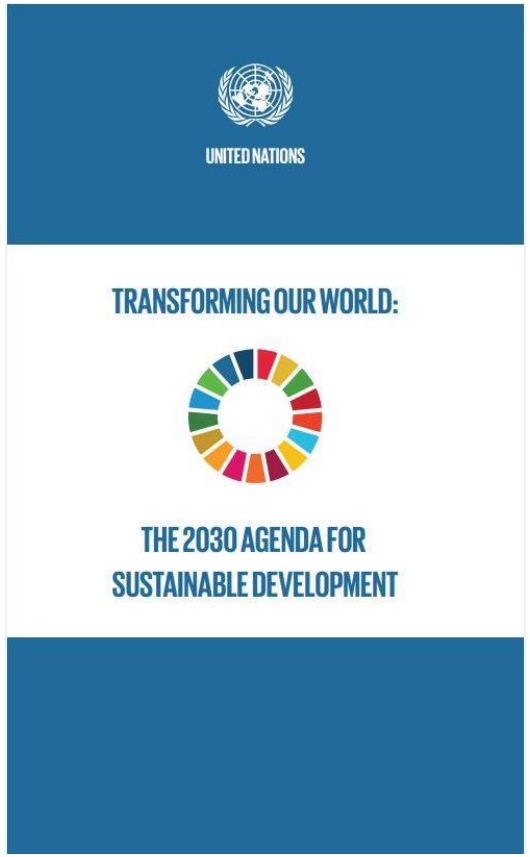
Kartverket

How to contribute to the last exploration of our planet

Join the crowd, map the seabed
Nordic Hydrographic Commission

UN Agenda for Sustainable Development 2030



- Adopted by UN General Assembly September 2015
- UN Sustainable Development Goal 14 specifically targets the conservation and sustainability of the oceans, seas and marine resources
- Growing realization that almost all activities and phenomena in, on or under the sea are influenced in some way or other by the depth and the shape of the seafloor.

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

TARGET 14.A

INCREASE SCIENTIFIC KNOWLEDGE, RESEARCH AND TECHNOLOGY FOR OCEAN HEALTH

International Hydrographic Organization

A principal Aim of the IHO is to ensure that all the world's seas, oceans and navigable waters are surveyed and charted.

The **Mission** of the IHO is to create a global environment in which States provide adequate and timely hydrographic data, products and services and ensure their widest possible use.

The **Vision** of the IHO is to be the authoritative worldwide hydrographic body which actively engages all coastal and interested States to advance maritime safety and efficiency and which supports the protection and sustainable use of the marine environment.

IHO Secretary General Robert Ward at IRSO 2017:

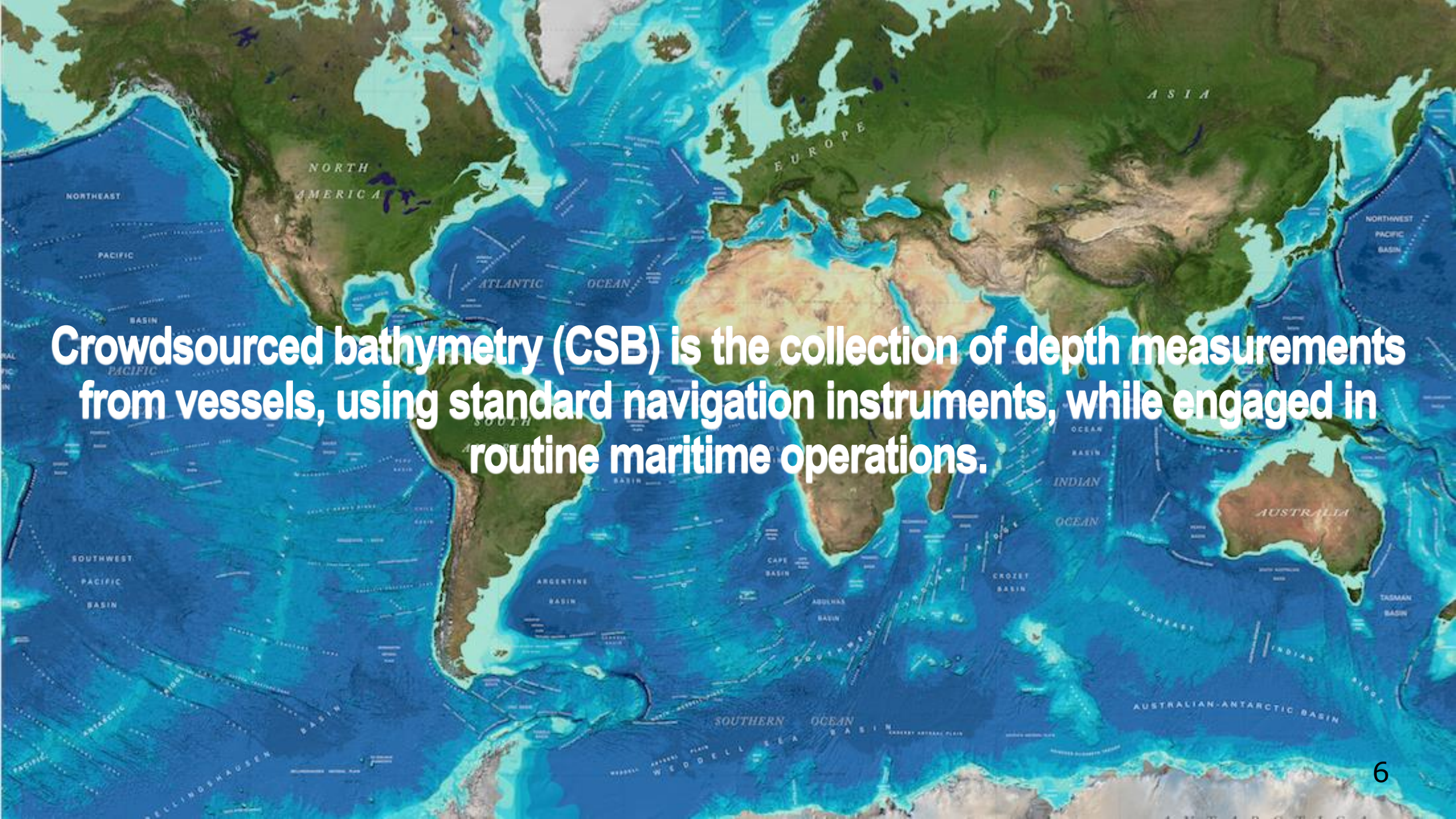
Data coverage is very poor and improving only very slowly

- Waiting for hydrographic survey ships is NOT an option!
- Hidden or lost data should be identified and made discoverable
- All ships at sea can be collecting useful depth data - using existing equipment

My take-home messages:

… The ship's echo sounder should be running and recording whenever possible

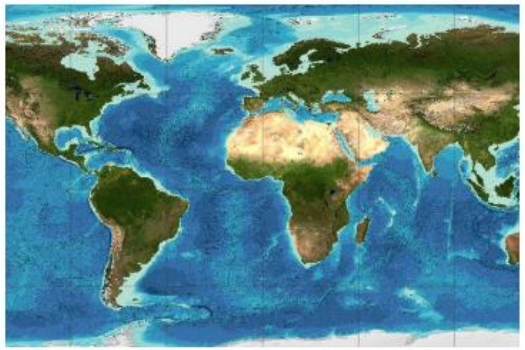
… Existing depth data, collected for whatever reason, should be made discoverable


Crowdsourced bathymetry (CSB) is the collection of depth measurements from vessels, using standard navigation instruments, while engaged in routine maritime operations.

It’s not new:

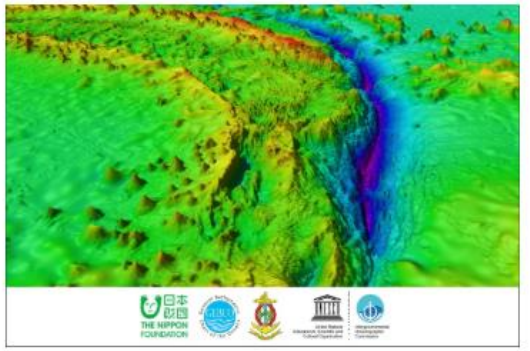
GEBCO started in 1903!

