



RESEARCH
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION

NOAA in the Arctic

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AICC Winter Meeting

Seattle, WA

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NOAA Arctic Strategic Drivers

Weather and Water

- Arctic weather, water, and S2S research
- Arctic observations
- Arctic contributions to our global weather modeling to implement the Weather Act and regain world leadership in our weather model (ice model advancement and coupling)
- Alaska-unique IDSS and social science

Blue Economy

- Presidential Memorandum on Ocean Mapping and Characterization
- Seafood competitiveness and mariculture in Alaska
- Tourism and recreation support from all lines
- Coastal resilience in Alaska

Innovative Partnerships in Alaska and the Arctic

- National Security
- Engagement with Indigenous communities

Overview of NOAA's Arctic Work

6 Line Offices

- ❖ NMFS*
- ❖ NOS*
- ❖ OAR*
- ❖ NWS
- ❖ NESDIS
- ❖ OMAO*

- National Marine Fisheries Service - Alaska Fisheries Science Center
 - Fish and marine mammal surveys in Gulf of Alaska, Aleutian Islands, East Bering Sea, Northern Bering and Chukchi Sea, and the Beaufort
 - *Arctic Strategic Plan, expand surveys into N. Bering and Chukchi as cod/pollack continue to move north, innovative tech, ecosystem assessment for adaptive management
- National Ocean Service
 - Ocean & coastal mapping, water levels and ocean modeling, HABs, oil spill response
 - *Presidential memo on Alaska and Arctic mapping

Overview of NOAA's Arctic Work

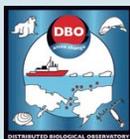
6 Line Offices

- ❖ NMFS*
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- Oceanic and Atmospheric Research
 - Distributed Biological Observatory, moorings, ice buoys, Saildrone, ocean acidification, HABS, sea ice modeling and forecasting, ocean exploration
 - *maintain long-term monitoring and observations, innovative tech, Bering Sea changes, HABs, support Pres. memo on mapping, modeling and forecasting of sea ice and mid-latitude impacts
- Office of Marine and Aviation Operations
 - Operates NOAA fleet
 - No ice-capable ship; Oscar Dyson & Fairweather in AK

NOAA Arctic Activities - FY20

- No NOAA-sponsored HEALY cruise in FY20
 - DBO/EcoFOCI on the NOAA FAIRWEATHER
 - August 1 - 24, Nome - Nome
 - Physics, nutrients, benthic, HABs, zooplankton, larval fish, microbes, sea birds, marine mammals, and 22 moorings



