

discovering the unknown

GEBCO

The General Bathymetric Chart of the Oceans

***The name is used for the organisation,
the people involved,
and the products***

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GEBCO

The General Bathymetric Chart of the Oceans

GEBCO, as a mapping project, is 108 years old

today, it has developed from being a series of paper charts into a series of digital products fit for the 21st century

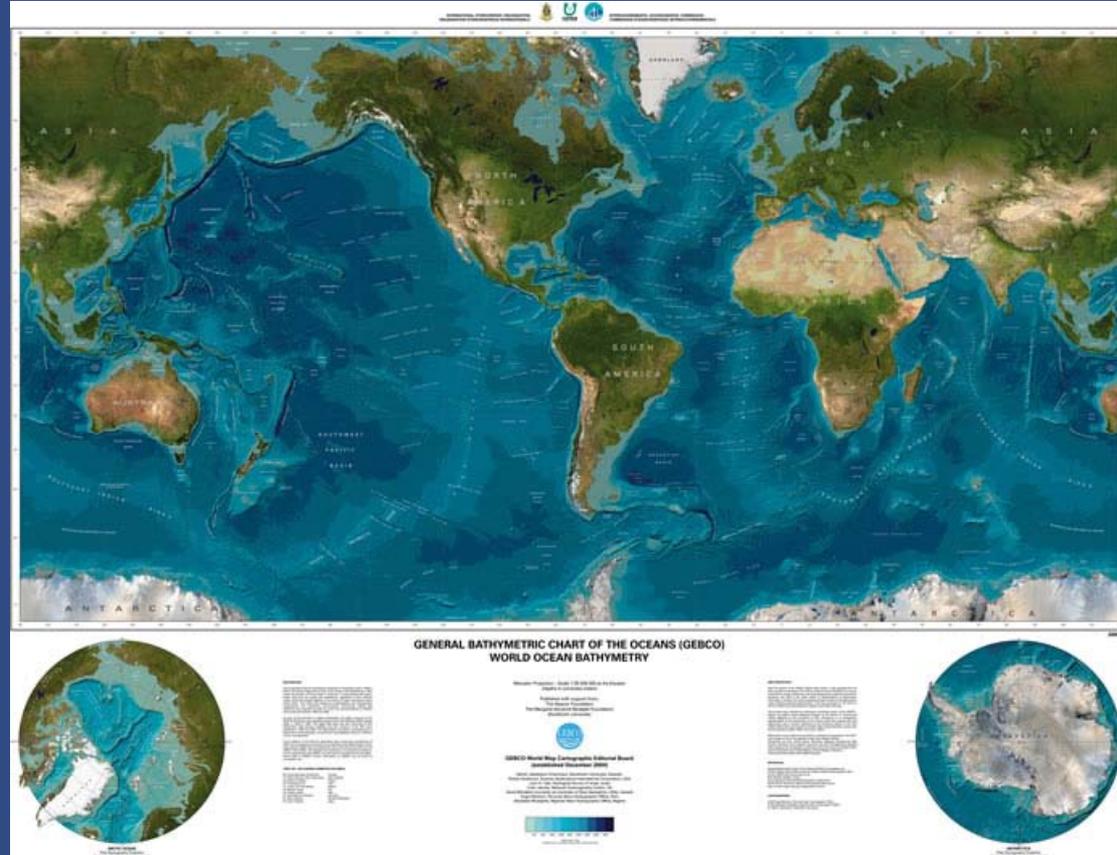
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GEBCO

but most people just think of this...



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or maybe this...

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though it is now also here... (though not in its most up-to-date form)





GEBCO

the organization operates in affiliation with

The International Hydrographic Organization (IHO)

“A subsidiary mission is the application of hydrographic data to support science, and to promote its use in geographic information systems...”

Intergovernmental Oceanographic Commission – IOC (of UNESCO)

“The IOC assists Member States of the UN to address their individual and collective ocean and coastal problems through the sharing of knowledge, information and technology and through the co-ordination of national programmes.”

GEBCO

***GEBCO, the organization
is a network of volunteers, both individuals and organizations,
who cooperatively produce bathymetry of the world ocean***

***GEBCO, the products
are a series of descriptions in maps, numerical grids and
nomenclature of what is known of the physiography of
the World Ocean at a scale appropriate to the
amount of data available at the time of publication***

***GEBCO, the people
operates a program to train younger scientists and
hydrographers in oceanic bathymetry
and to build capacity in their home countries***



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GEBCO

the organization....

