



SAIHC20

GEBCO-SB2030

Agenda item 10.3

SAIHC20, Kisumu Kenya 17-19 September 2024



IHO

Highlights

International
Hydrographic
Organization

1. New GEBCO Strategy
2. GEBCO Governance Review
3. Celebration 120-year anniversary
4. Ocean Mapping focus at Barcelona April 2024 + Nice June 2025
5. SB2030
6. Sub-Committee highlights
7. GGC41 in Fiji, jointly with SB2030 Pacific RDACC



IHO

International
Hydrographic
Organization

New GEBCO strategy, endorsed by IHO + IOC

Vision:

To bring knowledge about our planet's seabed to everyone

Mission:

To produce free, open and complete seabed data and information for the world's oceans.

This is achieved by enabling and inspiring seabed mapping efforts through international collaboration, technological innovation, capacity development, and education.



IHO

International
Hydrographic
Organization

GEBCO Governance Review, endorsed by IHO + IOC

SCOPE

- Mapping of GEBCO organizational and functional structure, detailing the nature of any relationships, reporting lines, obligations or liabilities;
- Review of the legal structure and framework with a statement on the current and recommended future status (if change is deemed necessary);
- Review of financial arrangements with a statement on the current and recommended future status (if change is deemed necessary);
- A gap analysis of the current governance instruments (e.g. MoUs, ToRs etc.);

GGC has started to organize implementation (if + how + priority) of both strategy and governance review

SAIHC20, Kisumu Kenya 17-19 September 2024



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Ocean Mapping focus

...is increasing as more people from different disciplines, countries and decision levels are becoming more aware of the relationship between seabed knowledge and:

1. Improved climate modelling
 2. Marine biodiversity discovery and monitoring
 3. Offshore wind planning process
-
- UN Ocean Decade conference Barcelona April 2024
 - UN Ocean Conference Nice June 2025
 - New IOC Executive Secretary



IHO

International
Hydrographic
Organization

REVIEW OF USER REQUIREMENTS AND CONTRIBUTIONS TO GEBCO PRODUCTS 2024

- 63 responses from 38 countries
- Highly supportive of GEBCO, 90% valuing GEBCO gridded bathy sets, 70% GEBCO web-service, >60% undersea feature names + Cap. Dev. aspects of GEBCO
- Request for higher resolution products
- Interest in expanding scope of GEBCO products
- Request for greater choice of file formats, including better visualization tools
- Request for an international seabed data users group



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Highlights GEBCO Sub-Committees

- Improved cooperation / harmonization between SC's, work from new strategy
- SCUFN: max 25 naming proposals per country per year, max 250 total, South China Sea no-og area for undersea feature naming
- TSCOM: work on improving availability, discoverability and accessibility of bathymetric data
- SCRUM: Supporting regional CSB/SB2030 coordinators
- SCOPE: new tasks and comms strategy under development
- SCET: Identify relevant institutions that provide ocean mapping and oceanography courses, work in progress.

THE NIPPON FOUNDATION-GEBCO

SEABED
2030

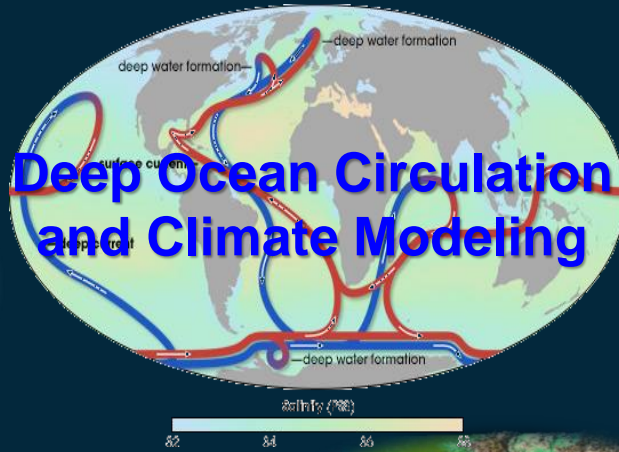
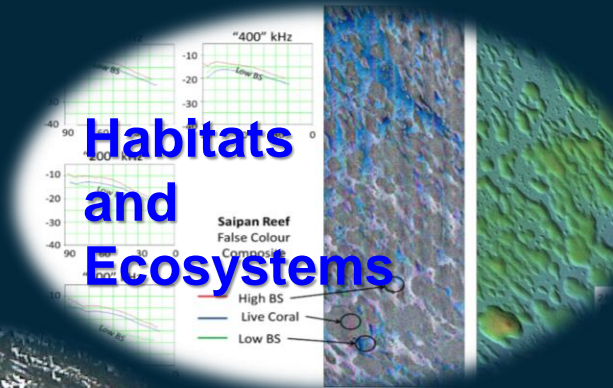
SEABED 2030

Energizing Ocean Floor Mapping

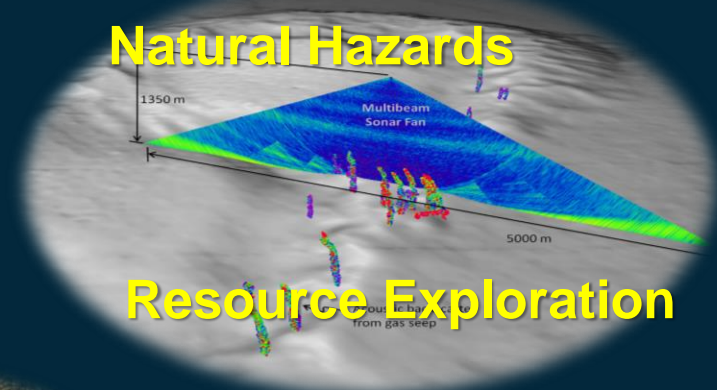


Jamie McMichael-Phillips
Seabed 2030 Director

WHY MAP???



Deep Ocean Circulation and Climate Modeling

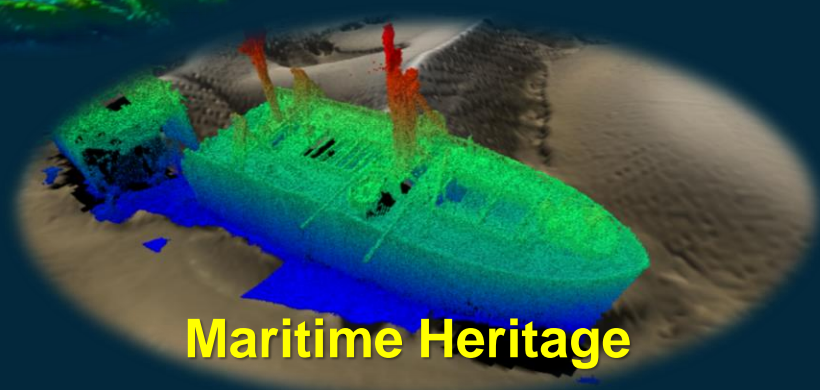
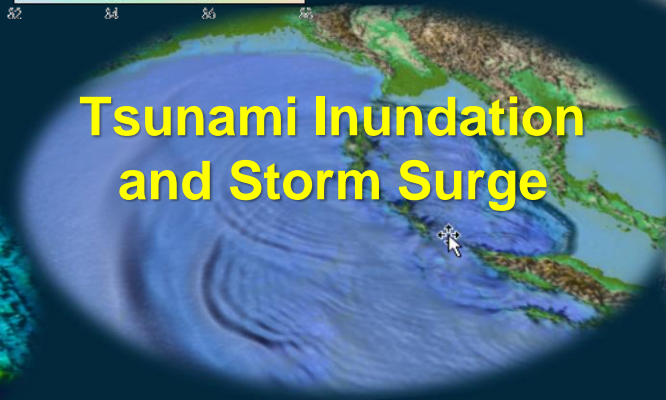
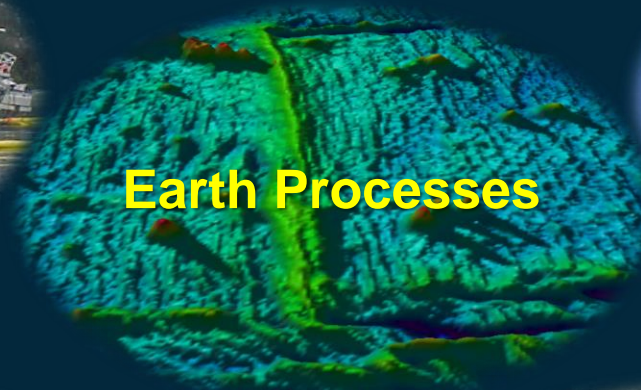


Natural Hazards

Resource Exploration



Safety of Navigation



OCEAN DECADE CHALLENGES



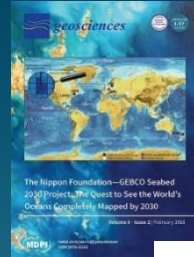
- Clean
- Healthy & Resilient
- Productive
- Predicted
- Safe
- Accessible
- Inspiring & Engaging

Challenge	Associated Activities
Pollutants	Coastal -bathymetry
Ecosystems	Mapping central
Food from the Ocean	Bathymetry dependent
Ocean economy	Mapping intensive
Ocean-climate nexus	Modelling, SLR, etc.
Ocean-related risks	Bathymetry intensive
Ocean observing system	Georeferencing
Ocean digital representation	Central facility
Capacity development	Strongly needed
Behaviour change	Resonates with people

