

Scientist-Local Community Interactions

Report for AICC Meeting
November 9-10, 2016
Seattle

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University of Maryland Center for Environmental Science

Arctic Waterways Safety Committee (<http://www.arcticwaterways.org/>)

Area of responsibility in mauve

The mission of the Arctic Waterways Safety Committee is to implement lawful best practices to ensure a safe, efficient, and predictable operating environment for all Arctic waterway users.





Organizational Structure

Officers			
Willie Goodwin <i>Chairman</i>	James Boyer <i>Vice Chair</i>	Jack Omelak <i>Treasurer</i>	Wendie Schaeffer <i>Secretary</i>

Subsistence Hunters
Willie Goodwin <i>Alaska Beluga Whale Committee</i>
Harry Brower *George Noongwook <i>Alaska Eskimo Whaling Commission</i>
John Goodwin <i>Alaska Ice Seal Committee</i>
Jack Omelak *Charles Brower <i>Alaska Nanuuq Commission</i>
Vera Metcalf *Charles Brower <i>Eskimo Walrus Commission</i>

Industry
David George, Shell <i>Oil and Gas</i>
Greg Pavellas, Crowley Jim Dwight, Bowhead <i>Tug & Barge</i>
TBD <i>Regional Economic Development</i>
TBD <i>Commercial Fishing</i>
TBD <i>Tourism</i>

Other
Mayor Denise Michels <i>City of Nome</i>
Wendie Schaeffer <i>Northwest Arctic Borough</i>
Paul Fuhs <i>North Slope Borough</i>
Austin Ahmasuk, Kawerak <i>Regional Tribal Organization</i>
James Boyer <i>Alaska Marine Pilots</i>

Executive Secretary
Jenny Evans

Sub-Committees & Chairmanship
Subsistence: Harry Brower, Jr. Standards of Lightering and Barge Operations: Jim Dwight & Greg Pavellas Science: Dr. Martin Robards Infrastructure: Paul Fuhs & Denise Michels

Ex-Officio Observers
David Pikul, <i>State of Alaska</i> ; Capt. Ed Page, <i>Marine Exchange of Alaska</i> ; CDR Hector Cintron, <i>U.S. Coast Guard, Sector Anchorage</i> ; Dr. Martin Robards, <i>Science/NGO</i> ; Bob Poe, <i>University of Alaska</i> ; OSRO/Marine Salvage

* Alternates

Arctic Waterways Safety Committee

<http://arcticwaterways.org>

**Workshop on Strategies and Communication
Protocols to Mitigate Impacts of Research Vessels on
Alaska Native Subsistence Hunts in the High Arctic**

Anchorage, December 10-11, 2015

Follow-up Meeting, Juneau, March 2-3, 2016

Informal meeting with scientist involvement

**Arctic Science Summit Week, Fairbanks, March 13 and
March 16, 2016**

What is a Standard of Care?

In tort law, the standard of care is the only degree of prudence and caution required of an individual who is under a duty of care. The requirements of the standard are closely dependent on circumstances.

https://en.wikipedia.org/wiki/Standard_of_care

“What separates a common accident from an act of negligence, however, is the "[standard of care](#)" required in a given situation. By neglecting the proper standard of care for a given situation, an individual may be found liable for any resulting injuries.” Source: <http://injury.findlaw.com/accident-injury-law/standards-of-care-and-the-reasonable-person.html>

AICC comments on Standard of Care Document

AICC comments on draft Standard of Care document submitted by Bob Campbell, February 25, 2016

Revised version comments submitted, October 20, 2016

Some of the major criticisms revolved around unrealistic timelines for cruise planning and the potential for significant travel to meet reporting requirements, and other factors that scientists may not have much control over. North Pacific Research Board has also contributed critical suggestions (per Danielle Dickson)

My conclusion is that we need a Best Practices document, not a Standard of Care

Pacific Arctic Group (PAG): Informing our International Colleagues

Briefing Provided at PAG meetings

2016 meetings in Fairbanks, March 2016 (primarily about the Arctic Waterways Safety Committee and need to communicate cruise plans to local communities)

