



United Nations
Educational, Scientific and
Cultural Organization



Intergovernmental
Oceanographic
Commission

Briefing on the work of GEBCO



What is GEBCO?

GEBCO aims to provide the most authoritative publicly-available bathymetry of the world's oceans.

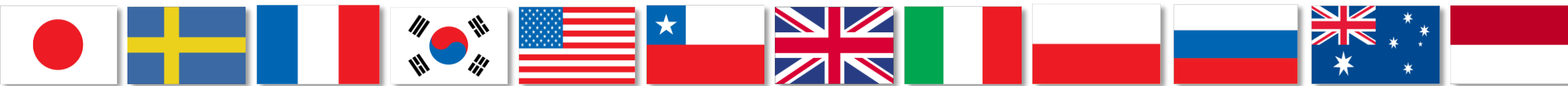
It operates under the joint auspices of the International Hydrographic Organization (IHO) and the Intergovernmental Oceanographic Commission (IOC) of UNESCO



What is GEBCO?

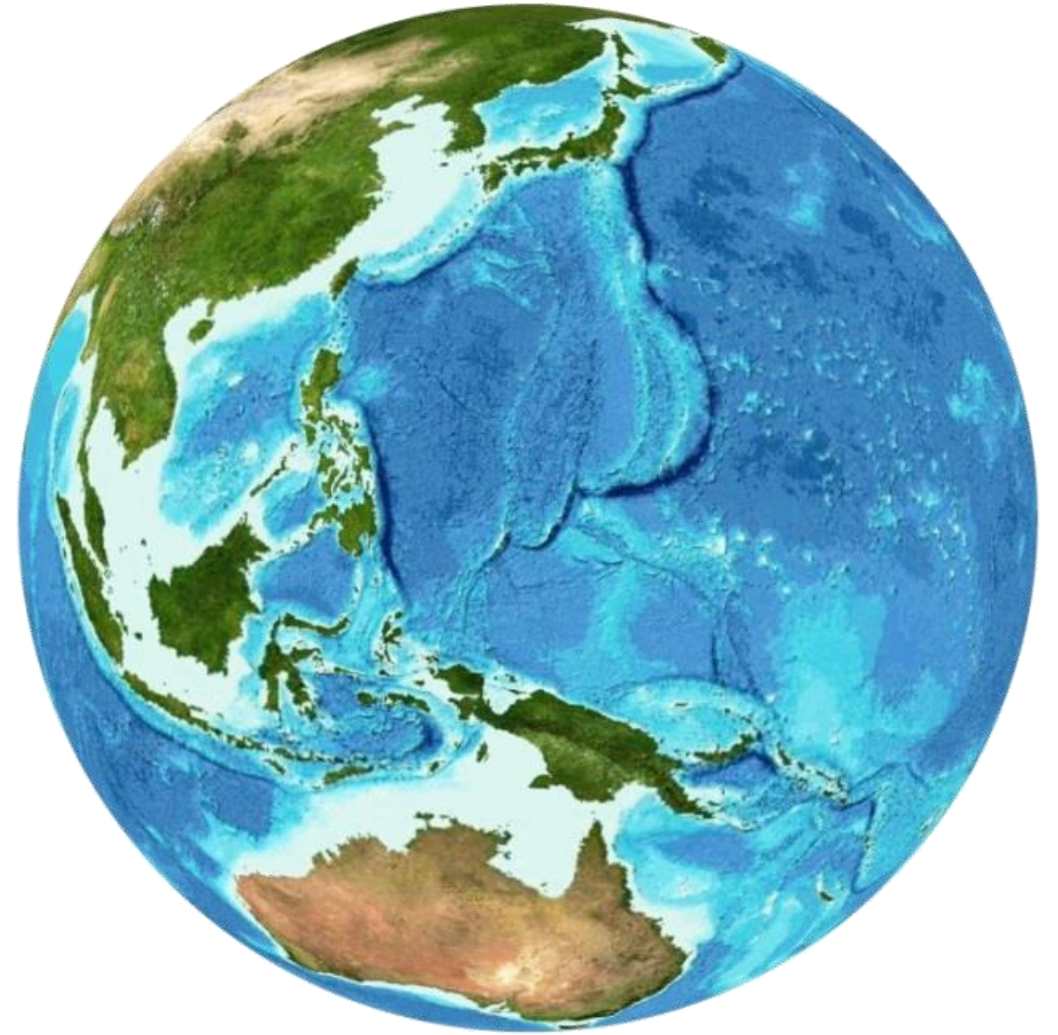
GEBCO's work is directed by a *Guiding Committee* and supported by *sub-committees* and *ad hoc working groups*:

- Technical Sub-Committee for Ocean Mapping (TSCOM)
- Sub-Committee for Undersea Feature Names (SCUFN)
- Sub-Committee for Regional Undersea Mapping (SCRUM)
- Outreach Working group
- IHO-IOC GEBCO Cook Book Working group



GEBCO Products

- Global gridded bathymetric data
 - GEBCO 2014: 30 arc-second grid
 - GEBCO 2019: 15 arc-second grid
- Gazetteer of Undersea Feature Names
- Digital Atlas
- Grid viewing software
- Printable maps
- Web Map Service (WMS)
- IHO-IOC GEBCO Cook Book



Capacity-building Initiative: Postgraduate Certificate in Ocean Bathymetry



Funded by:

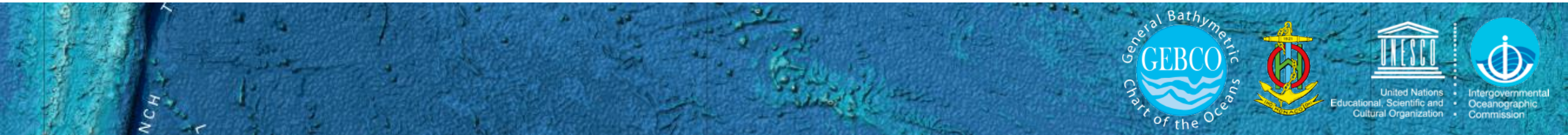
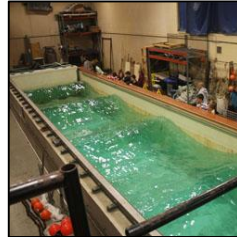
The Nippon Foundation of Japan

Taught at:

