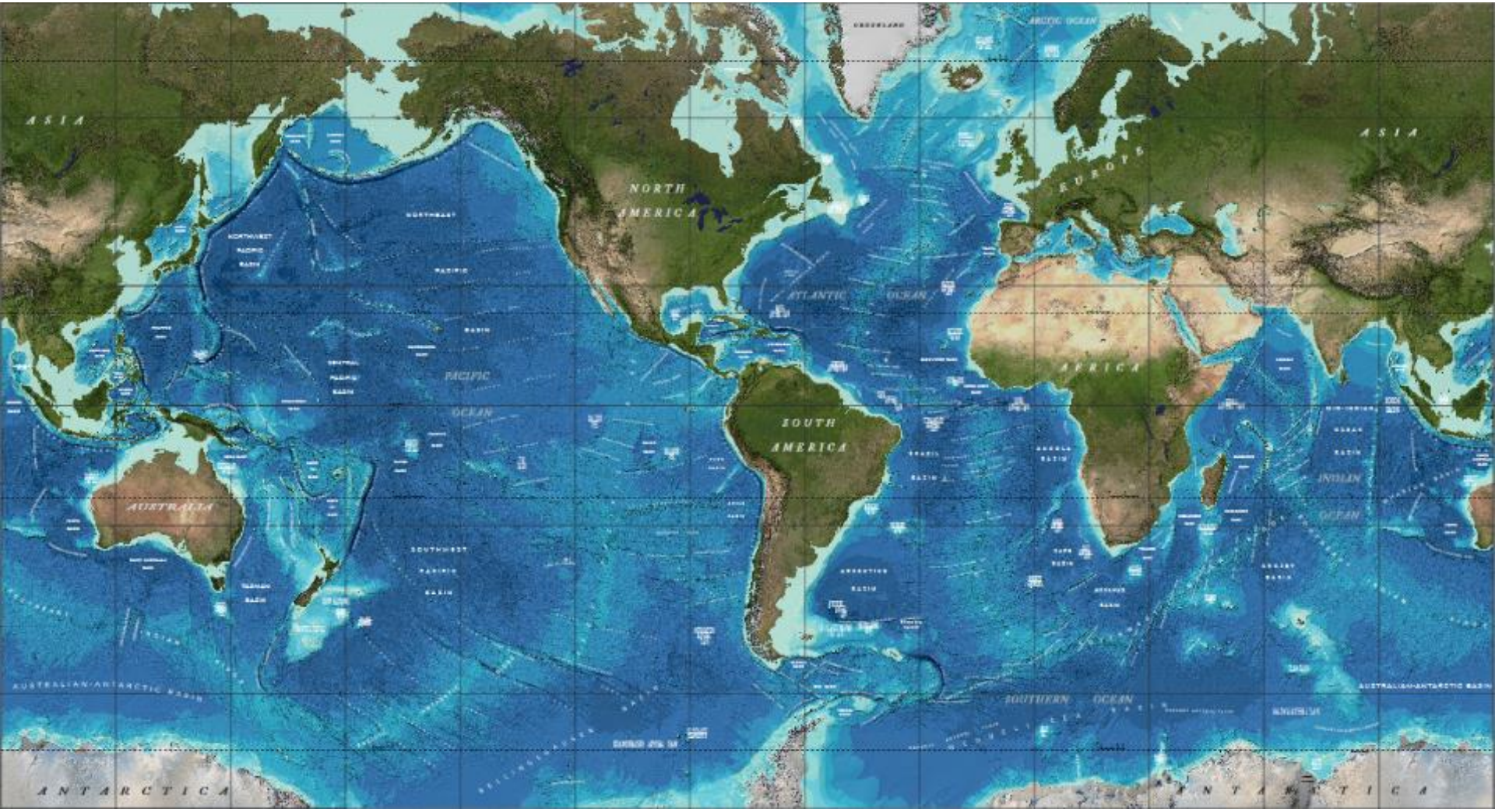
GEBCO and Seabed 2030



General Bathymetric Chart of the Oceans

GEBCO

IHO

United Nations Educational, Scientific and Cultural Organization

UNESCO

Intergovernmental Oceanographic Commission

What is GEBCO?

- GEneral Bathymetric Chart of the Oceans
- An international group of experts who work on the development of a range of bathymetric data sets and data products
- Aims to provide the most authoritative, publicly-available bathymetric data sets for the world's oceans
- Operates under the auspices of the International Hydrographic Organization (IHO) and the Intergovernmental Oceanographic Commission (IOC) of UNESCO
- First GEBCO paper chart series initiated in 1903(!)

United Nations Educational Scientific and Cultural Organization

International Hydrographic Organisation

Intergovernmental Oceanographic Commission

General Bathymetric Chart of the Oceans

GEBCO

Guiding Committee

- **Technical Sub-Committee on Ocean Mapping (TSCOM)**
- **Sub-Committee on Regional Undersea Mapping (SCRUM)**
- **Scientific Committee on Undersea Feature Names (SCUFN)**

Regional mapping work

GEBCO has setup the Sub-Committee on Regional Undersea Mapping (SCRUM) to:

- Build a closer collaboration with regional mapping efforts and coordinate, as well as encourage, the incorporation of their compilations into GEBCO.

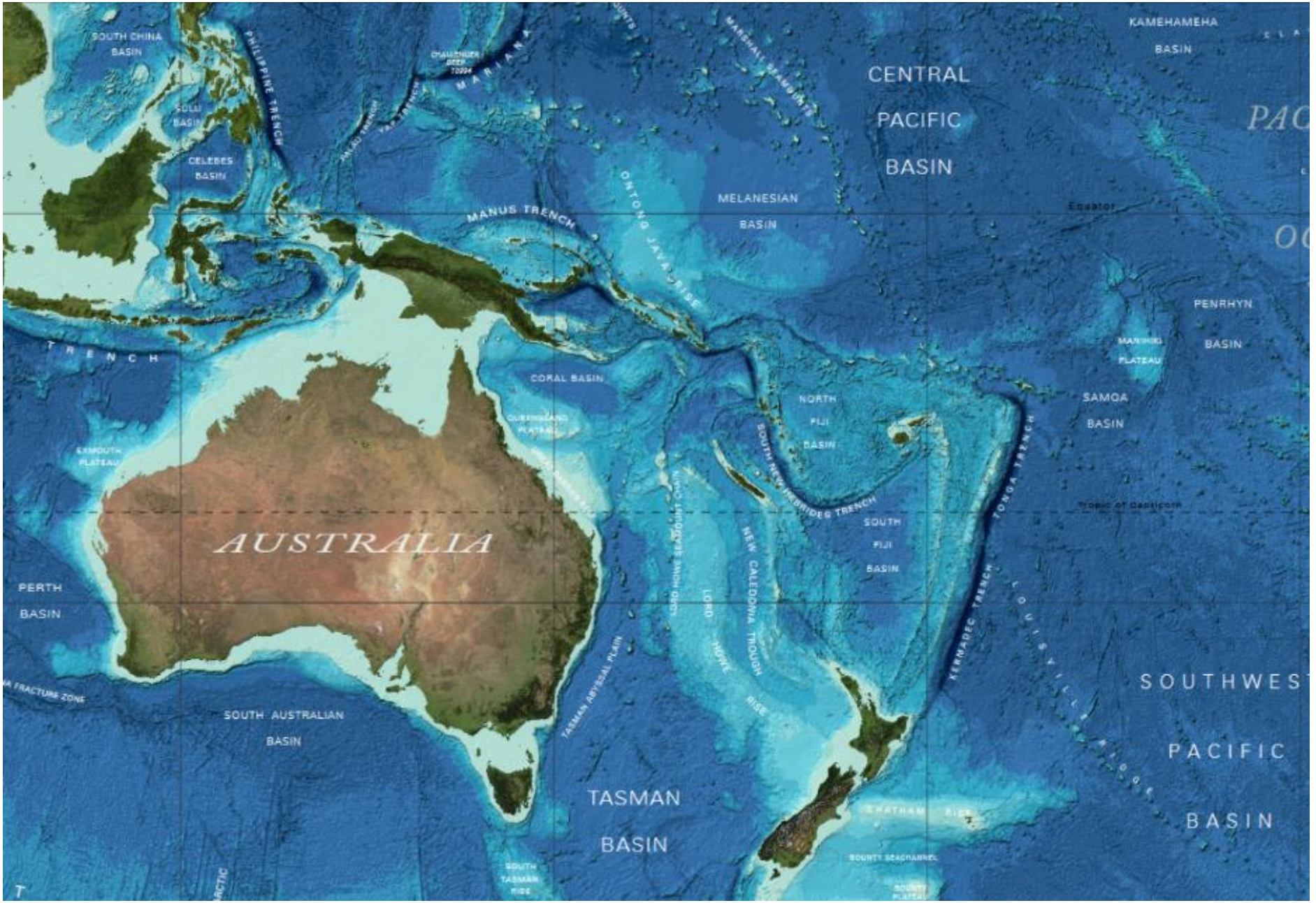
- The Global GEBCO grid is continuously updated in part from these regional grids, benefiting greatly from their local knowledge and expertise.