The Nippon Foundation-GEBCO Seabed 2030 Project



June 2016



June 2017



June 2021

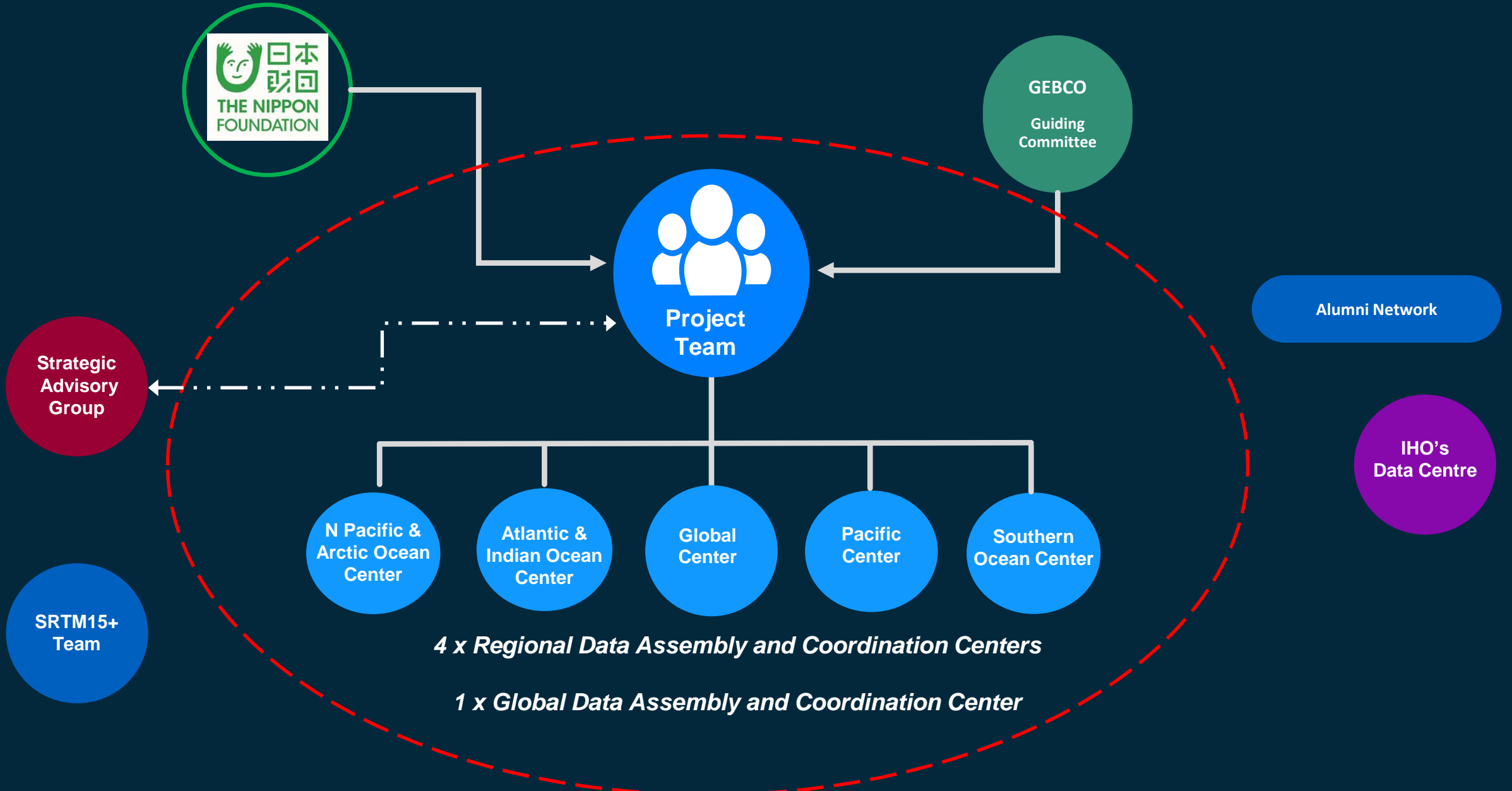


Seabed 2030 = accelerator to GEBCO's aim

Collaboration to:

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

Seabed 2030 Simplified Network

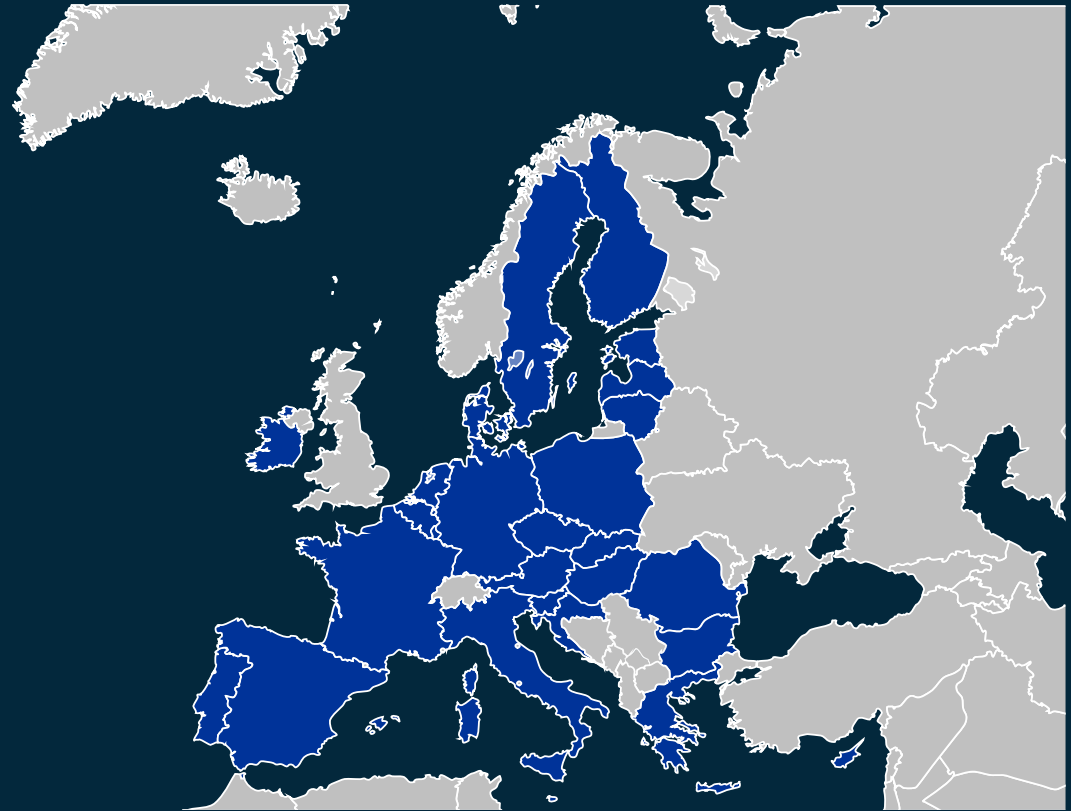
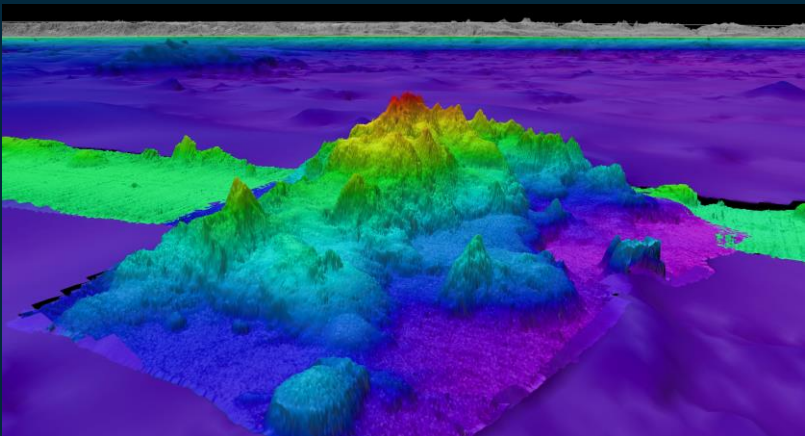


Progress so far ...

Apr 23 to Jun 24

4.34 million km² new bathymetry added

- Equates to size of EU



Credit: [Wikipedia](#) Kolja21

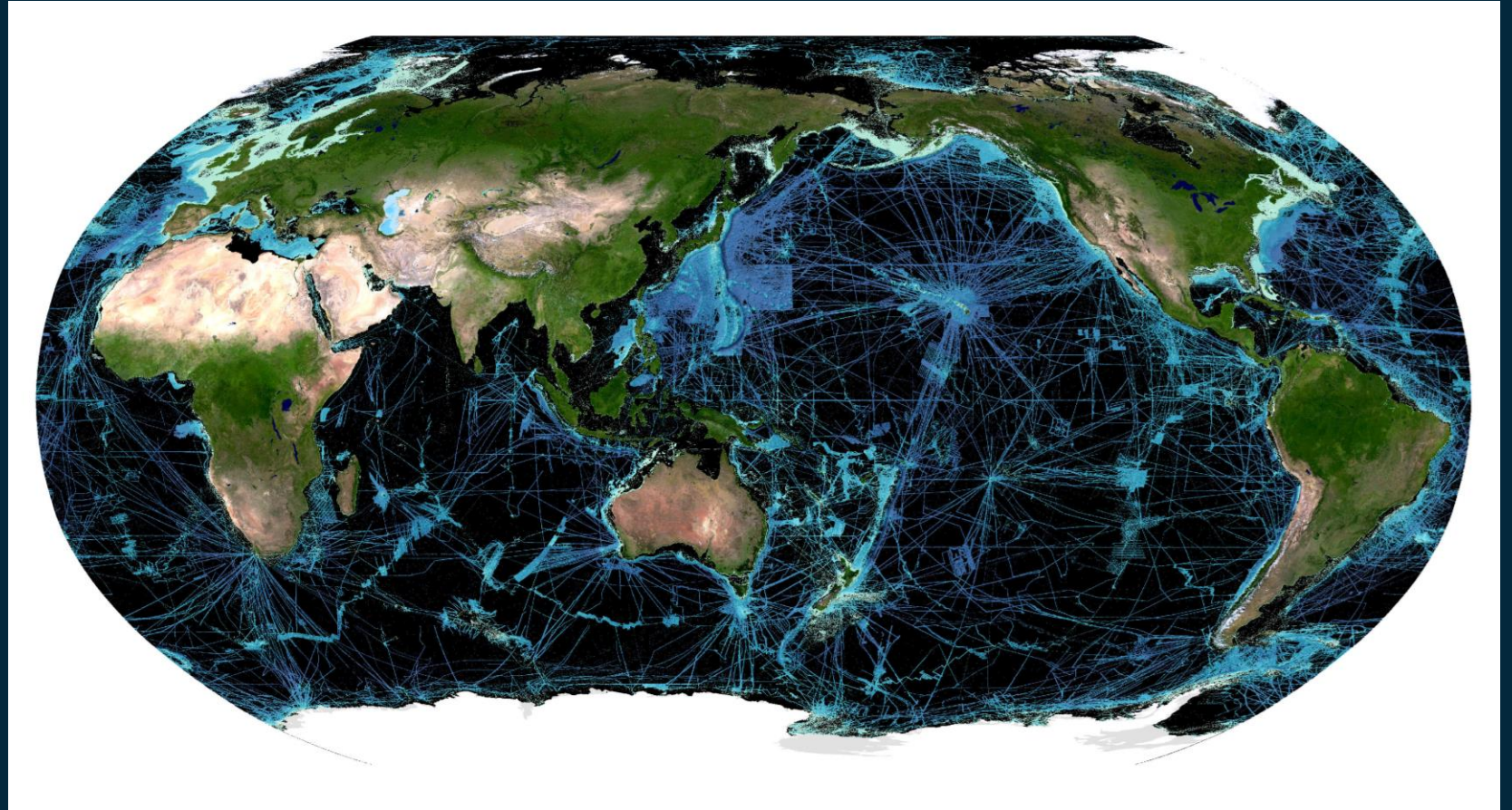
Courtesy: Martin Jakobsson, SU

.... a significant quantity of data

Progress so far ... (cont'd)

