

Report of the GEBCO Guiding Committee

Submitted by: Chair

Related Documents: IHO CL 11/2016 dated 1 March 2016
See Annex B for IHO Publications and Resolutions

Related Projects: ??

Chair: Shin Tani, Japan

Vice-Chair: Martin Jakobsson, Sweden

Secretary: David Wyatt, IHB

Member States: Chile, Germany, Italy, Japan, Malaysia, New Zealand, Republic of Korea, Sweden, UK, USA

Expert: Contributors:

See Annex A for full details

1. Meetings Held During Reporting Period

The 32nd meeting of the GEBCO Guiding Committee (GGC) was held in Kuala Lumpur, Malaysia, from 8 to 9 October 2015; the meeting was chaired Mr Shin Tani (Japan). The GEBCO Technical Sub-Committee on Ocean Mapping (TSCOM) and the Sub-Committee on Regional Undersea Mapping (SCRUM) held a joint meeting from 6 to 7 October 2015; the meeting was co-chaired by Dr. Karen Marks (USA), (Chair of the TSCOM), and Professor Martin Jakobsson (Sweden), (Chair of the SCRUM). These meetings were preceded by the GEBCO Science Day, which was held on 5 October 2015. 53 delegates participated across the five days. The Sub-Committee for Undersea Feature Names (SCUFN) held its meeting in Niterói, Brazil, 12-16 October; the meeting was chaired by Dr Hans-Werner Schenke (Germany).

2. Work Programme

For the tenth consecutive year, the GEBCO project organized a “Bathymetric Science Day”. The Science Day, which included a poster session and involved contributions from a pleasing number of Scholars of the Nippon Foundation ocean mapping programme, featured presentations on a diverse range of topics.

Following a discussion at the TSCOM/SCRUM on the need for a higher resolution grid, the meeting agreed that a new edition of the 30 arc-second GEBCO 14 grid

should be produced. The latest SRTM¹ 15 arc-second grid is to be used (provided that there are no copyright restrictions) for areas where no depth data exists. Between June 2014 and August 2015, the GEBCO gridded data sets were downloaded 17,288 times. The meeting agreed that the bathymetric data for coastal and shallow water areas available to GEBCO and its mapping programmes required improvement, and proposed that national hydrographic authorities be invited to provide depth data for these areas where it existed. Crowd Sourced Bathymetry (CSB) would also be an important source of shallow water data in these areas. The meeting discussed various outreach activities such as, outreach for high school and college students, using the IHO-IOC GEBCO Cook Book (B-11) as an educational resource, and making scanned versions of the five GEBCO printed map editions available for download and as an online tile map service. Information on the Cook Book was included in Earth Observing System (EOS) news brief and in an article in Hydro International.

Update reports were provided on the following regional mapping projects: Indian Ocean Bathymetric Compilation (IOBC), North Atlantic Seabed Mapping Project, International Bathymetric Chart of the Arctic Ocean (IBCAO), International Bathymetric Chart of the Southern Ocean (IBCSO) and Baltic compilations.

The GGC received brief reports from its Sub-Committees and endorsed the work which they had undertaken. The GGC also received reports from key personnel performing functions on behalf of GEBCO as well as reports from its parent bodies - IHO and IOC, on activities since the previous meeting. A detailed report was received covering education and outreach activities, the results of a year-long focused study.

The Committee noted its new Terms of Reference and Rules of Procedure, which had been approved by the IOC and the IHO Member States in September 2015.

The GGC devoted significant time to considering its future direction and associated ten-year plan. It was agreed that the goals and vision should be guided by four main underpinning themes: human capacity, science and technology, outreach and education, and resources (human and financial). There was a clear understanding that data quality and coverage were the underpinning foundation on which the many uses and products would be developed and that the GEBCO project should be focused on obtaining and making bathymetric data available, and that it was for others to develop products and services from that data. The Guiding Committee was briefed on the plans and preparations for a GEBCO-Nippon Foundation sponsored forum, Forum for Future Ocean Floor Mapping (F-FOFM), a three day international event in Monaco, 15-17 June 2016, bringing together ocean experts to set the goal of accelerating the ability of GEBCO to accurately portray the shape of the world's ocean floor.

A desire was expressed to seek ways in which the naming process used by the Sub-Committee on Undersea Feature Names (SCUFN) could be made more efficient, one of which was to reassess the way in which the GGC provided its endorsement of

¹ SRTM: Shuttle Radar Topography Mission.

names approved by SCUFN. It was agreed in future this would be done by correspondence.