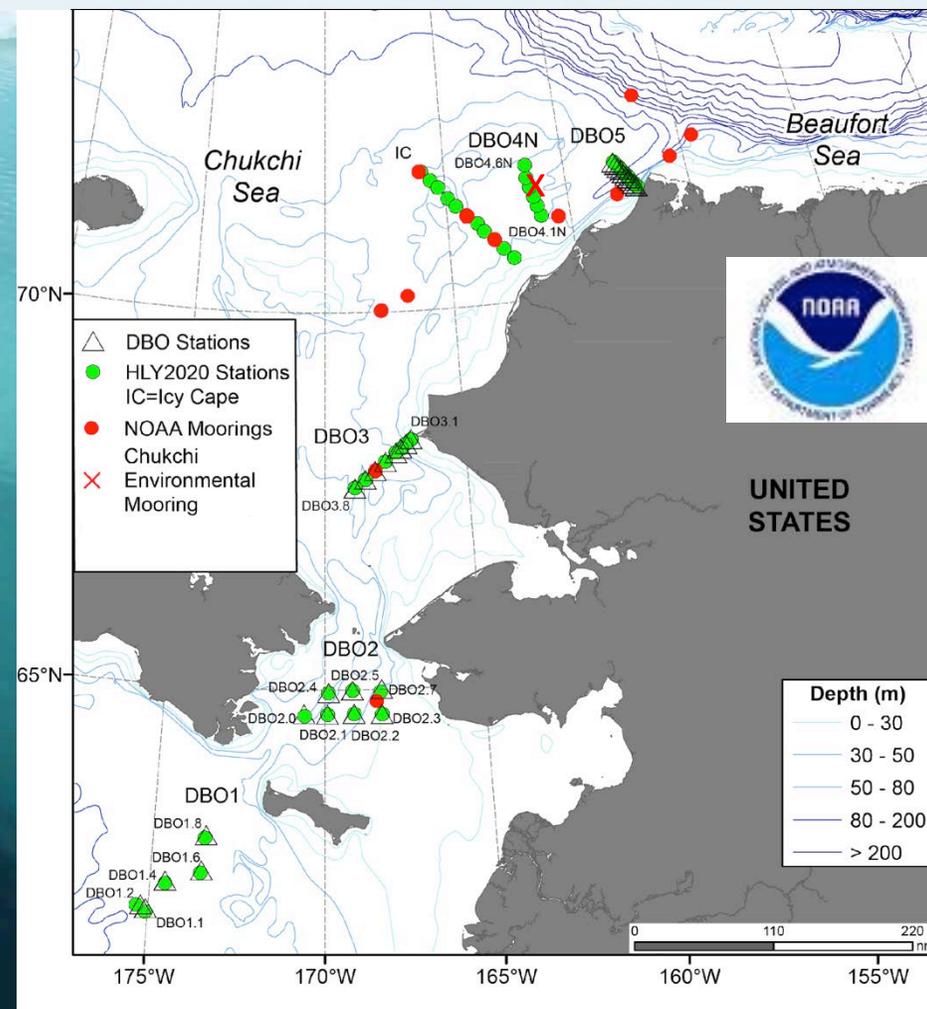
Contact: Chief Scientist: JackieGrebmeier/UMCES:
jgrebmei@umces.edu
DBO-NCIS = Distributed Biological Observatory –
Northern Chukchi Integrated Study



EcoFOCI

Ecosystems & Fisheries-Oceanography Coordinated Investigations

Contact: Phyllis Stabeno/NOAA:
phyllis.stabeno@noaa.gov



NOAA Arctic Activities - FY21 & Beyond

- DBO/EcoFOCI/AMBON in FY21
 - Consolidating footprint - internal conversation ongoing
 - Could align with SAS cruise on HEALY - NSF funded?

- Arctic GO-SHIP in FY25?
 - Previously on the HEALY in FY15
 - Proposal in works to NSF, but some NOAA work aboard (tentative)

HEALY Cruise 1901

Project Title: The Distributed Biological Observatory –
Northern Chukchi Integrated Study (DBO-NCIS)