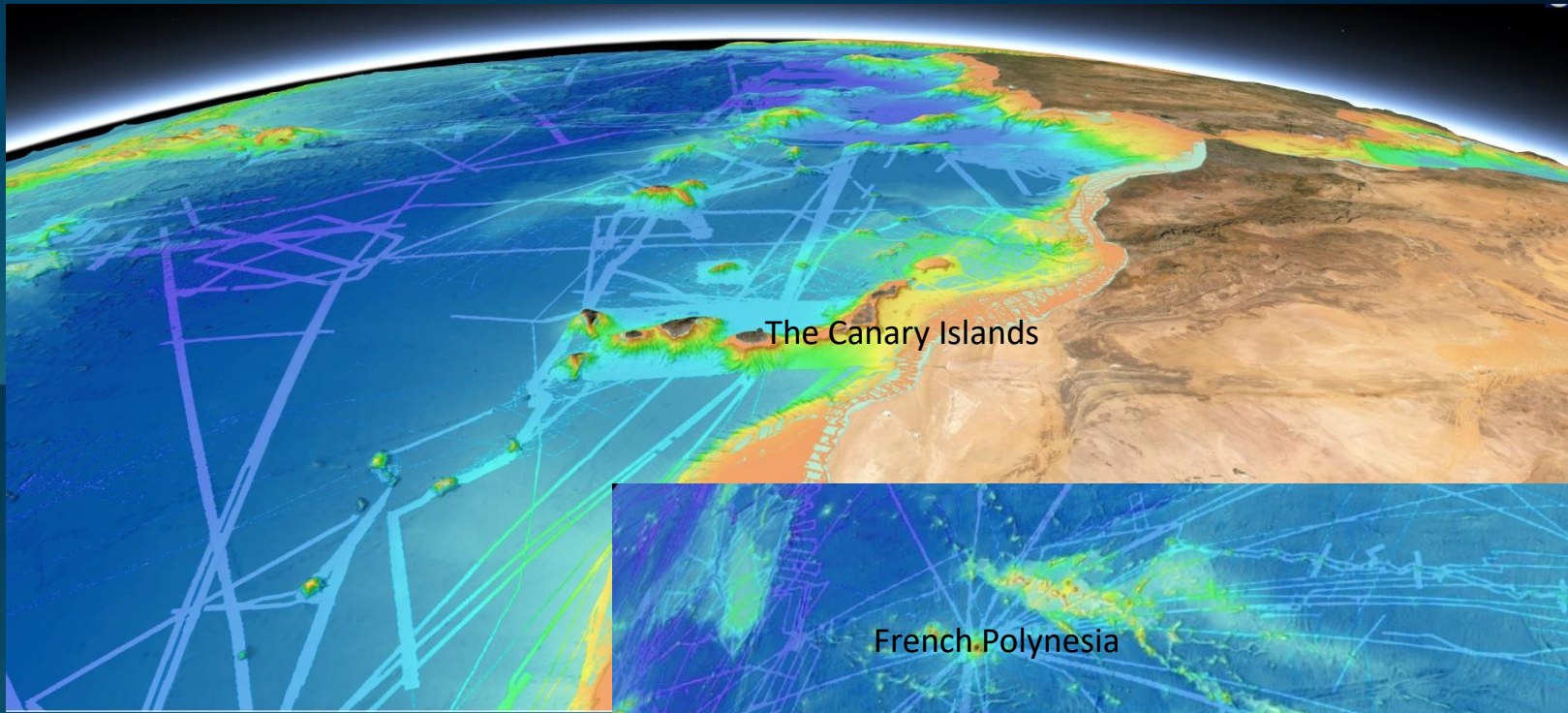
GEBCO Map:

- 6% in 2017
- Now **26.1%**

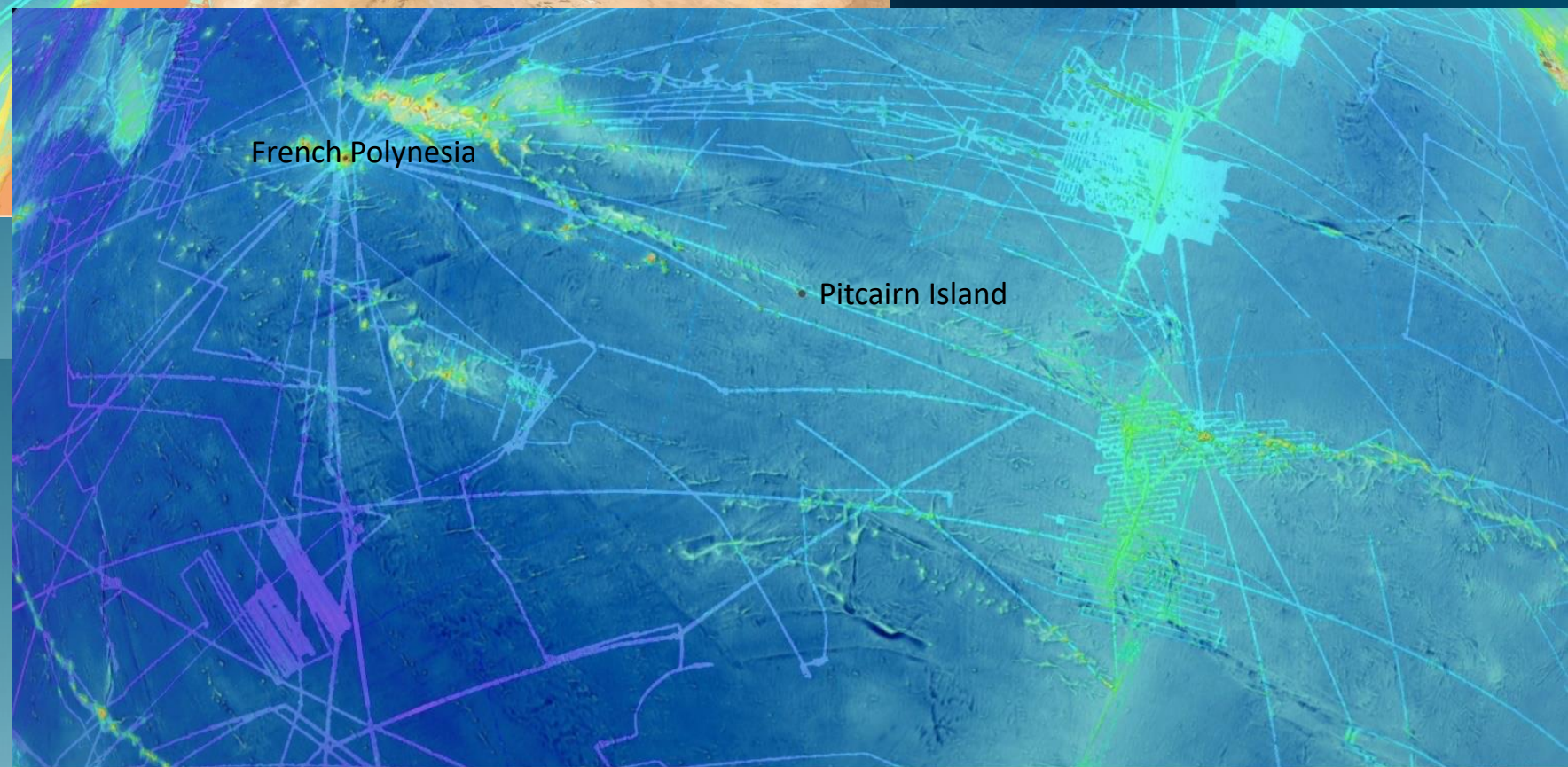


Courtesy: Martin Jakobsson, SU

Just under 3/4 of ocean floor still to go



**Paucity of
Depth Information**



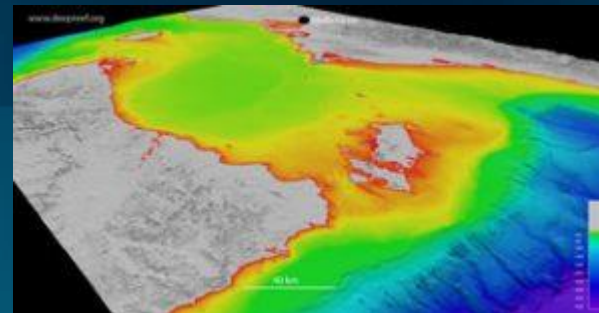
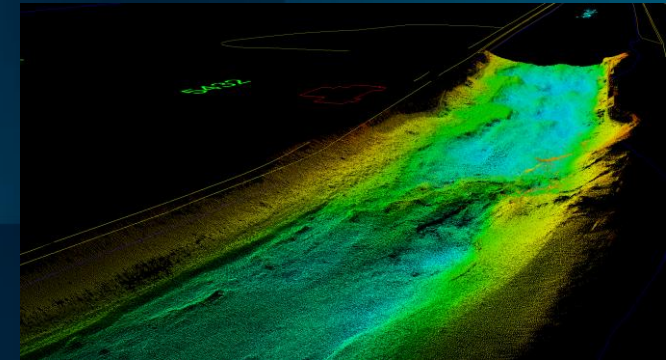
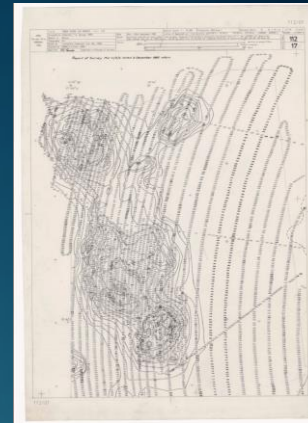
**To manage
effectively**
...we must map

What is meant by data?

Any form of data that contains a bathymetric measurement is gratefully accepted by Seabed 2030 and by GEBCO!