Cruise information sharing for 2017, October 27, 2016

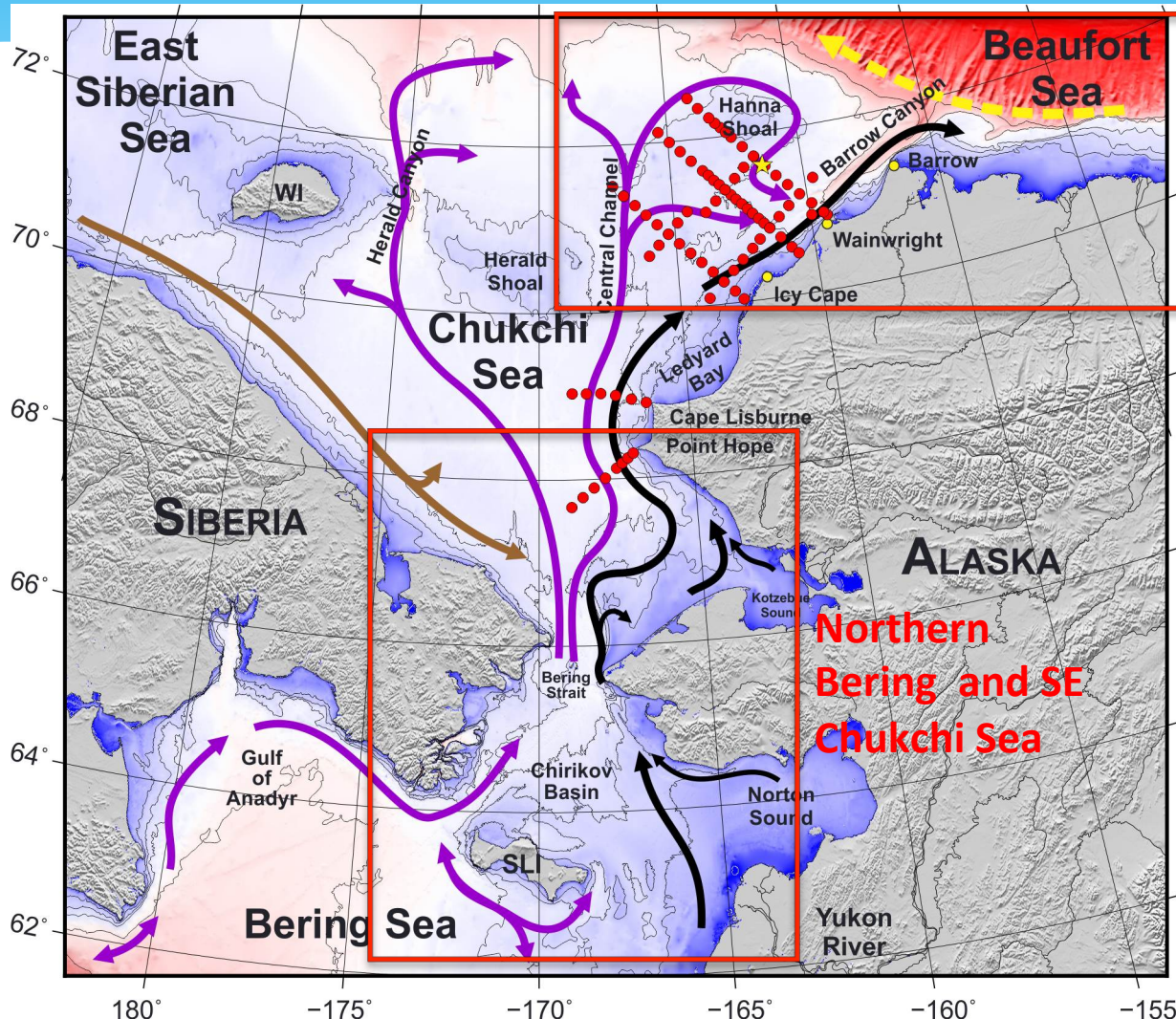
Sophia International Hotel
Qingdao, China



<http://pag.arcticportal.org>

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



NE Chukchi and Beaufort Sea

Northern Bering and SE Chukchi Sea

[modified from S. Danielsen map 2015]

Pacific Arctic Group (PAG): Examples of one page summaries provided to Alaska Eskimo Whaling Commission, February 2016

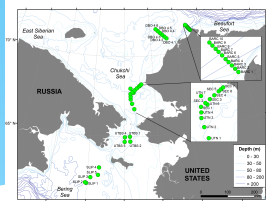


Canada's Three Oceans (C3O) and
the Distributed Biological Observatory (DBO) Program
CGS Sir Wilfrid Laurier, July 10-22, 2016
Ports: Victoria, BC, Canada to Barrow, Alaska, USA



US DBO Contact: Jackie M. Griebmeier, Chesapeake Biological Laboratory, University of Maryland Center for Environmental Science, Solomons, MD 20688, USA; ph. 410-326-7334, fax 410-326-7302; email: jgriebmei@umces.edu; Canadian Chief Scientist: Svein Vagle Svein.Vagle@dfp-mpo.gc.ca

During the annual cruise of the Canadian Coast Guard icebreaker *Sir Wilfrid Laurier* from US into Canadian waters, we plan to re-sample five regions (Figure 1) extending from the northern Bering Sea to the northern Chukchi Sea as part of the Distributed Biological Observatory (DBO) program www.arctic.noaa.gov/dbo/. We are tracking the seasonal and year to year changes in the marine ecosystem, returning to the same "hotspots" of biological productivity each year. The DBO has been developed in the Pacific Arctic as a "change detection array" so we can document ecosystem changes as sea ice disappears earlier, returns later, and the ocean warms. These five regions are important feeding areas for Pacific walrus, bearded seals, bowhead whales, and diving seabirds at different times of the year. During our cruise, we will study water column temperature and salinity, currents, nutrient and chlorophyll content, phytoplankton, zooplankton and benthic species composition. The data we collect includes abundance and biomass, surface sediment characteristics, and marine mammal and seabird observations. The map below (Figure 1) shows the proposed sampling during July 2016. The sampling within each of the five regions takes 12-24 hours, although sampling for the handful of stations in the coastal zone between 5-12 miles from shore are normally completed within 2 hours. We hope to hear of any concerns or questions about our research plan from local communities. Data and other information on the research we have already completed as part of DBO effort are available at <http://www.arctic.noaa.gov/dbo/>, but of course we would welcome the opportunity to come in person to local communities as funds and time permit. DBO studies are funded by the US National Oceanic and Atmospheric Administration, National Science Foundation and other national government agencies. We do this work in cooperation with international partners including scientists on other ships from China, Korea, Japan and Russia, in addition to the Canadian scientists we have worked with each year since 1998 aboard the *Sir Wilfrid Laurier*.



