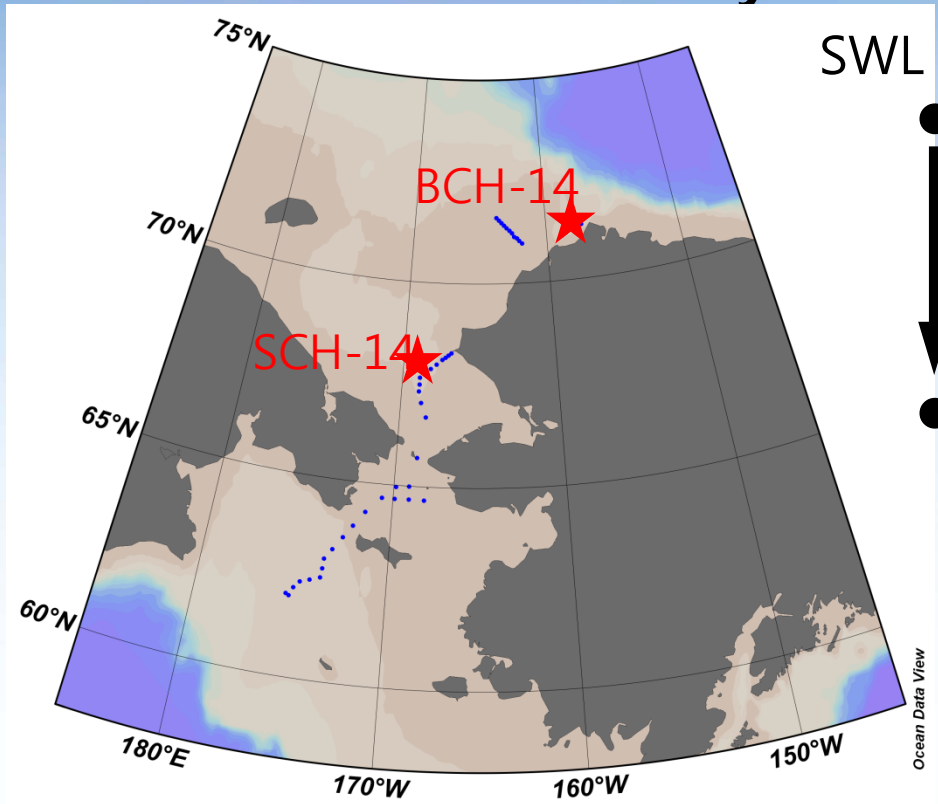
CCGS S. W. Laurier





Participation in ice breaker cruise in 2014

CCGS S. W. Laurier July cruise

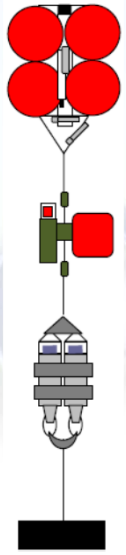


CTD stations during SWL July cruise in 2014

SWL July cruise in 2014

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

[Mooring diagram of SCH-14 & SCH-14