The GGC discussed outreach and ways to raise the profile of the GEBCO project amongst the different stakeholder and user communities - including IHO and IOC Member States, the maritime and scientific community and the public. It was noted that different strategies would be required for each of these groups. The GGC also reviewed its current financial situation in relation to proposed planned projects; the Committee recognised that the sub-committees would need to present more detailed proposals for consideration at future GGC meetings for the subsequent consideration and endorsement by the IHO Inter-Regional Coordination Committee (IRCC).

The current secretary advised the Committee that his term of office would finish at the end of 2015. The GGC accepted the offer of the IHB to provide secretarial assistance and Assistant Director David Wyatt was appointed to the position of GEBCO secretary from 1 January 2016. It was agreed that the 33rd meeting of the Committee would take place, together with meetings of TSCOM, SCRUM and the GEBCO Science Day, in Viña del Mar, Chile, during the week 10 to 14 October 2016.

3. Progress on IRCC Action Items

IRCC7 Action 52: RHCs to continue supporting GEBCO regional projects and report back to IRCC (deadline: IRCC8) (Permanent).

GEBCO personnel attended a number of RHC meetings during the period covered by this report. It is intended to continue this level of representation.

IRCC7 Action 53: RHC Chairs to remind HOs of the standing request to provide GEBCO with access to existing shallow water bathymetric data, at whatever resolution is permissible by the country and to report progress to IRCC (deadline: IRCC8).

IHO CL 11/2016 dated 1 March 2016 issued to request Member States to consider providing sounding data from their ENC. Soundings extracted from ENC usage bands 2 (General) and 3 (Coastal) are the most suitable. Only the depth contour (DEPCNT) and sounding (SOUNDG) geo objects are required for improving the GEBCO grid bathymetry. It should also be noted that these objects will not be included directly in any of the GEBCO products. They will only be used as source data to improve the accuracy and quality of the derived GEBCO Grid. It is noted that the East Asia Hydrographic Commission and the following Member States have already provided shallow water bathymetry data from their ENCs or through regional mapping programs to GEBCO and therefore did not need to do so again unless they considered that the bathymetry included in their ENCs has improved significantly since their previous submissions: Australia, Bahrain, Belgium, Chile, Ecuador, Finland, Germany, Greece, India, Italy, Republic of Korea, Latvia, Malaysia, Netherlands, Norway, Peru, Poland, Portugal, South Africa, Sweden and USA. The GGC would like to thank these Member States for their contribution to the improvement of the GEBCO Grid.

IRCC7 Action 54: IHB and the GGC to report on further developments in the Governance and administration of GEBCO to IRCC (deadline: IRCC8).

Budgets and Work Plans for 2017-2018 are being developed in preparation for presentation at the 33rd meeting of the GGC in Viña del Mar, Chile, in October 2016. These will be presented to IRCC9 for endorsement and action as appropriate.

4. Problems Encountered

The GEBCO ocean mapping programme is dependent on the availability of bathymetric data and undersea feature information. In order to achieve its goals, GEBCO proactively collects, stores and disseminates bathymetric data for the world's oceans. GEBCO has worked towards improving its participation in regional mapping activities and has also appointed representatives to participate in selected RHC meetings.

Traditionally GEBCO has focused on areas deeper than 200m, however, it is now actively collecting data in shallow water areas to support activities such as coastal zone management and the mitigation of seaborne disasters such as storm surges and tsunami inundation. IHO Member States are encouraged to contribute bathymetric data in shallower coastal areas to support the production of higher resolution gridded data products. See Annex C for current areas where ENC sounding data have been provided. The rate of contribution has slowed considerably and there is now a clear need for renewed efforts.

5. Any Other Items of Note

IHO publication B-9 the “GEBCO Digital Atlas” (GDA) is a two-volume DVD and CDROM set which contains: the GEBCO global bathymetric grid at 30 arc-second intervals; the GEBCO One Minute Grid global bathymetric grid, a global set of digital bathymetric contours and coastlines, the GEBCO gazetteer of undersea feature names and a software interface for viewing and accessing the data sets. The GEBCO grids are generated by combining quality-controlled ship depth soundings with depth interpolations between sounding points guided by satellite derived gravity data. The grids were updated in March 2015 due to an error in the procedure used to include the IBCSO data set. The new version of the GEBCO_2014 grid was produced with a revised version number: 20150318. The grid is available for download from the GEBCO website.

GEBCO continues to promote the importance of bathymetric data to the international community. A significant GEBCO annual outreach event is the annual Science Day which includes oral presentations and poster displays on topics relating to ocean-floor mapping and its applications.

GEBCO data was highlighted in a feature article (by the Earth Observing System (EOS)) on the search for the missing aircraft MH370. The IHO-IOC GEBCO Cook Book (B-11) continues to be used as an important educational resource for ocean mapping students.

