

# Seabed2030 and TSCOM

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# GEBCO 2019 Grid







# Types/sources of input data

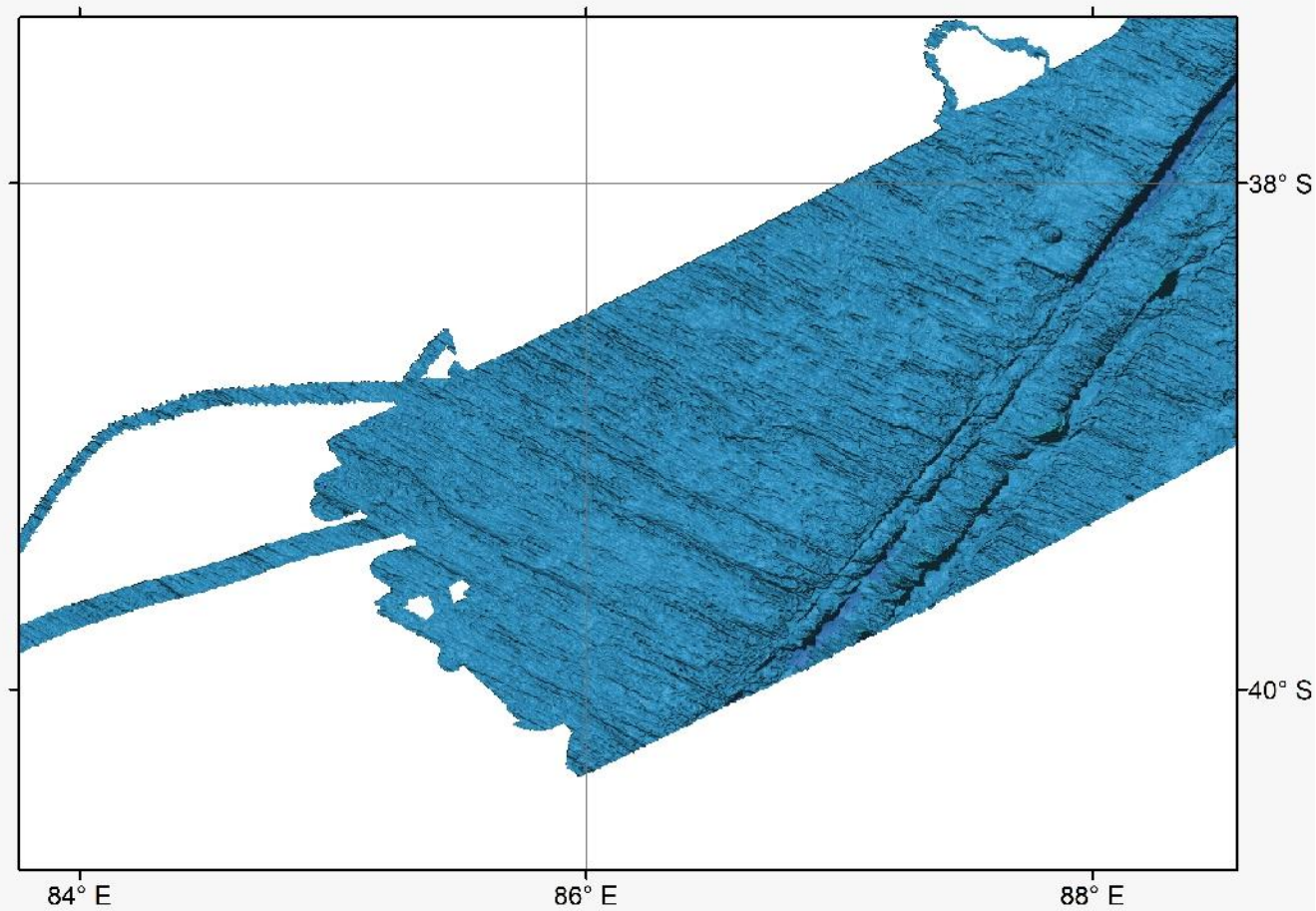
- SRTM15\_plus (v1) – used as ‘base grid’
- Sparse grids supplied by Regional Centers (Atlantic/Indian Ocean, South & West Pacific and North Pacific)
- Complete grids supplied by Polar Regional Centers (Southern Ocean to 50S and Arctic+ plus regions)
- Sparse grids supplied by SHOM (provided close to deadline for data contributions so included in global grid at the GDACC)
- GEBCO specific data sets
  - A few pre-generated grids
  - some ENC sounding data, gridded using GMT and added in the form of a ‘pre-generated grid’.



# Compiling the global bathymetric grid

- 30x30 degree tiles (plus overlap) for 50S-60N (30x20 degrees for 30S-50S)
- Source data for each tile combined into one file
- ‘remove-restore’ to add new data sets onto base grid for non-polar
  - Initial merged grid produced
  - new data set ‘re-added’ onto the merged grid to help preserve the values in the new data set
- Tiles cropped to remove overlap
- Tiles pasted (‘grdpaste’ from GMT) -> draft GEBCO\_2019 Grid