Examples of data are:

- Sounding sheets
- Raw data from sounders
- NMEA data (e.g. from CSB data loggers)
- Processed data (e.g. GSF or XYZ)
- S-57 ENC
- Processed grids or bathymetric surfaces
- Regional bathymetric products



Target Resolutions

- Depth dependent
- We will never ask for data of any higher resolution than:
 - 1 x depth value in 100x100m box

At best only one depth value in area ~ size of a soccer pitch



In Perspective

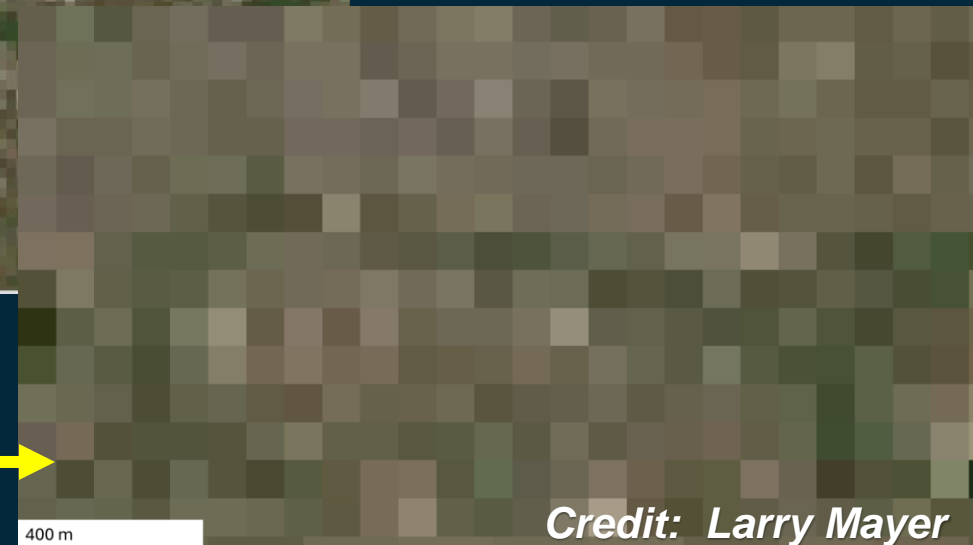


← X Not this resolution

✓✓ We ask for this →



✓ But will work with lower resolution →



Credit: Larry Mayer

Benefits Analysis

THE NIPPON FOUNDATION-GEBCO
**SEABED
2030**


NLA INTERNATIONAL

**NLA INTERNATIONAL-SEABED 2030
PHASE 3: BENEFITS ANALYSIS WORKSTREAM**

Compendium of Seabed Mapping Use Cases

January 2024

THE NIPPON FOUNDATION-GEBCO
**SEABED
2030**


NLA INTERNATIONAL

NLA International- Seabed 2030

Phase 2b: Benefits Analysis Workstream

Seabed 2030 Value Proposition Document

February 2024



THE NIPPON FOUNDATION-GEBCO
**SEABED
2030**

USE CASE: CLIMATE CHANGE GLOBAL OCEAN MODELS • USE CASE REF ID: UC006

USE CASE: CLIMATE CHANGE OCEAN MODELS

Climate change refers to long-term shifts in temperature and weather patterns. Climate models enhance our understanding of climate change and provide climate future state predictions. They provide a better understanding of climate change and inform climate change impact assessment, climate change mitigation and adaptation planning.

Seabed mapping has a key role to play towards improving climate ocean models. As a data input for the modelling of key elements such as sea-ice action in polar settings, sub-ocean processes, shore and coastal interactions, seabed mapping enhances our understanding and response to climate change." Jamie McMillan-Phillips, Seabed 2030 Director

Challenge

Climate change is a global challenge.

Climate Models aim to understand and predict conditions at large spatial scales. They consider atmospheric and oceanic factors along with sea ice and land-surface components.

Regional/Oceanic models can be combined, sub-models used to bring in additional data modelling interests.

Models are used and tailored to reflect local setting support work at smaller (more detailed) spatial scales. In this way climate change mitigation and adaptation measures can be reviewed and assessed.

Seabed Mapping data is/ can be used to enhance climate models and our understanding of climate change. E.g., sea floor roughness is important for ocean mixing, among others.

Open Ocean areas and in particular the Polar regions present challenging operating conditions for seabed mapping data acquisition, yet we now have technologies and approaches that can be used to overcome



Introduction

United Nations defines climate change as referring to long-term shifts in temperatures and weather patterns. The shifts may be natural, such as through variations in solar cycle, or as a result of human activities, such as the burning of fossil fuels like coal, oil and gas. Climate change encompasses global warming, i.e., the long-term warming of our planet, and additionally refers to the broader range of changes that are happening to our planet. For instance, the UN identify that climate change consequences go beyond temperature rise, including, among others, intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms and declining biodiversity. Many of these consequences relate to our Oceans.

Climate change And Our Oceans. Climate change is impacting our Oceans. As the planet's greatest carbon sink, the ocean absorbs heat and energy released from rising greenhouse gas emissions trapped in the Earth's system. Today, the ocean has absorbed about 90 percent of the heat generated by rising emissions. As the excessive heat and energy warms the ocean, the change in temperature leads to ice-melting, sea-level rise, marine heatwaves, and ocean acidification.

UN presents the following key facts: **Sea-level Rise:** Sea level has continued to rise over the past decades due to increasing ice loss in the world's polar regions. Global mean sea-level reached a new record high in 2021, rising an average of 4.5 millimetre per year over the period 2013 to 2021 (UN reference WMO), compared to 2.1 millimetre per year during 1993-2002. Together with intensifying tropical cyclones, sea-level rise has exacerbated extreme events such as deadly storm surges and coastal hazards such as flooding, erosion and landslides, which are now projected to occur at least once a year in many locations. Such events occurred once per century historically. **Ocean Acidification:** Due to climate change, the ocean is warmer, more acidic and less productive today. The ocean has absorbed between 20 to 30 per cent of human-induced carbon dioxide emissions since the 1980s, exacerbating acidification. (UN reference IPCC). **Marine heatwaves:** Periods of unusually high ocean temperatures that threaten marine biodiversity and ecosystems and make extreme weather more likely - have doubled in frequency since 1982 and are increasing in intensity. Their frequency will increase with rising greenhouse gas emissions. (UN reference IPCC).

Rising temperatures increase the risk of irreversible loss of marine and coastal ecosystems. Today, widespread changes have been observed, including damage to coral reefs and mangroves that support ocean life, and migration of species to higher latitudes and altitudes where the water could be cooler. UNESCO warn that more than half of the world's marine species may stand on the brink of extinction by 2100. At a 1.1°C increase in temperature today, an estimated 60 percent of the world's marine species have already been reported to be lost or at risk of disappearing.

Detailed work based on research, interviews and surveys

Benefits Analysis – Use Cases

1: Seabed Mapping Innovation

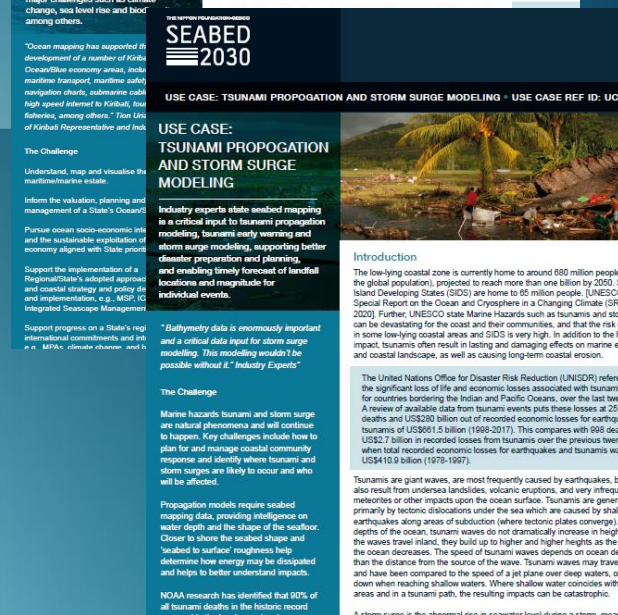
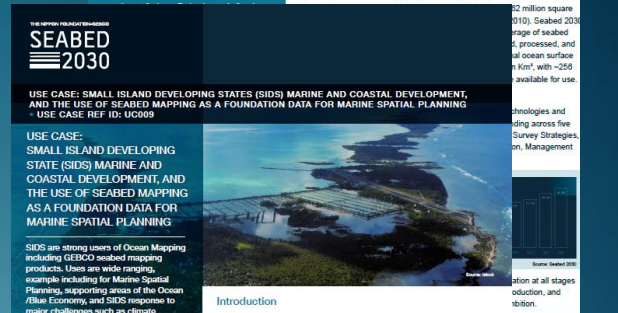
2: EEZ Seabed Mapping in the Absence of a National HO

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

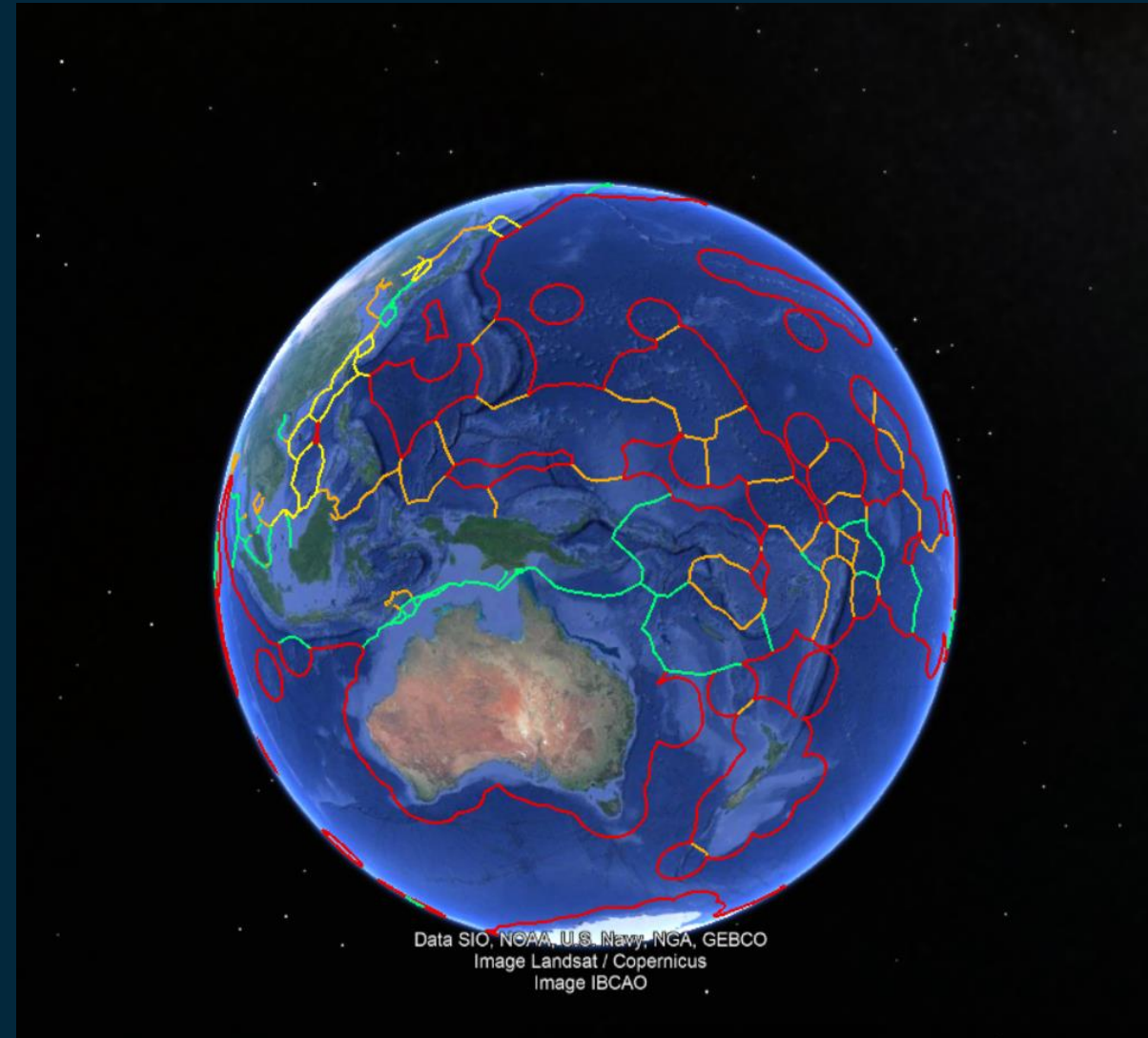
11: Ocean Discovery & Ocean Exploration

12: Driving Hydrographic Industry Expansion & Human Capital Benefits

(* Small Island Developing States)