- Figure 1. Map and timing of planned sampling sites in July 2016**
- July 14-south St. Lawrence Island (DBO1)
 - July 15-Chirikov Basin (DBO2)
 - July 17- SE Chukchi Sea (DBO3)- closest station 5 miles from coast, estimate time within 12 miles to be 2 hours
 - July 19- NE Chukchi Sea off Wainwright (DBO4)-closest station 30 miles offshore
 - July 20 off Barrow (DBO5)-closest station 5 miles from coast; estimate time within 12 miles to be 2 hours

Multidisciplinary ocean survey in the western Arctic Ocean

ARAUN, Aug 3 - Aug 20, 2016: Nome to Barrow, Alaska

Chief Scientist: Eun Jin Yang, Department of Polar Ocean Environment, Korea Polar Research Institute, 26, Songdomirae-ro, Yeosu-gu, Incheon, 21990, Republic of Korea; ph. 82-32-760-5334; Email: einyang@kopri.re.kr

The icebreaker ARAUN will be sampling north of the Bering Sea, Chukchi Sea and East Siberian Sea from Aug 3 to Aug 20 during the summer of 2016. The objective of this cruise is to investigate the structure and processes in the water column and subsurface sediment around the Pacific Arctic Ocean in rapid transition. Another objective is to understand sea ice dynamics and sea ice ecosystem in the Chukchi Sea. These studies, funded by the Ministry of Oceans and Fisheries and Korea Polar Research Institute, will be undertaken by a team of scientists from the Korea Institute of Science and Technology Busan National University, Inha University, Incheon National University, Hanyang university, SAMS, BAS, University of Seattle, Ocean University of China and Tokyo University of Marine Science and Technology. We will study the plankton (bacteria, phytoplankton and zooplankton), phytoplankton physiology and pigments, primary production, nutrients, DOC, POC, PON, DON, pCO₂, DIC, Amino acid, N₂O gas, black carbon, interaction between water column and atmosphere, as well as physical oceanographic studies of the currents and ice conditions. The map below (Figure 1) shows about 40 stations that we will sample during summer 2016 that are similar to our 2015 effort. Particularly, we are going to take samples at 6 stations in DBO line 3 between 4 and 6 August.

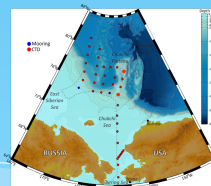


Figure 1. Map of our proposed sampling sites (2016 Arctic Cruise)



R/V Mirai Arctic Ocean cruise
22 Aug - 23 Sep, 2016: Shimizu (Japan) to Nome (Alaska)

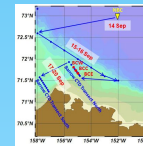
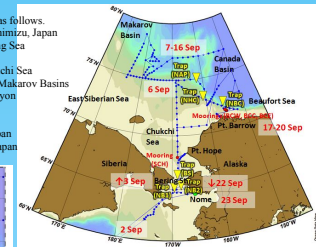
Chief Scientist: Shigetoshi Nishino
Japan Agency for Marine-Earth Science and Technology (JAMSTEC)
2-15 Naibusshima, Yokosuka, Kanagawa 237-0061, Japan
Tel. +81-46-867-9487; Email: nishinos@jamstec.go.jp



The Research Vessel Mirai (R/V Mirai) belonging to Japan Agency for Marine-Earth Science and Technology (JAMSTEC) will conduct hydrographic, marine biogeochemical, and meteorological surveys in the Arctic Ocean during September, 2016. The objective of this cruise is to quantify on-going changes in the ocean, atmosphere, and ecosystem, which are related to the recent Arctic warming and sea ice reduction.

The observational activities consist of CTD/XCTD/UCTD, drifting buoy deployments, mobile float observation with camera and sensors, optical measurements, water samplings, plankton net samplings, sediment samplings, visual observation of marine animals, wave and sea spray observations, ship-board ocean current and surface water monitorings, meteorological measurements and samplings, radionodes, Doppler radar, sea bottom topography, gravity, and magnetic field measurements, and mooring and sediment trap recoveries and deployments.

- Planned schedule is as follows.
- 22 Aug: Depart from Shimizu, Japan
 - 2 Sep: Northern Bering Sea
 - 3 Sep: Bering Strait
 - 6 Sep: Northern Chukchi Sea
 - 7-16 Sep: Canada and Makarov Basins
 - 17-20 Sep: Barrow Canyon
 - 22 Sep: Bering Strait
 - 23 Sep: Nome
 - 4 Oct: Hachinohe, Japan
 - 5 Oct: Sekinehama, Japan



Enlarged view near Barrow.

Geographical areas of the intended work, locations of sampling stations, and cruise tracks of survey lines in the Arctic Ocean. Planned points of stationary observations are represented by red dots. Locations of moorings and sediment traps are represented by blue circles and yellow triangles, respectively. The stations and cruise tracks are subject to change due to weather, sea ice, and other conditions.