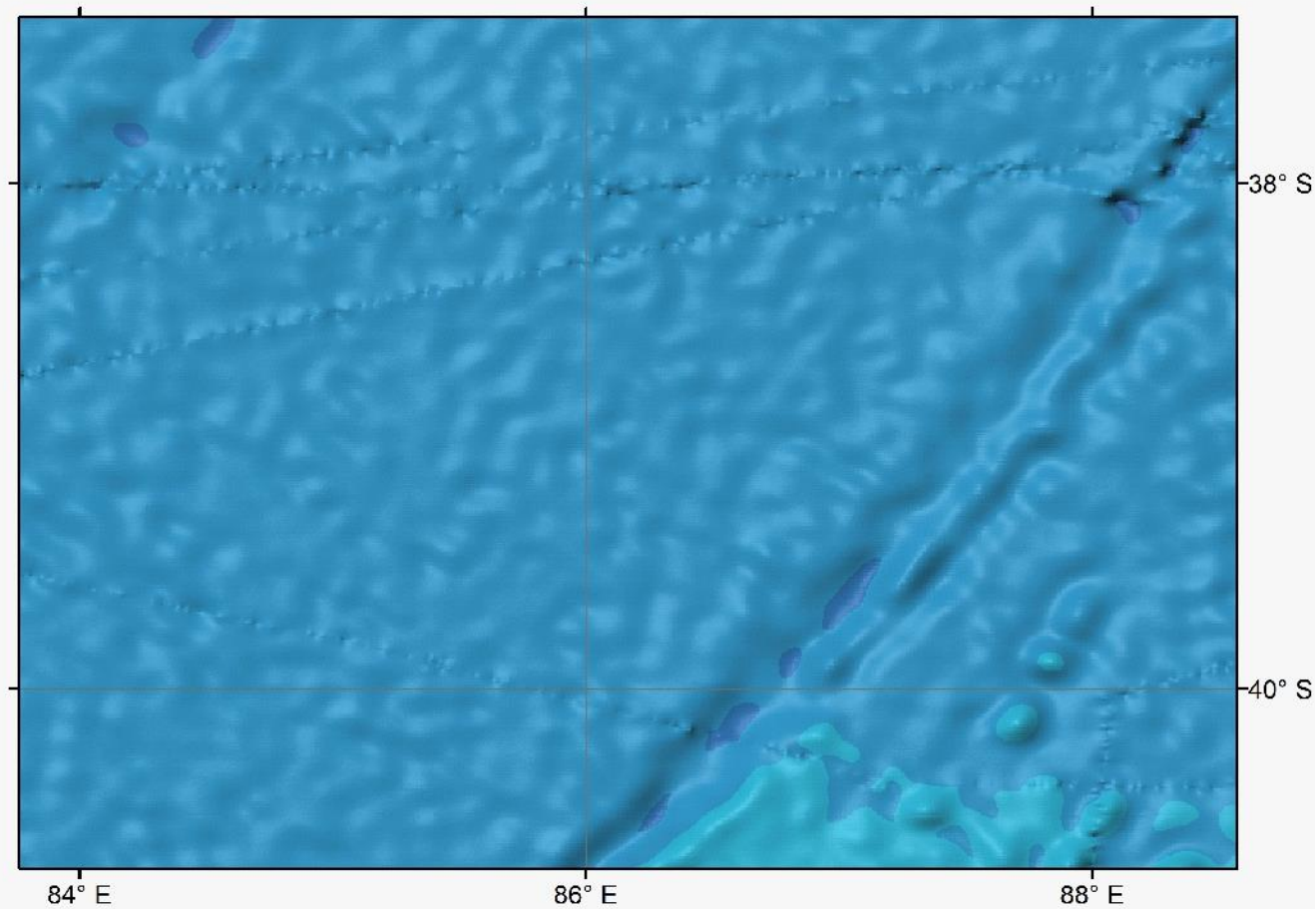
# Example 'remove-restore'