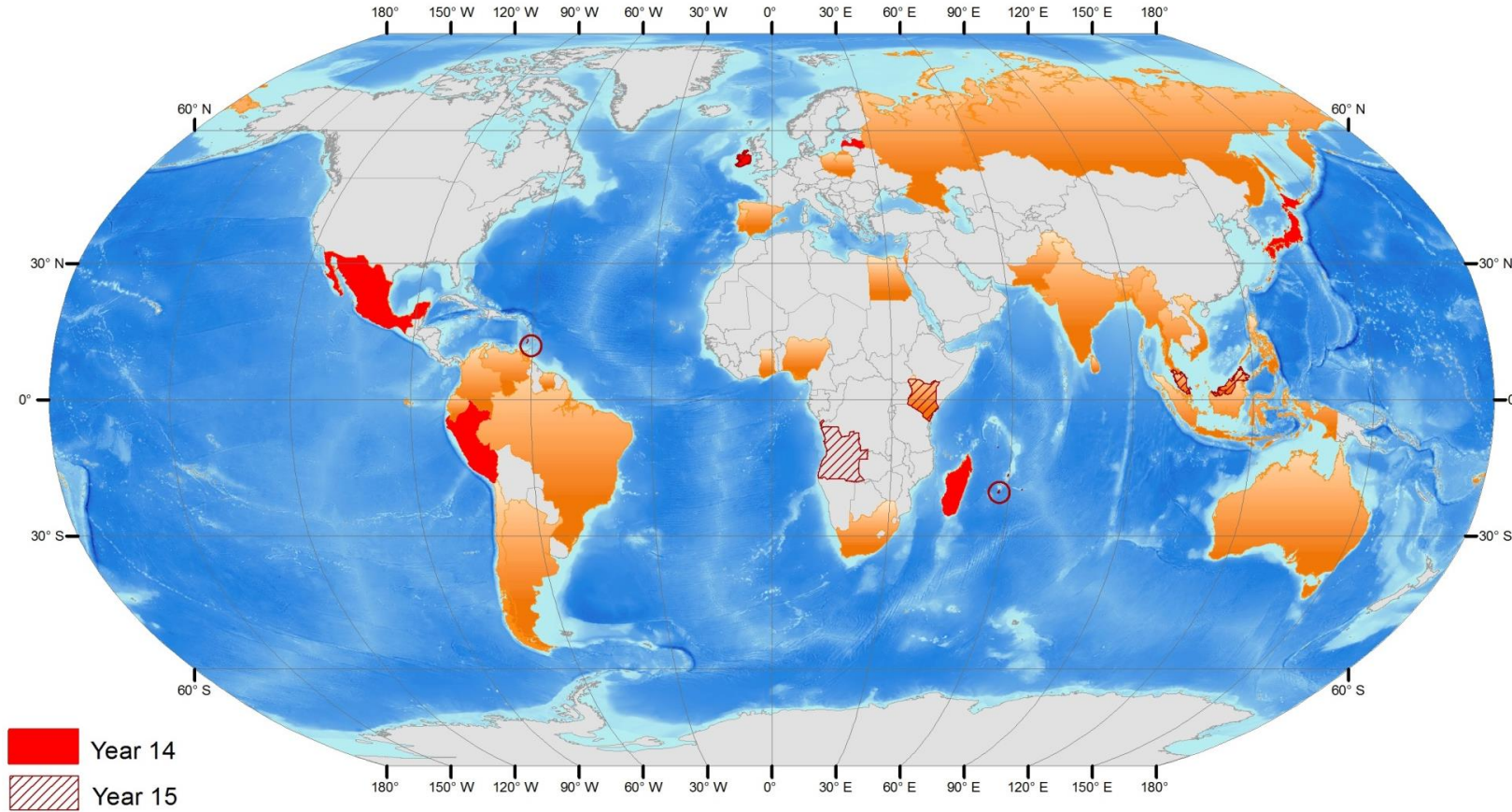
The Center for Coastal and Ocean Mapping / Joint Hydrographic Center;
University of New Hampshire, USA



Training a new generation of scientists and hydrographers in ocean bathymetry



Capacity-building Initiative: Nippon Foundation / GEBCO Alumni



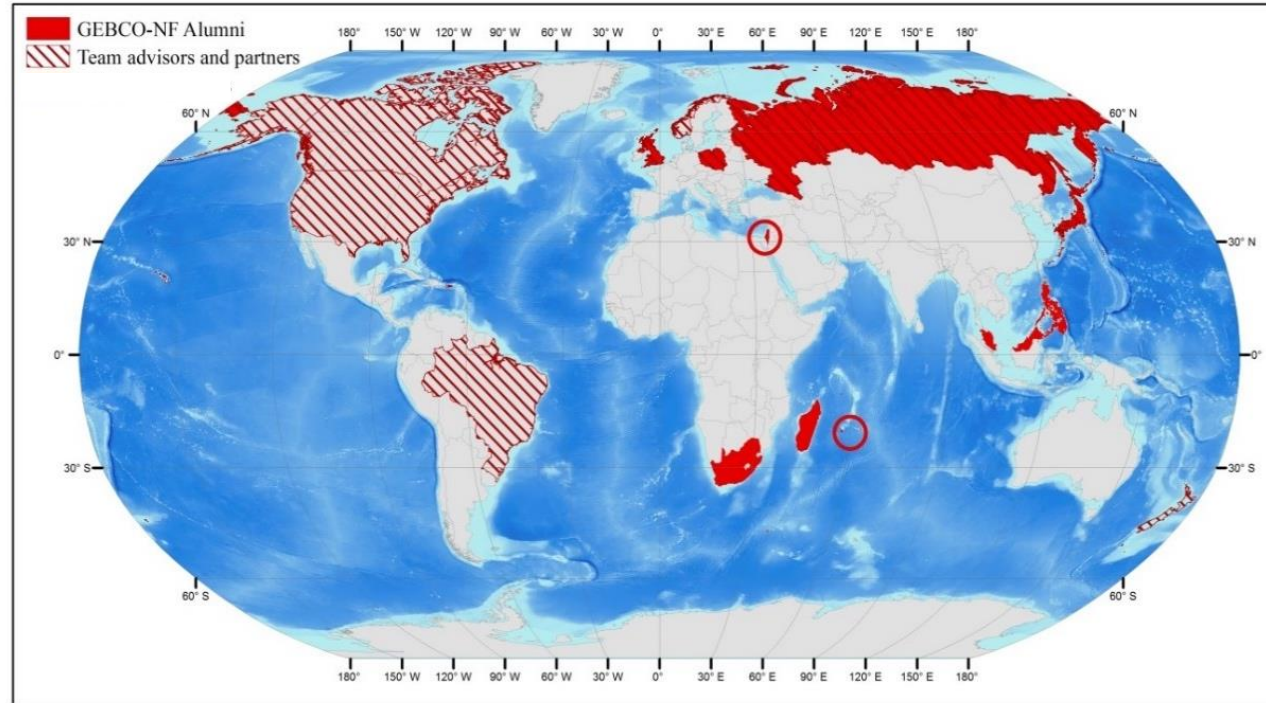
90 Scholars from 40 coastal states over last 15 years!