Dates/Ports: August 4-23, 2019 / Nome to Nome

Chief Scientist: Robert Pickart, WHOI

Science Party: 40 scientists comprising 10 groups from 9 institutions

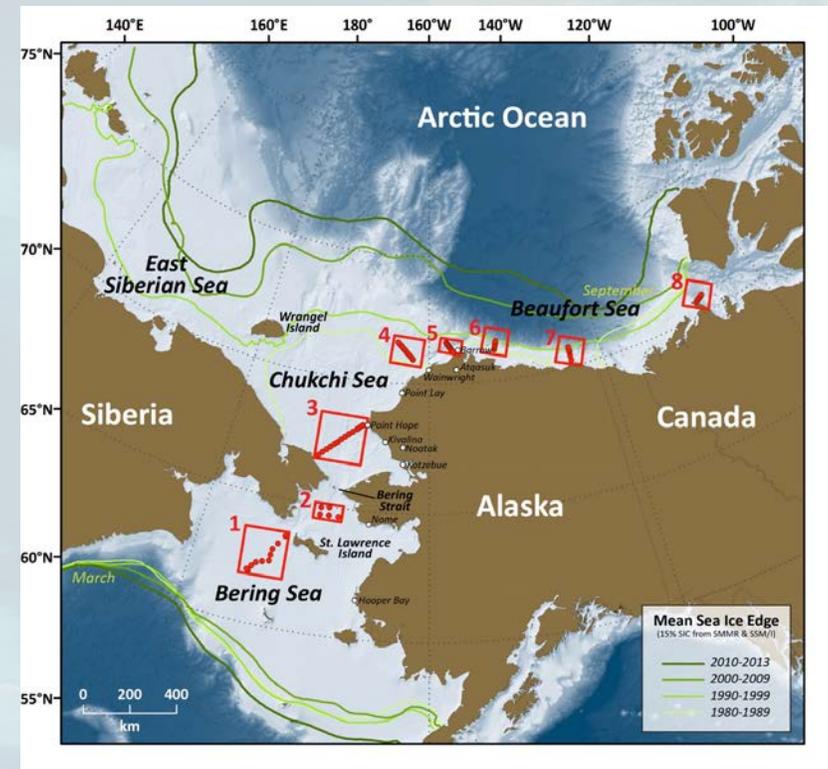
HEALY 1901

There were two primary components to the cruise

1. Distributed Biological Observatory

DBO is comprised of a set of eight transects spanning the region from the Northern Bering Sea to the eastern Beaufort Sea. The locations were chosen because they correspond to biological “hotspots”.

DBO sections



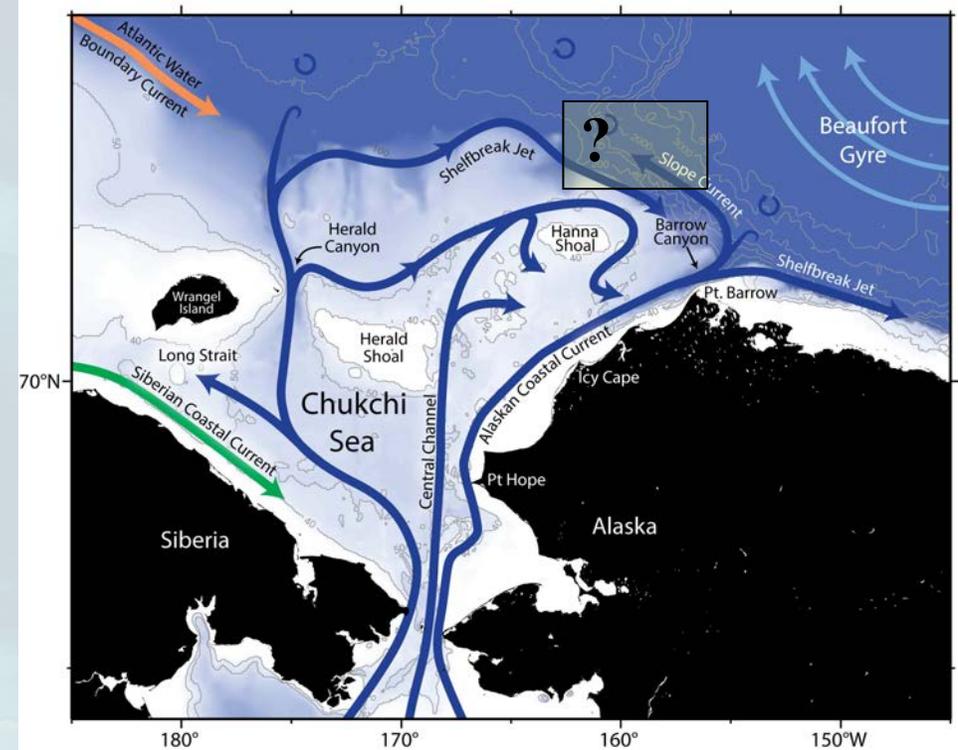
HEALY 1901

There were two primary components to the cruise

2. Northern Chukchi Integrated Study

NCIS is more exploratory science. In the past we've investigated the circulation on the northeast shelf and the outflow from Barrow Canyon. In 2019 we addressed the fate of the Chukchi Slope Current.

