

NOAA Update

AICC Winter 2021 Meeting

February 4, 2021

David Allen, NOAA Arctic Research Program

Jackie Grebmeier, Chief Scientist

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MD



Updates from the 2020 NOAA Ship Oscar Dyson DBO/EcoFOCI Cruise Aug 24-Sept 26, 2020

Jackie Grebmeier, Chief Scientist

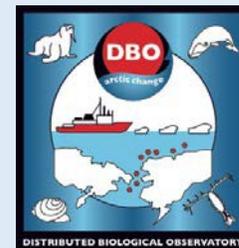
At sea:

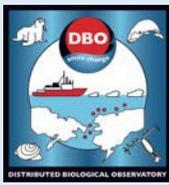
Catherine Berchok, NMML
Sarah Donohue, NOAA Corp
Charlie Wright, USFWS,
AMBON/UAF, plus Dyson
Officers and crew



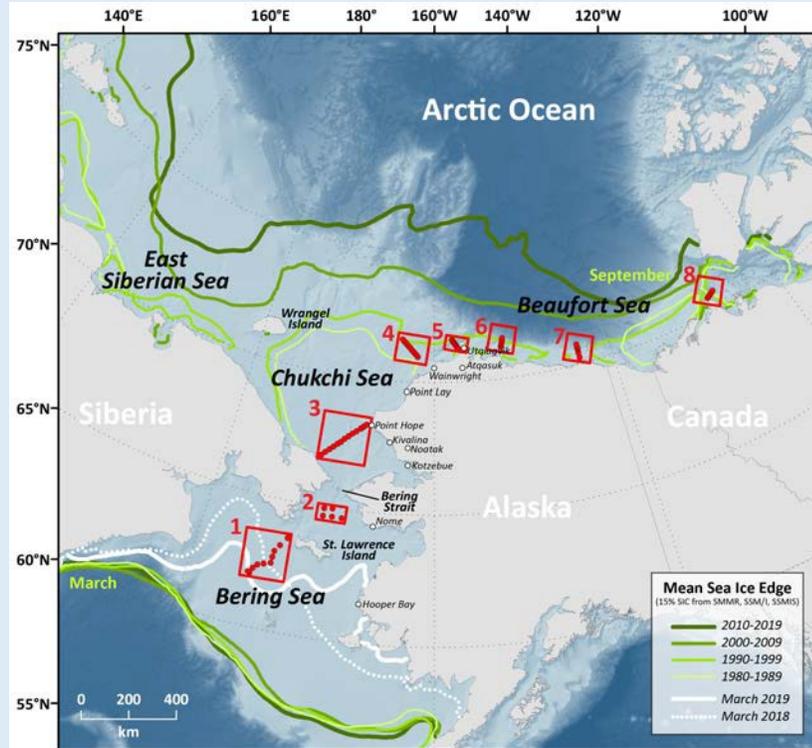
EcoFOCI

Ecosystems & Fisheries-Oceanography Coordinated Investigations





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



[updated from Grebmeier et al. 2019, DBO DSR Special Issue 162:1-7]

Core Ship-based sampling:

- CTD and ADCP
- Chlorophyll, nutrients, carbon products
- Plankton (size, biomass and composition)
- Benthos (size, biomass and composition)
- Seabird and marine mammal surveys
- Fishery acoustics
- Bottom trawling (every 3-5 years)

Autonomous sensor sampling:

- Gliders, moorings, saildrone
- Satellite observations

DBO lines also embedded in process cruises

- DBO sites (red boxes) are regional “hotspot” transect lines and stations, based on high productivity, biodiversity, and/or overall rates of change
- DBO serves as a change detection array for consistent monitoring of biophysical responses
- Sites occupied by national and international entities with shared data plan





NOAA'S EcoFOCI program:

- conducts research in the Gulf of Alaska, Bering Sea and US Arctic to understand the dynamic relationships among climate, fisheries, and the marine environment to ensure sustainability of Alaskan living marine resources and healthy ecosystems.

