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IOC-IHO/GEBCO XXXII Guiding Committee

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**INTERNATIONAL HYDROGRAPHIC
ORGANIZATION**



**United Nations
Educational, Scientific and
Cultural Organization**



**Intergovernmental
Oceanographic
Commission**

General Bathymetric Chart of the Oceans (GEBCO)

Thirty Second Meeting of the GEBCO Guiding Committee

The Royale Chulan Hotel

5 Jalan Conlay

Kuala Lumpur

Wilayah Persekutuan 50450

Malaysia

October 8 – 9, 2015

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Opening remarks

The Chair of GEBCO, VADM Shin Tani, welcomed the attendees to the 32nd GEBCO Guiding Committee (GGC) meeting. Tani thanked the Royal Malaysian Navy and the Malaysian National Hydrographic Center for hosting the Guiding Committee meeting as well as the TSCOM, SCRUM, CSBWG and the GEBCO Bathymetric Science Day. All attendees introduced themselves. Tani said that the main goal of this meeting is to discuss what GEBCO will emphasize for the next ten years.

Mustafa Iptes, Director of the International Hydrographic Bureau, welcomed the attendees and complemented GEBCO for its expert efforts to compile the definite global bathymetric database and publishing world-class global bathymetric maps. He complimented also the effort to update and revise the Guiding Committee TORs and ROPs. There was good cooperation between IHO, IOC and the GGC. However, he did note that there was some communication problems between the IHO Secretariat and the Chair of the GGC. He welcomed the new members of the GGC. To be discussed at this meeting, he said that the IHO would assume the sole sponsorship of GEBCO if IOC determines that this is the best course of action. He also noted that all of the GEBCO funds now reside at the IHB and that they will act as the GEBCO treasurer. He announced that the Forum for Future Ocean Floor Mapping F-FOFM would take place in Monaco in June 2016. He stressed that GEBCO participation in the IHO Regional Hydrographic Commission meetings is very important.

Julian Barbière, the Representative of the Intergovernmental Oceanographic Commission, welcomed all attendees and thanked the local organizer for hosting the meeting. He noted that IOC's capacity building currently is a key element in its focus on the oceans health. IOC regrets that its financial support to GEBCO has been lacking in recent years, a product of dwindling national contributions to UNESCO. In spite of that, he felt that GEBCO and IOC can work together in many areas, including tsunami and ecosystems. The IOC review of GEBCO will result in identifying areas where GEBCO can complement IOC programs. The review will be presented to the Executive Committee in June 2016 and should help pointing a way forward for IOC and GEBCO.

Meeting Administration

It was determined that there was a quorum for the meeting. Tani announced that this is the first meeting of the GGC under the newly approved Terms of Reference and Rules of Procedure. He reminded the GEBCO member who are attending the GGC as observers that they can only speak when recognized. The GGC members who sent their apologies were Marzia Rovere (she attended the second day), Chrétien Ngouanet, Nataliya Turko, and Peush Pawsey. The agenda was approved but Tani reserved the right to move topics around on the schedule as needed. See Annex 1.

Approval of GGC XXXI report

Clark introduced the report from the 31st GGC meeting. Tani asked for comments. The report was approved.

IHO report

http://www.gebco.net/about_us/meetings_and_minutes/gebco_gc_meeting_2015.html

On behalf of IHB, David Wyatt, congratulated and welcomed the new members of the Guiding Committee. It is believed that their active contribution will be of great benefit to GEBCO and ocean mapping community. IHO now has a new structure. The changes include a new approval process for potential member states, changes in governing structure and, most importantly for GEBCO, changing the programme cycle from five years to three. There have been three new members joined to the IHO, Brunei Darussalam, Georgia and Vietnam. There are now 85 members of IHO. The IHO GIS Data Base continues its positive progress. The GIS database has two main parts: a country database and a regional database. In addition, the project to scan historical GEBCO charts is progressing well. World Hydrography Day 2016 will have the theme “Hydrography, the key to well managed seas.” The International Hydrographic Review has a review board made up of representatives from each RHC and GEBCO is invited to submit articles to the IH Review.

The IHO Capacity Building program remains limited but Wyatt encourages all GEBCO members to support it. He acknowledges the very successful the NF-GEBCO Training Program at UNH. He suggested that the RHC and the commercial sector can contribute. He noted that there were training courses at the UK Hydrographic Office in Taunton and Busan, Republic of Korea. IHO is looking for new funds for capacity building.

Wyatt reviewed other IHO topics briefly. The B 7 IHO publication “GEBCO Guidelines” needs revision but has not progressed. The GGC has been considering this revision since 2012. He noted that the revised GEBCO Guiding Committee Terms of Reference/Rules of Procedure were presented and endorsed by the 28th session of the IOC Assembly in Paris in June 2015; they were subsequently circulated to IHO Member States for approval under IHO Circular Letter 49/2015 dated 9 July 2015. The IHO Member States endorsed the new ToRs and RoPs on 10 September 2015. He acknowledged the receipt of GEBCO funds from Stockholm University and the establishment of four GEBCO funds at IHB. The GGC is expected to continue to exercise its long-standing role of deciding on how funds will be spent, in conformance with the GGC developed spending rules for each fund, its established procedures and work programme.

This year, the IRCC has established the Crowd-Sourced Bathymetry Working Group (CSBWG) to provide guidelines on the collection and use of crowd-sourced bathymetry. (See CSBWG report in this report). IHO considers this a very important project in the mapping of the global sea floor.

Wyatt asks that the GGC develop ways to engage directly with the CSBWG to bring the ocean mapping expertise and capability into the project as well as collaborate with the outreach aspects of the wider Galway Statement process; and to discuss ways to improve the recognition of GEBCO as “the most authoritative publicly-available bathymetry of the world’s oceans” in particular in relation with other global programs related with Earth observation and monitoring.