Canada

Korea

Japan

<http://pag.arcticportal.org>

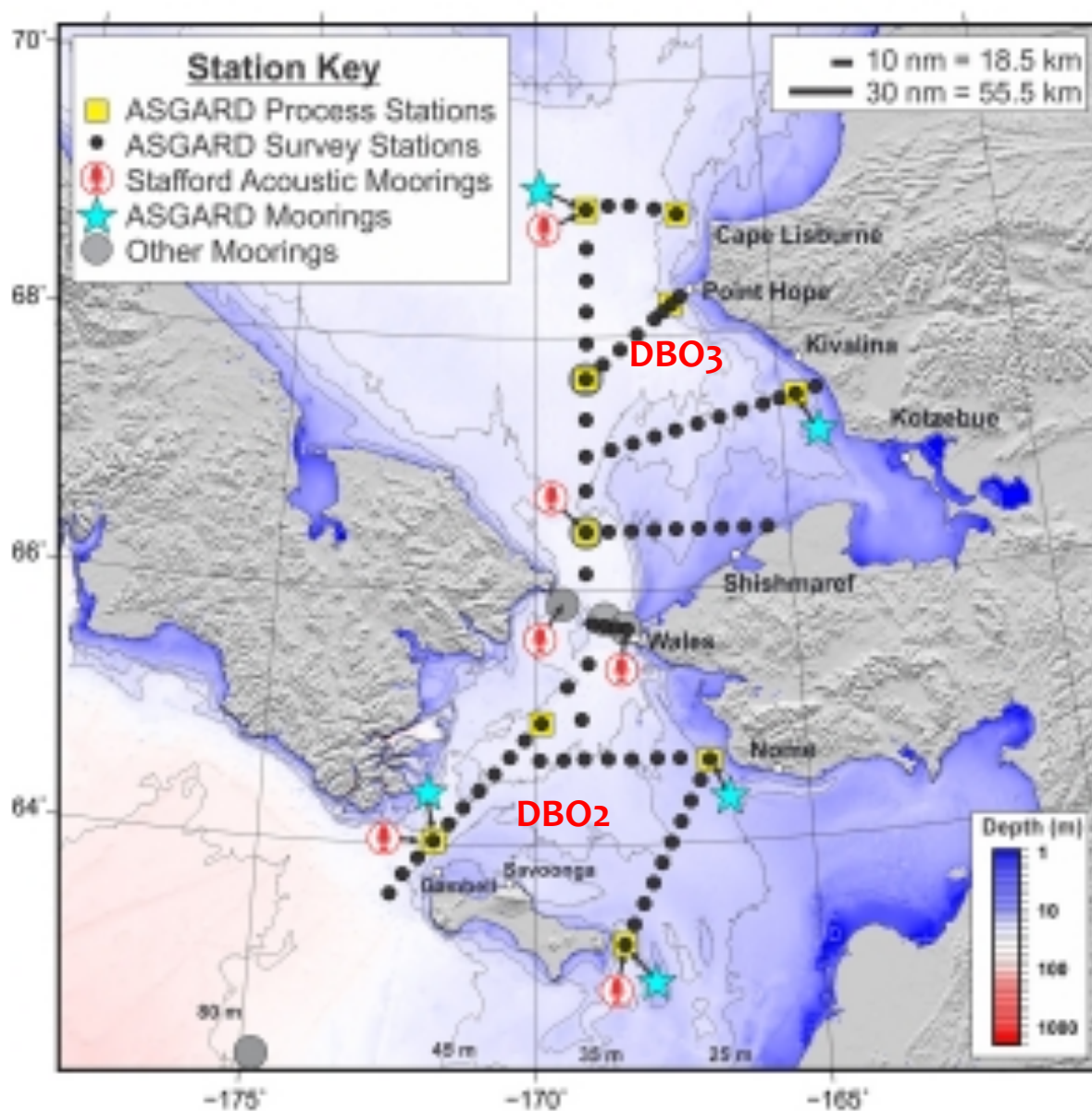


2017 PAG and DBO Field Plan-DRAFT v1

2017 PAG and DBO Field Season (10_27_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
May-June	Sikuliaq	2, 3	ASGARD	Seth Danielson	Seth Danielson
July (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
August	TBD	3, 4	ArcticEIS2	Jackie Grebmeier jgrebmei@umces.edu	Ed Farley ed.farley@noaa.gov
Aug 5-25	Araon	3+Chukchi Borderland+ East Siberian Sea	Korean Expedition (KOPRI) ocean and Sea-ice researches	Sung-Ho Kang shkang@kopri.re.kr	Leg 1 - Eun-Jin Yang ejyang@kopri.re.kr
Aug 27-Sept 10		Chukchi Borderland	Geophysical/paleoceanographic researches	-same	Leg 2 - Young Ken Jin ykjin@kopri.re.kr
Sept 1-14	Healy	3,4,5	ARP DBO and SBE	Jackie Grebmeier jgrebmei@umces.edu	Robert Pickart rpickart@whoi.edu
Sept 16-Oct 15	Healy	-	Navy	-NA	Navy
Aug 22-Oct 5	Mirai	3,5+Arctic Basin	Japanese ArCS	Takashi Kikuchi takashik@jamstec.go.jp	Shigeto Nishino nishinos@jamstec.go.jp
August	TBD	3,4,5	NOAA/PMEL	Phyllis.Stabeno@noaa.gov	Phyllis.Stabeno@noaa.gov
August-Sept	Sikuliaq	3,4,5,6	Arctic N Fixation Arctic Productivity/	rcrain@nsf.gov	ljuraneck@coas.oregonstate.edu ; Rachel Sipler
Aug 24-Oct 4	Oscar Dyson F/V Cape Flattery	1 2	NOAA/AFSC/EMA/FOCI	jeanette.gann@noaa.gov	lisa.eisner@noaa.gov
Oct 3-11	Sir Wilfrid Laurier	4,8	C30	Bill.Williams@dfo-mpo.gc.ca	Humfrey.Melling@dfo-mpo.gc.ca
Oct-Nov	Sikuliaq	Arctic Basin	ONR Acoustics	M. Badley/Arctic Shelf-Basin/Sonar Performance	Navy/ONR

