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GEOSPATIAL WORLD FORUM
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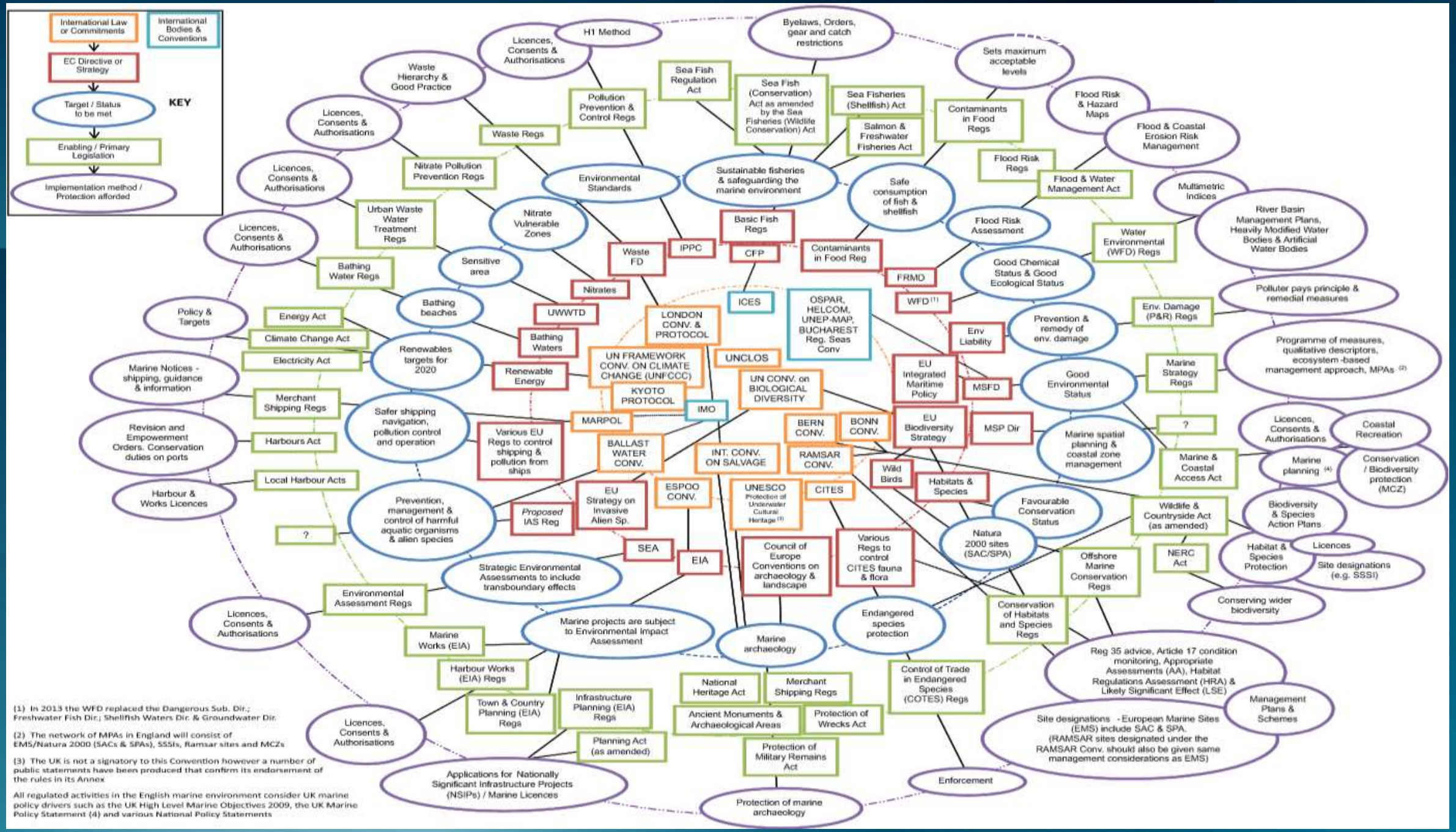
THE NIPPON FOUNDATION-GEBCO SEABED 2030

SEABED 2030

Energizing Ocean Floor Mapping

Steve Hall CMarSci FIMarEST
Seabed 2030 Head of Partnerships
partnerships@seabed2030.org



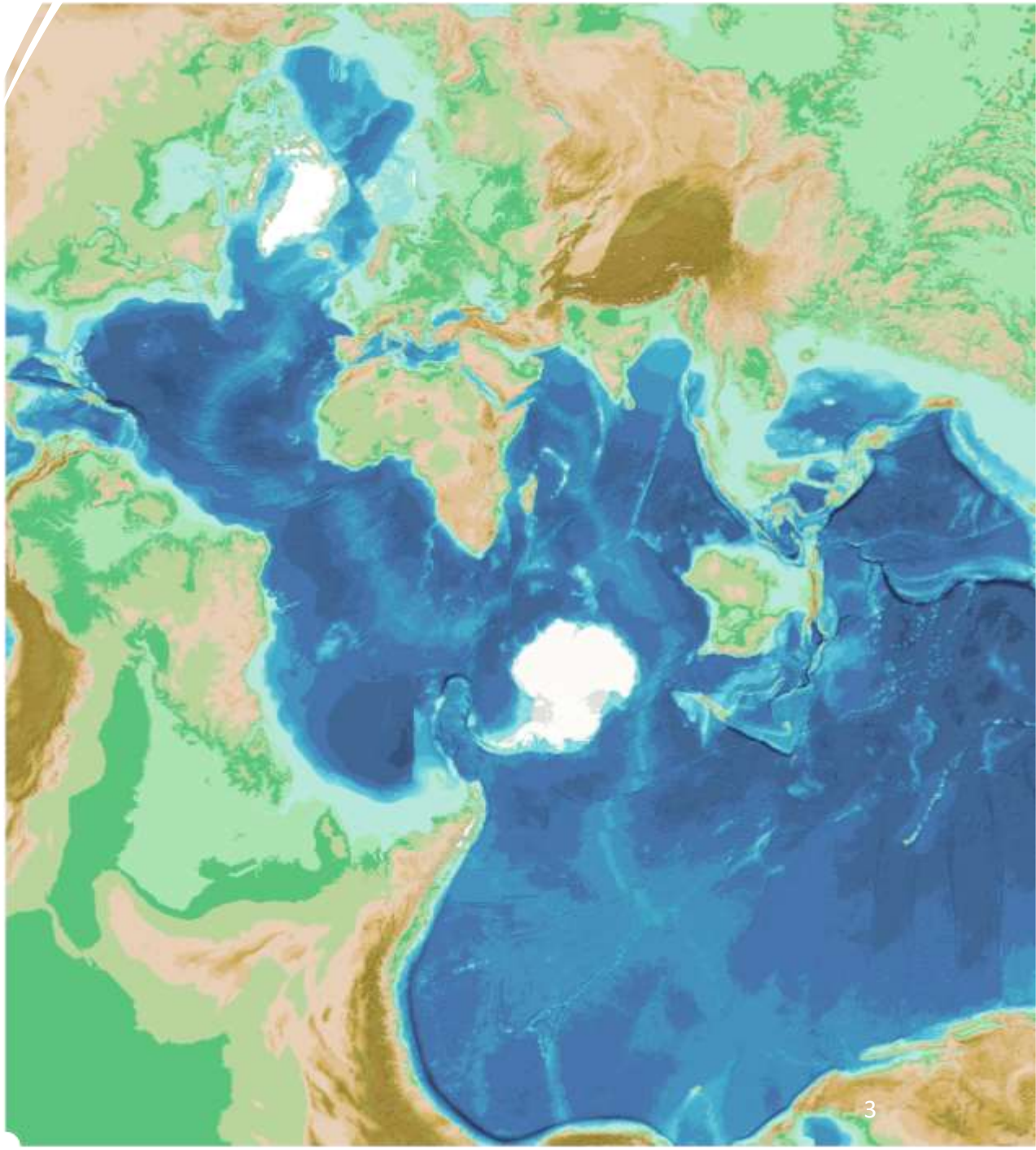
(1) In 2013 the WFD replaced the Dangerous Sub. Dir.; Freshwater Fish Dir.; Shellfish Waters Dir. & Groundwater Dir.