www.gebco.net/regional_mapping/mapping_projects/

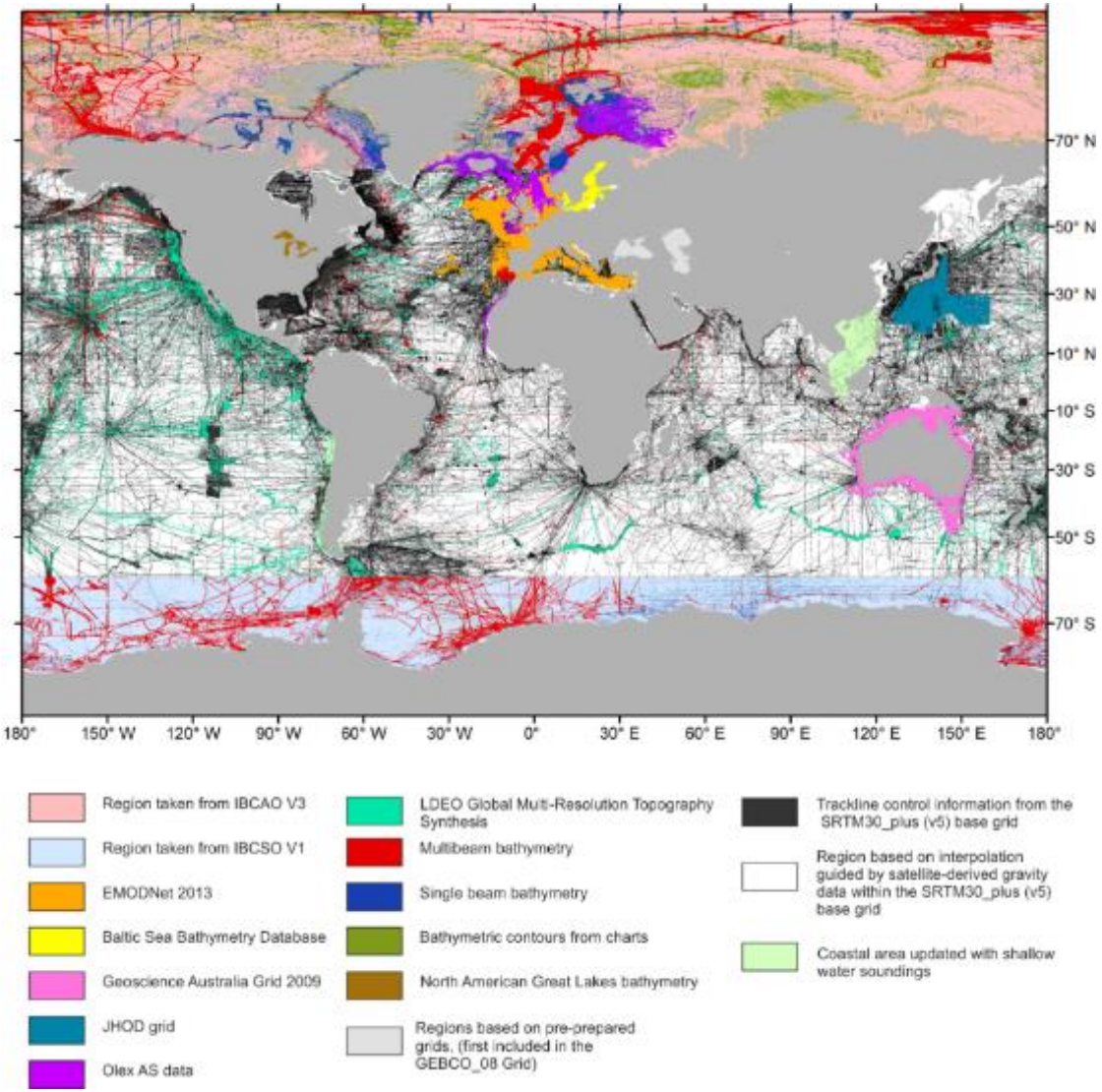
GEBCO Products

- Gridded Bathymetry (30 arc seconds)
  - Digital atlas
  - Maps, Charts, and Viewers
  - Web Services
- Undersea Feature Names
- Bathymetry Processing Cookbook

Available at https://www.gebco.net


SOUTH CHINA BASIN
PHILIPPINE TRENCH
CELEBES BASIN
MANUS TRENCH
ONTONG JAVA RISE
MELANESIAN BASIN
CENTRAL PACIFIC BASIN
KAMEHAMEHA BASIN
PENRHYN BASIN
SAMOA BASIN
NORTH FIJI BASIN
SOUTH FIJI BASIN
TONGA TRENCH
KERMADEC TRENCH
CORAL BASIN
AUSTRALIA
PERTH BASIN
SOUTH AUSTRALIAN BASIN
TASMAN BASIN
TASMAN ABYSSAL PLAIN
NEW CALEDONIA TROUGH
LORD HOWE RISE
SOUTHWEST PACIFIC BASIN
Equator
Tropic of Capricorn

GEBCO's products: Source Identifier Grid



The GEBCO Source Identifier (SID) Grid:

Shows the source of depth value in each grid cell, i.e. if it is based on trackline data; pre-existing grids or if it is based on interpolation