Schematic flow map of Chukchi Sea



HEALY 1901

Shipboard operations

During the cruise we carried out:

- [CTD casts](#) [24-place rosette, 10L Niskins]
- [water sampling](#) [oxygen, DIC, TA, nutrients, Chl, O18, INPs, HABs, microbes, salts]
- [net tows](#) [zooplankton, larval fish]
- [benthic work](#) [cores, grabs]
- [moorings](#) [oceanographic, sediment traps]
- [underway measurements](#) [shipboard ADCP, Imaging Cytobot, HydroFIA, CTD/pCO₂]
- [atmospheric measurements](#) [aerosols]
- [upper trophics](#) [seabirds, marine mammals]
- [additional operations](#) [Saildrone calibration, float deployments]
- [outreach](#) [PolarTREC teacher, blogging]

HEALY 1901

CTD and water sampling: 124 stations



Photos by Lindsey Leigh Graham/NOAA

HEALY 1901

Zooplankton and larval fish: Bongo net tows



Photos by Lindsey Leigh Graham/NOAA



HEALY 1901 Benthic biology/chemistry: Haps cores and van Veen grabs



Photos by Lindsey Leigh Graham/NOAA

HEALY 1901

Atmospheric measurements: aerosols

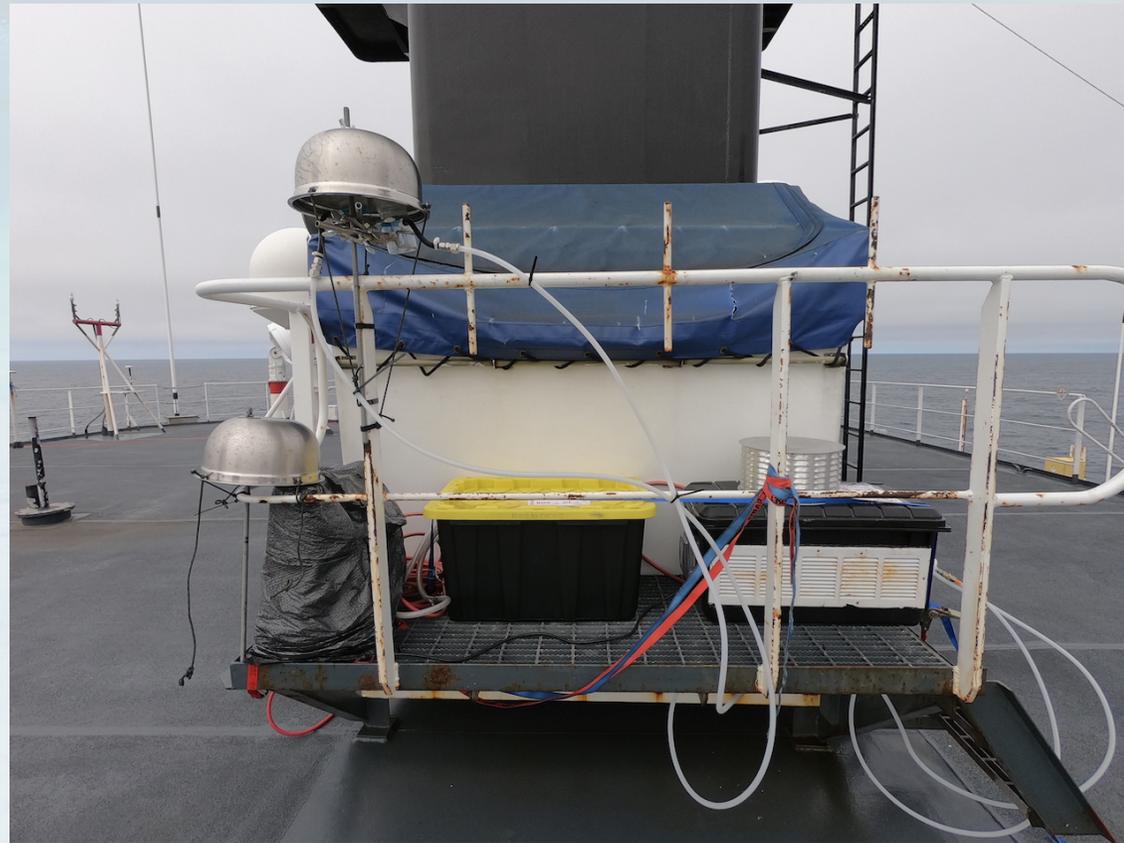


Photo by Jun Uetake/CSU

HEALY 1901

Moorings: 6 recoveries and 3 deployments



Photos by Jo Onodera/JAMSTEC

HEALY 1901

Seabirds and marine mammals: NFWS observers



Photos by Linnaea Wright / NFWS

HEALY 1901

Seabirds and marine mammals: NFWS observers

Retrieving a dead
bird on HLY1901



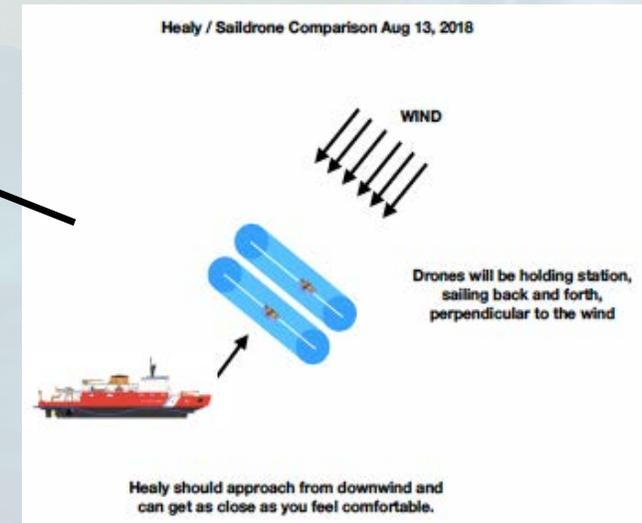
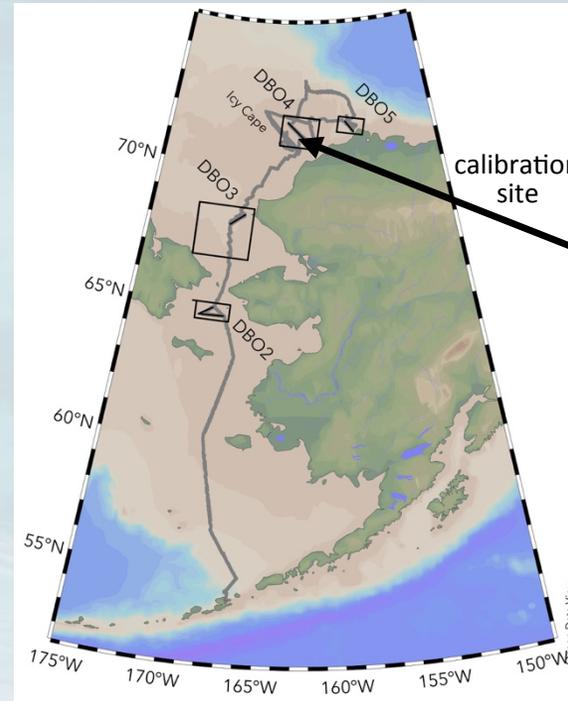
Photos by Linnaea Wright / NFWS

HEALY 1901

Additional operations: Sairdrone calibration



Photo by Lindsey Leigh Graham/NOAA



HEALY 1901

Outreach



PolarTREC journals:

<https://www.polarrec.com/expeditions/northern-chukchi-integrated-study>

NOAA Research News:

<https://research.noaa.gov/article/ArtMID/587/ArticleID/2480/Searching-for-tiny-clues-to-changing-seas>

<https://research.noaa.gov/article/ArtMID/587/ArticleID/2479/Bird-die-offs-provide-window-into-a-changing-Arctic>