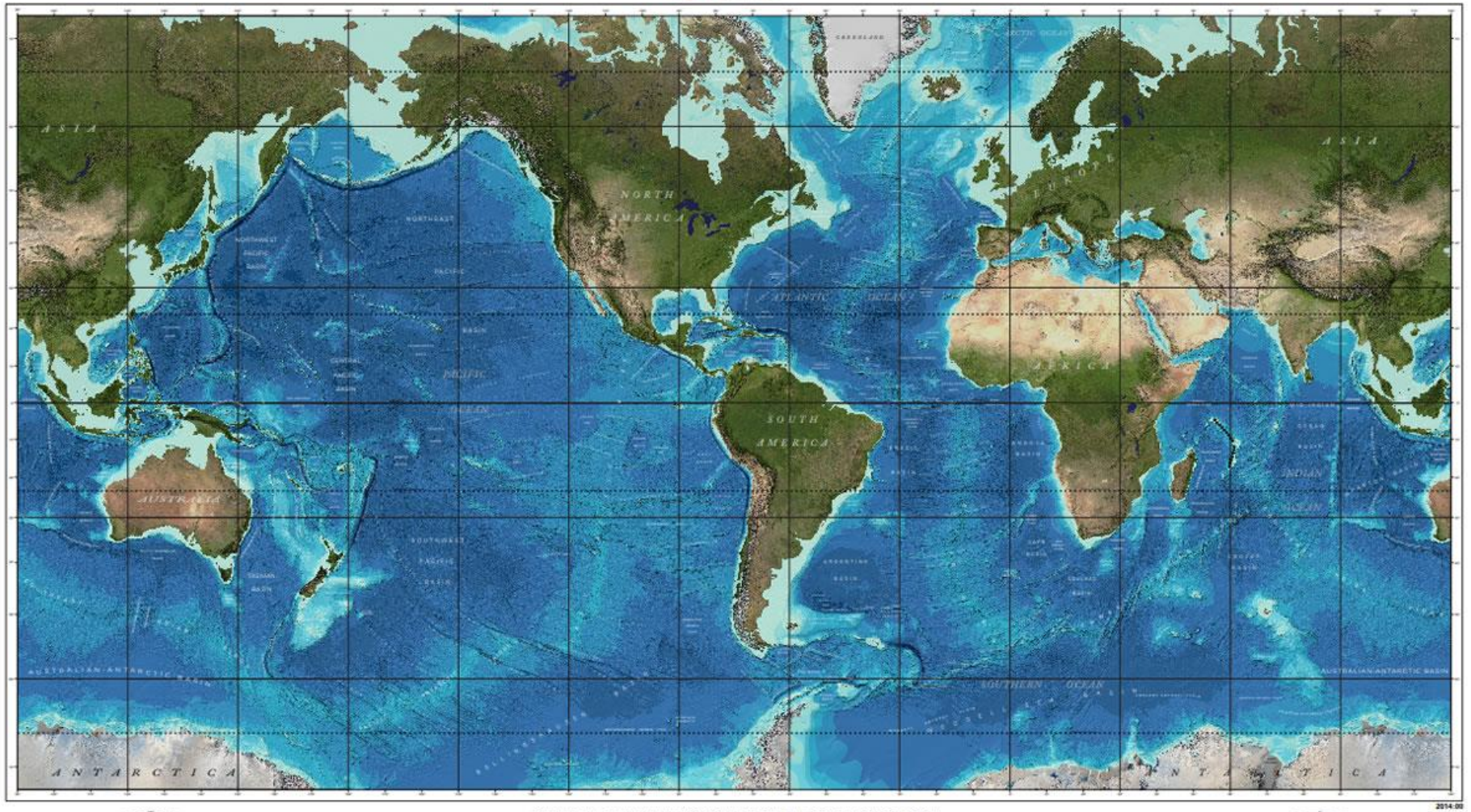
Gridded Bathymetry Data



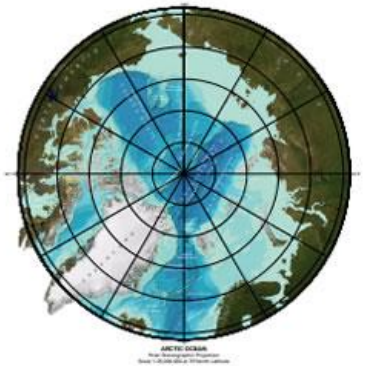
Data & Products

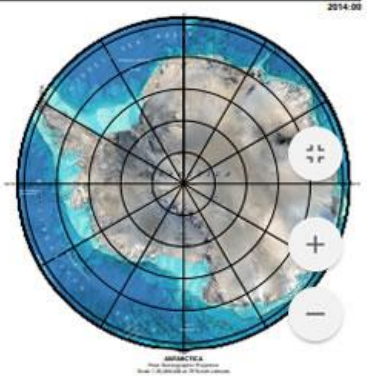
Seabed 2030





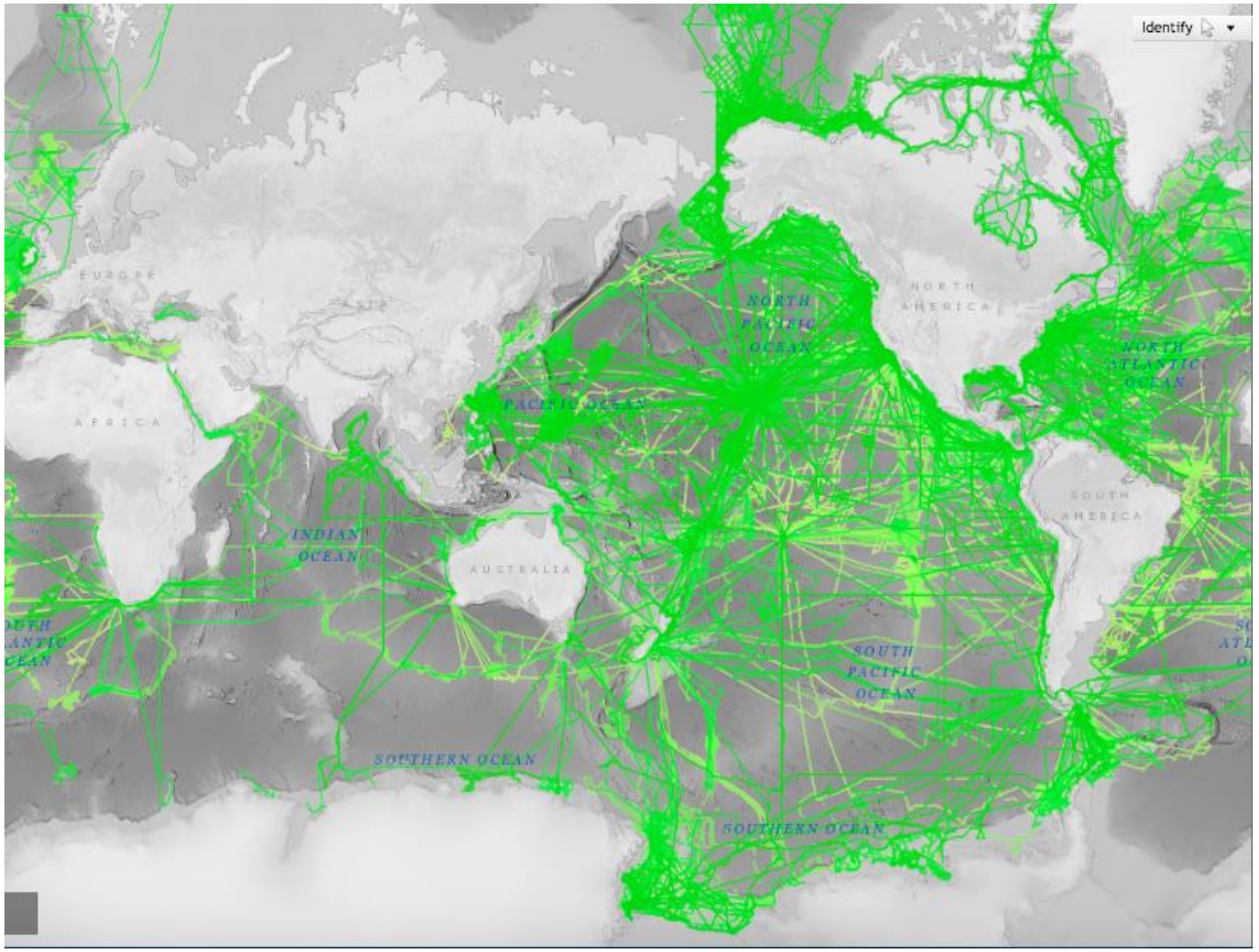
GENERAL BATHYMETRIC CHART OF THE OCEANS (GEBCO)
WORLD OCEAN BATHYMETRY



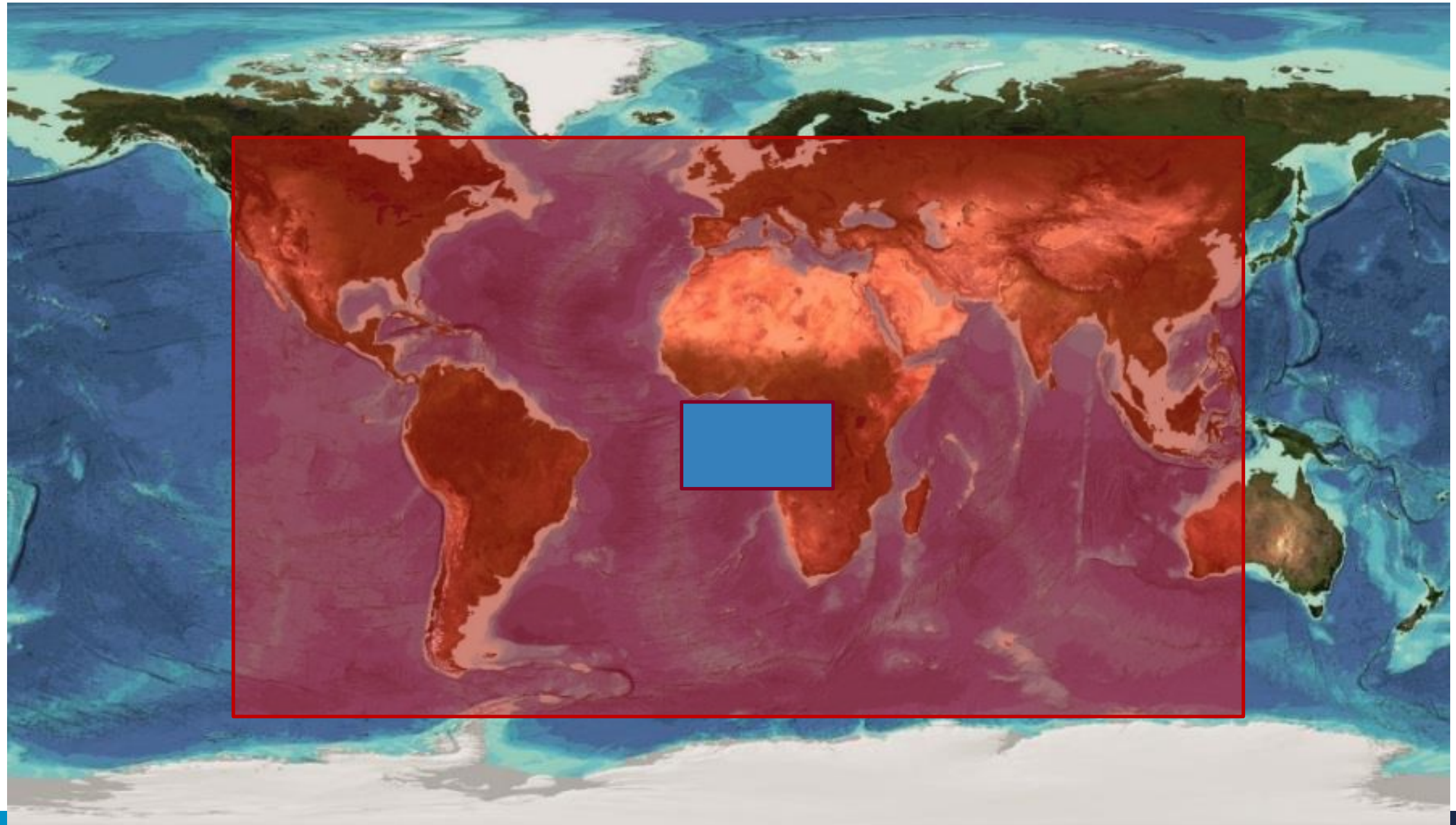


The IHO & GEBCO

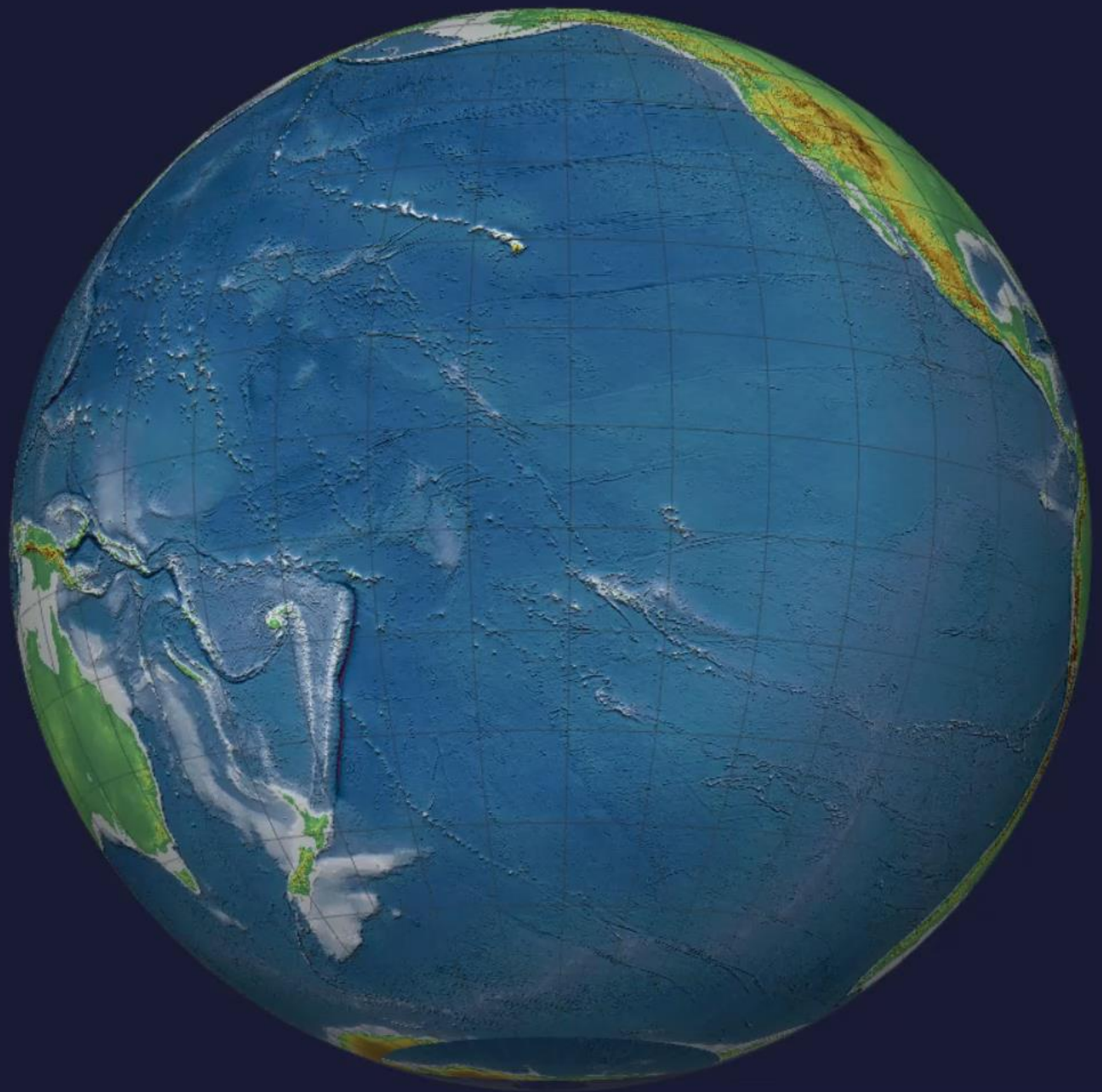
While systematic surveys are now routinely used to improve the maps and grids, “passage soundings” continue to play an important role in enabling the creation of progressively more-detailed seafloor maps and digital data grids.



How little of the ocean has been mapped?



THE CHALLENGE

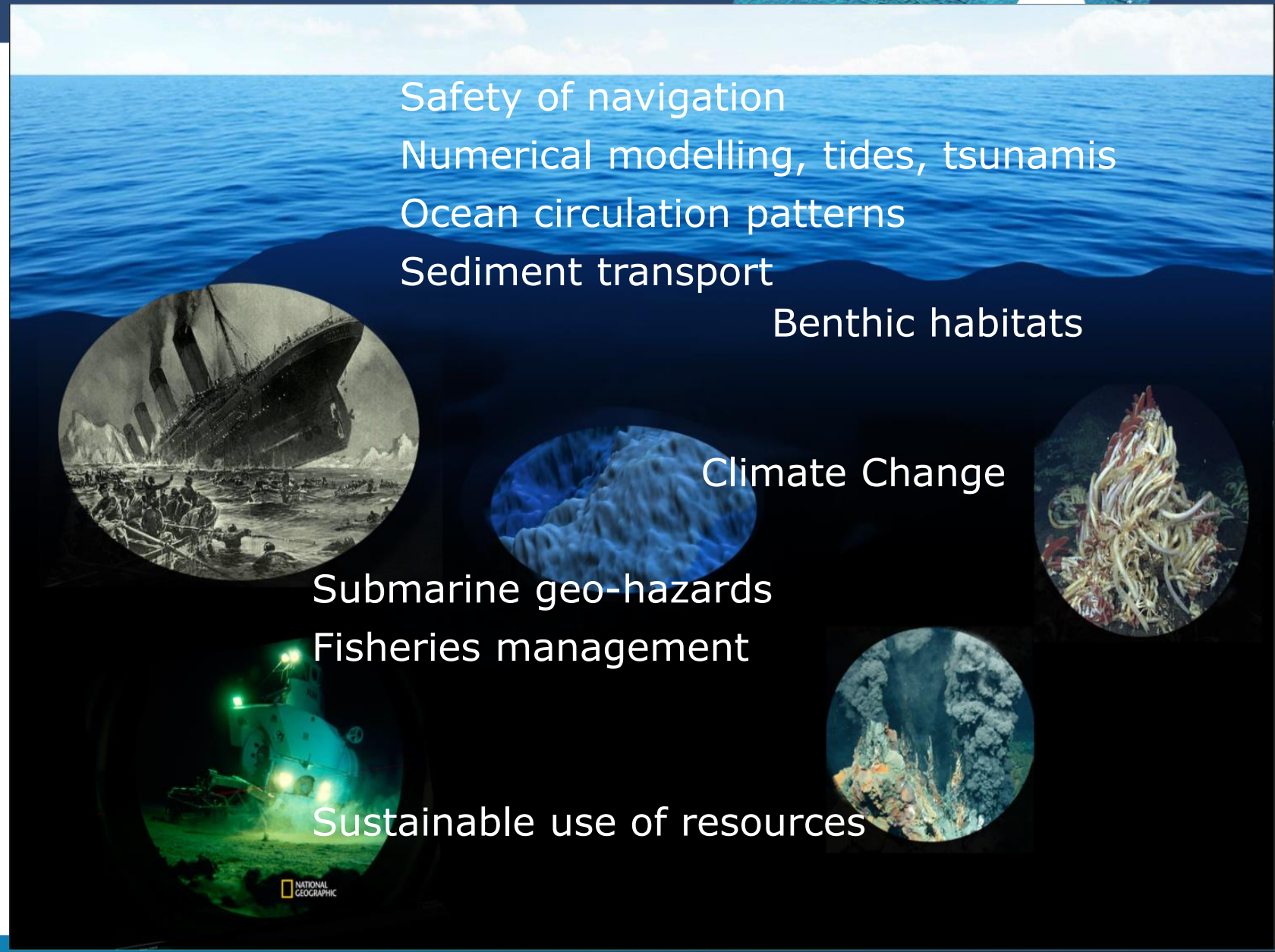


Benefits of Sea Bed Mapping

- Fundamental to sustaining life
- Controlling climate
- Fisheries management
- Facilitating commerce and connectivity
- Safety of navigation
- Tsunami modelling
- Tidal Energy
- Recovery of assets lost at sea