Seabed 2030

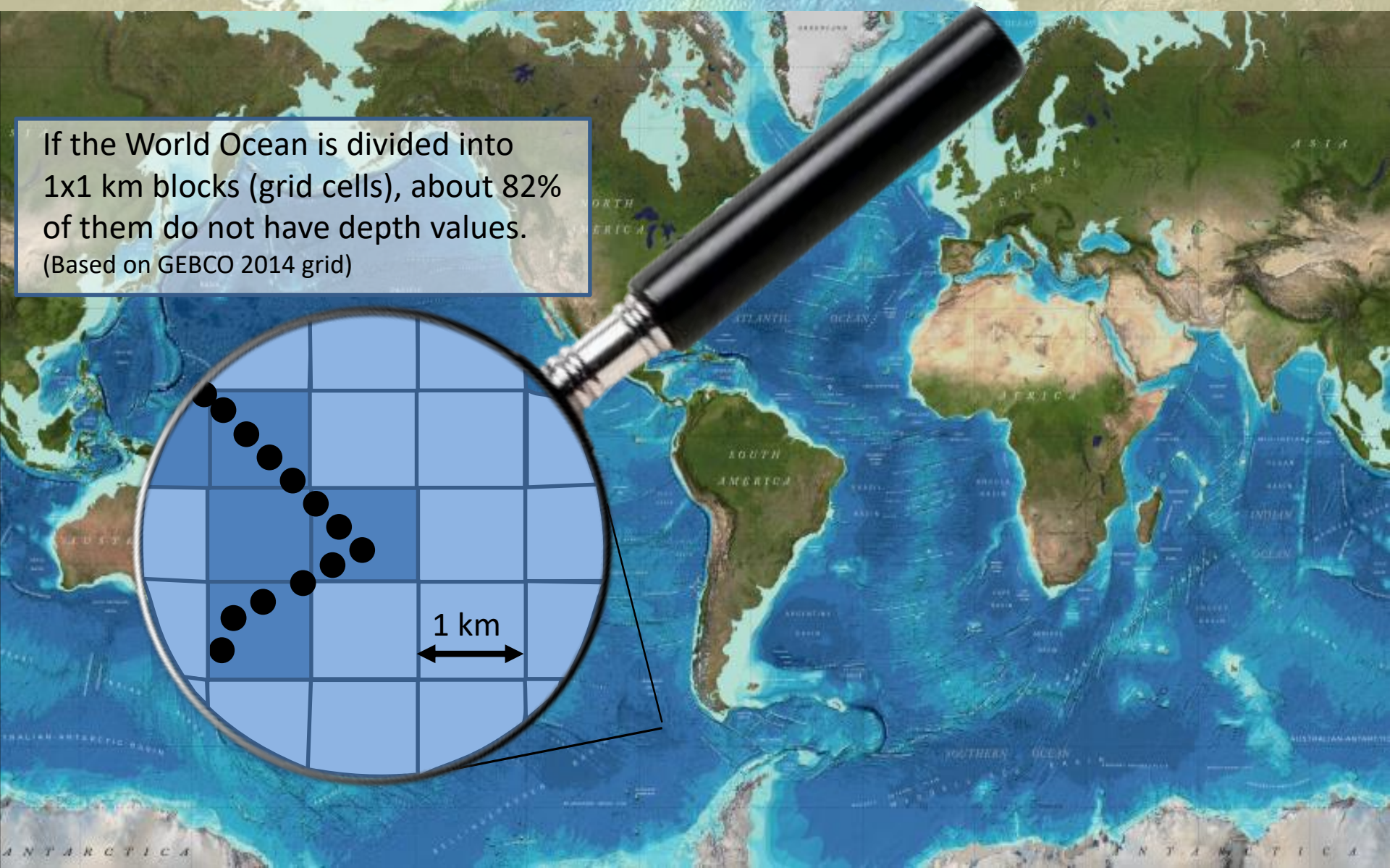
- A program to produce the definitive map of the World Ocean floor by 2030 to empower the world to make policy decisions, use the ocean sustainably, and undertake scientific research based on detailed information of the Earth's seabed.

- Supports United Nations Sustainable Development Goal 14: to conserve and sustainably use the world's oceans, seas and marine resources

SDG14 will be impossible to achieve without a comprehensive map of the world's ocean floor

