PACIFIC ARCTIC GROUP (PAG)

PAG Update 2025 Field Program

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March 20, 2025

Forum of Arctic Research Operators (FARO) Annual Meeting 2025

ASSW25, Boulder, Colorado, USA

http://pag.arcticportal.org

2025 PAG and DBO Cruise Plan Table

2025 PAG and DBO Field Season (version 03_21_25): Sampling Contributors. Projects Key: AON=Arctic Observing Network; ArCS II=Arctic Challenge for Sustainability (JAMSTEC=Japan Agency for Marine-Earth 0cience and Technology); AMOS=Arctic Mobile Observing System; C30=Canada's Three Oceans (DFO=Department of Fisheries and Oceans Canada); DBO=Distributed Biological Observatory; EcoFOCI=Ecosystem & Fisheries Oceanography Coordinated Investigations; JOIS=Joint Ocean Ice Study/BGOS = Beaufort Gyre Observatory System (DFO); K-AWARE (KOPRI)=Korea- Arctic ocean WARming & Ecosystem study (Korea Polar Research Institute).
DBO Region Key: DBO1=So. St. Lawrence Island, 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 2025 (Port calls)	Ship	DBO Region	Projects	PAG contact	Chief Scientist
July 15-28 (Nome- Utqiagvik)	Sir Wilfrid Laurier	1,2,3,4,5	DBO-C30	Jackie Grebmeier jgrebmei@umces.edu	Paul Macoun Paul.Macoun@dfo-mpo.gc.ca
July 20-Aug 20 (Dutch Harbor -Utqiagvik)	Araon	3, Chukchi Borderland	K-AWARE (KOPRI)	Eun Jin Yang ejyang@kopri.re.kr	Eun Jin Yang ejyang@kopri.re.kr
July (Nome-Nome)	Norseman II	3; moorings; CTDs	Bering Strait Mooring Project (AON/NSF)	Rebecca Woodgate woodgate@uw.edu	Rebecca Woodgate woodgate@uw.edu
Jul 16 - Aug 18 (Dutch Harbor-Dutch Harbor)	Healy	-	AMOS (ONR)	Craig Lee craig@apl.washington.edu	Craig Lee craig@apl.washington.edu
Aug 13-Sept 6 (Nome-Nome)	Sikuliaq	1,2,3,4,5	DBO-EcoFOCI-AMBON-CEO	Jackie Grebmeier jgrebmei@umces.edu	Katrin Iken kbiken@alaska.edu
Aug 25-Oct 2 (Dutch Harbor, Alaska to Shimizu, Japan)	Mirai	3,5	ArCS II (JAMSTEC)	Shigeto Nishino nishinos@jamstec.go.jp	Amane Fujiwara amane@jamstec.go.jp
Sept 18-Oct 23 (Cambridge Bay-Cambridge Bay)	Louis S. St-Laurent	-	JOIS/BGOS (DFO/NSF)	Bill.Williams@dfo-mpo.gc.ca	Sarah.Zimmermann@dfo-mpo.gc.ca
Sept 30-Oct 14 (Kugluktuk-Nome)	Sir Wilfrid Laurier	8	BSMO (Beaufort Shelf Marine Observatory; SWL Leg 4)	Bill.Williams@dfo-mpo.gc.ca	Bill.Williams@dfo-mpo.gc.ca
~Sept-Oct (TBD)	Xuelong2	3	CHINARE25?	Jianfeng He hejianfeng@pric.org.cn	Jianfeng He hejianfeng@pric.org.cn