(2) The network of MPAs in England will consist of EMS/Natura 2000 (SACs & SPAs), SSSIs, Ramsar sites and MCZs

(3) The UK is not a signatory to this Convention however a number of public statements have been produced that confirm its endorsement of the rules in its Annex

All regulated activities in the English marine environment consider UK marine policy drivers such as the UK High Level Marine Objectives 2009, the UK Marine Policy Statement (4) and various National Policy Statements

It all needs maps!



History - GEBCO – established 1903

Now a joint programme of:

- The International Hydrographic Organization (IHO)

&

- The Intergovernmental Oceanographic Commission (IOC/UNESCO)

Aim: provide authoritative, publicly-available bathymetry (depth) data sets of the world's oceans

Mainly voluntary international community of:

- Scientists
- Oceanographers
- Hydrographers
- Citizens

GEBCO over the decades – more data, higher resolution

1st Edition 1903

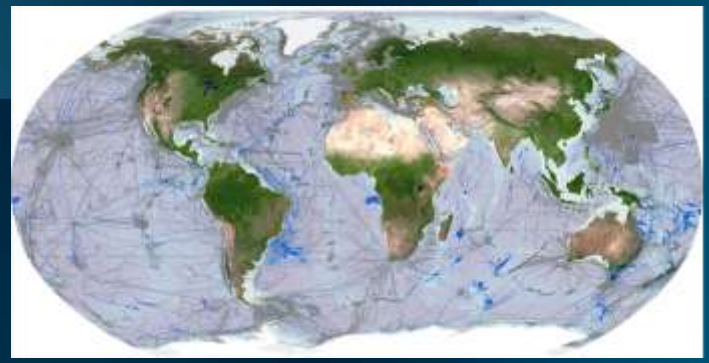
2nd Edition 1910-30

3rd Edition 1932-66

4th Edition 1958-73

5th Edition 1973-82

2023 Release



The Nippon Foundation-GEBCO Seabed 2030 Project

Forum for Future Ocean Floor Mapping

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

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

Flagship Programme

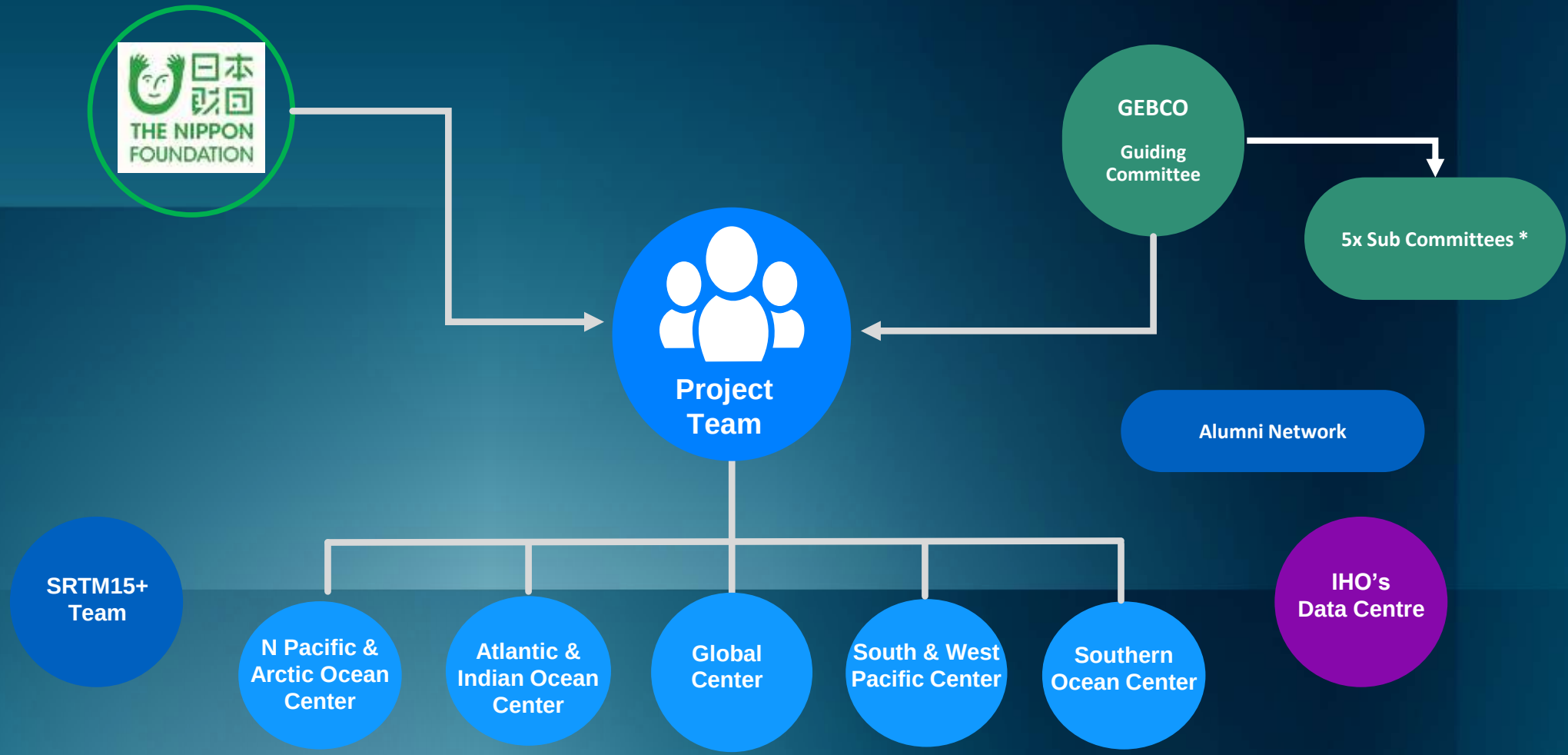
June 2016 → **June 2017** → **June 2021**