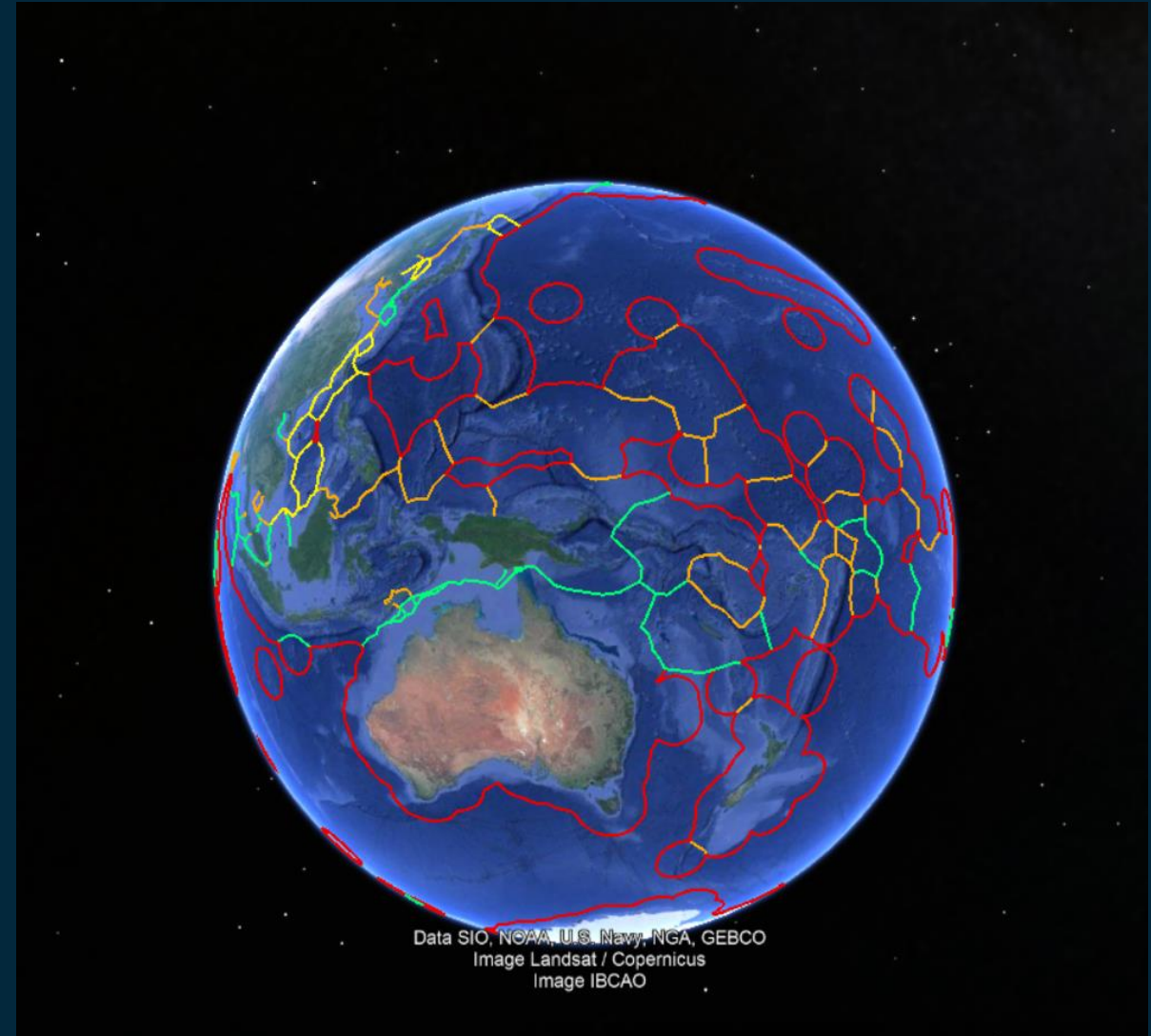
CHALLENGES WE FACE:

- Reluctance to release existing data
- Who will pay for new data collection?
 - especially beyond national jurisdiction
- Even if someone pays – reluctance to grant permission - MSR



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

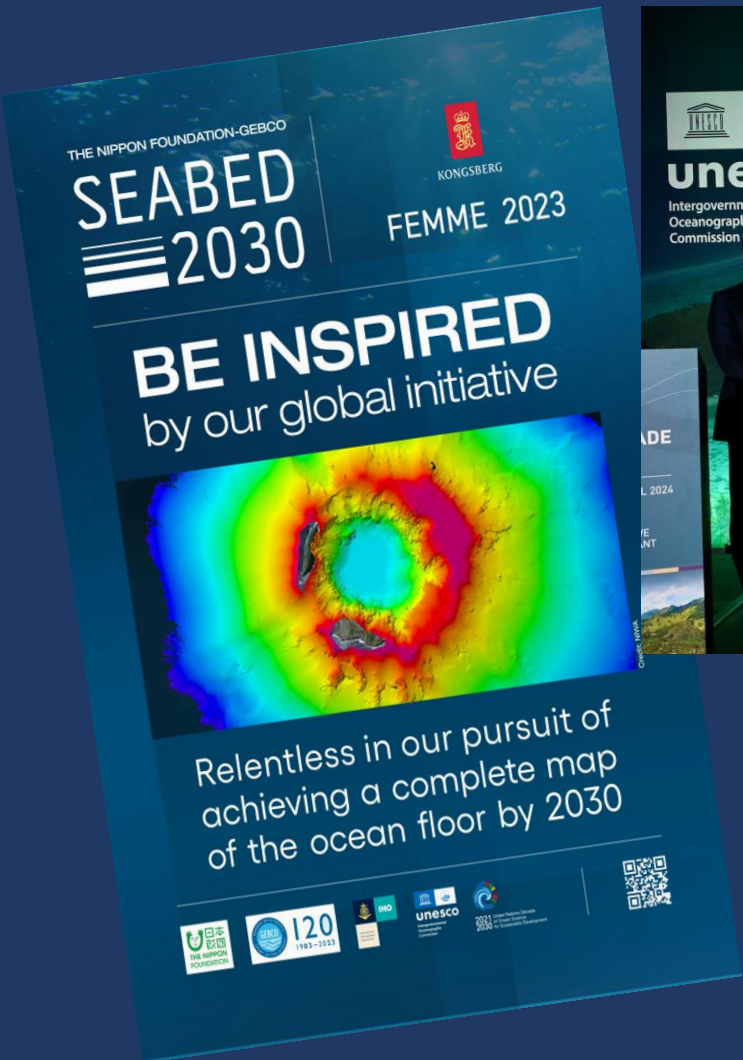


- **Bathymetry Collation & compilation in Western Indian Ocean (WIO)**
 - **Multi-scale & multi-resolution**
 - **First bathymetric map of WIO region**
- **Project Team of 8 Nippon Foundation-GEBCO Fellows:**
 - **Kenya, Tanzania, Mauritius & Madagascar**
- **Supported by Fellows from South Africa**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

Credit: Amon Kimeli

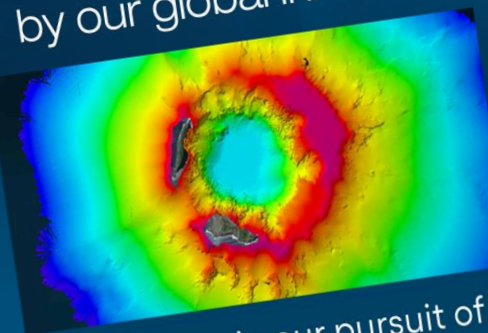


Outreach is vital, engage widely, & as early as possible.




THE NIPPON FOUNDATION-GEBCO
SEABED 2030
KONGSBERG
FEMME 2023

BE INSPIRED
by our global initiative



Relentless in our pursuit of achieving a complete map of the ocean floor by 2030



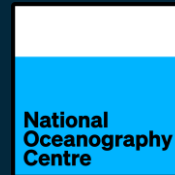
THE NIPPON FOUNDATION-GEBCO

SEABED 2030

PODCAST

A graphic for the SEABED 2030 Podcast. It features the text 'THE NIPPON FOUNDATION-GEBCO' at the top, followed by 'SEABED 2030' in large, bold, white letters. Below that is the word 'PODCAST' in a smaller, bold, white font. The background is dark blue with white topographic contour lines.