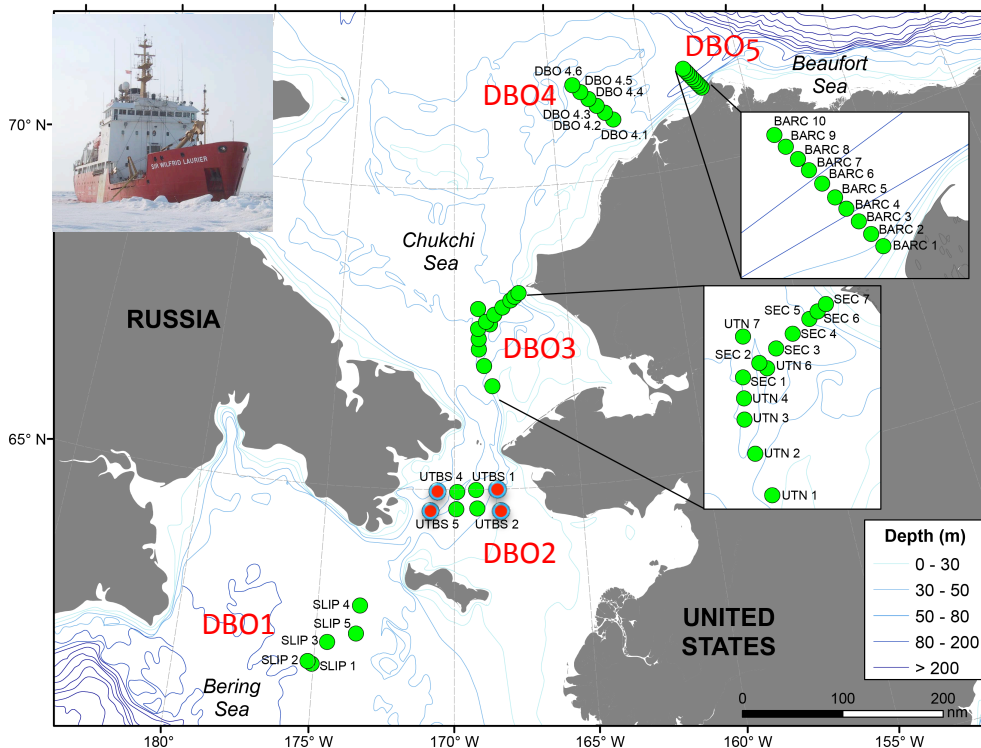
Arctic Shelf Growth, Advection, Respiration and Deposition Rate Experiment (ASGARD): UAF (Lead: Seth Danielson): June 2017 and 2018 (NPRB)





Canada's Three Oceans (C3O) and the Distributed Biological Observatory (DBO): CCGS Sir Wilfrid Laurier, July 10-22, 2017

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) (5 process, 4 CTD only)
- July 15-Chirikov Basin (DBO2)-add 7 stations (4 CTD only)
- 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

