



TSCOM report to GC 2017

Preliminary report
16-17 November 2017

Hosted by the Hydrographic Society of Korea (HSK)
Supported by the Korea Hydrographic and Oceanographic Agency (KHOA)
Busan, Korea

Venue

TSCOM met jointly with SCRUM November 13-14, 2017,
in the Sicily Room, Paradise Hotel, Busan

We gratefully acknowledge the HSK and KHOA for:

- Excellent logistical support
- Fine venue
- Superb hospitality provided by our hosts

Reports of Activities

- TSCOM tabled reports on:
 - GEBCO_2014 grid
 - EMODNet
 - Crowd-Sourced Bathymetry
 - IHO DCDB
 - Outreach
 - GEBCO Symposium
- IHO-IOC GEBCO Cook Book updated
- Reports on Seabed 2030 and regional mapping activities were taken under SCRUM
- See reports for the details

TSCOM Actions

- Contributed input to Seabed 2030 Roadmap
- Provided scientific and technical support for Seabed 2030 Roadmap
- Work Plan 2018-2019
- Interim amendment of IHO Resolutions
 - Final amended version pending guidelines from CSB WG and Seabed 2030

TSCOM Membership

Committee Members

Jenifer Austin – Google Earth, USA

Vicki Ferrini – LDEO, USA

John Hall – Geological Survey of Israel

Timothy Kearns – OneOcean Corporation, USA

Karen Marks – NOAA, USA (Chair)

Marzia Rovere – Istituto di Scienze Marine, Consiglio Nazionale delle Ricerche, Italy

Thierry Schmitt – SHOM, France (Vice Chair)

Walter Smith – NOAA, USA

Shin Tani – Hydrographic and Oceanographic, Coast Guard, Japan

Pauline Weatherall – British Oceanographic Data Center, UK

Scientific Advisors

Paul Elmore, NRL, USA

Tony Pharosah, IHO, Monaco

Martin Jakobsson, Stockholm University, Sweden

David Sandwell, Scripps Institution of Oceanography, USA

TSCOM Leadership and Growth

- Thierry Schmitt appointed Vice Chair in Aug. 2016
- Karen Marks appointed Chair at 2013 GEBCO GC Meeting
- ToRs & RoPs- Chair terms are 3 years
- TSCOM has 10 committee members and 4 scientific advisors
- 3 people asked to become new TSCOM members
 - Eunmi Chang, Mark Zimmermann, Caitlyn Raines
- Chairs seek to add new members and retire inactive ones

TSCOM Work Plan updates

- Task J- “Support Seabed 2030” added
- Add “CSB Guidelines B-12” to Task E- Maintain IHO bathymetric publications
- Replace Task I- Instructor-led “short course on compiling and gridding bathymetric data” with “Instructive chapters in IHO-IOC GEBCO Cook Book related to Seabed 2030 as needed”

TSCOM Work Plan and Budget

1.1. IHO-IOC GEBCO Technical Sub-Committee on Ocean Mapping (TSCOM) Work Plan 2018-2019

1.1 TSCOM Tasks

- B Ensure conduct of TSCOM meeting in 2018 (IHO Task 3.6.1)
- C Ensure effective operation of IHO DCDB (IHO Task 3.6.2)
- D Encourage the contribution of bathymetric data to the IHO DCDB (IHO Task 3.6.3), identify priority areas for regional mapping and promote data contribution through GEBCO participation in RHCs meetings
- E Maintain IHO bathymetric publications (IHO Task 3.6.6) including: B-4, B-9, B-10 and B-11
- F Develop the on-line function of B-4 (Information concerning recent bathymetric data) (IHO Task 3.6.6)
- G Contribute to outreach and education about ocean mapping (IHO Task 3.6.7) by development of outreach and educational materials and printing of IHO-IOC GEBCO World Map
- H Ensuring IHO-IOC GEBCO Web site is kept current and updated regularly (IHO Task 3.6.8)
- I Develop short course and course material on compiling digital bathymetric models (DBMs) to be included in GEBCO from a heterogeneous bathymetric source database (IHO Task 3.6.9)

Task	Work item	Priority H-high M-medium L-low	Milestones	Start Date	End Date	Status P-planned O-ongoing C-completed	Contact Person(s) * indicates leader	Related Pubs/Standard	Funding Bid (€)	GGC Decision
B	Ensure conduct of TSCOM meeting	H		2018	2018	P	Chair TSCOM			
C	Ensure effective operation of IHO DCDB	H		Continuous		O	Director DCDB			
D1	Encourage the contribution of bathymetric data to the IHO DCDB	H		Continuous		O	All members of GEBCO GC through the Chair			