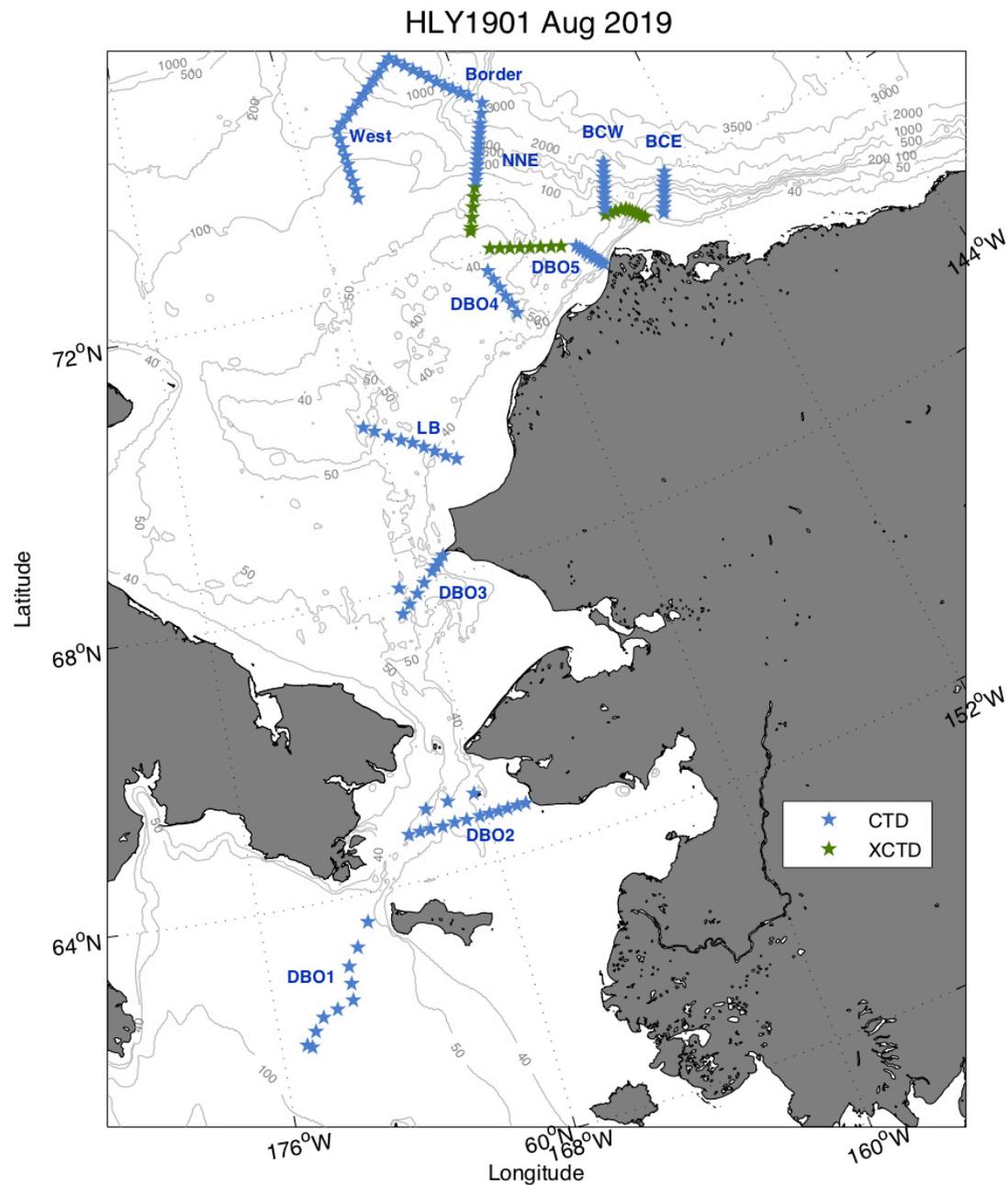
Photo by Nicole Villeneuve

PolarTREC teacher Piper Bartlett-Browne from St. Thomas Aquinas High School in Dover, NH; hosted by Lee Cooper, UMCES.