- Minerals, medicines

The Blue Economy is currently estimated to be worth $1.5 trillion a year and supports 31 million jobs

Seabed 2030 will create a new ocean monitoring market worth billions of dollars a year



Seabed 2030

Forum for Future Ocean Floor Mapping

June 2016

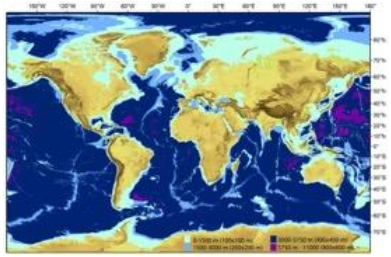
Mr Sasakawa, Chairman of the Nippon Foundation proposed '…to map 100% of the topography of the World Ocean by 2030'

THE OCEAN CONFERENCE
UNITED NATIONS, NEW YORK, 5-9 JUNE 2017

June 2017

Nippon Foundation - GEBCO Seabed 2030 Project announced

Project Operational



1st February 2018

2030

100% of ocean mapped

The Nippon Foundation – GEBCO Seabed 2030 Project

GEBCO operates under the joint auspices of the International Hydrographic Organization (IHO) and UNESCO's Intergovernmental Oceanographic Commission (IOC)

Picture Source: Australian Transport Safet

At what resolution will Seabed 2030 map the ocean floor?

