

*Swedish Polar Research Secretariat*

*Research expeditions & the Polar Code*

Dr. Åsa Lindgren  
Head of Ship-based Research Support



**SWEDISH POLAR  
RESEARCH SECRETARIAT**  
POLARFORSKNINGSSEKRETARIATET

# The Secretariat's mission and activities

- » Advance high quality polar research and the dissemination and use of research findings in society
- » Research planning
- » Research infrastructure
- » Communication
- » International negotiations and partnerships
- » Represent Sweden in polar matters
- » Dispense permits according to the Swedish Antarctic Act



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# Infrastructure

- » Abisko Scientific Research Station
- » Wasa and Svea Research Stations in Antarctica
- » The icebreaker Oden
- » The research platforms are continuously developed to meet the needs of scientists





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Swedish Polar Research Secretariat

2021-11-17



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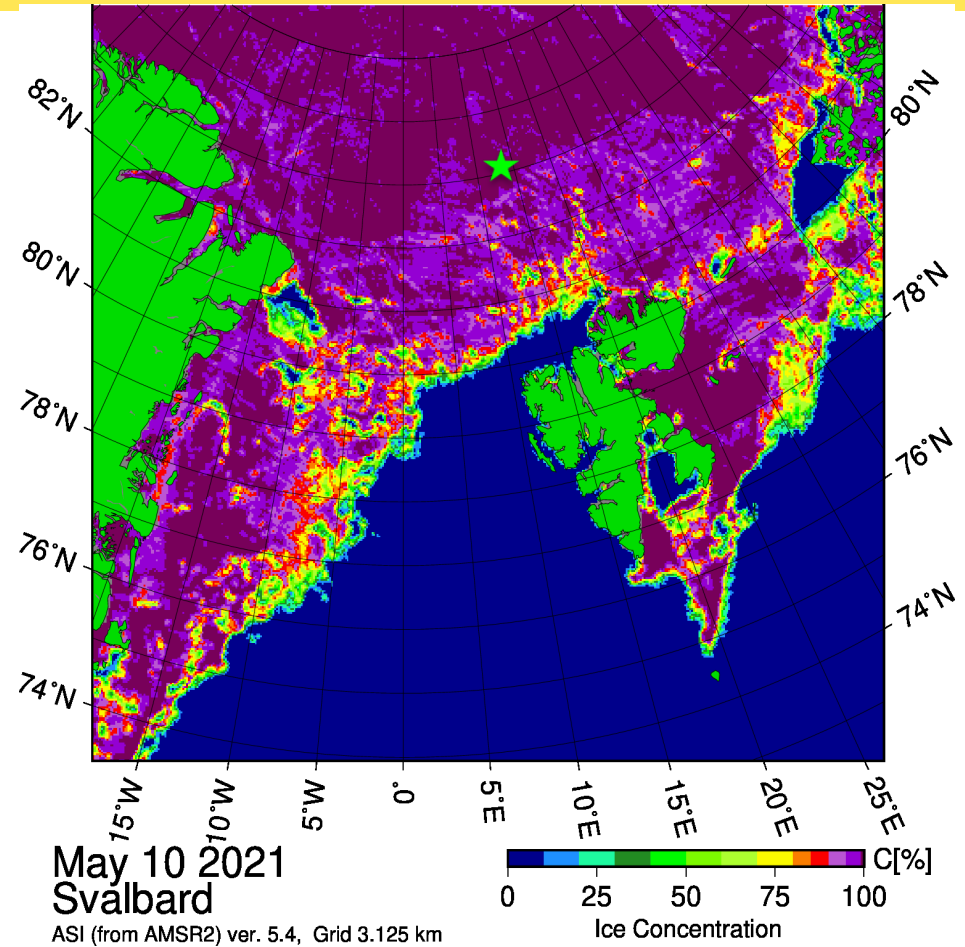
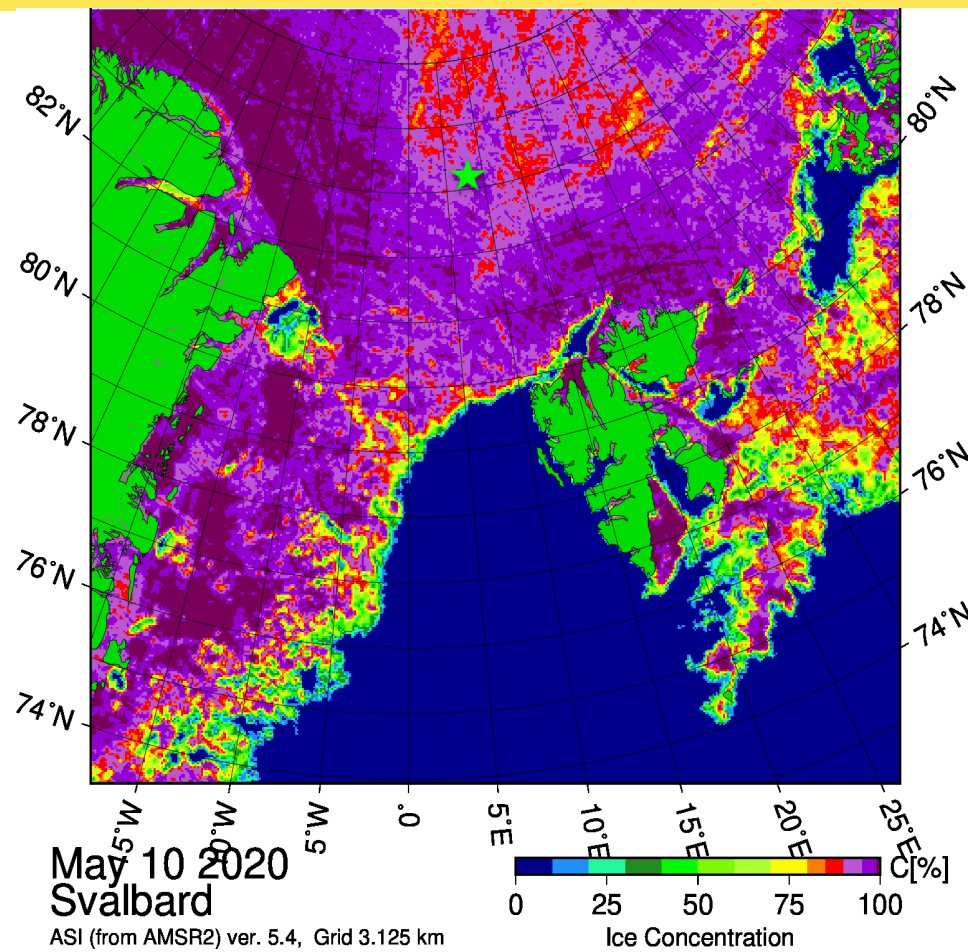
2021-11-17