HEALY 1901

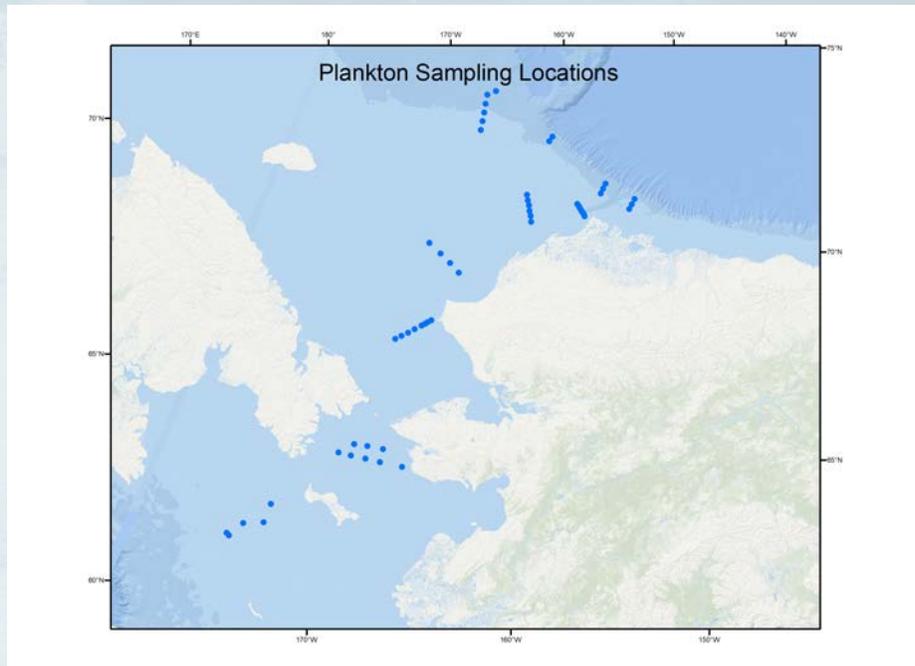
We departed Nome two days late due to inclement weather, yet we accomplished nearly all our goals

Station map for HLY1901

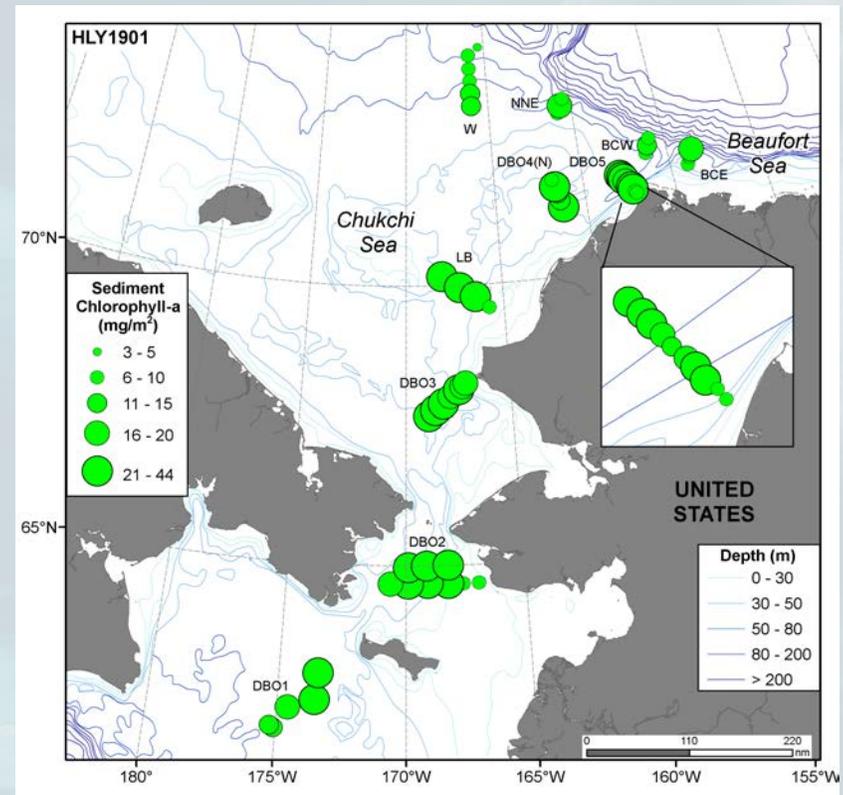


HEALY 1901 Multidisciplinary DBO lines (process stations)