TSCOM Work Plan and Budget

Task	Work item	Priority H-high M-medium L-low	Milestones	Start Date	End Date	Status P-planned O-ongoing C-completed	Contact Person(s) * indicates leader	Related Pubs/Standard	Funding Bid (€)	GGC Decision
D3	Promote data contribution through GEBCO participation in RHCs meetings	H		Continuous		O	All members of GEBCO GC through the Chair		See SCRUM WP	
E	Maintain IHO bathymetric publications	M H M L M H		Continuous		O	All members of GEBCO GC through the Chair	B-4 - Information concerning recent bathymetric data B-7 - GEBCO guidelines B-9 - GEBCO digital atlas B-10 - The history of GEBCO B-11 - GEBCO Cookbook B-12 - CSB Guidelines	See SCRUM WP	
F	Develop the on-line function of B-4	M		Continuous		O	Director DCDB			
G3	Printing of IHO-IOC GEBCO World Map	M		2015	2018		Chair TSCOM + Chair SCRUM	B-9 - GEBCO digital atlas	2,000	
H	Ensuring IHO-IOC GEBCO Web site is kept current and updated regularly	M	Add news items relating to GEBCO's activities Add documents relating to GEBCO's meetings and events	Continuous Continuous		O O	BODC		5,000	

TSCOM Work Plan and Budget

Task	Work item	Priority H-high M-medium L-low	Milestones	Start Date	End Date	Status P-planned O-ongoing C-completed	Contact Person(s) * indicates leader	Related Pubs/Standard	Funding Bid (€)	GGC Decision
I	Develop short course and course material on compiling digital bathymetric models (DBMs) to be included in GEBCO from a heterogeneous bathymetric source database Add instructive chapters in IHO-IOC GEBCO Cook Book related to Seabed 2030 as needed	M	Discuss at 2017 TSCOM/SCRUM meeting (leader for course development needed)	2018	2030	O	Chair TSCOM			
J	Support Seabed 2030	H	Provide scientific expertise and outreach	2018	2030	P	Chairs TSCOM, SCRUM, Outreach, SCUFN			

1.2 TSCOM Meetings (IHO Task 3.6.1 refers)

Date	Location	Activity
1-4 October 2012	IHB, Monaco	XXVIII th Meeting
7&9 October 2013	Venice, Italy	XXIX th Meeting
11-13 December 2014	Mountain View, California, USA	XXX th Meeting
5-7 October 2015	Kuala Lumpur, Malaysia	XXXI th Meeting
10-12 October 2016	Viña del Mar, Chile	XXXII th Meeting
13-14 November 2017	Busan, Korea	XXXIV th Meeting

Interim Amendment of IHO Resolutions

Updated:
Language
Data Formats
Data Protocols

Pending:
CSB and Seabed
2030 guidelines

IHO Resolutions

The following IHO Resolutions cover topics and issues, in total or part, for which the GEBCO Guiding Committee (GGC) and its subordinate bodies are subject matter experts. It is therefore appropriate for the GGC to task the relevant subordinate body/bodies to review the Resolutions and propose changes and amendments as necessary for GGC34.

In the first instance it is considered this process will be led as indicated below:

3/1929 as amended (*Centralization of oceanic soundings*) - TSCOM;
3/1932 as amended (*Collecting oceanic soundings*) - TSCOM;
4/1932 as amended (*Metadata for oceanic soundings*) - TSCOM/SCRUM;
2/1962 as amended (*Oceanographic observations*) - SCRUM/TSCOM; and
8/1962 as amended (*Oceanographic information*) - SCRUM/TSCOM.

CENTRALIZATION OF OCEANIC SOUNDINGS	3/1929 as amended	85/2008	A5.3
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1 Full details of the information required to accompany data, and the criteria for its quality control, are contained in the GEBCO Guidelines (IHO Publication B-7).

2 Data Storage and exchange of data.

- a) Member States are requested to remind institutions and organizations within their own country of the desirability of collecting bathymetric data, whenever possible, in the course of oceanographic missions.
- b) It is recommended that Member States inform the **IHO Secretariat** of any details concerning recent bathymetric data collected by themselves or by other national institutions and organizations, about which they may have been notified. The standard format below should be used for this purpose:
 - i) Country of origin;
 - ii) Institution or authority responsible for the mission;
 - iii) Name of vessel which carried out the soundings;
 - iv) Date (month and year);
 - v) Location (general sea area or significant points along track); and
 - vi) Terms under which data may be obtained (address for requests, method of ordering, price, or whether free on a mutual data exchange basis, etc.).