DBO-C30 July 2025

DBO=Distributed Biological Observatory
C30=Canada's Three Oceans

CCGS Sir Wilfrid Laurier

Dates: July 17-28, 2025

Research Area Location: Northern Bering and Chukchi Seas

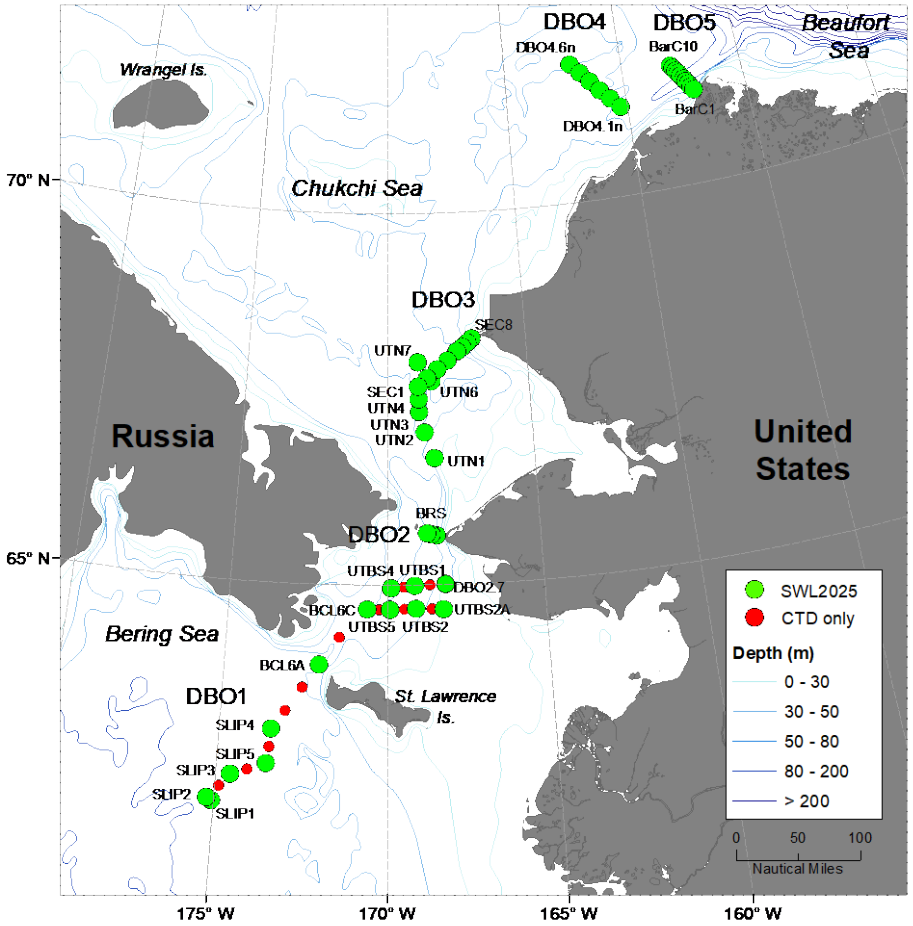
Vessel: CCGS Sir Wilfrid Laurier (mobilize July 16-Nome, demobilize July 28, Utqiaġvik, Alaska)

Mission: To track the status and change in environmental drivers and ecosystem components undergoing change in the Pacific Arctic

Funding: Financial support provided by US National Science Foundation and Fisheries and Oceans Canada; participants from US Fish & Wildlife Service (USFWS) and University of Victoria (Canada)

Communication and outreach plans:

- Pre & post-cruise discussions & reporting-back with Alaska Eskimo Whaling Commission (AEWC)
- Communication of activities with Alaskan coastal communities