Net tow locations



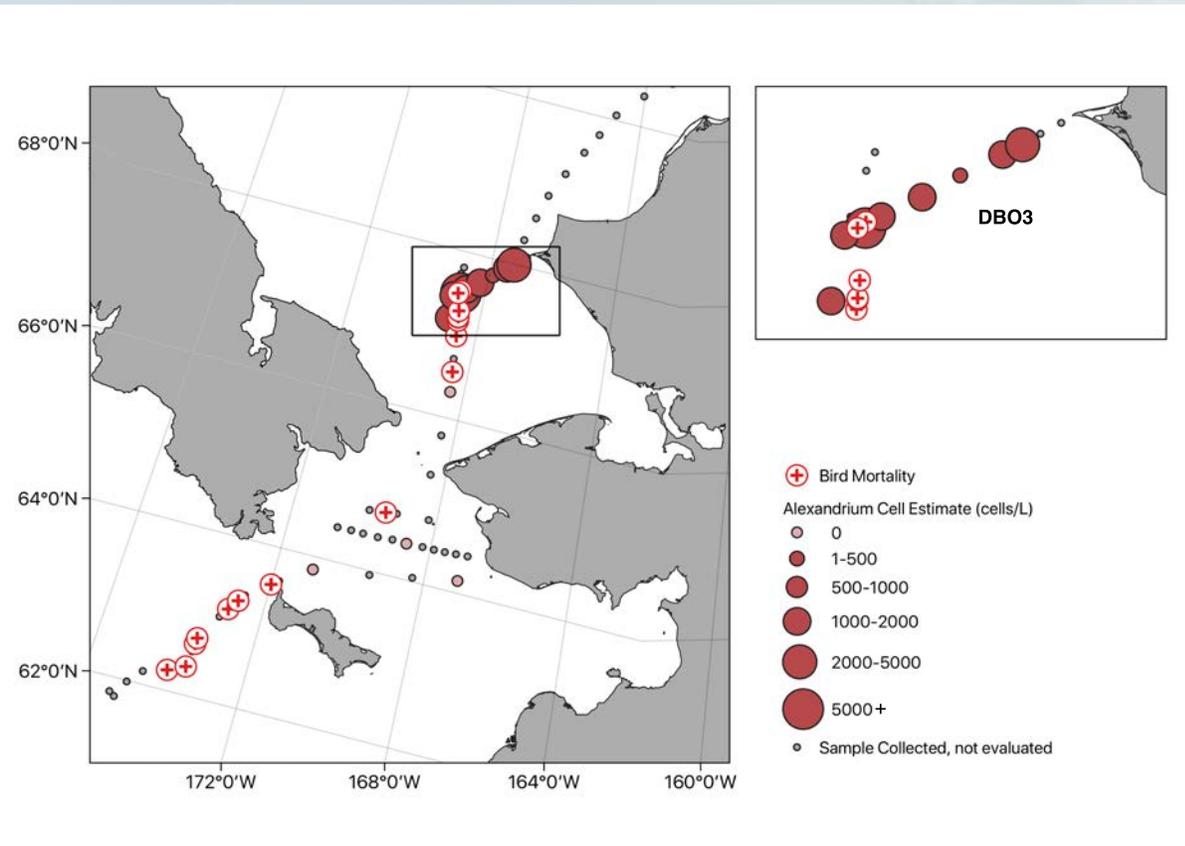
Sediment chlorophyll map



HEALY 1901 Science highlight

Harmful algal bloom observed near Point Hope coincident with increased bird mortality

Anderson Lab (WHOI)



HEALY 1901

Input for AICC

- Adequate time for testing of gear during shakedown
- Station keeping and multiple component stations
- Mooring ops capability
- Increased use of small boat operations for science
- Mapserver (or enhanced Healy webpage)
- Northern ports (Nome, Utqiagvik)
- Pre-cruise planning (UNOLS cruise form, telecons)

HEALY 1901

Acknowledgements

We acknowledge the officers and crew of the *Healy*, whose hard work and dedication enabled us to carry out our science operations in a safe and productive environment. The team of STARC technicians kept the ship's science systems running smoothly throughout the cruise.



Questions?