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GEBCO-NF Alumni Team





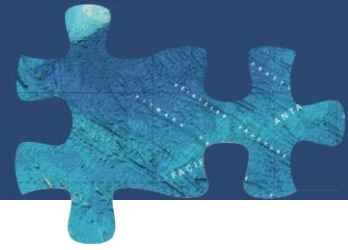
The Nippon Foundation-GEBCO Seabed 2030 Project

Vicki Ferrini, PhD

Head, Seabed 2030 Regional Data Center for the Atlantic and Indian Oceans

Lamont-Doherty Earth Observatory of Columbia University

atlantic-Indian@seabed2030.org



A collaborative project between The Nippon Foundation and GEBCO 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.



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-The **Nippon Foundation** is a private Japanese-based, non-profit grant-making organization with a mission based around philanthropic activities to pursue global maritime development and assistance for humanitarian work.

-The **General Bathymetric Chart of the Oceans (GEBCO)** organization operates under the joint auspices of the International Hydrographic Organization (IHO) and the Intergovernmental Oceanographic Commission (IOC) of UNESCO



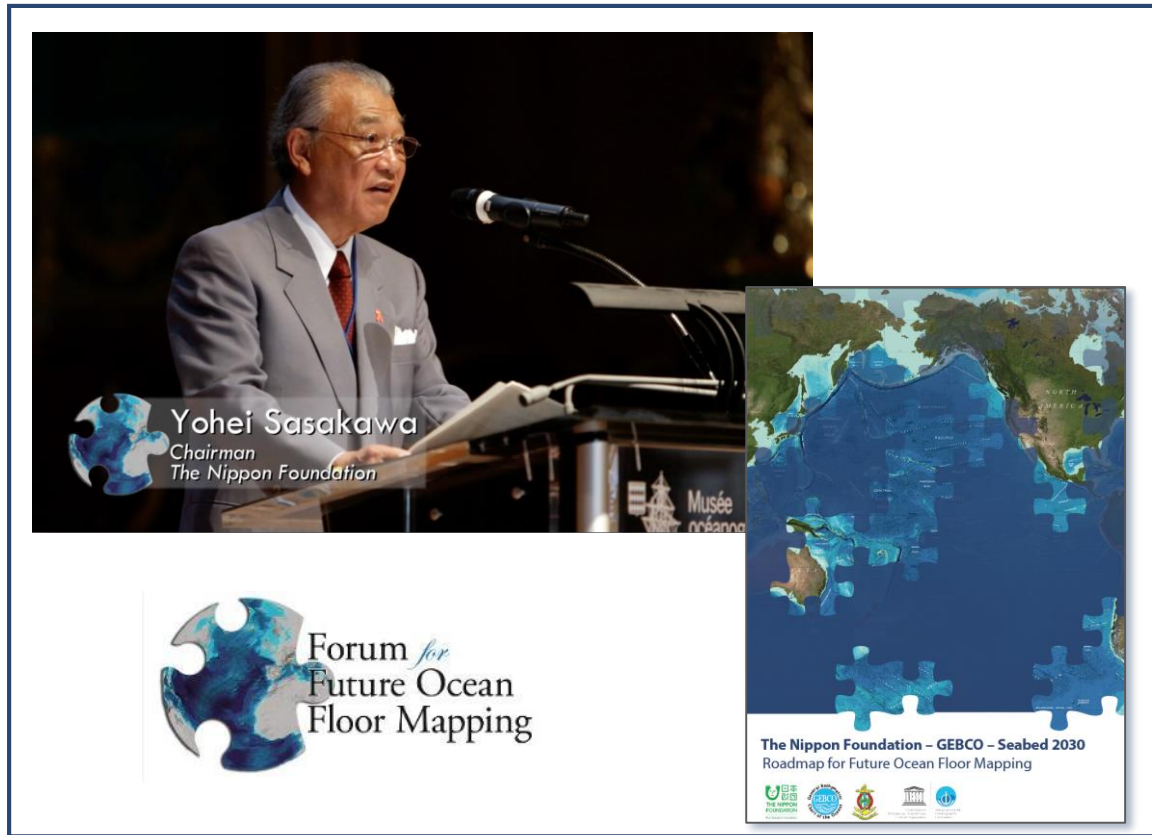
Empower the world to *make policy decisions, use the ocean sustainably*, and *undertake scientific research* that is informed by a detailed understanding of the global ocean floor.

*Only a small portion of the ocean has been mapped with direct measurement.
~ 50% of the world's coastal waters remain unsurveyed**

*IHO publication C-55, Status of Surveying and Charting Worldwide




Vision Established through 2016 Forum for Future Ocean Floor Mapping



Yohei Sasakawa
Chairman
The Nippon Foundation

Forum for Future Ocean Floor Mapping

The Nippon Foundation – GEBCO – Seabed 2030
Roadmap for Future Ocean Floor Mapping



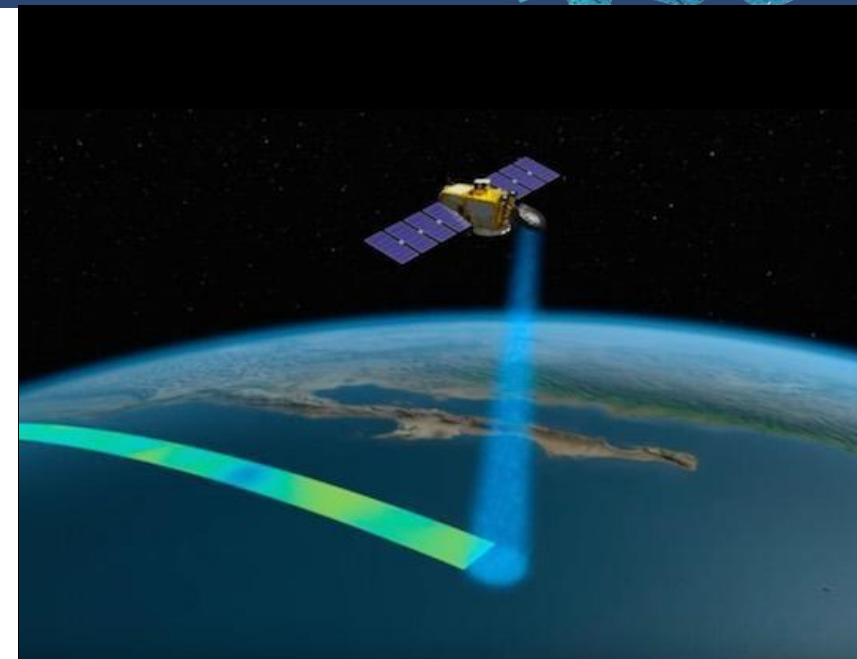
Project Announced at 2017 UN Ocean Conference



Why are Bathymetry Data Important?