IOC report

http://www.gebco.net/about_us/meetings_and_minutes/gebco_gc_meeting_2015.html

Osamu Miyaki presented the IOC report. He reported that his secondment to IOC was extended for an additional two years.

At the 28th Session of IOC Assembly there were two notable items concerning GEBCO. The first was that revised GEBCO Terms of Reference and Rules of Procedure were examined by the Assembly after discussion by a sessional working group and with some Member States and were endorsed by the Assembly and conveyed to the IHO. The second was that an IOC intersessional review group would review the IOC role in GEBCO. The review group would be made up of representatives from IOC programs IODE, GOOS, JCOMM, GLOSS, TOWS/WG and Regional Subsidiary Bodies IOCAFRICA, IOCARIBE, and WESTPAC. Also, interested Member States can nominate a representative. He noted that IOC is unable to provide any funding to GEBCO, but the seafloor bathymetry from GEBCO is very important to the IOC programs. He stated that the joint governance of GEBCO by IOC and IHO may need to be redefined. (*NB: see other section of this report regarding the IOC GEBCO review*) IOC has asked for nominations, including a representative from GEBCO. Other notable outcomes from the Assembly were: the 2nd International Indian Ocean Expedition (IIOE-2) will be launched December 2015; the IOC Capacity Building Strategy (2015-2021) was adopted; and, the draft IOC budget was adopted but did not include any funding for Ocean Mapping.

Miyaki then reviewed areas within IOC that could directly benefit from the GEBCO project. These included supporting as decision support tool for marine spatial planning including the SPINCAM and Caribbean Marine Atlas Phase 2 projects; and the Transboundary Waters Assessment Programme (GEF TWAP)-Large Marine Ecosystem (LME) program. Taylor noted that it seems that IOC is more a stakeholder than a directing body. Barbière agreed and said the IOC is really both a directing body and a stakeholder, but that we shouldn't jump to conclusions; it could be the other way.

Tani recounted the history of the timeline and process for the approval of the revised TOR-ROP. One of the big changes in the revision was the process for establishment of GEBCO subcommittees. In the past, the SCRUM took two years+ to be approved. Iptes said that the revised TOR-ROP will be important in the running of GEBCO in the future. He noted that even though it took a long time, there was considerable support for the revision. Tani said that the revision is good but he is still concerned about the subcommittee establishment process. Barbière understood the concerns, but said compromises have to be made, especially when the establishment of subordinate body is needed intersessionally. Wyatt clarified the wording in the revised TOR-ROP that it gives the GGC the ability to establish a subcommittee without getting approval. Then eventually the IOC and IHO will give its concurrence when they meet annually.

One item in the new TOR-ROP that still needs to be clarified is the status of Observers at the GGC meeting. Observers do have something to contribute. Tani agreed but in the past, Observers sometimes dragged out discussions that adversely impacted the GGC agenda. Jakobsson said that Observers are good, and noted we are all volunteers and all want to map the ocean.

IHO DCDB report

http://www.gebco.net/about_us/meetings_and_minutes/gebco_gc_meeting_2015.html

Lisa Taylor presented an update on the IHO Data Center for Digital Bathymetry with three areas of emphasis: the DCDB Infrastructure and Interface Enhancement Project; the initiation of the IHO Crowdsourced Bathymetry Pilot Project and the need for maintenance and enhancement of the GEBCO Undersea Feature Names Gazetteer. The DCDB enhancement project is being funded by the NOAA's Office of Coast Survey. The IHO Crowdsourced Bathymetry pilot project involves the DCDB, IHO, the Professional Yachting Association and SEA-ID. The ingest system is currently being tested using data streams from the Association of Arctic Expedition Cruise Operators and Sea-ID.

The GEBCO Data Store was also discussed. The Data Store project would develop a one-stop-shop for current and potential GEBCO Grid source data as well as regional grids used in the GEBCO Grid compilation. The Data Store effort is currently on hold due to lack of funding. Due to US government regulations, the DCDB cannot use GEBCO funding to continue the development. In lieu of the Data Store, GEBCO data contributions can be sent to the DCDB where it will be flagged as a GEBCO contribution.

Taylor outlined future activities of the DCDB, including enhancing discovery and download functionalities leveraging other development efforts to accelerate progress, adding crowdsourced bathymetry data streams and an interactive map layer for discovery and expanding crowdsourced bathymetry partnerships.

Digital Atlas Manager Report

http://www.gebco.net/about_us/meetings_and_minutes/gebco_gc_meeting_2015.html

Pauline Weatherall summarized the activities of the GEBCO Digital Manager activities at BODC. In December 2014, GEBCO released the GEBCO_2014 Grid. She noted that the royalties from selling the GEBCO Grid was sent to GEBCO for its operating fund and in 2014 amounted to 2867 GBP. In addition, there was a new web application deployed for delivering GEBCO's grids that used new download formats: ESRI, ASCII raster and Geotiff in addition to netCDFn. Also in 2015, the GEBCO Web Map Services was updated to use GEBCO_2014 Grid, to include SID grid layer and to allow plotting centered on 0° or 180° longitude. Since the launch of GEBCO_2014 in December 2014 there have been 8,303 downloads of the Grid. Jakobsson was very impressed with the number of downloads. Weatherall noted that the GEBCO Facebook page is going strong and 34 news items were posted this year with over 700 "likes". Future activities include updating the bathymetric contour data set derived from GEBCO_2014.

Discussion resulted in a number of actions: 1. Place GEBCO world map with SCUFN names on GEBCO web site (Weatherall) 2. Report to the GGC the number of accesses to the GEBCO Gazetteer (Taylor) 3. Post a link to the new Arctic and Antarctic maps on the GEBCO web page. (Weatherall).