Seabed 2030 = accelerator to GEBCO's aim

Collaboration to:

- **inspire 100% seabed mapping by 2030**
- **compile the GEBCO Map**

Seabed 2030 Simplified Network

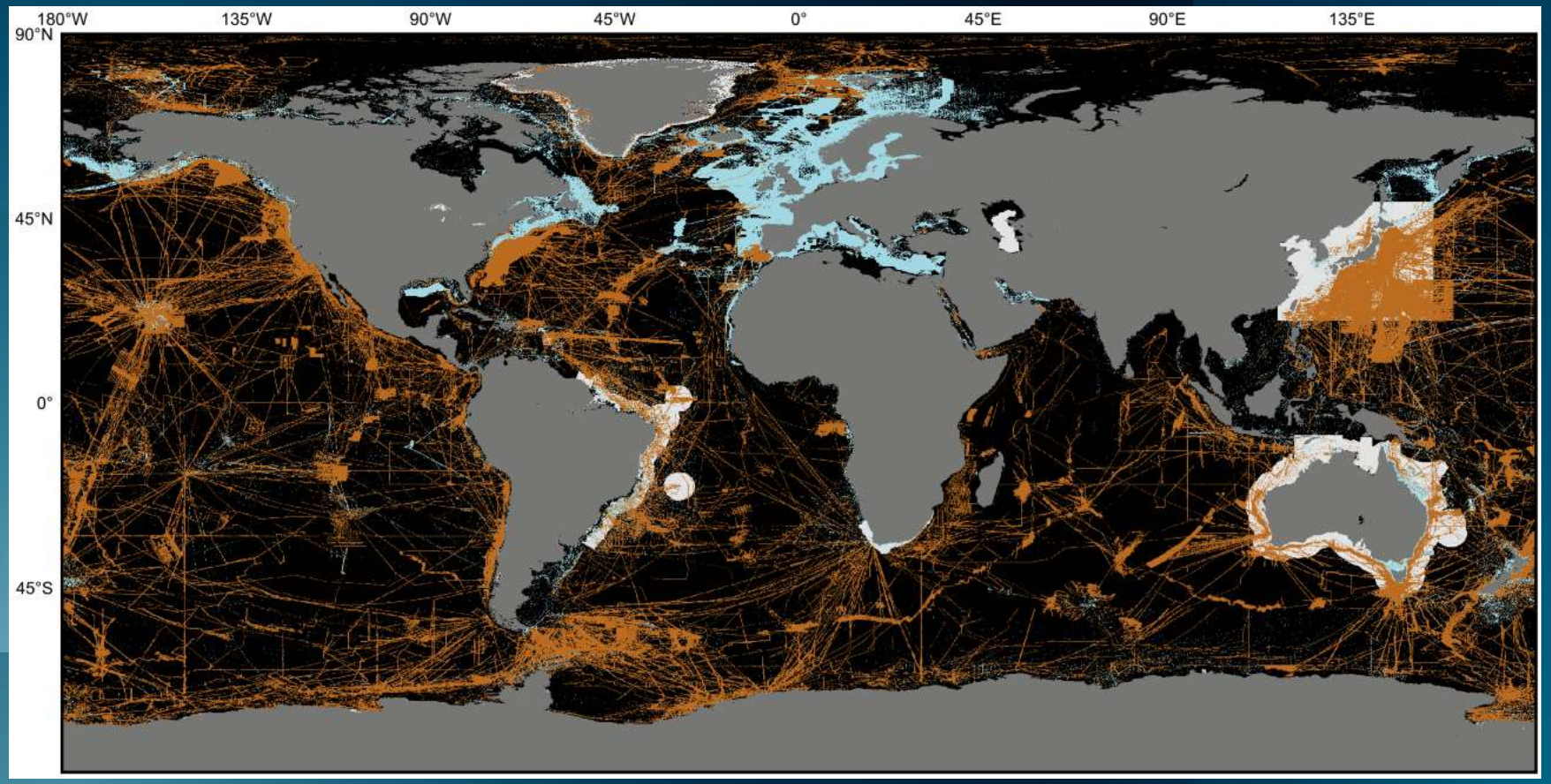


* *Technical | Regional | Undersea Feature Names | Engagement & Outreach | Education & Training*

Progress so far …

GEBCO Map:

- *6% in 2017*
- Now **24.9%**
  - *90.1 million KM2*
  - *5 x South America*
  - *3 x Africa*



Courtesy: Martin Jakobsson, SU

3/4 of ocean floor still to go …..


ocean


ocean
PAVILION
For our blue planet


SEABED
2030
150
OBIS


OCEAN
TEACHER
GLOBAL
ACADEMY
SEABED
2030


SEABED
2030


unesco


2024 OCEAN DECADE
CONFERENCE

In Perspective

X Not this resolution

✓✓ We ask for this

✓ But will work with lower resolution

Credit: Larry Mayer

The Rise of the Robots

- The use of marine autonomous systems, surface and subsurface, lets us gather data from hard-to-reach places, often at a lower cost than a traditional survey vessel, & widens access to users who can't afford a ship.
- A new generation of sensors & sonars offer constantly-improved mapping, from shelf seas to the deepest trenches.