- Nautical charts
- Oil and gas exploration
- Safety and storm surge/tsunami inundation models
- Ecosystem identification and management
- Emergency response
- Satellite verification models
- Ocean Models
- Coastal/Marine Spatial Planning
- Coastal Hazard Assessment
- Ocean Exploration
- Coastal Change Analysis
- Sea Level Rise Mitigation
- New Energy Siting
- Marine heritage

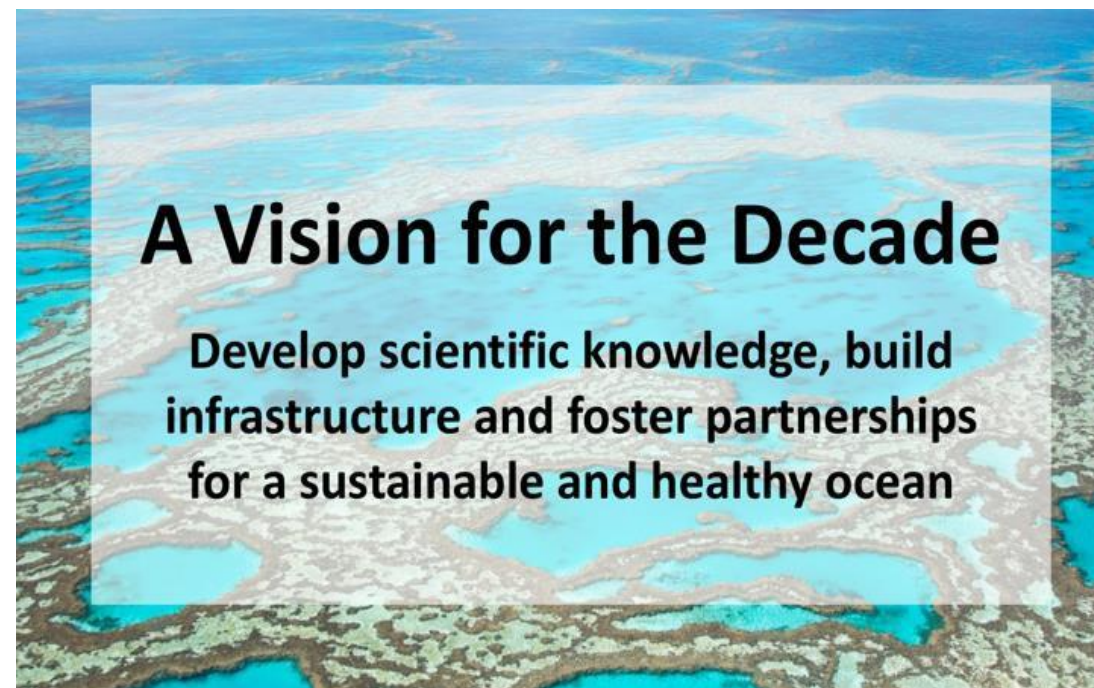


The UN Decade of Ocean Science for Sustainable Development (2021-2030)



14 LIFE BELOW WATER

CONSERVE AND SUSTAINABLY USE THE OCEANS, SEAS AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT



A Vision for the Decade

Develop scientific knowledge, build infrastructure and foster partnerships for a sustainable and healthy ocean

SDG14 will not be achievable without a comprehensive map of the world ocean floor





Partnership

- Work with all stakeholders to form a global coalition dedicated to giving the world a complete GEBCO Ocean Map.

Sharing and acknowledging

- Encourage and facilitate the sharing of bathymetric data, giving due acknowledgement to Partners and data contributors.

Invest in human capacity development

- Invest in capacity development to increase skills and greater capacity in ocean mapping, and meet growing needs of big data analysis and visualization.

Leverage technology innovation

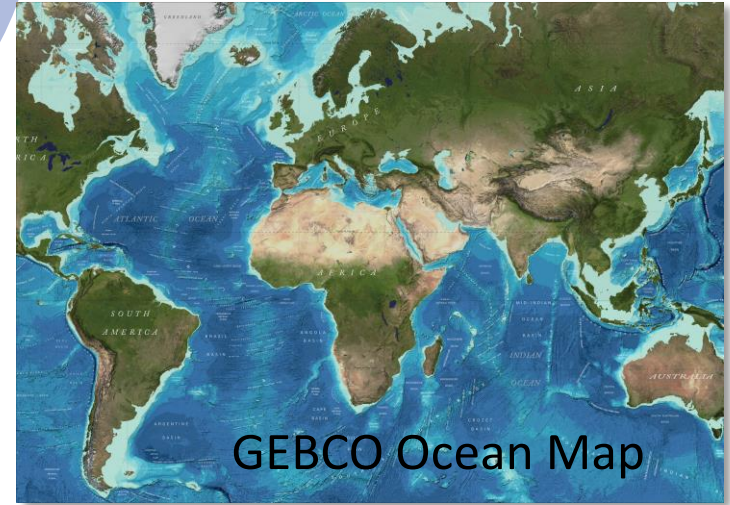
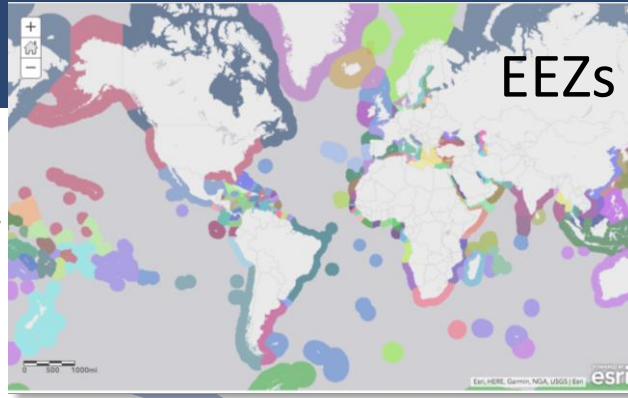
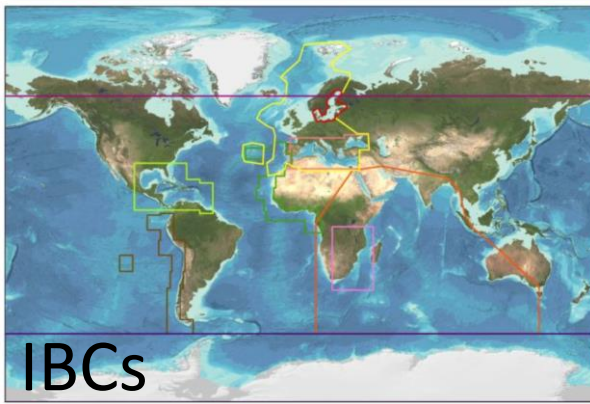
- Work with technology partners to apply new mapping and data analysis techniques to support Seabed 2030's mission.

