

Pacific Arctic Group: USA Country Report

Jacqueline M. Grebmeier

University of Maryland Center for Environmental Science, Chesapeake
Biological Laboratory, Solomons, Maryland, USA



PACIFIC ARCTIC GROUP 2016 MEETING

**MARCH 13, 2016
ARCTIC SCIENCE SUMMIT WEEK 2016
FAIRBANKS, ALASKA, USA**



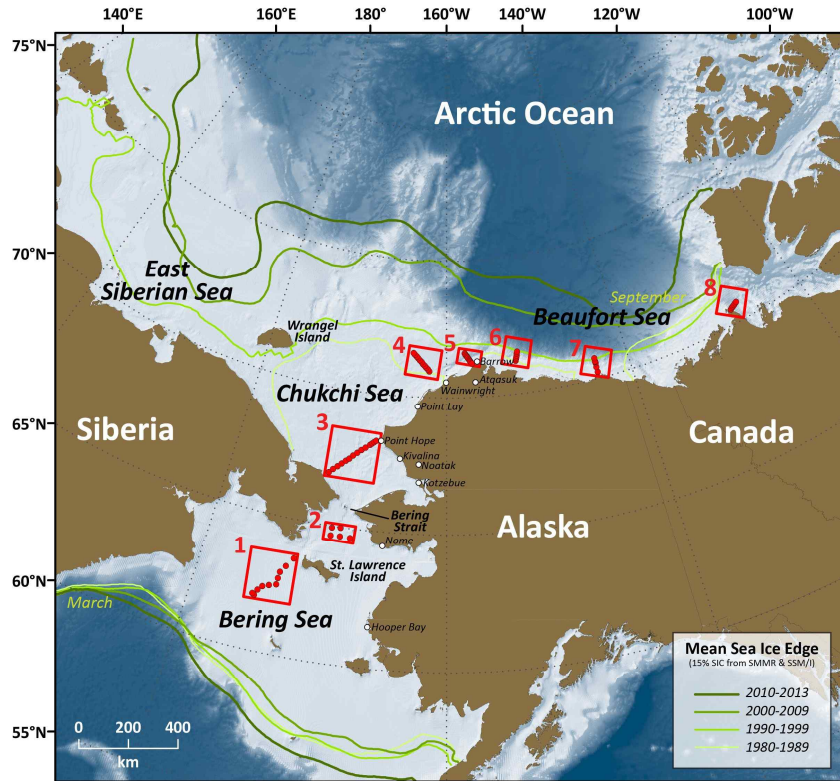
<http://pag.arcticportal.org>

2016 PAG and DBO Field Plan-Updated 3/31/16

F2016 PAG and DBO Field Season (3_31_16): Sampling Contributors. Projects Key: AON=US Arctic Observing Network (National Science Foundation); ArCS=Arctic Challenge for Sustainability; C30=Canada's Three Oceans; CHINARE=Chinese Arctic Research Expedition; DBO=Distributed Biological Observatory, JAMSTEC= Japan Agency for Marine-Earth Science and Technology; KOPRI = Korea Polar Research Institute; NOAA=National Oceanic and Atmospheric Administration; Office of Naval Research (ONR) Marginal Ice Zone (MIZ) project; PMEL=Pacific Marine Environmental Laboratory; RUSALCA=Russian-American Long-term Census of the Arctic. **DBO Region Key:** DBO1=So. St. Lawrence Is., DBO2=Chirikov Basin, DBO3=So Chukchi Sea, DBO4=NE Chukchi Sea, DBO5=Barrow Canyon, DBO6=East Beaufort Sea, DBO7=Beaufort Sea Central, DBO8=Bathurst polynya region.

Dates (Port calls)	Ship	DBO Region	Projects	PAG contact	Chief Scientist
July 7-15 (Nome-Nome)	Norseman II	3	Bering Strait Mooring Project/AON	Rebecca Woodgate woodgate@apl.washington.edu	Rebecca Woodgate woodgate@apl.washington.edu
July 1-22 (Victoria, BC-Barrow)	Sir Wilfrid Laurier	1,2,3,4,5	C30/DBO (AON)	Jackie Grebmeier jgrebmei@umces.edu	Svein Vagle Svein.Vagle@dfo-mpo.gc.ca
July (2-Aug 10 (Seward- Seward)	Healy	- (Arctic Basin)	NOAA Ocean Exploration	Russell Hopcroft rrhopcroft@alaska.edu	Russell Hopcroft rrhopcroft@alaska.edu
Aug-Sept	Araon	3+Chukchi Borderland	Korean Expedition (KOPRI)	Sung-Ho Kang shkang@kopri.re.kr	Eun-Jin Yang ejyang@kopri.re.kr
Aug 15-Sept 16	Healy	-	Navy		Navy/Worester
Aug 9-Sept 2	Xuelong	3, 5+Arctic Basin	CHINARE	Jianfeng He hejianfeng@pric.org.cn	Jianfeng He hejianfeng@pric.org.cn
Aug 15-Sept 25	Mirai	3,5+Arctic Basin	Japanese ArCS	Takashi Kikuchi takashik@jamstec.go.jp	Shigeto Nishino nishinos@jamstec.go.jp
Aug-Sept	TBD	3,4,5	NOAA/PMEL	Phyllis.Stabeno@noaa.gov	Phyllis.Stabeno@noaa.gov
Aug-Oct	TBD	1,2	NOAA/AFSC/ EMA/FOCI	jeanette.gann@noaa.gov	ed.farley@noaa.gov
Sept 10-30	Viktor Buynitsky	3,4	RUSALCA	Jackie Grebmeier jgrebmei@umces.edu	Robert Pickart rpickart@whoi.edu
Sept 18-28	Healy	-	UNCLOS	?	Larry Mayer larry@ccom.unh.edu
Sept-Oct	Sir Wilfrid Laurier	4	C30	Bill.Williams@dfo-mpo.gc.ca	Humfrey.Melling@dfo-mpo.gc.ca
Oct-Nov	Sikuliaq	-	Arctic N Fixation Arctic Productivity/	TBD	Rachel Sipler/NSF Juraneck, L/NSF
Oct-Nov	Sikuliaq	Arctic Basin	ONR Acoustics	M. Badley/Arctic Shelf-Basin/Sonar Performance	Navy/ONR