At the best possible resolution within practical limits

- Gathering bathymetric data gets more difficult as the ocean gets deeper
- An overall minimum requirement for different ocean depths has been set, based on what we can achieve with state-of-the-art multibeam technology

The table below shows the minimum resolutions aimed to be achieved at each depth range by Seabed 2030

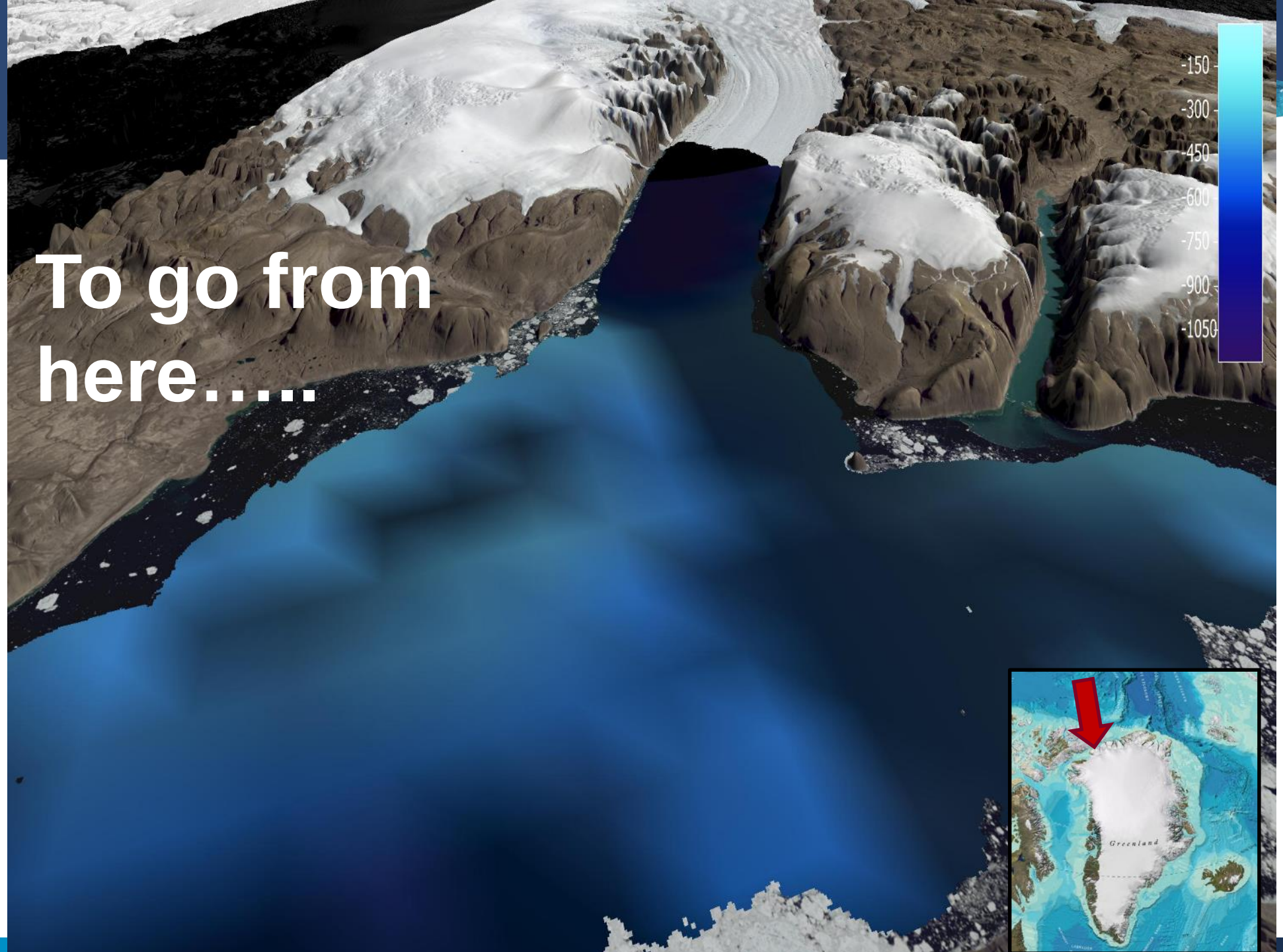
Depth Range	Grid-Cell Size	% of World Ocean
0–1500 m	100 × 100 m	13.7
1500–3000 m	200 × 200 m	11
3000–5750 m	400 × 400 m	72.6
5750–11,000 m	800 × 800 m	2.7

THE NIPPON FOUNDATION

General Bathymetric Chart of the Oceans

GEBCO

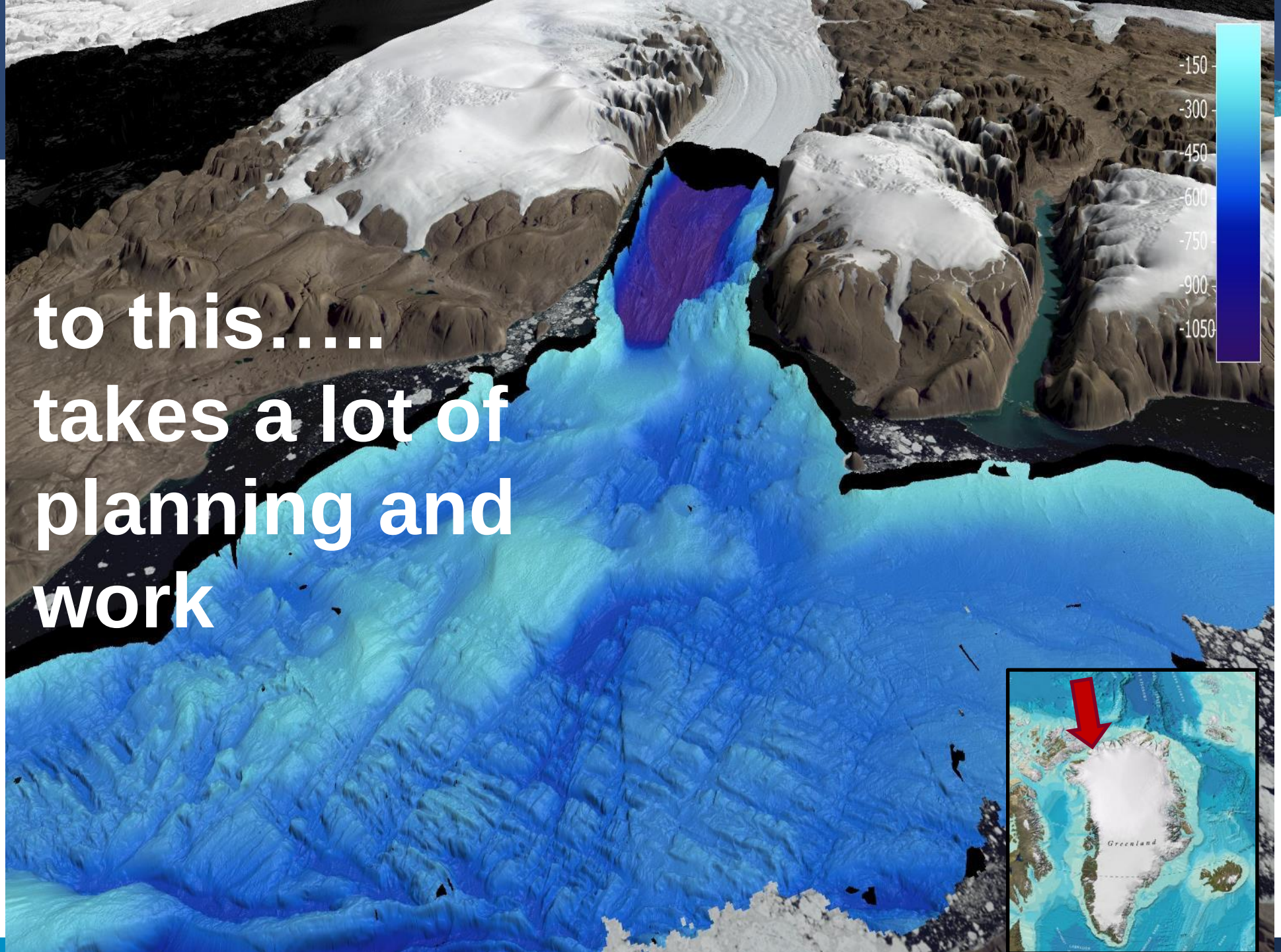
To go from here…..