Seabed 2030: Data Centers



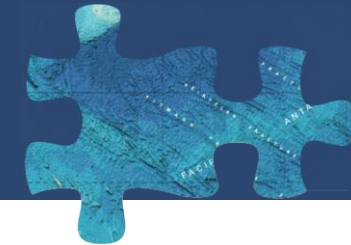


Data Assembly



Collaborate with national and regional efforts to build regional and global communities & products

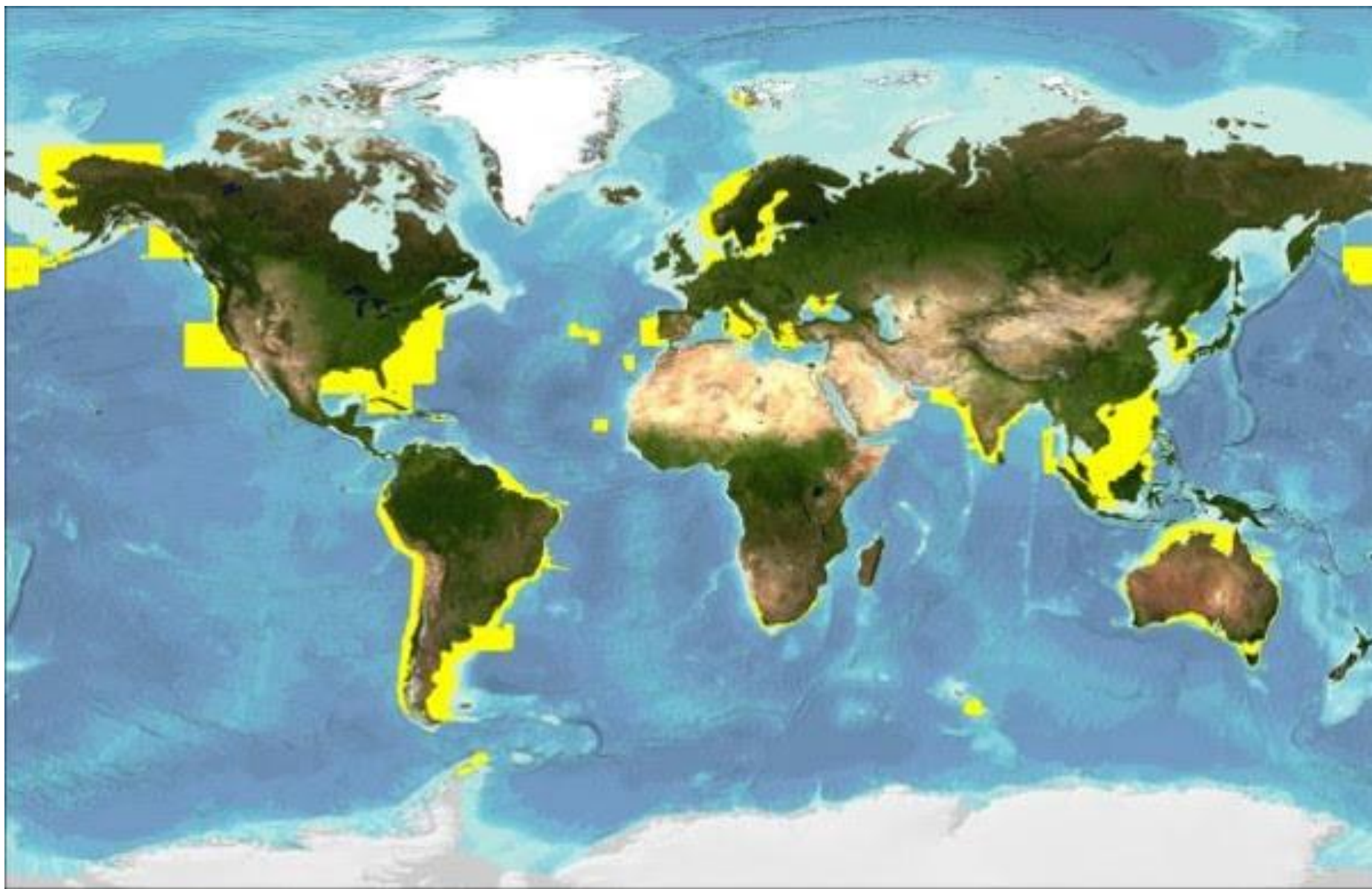
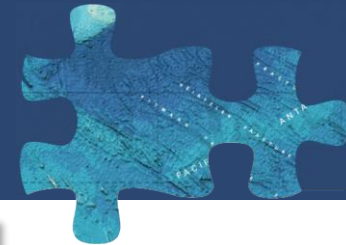
Data Sources: *Power of the Crowd*



- Government
 - Survey Vessels
- Academic
 - Research Vessels
- Industry
 - Survey Vessels
 - Cruise Ships
 - Fishing Boats
- Public
 - Private Boats and Yachts
 - Recreational Mariners