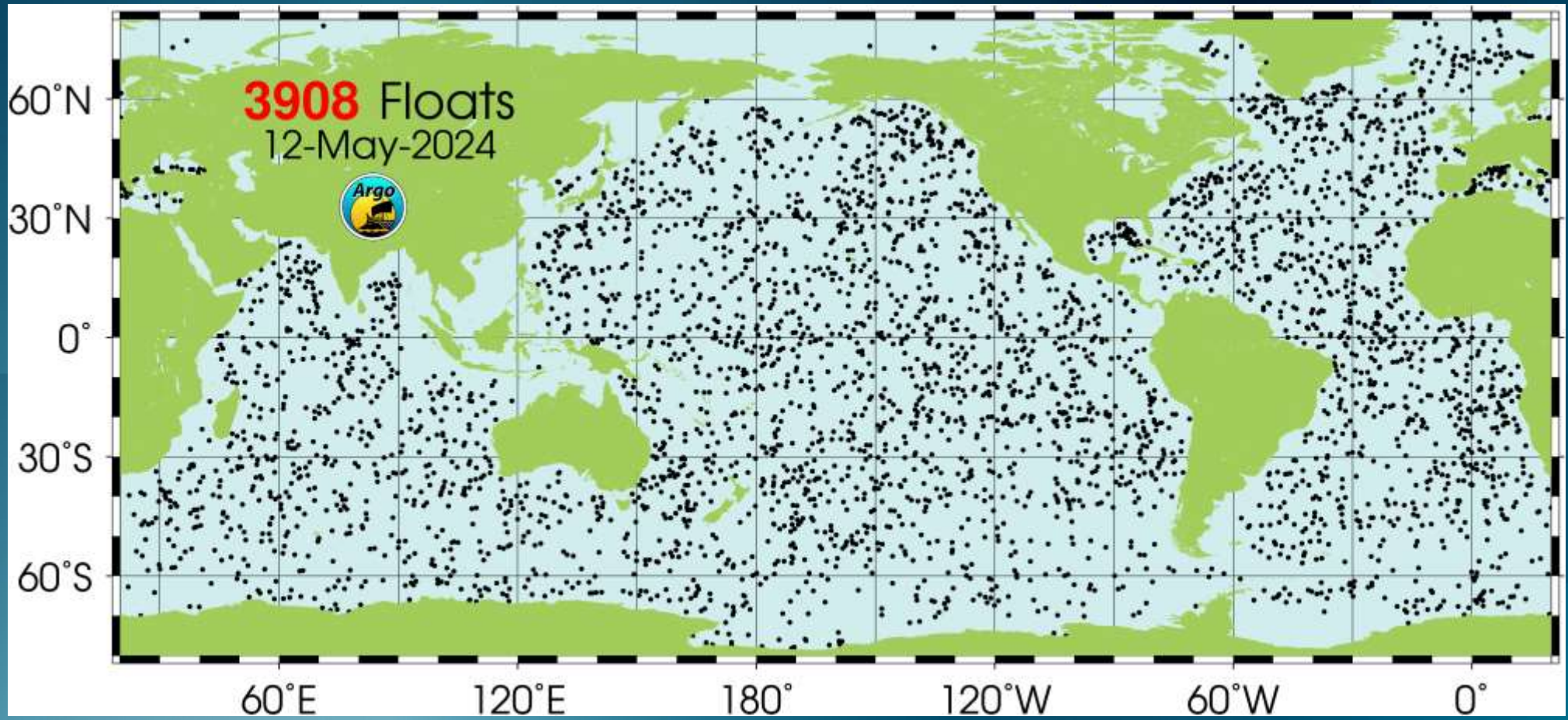
The iXblue DriX platform is returning superb results for Seabed 2030 partner NOAA..

Saildrone Surveyor – latest version offers significant possibilities for sustained ocean mapping..

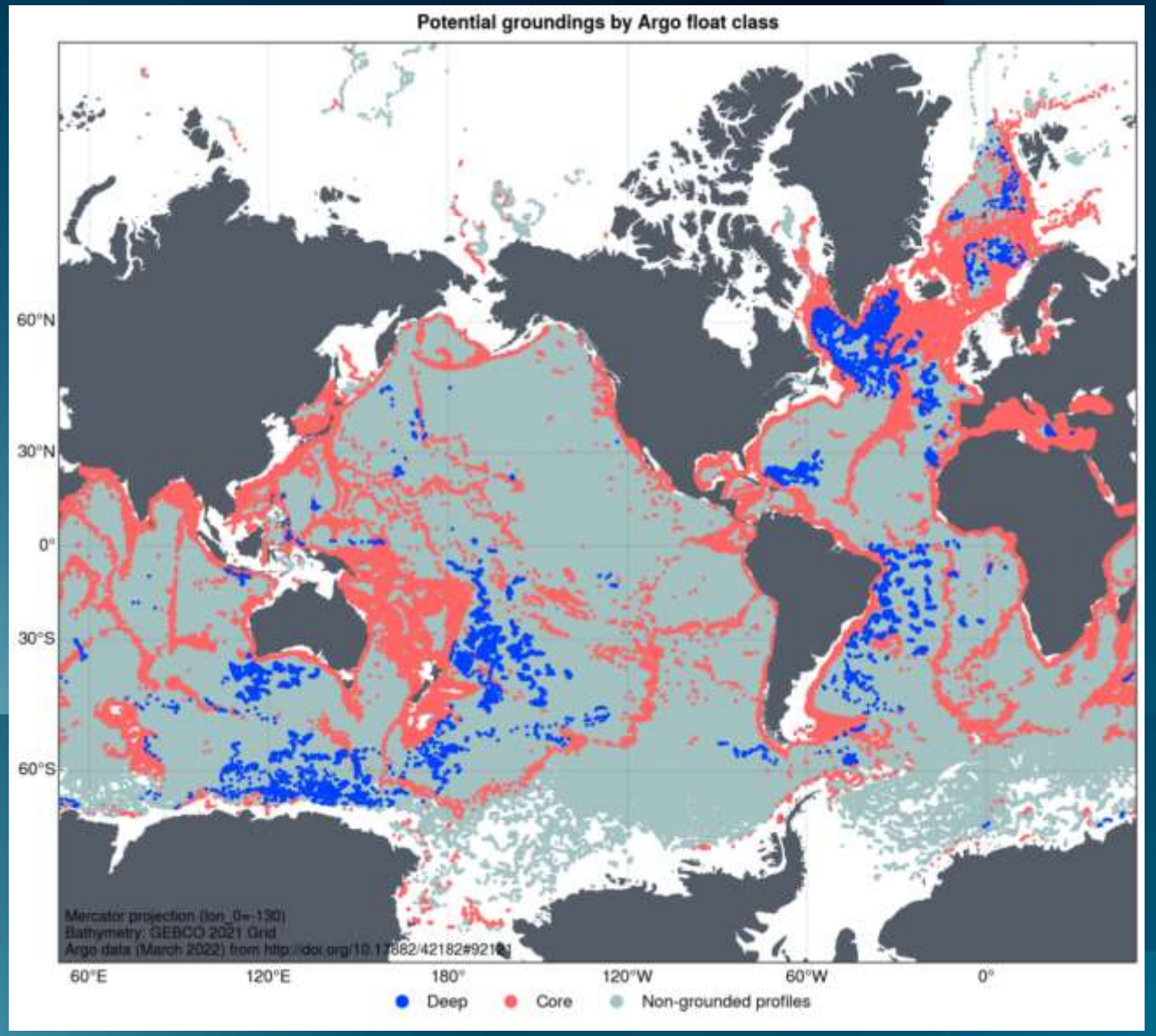
Physical Oceanographers have it easy ;)