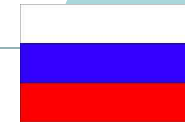
Linking Physics to Biology: the Distributed Biological Observatory (DBO)



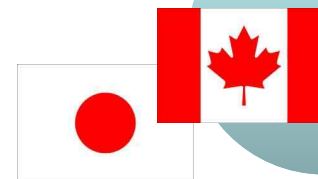
- DBO sites serve as a change detection array for consistent monitoring of biophysical responses



- Pacific Arctic Group
- IASC Marine Working Group
- Arctic Icebreaker Coordinating Committee



- Viktor Buynitsky & Professor Khromov
- RUSALCA
- NOAA-RAS Agreement



- Sir Wilfrid Laurier
- Collaborative Agreement UMCES & DFO



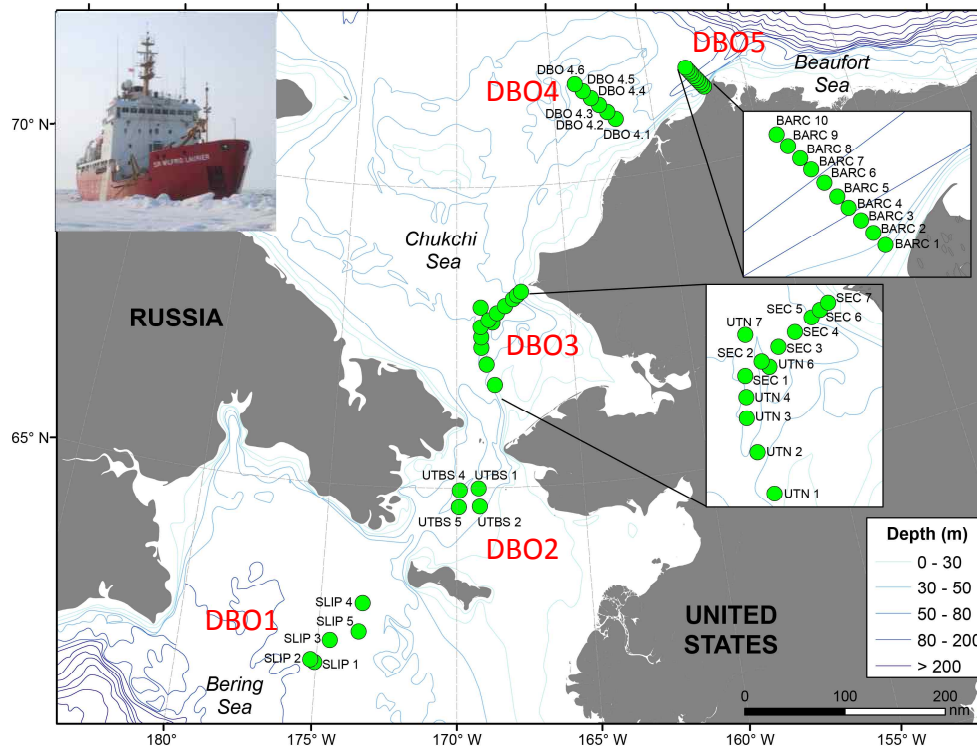
Abbreviations: IASC, International Arctic Science Committee; RUSALCA, Russian-American Long-term Census of the Arctic; RAS, Russian Academy of Sciences; UMCES, University of Maryland Center for Environmental Science; DFO, Fisheries and Oceans Canada





Canada's Three Oceans (C30) and the Distributed Biological Observatory (DBO): *CCGS Sir Wilfrid Laurier*, July 10-22, 2016

Focus: sampling along latitudinal transect lines developed as a “change detection array” for consistent monitoring of biophysical responses to changing environmental conditions



Estimated Timeline:

- July 14-south St. Lawrence Island (**DBO1**)
- July 15-Chirikov Basin (**DBO2**)
- July 17: SE Chukchi Sea (**DBO3**)-closest station 5 nm from coast, estimate time within 12 nm to be 2 hrs
- July 19: NE Chukchi Sea off Wainwright (**DBO4**)-closest station 30 nm offshore
- July 20: off Barrow (**DBO5**)-closest station 5 nm from coast, estimate time within 12 nm to be 2 hrs

DBO data collections

- Seawater temperature and salinity; velocity measurements
- Nutrients, chlorophyll, carbon products, CDOM
- Phytoplankton, zooplankton and macrobenthic abundance, biomass, community structure
- Marine mammal and seabird surveys

Contact: Dr. Svein Vagle,
Canadian Chief Scientist, Jackie
Grebmeier,
UMCES and PAG,
jgrebmei@umces.edu