SCUFN report

http://www.gebco.net/about_us/meetings_and_minutes/gebco_gc_meeting_2015.html

Hans-Werner Schenke gave an update on the activities of SCUFN. The 27th Meeting of SCUFN took place from June 16-20, 2014 at IHB in Monaco. Schenke reminded all that from the TOR-ROP: “Members who are absent from meetings over two consecutive years will normally be considered to have resigned and new nominations shall be sought from the relevant parent organization.” There were three SCUFN members who were absent at SCUFN 23. However, the circumstances for Felipe Barrios, Chile, are exceptional (he is finishing his graduate degree). Also Lisa Taylor has stepped down from SCUFN, so a new Vice Chair will need to be appointed. So SCUFN will begin the process for selecting a replacement.

Summary from the SCUFN 27: 63 undersea feature name proposals were considered/discussed; 47 new proposals were discussed and finally accepted; 32 undersea feature names from NZGB were checked and are pending; 14 proposals are pending; two proposals were not accepted.

Schenke commented that in order for SCUFN to do a good job on the proposals; they need to be submitted six weeks prior to the meeting. This way they can be considered intersessionally. Other SCUFN activities in 2014 included publishing IHO-IOC Publication B-6 and was published in several languages; there is a working group to finalize the generic terms and images web page; and, implementation of the gazetteer of feature names on-line. The Korean delegation did a demonstration of the on-line gazetteer. B6 is now like the GEBCO Cookbook, it is a living document with periodic updates. Lastly, SCUFN has made some significant contacts last year with liaisons with ACUF US Board on Geographical Names and the UN Group of Experts on Geographical Names.

Schenke said that there is a need to streamline the review of the proposal process. He recommended that possibly the proposed undersea feature names should be submitted directly to the GGC. David Wyatt suggested that SCUFN should change their TOR to reflect this. This was accepted by the GGC. Action: Section 2.11 of the SCUFN TOR-ROP should be deleted (Tani). Tani suggested this could be done on-line. Schenke hoped that this change will result in a smaller number of proposals. Wyatt and Schenke agreed that all member states need more awareness of the process. Rovere asked if name proposal could be submitted by any agency. Schenke clarified that any agency can submit outside of territorial waters, but in territorial waters it needs to be submitted through national hydrographic office.

The 28th GEBCO/SCUFN Meeting will be held in Niteroi, Brazil hosted by the DHN (Directoria de Hidrografia e Navegacao).

The SCUFN members, the GGC and all GEBCO members offered Michel Huet, the former Secretary of the SCUFN, best wishes for his retirement and thanked him for meritorious service in making SCUFN a highly efficient and successful organization. All welcomed the new SCUFN Secretary Yves Guillam from the IHO Secretariat.

TSCOM Report

http://www.gebco.net/about_us/meetings_and_minutes/gebco_gc_meeting_2015.html

Karen Marks gave an update on the GEBCO TSCOM. She noted that the TSCOM does not have a Vice Chair. The subcommittee will select a vice chair soon. Marks recommended that all GEBCO members who are involved in TSCOM activities be listed on the web site in addition to the members. This helps encourage agency participation.

Discussion on the GEBCO_2014 grid release. Recommendations for updating the grid include seeking bathymetric contributions from member states; move from 30 arc second grid spacing to 15 arc second; and, seek to use the current version of the SRTM15_Plus without copyright restrictions. Questions on how and who should approach Scripps for release of the SRTM15. Falconer said that it needs to be the right technical person plus the GGC Chair because it will need to be considered at the Chancellor level at Scripps. Action: Request Scripps Oceanographic Institution to release SRTM15 to GEBCO for incorporation into the GEBCO Grid (Jakobsson, Tani). All complimented TSCOM on the publication of the GEBCO_2014 paper in the AGU's Earth and Space Science on-line journal. The paper was publicized on GEBCO Facebook and blog. Clark noted that the publication fee was paid for by GEBCO.

The 2015 Bathymetric Science day was held on October 5, 2015 at the Kuala Lumpur Convention Center. There was 15 oral and 34 poster presentations. There was approximately 180 attendees. In 2014, the SCRUM and TSCOM help their annual meeting at Google Headquarters in Mountain View, California, USA. The 2014 Bathymetric Science day was held as a scientific session at the American Geophysical Union's Fall annual meeting following the meeting at Google. She noted that Paul Elmore who has been organizing the Science Day for the last several GEBCO meetings will be stepping down from leading and organizing it. Therefore, a new lead organizer is needed. All in attendance gave Paul kudos for his excellent efforts.

Other TSCOM activities in 2015 included the updating and promoting of the GEBCO Cook book that was started in 2009 and published in 2012; and organizing Nautical Chart Adequacy Workshop at NOAA Headquarters in July 2015. The current class of the Nippon Foundation Scholars at UNH attended the workshop. Marks then briefly summarized the TSCOM/SCRUM breakout sessions held earlier. The Outreach and Education Working group discussed outreach for High School and College students and has begun developing a Master plan for subpages on GEBCO website. Breakout on Grid Uncertainties discussed how to determine uncertainties and their application to GEBCO grid.