ENC Data in GEBCO Products





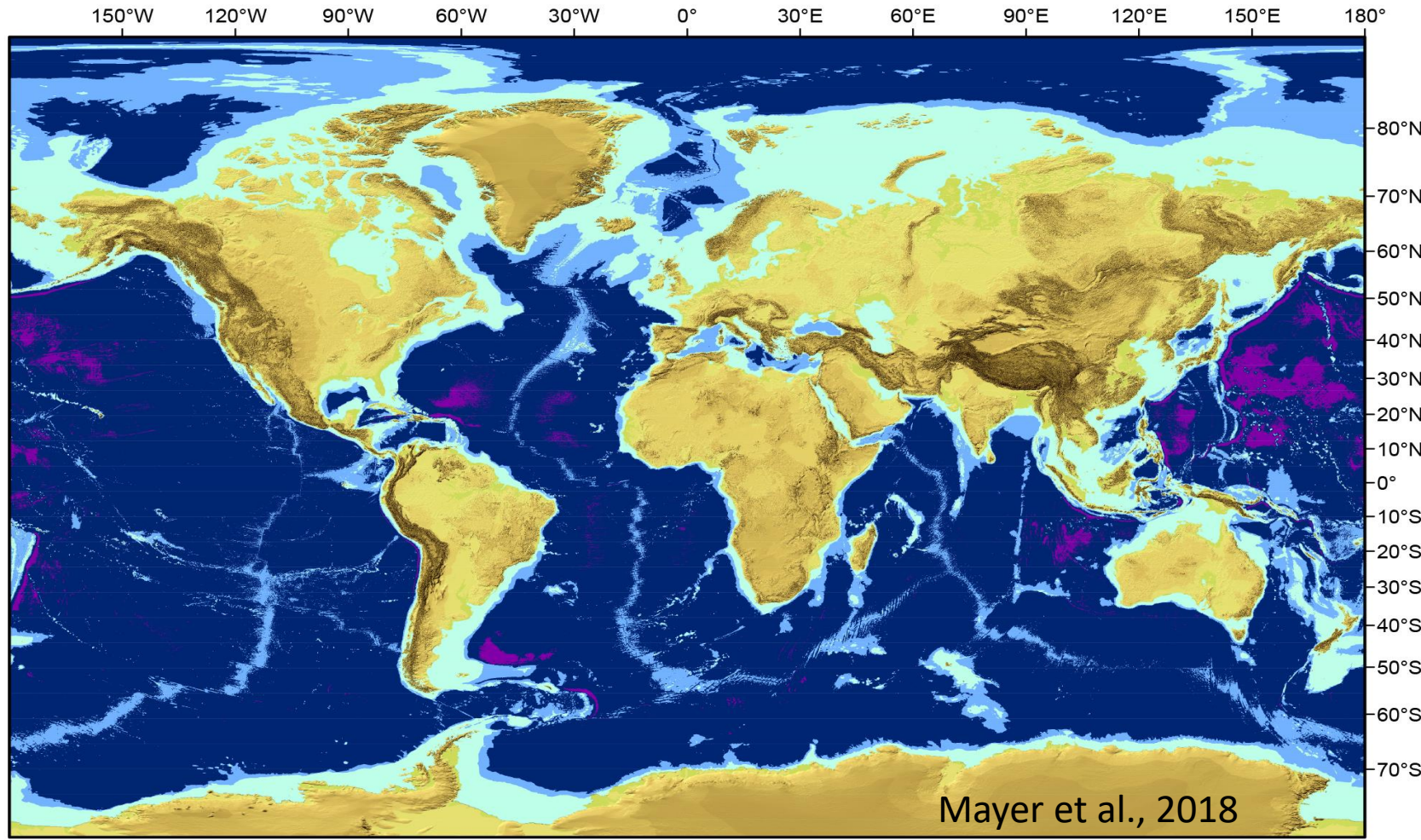
- Seabed 2030 Atlantic/Indian Oceans Data Center
 - IBC of the Caribbean Sea & Gulf of Mexico (IBCCA)
 - IBC of the Central Eastern Atlantic (IBCEA)
 - IBC of the Mediterranean (IBCM)
 - IBC of the Western Indian Ocean (IBCWIO)
- Seabed 2030 South & West Pacific Data Center
 - IBC of the South Eastern Pacific (IBCSEP)
- Seabed 2030 Arctic/North Pacific Data Center
 - IBC of the Arctic Ocean (IBCAO)
 - IBC of the Caribbean Sea & Gulf of Mexico (IBCCA)
- Seabed 2030 Southern Ocean Data Center
 - IBC of the Southern Ocean (IBCSO)







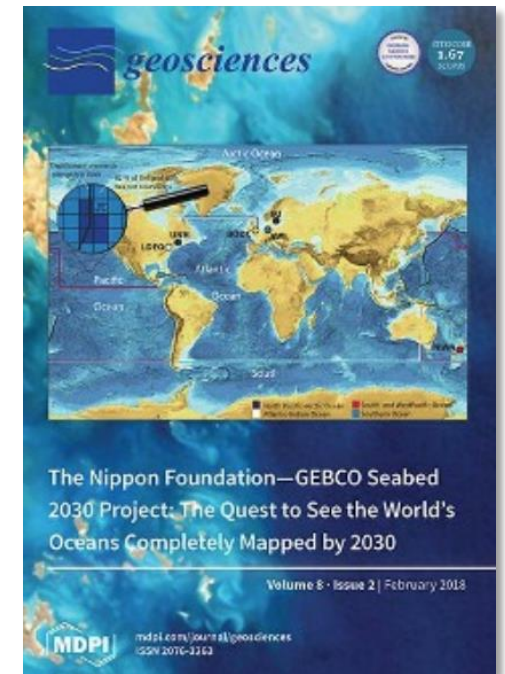
What does “100% mapped” mean?



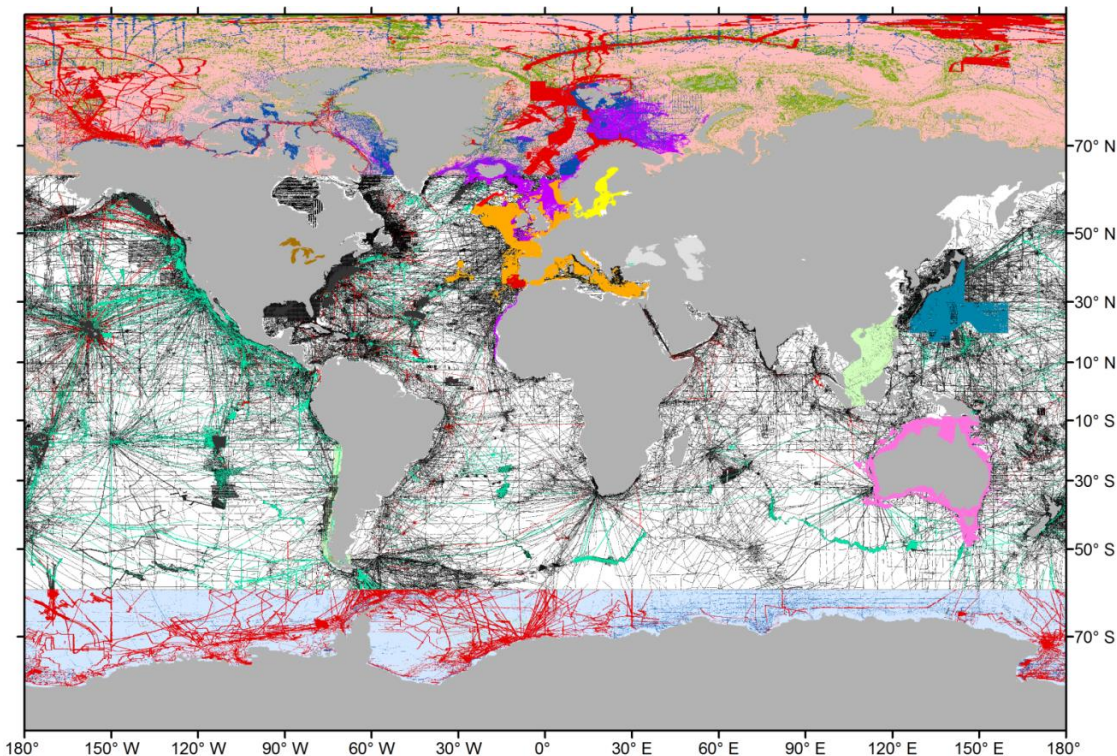
Depth-dependent resolution goals



-  100x100 m (0-1500 m)
-  200x200 m (1500-3000 m)
-  400x400 m (3000-5750 m)
-  800x800 m (5750-11000 m)