GEBCO Guiding Committee

***Sub-Committee on Undersea Feature Names
(SCUFN)***

***Technical Sub-Committee
(TSCOM)***

***Sub-Committee on Regional Undersea Mapping
(SCRUM)***





GEBCO

the organization....

GEBCO Guiding Committee

establishing standards for data quality and data access

maintaining a network of experts in data collection and interpretation

encouraging broad participation with other data suppliers
within a common data warehouse framework

establishing new access channels between data holdings and end users

As GEBCO Bathymetric Editor, I usually report to this committee



GEBCO

the organization....

Sub-Committee on Undersea Feature Names (SCUFN)

SCUFN maintains and makes available the IHO-IOC GEBCO Gazetteer of Undersea Feature Names

prepares and maintains lists standardised feature definitions

ensures that proposed names will adhere to the guidelines of IHO-IOC Publication B-6, and the feature's existence will be supported by valid evidence

ideally SCUFN has 12 members, 6 appointed by IOC and 6 by the IHO



GEBCO

the organization....

Technical Sub-Committee (TSCOM)

TSCOM “looks after” many aspects of technical detail as regards the updating, maintenance and quality of the GEBCO products

has the power to create and disband further working groups to look into specific areas (e.g. GEBCO cookbook)

is usually composed of 10 experts who are there for their expertise, and not their affiliation (i.e. IOC or IHO)



GEBCO

GEBCO cookbook

This working group is developing a technical reference book on how to create highest quality bathymetric grids.

It will, when finished, give advice on data handling (all types of processing including editing and data cleaning), databasing and storage, web access, grid creation and publication, using a range of platforms and software.

It will be aimed at all kinds of users from those who wish to make a simple map with a GMT script, to those who wish to write their own code for contour production via kriging or fractals

It will be freely down-loadable from the internet (and some parts of it already are), with a focus on open-source software.

GEBCO

the organization....

Sub-Committee on Regional Undersea Mapping (SCRUM)

SCRUM's aim is to build a closer collaboration with regional mapping efforts and coordinate, as well as encourage, the incorporation of their compilations into GEBCO

current areas of focus are the South East Pacific, Indian Ocean and the Southern Ocean

this effort is being very strongly supported by direct funding from the Nippon Foundation

I serve as the vice-Chair of this committee





GEBCO

in general, support comes from...

Individual members' home organizations
(Government, Academia and Industry) support participation

US Government supports GEBCO by funding work at the
National Geophysical Data Center
and at Lamont-Doherty Earth Observatory (GMRT) via the NSF

IHO supports DCDB
(Data Center for Digital Bathymetry – Boulder, Colorado, USA)

Currently the UK Government supports the Bathymetric Editor (NOC) and
Digital Data Manager (BODC)

AWI, Bremerhaven, will be supporting the regional mapping efforts in the
Southern Ocean

Private Charitable Foundations such as the Nippon Foundation
and the Margaret Kendrick Blodgett Foundation both provide funding

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GEBCO

GEBCO, the people

operates a program to train younger scientists and hydrographers in oceanic bathymetry and to build capacity in their home countries

this program is funded by the Nippon Foundation, a Private, non-Profit Japanese grant-making organisation