SCRUM Report

http://www.gebco.net/about_us/meetings_and_minutes/gebco_gc_meeting_2015.html

Martin Jakobsson noted the overlap with the SCRUM. He stated the goal of GEBCO as "To produce the most authoritative coherent portrayal of the seafloor, from the coast to the deepest parts of the oceans." He said that to address this goal; the SCRUM needs to overlap with TSCOM. Jakobsson reviewed the GEBCO International Bathymetric Charting projects (formerly the IOC IBCs). He noted that the IBC Arctic Ocean 3.0 is completed and is incorporated into GEBCO_2014 and the map has been printed. An update is in progress. The

IBC of the Southern Ocean, Version 1.0 has been completed and is in GEBCO_2014. The regional map of the eastern Pacific (around Japan) has been incorporated in GEBCO_2014. He also briefly described the new compilation in Baltic, which is in GEBCO_14. EMODnet compilation in the Mediterranean and the Atlantic are included in GEBCO_14. The data compilation in the Indian Ocean is progressing and involves many Nippon Foundation Scholars from UNH. Jakobsson also noted that some IBC are dormant now and that we should prioritize which ones to jump-start. Also needed is to move these projects from making a paper chart to doing a digital gridded data compilation. He briefly listed the New SCRUM initiatives and engagements: North Atlantic, IBCAO-Greenland, IBCAO-Svalbard, ARDEM (New Western Arctic and North Pacific Digital Elevation Model), and swIOBC (Southwest IOBC). He announced the GEBCO: Arctic-Antarctic seafloor mapping meeting to be held in Monaco prior to the Nippon Foundation – GEBCO Forum for Future Ocean Floor Mapping, June 2016.

There was a brief discussion on updating the GEBCO Grid (it is on-going). Jakobsson asked are there areas for cooperation? As noted earlier, the IOC IBC do not exist anymore. Wyatt suggested that we change the name to GEBCO IBCs. Tani cautioned that the IOC countries like the IBCs because they are complementary to their national programs. He suggested that we just change the name, not the actual way they operate and are organized. Schenke said some IBCs exist and are very active. Barbière agreed and that this should just be a name change to reflect the change from IOC to GEBCO coordinating body. Action: SCRUM to contact each IBC and RHC project to inform them that IOC is no longer the formal sponsor of the IBCs. Action: Transition IBC web pages to BODC for update and maintenance (Weatherall and Taylor). Barbière described the SPINCAM project the Southeast Pacific data and information network in support to integrated coastal area management. It is funded by the Flemish Government of the Kingdom of Belgium and started in 2008, and entered its second phase in 2012. <http://www.spincamnet.net/> Tani noted the IIOE2 for Indian Ocean. SCRUM needs to contact the participants since the data compilation project cannot progress without resolution of the boundaries.

Outreach and Education Working Group (OEWG) report

http://www.gebco.net/about_us/meetings_and_minutes/gebco_gc_meeting_2015.html

Hyo Sung outlined the GEBCO Outreach Road map. In 2013 an Outreach master plan was developed. In 2014 the Outreach working groups began setting priorities. An attempt was made to develop a prototype, which was a student-targeted web page. A storyboard was made and a “web cartoon” developed. From this Icosahedron, maps were produced. Sung summarized the results from the Outreach breakout. One thing the OEWG needs are more working group members. Also needed is an overall outreach strategy and ideas for implementation. One difficulty is the need for using different languages. One idea is to use NF Scholars. Also needing resolution is the funding for the OEWG.

Tani said we need a presentation to introduce GEBCO to National Hydrographers. Others asked why do outreach and who are the targets? Rovere noted that when she made her report at the RHC meeting, many hydrographers at the meeting did not know about GEBCO. Jakobsson said the same is true in Sweden. It was suggested that what is needed is a broad scope, not necessarily just Hydrographers. Taylor strongly endorsed looking at broad scale, i.e., look closely at all the stakeholders. The NF Scholars can play an important role. It is important to get input from the public. Barbière noted that IOC members are a group of stakeholders and GEBCO needs to

make them aware. IOC could use their Circular Letters to make them more aware. Also at IOC, meetings there could be organized side events. IOC has a number of networks. Another idea is that the World Ocean Council would be a good partner for GEBCO.

Mustafa Iptes asked what the target is. First priority is to define the targets. For IHO, this would be the National Hydrographers. He suggested that perhaps a team is needed to do this specific effort. Some suggestions were to develop a GEBCO “sticker”, make small globes, make a GEBCO exhibit for meetings and conferences, improved the web site, and make more GEBCO videos. Clark noted that there is a budget for Outreach (10K Euro/year). All agreed that implementation is the difficult part of the effort. Taylor said it was important to acknowledge the group who is trying make this work. GEBCO needs to engage people. She suggested to use the IHO Crowdsourced Bathymetry project for outreach. We need to pique people’s imagination. GEBCO needs to engage the younger generation beyond just the NF Scholars. Marks strongly recommended using the web and social media. Marks referenced the new GEBCO grid release paper, and maybe a new EOS article should be considered. Graham Allen complimented the OEWG efforts and made two recommendations to further the effort. First is to make a good marketing plan. Second is to acknowledge the stakeholders and articulate their needs.

The question was asked, who drafts the implementation plan? Jakobsson said that we need to see the strategy plan first. Schenke said that we need to look for the gaps. Ferrini said a video project is being done for the NF Scholars so other video projects can be done. Weatherall said that we need content for the GEBCO web site. It was noted that GEBCO needs to engage the commercial sector more. They don’t know who GEBCO is. One idea is to establish a users group.

Tani summarized the discussion. We need to answer: What is GEBCO? What products from GEBCO are needed? Who needs these products? Who are the users? And why are they needed or our project (GEBCO) is just a hobby? There are lots of data creators who don’t interface with GEBCO, but are really stakeholders. Need better link to data creators and users. Many hydrographers don’t know GEBCO. Some say why do they need GEBCO since we have Google maps. Suggestion to use Google for outreach. He needs some recommendations from the OEWG. Wants OEWG to think about a variety of projects, not just one. Schools kids are secondary for GEBCO since outreach to them is a matter of limited resources.

Falconer asked what do we want to do? Taylor said GEBCO needs an overarching strategy. Allen said we need an implementation plan. Action: Tani asks the OEWG to report back to the GGC with implementation plan, with outreach opportunities via IOC, and with budget and items. Prime target is the professional stakeholders who use bathymetry. We need more OEWG volunteers.