How much of the ocean is mapped?



$$A + B + C = 100\%$$

known



unknown

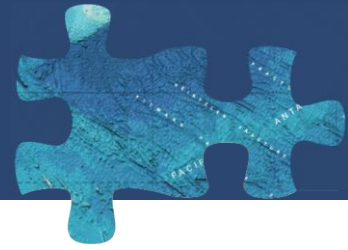
A: Data in GEBCO products

B: Data that exists but are not yet integrated

- Public
- Embargoed

C: Data that must be acquired

Completing the Map



Existing data not yet integrated

- Gather information about existing data even if embargoed
- Reveal gaps to inform new acquisition
- Promote data sharing

New Data Acquisition

- Coordination and communication
- Share information about planned surveys

Technology Innovation & Acceleration

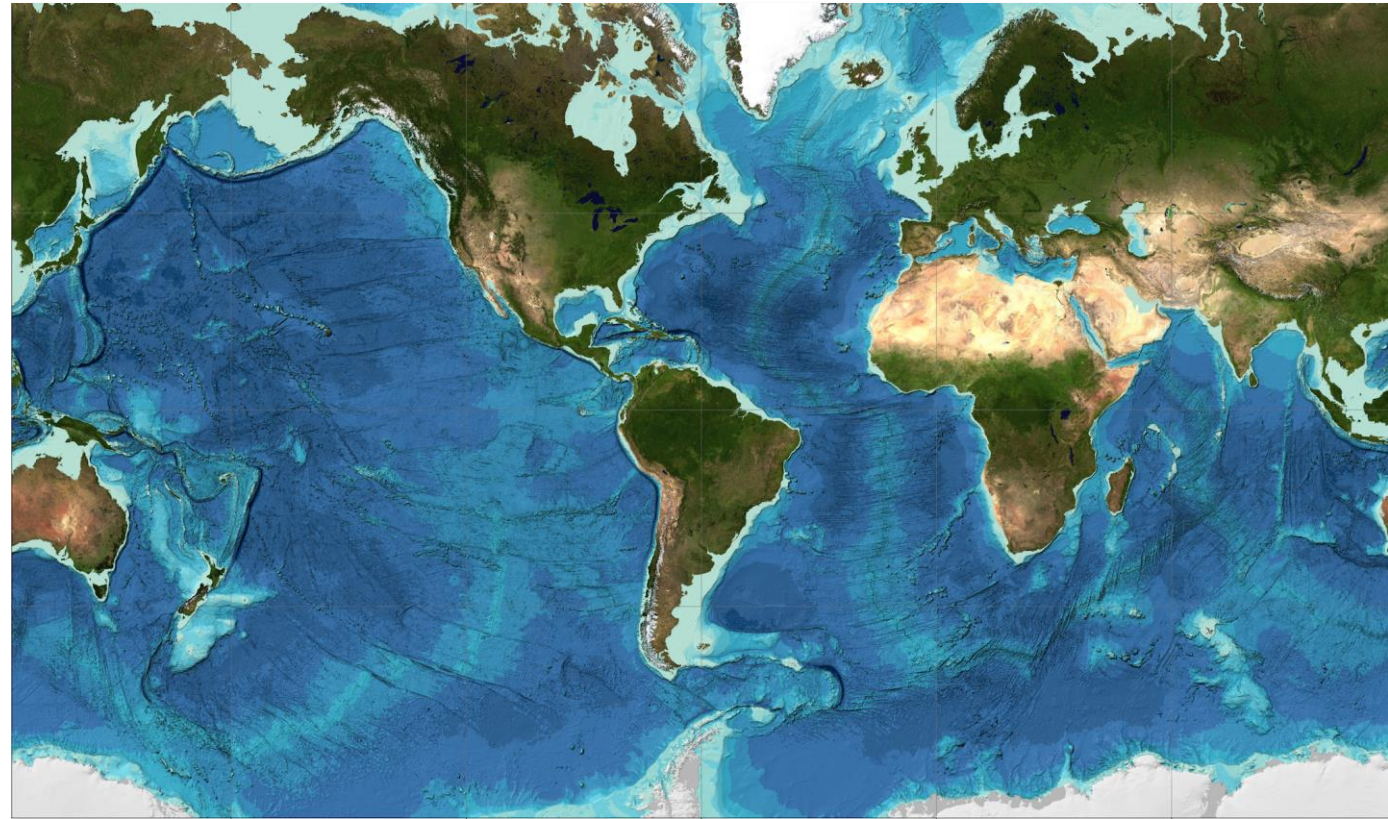
- Data Acquisition
- Processing/Integration