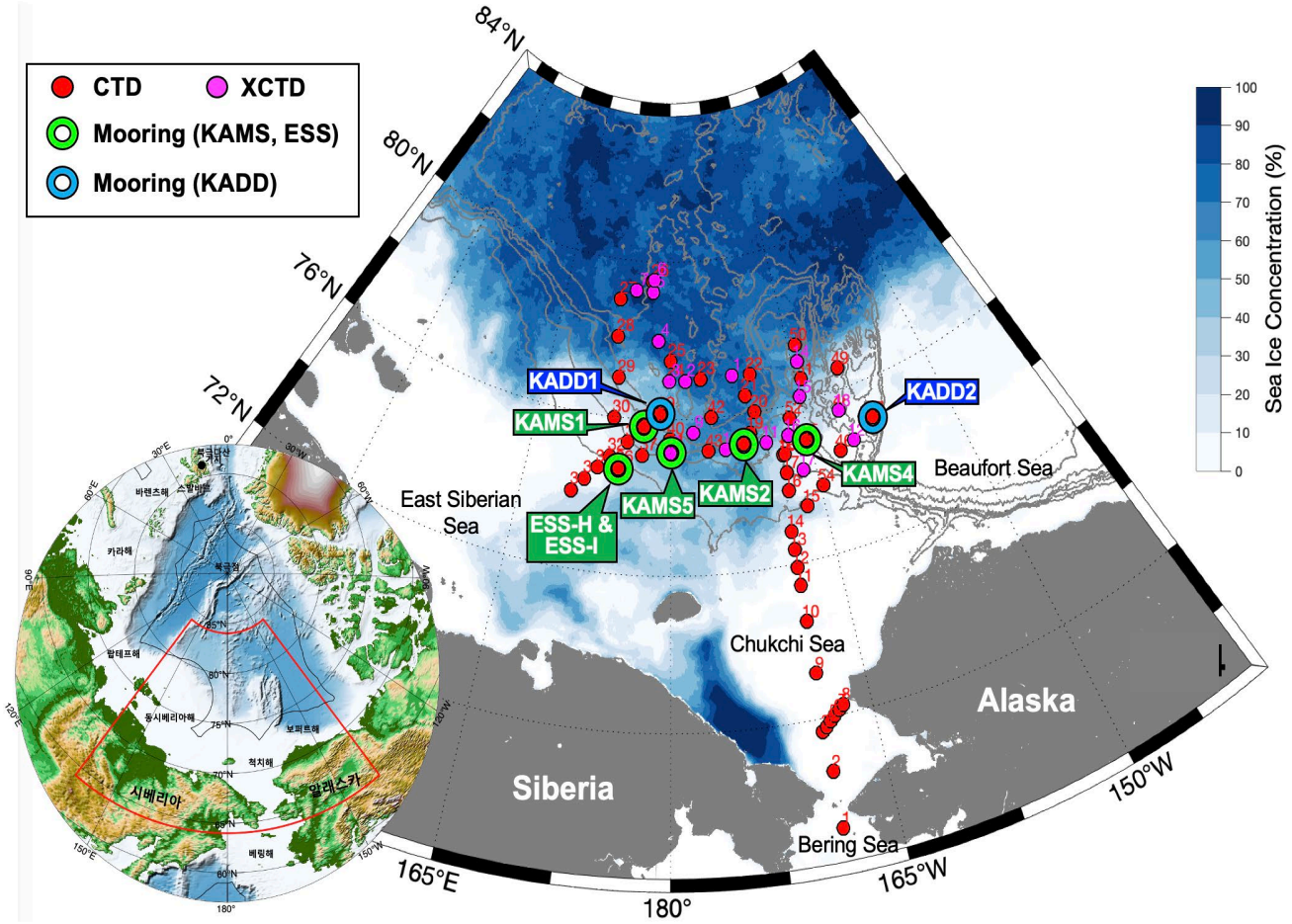
University of Maryland
Center for Environmental Science
Chesapeake Biological Laboratory

Fisheries and Oceans Canada

Pêches et Océans Canada

2025 Korea Arctic Ocean Expedition (2nd Leg): July 20-August 20

Ocean-Sea Ice-Atmosphere



Dutch Harbor to Utqiagvik

Chief Scientist: Eun Jin Yang, ejyang@kopri.re.kr

Objectives: to identify key environmental parameters in rapid transition due to the sea-ice decrease on the marine ecosystem components in the western Arctic Ocean (Chukchi and East Siberian Seas) and to predict environmental change patterns.

- atmospheric measurements
- sea ice dynamics
- physical, chemical and biological oceanography