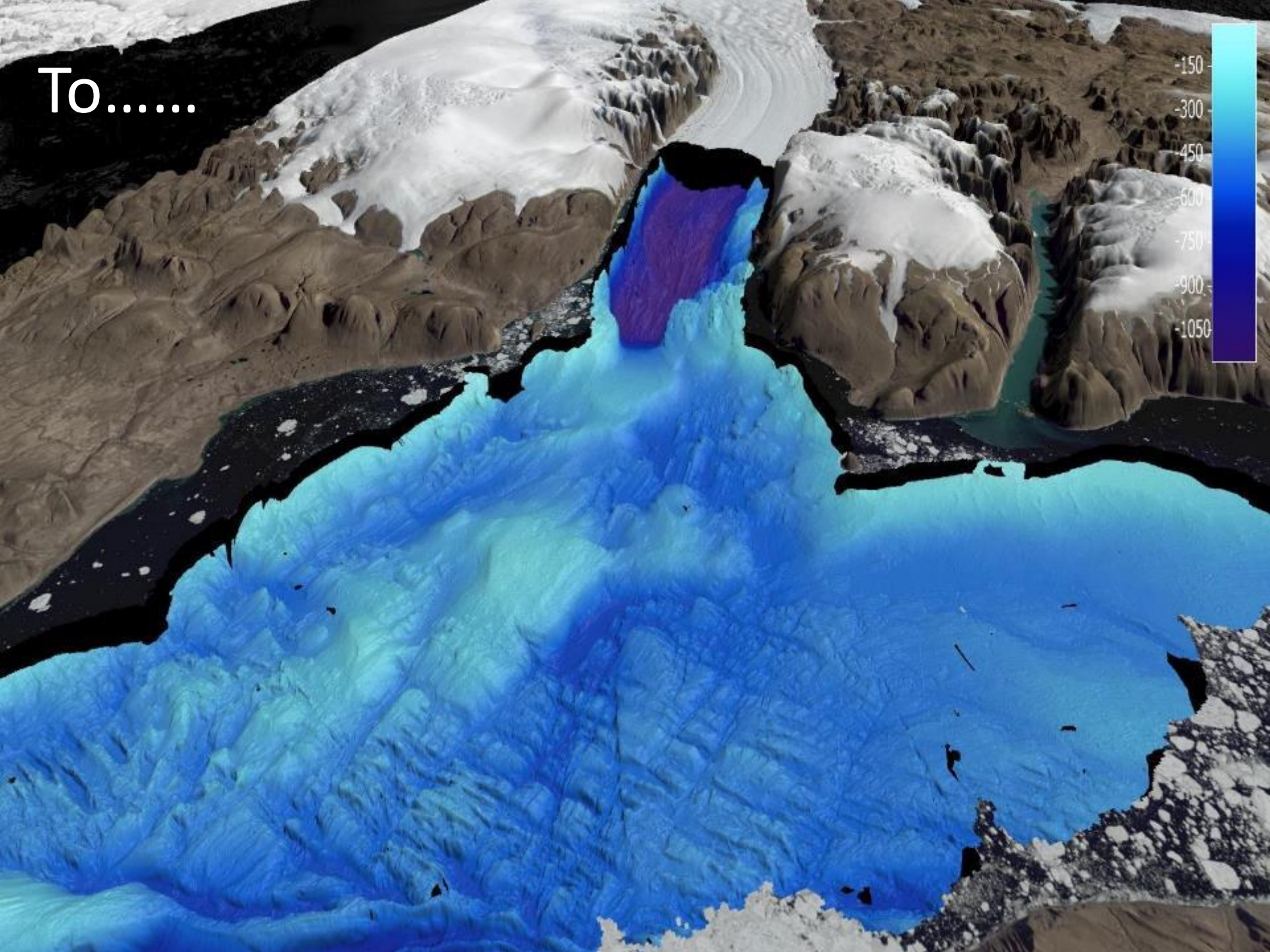
GEBCO

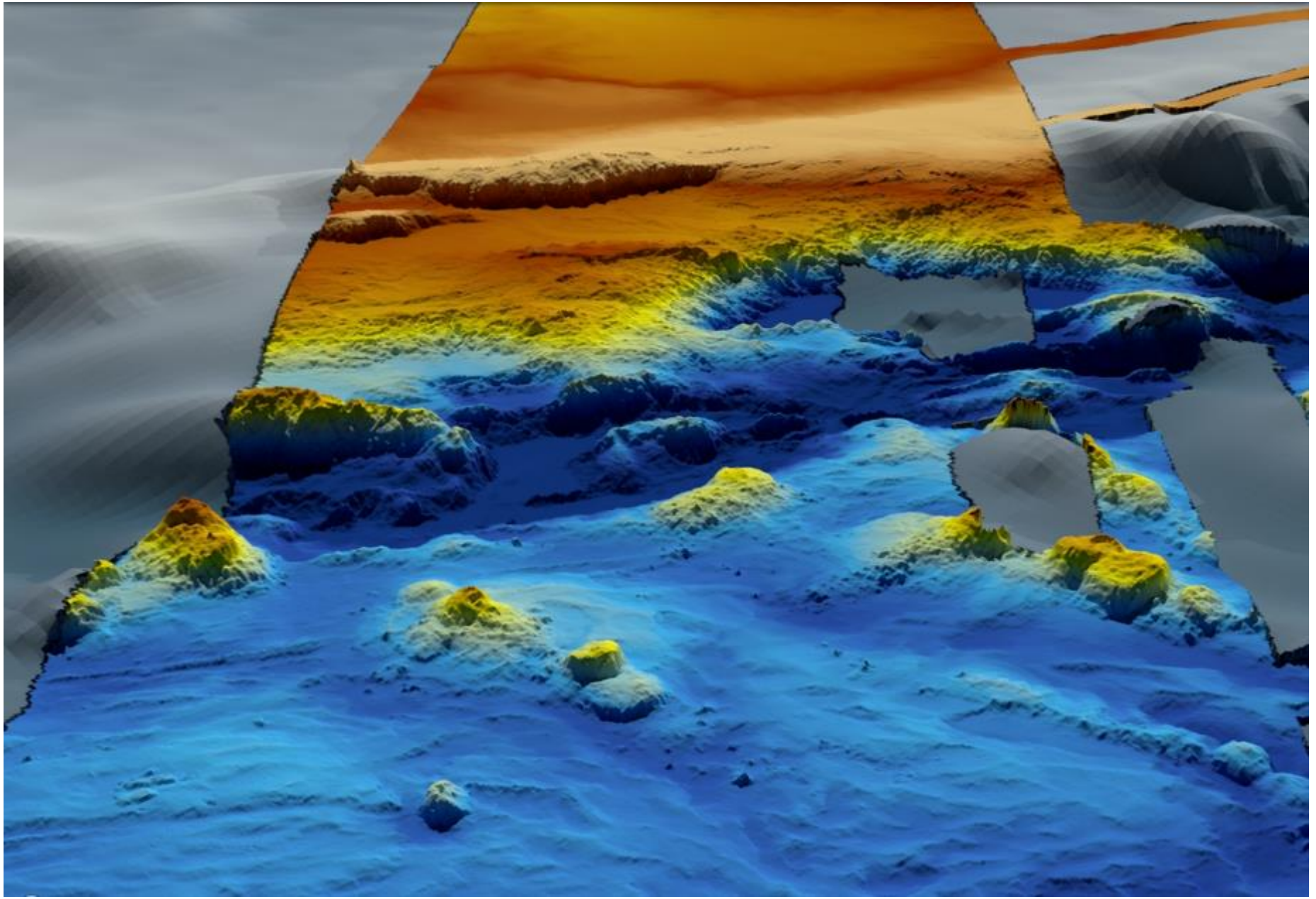
General Bathymetric Chart of the Oceans



From……

-150
-300
-450
-600
-750
-900
-1050


To……
-150
-300
-450
-600
-750
-900
-1050



Seabed 2030: How we got here

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'

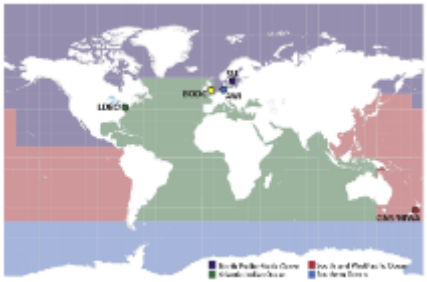
THE OCEAN CONFERENCE
UNITED NATIONS, NEW YORK, 5-9 JUNE 2017

June 2017

Nippon Foundation - GEBCO Seabed 2030 Project announced

Mr Sasakawa – 1 of 8 IOC-UNESCO "Champions of Global Ocean Science"