# Tentative timetable IB Oden

Year	Expedition	Geographical area	Partners	Acronym	Links to relevant documents
2021	Synoptic Arctic Survey	Arctic Ocean	SPRS, ARICE	SAS	<a href="https://polar.se/om-polarforskning/expeditioner/synoptic-arctic-survey-2020-2022/">https://polar.se/om-polarforskning/expeditioner/synoptic-arctic-survey-2020-2022/</a>
2022	ArcOP	Lomonosov Ridge	SPRS, ECORD	IODP 2021	<a href="https://polar.se/om-polarforskning/expeditioner/arcop-2022/">https://polar.se/om-polarforskning/expeditioner/arcop-2022/</a>
2023	Atmospheric rivers and the onset of sea-ice melt	Arctic Ocean	SPRS, open for partners	ARTofMELT, Polar research process	To be updated
2023	Eurasian-Arctic shelf-basin interactions of climate-cryosphere-carbon-contaminants	Kara Sea, East Siberian Sea and Lomonosov Ridge	SPRS, open for partners	EURASIAN ARCTIC C4, Polar research process	To be updated
2024	North Greenland Earth-Ocean-Ecosystem Observatory	North of Greenland	SPRS, open for partners	GEOEO, Polar research process	To be updated

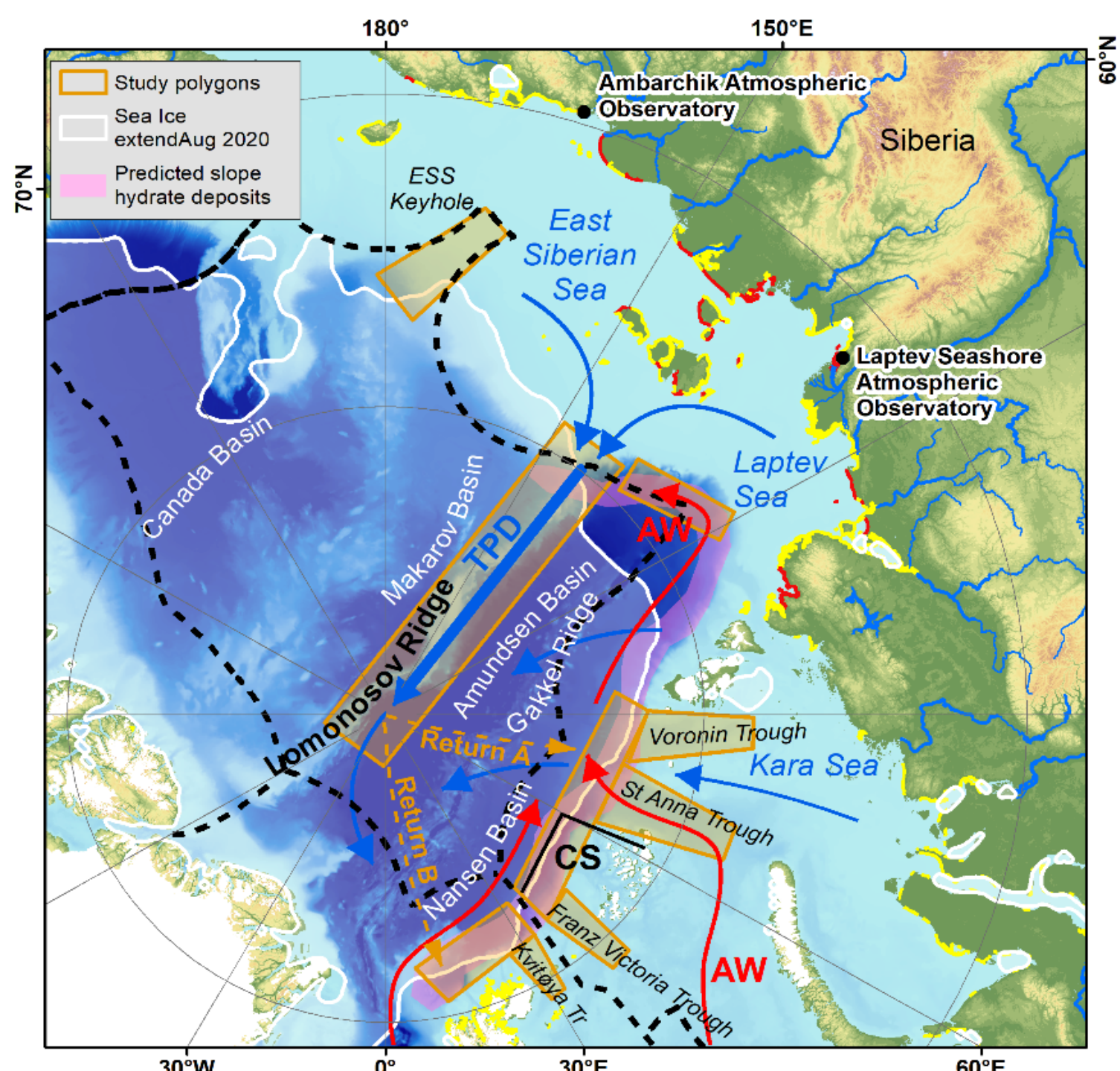






Expedition ARTofMELT 2023, May - June





# Expedition Eurasian Arctic C4 2023, August - September



# Expedition North Greenland Earth-Ocean-Ecosystem Observatory – GEOEO 2024, August - September



# Safety on ice stations





# How can science contribute to safety in Arctic Shipping?

- » **Weather systems & meteorology; improving weather forecasts**