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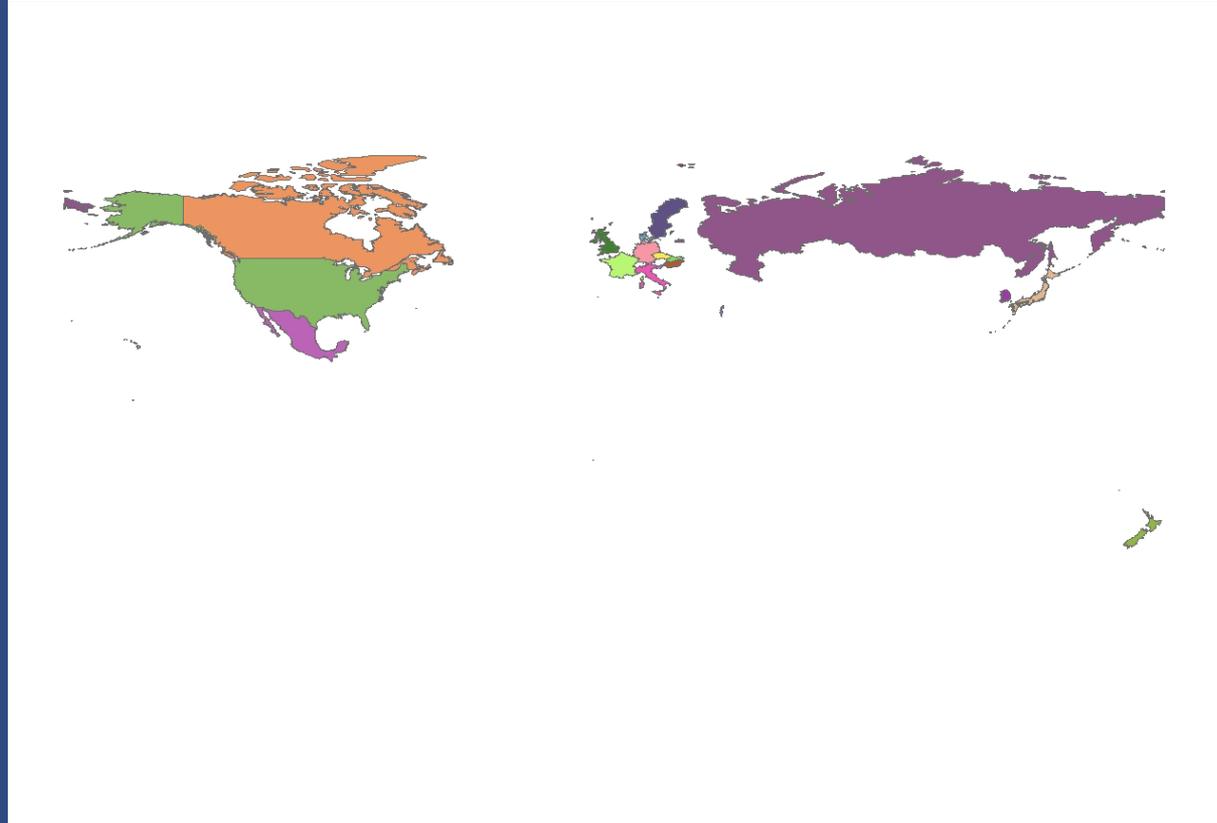
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GEBCO

GEBCO, the people

before the involvement of the Nippon Foundation Training Program,
the global participation within GEBCO looked like this



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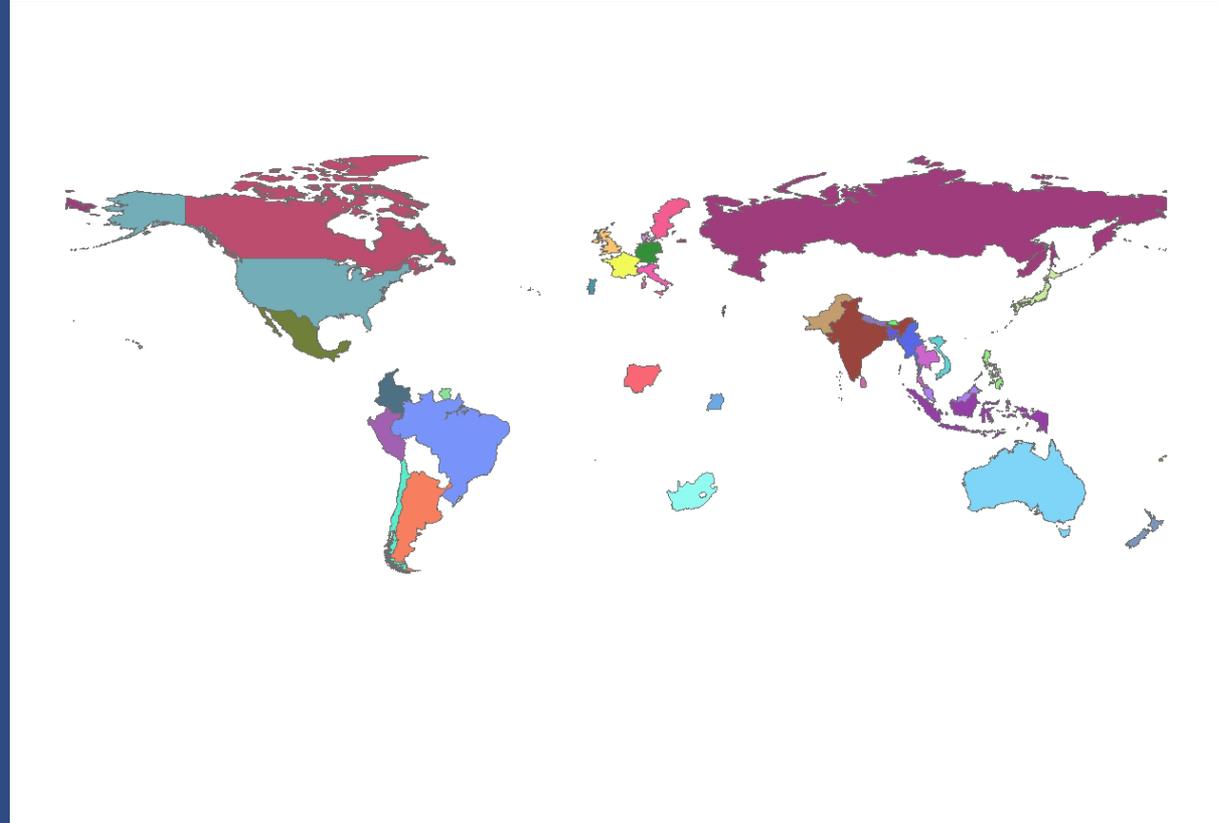
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GEBCO