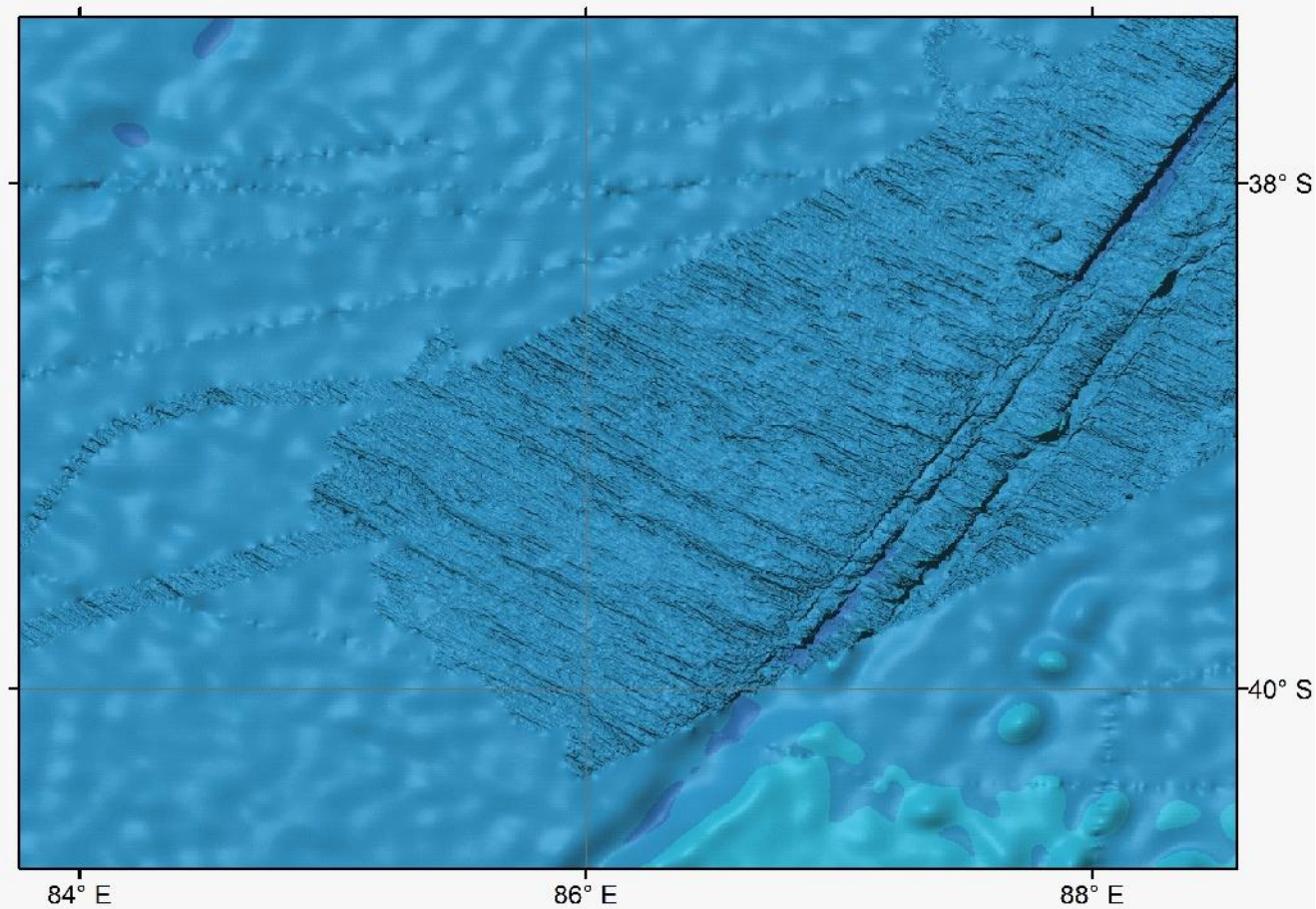
Source data



# Example 'remove-restore'



# Example 'remove-restore'



Merged grids





# Adding the Polar Regions

- Extract 'boundary section' from the Polar grids (+ overlap)
- Extract matching boundary section from draft GEBCO\_2019 Grid (+ overlap)
- 'Blended' section of grid produced using GlobalMapper feather blending algorithm
- Merge the blended Polar sections to rest of the draft GEBCO\_2019 Grid (GMT grdpaste)