- » **Currents**
- » **Ice coverage & drift**
- » **Bathymetry**



# Improved Ice drift forecasts

# Year of Polar Prediction, YOPP

EGU2019-17576

**MOSAic** International Arctic Drift Expedition

**YOPP** YEAR OF POLAR PREDICTION

**Sea Ice Drift Forecast Experiment** SIDFEx 2017–2020

All the details at [www.polarprediction.net/yopp-activities/sidfex](http://www.polarprediction.net/yopp-activities/sidfex)

**SIDFEx Lead Team:** Helge Goessling, Axel Schweigen, Ed Blanchard, Striggleworth, Thomas Krumpen, Marcel Nicolaus, Ignatius Rigor, Bob Grumbine, Frank Kauker, Rüdiger Gerdes, and Simon Reffenberg

**Contributors:** Wendy Ermold, François Massonnet, Quentin Daladen, Pam Power, Jon Metzger, Michael Phelip, Laurent Berthou, Malte Müller, Maxime Beauchamp, Amy Solomon, Janet Inners, Frédéric Dupont, Yukie Hata, Ed Blockley, Nick Szapiro, Mario Hoppmann, Steffen Tartsche

**Communities involved:** YOPP, MOSAic, SPIN20, FAMOS, SARP

SIDFEx is a community effort to collect and analyse Arctic sea-ice drift forecasts at lead times from days to a year. Forecasts are made with various methods for drifting sea-ice buoys and, ultimately, the trans-Arctic MOSAic drift campaign.