Global ‘Argo’ float network status, as of 12th May 2024 – *some future Argo floats will also measure bathymetry..*

New technologies & more platforms will complete the seabed map…



Using Argo for bathymetry



The spatial distribution of potentially grounded Argo profiles (Argo dataset, March 2022, http://doi.org/10.17882/42182#92121). Core Argo profiles (red) and Deep Argo profiles (blue) that have passed through initial screening tests indicating a potential grounding.

The Value of Crowdsourced Bathymetry Data

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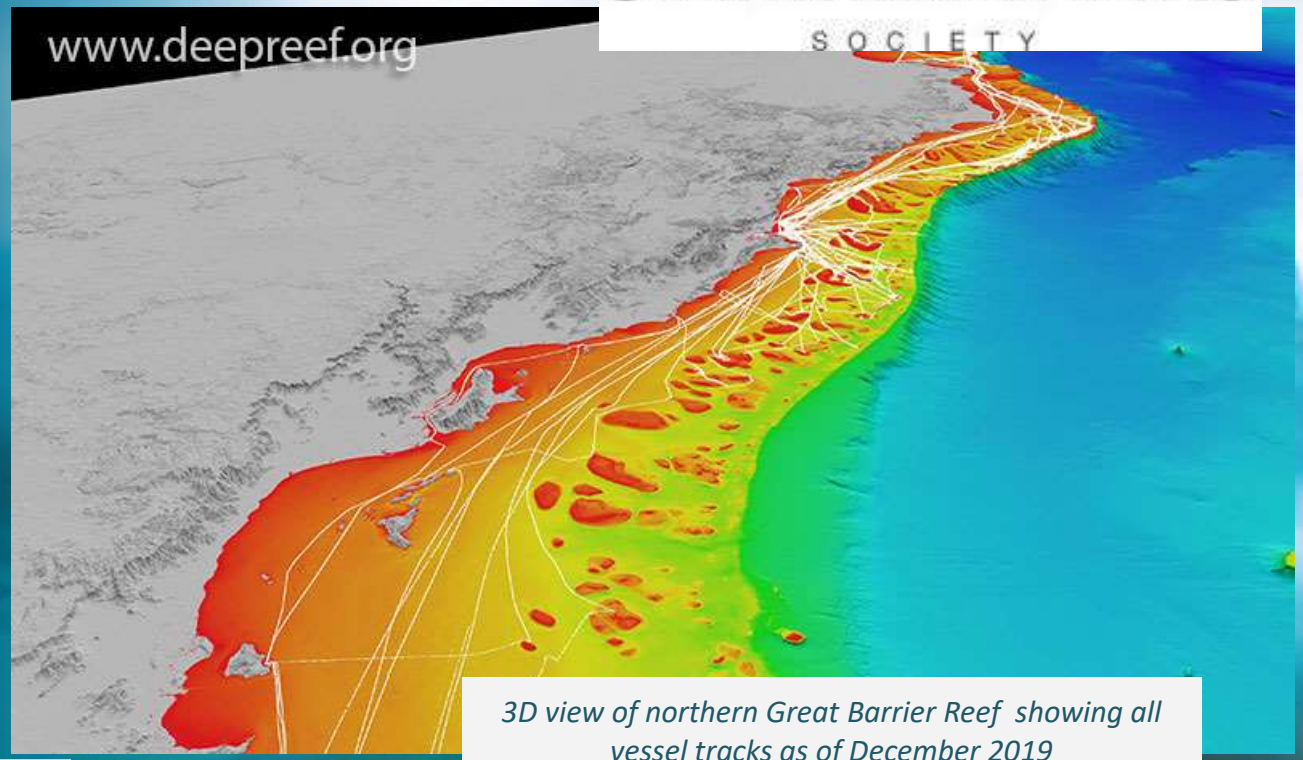
- Data with scientific, commercial & research value at no cost to the public sector
- Fill gaps where data is scarce (eg: Arctic, SIDS)
- Useful along shallow, complex coastlines
- Identify uncharted features
- Assist in verifying charted information
- Confirm whether charts are appropriate for the latest traffic patterns.

THE INTERNATIONAL SEAKEEPERS SOCIETY



3D view of northern Great Barrier Reef showing all vessel tracks as of December 2019