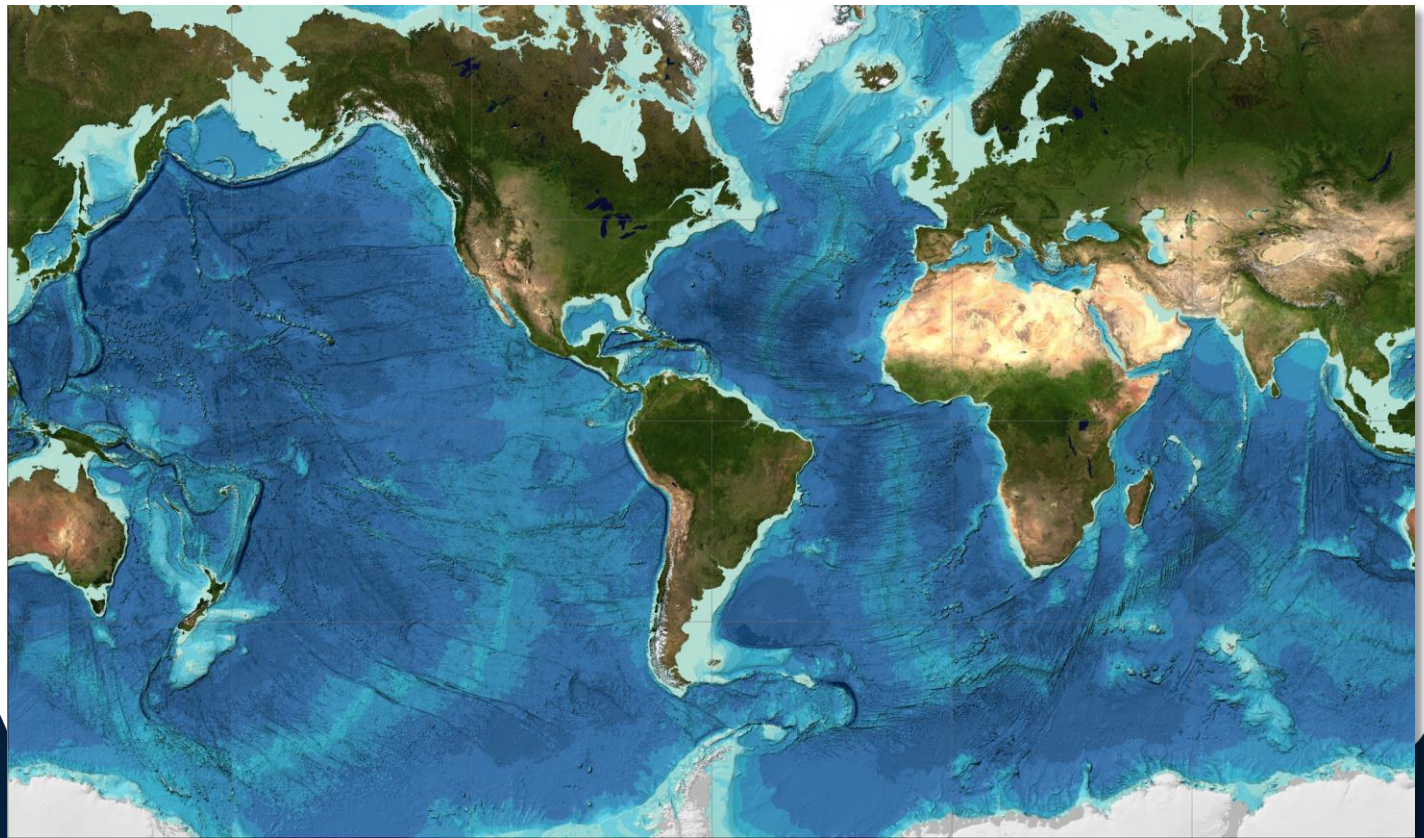
# TID grid

- Cell coding based on **data type** rather than indicating data source
- SRTM15\_plus **S**ID base grid re-coded to appropriate values from the **T**ID coding scheme
- Tiled – same scheme as for the bathymetry grid
- ‘Sparse’ TID tiles added to base SRTM15\_plus TID tiles (GMT’s ‘grdmath’)
- Draft GEBCO\_2019 TID Grid created from the tiles (GMT’s ‘grdpaste’)
- Polar regional TID grids added to create the global GEBCO\_2019 TID Grid



# GEBCO 2019

- Two-fold increase in resolution (from ~1km to ~500m)
- Coverage more than doubled
  - GEBCO 2014: 6% of goal
  - GEBCO 2019: 15% of goal
- Data from all sectors
  - Government
  - Academia
  - Industry
  - Private







# Lessons Learned

- We need much better metadata!
  - See (easily) data sets included in the GEBCO grid
  - See what is intended for inclusion in next release
- A global 15 arcsec grid is not easily dealt with
  - Generating new grid takes time
  - Compressed NetCDF not dealt with well in (some) GIS applications
- We need a longer review period, **with external reviewers**



# Remaining Questions

- Is supplying data as sparse grids for inclusion in global grid the best approach?
- Use of spot soundings
  - Generate sub-grid?
  - Add spot soundings using remove-restore?
- How do we improve data coverage in shallower water?
  - SRTM15\_+ references NGA source data in some shallower water regions





# GEBCO 2020 Grid





# GEBCO\_2020

- SRTM\_15+v2 base grid
- Receive and review regional grids at Global Center
- Produce a rough draft grid for review late November / early December
- Finalise draft global grid and TID grid by end January 2020
- February – **Grid out for review to SCRUM/TSCOM**
- 21st Feb deadline for providing feedback
- Finalised global grid, TID and WMS layers by mid March (2 weeks)
- Final testing and transfer to live server: publication on late March 2020



