The Nippon Foundation – GEBCO
SEABED 2030

Geoffroy Lamarche
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Head, Seabed 2030 South and West Pacific Centre

100% of the Ocean Floor Mapped by 2030
Seabed 2030 Mission

To empower the world to make policy decisions, use the ocean sustainably and undertake scientific research based on detailed bathymetric 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 world’s ocean floor.
What does “100% mapped” mean?

The GEBCO global terrain model grid

- ship-track soundings + interpolation guided by satellite-derived gravity data
- Includes regional grids which may be based on different interpolation models

18% of 30” cells have depth measurements
6% of 15” cells have depth measurements
Target Grid Variable Resolution

Target GEBCO Grid
Depth-dependent Variable Resolution

<table>
<thead>
<tr>
<th>Depth Range</th>
<th>Resolution</th>
<th>% of ocean</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–1500 m</td>
<td>100 × 100 m</td>
<td>13.7</td>
</tr>
<tr>
<td>1500–3000 m</td>
<td>200 × 200 m</td>
<td>11</td>
</tr>
<tr>
<td>3000–5750 m</td>
<td>400 × 400 m</td>
<td>72.6</td>
</tr>
<tr>
<td>5750–11,000 m</td>
<td>800 × 800 m</td>
<td>2.7</td>
</tr>
</tbody>
</table>
Seabed 2030 Governance & Operations

Director + Center leads

Review Panel

GEBCO Guiding Committee

Advisory Group

Project Team

SCRUM
SCUFN
TSCOM

N Pacific & Arctic Ocean
Atlantic & Indian Ocean
Global Center
Southern Ocean
South & West Pacific
Regional Approach

- Regional stakeholders
- Regional data assembly & coordination
- Regional products feed into global GEBCO products
- Follows successful model of GEBCO Regional Mapping approach
Seabed 2030 Governance & Operations

Operational since 1st February 2018

**Leader Team** (from left to right): Graham Allen; Vicki Ferrini; Larry Mayer; Helen Snaith; Boris Dorschel; Pauline Weatherall; Martin Jakobsson; Geoffroy Lamarche;

**Comms**: Patrick Orr; Henry Gilliver

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**Advisory Group**

- **Dawn Wright**
  - Chief Scientist, ESRI

- **Bjorn Jalving**
  - Executive VP, Kongsberg Maritime

- **Dr. Kilaparti Ramakrishna**
  - Head of Strategy, Green Climate Fund

- **Yulia Zarayskaya**
  - NF-GEBCO Alumni Team Lead XPrize
Four Pillars of Seabed 2030

• Data Assembly and Coordination
  • Integrate and process existing data & *gap analysis* to inform future mapping missions
  • Promote data sharing by encouraging contribution of data to the IHO DCDB
  • Create new data products – distribute through GEBCO

• Global Community Engagement
  • Identify & engage stakeholders through community events, traditional & digital media

• Consolidate Technical and Human Capacity
  • Explore and leverage new technology
  • Engage GEBCO Nippon Foundation Training Project Alumni

• Cross-cutting area of Corporate Governance
  • Strong stakeholder communication
  • Legal and accounting standards
Seabed 2030 Culture

- Co-operation and Community Building
  - 3,000 individuals, 40 organizations, 50 countries and growing

- Coordination
  - Initial Seabed 2030 focus on > 200 meters water depth
  - Hydrographic Offices critical < 200 meters water depth

- Crowdsourcing
  - Fishing boats, cargo, cruise ships, private yachts...

- Credit and Attribution
  - Recognize data contributions, in-kind services, promotion, capacity building...

https://seabed2030.gebco.net
@seabed2030
Seabed 2030 Phases

\[ \text{X} + \text{Y} + \text{Z} = 100\% \]

- **GEBCO_2014**
- Data NOT in Grid
- Map the Gaps
Seabed 2030 Preferred Data Flow

- **Data Contributors**
  - IHO DCDB
  - Other data stores

- **Regional Centers**
  - Regional gridded products

- **Seabed 2030 Global Center**

- **Global GEBCO grid**

- **User community**

**Regional & global mapping initiatives**

Arrows indicate the direction of flow of source data sets into the compilation of the GEBCO grid:
- Source bathymetry data, e.g. single beam/multibeam
- Bathymetric grids
- Compilation of source data and grids into the regional bathymetric grids
- Compilation of the GEBCO grid
Options to submitting data directly to Regional or Global Centers:

1) **Public data access (preferred)**
Data forwarded to IHO-DCDB for archive and public access

2) **Restricted data access**
Data forwarded to IHO-DCDB for archive and restricted access

3) **Private data access**
Data not forwarded to IHO-DCDB, archived at Seabed 2030 Center
Usage restricted to only inclusion in GEBCO Products; no distribution of data

**Data Sources**
- Raw & Processed Swath Files
- ENC xyz
- Single-beam
- Gridded data
123,515,000 km² of ocean
67,000,000 km² outside national jurisdiction
39 countries and territories
~80% deeper than 3000 m
Includes the two deepest ocean trenches:
Mariana Trench (10,994 m)
Kermadec Trench (10,047 m)
# The South and West Pacific Centre
## Data coverage

Based on Oct 2018 Gap analysis

<table>
<thead>
<tr>
<th>Area (km²)</th>
<th>% of area</th>
<th>Available Data (km²)</th>
<th>Available Data (% of area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 200 m</td>
<td>4,989,826</td>
<td>1,342,377</td>
<td>27%</td>
</tr>
<tr>
<td>200 - 1500 m</td>
<td>5,258,836</td>
<td>2,156,631</td>
<td>41%</td>
</tr>
<tr>
<td>1500 - 3000 m</td>
<td>13,068,933</td>
<td>4,600,667</td>
<td>35%</td>
</tr>
<tr>
<td>3000 - 5750 m</td>
<td>93,198,225</td>
<td>19,692,187</td>
<td>21%</td>
</tr>
<tr>
<td>5750 - 11000 m</td>
<td>6,999,943</td>
<td>2,919,090</td>
<td>42%</td>
</tr>
<tr>
<td>Total</td>
<td>123,515,763</td>
<td>30,710,952</td>
<td>25%</td>
</tr>
</tbody>
</table>

SaWPaC mainly deep water ->
How you can get involved

• Contribute data
• Acquire data to fill gaps in coverage
• Regional Mapping Committees
• GEBCO Meetings
• Spread the word!

https://seabed2030.gebco.net
@seabed2030
Call to Action

- Support data availability at Seabed 2030 target resolution
- Facilitate legal availability at Seabed 2030 target resolution
- Engage with Regional Centers or Global Center
- Support & promote GEBCO activities & products
South and West Pacific Regional Center Mapping Committee Inaugural Workshop

Inaugural Seabed 2030 South and West Pacific Meeting

11th – 13th Feb 2019 - Wellington, New Zealand

All welcome! pacific@seabed2030.org

- Establish Regional Mapping Committee
- Identify sources of bathymetric data
- Methods for data sharing and management
- Identify upcoming voyages

Register on https://seabed2030.gebco.net/data_centers/first_swPacific_polar_meeting.html
Key Documents

Roadmap
https://seabed2030.gebco.net/

10 year Business Plan

https://seabed2030.gebco.net/
doi:10.3390/geosciences8020063
Thank you!

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pacific@seabed2030.org
Break down of the source of data types that the GEBCO grid is based on

<table>
<thead>
<tr>
<th>Grid cell type (30 arc-second)</th>
<th>GEBCO_2014</th>
<th>New grid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpolation guided by satellite-derived gravity data</td>
<td>66.5%</td>
<td>62.4%</td>
</tr>
<tr>
<td>Interpolation guided by computer programme, e.g. GMT</td>
<td>14%</td>
<td>14.3%</td>
</tr>
<tr>
<td>Multibeam</td>
<td>9%</td>
<td>12.4%</td>
</tr>
<tr>
<td>Single beam</td>
<td>1.9%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Pre-generated grid</td>
<td>2.7%</td>
<td>4.3%</td>
</tr>
<tr>
<td>Unidentified track type</td>
<td>3.9%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Isolated soundings, e.g. ENC soundings</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Contours</td>
<td>1.9%</td>
<td>1.9%</td>
</tr>
</tbody>
</table>