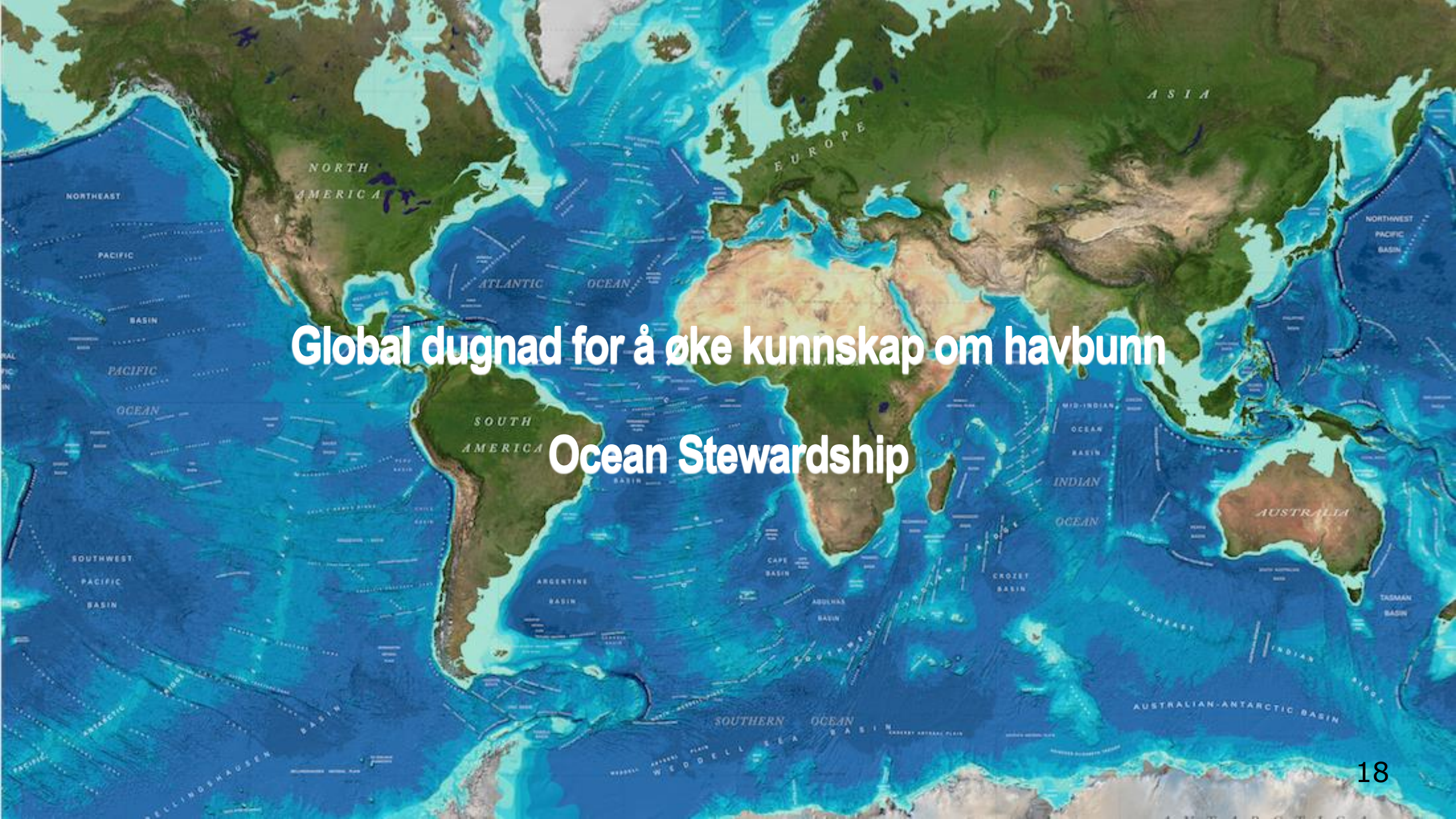


THE NIPPON FOUNDATION

GEBCO General Bathymetric Chart of the Oceans

to this…..
takes a lot of planning and work

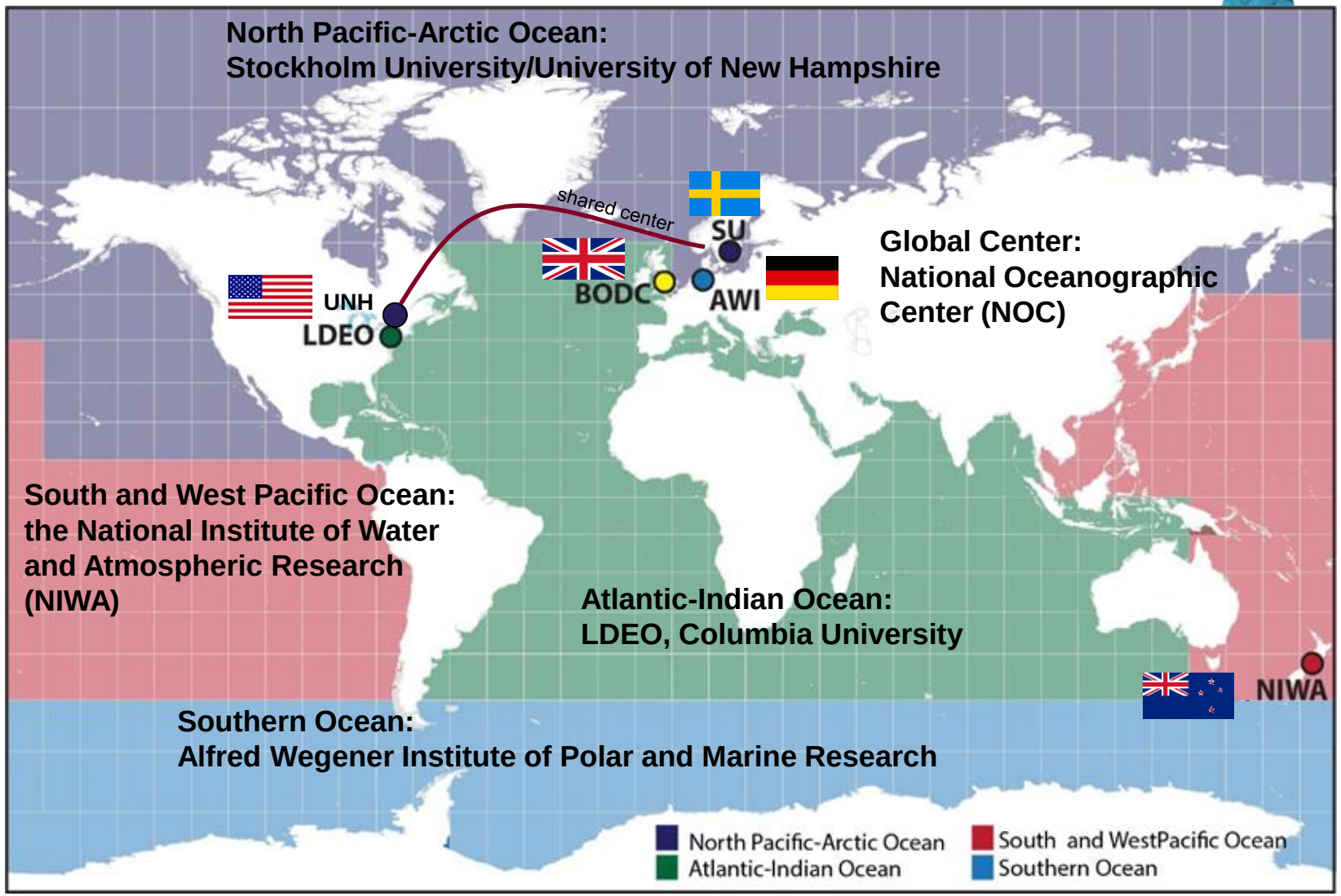




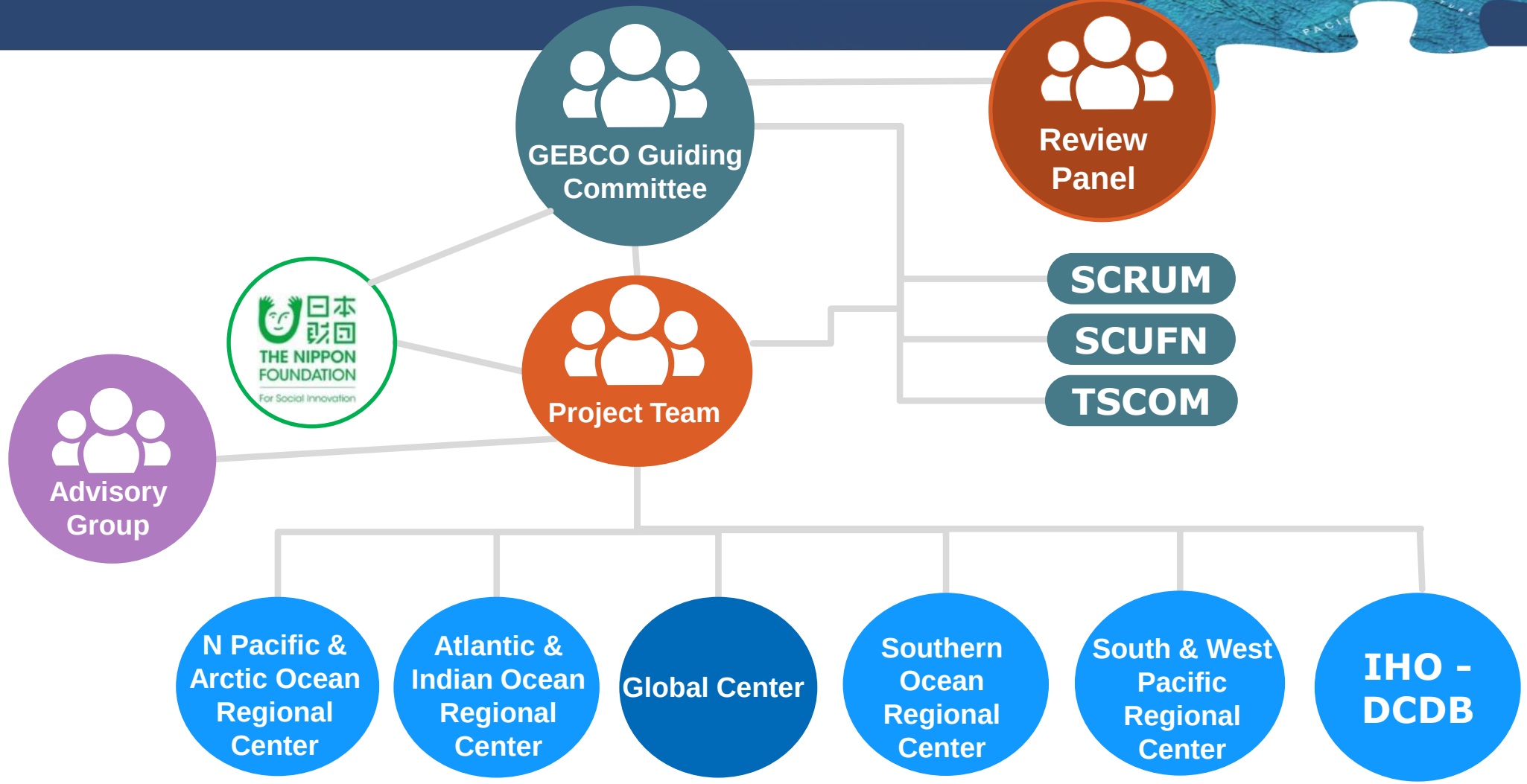
Global dugnad for å øke kunnskap om havbunn