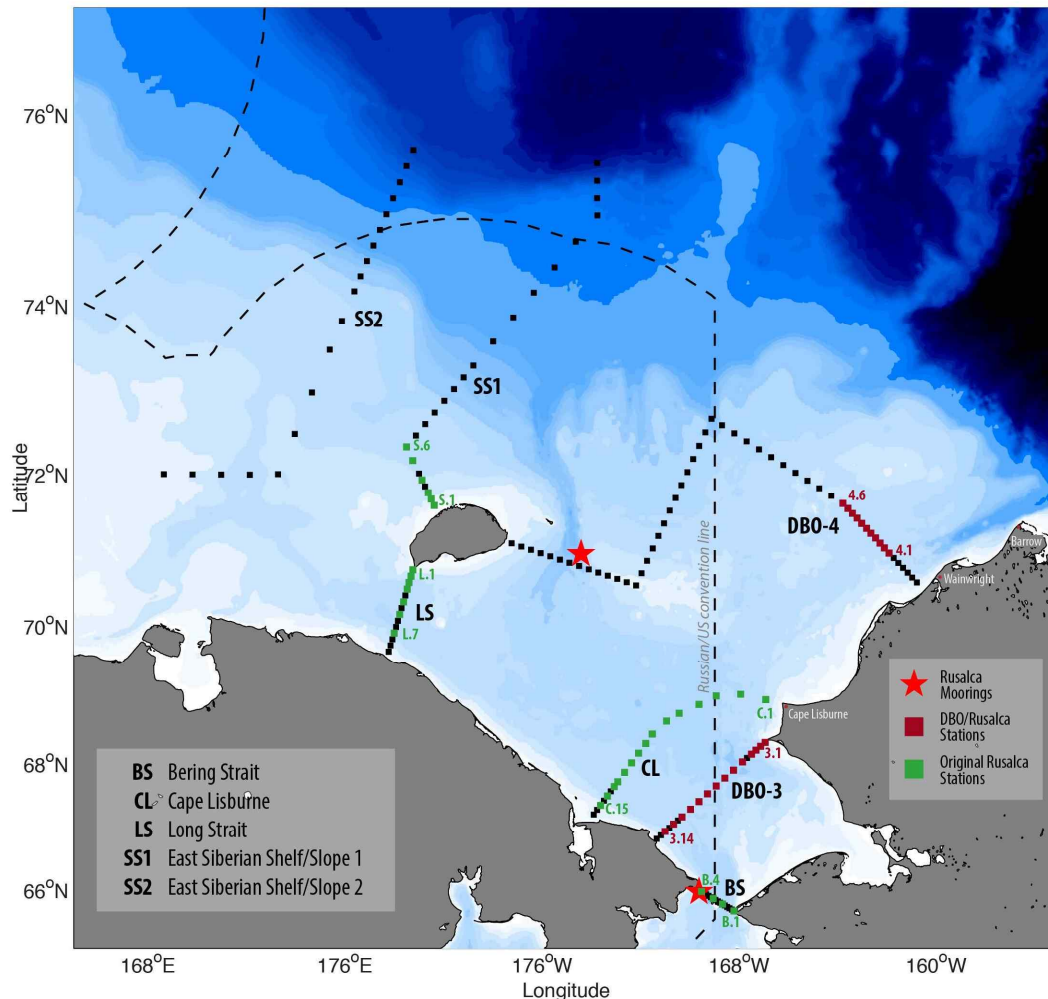
www.arctic.noaa.gov/dbo/



Russian-American Long-term Census of the Arctic (RUSALCA)

2016 cruise *RV Victor Buynitskiy*, Sept 10-30, 2016

RUSALCA Contract: Jackie M. Grebmeier, Chesapeake Biological Laboratory, University of Maryland Center for Environmental Science, Solomons, MD 20688, USA; ph. 410-326-7334, fax 410-326-7302; email: jgrebmei@umces.edu.