Thank you



THE NIPPON FOUNDATION-GEBCO

SEABED
2030

The Nippon Foundation-GEBCO Seabed 2030 Project Atlantic and Indian Ocean Regional Center



Southern African and Islands Hydrographic Commission



2024 Southern African And Islands Hydrographic Commission (SAIHC20) VTC September 2024

A regional approach



Global Center (GDACC)

- Assemble global products
- Disseminate global products

Regional Centers (RDACCs)

- Engage with stakeholders
- Build upon existing efforts
- Assemble regional products
- Identify gaps



Atlantic and Indian Oceans Regional Center

- o Engage with stakeholders
- o Assemble regional products
- o Identify gaps in data coverage
- o Provide technical guidance and assistance



atlantic-Indian@seabed2030.org

 COLUMBIA CLIMATE SCHOOL
LAMONT-DOHERTY EARTH OBSERVATORY



Vicki Ferrini, PhD
Center Head



Frank Nitsche, PhD
Research Scientist



Tinah Martin
*Lead Data Manager,
Indian Ocean*



Hayley Drennon
*Lead Data Manager,
Atlantic Ocean*



Sheila Caceres
Data Manager

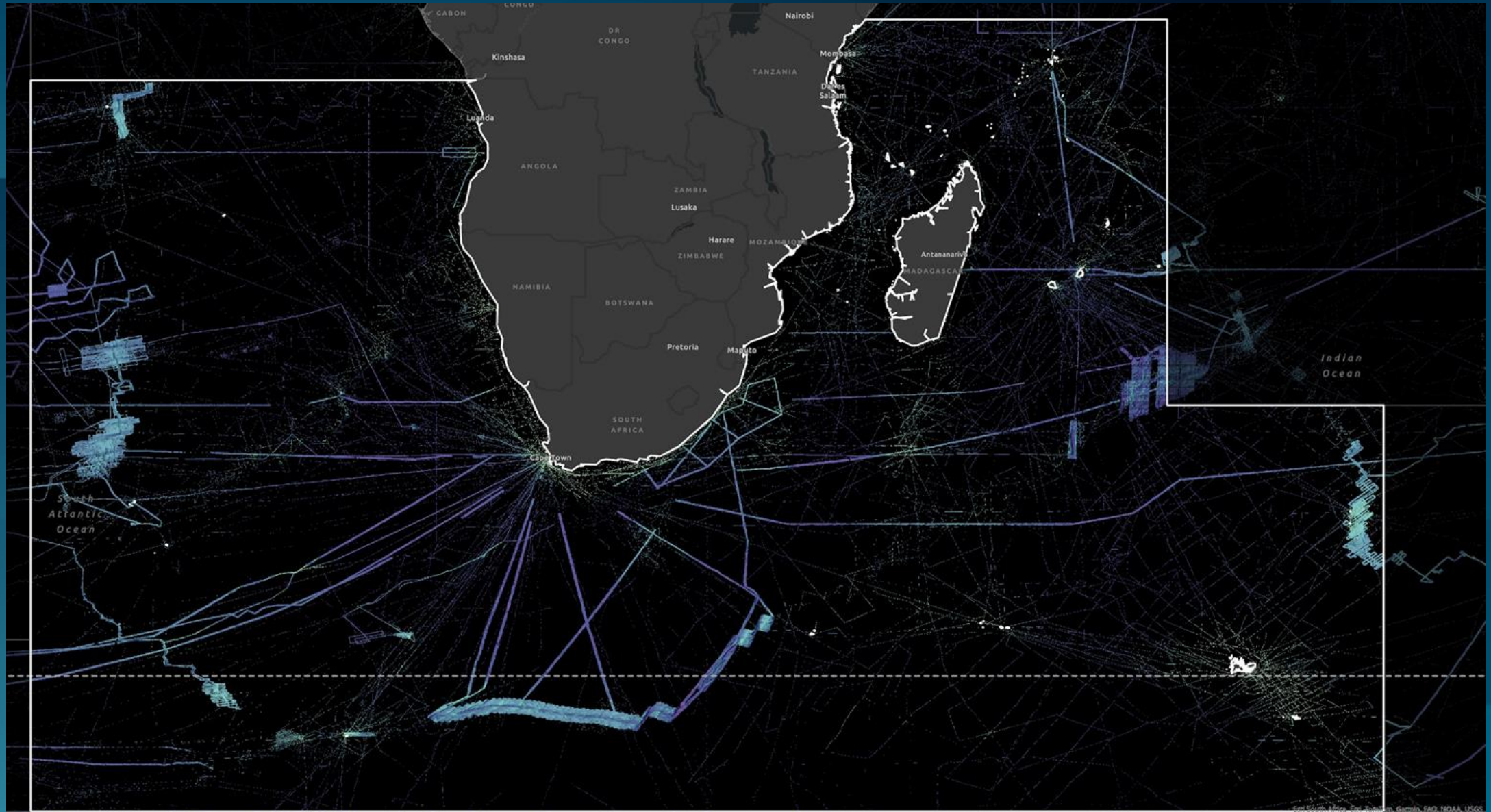


John Morton
*Applications
Developer*

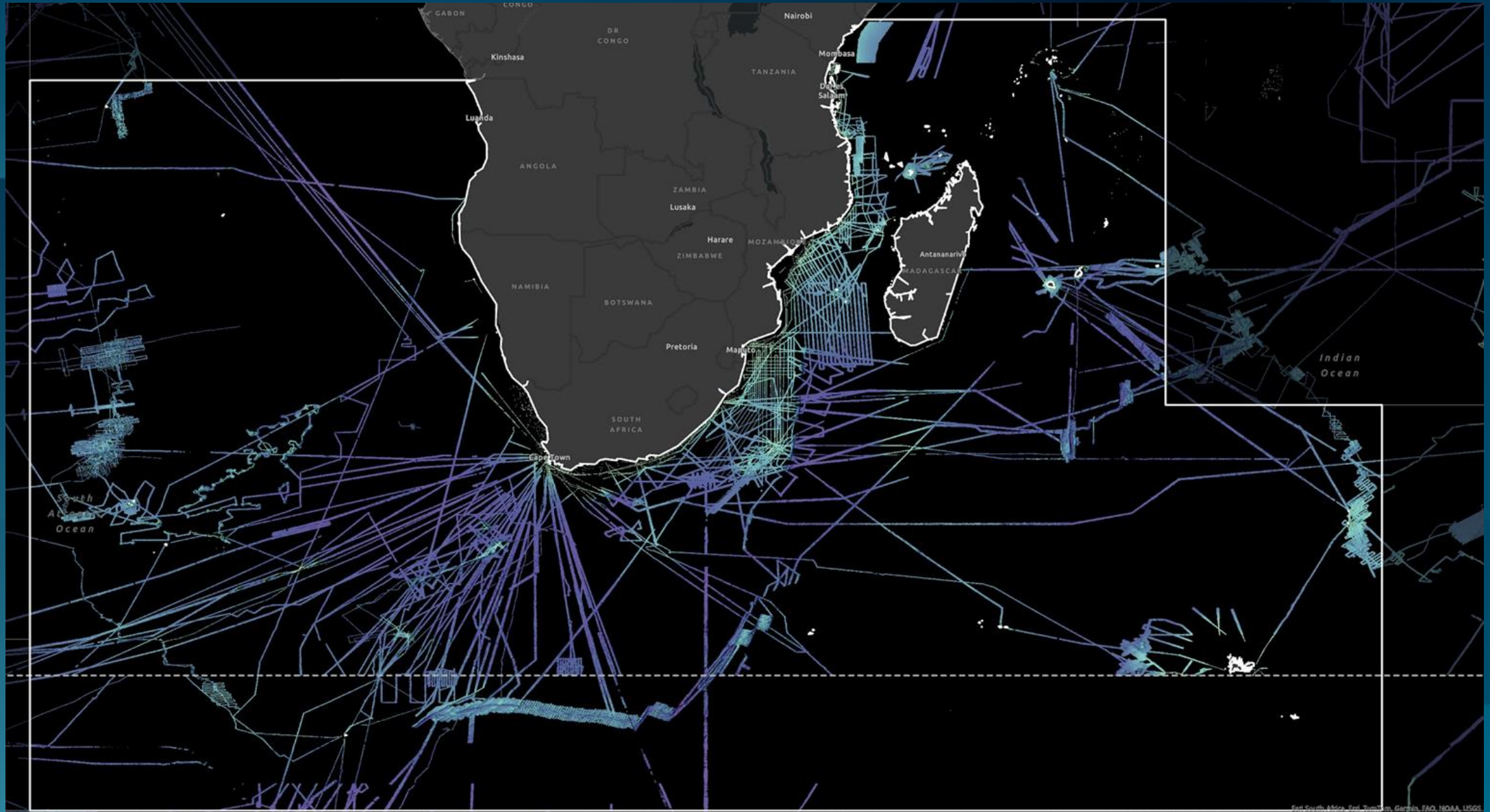
Country
of origin



Status of Mapping within the SAIHC

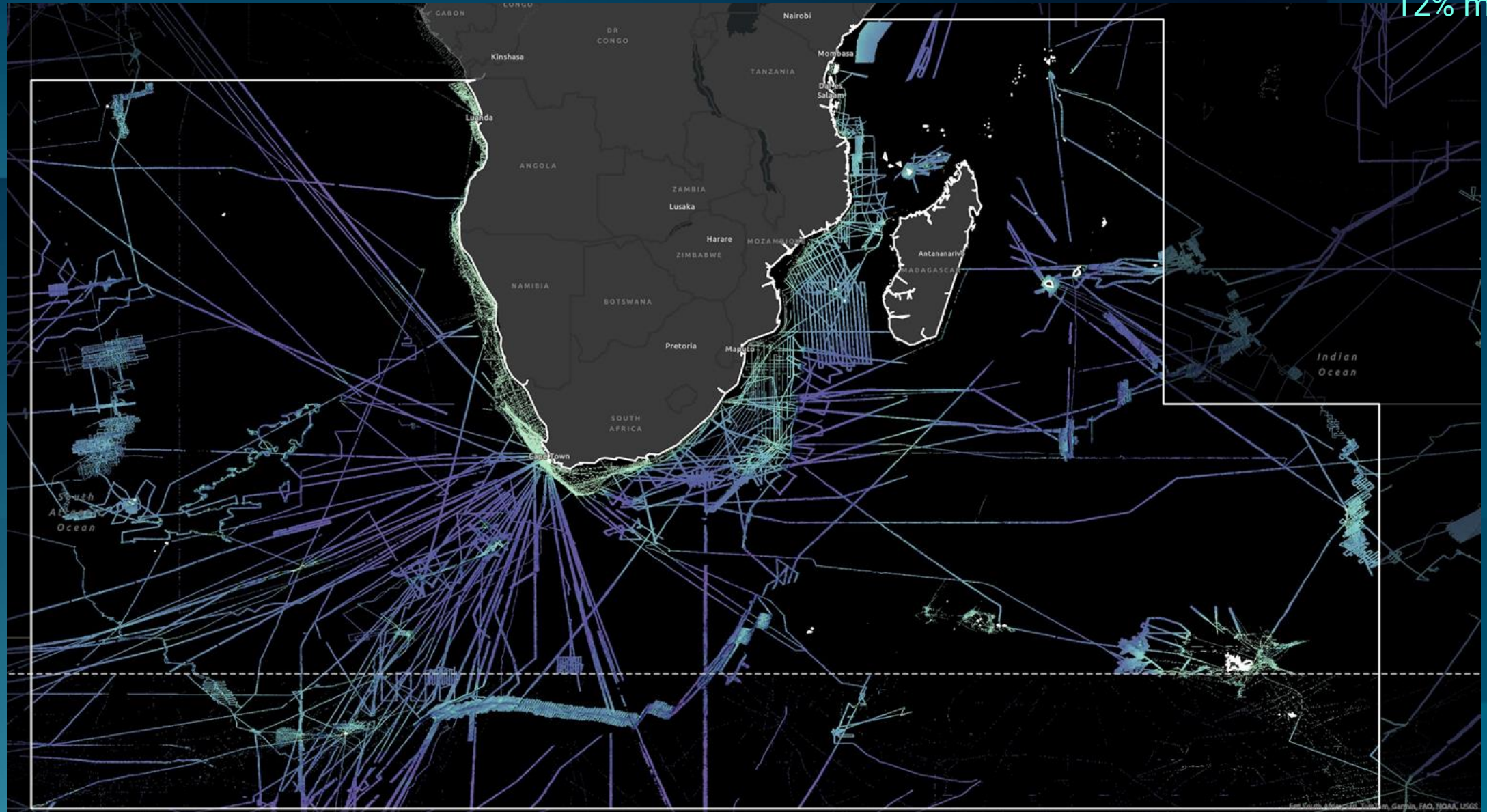