Scanning and Archiving the Five GEBCO Chart Editions

http://www.gebco.net/about_us/meetings_and_minutes/gebco_gc_meeting_2015.html

Tony Pharaoh described the IHO project to scan IHB archive of historical GEBCO ocean charts. Each of the five editions of the GEBCO are in the process of being scanned. Iptes noted that this project was funded from IHB funds. In the 1st edition of the GEBCO Maps, Sheet A1 is missing

and IHB is trying to find a copy. 2nd edition is completed. 3rd edition is not complete and some of the sheets are missing. Scanning of the 4th edition is progressing; some of the sheets apparently are in the possession of French Institut Géographique National (IGN). The 5th edition scanning is completed. Polar sheets are too large to be scanned. GEBCO members are urged to look at the web site with the digital versions. <http://www.iho-wms.net/gebco>

Crowd Source Bathymetry Working Group report

http://www.gebco.net/about_us/meetings_and_minutes/gebco_gc_meeting_2015.html

Lisa Taylor gave an update on the activities of the IHO Crowdsourced Bathymetry Working Group. She noted that most of the attendees to the GGC had seen this information earlier in the week. The vision for the CSBWG is “The floor of our oceans and seas revealed” and the mission is to “Empower mariners to map the gaps.” NOAA’s Office of Coast Survey is funding a multi-year project to enhance the DCDB infrastructure to accommodate crowdsourced bathymetry data. There is a pilot project with the Professional Yachting Association, IHO DCDB and Sea-ID. Also data are being collected using trackline data from the Association of Arctic Expedition Cruise Operators. A pilot project was also carried out in Malaysian waters by the National Hydrographic Centre of the Royal Malaysian Navy. Taylor outlined the next steps of the CSB project: hold intersessional virtual meetings to progress the IHO CSB policy document; expand CSB pilot projects; continue to ingest CSB pilot project data into IHO DCDB; and, enhance the DCDB infrastructure and interface to accommodate CSB data.

Taylor encouraged GEBCO members to engage with the CSB project. GEBCO members can participate as observers and subject matter experts. Hassan asked if the CSB WG was under IRCC or under GEBCO. Taylor said that it is an IHO project that reports through the IRCC. Tani commented that the CSB WG will benefit GEBCO mostly and that much knowledge that is applicable to the CSB WG resides in TSCOM. Iptes said it is one of the most important issues over the last several years. All agreed that GEBCO should participate in the CSB project. The GGC recognizes the importance of the CSB project.

NF/GEBCO Project

Robin Falconer summarized the Nippon Foundation/GEBCO project. He said it was more than just the UNH training project. He said last year over \$950 K USD was received by GEBCO from the Nippon Foundation. Tani noted that the Nippon Foundation is interested in many aspects of the world oceans.

UNH training program Status

http://www.gebco.net/about_us/meetings_and_minutes/gebco_gc_meeting_2015.html

Rochelle Wigley briefed on the current status of the Nippon Foundation/GEBCO Training Program at the University of New Hampshire. The program was funded at \$540K USD for the current year. There are six new students in the program. They take a full course load for one academic year. In addition to academic work, they develop a human network, and visit various laboratories, which are selected to help them in their future work. At the end of the training year, they get a certificate from UNH. Factors which apply to the selection for the program is that they have a passion for the oceans and have strong support of their home institutions. All have a four-year degree. The Nippon Foundation’s ultimate goal is promoting human capacity

development. The Nippon Foundation is very committed to the program and this is demonstrated by the fact they initially funded the program for five years, but now the program is in its 12th year. The program may be expanded in future years.

Nippon Foundation Ambassador program

Falconer said that this program has yet to get off the ground and so not a lot has been done. There is \$40K USD support for the program this year. The ambassador program would have a GEBCO participant visit organizations to encourage them to support the NF Scholars with positions related to bathymetric mapping. Dave Monahan was initially selected to begin this program; there have been some circumstances which have delayed his participation. Falconer said that the ambassador program will evolve next year to better reflect some of the new GEBCO goals for ocean mapping.

Special Projects funds

Falconer said that the funds are being used for Arctic and Indian Ocean mapping projects.

Management Committee membership

The Management Committee will be restructured it and there will be new members.

Allen remarked that the program appears to be very, very good and produces good results. He asked what the GGC could do to enhance the program. Wigley suggested that more ship time for the Scholars would be extremely beneficial. For the Scholars any practical experience is of great value. She welcomes more ideas. Action: Falconer to send new candidates for membership to the Management Committee to the GGC. Iptes asked if the notice asking for candidates for the training program be issued earlier. Falconer noted that the request for NF funding needs to be requested each year by submitting a comprehensive proposal. The Nippon Foundation fiscal year is April to March. It was noted that the first NF Scholar, Norhizam Hassan, is now a member of the GEBCO Guiding Committee.

Forum for Future Ocean Floor Mapping

Tani announced that the Nippon Foundation-GEBCO Forum for Future Ocean Floor Mapping (F-FOFM) will take place in Principality of Monaco, June 15-17, 2016. The Nippon Foundation wants a forum to begin to address the ocean floor mapping for the next 10 years. The Nippon Foundation will financially support the Forum. There is an organizing team, which is made up of Logistics, Program and Media planning teams. Several professionals have been hired (event and media) to assist the GEBCO members to make up the teams. Also during the week, a NF Scholars' meeting will be held as well as an Arctic-Antarctic Workshop. Jakobsson described the workshop and asked if some funds could be allocated for the Arctic-Antarctic Workshop. All agreed that \$10K Euro of GEBCO could be used to support the Workshop. Iptes noted that it would need close coordination with IHB.