GEBCO, the people

now, with the involvement of the Nippon Foundation Training Program,
the additional student participation makes GEBCO look like this





GEBCO

Products...

bathymetric maps of the world ocean, in paper and digital versions
with a new web-map service hosted at BODC

global grid of topography covering the entire world at a resolution
of 30 arc-seconds

worldwide digital data bank of oceanic soundings
(IHO Data Center Digital Bathymetry)

<http://www.ngdc.noaa.gov/mgg/bathymetry/iho.html>

Gazetteer of Undersea Feature Names

viewing and download of 100m resolution grids – GMRT
Global Multi-Resolution Topography
(via Lamont-Doherty Earth Observatory)

<http://www.marine-geo.org/portals/gmrt/>

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Now, the focus is on

enlarging the GEBCO Community (people)

getting more data submitted to the International Data Banks

attribution of data sources

obtaining higher resolution data

involvement of regional participants

outreach

digital delivery

Under High Priority Development....

Regional Undersea Mapping programmes – grids (and printed maps)
of the S E Pacific, N Indian Ocean, Southern Ocean

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In the last 12 months....5,600 downloads of the GEBCO_08 Grid

The main NERC web page for Policy Makers, Industry and Business states....

“we are keen to make our advances in science and technology available to potential users”

and

“or we can support existing activities by, for example, providing environmental data”



GEBCO

Major users of GEBCO's data and products includes

app developers

fisheries

schools

general public

United Nations Division for Ocean Affairs and the Law of the Sea

engineers

cable companies

defence

oceanographic modellers

marine spatial planners

mining companies

government agencies

academia

tsunami inundation modellers

hydrocarbon companies

marine biologists

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The incorporation of GEBCO bathymetry into Google Earth probably makes this the most publically visible science project in the world – something that may not be recognised....

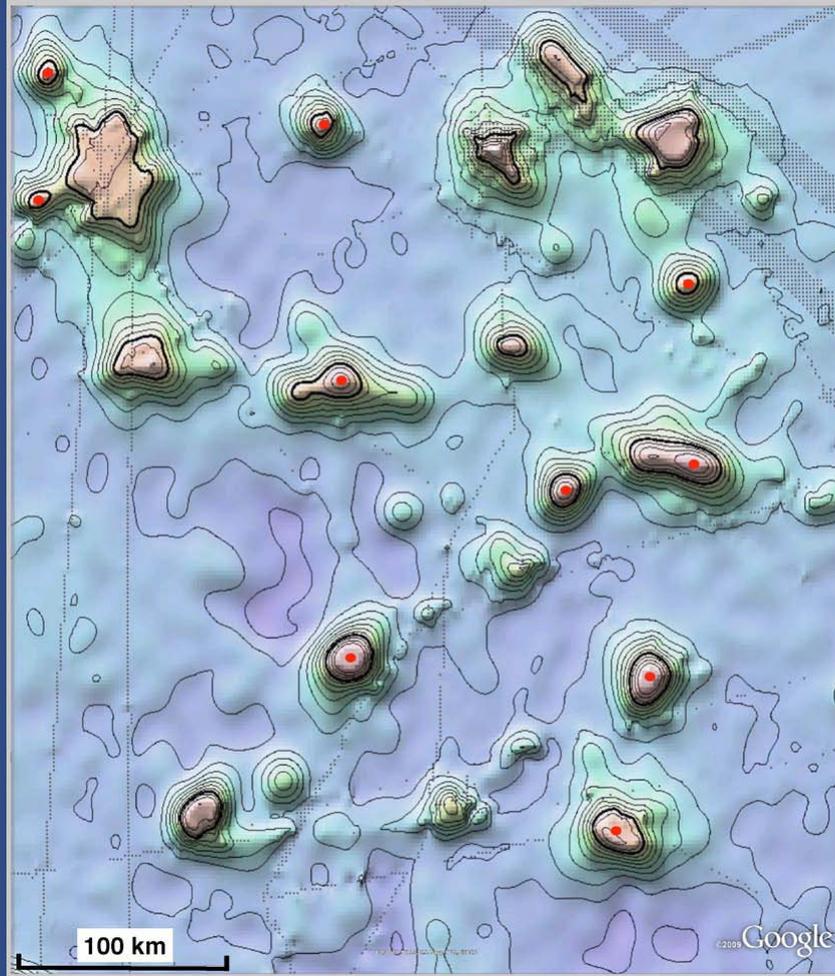
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GEBCO