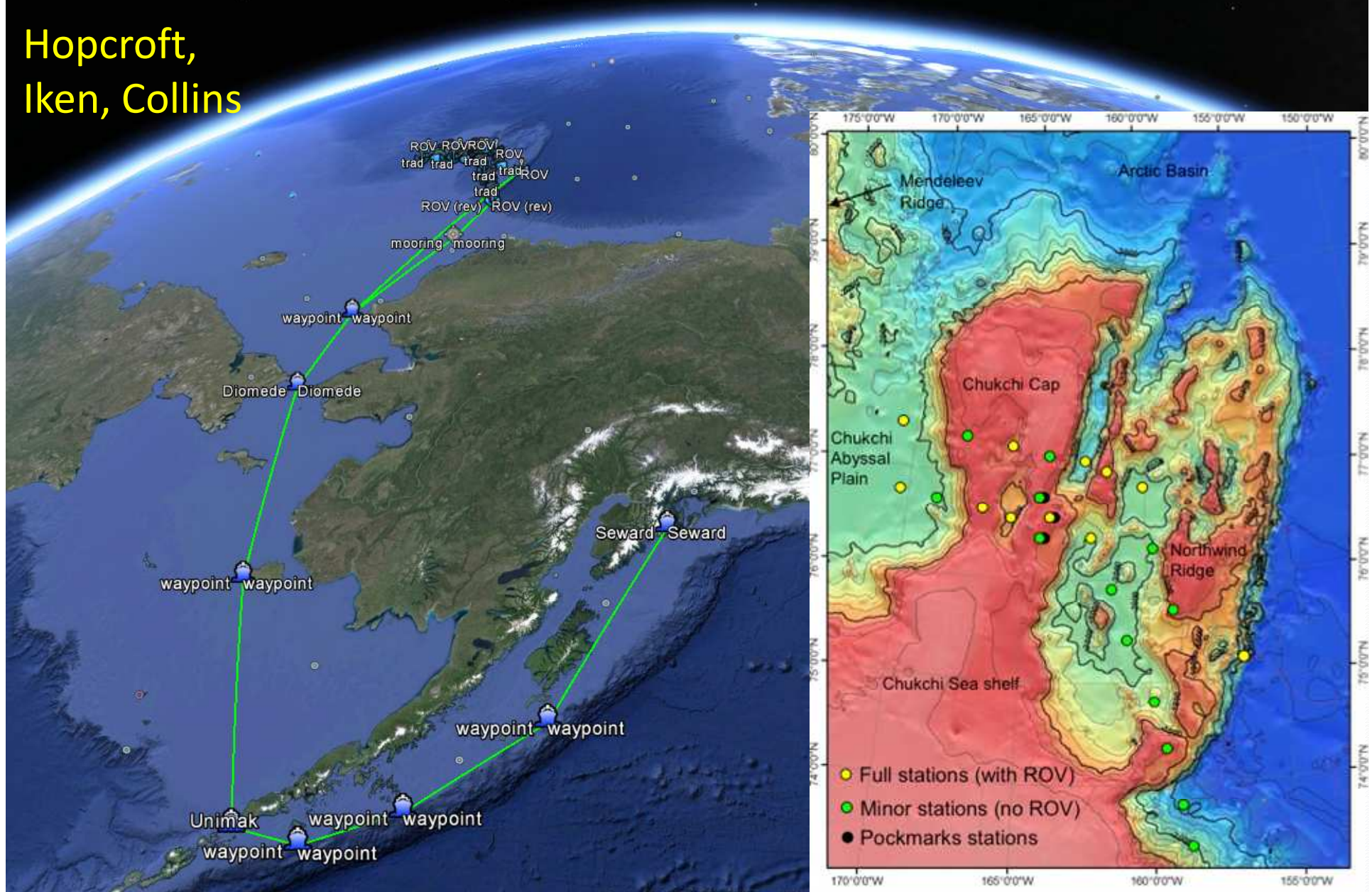
Field Measurements:

- Physical: CTD and lowered ADCP, moorings
- Chemical: nutrients, oxygen-18, chlorophyll-a (Chl a),
- Biological: zooplankton (abundance and biomass, growth rates)
- Benthos: macrobenthos abundance, biomass and population structure,
- Sediment: organic carbon/nitrogen content, chl a content, grain size, Cs-137 and Pb-210 content; benthic oxygen uptake and nutrient exchange
- Upper trophic: marine mammal shipboard surveys, passive acoustics on moorings