Ocean Stewardship

Seabed 2030 - Regional and Global Centres

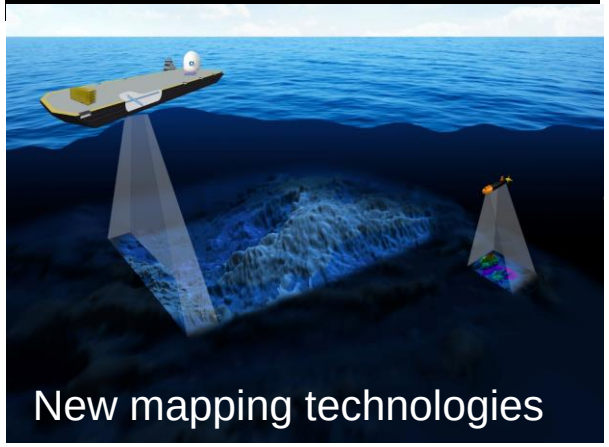


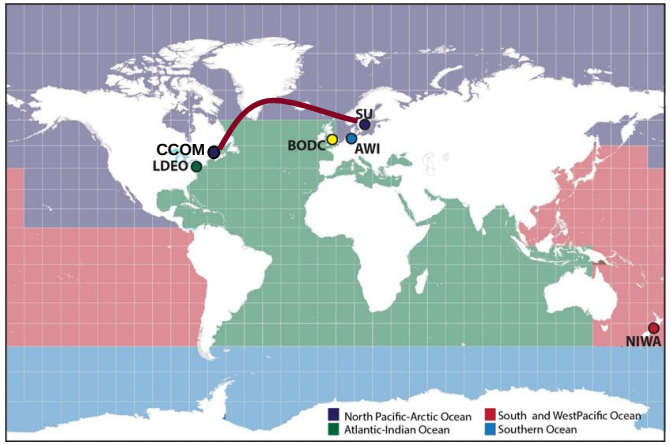
Seabed 2030 Structure



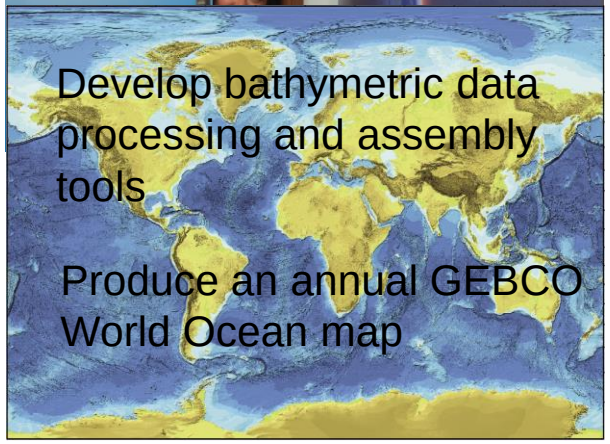
4 Regional Data Assembly & Coordination Centres (RDACC)
1 Global Data Assembly and Coordination Centre (GDACC)
1 International data repository (IHO-DCDB)

What will the centers do?