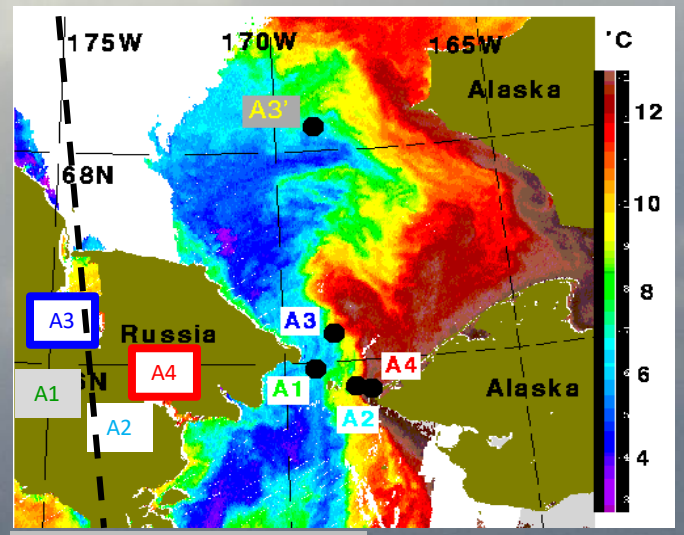
- ➢ North of Bering Strait
- ➢ DBO 3 line
- ➢ Chukchi shelf and Chukchi Borderland
- ➢ Sea Ice camp stations
- ➢ CTD stations + xCTDs
- ➢ Ocean mooring systems
- ➢ Acoustic mooring

Bering Strait Mooring Project

PIs: Rebecca Woodgate & Cecilia Peralta-Ferriz
University of Washington (UW), Seattle, USA
psc.apl.washington.edu/ BeringStrait.html
woodgate@uw.edu

Funding from US-NSF Arctic Observing Network (AON)

1990 – present (34+ years)
== **year-round moorings**
mid channel (e.g.,A1, A2, A3, A3')
== mostly near bottom
== 2001 started measuring the Alaskan Coastal Current with A4



MODIS SST 26th Aug 2004

To 2022: Physical data:
- hourly (or better)
  - temperature (T)
  - salinity (S)
  - velocity (ADCP)

after 2007 also
  - ice
  - upper "ISCAT" TS

From 2022: NSF-OPP-AON funding:
- Continues physical moorings from 2022-2026
- Adds
  Biooptics on moorings (A3 and A2):
  - hourly
    - SUNA nitrate
    - Fluorescence
    - Dissolved Oxygen
    - Turbidity

  SUNA nitrate & nutrient sampling to annual cruises

2021+ .. High resolution trace metal sampling on cruises.
Lead: Laramie Jensen (UW)

September 2024 Cruise (Norseman2, Nome to Nome)
- recovered and redeployed moorings
- CTD sections with SUNA nitrate, + water sampling for nutrients, trace metals (Jensen), & isotopes (Payne, ETH; Iodine, Uranium, Hafnium and Neodymium)

Field plans:
July 2025
Norseman2,
Nome to Nome

Want to add elements to the moorings/cruises? Or join SUNA user group?
Email Rebecca

August 13-September 6, 2025: SKQ2024-15S

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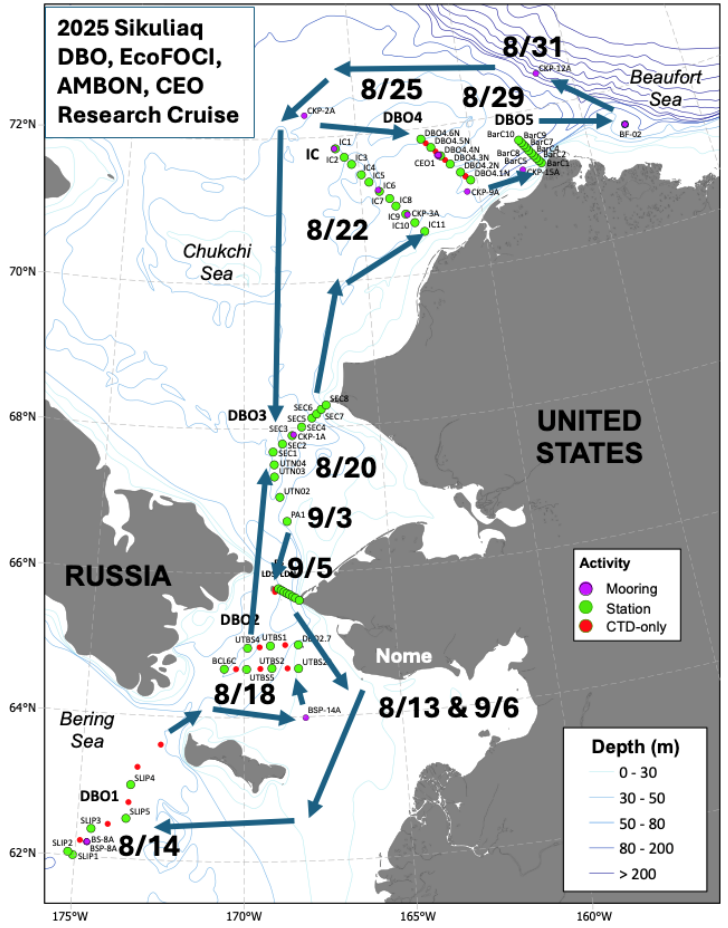
*Chief Scientist, ** Co-Chief Scientist