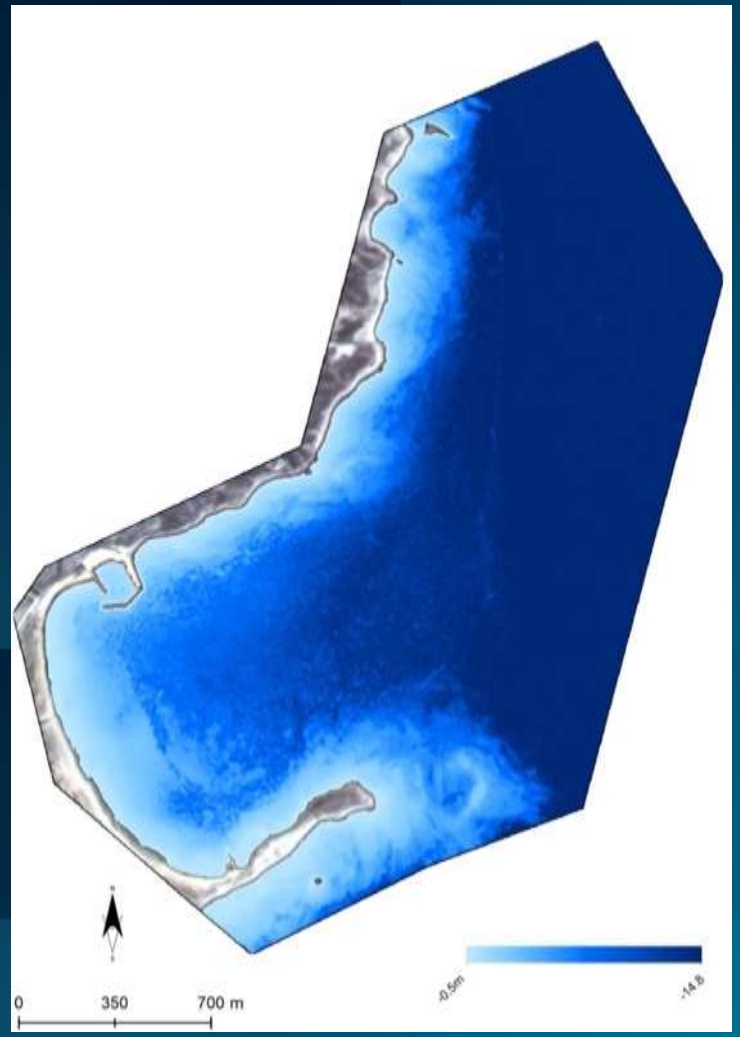
...but only if vessels collect depth information while on passage!

‘Sea ID’ Nemo 30 – example of a compact data-logger for crowdsourced bathymetry

Satellite, aircraft & drone Derived Bathymetry

- Physically measuring the depth and shape of the ocean floor with multibeam techniques is accurate – but slow, and can be expensive.
- Robotic systems help – but remote sensing is much faster and more affordable.
- There are limitations – limited max depth, can't see through ice or turbid conditions – but still gives useful data that is more accurate than legacy maps.
- Deep LIDAR is becoming possible but early days..
- Perhaps in the future a breakthrough in quantum imaging sensors will enable true ocean transparency, but it's a long way off.

The bathymetry of Plaka area, Lemnos estimated by Planet SuperDove 8-bands imagery on 16/05/2022
Credit – Dimitris Poursanidis, Terrasolutions.eu



Benefits Analysis – Use Cases

1: Seabed Mapping Innovation

2: EEZ Seabed Mapping in the Absence of a National HO

3: Subsea Cable Planning & Design

4: Tsunami Propagation & Storm Surge Modeling

5: Renewable Energy - Offshore Wind Energy

6: Climate Change Ocean Models

7: SIDS* - Sea Level Rise and Coastal Inundation

8: Marine Biodiversity

9: SIDS* - Marine & Coastal Development, & Use of Seabed Mapping as Foundation Data for Marine Spatial Planning

10: Government Policy

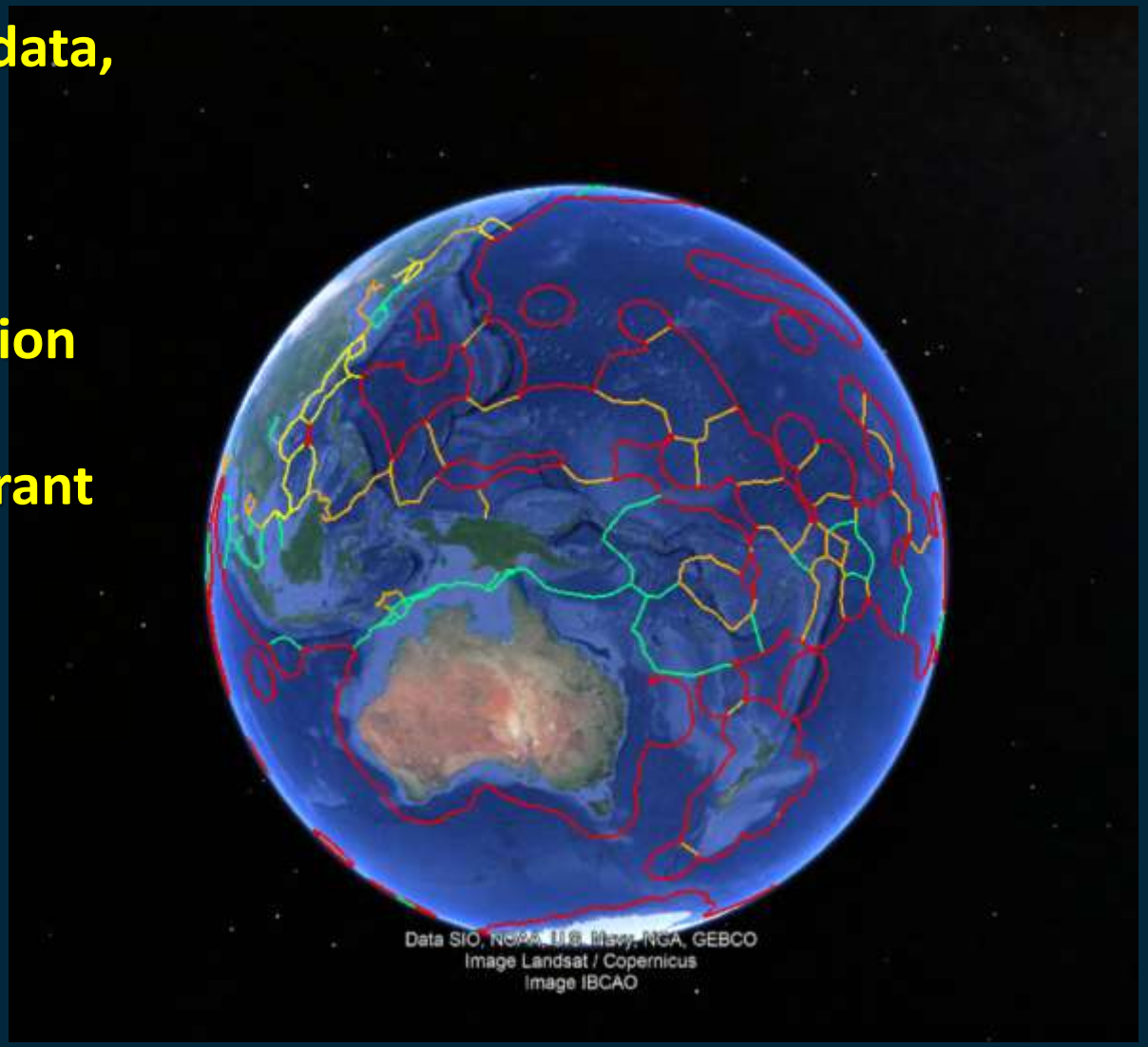
11: Ocean Discovery &Ocean Exploration

12: Driving Hydrographic Industry Expansion & Human Capital Benefits

*(*Small Island Developing States)*

CHALLENGES WE FACE:

- Reluctance to release existing data – often because data gatherers don't own the data, they gather it for clients..
- Who will pay for new data collection?
  - especially beyond national jurisdiction
- Even if someone pays – reluctance to grant permission – MSR / UNCLOS issues

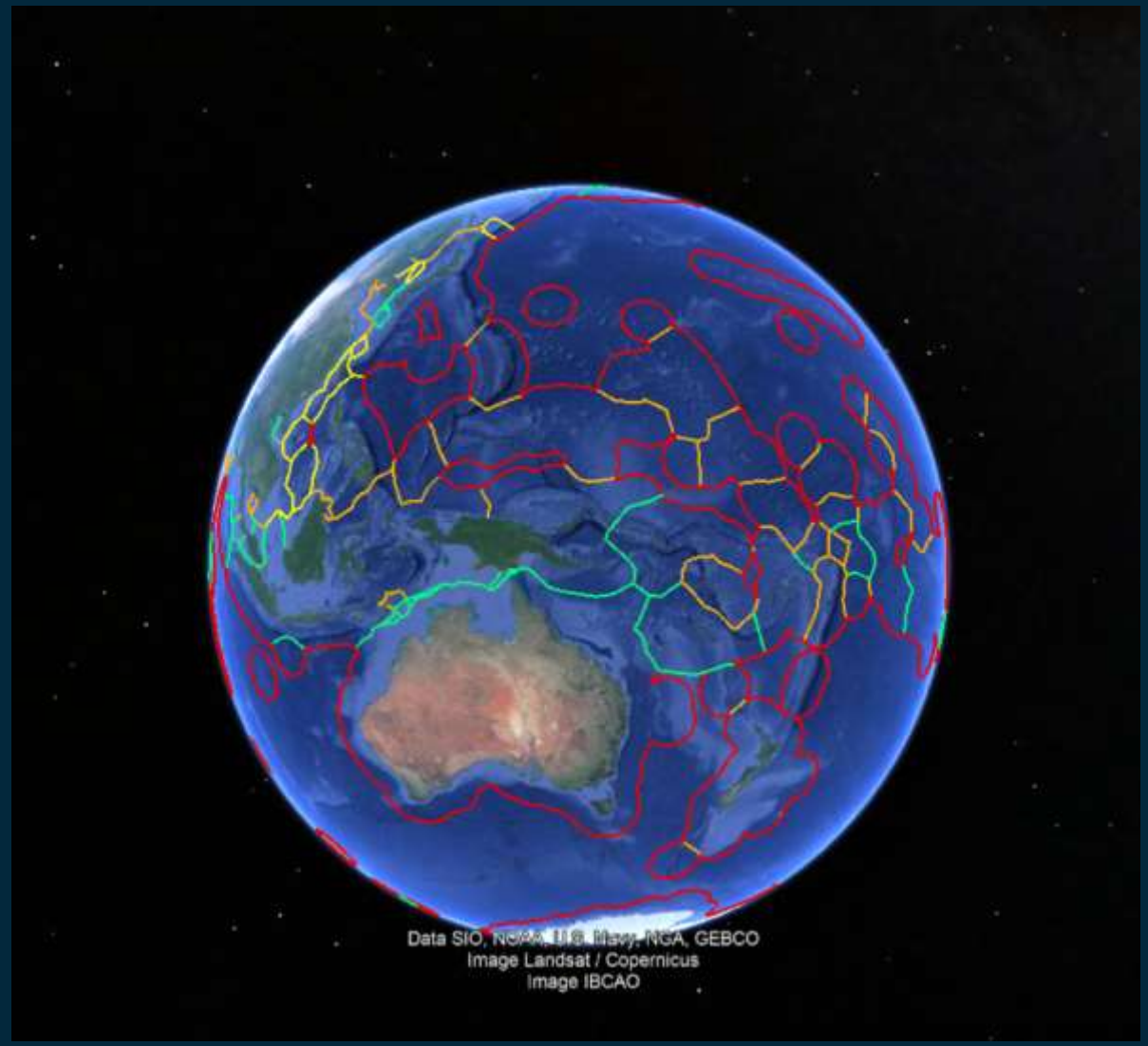


Credit: UNH/CCOM-JHC

OPPORTUNITIES:

- Collaborate in forming regional alliances
  - to encourage new mapping.

- Develop mechanism to allows bathymetry acquisition
  - in support of
    - SB2030
    - SDG14
    - Ocean Decade
  - without MSR regime constraints