The **IHO Secretariat** will issue an annual CL requesting such information.

3 All bathymetric data collected should be forwarded by HOs to the IHO Data Centre for Digital Bathymetry (DCDB) via File Transfer Protocol (FTP), email, or mail (CD, DVD, and hard drive) in the formats below. Other formats will be considered on a case-by-case basis. The IHO DCDB should be notified of digital data that have been found to be in error; if possible, a corrected version should be submitted as well.

- **Raw sonar data:** MGD77T or the original manufacturer's format
- **Processed data:** BAG, NetCDF, tiff, xyz, sd, asc, etc.
- **Metadata:** XML or text

Interim Amendment of IHO Resolutions

4 Information concerning Recent Bathymetric Data IHO Publication B-4

At the beginning of each calendar year, the **IHO Secretariat** shall make available an updated version of the online publication B-4 showing all bathymetric data received during the preceding year. These data will be available for download from the IHO DCDB **in the formats provided and listed above**.

COLLECTING OCEANIC SOUNDINGS	3/1932 as amended	85/2008	A5.1
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- 1 It is strongly recommended that Hydrographic Offices include in their programmes regular and systematic surveys of ocean areas beyond the continental shelves.
- 2 It is recommended that when Hydrographic Offices plan oceanic surveys they attach sufficient importance to obtaining data which will be useful not only for navigation purposes but also for promoting knowledge of the morphology of the sea floor **and filling gaps in global ocean survey coverage**.
- 3 It is recommended that Hydrographic Offices interested in the same oceanic areas arrive at an understanding among themselves regarding a suitable division of their zones of activity and priorities.
- 4 It is recommended that, as concerns oceanic soundings, Hydrographic Offices work in close cooperation with the oceanographic bodies of their respective countries and use a standard procedure for recording data.
- 5 It is recommended that ships fitted with MBES or SBES be requested to collect bathymetric soundings and communicate the results of such soundings to the Hydrographic Offices of their respective countries with all information required to enable their accuracy to be estimated. The use of sound velocity calibration in accordance with the guidance set out in the IHO Manual on Hydrography (C-13) is recommended.
- 6 It is recommended that newly-discovered topographic undersea features should be properly mapped and named following the "Standardization of Undersea Feature Names" IHO-IOC Publication B-6.

METADATA FOR OCEANIC SOUNDINGS	4/1932 as amended	85/2008	A5.2
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It is resolved that oceanic soundings, together with the metadata and potential additional supplementary information, shall be collected and **exchanged in digital form**.
Metadata should comprise at least information on:

- a) the survey in general as e.g. date, area, equipment used, name of survey platform;
- b) the geodetic reference system used, i.e. horizontal and vertical datum; including ties to WGS 84 if a local datum is used;
- c) calibration procedures and results;
- d) sound velocity;
- e) positioning information e.g. GPS, RT-DGPS, GLONASS, GALILEO;
- f) tidal datum and reduction (if applicable); and
- g) accuracies achieved and the respective confidence levels.

Interim Amendment of IHO Resolutions

OCEANOGRAPHIC OBSERVATIONS	2/1962 as amended	59/1991	A1.3
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It is recommended that Member States should make every effort to collect and coordinate the collection of all types of oceanographic data, by their hydrographic services and other of their national institutions. The results of all such observations should be communicated to appropriate national and international Oceanographic Data Centres for maximum utilization by all marine scientific and hydrographic users.

OCEANOGRAPHIC INFORMATION	8/1962 as amended	IHC 16	C3.13
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- 1 It is recommended that the introductory part of Sailing Directions includes oceanographic information concerning general currents and a brief account of the main characteristics (temperature, salinity, density) of surface water.
- 2 It is recommended that a reference be made to the relevant oceanographic and tidal atlases, whenever possible.