**Why SIDFEx?**

- Provide better guidance than "climatology" ahead of the MOSAic drift start based on the state of the sea ice, ocean, and atmosphere.
- Exploit ice drift forecast capabilities to support drift campaign operations (satellite image ordering, asset recovery, drift camp rendezvous, etc.).
- Learn more about the applied methods, models, and underlying physics by comparing a diverse set of drift forecasts, on a seamless timescale range from days to a year.

**Contribute to SIDFEx!**

- Any forecast method
- Simple format convention
- All data public in real-time
- Software available
- Upload process automatable

**Seasonal forecasts (example)**

Sea Ice Outlook 2018 forecasts for one buoy from six systems. Ellipses enclose 90% probability.

**Short-term forecasts (example)**

10-day forecasts for one buoy from two systems, daily initial times between 14 February and 20 April 2018. Top: Observed (grey) and forecast (coloured) trajectories. Bottom: Drift speed and angle relative to observations.

**SIDFEx Database**

Each dot denotes the availability of a forecast >37,000 SIDFEx forecasts to date!

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**HELMHOLTZ**

**AVI**

**IASC**

# Clipper Adventurer Cruise Ship Runs Aground in the Arctic

By Jim Walker on August 29, 2010

POSTED IN SINKING

Canada's [National Post](#) reports that a cruise ship has run aground in the Arctic.



The newspaper reports that the *Clipper Adventurer*, operated by Adventure Canada and carrying around 200 passengers and crew, ran aground Friday evening in "three meters of water." The location of the grounding is about 55 nautical miles from Coppermine, Nunavut, near the border with the Northwest Territories

But the cruise operator claims that the cruise ship ran aground on an "uncharted rock."

# Arctic Cruise Ship Runs Aground in Canada's Northwest Passage



Akademik Ioffe sailing through loose ice in Paradise Bay. (Photo: Baron Reznik/Flickr)

Published at: Aug 28 2018 - 12:10 / Updated at: Jun 25 2020 - 15:08

# Second attempt to remove grounded fishing vessel underway in northern Svalbard

Last summer's attempt to salvage the *Northguider* had to be called off after bad weather slowed efforts to refloat the vessel.

By Kevin McSwain - July 28, 2020



Members of the Norwegian Kystverk inspect the *Northguider* in July 2019. By that time ice and currents had resulted in the ship listing at larger angle than when it ran aground. (Kystverket)



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Slide by: Martin Jakobsson



THE NIPPON FOUNDATION-GEBCO

SEABED

2030

*Seabed 2030 aims to inspire the complete mapping of the world's ocean by 2030 and to compile all bathymetric data into the freely-available GEBCO Ocean Map.*