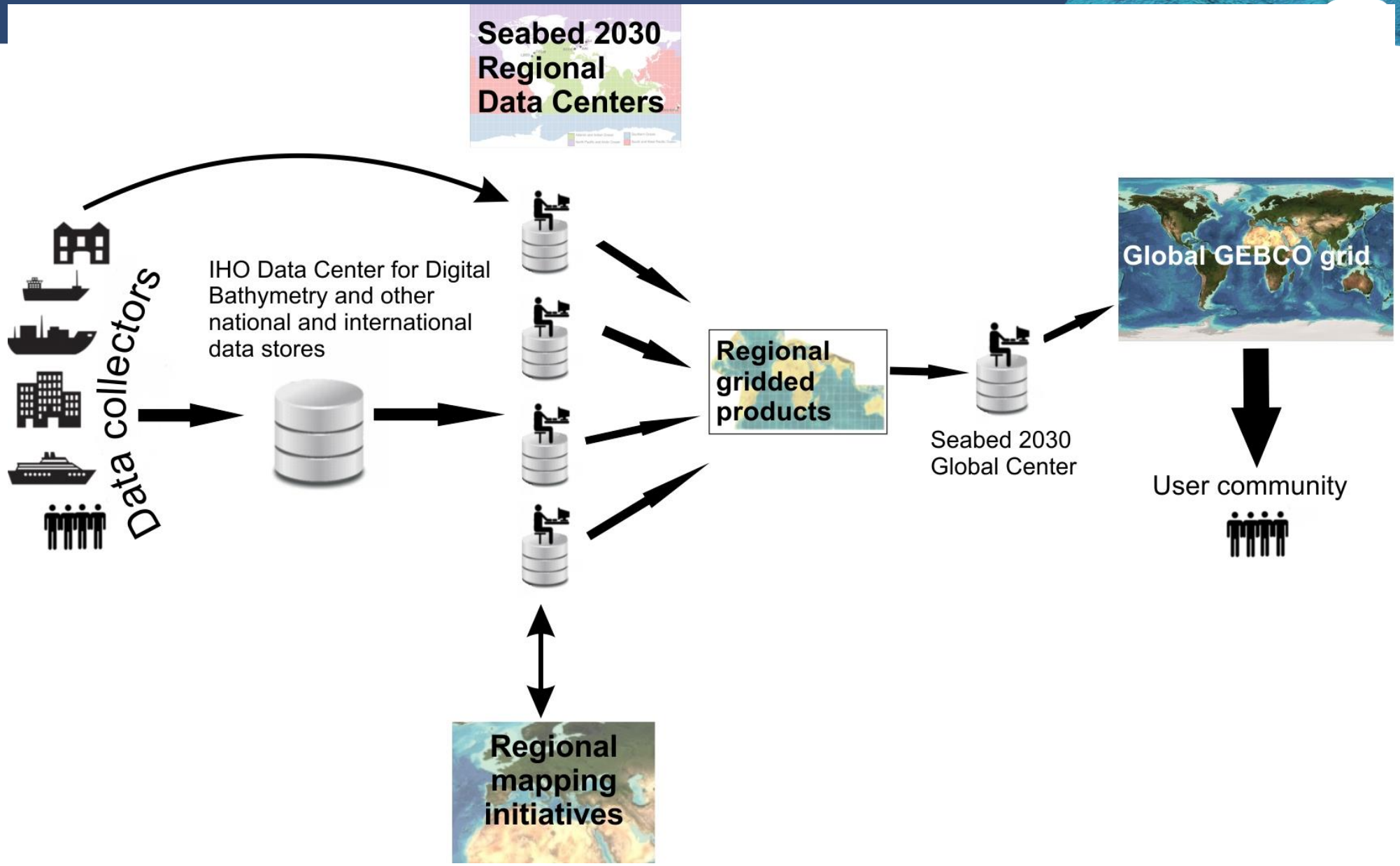




Co-operate and work closely with existing regional mapping initiatives



Seabed 2030 Work Flow



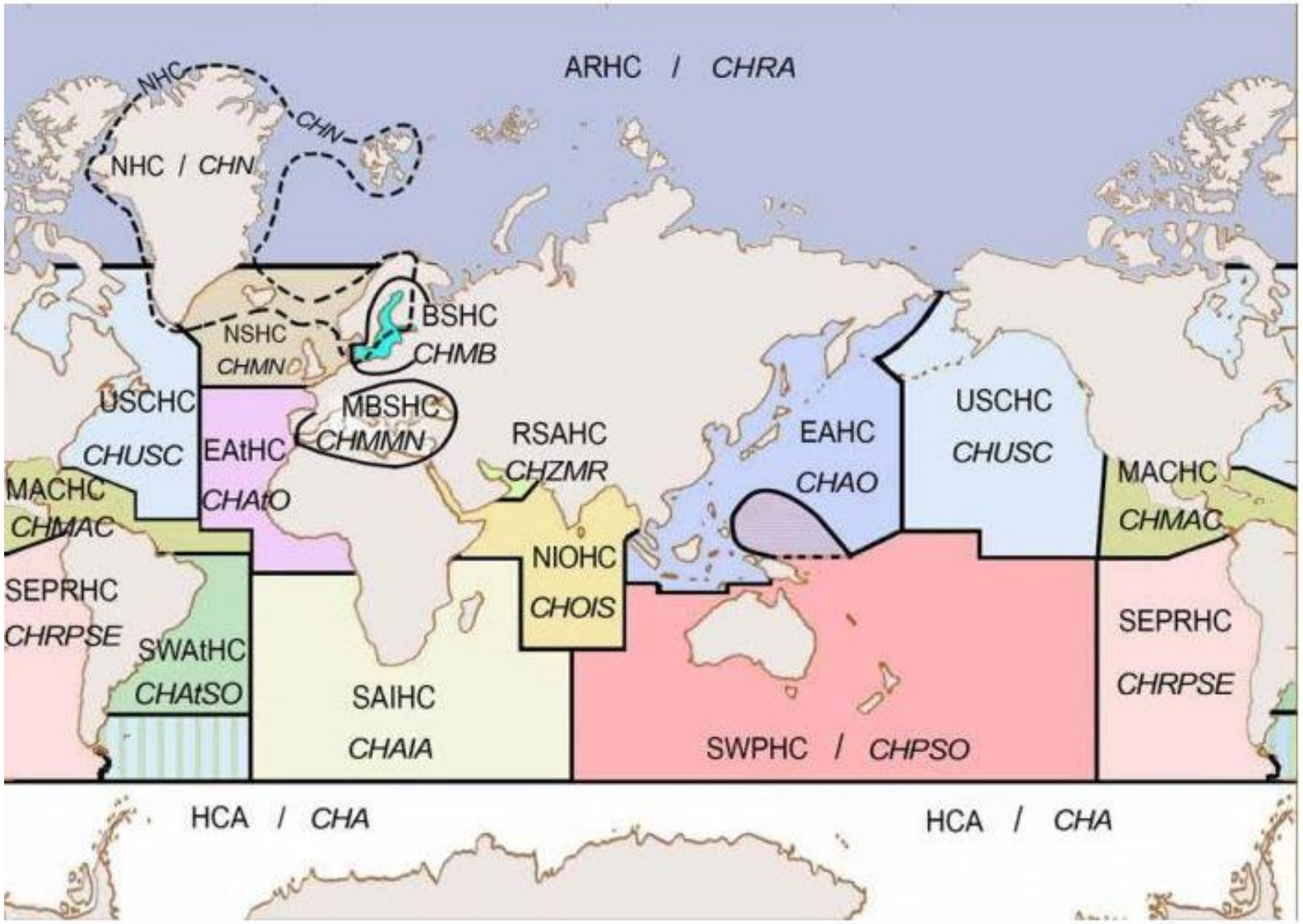
IHO Seabasin based regional cooperation

16 Regional Hydr. Commissions, Norway in 5:

- Arctic
- Nordic
- North Sea
- Southern Africa & Islands
- Antarctic

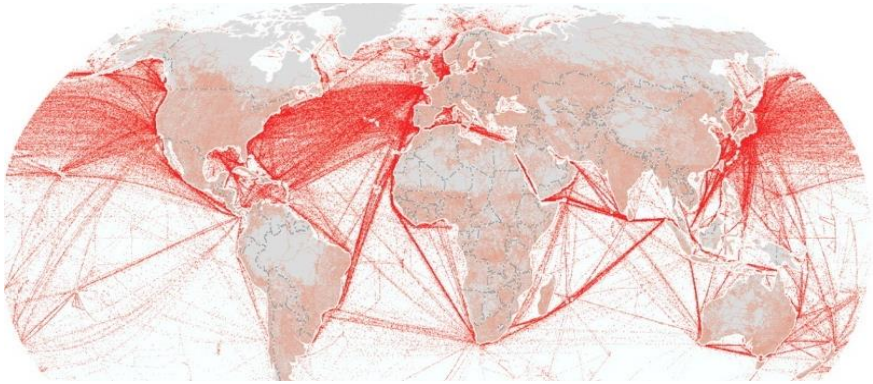
Through PRIMAR in additional 4

PRIMAR: global service for distribution of ENC's (98% of all ENC's world wide)



NF-GEBCO Seabed 2030 Culture

- **Co-operation and Community Building**
- **Coordination**
  - Initial Seabed 2030 focus on > 200 meters water depth
  - Hydrographic Offices concentrate on < 200 meters water depth
- **Crowdsourcing**
  - Fishing boats, cargo, passenger and cruise ships, private yachts…
- **Credit and Attribution**
  - Recognize data contributions, in-kind services, promotion, capacity building.
  - E.g. Recent film with FUGRO



Biggest potential contributors: Research Vessels of the world!

Potential contributors, who are they?

- In principal every vessel with a depth sounder, including leisure boats:
  - 40 percent of Australia’s Great Barrier Reef is surveyed with leisure boats
  - However, standard single beam navigation echo sounders have a maximum depth range of 200 to 300 meters while the average depth of our oceans is more than 3000 meters

Potential contributors:

- Those that sail outside planned searoutes
- Those that can log X, Y, Z, T

Who are they:

- Research Vessels
- Commercial general survey and seismic survey vessels
- Fishing vessels
- (Expeditionary) Cruise Ships

Research vessel strengths

- Professional scientific staff.
- High quality, fit for purpose equipment (both for measuring and recording).
- Sail where no or few other vessels sail.

Research vessel challenges

- Financed per mission for specific scientific task.
- No or little time / resources available for other activities.
- Equipment interference.

Research vessel opportunities

- Cooperation between Research vessel operators / scientific institutions and hydrographic offices
- Commitment from relevant leadership
- Engagement with industry to overcome technical challenges

Contribute to global seabed knowledge!

Engagement with industry

Norwegian seismic survey company PGS

- Contribute with existing data to Seabed 2030
- Facilitate contribution of data owned by others
- Develop routines for future contributions
- Set an example for other seismic survey companies to follow through IAGC (be the seismic survey branch ambassador for Seabed 2030)

PGS joins Seabed 2030

oceannews.com/news/science-technology/pgs-fleet-to-support-the-nippon-foundation-gebco-seabed-2030-project

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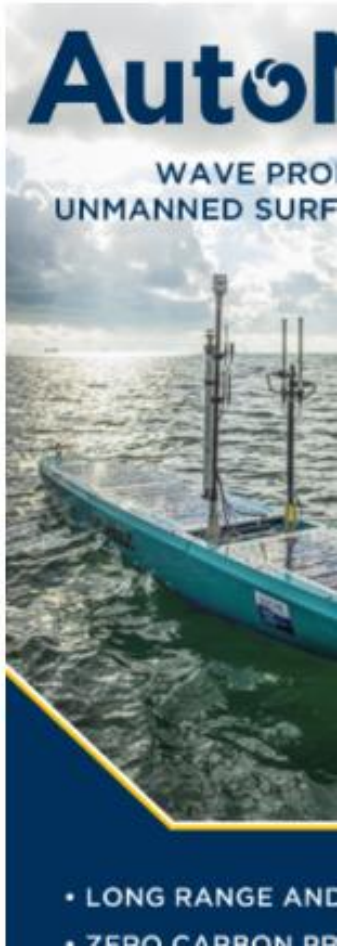
Science & Technology

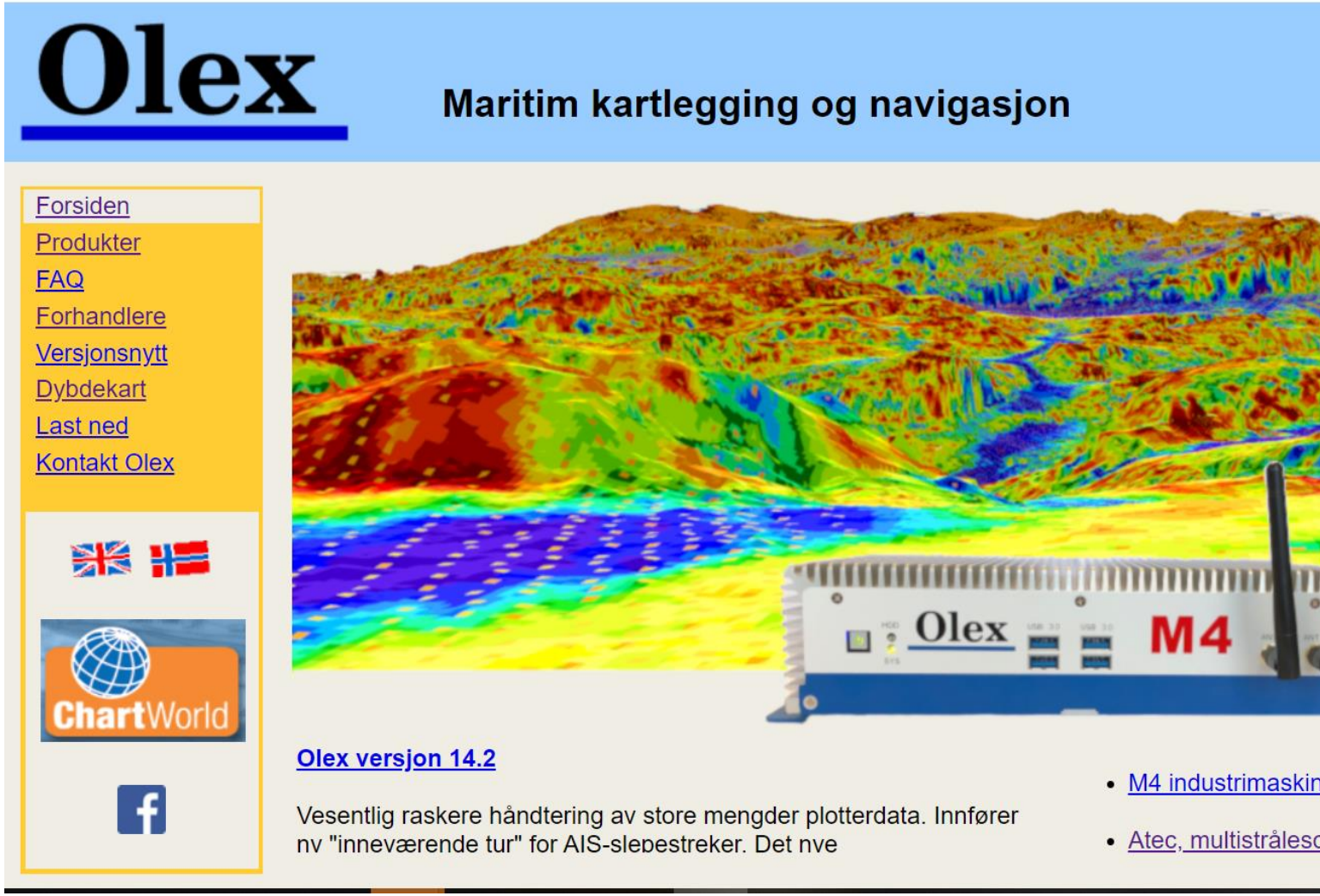
PGS Fleet to Support the Nippon Foundation GEBCO Seabed 2030 Project