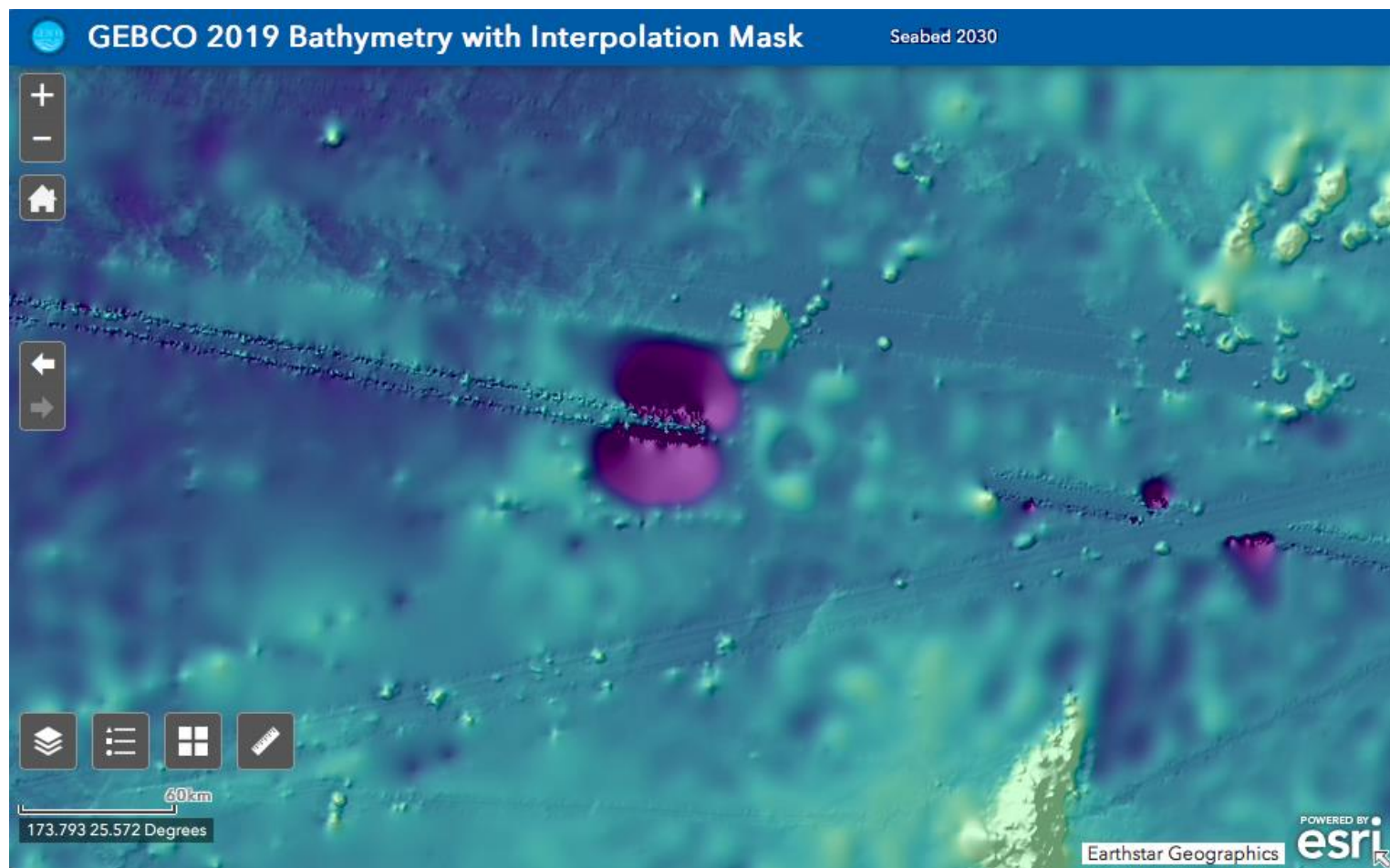



# Input from GEBCO?

- Very useful interaction with TSCOM on TID and Metadata (see later)
- Useful code - any contributions to:
  - <https://github.com/gebco/GEBCO-15-arcsec-grid>
- Use of SRTM
- **Reviewing** - see Vicki's talk on reviewing app