The Chukchi Borderlands

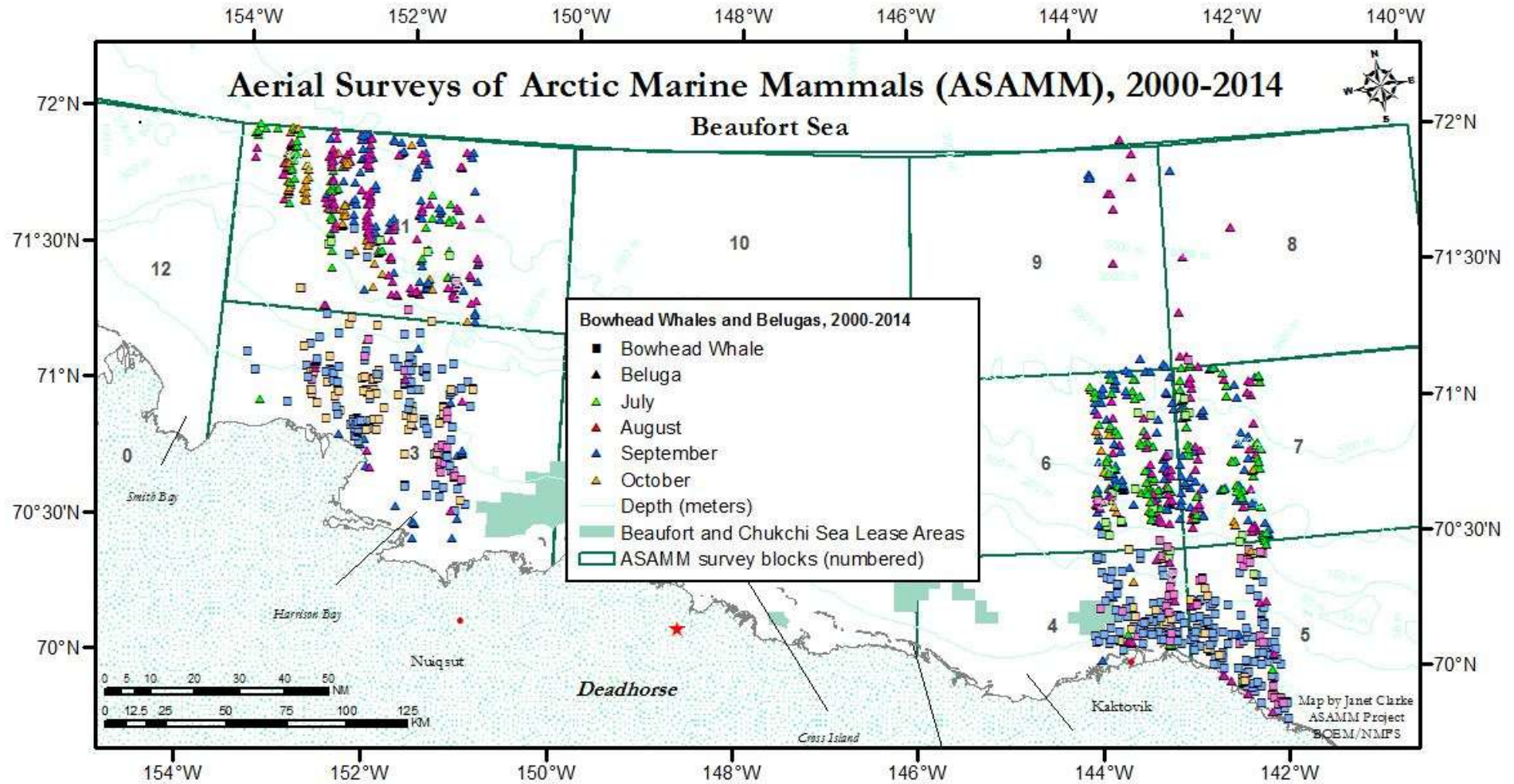
Hopcroft,
Iken, Collins



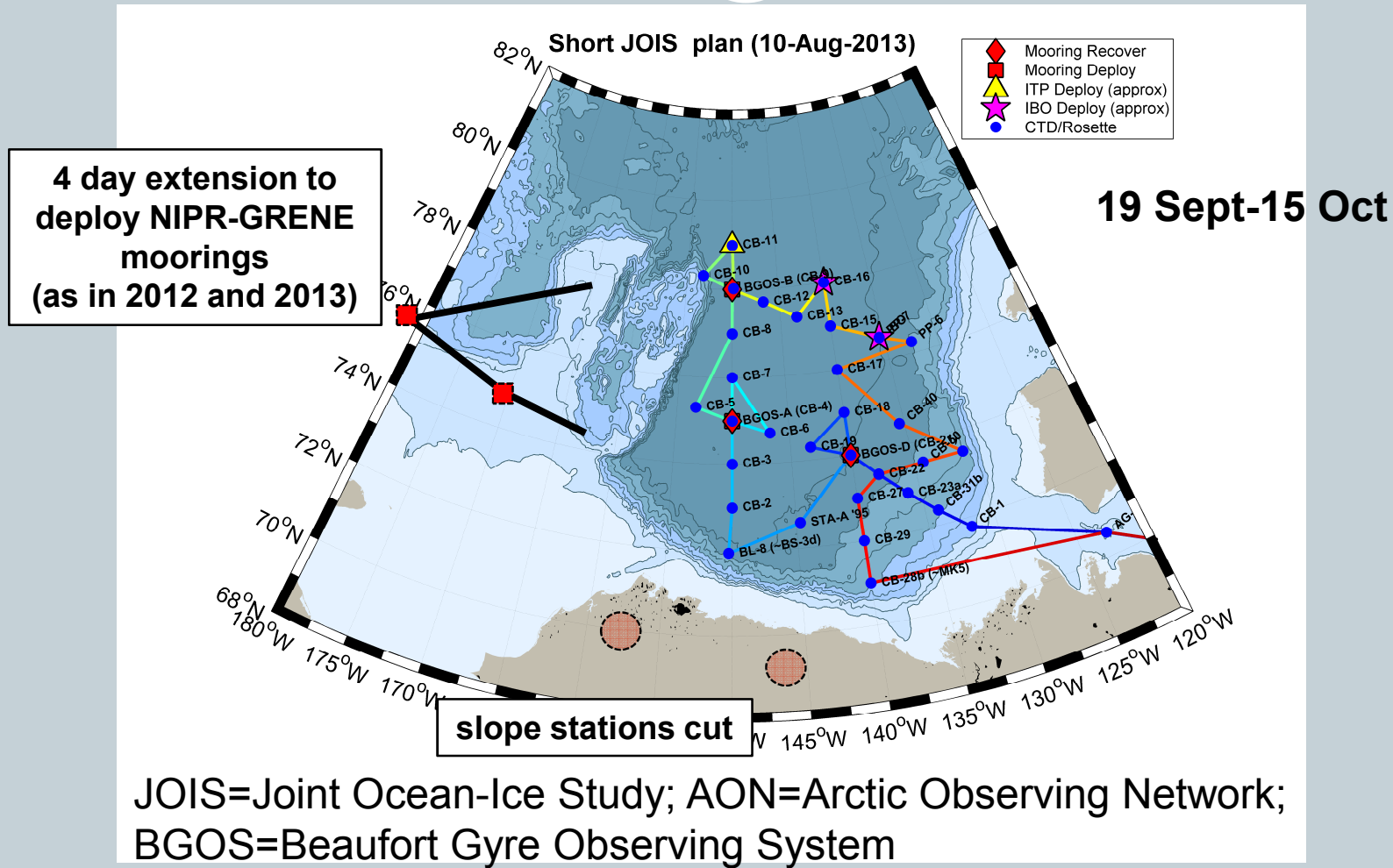
- Ocean Exploration funding
 - ~28 days in work area
- 3 major projects:
 - Plankton, Benthos, Sea ice
- ROV, traditional tools, molecular analyses
- Mammal & (likely) seabird observer
- Media & Teacher-at-sea