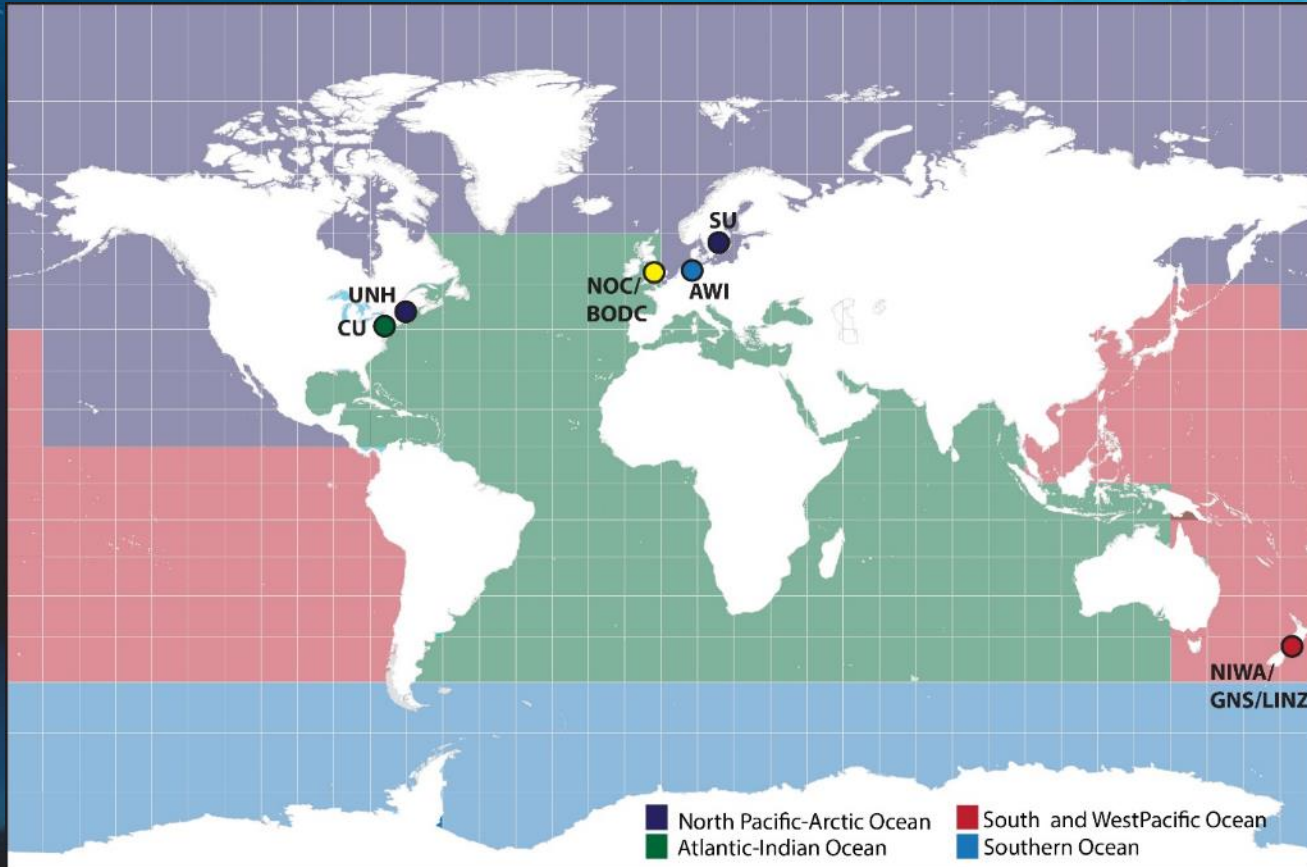
*Collaboration with hydrographic offices aims to improve safe of navigation.*



Slide by: Martin Jakobsson



# The Network of Centers



## North Pacific –Arctic Ocean

Stockholm University & University of New Hampshire (SU & UNH)

## Southern Ocean

Alfred-Wegener-Institut (AWI)

## Atlantic-Indian Ocean

Lamont-Doherty Earth Observatory, Columbia University (CU)

## South-West Pacific Ocean

National Institute of Water & Atmospheric Research (NIWA)  
Land Information New Zealand (LINZ)  
GNS Science (GNS)

## Global Center

British Oceanographic Data Centre,  
National Oceanography Centre (NOC/BODC)



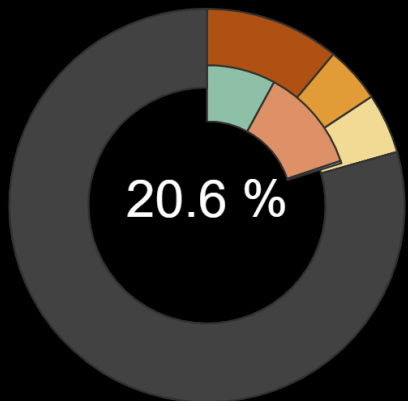
IHO

International Hydrographic Organization



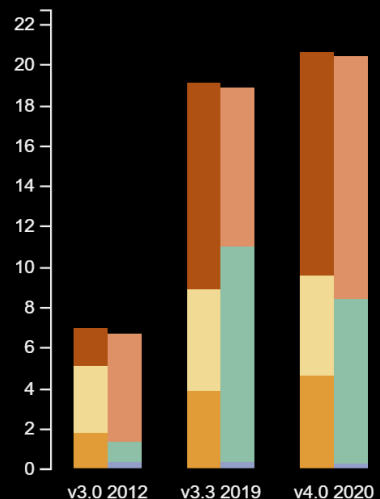
2021-2030 United Nations Decade of Ocean Science for Sustainable Development

# Coverage v4.0.0



- 100 m
- 200 m
- 400 m
- No data
- Grids
- Multibeam
- Singlebeam
- No data

# Coverage



- 100 m
- 200 m
- 400 m
- Grids
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- Singlebeam