# Seabed 2030 Data Migration, ~~Acquisition, and Archiving~~ Processes

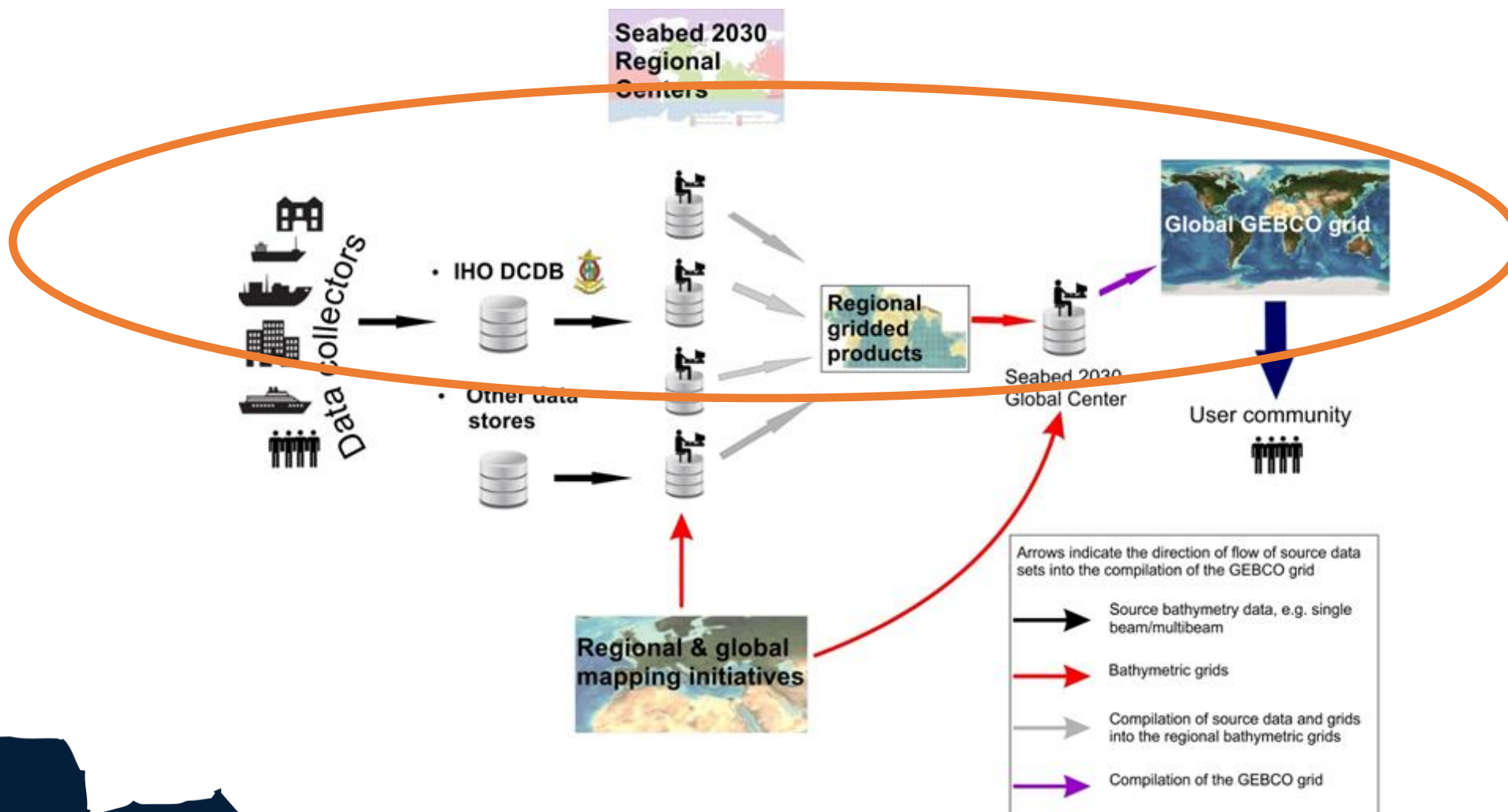




# 'GEBCO-specific' data sets-> Regional Centres

- Alaska bathymetry compilations for the Aleutian Islands, central Gulf of Alaska and Norton Sound
- Grid for part of the Red Sea region and the South East Pacific region (PANGAEA)
- Australian Bathymetry and Topography Grid, June 2009
- Grid, based on multi-beam data, for a region of the North Pacific, 1800 km southwest of the Mexican Baja Peninsula
- Israel EEZ
- Japan Coast Guard Grid for the North Western Pacific Ocean
- Olex data
- SHOM data

# Data Flow

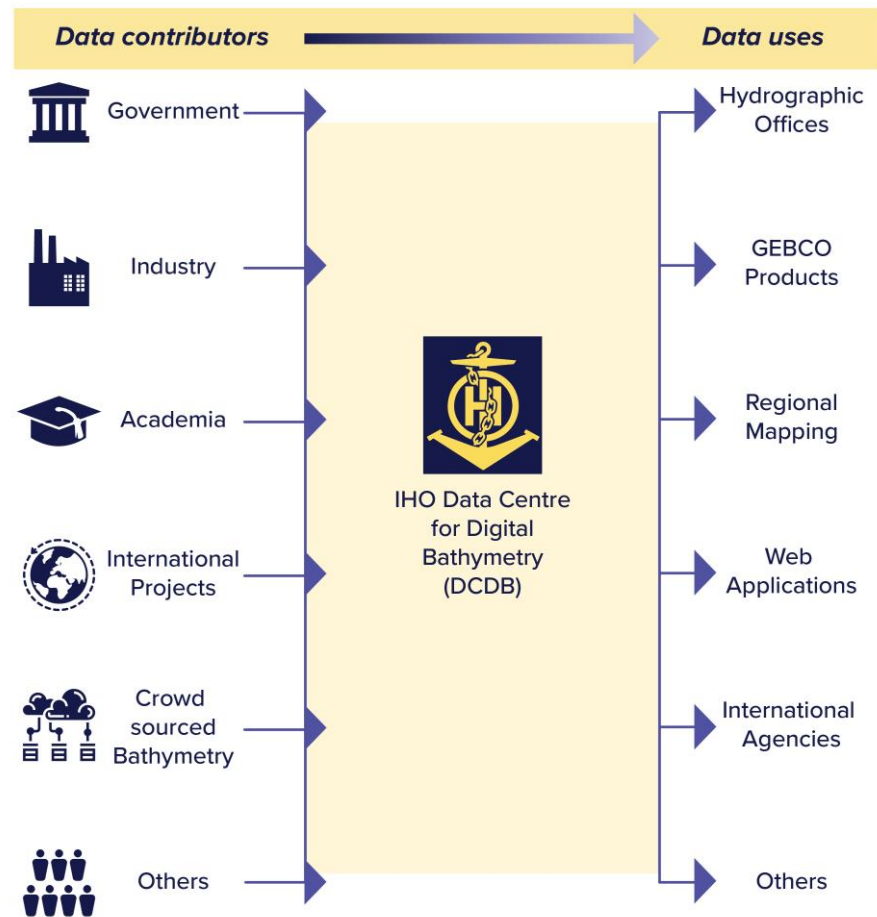






# Data Contribution

- Contributing data for public access
  - GEBCO encourages the sharing of source bathymetric data within the international community for the benefit of all.
  - The IHO DCDB manages a worldwide publicly-accessible digital data bank of oceanic soundings on behalf of the Member Countries of the IHO.
  - If you would like to make your data publicly available, [please contact](#) the International Hydrographic Organization Data Center for Digital Bathymetry (IHO DCDB) hosted at the US NOAA National Centers For Environmental Information (NCEI) to find out how to submit data.







# Data Contribution

- Contributing data for updating the GEBCO grid only
  - If you do not want your source data to be made publicly available, you can contribute the data directly either to the Seabed 2030 [Regional Centers or Global Center](#).
    - [Global Center](#)
    - [Arctic and North Pacific Center](#)
    - [South and West Pacific Center](#)
    - [Atlantic and Indian Ocean Center](#)
    - [Southern Ocean Center](#)
  - The data will only be used for updating GEBCO's products and will not be passed on or made publicly available.





















# Data Contribution

- Join the Crowdsourced bathymetry (CSB) data initiative
  - In order to map the whole of the global seafloor, we cannot rely on traditional survey vessels alone. An initiative has been setup to support and enable mariners and professionally manned vessels to collect CSB. This approach leverages underway x, y, z, t data already being collected on vessels with common commercial echo sounders and Global Navigation Satellite System receivers.
  - Find out [how to get involved](#).