Aerial Surveys of Arctic Marine Mammals (NOAA)



SCIENCE-Basin JOIS/AON BGOS (Canada-USA-Japan)

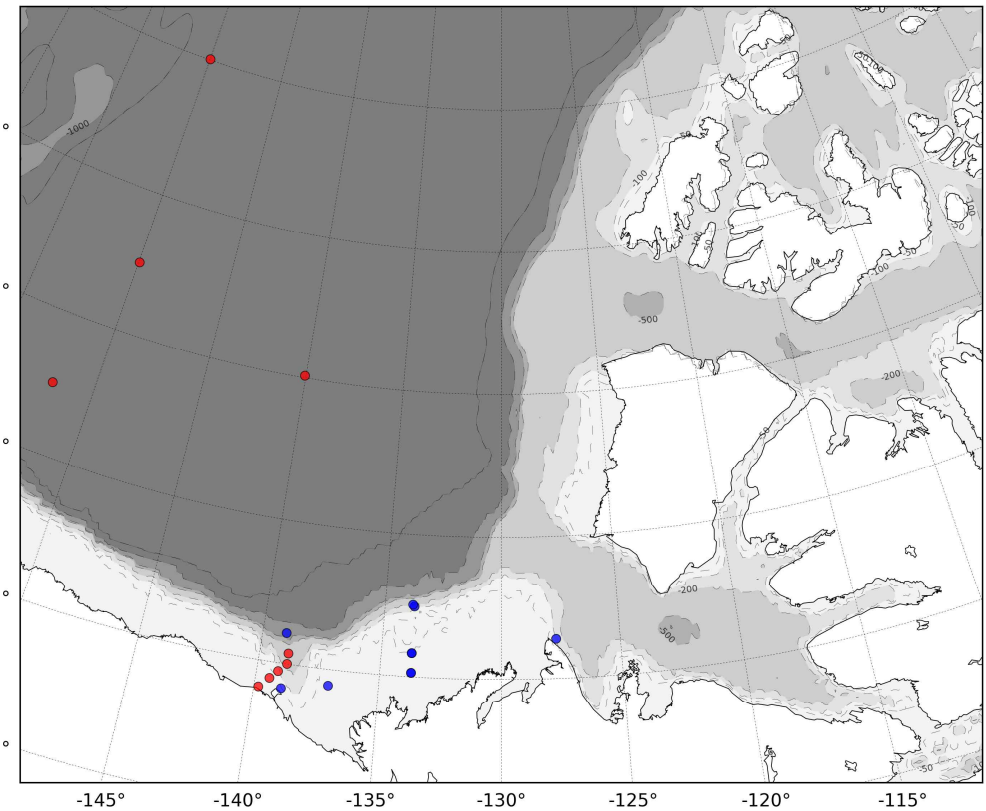
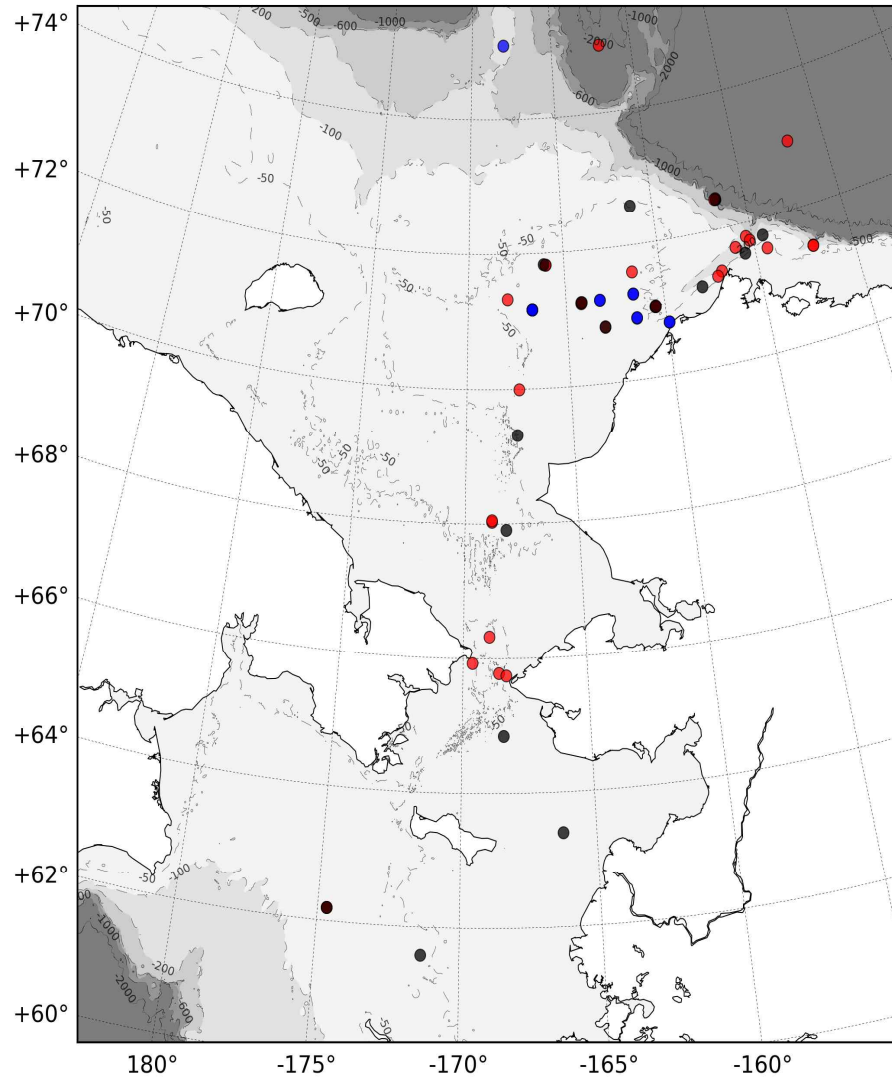