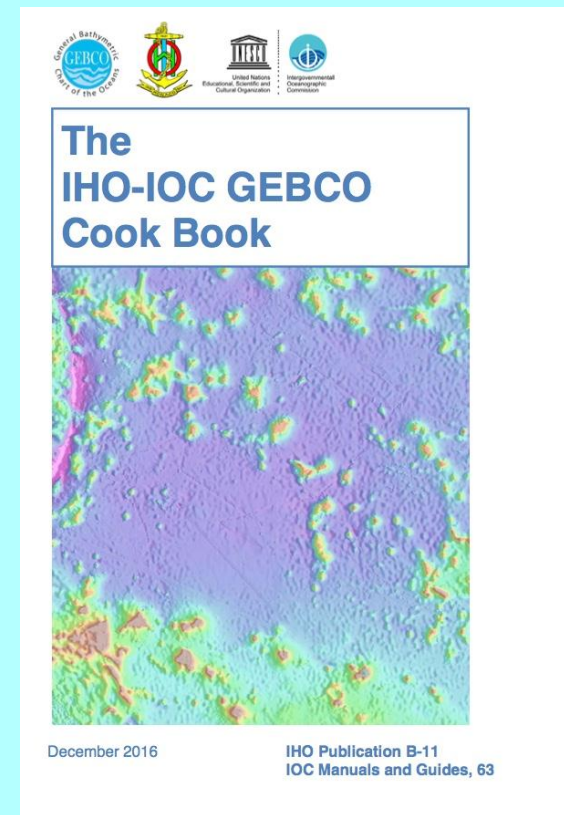
Future GEBCO_2014 Updates

- Updated regional compilations and new bathymetric data continue to improve GEBCO grid
- Release as Seabed 2030 grid planned for late 2018
- GEBCO_2014 estimated depths are based on SRTM30_Plus V5 bathymetry model
- Current SRTM30_Plus V11 is from 2014- copyright still prevents its use in public GEBCO grid
- Outreach to Scripps by GEBCO officials?

New Updates to Cook Book

- **Updates published Dec. 2016**
- New sections added to Chapter 13:
 - Chapter 13.2 – Generation of useful layers and files in a BASE surface to ease data processing with CARIS (Version 9)
 - Chapter 13.3 – Generation of a file in CARIS to distinguish areas with few soundings

Contributor: Lt. Commander Gustavo Adolfo Gomez-Pimpollo Crespo, Instituto Hidrografico de la Marina, Spain



12th Annual GEBCO Symposium



- Sicily Room, Paradise Hotel, Nov. 15, 2017
- Tim Kearns and Jaya Roperez, Conveners
- 25 oral and 10 poster presentations
- Attendees from all over the world

Break-out Support of Seabed 2030

- Led by Ferrini, Marks, Jakobsson
- TSCOM, SCRUM, Outreach WG explored promoting and providing support
- Specific goals and recommendations developed
- Notes to be submitted to Permanent Secretary
- Activity is ongoing

Break-out Goals

- Instructive Cook Book chapter on using public tools to find and investigate gaps
- Set up email/discussion board methods of communicating
- Metadata guidelines pending Seabed 2030 input
 - Is Metadata Working group needed?
 - Can existing published Metadata guidelines (e.g., IHO DCDB, CSB B-12, others) be refined for Seabed 2030?

Nautical Chart Adequacy Workshop



- Workshop developed and hosted by NOAA Coast Survey and UNH/CCOM
- Trained hydrographers and cartographers on procedures to assess adequacy of nautical charts using public information
- **Used Chapter 11 “Nautical Chart Adequacy Procedure” of Cook Book**

Shachak Pe’eri and Rochelle Wigley, UNH/CCOM



Workshop- July 2017

Keynote presentation gives overview of GEBCO



NOAA's Open House on Nautical Cartography

NOAA's Office of Coast Survey is pleased to announce its first one-day open house in conjunction with the International Cartographic Conference (held in Washington, D.C. at Marriott Wardman Park). The one-day event will focus on nautical cartography, highlighting the field of charting and GIS. It will offer nautical cartography-themed posters, presentations, tours, and exhibits. Participants include industry partners, government agencies, and charting offices from around the world. This event is open to the public.

	
<h3>Overview and GEBCO Mapping Projects</h3> <p>Karen Marks¹ and Rochelle Wigley²</p> <p>¹NOAA Laboratory for Satellite Altimetry</p> <p>²Center for Coastal and Ocean Mapping/Joint Hydrographic Center, Univ. of New Hampshire</p> <p>7 July 2017 Keynote at NOAA's Open House on Nautical Cartography</p>	<h3>GEBCO and Ongoing Nippon Foundation Support and a New Partnership</h3> <p>Rochelle Wigley</p> <p>Center for Coastal and Ocean Mapping, University of New Hampshire Project Director: GEBCO / Nippon Foundation projects rochelle@ccom.unh.edu</p>

END OF PRESENTATION