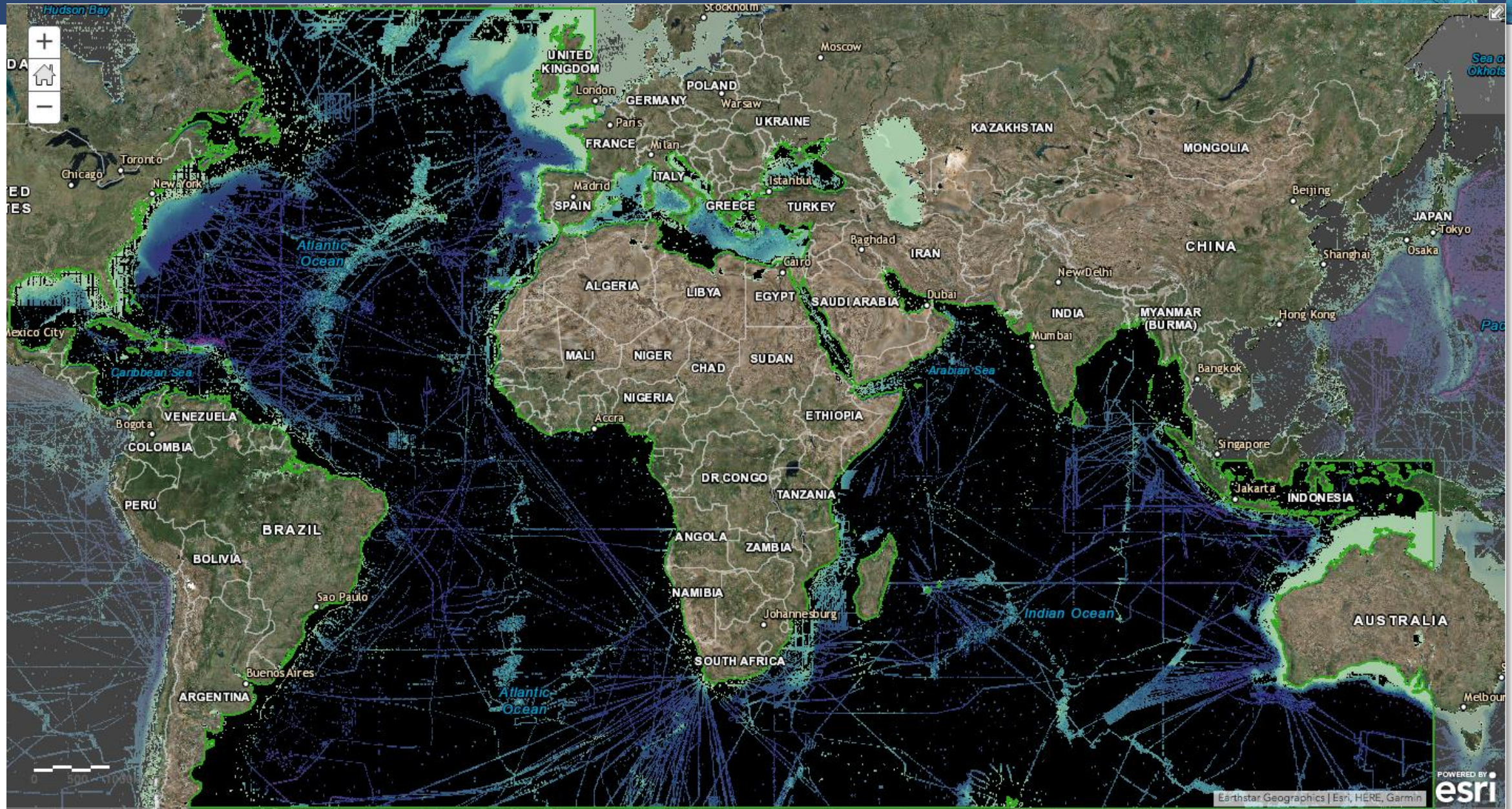
$$A + B + C = 100\%$$



- Released April 2019
- 15 arc second grid
- Coverage more than doubled
 - GEBCO 2014: 6% of goal
 - GEBCO 2019: 15% of goal
- New data from all sectors
 - Government
 - Academia
 - Industry
 - Private



GEBCO 2019 – Atlantic/Indian Region



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)



Norway sets example through interdisciplinary cooperation



XLII Antarctic Treaty
Consultative Meeting
Prague • Czech Republic • 2019

(type) (number)

ENG

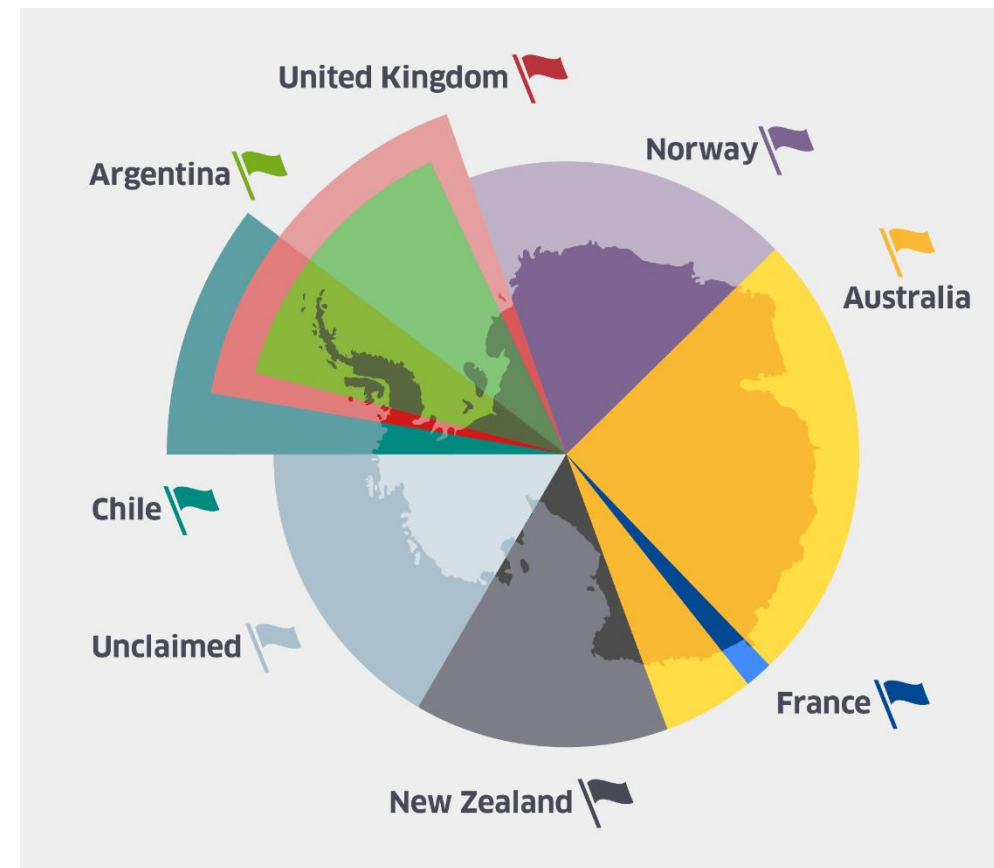
Agenda Item: (agenda item)
Presented by: Norway
Original: English
Submitted: (date submission)

Recommendation

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

Resolution XXX (2019)

Hydrographic Mapping of Antarctic Waters



Norwegian Mapping Authority

And hopefully creates a snowballing effect



what's the
opposite of
snowballing?



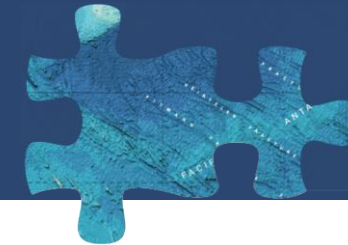
decrease, lessen, weaken, lower,
narrow, cut, shorten, subtract,
undermine, curtail



 Thesaurus.plus

To map the seabed of this planet

How to participate



- Contribute data to IHO DCDB
 - Gridded data products
 - Points from ENCs
- Contribute information about existing data coverage
- Share information about future mapping plans
- Engage with Data Centers
- Support and promote GEBCO activities and products



seabed2030.org

@seabed2030 



Thank you!