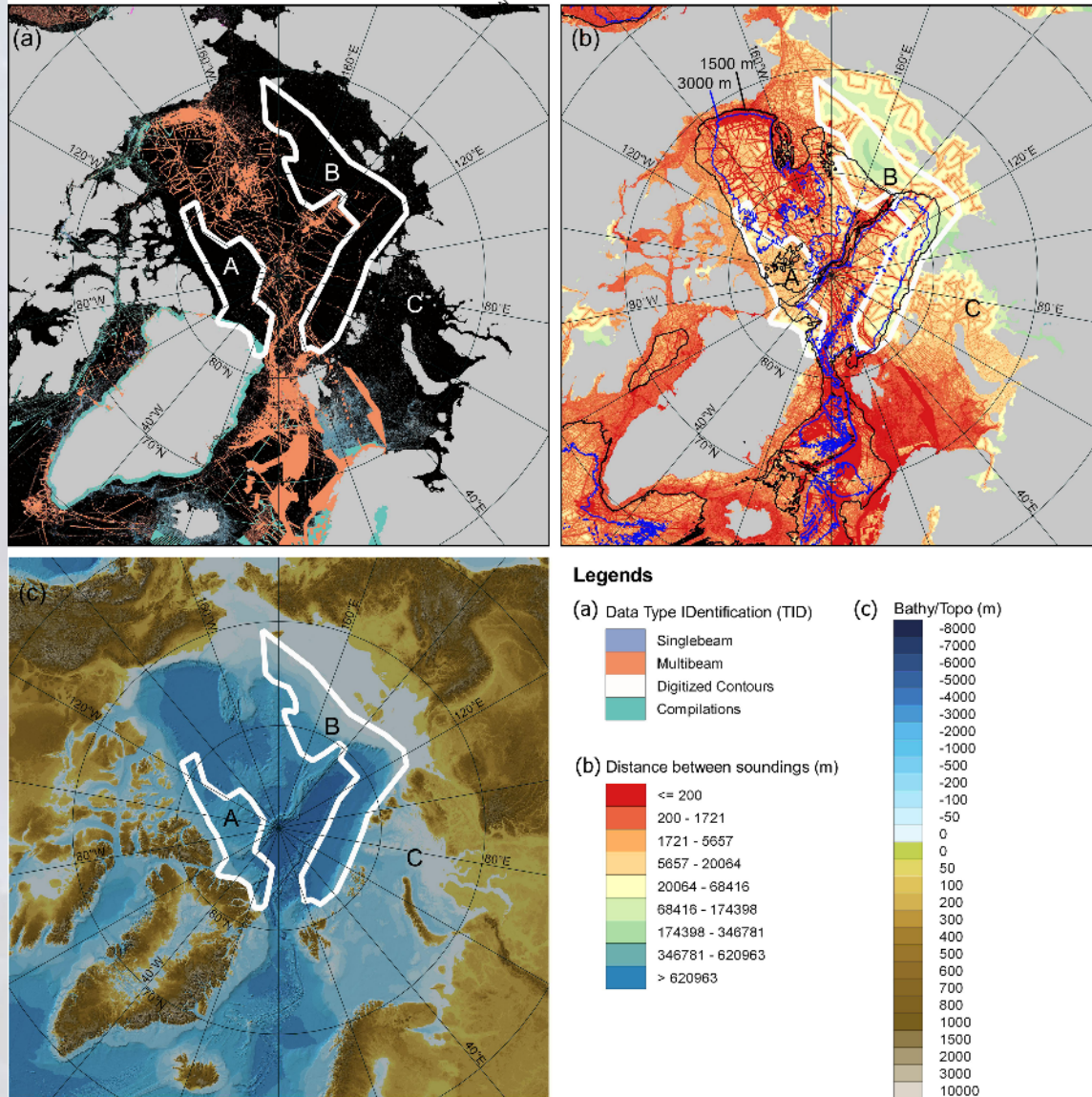
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# SEABED 2030

79.4 % uncharted







## Three areas of particularly poor data coverage in IBCAO 4.0

**A. Off Northern Greenland and the Canadian Arctic Archipelago**

**B and C. The outer continental shelves and slopes of the western Chukchi, East Siberian, Laptev, Kara and Barents seas**

In area A data are scarce because of few mapping activities due to difficult ice conditions. The are likely data existing in areas B and C which not yet been contributed to IBCAO.

Figure from Jakobsson and Mayer, submitted to *Ocean Frontiers*

# Questions?



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