Project start



1st August 2017

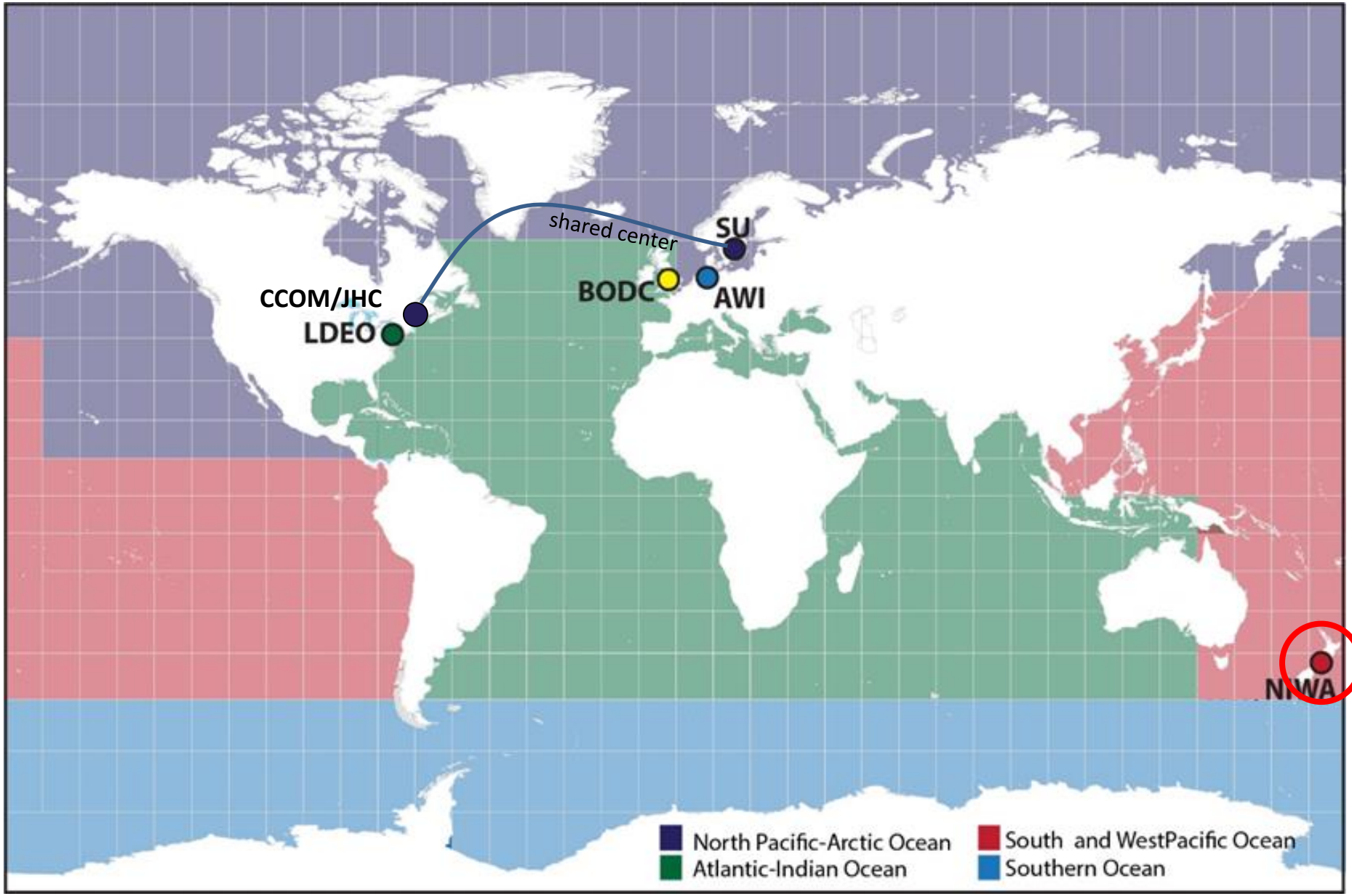
2030

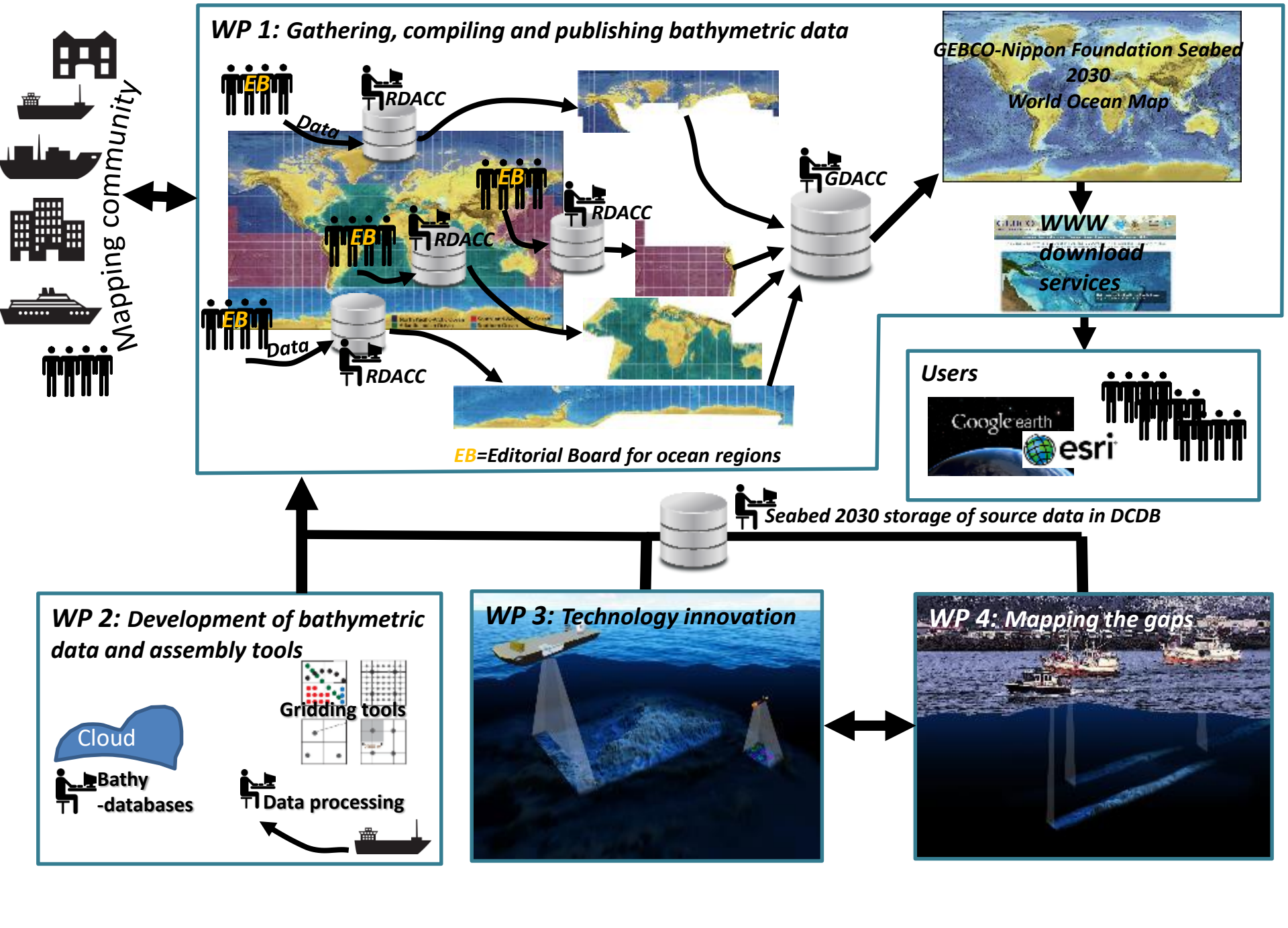
100% of ocean accurately mapped

Project Plan

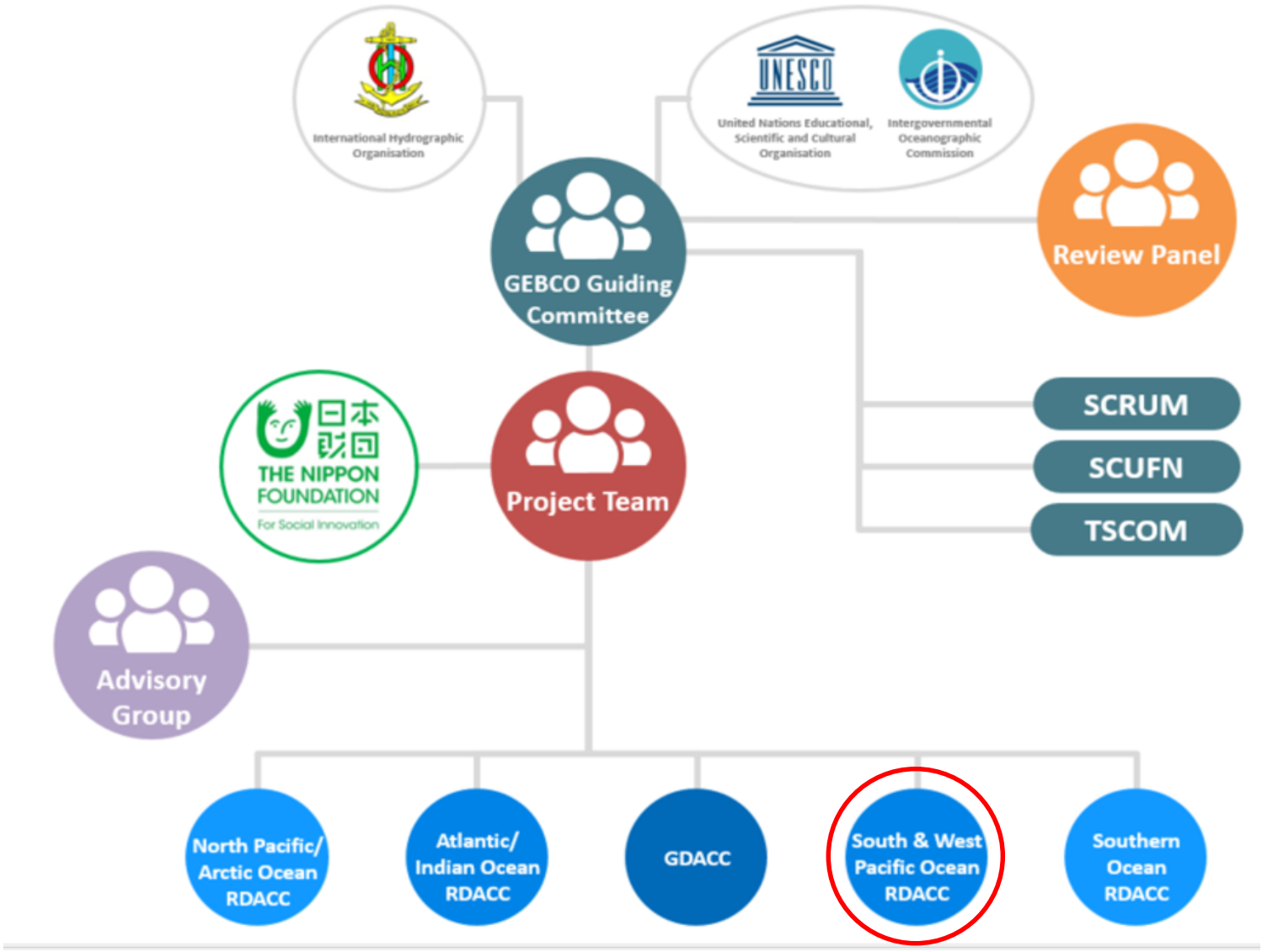
- **WP 1:** Gathering, synthesizing, publishing bathymetric data
  - *Merging all available data into the high resolution ocean map*
- **WP 2:** Development of standards, data assembly and delivery tools
  - *Developing the tools and systems to facilitate building and using the map.*
- **WP 3:** Technology innovation
  - *Identifying and encouraging technical innovation in bathymetric mapping*
- **WP 4:** Networking: map the gaps
  - *Future mapping expeditions to increase the coverage*
- **WP 5:** Management
  - *Managing the project*

One Global Data Assembly and Coordination Centre (GDACC) and Four Regional Data Assembly and Coordination Centres (RDACC) will be established