(courtesy Bill Williams, IOS)

Arctic Moorings - 2016

Number of moorings: ~80

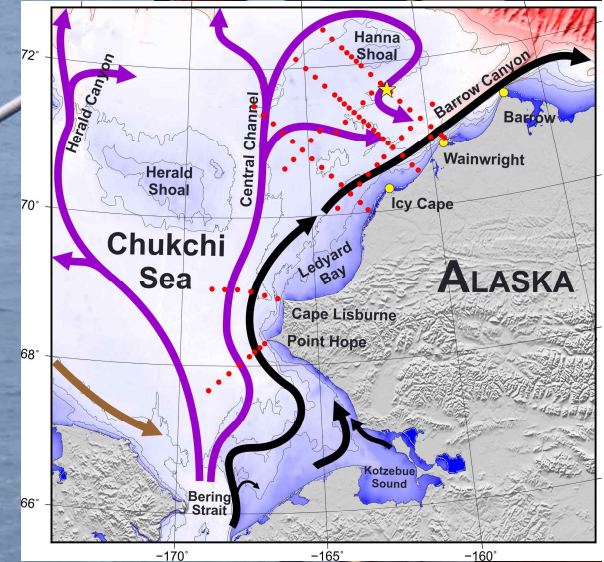
- Different dot color=various projects
- Further details and excel sheet via PAG website



[courtesy Phyllis Stabeno/NOAA]

NE Chukchi Ecosystem Observatory (CEO) 2015-2016 Measurements:

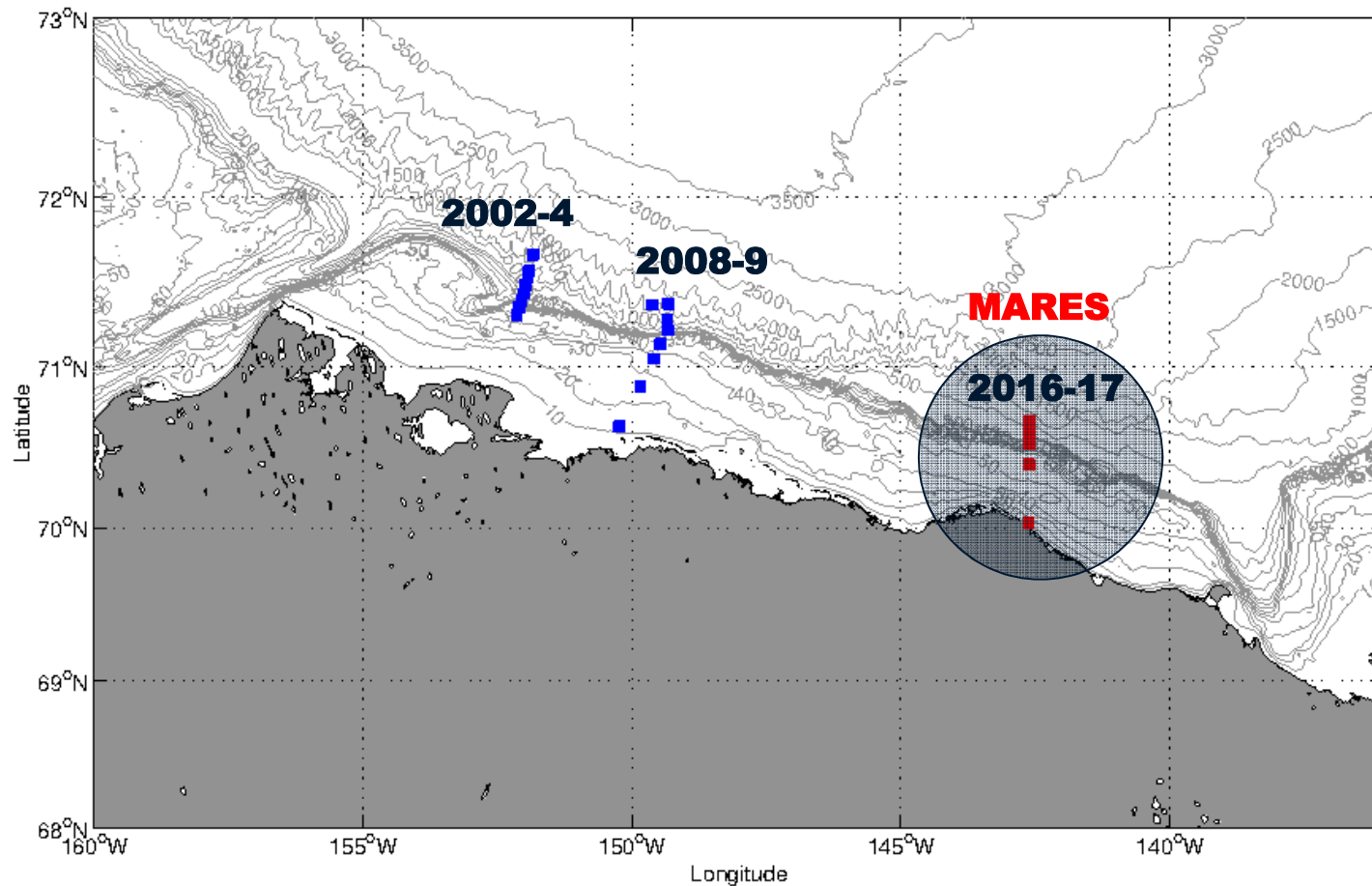
- Pressure, Temperature, Salinity
- Significant Wave Height & Direction
- Directional Wave Spectra
- Ice Draft (level ice thickness & keels)
- Passive acoustic recordings
- Acoustic Backscatter: 38, 125, 200 & 455 KHz
- Chlorophyll a fluorescence
- Optical Backscatter, PAR
- CDOM, NO₃, DO
- Webcam
- 24-bottle Sediment Trap:
 - Chlorophyll a
 - Phytoplankton identification
 - Total particulate matter (dry weight)
 - Particulate organic carbon
 - Particulate nitrogen
 - Zooplankton species
 - Zooplankton fecal pellets