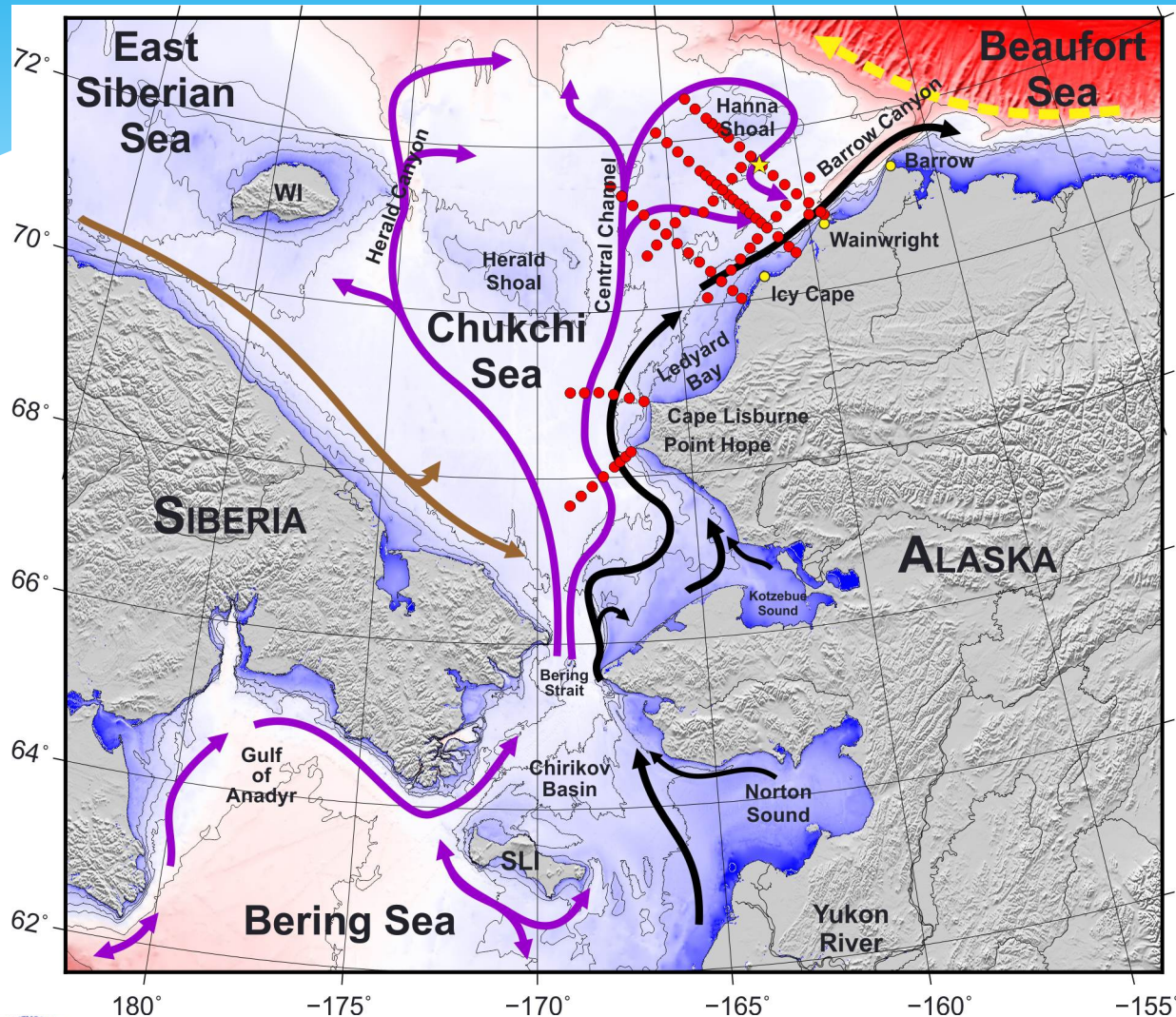
DBO data collections

- 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



Arctic Marine Biodiversity Observing Network (AMBON); NOAA/BOEM/Shell August 2017 (either Sikuliaq or Norseman II)-occupy DBO3 and 4