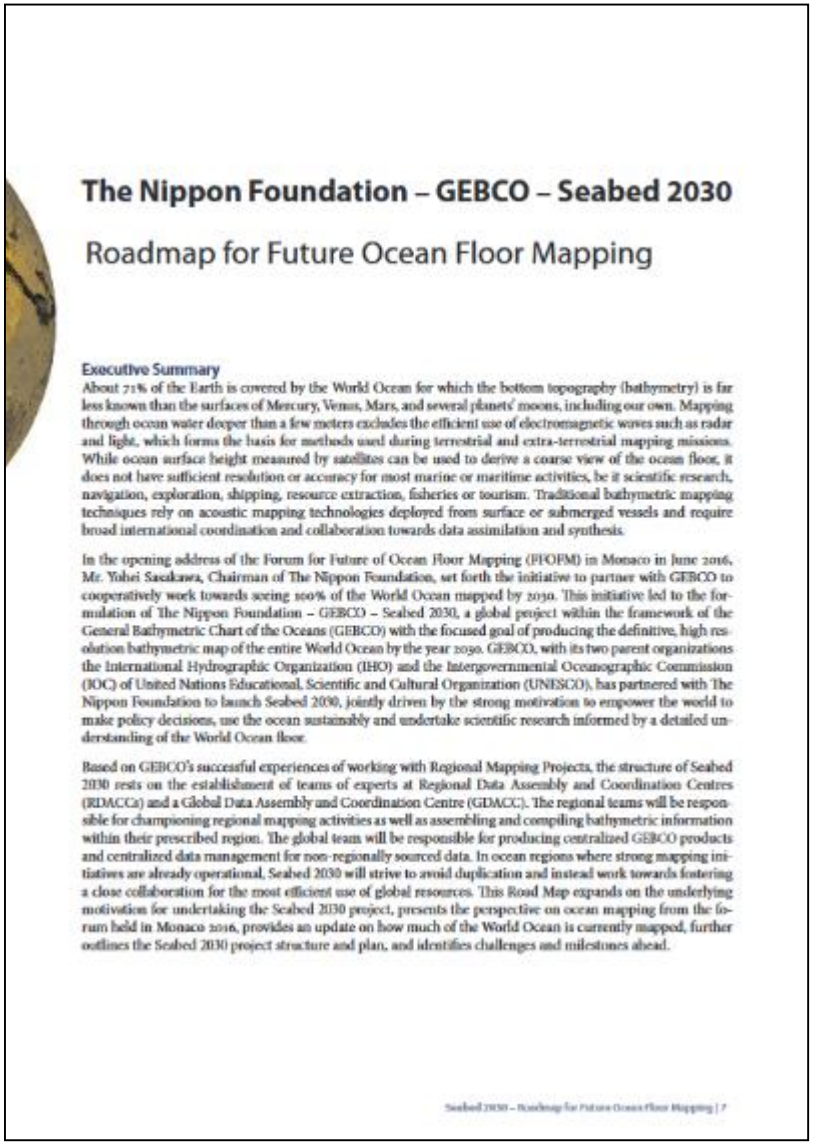

Mapping community
WP 1: Gathering, compiling and publishing bathymetric data
EB
RDACC
Data
EB
RDACC
EB
RDACC
EB
Data
RDACC
GDACC
GEBCO-Nippon Foundation Seabed 2030
World Ocean Map
WWW
download
services
Users
Google earth
esri
EB=Editorial Board for ocean regions
Seabed 2030 storage of source data in DCDB
WP 2: Development of bathymetric data and assembly tools
Gridding tools
Cloud
Bathy
-databases
Data processing
WP 3: Technology innovation
WP 4: Mapping the gaps

Seabed 2030 project management



Seabed 2030 Key Documents

https://seabed2030.gebco.net/



The Nippon Foundation – GEBCO – Seabed 2030

Roadmap for Future Ocean Floor Mapping

Executive Summary

About 71% of the Earth is covered by the World Ocean for which the bottom topography (bathymetry) is far less known than the surfaces of Mercury, Venus, Mars, and several planets' moons, including our own. Mapping through ocean water deeper than a few meters excludes the efficient use of electromagnetic waves such as radar and light, which forms the basis for methods used during terrestrial and extra-terrestrial mapping missions. While ocean surface height measured by satellites can be used to derive a coarse view of the ocean floor, it does not have sufficient resolution or accuracy for most marine or maritime activities, be it scientific research, navigation, exploration, shipping, resource extraction, fisheries or tourism. Traditional bathymetric mapping techniques rely on acoustic mapping technologies deployed from surface or submerged vessels and require broad international coordination and collaboration towards data assimilation and synthesis.

In the opening address of the Forum for Future of Ocean Floor Mapping (FFOFM) in Monaco in June 2016, Mr. Yohei Sasakawa, Chairman of The Nippon Foundation, set forth the initiative to partner with GEBCO to cooperatively work towards seeing 100% of the World Ocean mapped by 2030. This initiative led to the formulation of The Nippon Foundation – GEBCO – Seabed 2030, a global project within the framework of the General Bathymetric Chart of the Oceans (GEBCO) with the focused goal of producing the definitive, high resolution bathymetric map of the entire World Ocean by the year 2030. GEBCO, with its two parent organizations the International Hydrographic Organization (IHO) and the Intergovernmental Oceanographic Commission (IOC) of United Nations Educational, Scientific and Cultural Organization (UNESCO), has partnered with The Nippon Foundation to launch Seabed 2030, jointly driven by the strong motivation to empower the world to make policy decisions, use the ocean sustainably and undertake scientific research informed by a detailed understanding of the World Ocean floor.

Based on GEBCO's successful experiences of working with Regional Mapping Projects, the structure of Seabed 2030 rests on the establishment of teams of experts at Regional Data Assembly and Coordination Centres (RDACCs) and a Global Data Assembly and Coordination Centre (GDACC). The regional teams will be responsible for championing regional mapping activities as well as assembling and compiling bathymetric information within their prescribed region. The global team will be responsible for producing centralized GEBCO products and centralized data management for non-regionally sourced data. In ocean regions where strong mapping initiatives are already operational, Seabed 2030 will strive to avoid duplication and instead work towards fostering a close collaboration for the most efficient use of global resources. This Road Map expands on the underlying motivation for undertaking the Seabed 2030 project, presents the perspective on ocean mapping from the forum held in Monaco 2016, provides an update on how much of the World Ocean is currently mapped, further outlines the Seabed 2030 project structure and plan, and identifies challenges and milestones ahead.