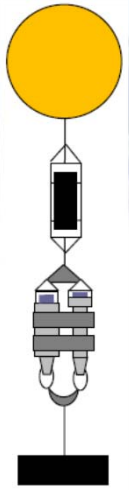


AZFP
T, S, DO, Chl-a
Turbidity

U, V

Acoustic
Release

Anchor



Acoustic
Monitoring
System

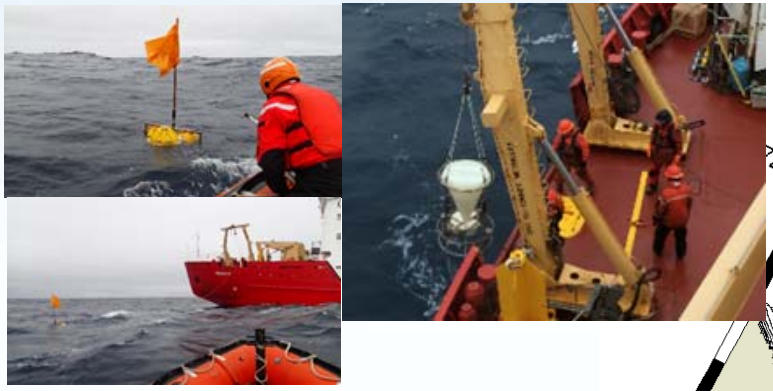
Acoustic
Release

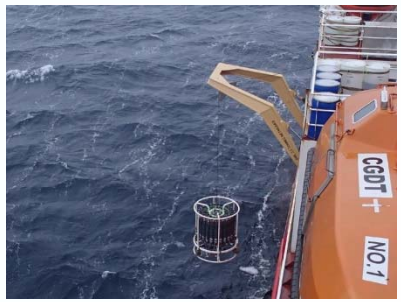
Anchor

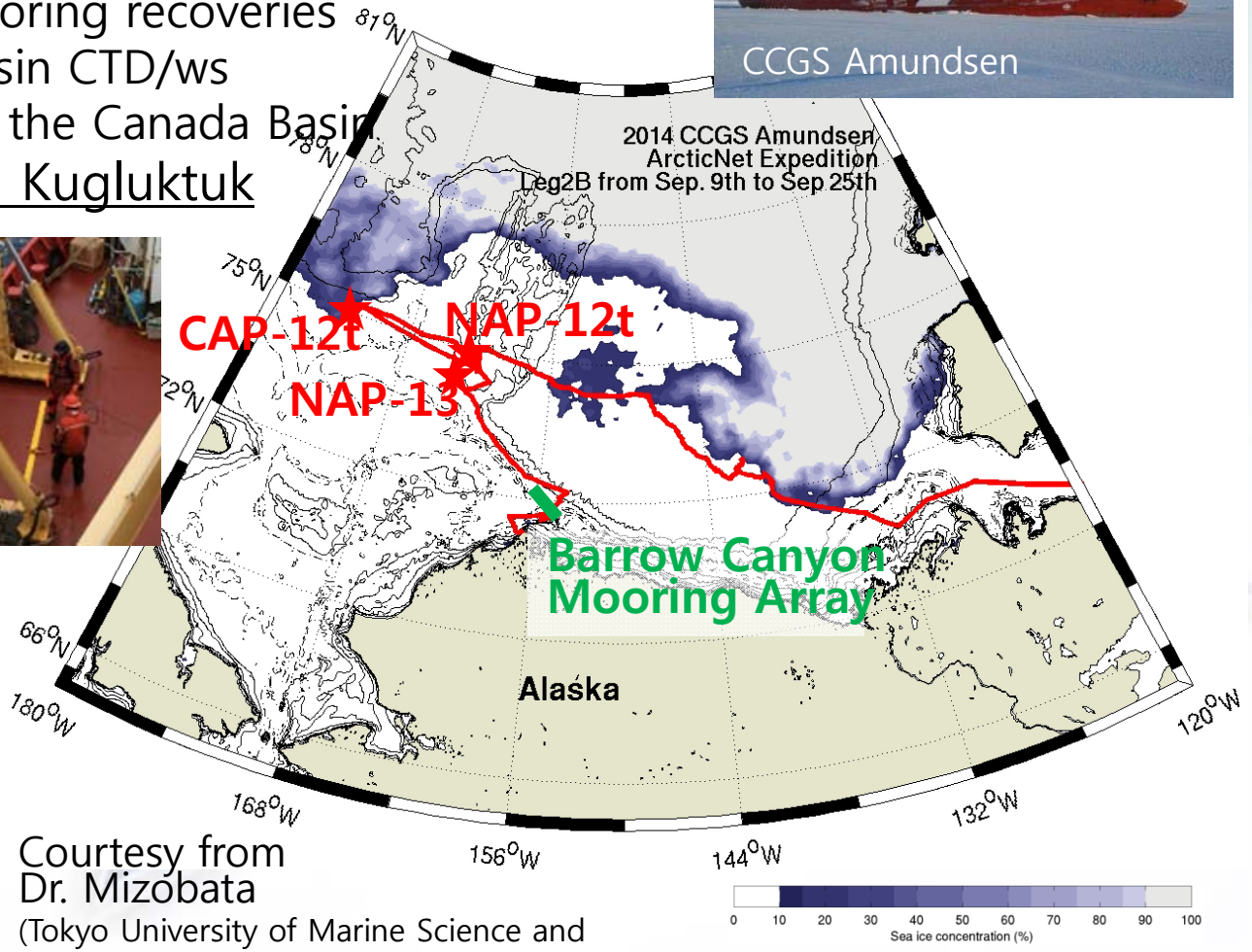
Participation in ice breaker cruise in 2014