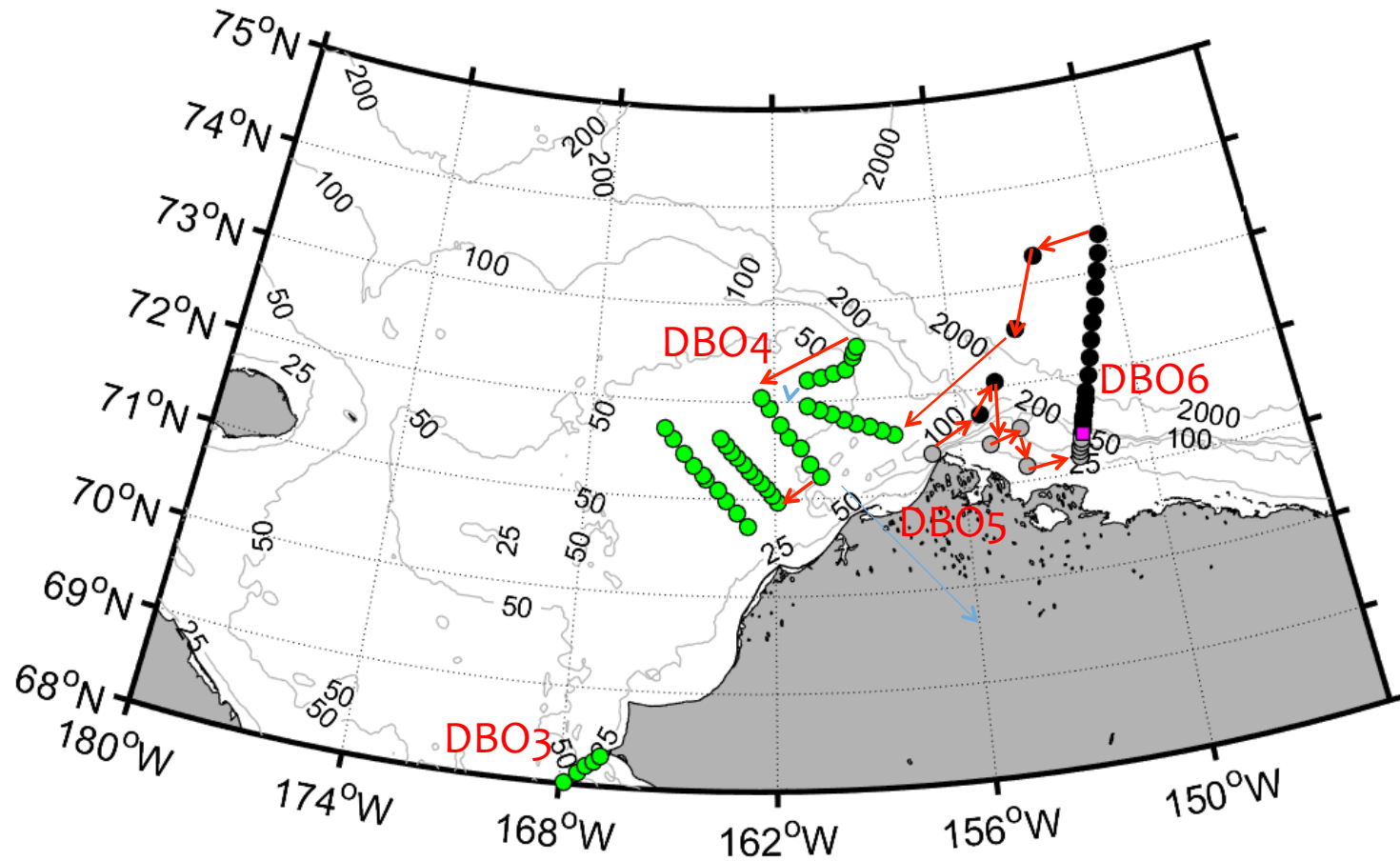


- Lead Katrin Iken (UAF); Co-PIs: Seth Danielson, Eric Collins, Russ Hopcroft, Franz Mueter
- co-PIs: Jackie Grebmeier, Lee Cooper (CBL/UMCES)
- Sue Moore (NOAA), Kathy Kuletz (USFWS)
- T/S
- Chlorophyll, nutrients
- Phytoplankton and zooplankton composition
- Macrofauna and epifauna
- Fishes
- Marine mammal and seabird surveys

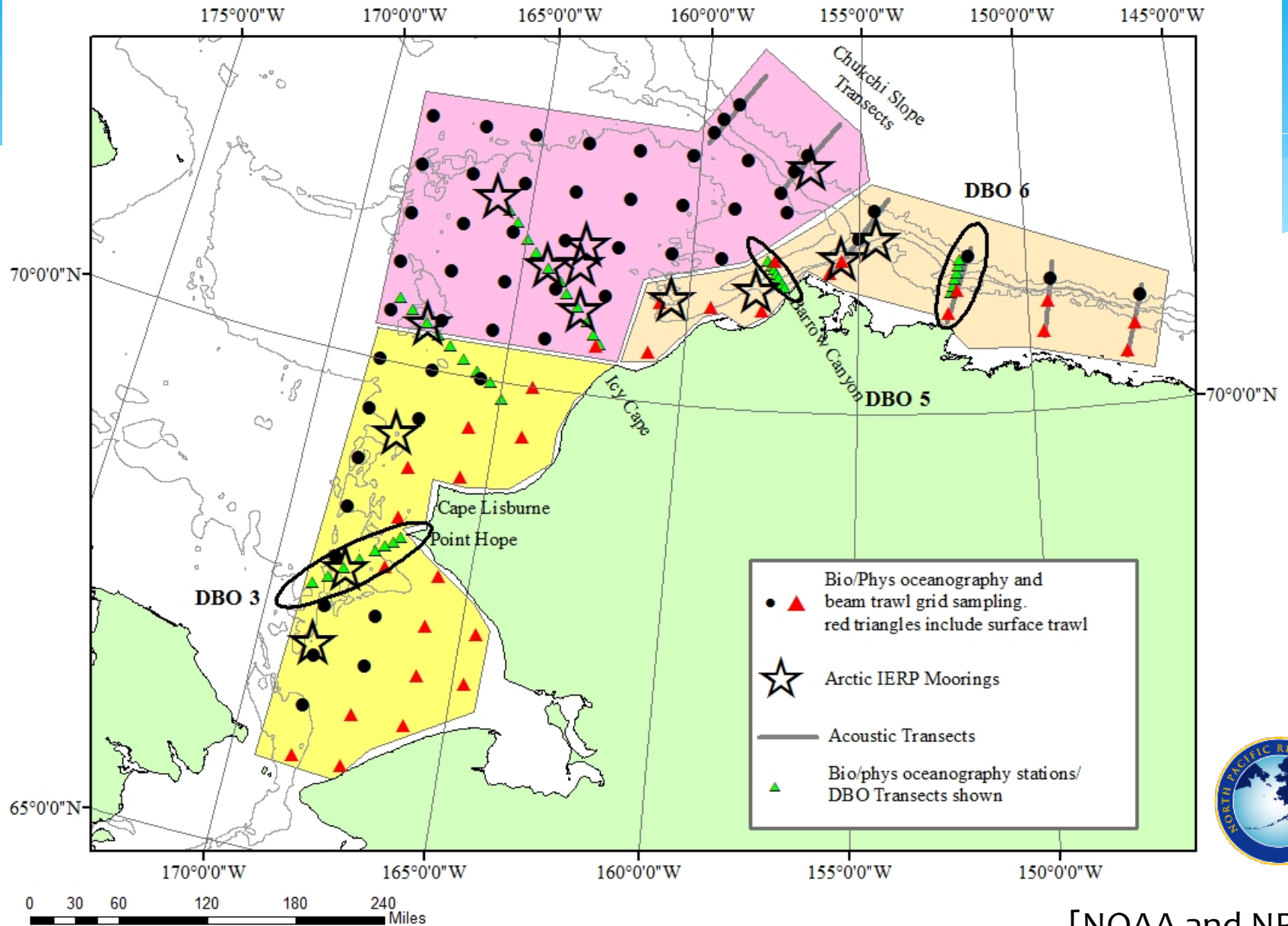
[from S. Danielsen map 2015]