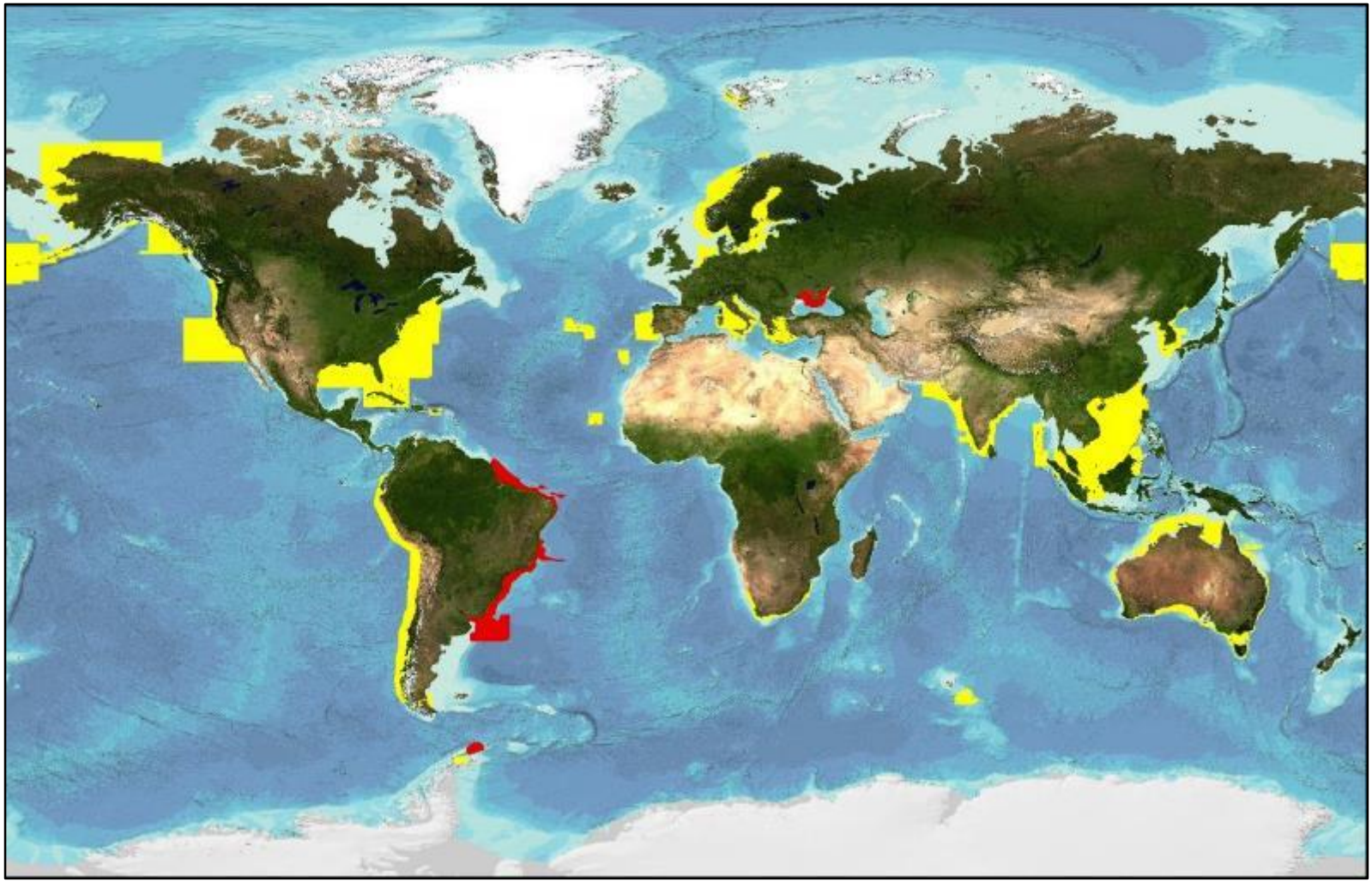
Filling the data gaps with bathymetry from ENC data

- To more accurately model the shape of the ocean floor in all areas and serve a wider user community, GEBCO is striving to improve its gridded bathymetric datasets in shallower waters

- In 2006 a request was made to IHO Member States to provide bathymetry data from ENCs (usage bands 2 and 3) to GEBCO to help update its global model

- New request to IHO MS for bathymetry data from ENCs sent out in March 2016 (circular letter 11/2016)

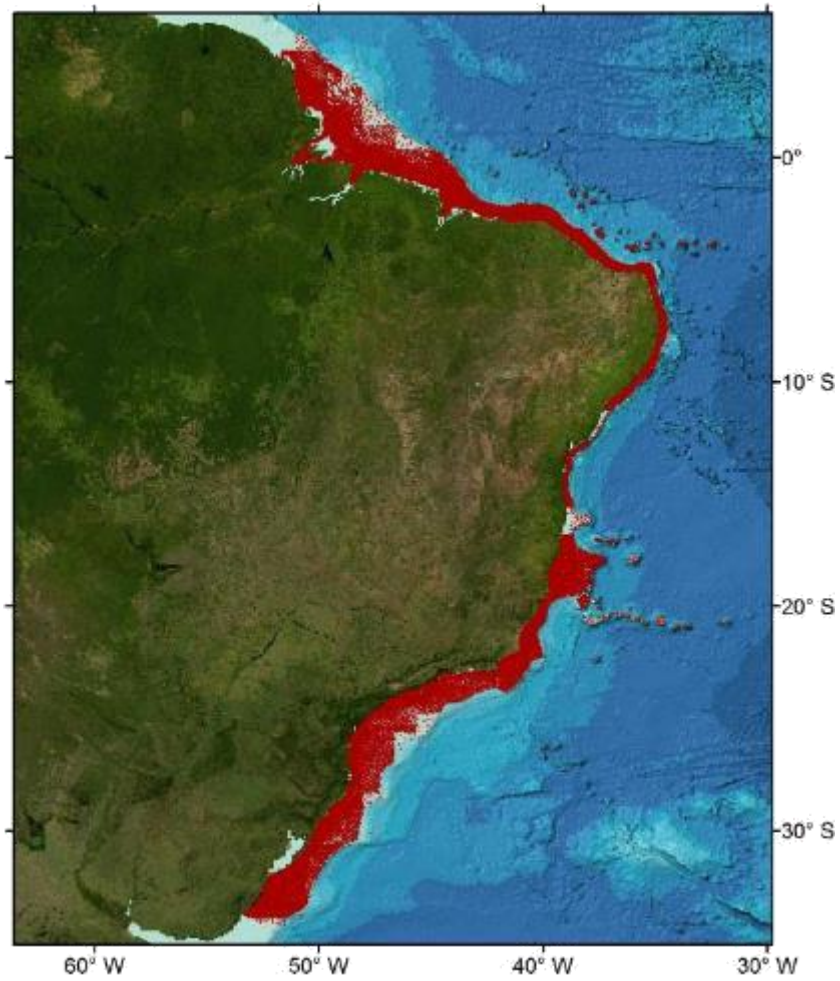
Shallow water bathymetry from ENC data



ENC data coverage (usage bands 2 & 3) provided by IHO MS and organizations, to date, to GEBCO for grid updating work after calls in 2006 (yellow) and 2016 (red),