# DCDB CSB

[www.ngdc.noaa.gov/iho/#csb](#)

CF Weather Bookable Roo... | CONNECT NOCS Python useful stuff Web editing Frivolous WishList Apple UK HE Apple - Supp...ort Coverage News Popular







# Partner Organisations

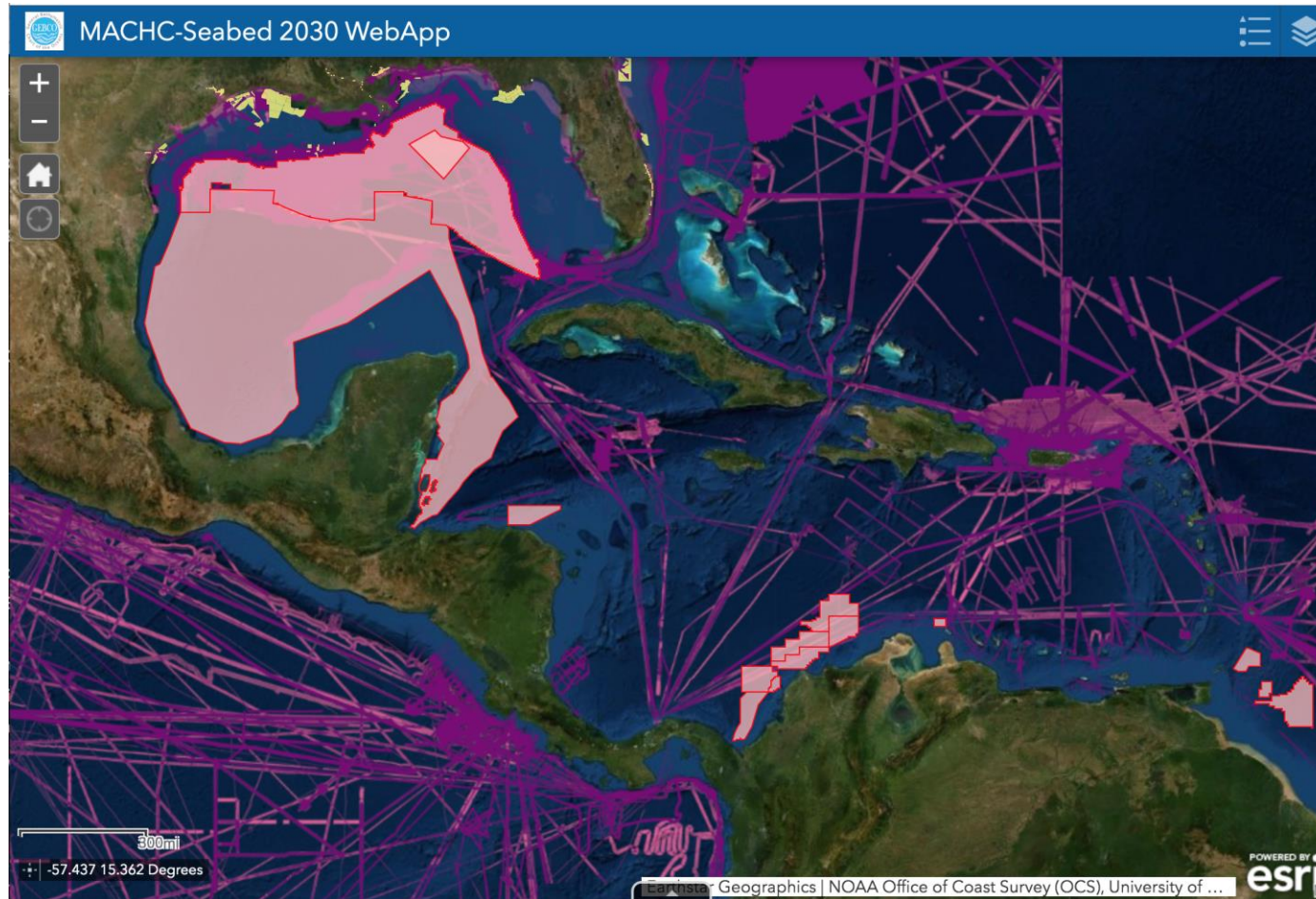
- Major Data Initiatives
  - GMRT, EmodNET, Geosciences Australia...)
- National Data Centres
  - AWI, SHOM, JAMSTEC ...
- IHO members!



# How do we 'hit' these audiences

- Making it easy!
- Services & tools for upload
  - DCDB packaging tool
- Acknowledgement of Contributions
- Providing tailored services for partners?

# Tools to Identify Gaps & Coordinate Acquisition







# GEBCO Download App



# Improved Data Delivery



Home » Data & Products » Gridded Bathymetry Data

We have updated our data delivery application. If you have requested data through the old application and want to access it, click [here](#).

## Global ocean & land terrain models

GEBCO's gridded bathymetric data set, the GEBCO\_2019 grid, is a global terrain model for ocean and land at 15 arc-second intervals. More [information](#) about the grid, its terms of use and attribution.

## Download the global grid files

- [Download the global GEBCO\\_2019 Grid](#) in netCDF format (11 Gbytes, 12 Gbytes uncompressed)
- [Download the global GEBCO\\_2019 SID Grid](#) in netCDF format (98 Mbytes, 1.2 Gbytes uncompressed)

## Select data for a user-defined area

Use our new application to select and download data in netCDF, Esri ASCII raster and data GeoTiff formats.