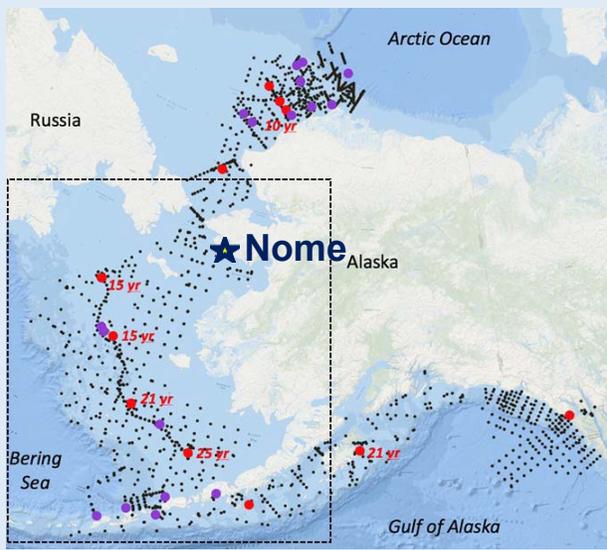
- **LONG TERM ECOSYSTEM RESEARCH TO UNDERSTAND, ADVANCE AND PROTECT RESOURCES**
- **PRODUCTS THAT BENEFIT STAKEHOLDERS & FISHERY MANAGERS**
- **PARTNERS ACROSS FEDERAL and NON-FEDERAL**

NOAA's Arctic Program:

- provides science, service and stewardship to the Arctic and its inhabitants. During the last decade, the program has supported a research cruise to explore Distributed Biological Observatories in the Bering Sea and Chukchi Sea.

www.ecofoci.noaa.gov





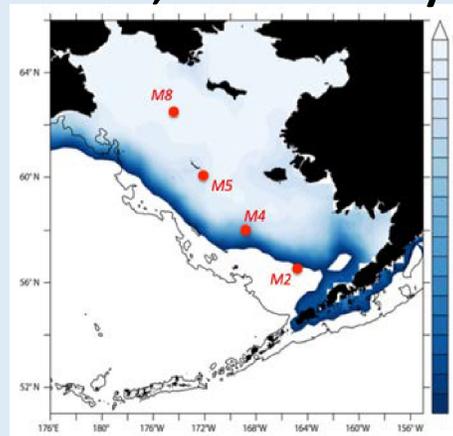
EcoFOCI:

- ~6 cruises/year
- >100 days at sea/year
- Includes an Arctic Research Program cruise to the U.S. Arctic

Instruments: Long-term moorings, short-term moorings, hydrographic stations, drifters, and new technology.