[Seth Danielson, UAF]

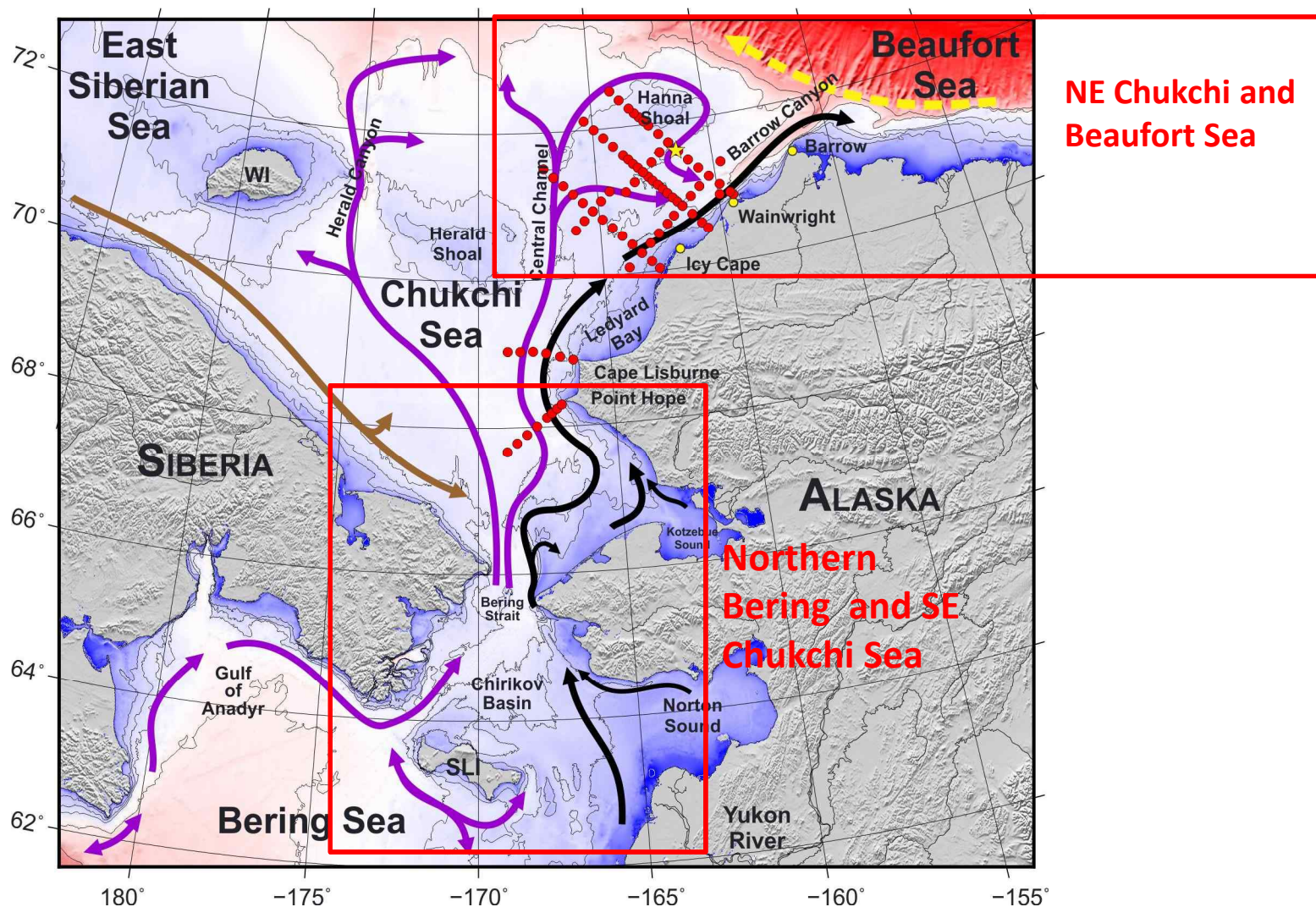
Mooring component of MARES

Mooring arrays across the Beaufort shelf/slope



Science access during subsistence whaling: April-May and Sept-Oct periods

-need to interface with coastal communities, contact Alaska Eskimo Whaling Commission, Eskimo Walrus Commission, and new Arctic Waterways Safety Committee



[modified from S. Danielsen map 2015]

Thank you for your
attention.

Any questions?