Open "<https://download.gebco.net>" in a new tab

## Jump to

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## Share this



**GEBCO Compilation Group (2019) GEBCO 2019 Grid  
(doi:10.5285/836f016a-33be-6ddc-e053-6c86abc0788e)**



# Download App

**GEBCO 2019 Gridded Bathymetry Data Download** [About GEBCO](#)

**ENTER BOUNDARIES**

50.3055  
-86.1052 -42.3685  
12.3893 [X Clear](#)

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GEBCO 2019	Grid	SID Grid
2D netCDF	<input type="checkbox"/>	<input checked="" type="checkbox"/>
GeoTIFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Esri ASCII	<input type="checkbox"/>	<input type="checkbox"/>

**YOUR DATA SELECTION**

**Bounds**  
N 50.3055 W -86.1052 S 12.3893 E -42.3685

**Grid dimensions**  
W 10497 H 9100

**File formats**  
Grid: GeoTIFF  
SID grid: netCDF

**File size (estimated)**  
574 MB

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**Map Interface:** A world map showing bathymetry data. A rectangular selection box is centered over the Atlantic Ocean. Coordinates **-42.369, 12.389** are displayed in the top right corner. On the right side of the map, there are four icons: a magnifying glass (zoom in), a magnifying glass with a minus sign (zoom out), a gear (settings), and a question mark (help).



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GeoTIFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Esri ASCII	<input type="checkbox"/>	<input type="checkbox"/>

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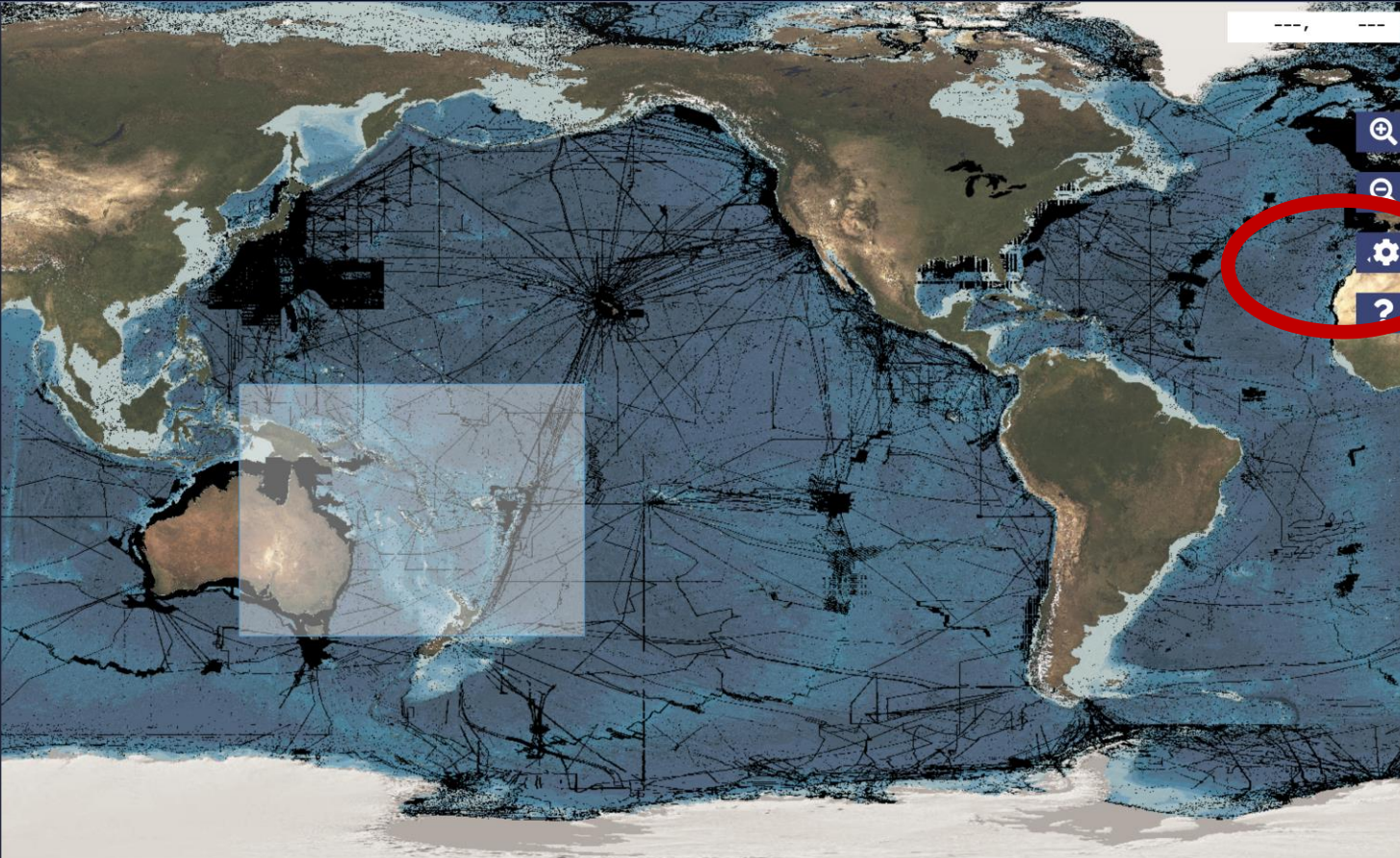
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# Next Developments

- Delivery new 'TID' grid
- Deliver Polar projection data
- Prioritising jobs
- Server optimisation
- Pre-prepared geotiff and ascii 'tiles'





# GEBCO

- Feedback received on Download App was excellent
- What do you want next?