- But in 2020...
- EcoFOCI participated in one research cruise, Oscar Dyson

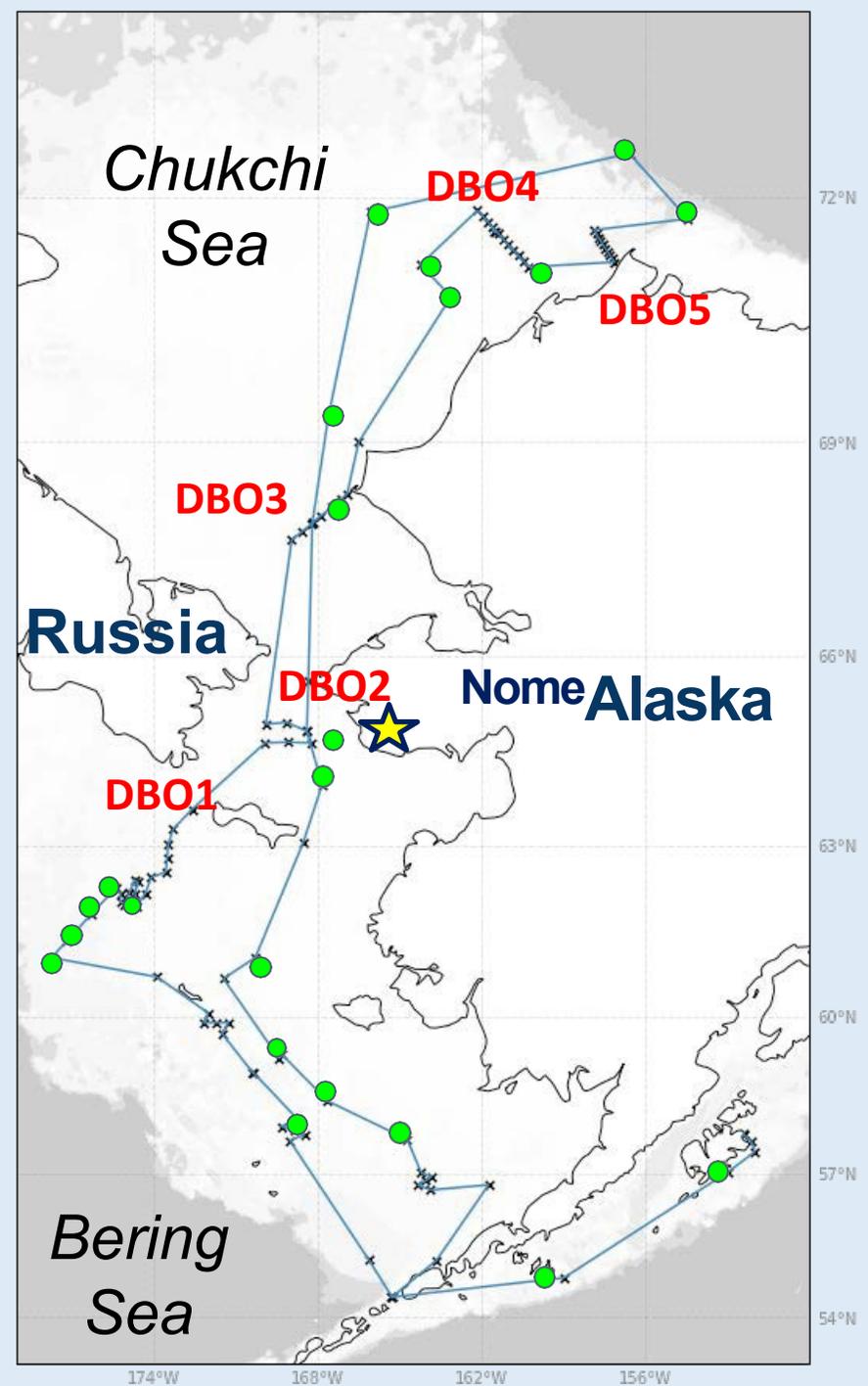


- maximum ice extent in 2020
- 4 time series moorings: M2, M4, M5, M8

R/V Dyson accomplishments

- >6,000 km traveled, 25 days at sea
- Sampled 5 Distributed Biological Observatories (DBO)
- Seabird Observer
- ~20 mooring sites (biophysical, marine mammals, and echo sounders), pop-up buoys,
- 68 CTD (nutrients, oxygen, chlorophyll-a), satellite-tracked drifters,
- 24 eDNA genetics samples
- 30 water column HABS
- 50 zooplankton tows

This cruise was a collaborative effort by NOAA's Arctic Research Program, AFSC, PMEL, and academic partners. It was accomplished through the hard work of the shore-based staff, sea-going scientists, and the crew and officers of Dyson.



NORSEMAN II

October 2-22, 2020
Nome to Nome



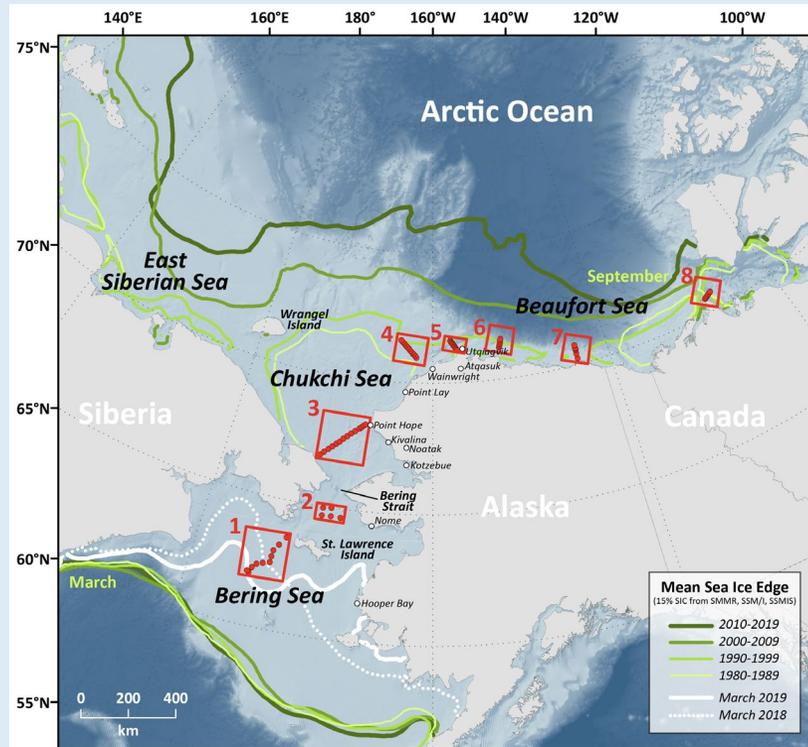
Norseman science team & crew, October 22, 2020