GEBCO 10 year plan

Review of IOC's Role and Involvement in GEBCO

http://www.gebco.net/about_us/meetings_and_minutes/gebco_gc_meeting_2015.html

Julian Barbière described the process and timetable for the review of GEBCO by the IOC. The review will address the role of GEBCO within IOC and make recommendations for the continued support for GEBCO by IOC. The review has members from some of the IOC programs, projects and regional subsidiary bodies plus some National members. In draft timetable to be proposed to the review group, the review group will develop its recommendation by mid – March 2016. GEBCO will have an opportunity to respond to the recommendations.

Falconer commended the review and GEBCO welcomes the opportunity to respond to the findings. He noted that continued joint sponsorship of GEBCO by IOC is critical in engaging IOC Member nations' support of GEBCO. IHO sponsorship compliments IOC's sponsorship. It was noted that IOC does not currently financially support GEBCO but has done so in the past. Financial support by IOC and IHO is cyclical. He strongly supports joint sponsorship. Jakobsson agrees with this position. He noted that IHO sponsorship emphasizes the hydrographic aspects of GEBCO whereas IOC emphasizes the science and other aspects of GEBCO. Rovere said the review is up to the group of member states but she is optimistic that they will find the joint sponsorship is necessary to accomplish GEBCO goals. Schenke said that is was good that this is being discussed and noted participation by AWI is predicated as an IOC activity. He strongly endorsed the joint role. Hassan agreed that GEBCO should maintain a joint operation. Joint sponsorship is complimentary. Some GEBCO GC members did not understand the issue and they asked why are we are even discussing it. They noted that it should be obvious that joint sponsorship is essential. Marks completely agreed. Allen noted that he was nominated by IHO, but has an "ocean" background and his organization, BODC, studies many aspects of the ocean. Taylor said it was important to have members on the GGC from both IOC and IHO to encourage GGC members from the two organizations to work together. As an example, SCUFN has a good mix of expertise to effectively accomplish its tasks.

Tani asked for comments from the observers. All unanimously supported continued joint sponsorship of GEBCO by IOC and IHO. Synergy of efforts and complementary support was often stated as benefits.

Barbière said that the review will look at GEBCO within IOC program structure. Outside of financial support, the linkages will be reviewed. The review is a good way to make the issue known within IOC. Iptes noted that IHB works well with IOC secretariat, but IOC currently has a lack of support for GEBCO. There is respect for IOC process but IHB proposes a single sponsor and has stated this by issuing a Circular Letter stating as such to its Member States. IHB is ready to assume single sponsorship of GEBCO. Tani reviewed some history of IOC's involvement in GEBCO. GEBCO 5th Edition map was produced after IOC joined GEBCO and it was very good. Tani has a concern that IOC members might not participate GEBCO if IOC is no longer a joint sponsor and maybe he could not continue as Chair of GEBCO. This is a very important point. Schenke noted that the IBCs were a product of the IOC and were (and in some cases like IBSCO still are) very successful.

Therefore, the GEBCO Guiding Committee unanimously agreed on the following statement regarding the proposed realignment of the IHO-IOC joint sponsorship of the GEBCO Project.

“The GEBCO Guiding Committee is unanimous in agreement that the role of GEBCO is best served by retaining the current structure of GEBCO being a subsidiary body of both IOC and IHO.”

Discussion whether there could be an IHO Circular Letter with this statement in it. Iptes said that this not possible. Barbière said the best way to voice this statement by the GGC is to have it incorporated into the IOC review. GEBCO needs to nominate a representative to the IOC GEBCO review.

Taylor asked when we would have a 10 year plan. Who is doing it? Falconer noted that there were several groups who were working on it and made several reports. Clark asked what is the 10 year vision of GEBCO? What do we want the goal to state? Jakobsson suggested that it could be “To produce the most authoritative coherent portrayal of the seafloor, from the coast to the deepest parts of the oceans.” He suggested that a short implementation plan be developed. Tani asked what can we do now? Action: develop a draft strategic plan by end of the year. Allen asked how can we draft a strategic plan without setting a 10 year goal. Tani asked everyone to think about a 10 year goal for GEBCO.

IHO RHC meetings participation

David Wyatt said that GEBCO needs to be an active participant in the RHC meetings and it was important to get on the agenda of the meeting. The RHCs need to know the value of GEBCO. Rovere strongly supported this. From her experience, it would be good to have a standard GEBCO presentation which could be shared when a GEBCO member attends an RHC meeting. Weatherall says that these presentations can be put on the GEBCO web site. Action: Prepare a standard GEBCO presentation.

Role of GEBCO in GEOSS

It was noted that IHB and IOC attend the GEO meetings. All agreed that GEBCO should participate. This topic was tabled.

Role of GEBCO in international programs, e.g., ICSU WDS, IODE, etc.

This topic should be discussed within Outreach and Education Working Group. Pharaoh said he attended the IODE meeting. The Partnership for Observation of the Global Oceans, POGO, chair, talked about GEBCO at the meeting. Wyatt suggested GEBCO becoming involved with the International Research Ship Association. They think that should be giving us data. Barbière noted that the POGO meeting will be held at JAMSTEC in January 2016. Action: Tani - Attend the POGO at JAMSTEC in January 2016. It was noted that IODE would have a representative on the review of GEBCO by IOC.

GEBCO Financial Report

http://www.gebco.net/about_us/meetings_and_minutes/gebco_gc_meeting_2015.html

David Clark presented the current GEBCO financial report. He said that the GEBCO Operations

and Nippon Foundation Special Projects accounts were transferred from Stockholm University to International Hydrographic Bureau June 2015. In September 2015, GEBCO established new account at IHB for support of the Forum for Future of the Ocean Floor Mapping. It currently has 59,199.23 € in the account. The Nippon Foundation renewed grant for the Training Program at University of New Hampshire for 2015-2016 in the amount of \$604,301USD. There are currently four GEBCO accounts at IHB (IHB identifies them as “Funds”): the GEBCO Operations Fund IHB # 15402000 in the amount of 5,530.88 €; the GEBCO -Nippon Foundation FOF Conference Support Fund IHB # TBA in the amount of 59,199.23 €; Nippon Foundation Special Projects Fund IHB # 15403000 in the amount of 53,389.82 €; and the GEBCO Fund IHB # 15401000 in the amount of 82,544.77 €.