Objectives

- Evaluate ecosystem status, biodiversity, and change at time series stations
- Deploy and recover NOAA and UAF moorings
- What conditions cause marine animal and seabird population to vary

DBO: Distributed Biological Observatory (Jackie Grebmeier, UMCES)
EcoFOCI: Ecosystems and Fisheries Oceanography Coordinated Investigations (Phyllis Stabeno, NOAA)
AMBON: Arctic Marine Biodiversity Observation Network (Katrin Iken, UAF)
CEO: Chukchi Ecosystem Observatory (Seth Danielson, UAF)



Funding support for this cruise and cruise activities provided by NOAA, ONR, AOOS, NPRB, USFWS, NSF & UAF

Cruise plan for R/V Mirai 2025

Post-ArCSII project

Chief scientist: Amane Fujiwara (JAMSTEC)
amane@jamstec.go.jp

Tentative Cruise Schedule

Aug 25 Depart Dutch Harbor, Alaska
Aug 28 Bering St.
Sep 23 Bering St. Call
Oct 2 Shimizu, Japan

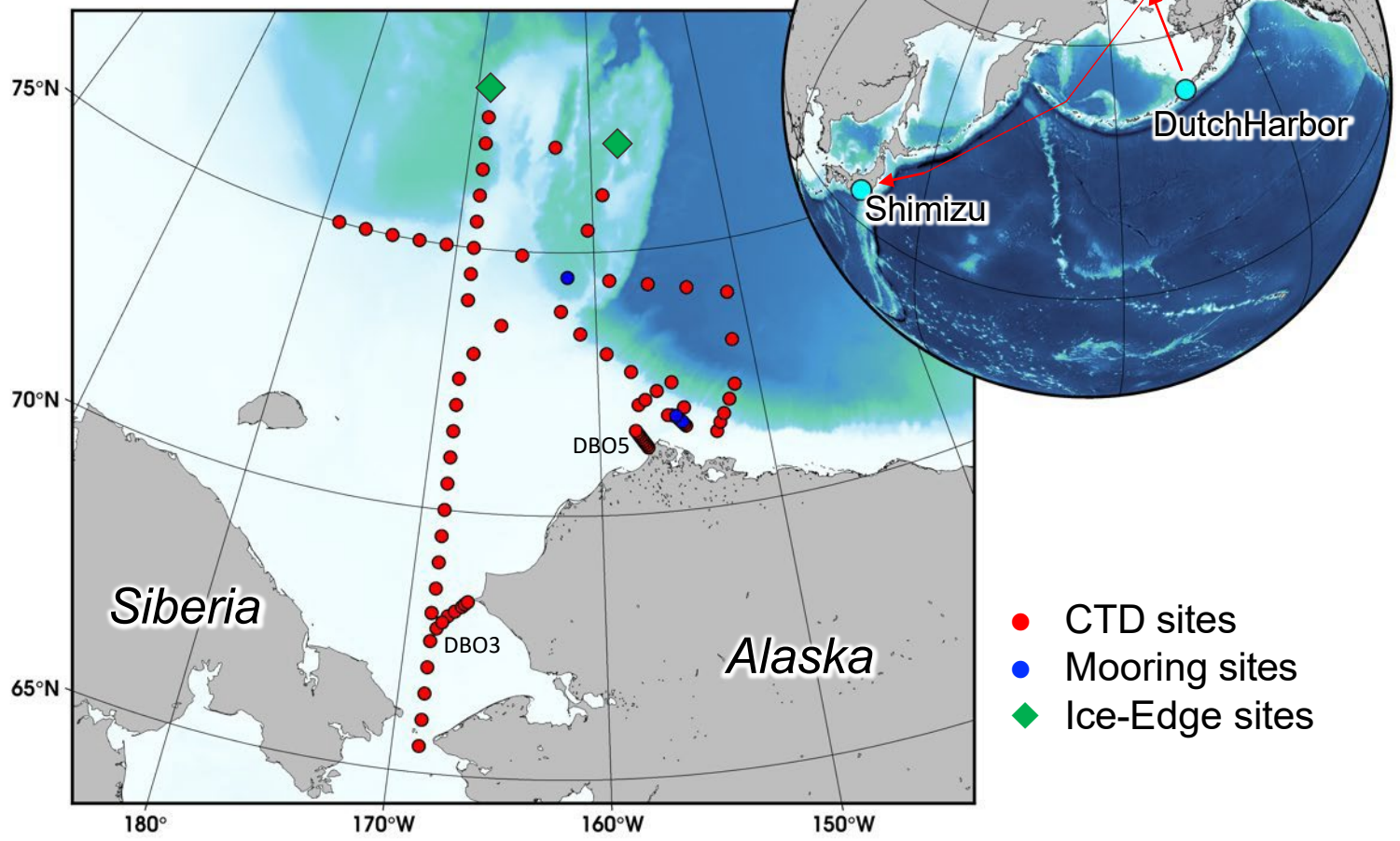
Planned Activities

Hydrography/Biogeochemistry
- CTD
- Mooring recovery/redeployment
- Plankton net
- Sediment samplings
- Ice samplings

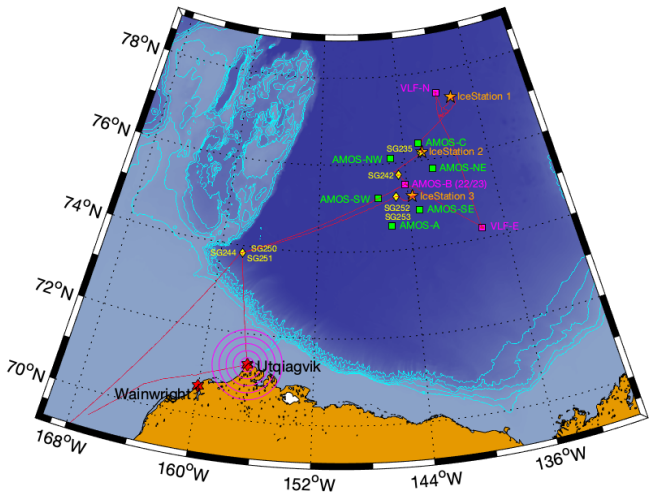
Atmospheric science/Meteorology
- Meteodrone
- Moored-balloon