Credit: UNH/CCOM-JHC

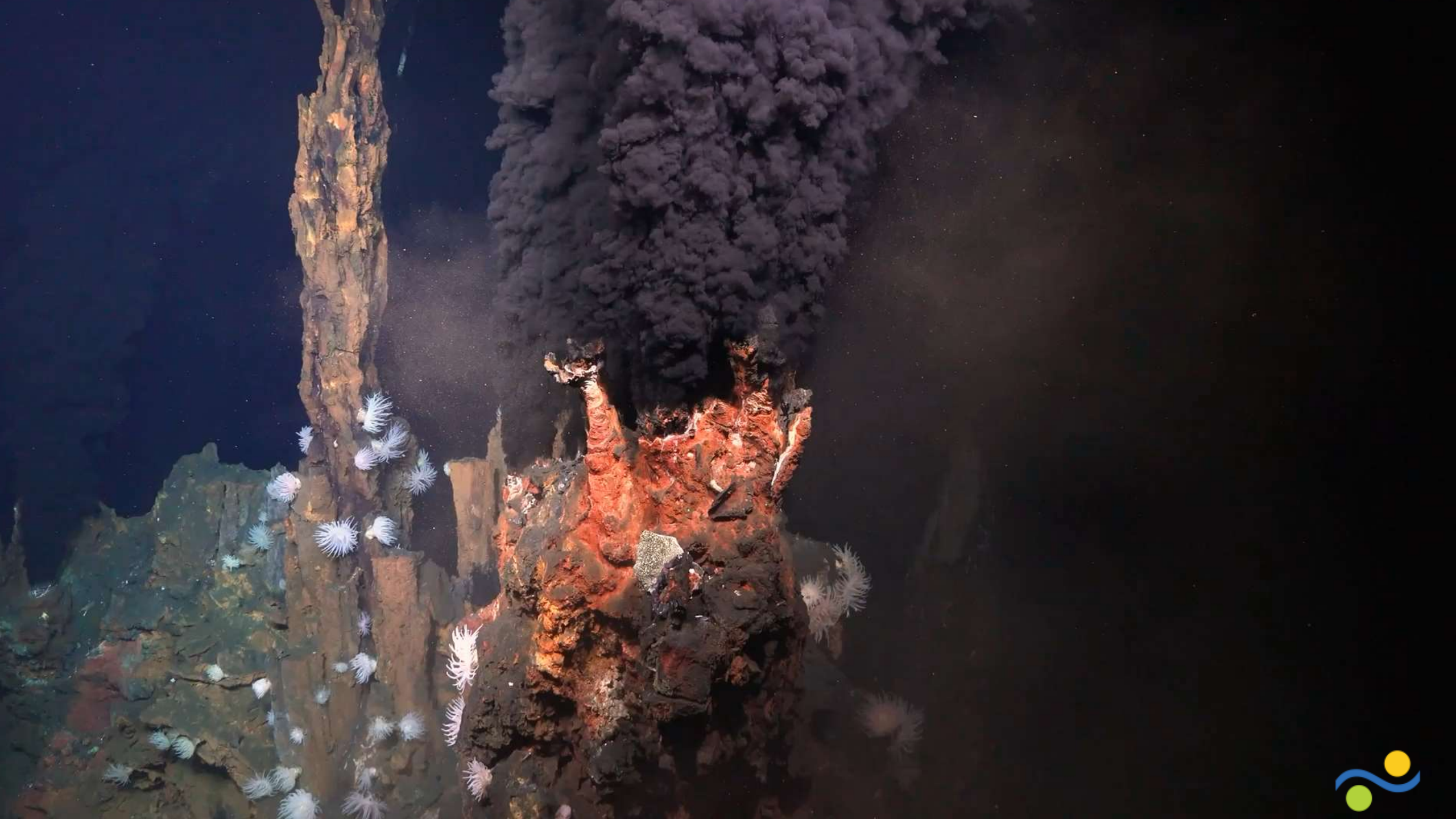
WIOBathy Project – Supporting Ocean Mapping

- **Bathymetry Collation & compilation in Western Indian Ocean (WIO)**
  - **Multi-scale & multi-resolution**
  - **First bathymetric map of WIO region**
- **Project Team of 8 Nippon Foundation-GEBCO Fellows:**
  - **Kenya, Tanzania, Mauritius & Madagascar**
- **Supported by Fellows from South Africa**
- **Championed by The Nippon Foundation**
- **Reaching out to other regional collaborators**

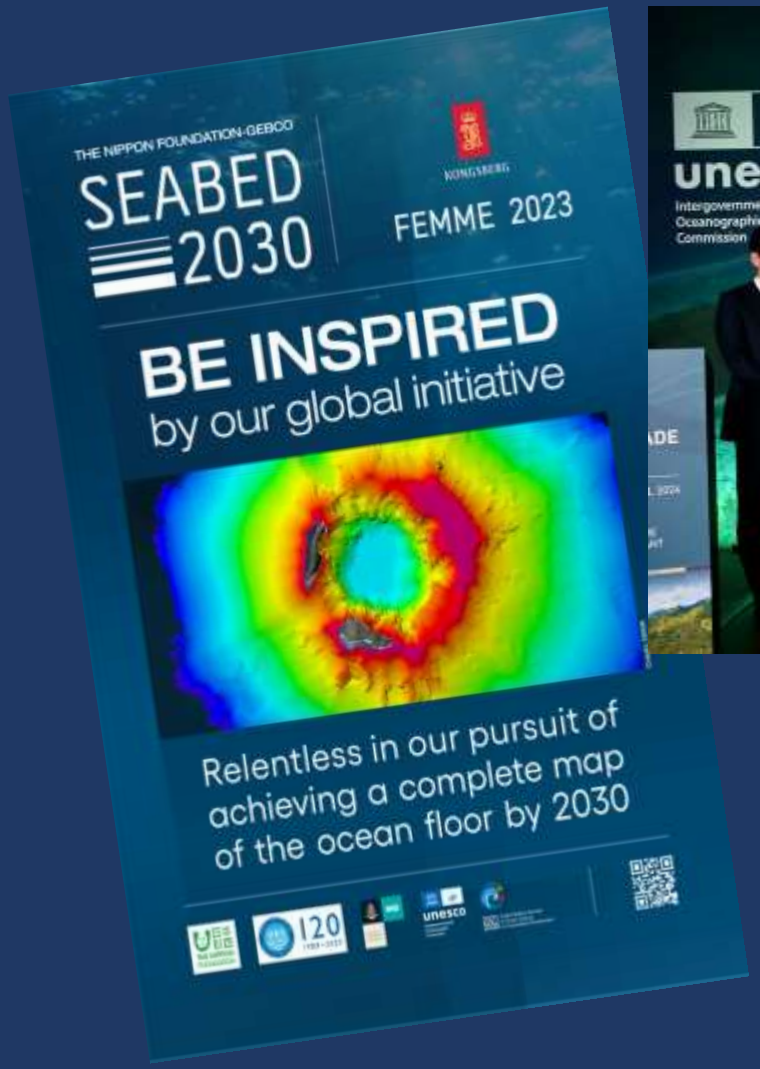
Credit: Amon Kimeli

How do partners contribute data?

- The process varies according to what sort of data they have – physical media such as tapes and paper files, versus digital media.
- The GEBCO community that Seabed 2030 serves offers a very high level of assistance to data providers to make the process as smooth and straightforward as possible.
- Go to http://seabed2030.org/contribute to see the form used to describe data, and a short video that describes the process.
- Contributors can also contact any of the Seabed 2030 team for help.



Outreach is vital, engage widely, & as early as possible.



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Thank you- contact Steve Hall at partnerships@seabed2030.org

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GEBCO 120 1903–2023

IHO

unesco Intergovernmental Oceanographic Commission

University of New Hampshire

Lamont-Doherty Earth Observatory COLUMBIA UNIVERSITY | EARTH INSTITUTE

National Oceanography Centre

AWI ALFRED-WEGENER-INSTITUT HELMHOLTZ-ZENTRUM FÜR POLAR- UND MEERESFORSCHUNG

Stockholm University

NIWA Taihoro Nukurangi

Land Information New Zealand