In February 2015, an application was launched for viewing and accessing GEBCO's grids via the GEBCO web site (www.gebco.net/data_and_products/gridded_bathymetry_data/). This is an addition to the previous means of accessing GEBCO's grids via GEBCO web pages hosted at BODC (http://www.bodc.ac.uk/data/online_delivery/gebco/). The grid download application was also extended to allow access to GEBCO's grids in Esri ASCII raster format in addition to the existing GeoTiff and netCDF formats.

A new version of the GEBCO Web Map Service (WMS) was developed in 2015. The new service, includes the GEBCO_2014 Grid and a Source Identifier (SID) grid, and shows which grid cells are constrained by data, either soundings or from other grids. The SID grid also includes metadata indicating the origin of the source data from which grid cells were derived.

A draft global contour dataset was developed in 2015. It includes bathymetric contours at depths of 100m, 200m, 500m and at 500m intervals thereafter. The data set has been reviewed by the TSCOM and SCRUM groups, and requires additional editing to remove a number of artifacts before it can be released. The dataset will probably be made available for download from the GEBCO website in Shapefile format.

6. Conclusions and Recommendations

It was agreed by the GGC that the revised Terms of Reference and Rules of Procedure, together with IHO Publication B-11 (IOC Manuals and Guides 63) – *GEBCO Cookbook*, have superseded the contents of IHO Publication B-7 – *GEBCO Guidelines* – and therefore it was felt there was no requirement to continue with the revision process, which has been in progress for the past 3 years. It was agreed to recommend to the IRCC that the publication is withdrawn permanently and any minor items not already covered by the ToRs or B-11, could be included in an additional section in B-11.

7. Justification and Impacts

8. Actions Required of IRCC

The IRCC is invited to:

- a. Note the contents of this report;
- b. Reappoint the GGC to continue its work under the current ToRs;
- c. Approve the withdrawal of IHO Publication B-7;
- d. Take what other action is deemed necessary.

IHO-IOC GEBCO GUIDING COMMITTEE (GGC)

List of GGC members - 1 January 2016

- | 1. IHO Appointed Members: | Term Period: |
|---|---------------------|
| Mr Shin Tani (Japan) (<i>Chair</i>) | (2013-2018) |
| Rear Admiral Patricio Carrasco (Chile) | (2013-2018) |
| Dr Hyo Hyun Sung* (Republic of Korea) | (2014-2019) |
| Captain Norhizam Hassan (Malaysia) (<i>New selected</i>) | (2015-2020) |
| Dr Graham Leslie Allen (United Kingdom) (<i>New selected</i>) | (2015-2020) |
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- | 2. IOC Appointed Members: | |
|---|-------------|
| Dr Martin Jakobsson (Sweden)* (<i>Vice-chair, Chair of SCRUM</i>) | (2013-2018) |
| Dr Robin Falconer* (New Zealand) | (2013-2018) |
| Ms Marzia Rovere (Italy) | (2014-2019) |
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- | 3. Ex-officio Members: | |
|---|--|
| Dr Martin Jakobsson (Sweden)* (<i>Chair of SCRUM, Vice-chair</i>) | |
| Dr Karen Marks (USA) (<i>Chair of TSCOM</i>) | |
| Dr Hans-Werner Schenke (Germany) (<i>Chair of SCUFN</i>) | |
| Ms Lisa Taylor (USA) (<i>Director of IHO-DCDB</i>) | |
- * Members serving a second 5-year term.
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- | 4. Secretary: | |
|----------------------|--|
| Mr David Wyatt (IHB) | |
| (2015) | |

NOTE: Members of the Secretariats of the IHO and IOC are permanent Observers in the Committee.

IHO PUBLICATIONS AND RESOLUTIONS

Publications and Resolutions for which GEBCO is the lead or subject matter expert:

Title	IHO Number	IOC Number	Edition/date
<i>Standardization of undersea feature names</i>	B-6	-	Edition 4.1.0 September 2013
<i>GEBCO guidelines</i>	B-7	-	Under review
<i>Gazetteer</i>	B-8	-	V1.1.1
<i>GEBCO digital atlas</i>	B-9	-	08 Grid March 2015
<i>The history of GEBCO</i>	B10	-	April 2003
<i>GEBCO Cookbook</i>	B-11	Manuals and Guides 63	11 January 2016

Resolution3/1929 as amended (*Centralization of oceanic soundings*);
 Resolution3/1932 as amended (*Collecting oceanic soundings*);
 Resolution4/1932 as amended (*Metadata for oceanic soundings*);
 Resolution2/1962 as amended (*Oceanographic observations*); and
 Resolution8/1962 as amended (*Oceanographic information*).

AREAS WHERE ENC SOUNDING DATA HAVE BEEN PROVIDED TO GEBCO