CCGS Amundsen cruise (in collaboration with ArcticNet)

- September 9Barrow
  - ✓ 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

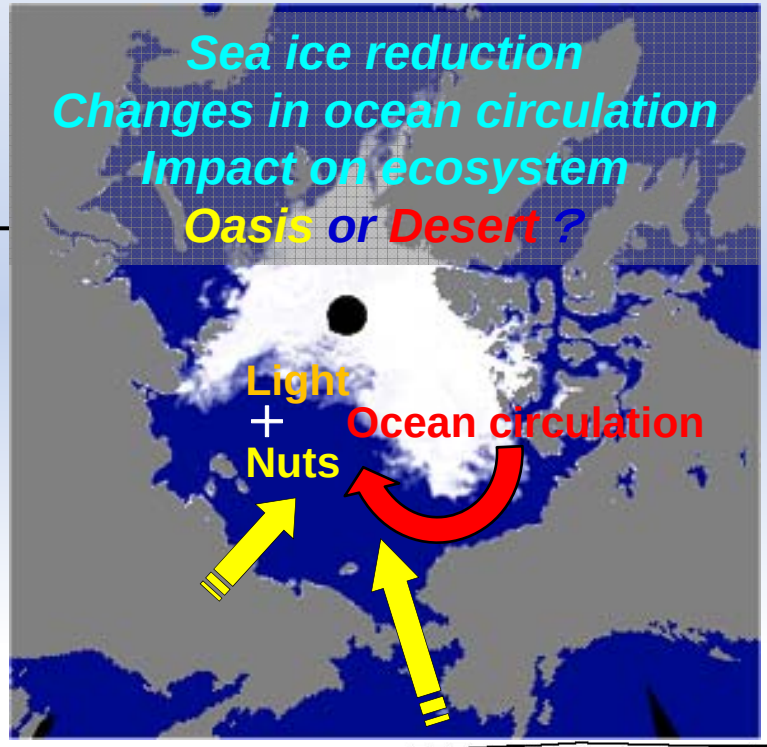






Courtesy from
Dr. Mizobata
(Tokyo University of Marine Science and Technology)

Schematics of 2015 R/V Mirai observational studies



Numerical model

Satellite

Ship

CO_2

Siberian side:
Collaborative observations

Increase or decrease in primary production?

Changes in phytoplankton species and distributions?

Sea ice reduction

Ocean acidification and freshening

Impact on ecosystem?

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

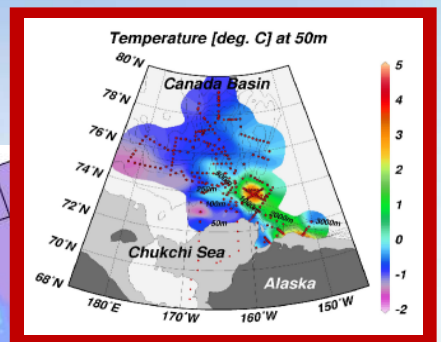
Enhancement or reduction of biological pump?

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"

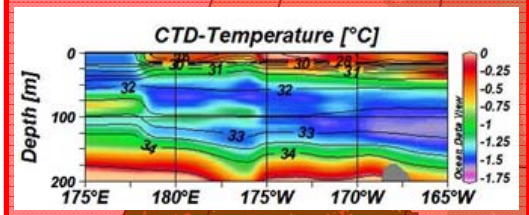
PI: Dr. S. Nishino (JAMSTEC)



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

Revisit obs.

Siberian shelf-basin interaction



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

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

Courtesy from Dr. Nishino (JAMSTEC)

[Tentative cruise plan]

August 25: Hachinohe (JAPAN)

September 4: Bering Str.

Observations in the Arctic Ocean

October 3: Bering Str.

October 6: Dutch Harbor (in)

October 9: Dutch Harbor (out)

October 21: Hachinohe (JAPAN)

CCGS Amundsen

Potential Habitability Improvements for Healy

CCGS Amundsen
September 2014