GEBCO IHO Work plan 2016

David Clark briefly reviewed the current GEBCO work plans. Support for the GEBCO Gazetteer was discussed. It was noted that NGDC cannot accept support from IHO or IOC for this task. One option could be funding IHB to contract for software engineering to support this. Discussion on the revision of IHO B7 “GEBCO Guidelines” publication. Wyatt said that the GEBCO Cookbook and others supersedes it. It was recommended that it be withdrawn. Action: Ask IRCC to withdraw B7.

GEBCO 2016 Budget

http://www.gebco.net/about_us/meetings_and_minutes/gebco_gc_meeting_2015.html

David Clark reviewed the GEBCO budget process. The GEBCO budget is, in part, tied to the GEBCO IHO Work Programme and its related budget. He noted that the NF-GEBCO Training Program at UNH are not factored into the GEBCO budget process. There are currently three yearly income streams: GDA data sales (amount varies, approximately 5,000GBP/year), IHB (8,200 Euro/year, and Monaco Principality (8,300 Euro/year). On occasion, Nippon Foundation provides one-time funding, e.g., Special Projects fund. The four accounts (funds) at IHB complicate developing an annual budget. Action: Clark to develop a GEBCO 2016 budget by October 30, 2016. Clark urged the GEBCO Subcommittees and Working Groups to submit budget requests for projects. Jakobsson proposed that 10K Euro be allocated from GEBCO Operations fund to support the Arctic-Antarctic workshop to be held in Monaco, 12-13 June 2016. This was approved by the GGC

GEBCO organizational issues

David Clark briefly reviewed the GEBCO travel guidelines. Wyatt will revise the travel guidelines to make them compatible with IHO travel guidelines.

Tani discussed the GEBCO Guiding Committee membership. There are two vacancies for IOC appointment. The GGC should formally notify IOC of the vacancies. Falconer pointed out that IOC would like some consultation with the GEBCO chair about the vacancies.

GEBCO Secretary Position. David Clark will step down as the GEBCO Secretary since he has finished his 5 year term. David Wyatt from IHB will assume the GEBCO Secretary position. Clark handed out a list of secretary duties as compiled by him. All thanked Clark for his service.

Dates and Places of Next Meetings

The Hydrographic and Oceanographic Service of the Chilean Navy (SHOA) offered to host the XXXIII GEBCO Guiding Committee at the Hydrographic and Oceanographic Service of the

Chilean Navy in Valparaíso, Chile. The dates offered were 26 to 30 September 2016 or 10 to 14 October 2016. It was decided that the 10 to 14 October 2016 was the best date for the GGC members.

Action item review

The actions from the meeting were reviewed. See Annex 2

Chair's closing remarks

Shin Tani thanked all participants for an interesting and productive meeting. He was encouraged by everyone's enthusiasm and hoped it carries over into the next year. He also thanked the Malaysian Navy and the National Hydrographic Center for their gracious hosting of the meeting. He wished all safe travel to their homes.

Attendees:

GEBCO Guiding Committee Members

IOC

Robin Falconer (Past Chairman)
Martin Jakobsson (Vice-Chair, Chair SCRUM)
Marzia Rovere

IHO

Shin Tani (Chairman)
Hyo Hyun Sung
Graham Allen
Norhizam Hassan

Karen Marks (Chair TSCOM)
Hans-Werner Schenke (Chair SCUFN)
Lisa Taylor (Director, IHO Data Center for Digital Bathymetry)

David Clark (Secretary/Treasurer)

Other Invited Attendees

Julian Barbière
Mustafa Ipteş
Osamu Miyaki
Tony Pharaoh
Pauline Weatherall
Rochelle Wigley
David Wyatt

Annex 1

Agenda

Version 2.6; 23Sept15

1. Opening remarks
 - GEBCO - Tani
 - IHO - Iptes
 - IOC - Barbière
2. Meeting administration - Tani/Clark
3. Approval of GGC XXXI report
4. IHO report - Iptes/Wyatt
5. IOC report – Miyaki
6. Revised GEBCO Guiding Committee ToRs and RoPs - Tani
7. IHO DCDB report - Taylor
8. Digital Atlas Manager report - Weatherall
9. SCUFN report - Schenke
10. TSCOM report - Marks
11. SCRUM Report – Jakobsson
 - Status of IOC IBCs
12. Education and Outreach Working Group report - Sung/Weatherall
 - Development of GEBCO Education and Outreach strategy
13. Crowd Source Bathymetry Working Group report – Taylor
 - Malaysian prototype project - Wigley
14. NF/GEBCO Project
 - Management report - Falconer
 - UNH training program Status – Wigley
 - Nippon Foundation Ambassador program
 - Special Projects funds – Falconer
 - Management Committee membership
15. Future of the Ocean Floor Forum – Tani
 - Arctic – Antarctic Workshop - Jakobsson
16. GEBCO 10 year plan – Tani
 - IOC Review of GEBCO
 - IHO RHC meetings participation
 - Role of GEBCO in GEOSS
 - Role of GEBCO in international programs, e.g., ICSU WDS, IODE, etc.
17. GEBCO Financial Report – Clark
 - GEBCO Operations Spending plan
18. GEBCO IHO Work plan 2016 – Clark
19. GEBCO 2016 Budget – Clark
 - Raising support for GEBCO operations
20. GEBCO organizational issues – Tani
 - GEBCO Travel Regulations - Clark
21. Guiding Committee membership - Tani