Posted by Ocean News
Published: 25 November 2019

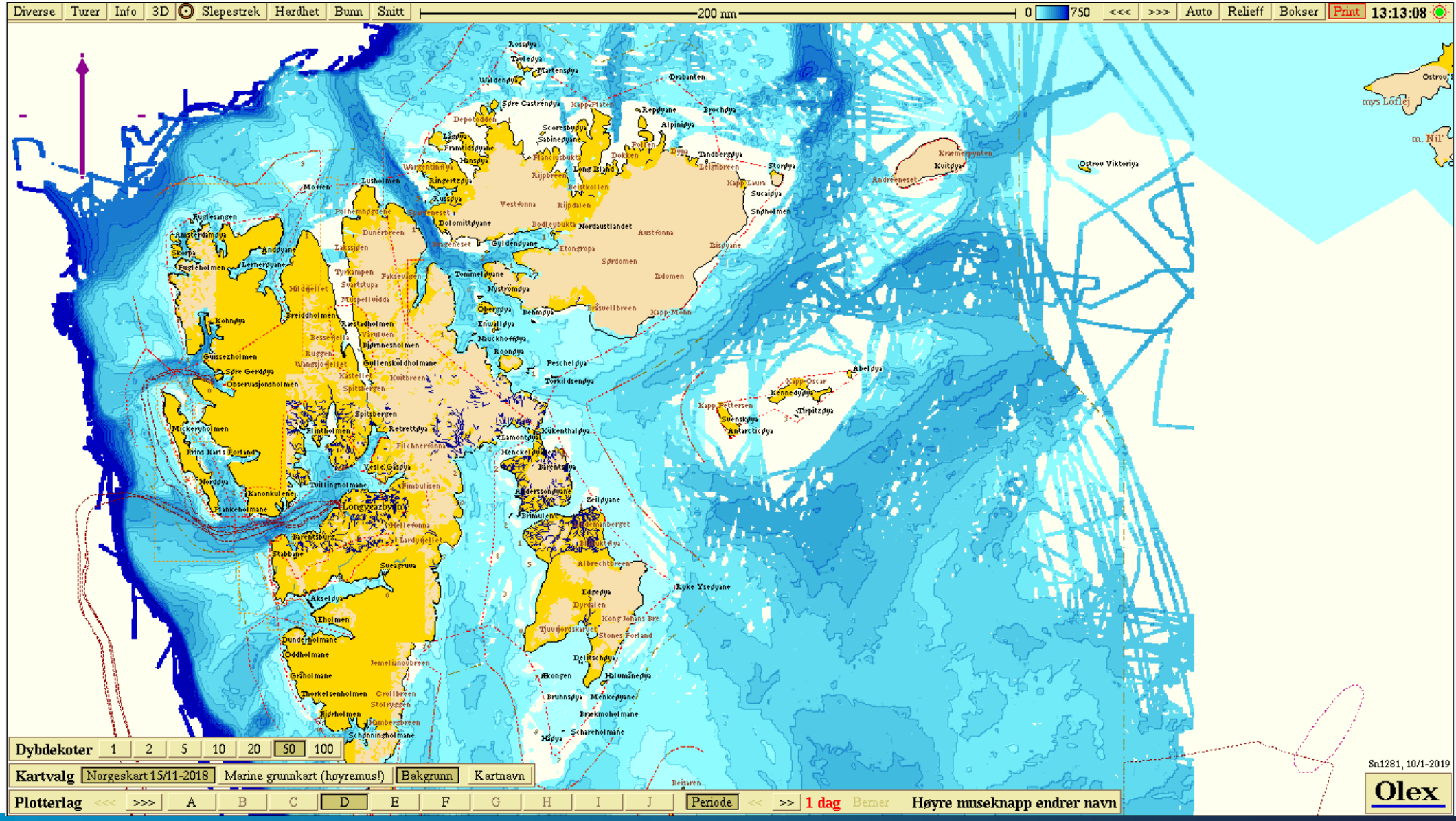


Fishing Vessels: Olex AS

- Fishery echo sounders
- Finding new fishery areas
- Terrain knowledge at greater depth important
- Cooperation with MAREANO (win win)



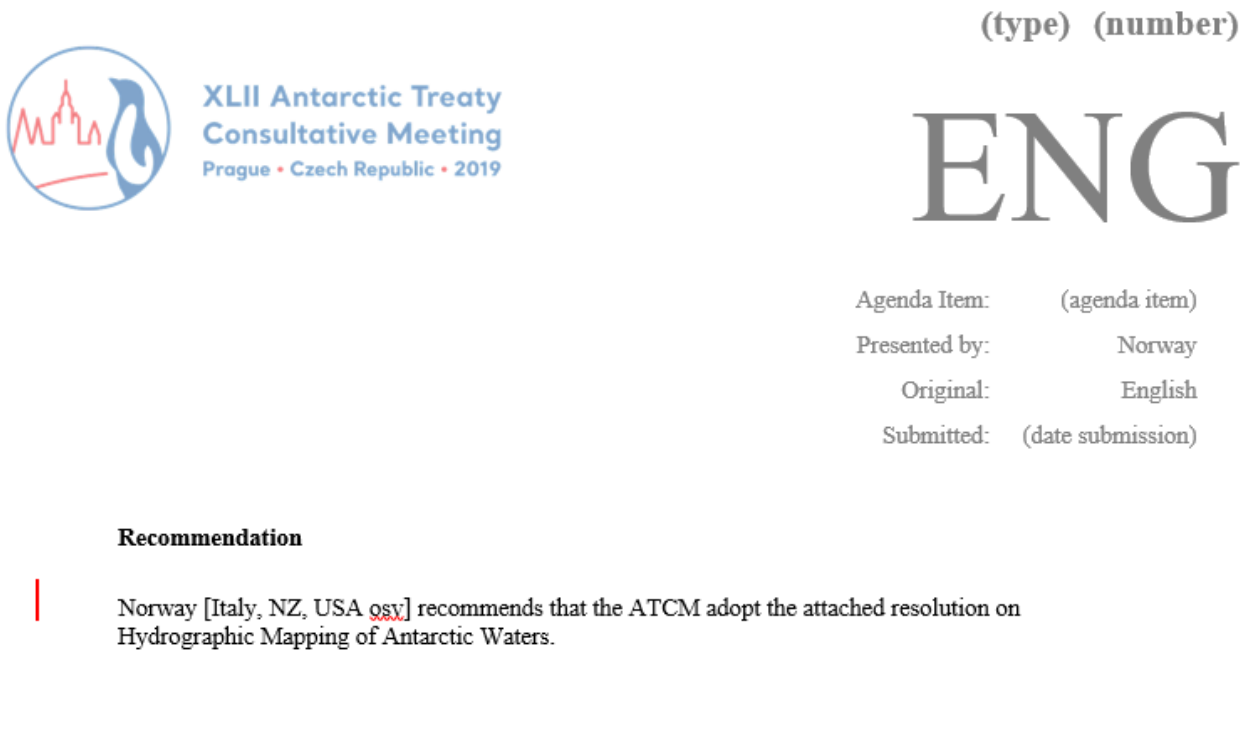
Olex coverage Svalbard



Kartverket

(Expeditionary) Cruise Vessels

Norway sets example through interdisciplenary cooperation



XLII Antarctic Treaty Consultative Meeting
Prague • Czech Republic • 2019

(type) (number)

ENG

Agenda Item: (agenda item)
Presented by: Norway
Original: English
Submitted: (date submission)

Recommendation

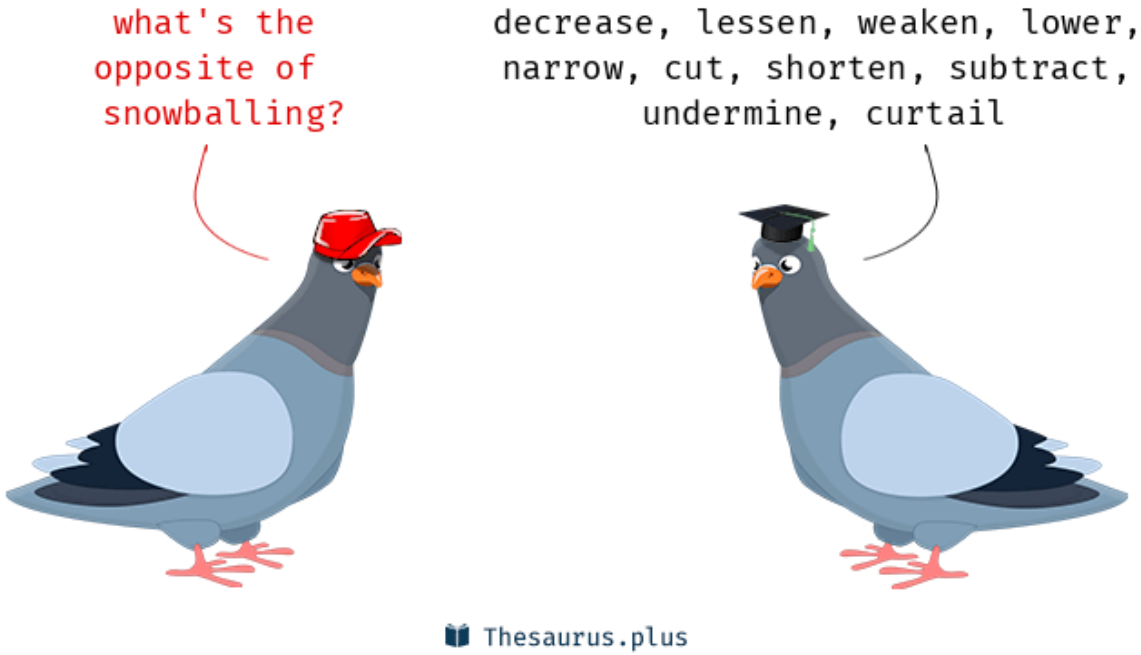
Norway [Italy, NZ, USA osv] recommends that the ATCM adopt the attached resolution on Hydrographic Mapping of Antarctic Waters.

Resolution XXX (2019)

Hydrographic Mapping of Antarctic Waters

Norwegian resolution for Research Vessel operators to integrate bathymetric data collection in their scientific voyages adopted by all signing member state countries of the Antarctic Treaty Consultative meeting.

And hopefully creates a snowballing effect



To map the seabed of this planet

Challenge for NHC Member States:

- What is the current percentage of your waters that is Seabed 2030 compliant? Are you monitoring progress for Seabed 2030 compliance in your waters?
- What relevant nationally, regionally, globally operating companies (shipping, cruise, fishing, software, hardware, leisure boat, etc) in your country could potentially contribute to Seabed 2030 (also outside waters of national jurisdiction)? Will you contact them?
- How can you as national hydrographic authority contribute to Seabed 2030?