Status of Mapping within the SAIHC



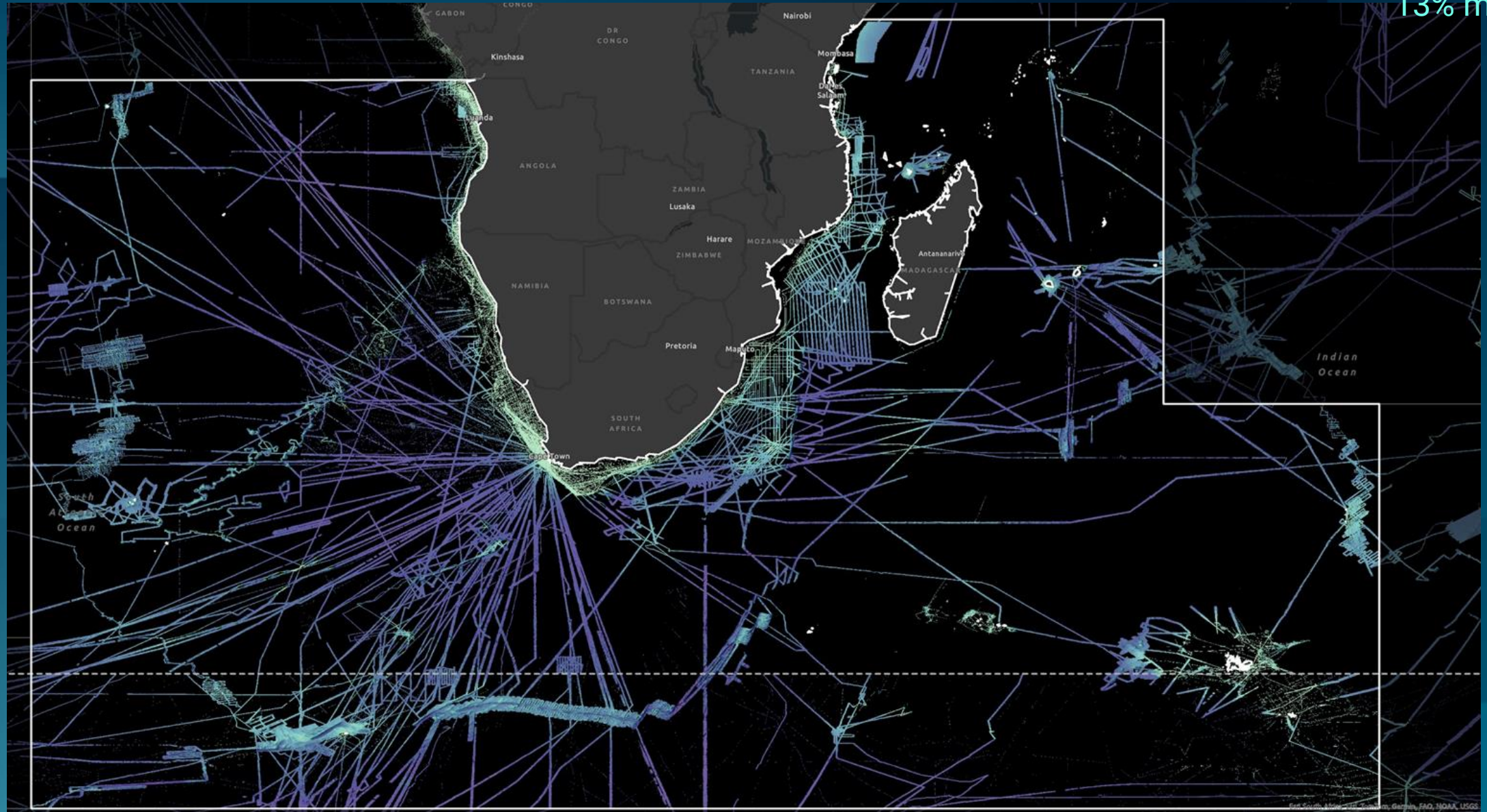
Status of Mapping within the SAIHC

12% mapped



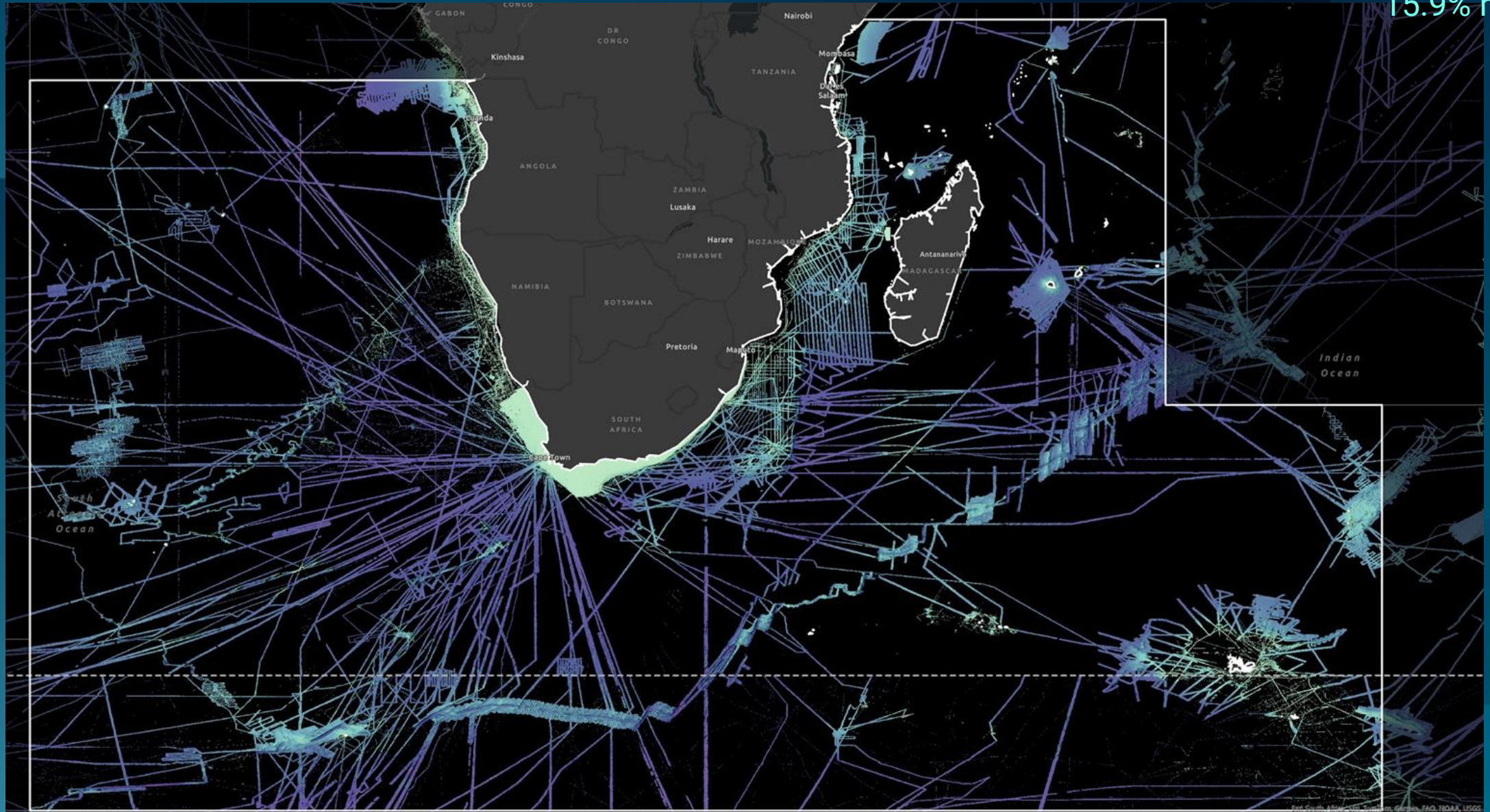
Status of Mapping within the SAIHC

13% mapped



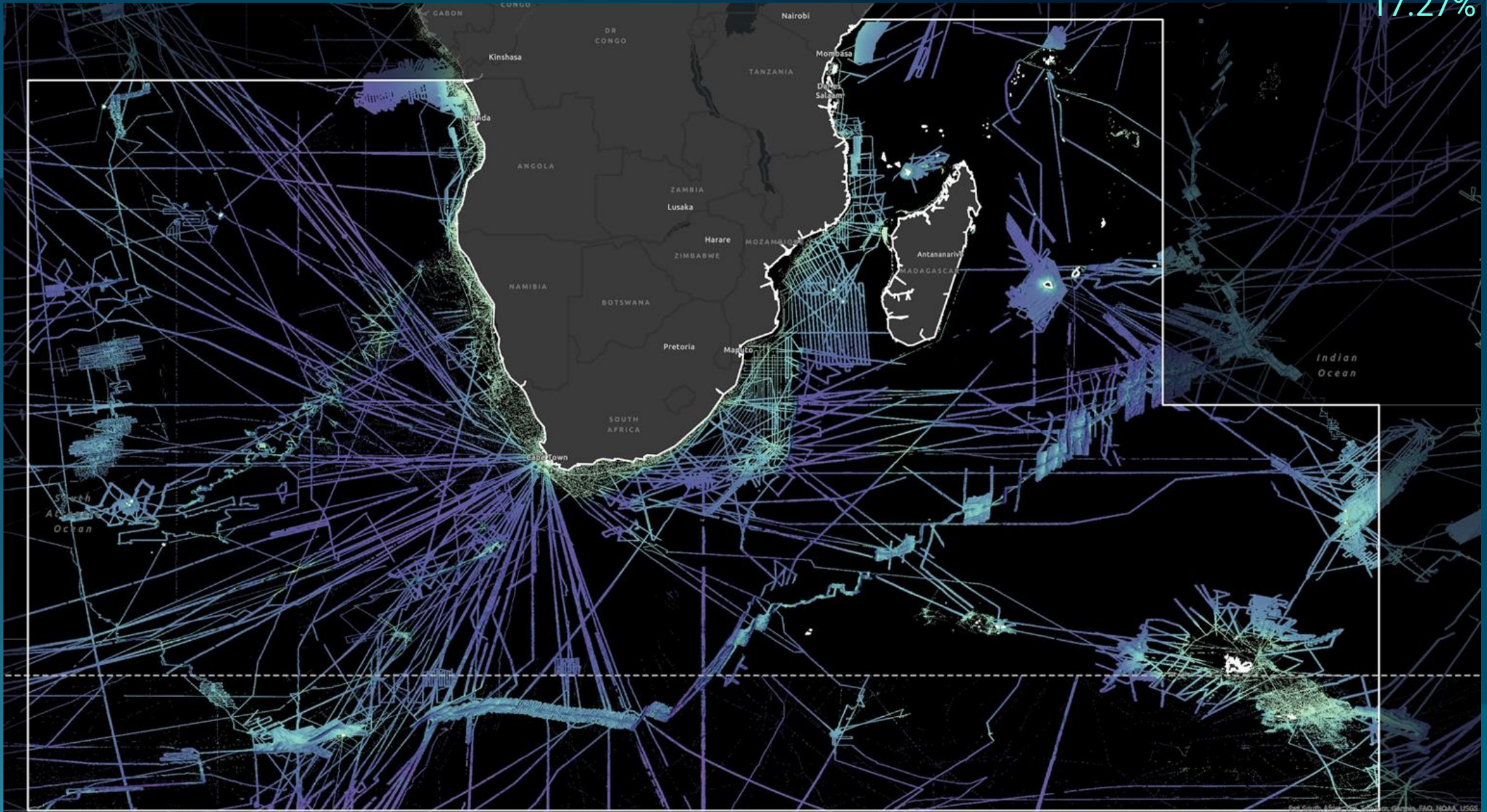
Status of Mapping within the SAIHC

15.9% mapped



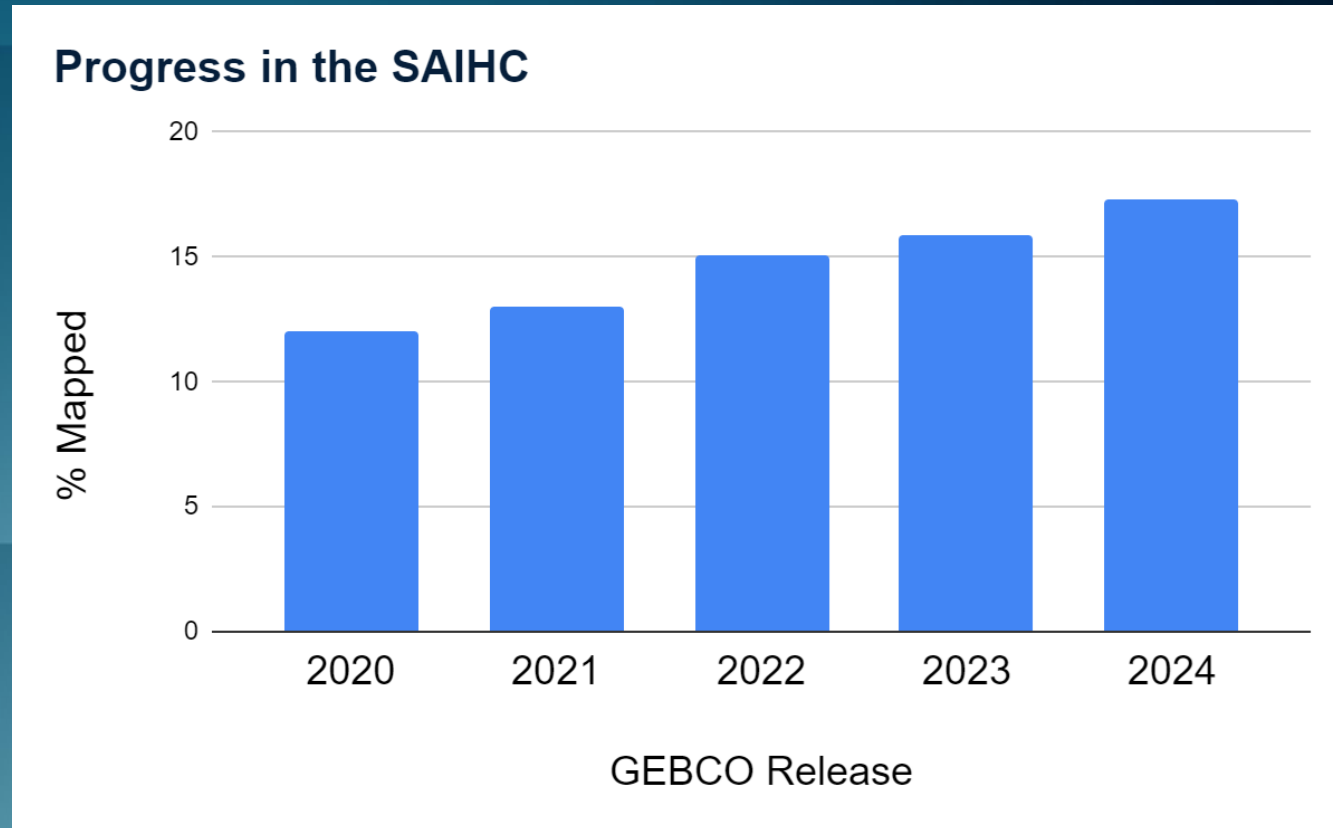
Status of Mapping within the SAIHC

17.27% mapped



Progress within the SAIHC

SAIHC: 17.27% mapped (GEBCO 2024)



Data contributors within the SAIHC region

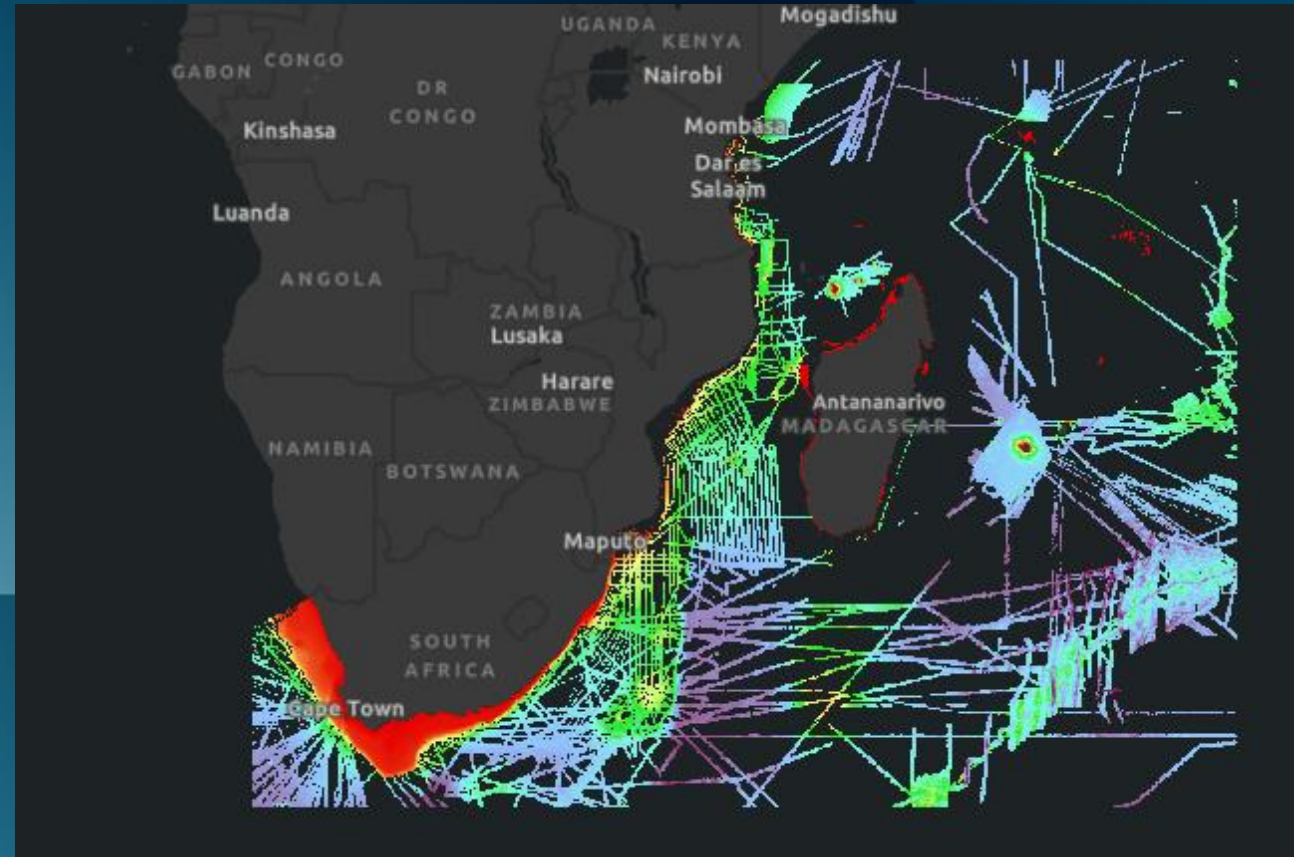


10 nations, > 22 organizations

Community Engagement Updates

Collation and Compilation of Multi-Scale and Multi-Resolution Bathymetric Data in the Western Indian Ocean (WIObathy)

- 9 WIO countries
- Alumni of the Nippon Foundation GEBCO Training from 5 countries
- Data Workshop focusing on data preparation/Assessment
- Coordination of data QA/QC
- Pathways to submit data



WIO Region coverage (AIORC 2024)

Community Engagement Updates

Next virtual AIORC Virtual RMC

January 14 -16, 2025

- Updates on mapping status within the region
- Technical session
- Regional Mapping Community initiatives and updates

Scan the QR code to express your interest in joining the virtual Community Mapping Meeting

Or contact the center at: atlantic-indian@seabed2030.org



GET INVOLVED

Everyone with a link to the ocean can play a powerful role in helping to map the entire seafloor by the end of the decade.

CONTRIBUTE DATA >

Contribute via the [GEBCO Data submission portal](#)

in

f

tw

CONTACT US

Book a video call during our office hours

The Atlantic and Indian Oceans Regional Center Team is here to assist with your bathymetric data inquiries!

BOOK A CALL



Office hours with the AIORC

- Technical assistance
- Guidance regarding bathymetry data question

An underwater photograph of a vibrant coral reef. The scene is filled with various types of coral, including branching and table corals, in shades of green, brown, and purple. Numerous small, colorful fish are swimming in the clear blue water above the reef. In the lower center, a large sea turtle is resting on the coral. Sunlight filters down from the surface, creating a bright, shimmering effect at the top of the frame. A semi-transparent dark blue horizontal band is overlaid across the middle of the image, containing the text.

UNITED WE
DISCOVER

THE NIPPON FOUNDATION-GEBCO

SEABED
2030

THANK YOU

Atlantic and Indian Oceans Regional Center: atlantic-indian@seabed2030.org