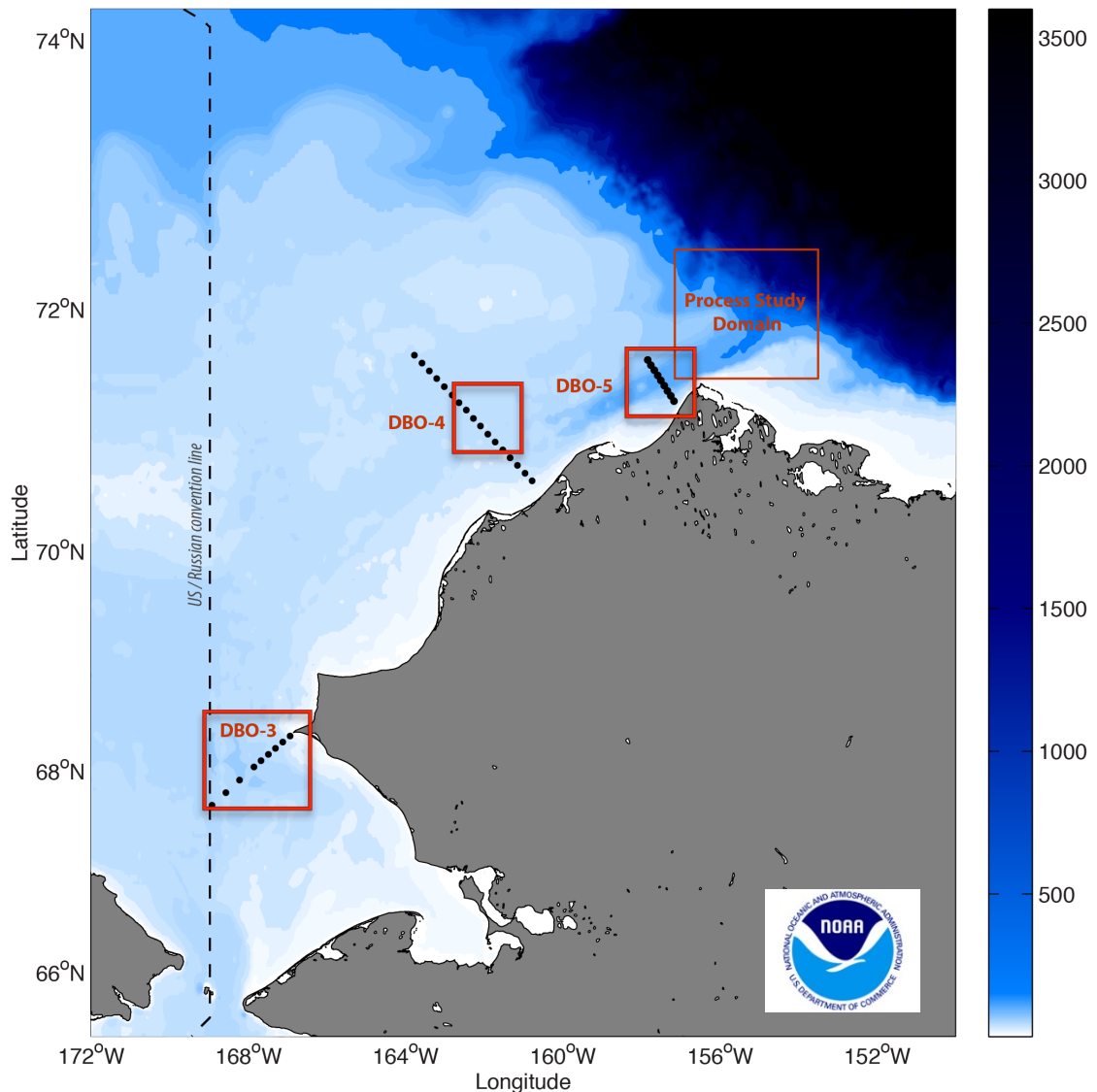
Sipler/Juranek (OSU) 2016 (?2017) August cruise (DBO 3,4,5,6)



Arctic Ecosystem Integrated Survey: ArcticEIS2 (NOAA)-August/Sept 2017 and



2017 DRAFT Plans DBO and Northern Chukchi Sea Shelf-Basin Exchange Study-NOAA Arctic Research Program (WHOI, UMCES and NOAA PMEL)-Aug/Sept (BC line prior to Sept 15)



Field Measurements: Standard DBO measurements and process studies

(DBO and Barrow Canyon region):

- Physical: CTD and lowered ADCP
- Chemical: nutrients, oxygen-18, chlorophyll-a (Chl a), carbon components
- 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 levels: marine mammal shipboard surveys

NSF Award #1637688 to Sitka Sound Science
Center

Alaska Science Communication Workshop,
October 31-November 2, 2016

Lisa Busch, lead PI

“goal of improving the communication skills of
Arctic researchers so that they can
effectively convey the goals and results of their
research to rural and Alaska Native audiences.”

Alaska Science Communication Workshop, October 31-November 2, 2016

Participant “Inspire” talks at
Mt. Edgecumbe High School
Visit to Public radio station
KCAW in Sitka

Discussions with Sitka
Native Tribe
on initiating
research
projects