- Chukchi Ecosystem Observatory recovery and re-deployment; new deployment at SLIP1 (near M8)
 - Arctic Marine Biodiversity Observing Network: zooplankton and e-DNA sampling
 - Distributed Biological Observatory grid



Norsemen II Cruise



[updated from Grebmeier et al. 2019, DBO DSR 162:1-7

- DBO serves as a **change detection array** for consistent monitoring of biophysical responses

- Sites normally occupied multiple times during the year, but limited due to COVID 19 this year

- Connection between surface water column plant production and animals living in the underlying sediments
- Time series effort in the Distributed Biological Observatory (DBO) evaluates water column and sediment samples at regional biological hotspots
- RV Norseman II Oct 3-22 to sample marine sediment and macrofauna, physical, chemical, and zooplankton measurements at DBO sites
- Joint program between DBO, Arctic Marine Biodiversity Observing Network (AMBON), Chukchi Ecosystem Observatory (CEO) and NOAA EcoFOCI
- Deploy CEO and M8 moorings/sed traps

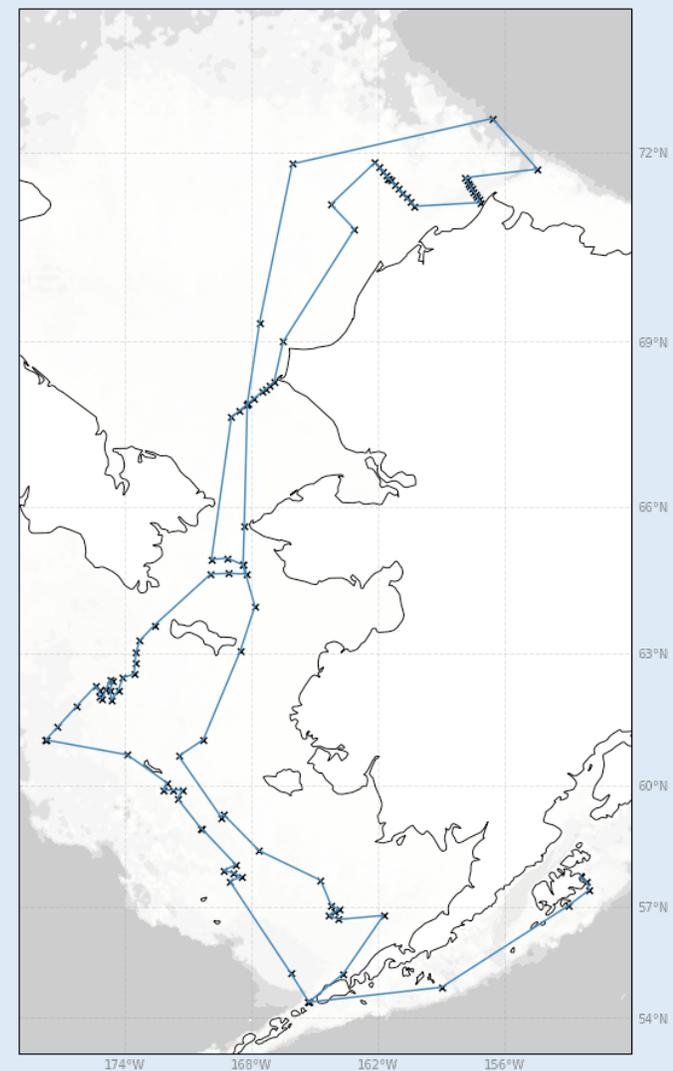
2021 EcoFOCI/DBO-NCIS Cruise

August 10-September 30, 2021; Seattle-to-Kodiak; TBD

Goal: evaluate ecosystem status and change at time series stations and deploy/retrieve ~25 NOAA moorings & Chukchi Environmental Observatory (CEO) mooring

Standard measurements and process studies:

- Physical: CTD/rosette; mooring retrieval and replacement (NOAA and UAF)
- Chemical: nutrients, oxygen-18
- Chlorophyll-a (chl-a), carbon components
- Water column: zooplankton and larval fish abundance and biomass
- Benthos: macrobenthos abundance, biomass and population structure
- Sediment: organic carbon/nitrogen content, chl-a content, grain size, harmful algal blooms
- Benthic oxygen uptake and nutrient exchange
- Seabird surveys



Contact: Chief Scientist: Jackie Grebmeier/UMCES:
jgrebmei@umces.edu; [DBO-NCIS](#) = Distributed Biological Observatory (DBO) –Northern Chukchi Integrated Study (NCIS)



EcoFOCI

Ecosystems & Fisheries-Oceanography Coordinated Investigations

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