Development of next-generation observation equipment
- In-water Drone trials

Tentative sampling sites



Arctic Mobile Observing System (AMOS) 2019-2025



Sept 2024

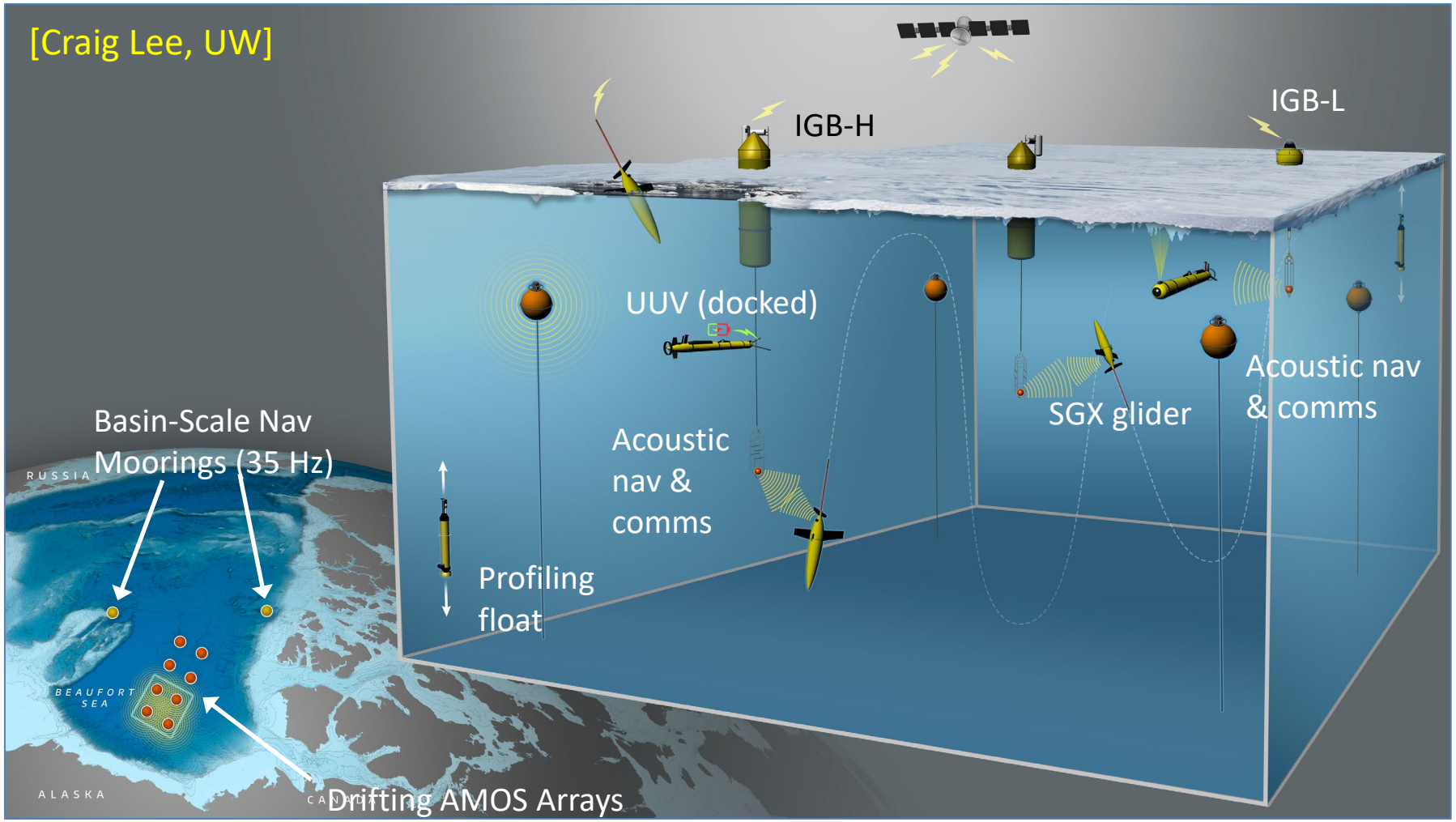
Geopositioning

- Moored and drifting (IGB-H, IGB-L) LF (900 Hz) provide regional coverage.
- Moored VLF (35 Hz) provide basin-scale coverage.