Shallow water bathymetry from ENC data

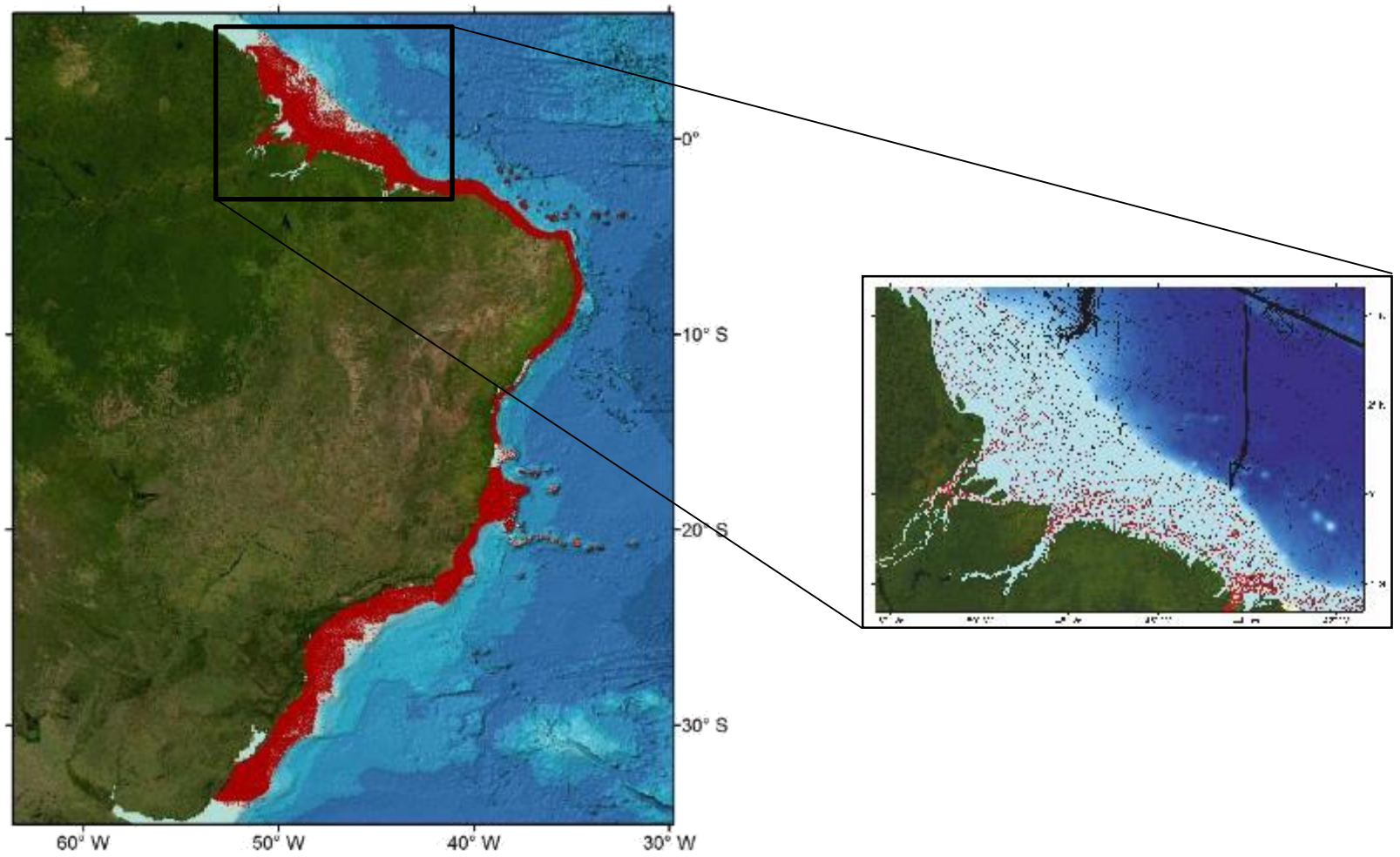
Data for waters off Brazil



Soundings points extracted from ENCs recently supplied to GEBCO for the waters off Brazil

Shallow water bathymetry from ENC data

Data for waters off Brazil



Capacity-building initiative:

The Postgraduate Certificate in Ocean Bathymetry

Designed to train a new generation of scientists and hydrographers in ocean bathymetry

is funded by:

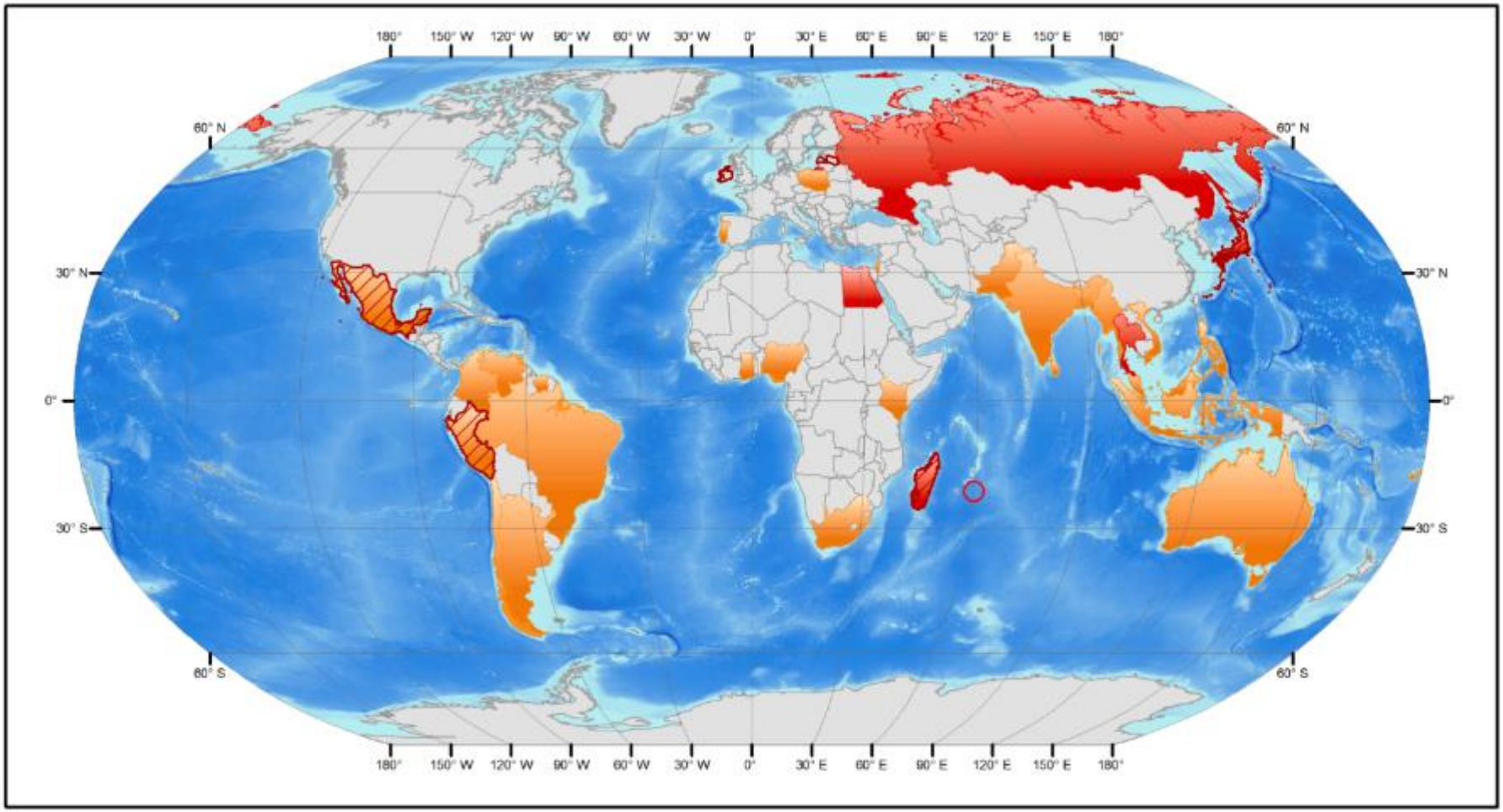
The Nippon Foundation of Japan

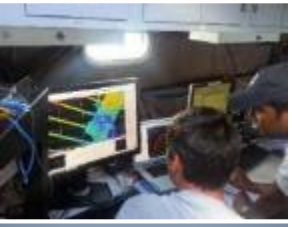
www.nippon-foundation.or.jp/en/

and taught at:

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

78 scholars from 35 coastal states over last 13 years
with the current class coloured red
Add incoming Year 14 class (hatch)
(84 people from 37 coastal states)






Training Program Content

Fall Semester
(August-December)

- Fundamentals of Ocean Mapping I
- Applied Tools in Ocean Mapping
- Geological Oceanography
- Elective (Math for Mapping etc.)

J-term

- Visit NGDC in Boulder, Co.
- Software training (e.g. Fledermaus & QinSy)

Spring Semester
(January-May)

- Fundamentals of Ocean Mapping II
- Bathymetric Spatial Analysis
- Geodesy and Positioning for Ocean Mapping
- Seamanship and Marine Weather
- Electives (LOS, Coastal Processes etc.)

Summer
(June-August)

- Students will take the Hydrographic Field Course

Lab Visit & Cruise

- The working visit to a research organization and / or a cruise over the summer is selected by student and their home organization in a field of mutual interest.
- The visit aims to round out the students training, to help them build networks and to deepen some of their newly-acquired theoretical knowledge. This training includes familiarization with the programs the visited organization is engaged in, as well as some directed work under supervision.






For more information

- GEBCO: https://www.gebco.net
- Training: https://www.gebco.net/training/training_programme/
- Seabed 2030: https://seabed2030.gebco.net/
- Johnathan Kool (GEBCO GGC)
  - johnathan.kool@ga.gov.au

THE NIPPON FOUNDATION
For Social Innovation

General Bathymetric Chart of the Oceans
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IHO

Intergovernmental Oceanographic Commission