Seamount Discovery tool

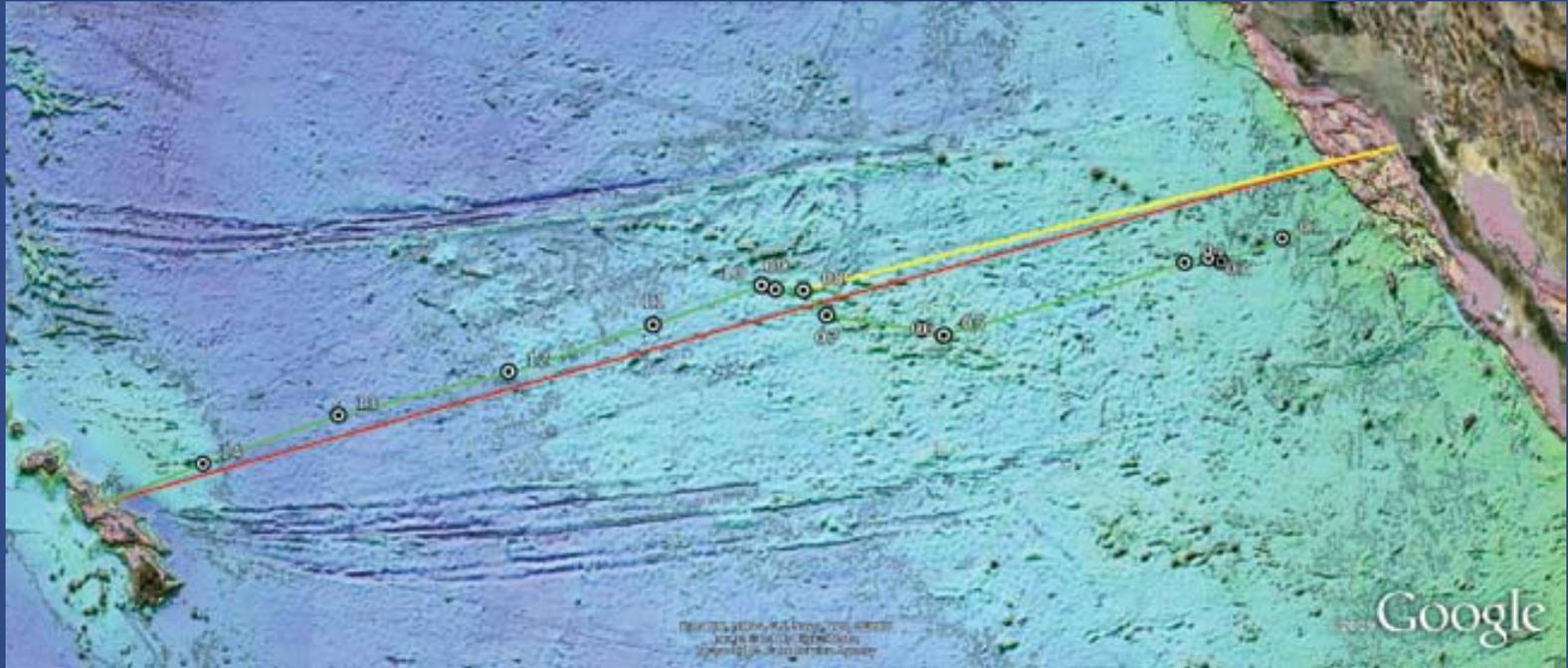


Wessel et al, in 2010 estimated that 100,000 or 90% of the seamounts greater than 1-km tall are unobserved by either ship soundings or satellite gravity

Red dots show 10 predicted but as yet uncharted seamounts more than 3-km tall



GEBCO



Possible transit routes from San Diego, California, to Oahu, Hawai`i, displayed in Google Earth along with the bathymetric overlay. The most direct route is a great circle (red line). The numbered way points mark positions of 12 uncharted seamounts > 1-km tall based on bathymetry predicted from satellite gravity. Following all the way points (green line) increases the path length by 2.8%. Following way points 8–14 (yellow, then green) increases the path length by only 0.23%, and seven large seamounts would be visited.

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Thank you – questions?