Communication

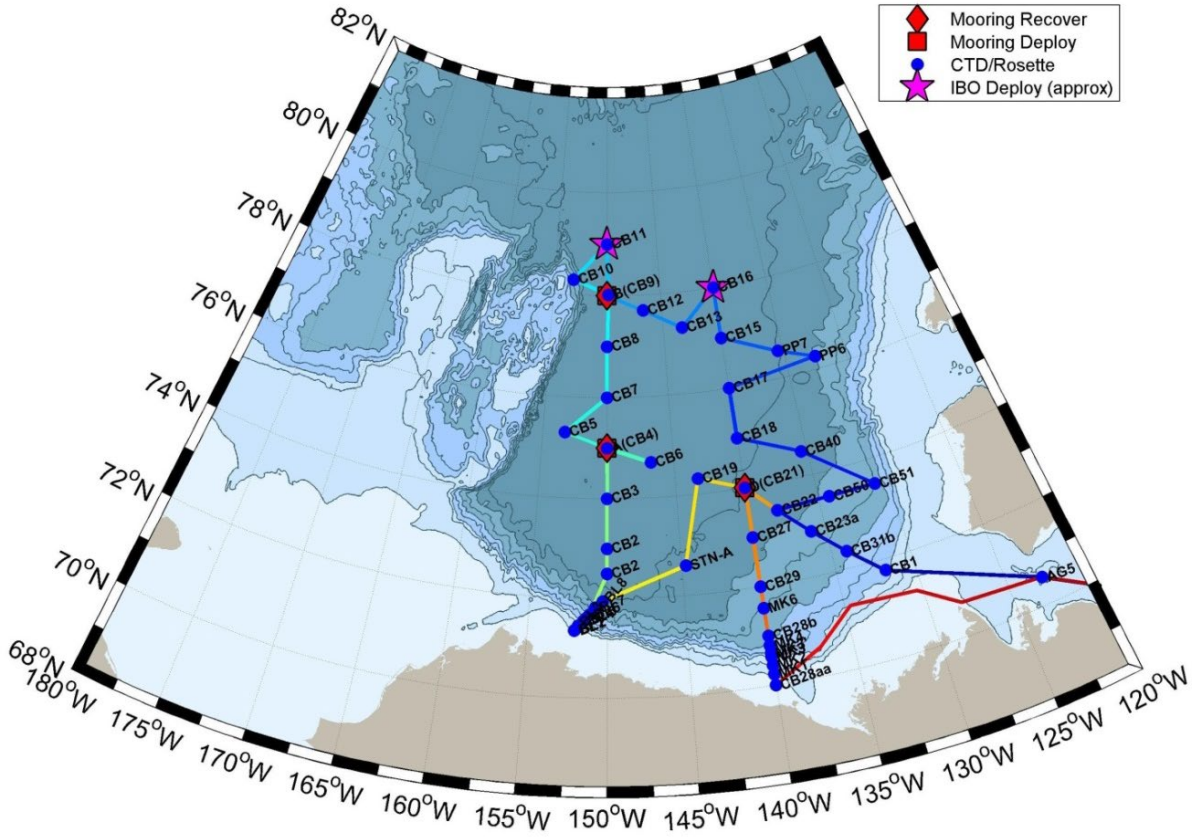
- IGB-H, IGB-L, REMUS, moorings carry LF (900 Hz) to provide low-bandwidth, two-way acomms at 100s of km.
- Gliders and floats can receive 900 Hz, but cannot transmit.
- IGB-H, IGB-L, REMUS, gliders, floats carry 10 kHz systems to provide two-way data transfer at 1s of km.

- Persistent , year-round sampling.
- Networked for communication, data telemetry, platform interaction.
- Basin-scale acoustic geolocation.



Joint Ocean Ice Study / Arctic Observing Network - Beaufort Gyre Observing System, 2025
CCGS Louis S. St-Laurent

- A USA-Canada collaboration aboard the *CCGS Louis S. St-Laurent,* Sept 18-Oct 23 (Cambridge Bay-Cambridge Bay)
- Created and supported by the National Science Foundation, Fisheries and Oceans Canada, Woods Hole Oceanographic Institution (Isabela Le Bras) and Yale (Mary-Louise Timmermans).
- 2025 is our 23rd year!
- Moorings, ice observations, buoys, CTD, rosette bottle biogeochemical sampling, XCTDs, underway sampling



[Bill Williams, DFO]

Beaufort Shelf Marine Observatories (BSMO), 2025

CCGS Sir Wilfrid Laurier: September 30 – October 14

Collaborators include:

- Wildlife Conservation Society Canada
- Environment & Climate Change Canada
- NOAA

- 15 oceanographic moorings to recover/deploy - Instrumentation includes ice profilers (IPS), acoustic current meters (ADCP), Zooplankton profilers (AZFP) and CTDs

- DBO-8 CTD/Rosette section
- 2 CPR tows, 1000 n mi total
- XCTDs across the southern Canada Basin
- Contaminants sampling

Canada

Thank you for your attention.

Questions and comments?

Thank you to all Pacific Arctic Region science colleagues and DBO collaborators, field and laboratory technicians over the years for the time series efforts. Financial support for the science provided by the US NOAA, NSF, ONR, BOEM, NASA, NPRB, USFWS, UAF, and ongoing national and international science partners in the Pacific Arctic Group.

http://pag.arcticportal.org, https://dbo.cbl.umces.edu/,
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