- GEBCO Secretary Position
22. New/Other business - Tani
23. Dates and Places of Next Meetings
- 2016 GEBCO Meetings – Valparaiso, Chile
24. Action item review (New and previous, see attachment) - Clark
Chairman closing remarks - Tani

Annex 2

GEBCO Guiding Committee Meeting (GGC-32)

Actions

24-Jan-16

Number	Action	Name*	Due Date	Status
GGC32-01	Place GEBCO world map with SCUFN names on GEBCO web site			Completed
GGC32-02	Make a selection of GEBCO representative to the IOC review	Tani		Completed
GGC32-03	Report to the GGC the number of accesses to the GEBCO Gazetteer.	Taylor		In progress
GGC32-04	Post a link to the new Arctic and Antarctic maps on the GEBCO web page.	Weatherall		Completed
GGC32-05	Post a link to the new Arctic and Antarctic databases on the GEBCO web page.	Weatherall		Completed
GGC32-06	Delete item 2.11 in the SCUFN Terms of Reference	Tani		
GGC32-07	Request Scripps Oceanographic Institution to release SRTM15 to GEBCO for incorporation into the GEBCO Grid.	Jakobsson, Tani		
GGC32-08	Contact each IBC and RHC project to inform them that IOC is no longer the formal sponsor of the IBCs	SCRUM		
GGC32-09	Transition IBC web pages to BODC for update and maintenance	Taylor, Weatherall		In progress
GGC32-10	Appoint a Vice-Chair for the TSCOM	Marks		In progress
GGC32-11	Draft a resolution from the GGC stating that the GGC strongly recommends continued joint sponsorship of the GEBCO project by IOC and IHO.	Tani, Falconer, Jakobsson		In progress
GGC32-12	Prepare a “standard” GEBCO presentation for general use by all GEBCO members.			
GGC32-13	Develop an Outreach implementation plan including budget items and milestones.	Outreach WG	31 Oct 2015	In progress

GGC32-14	Write a thank you letter to Paul Elmore and also a letter of recognition to Paul's supervisor for his organizing of the GEBCO Science Day			
GGC32-15	Attend the POGO at JAMSTEC in January 2016	Tani		
GGC32-16	Notify IOC that there are two vacancies in the GGC	Tani		
GGC32-17	Send revision (approval clause) for the GEBCO Fund Spending Rules to IHB	Clark		
GGC32-18	Send the approved GEBCO Operations Fund Spending Rules to IHB.	Clark		
GGC32-19	Draft the strategy and implementation plan for the 10 year vision of GEBCO			
GGC32-20	Determine if IHB travel guidelines/rules can apply to GEBCO	Wyatt		In progress
GGC32-21	Send to IRCC that the GGC recommends B-7 be withdrawn	Tani, Clark		
GGC32-22	Draft GEBCO budget and send to GGC for approval	Clark		
GGC32-23	Notify Chile that the proposed date for the 2016 GEBCO meeting (10 to 14 October 2016) was accepted.	Clark		Completed
GGC32-24	Appoint new Science Day convener	Guiding Committee		
GGC32-25	Post formal recognition and thanks to Science Day Convener on GEBCO website	Marks, Weatherall		Completed
	From GGC31			
GGC31-03	Write letter to NGDC complementing the exceptional work done developing the digital gazetteer	Tani, Schenke		
GGC31-05	Draft up certificates for NF Scholars at UNH for review.	Wigley		
GGC31-13	Send out request for proposals to the NF Special Project fund.	Falconer, Clark		
GGC31-21	Report on the feasibility to implement a monetary donation capability on the GEBCO web pages	Wyatt, Weatherall		
	From GGC30			
GGC30-02	Develop ideas for funding for GEBCO operations.	Tani, Jakobsson, Marks, Schenke		
	From GGC29			
GGC29-10	Explore link from ESRI to GEBCO web site	Weatherall		

* First names have the lead

Annex 3

Acronyms

AGU	American Geophysical Union
AWI	Alfred Wegener Institute
BODC	British Oceanographic Data Centre
BSBD	The Baltic Sea Bathymetry Database
CCOM	Centre for Coastal and Ocean Mapping
CGOM	Consultative Group on Ocean Mapping
CSBWG	Crowd Source Bathymetry Working Group.
DCDB	Data Center for Digital Bathymetry
DHN	Direccion de Hidrografia y Navegacion
EIHC	Extraordinary International Hydrographic Conference
EMODnet	European Marine Observation and Data Network
ENC	Electronic Navigational Chart
F-FOFM	Forum for Future of the Ocean Floor Mapping.
FGDC	Federal Geographic Data Committee
GA	Geoscience Australia
GEO	Group on Earth Observations
GEOSS	Global Earth Observation System of Systems
GGC	GEBCO Guiding Committee
GIS	Geographical information system
IBC	International Bathymetric Chart
IBCAO	International Bathymetric Chart of the Arctic Ocean
IBCCA	International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico
IBCM	International Bathymetric Chart of the Mediterranean
IBCSO	International Bathymetric Chart of the Southern Oceans
IHB	International Hydrographic Bureau
IHO	International Hydrographic Organization
IIOE-2	50th Anniversary of the International Indian Ocean Expedition (IIOE)
IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission
IOBC	Indian Ocean Bathymetric Compilation.
IODE	International Oceanographic Data and Information Exchange
IRCC	Interregional Coordination Committee
LDEO	Lamont-Doherty Earth Observatory
NF	Nippon Foundation
NGDC	National Geophysical Data Center, Boulder (USA)
NOAA	National Oceanographic and Atmospheric Administration
NOC	National Oceanographic Center, (UK)
NOCS	National Oceanography Centre - Southampton
NRL	Naval Research Laboratory (USA)
OEWG	Outreach and Education Working Group

PMEL	Pacific Marine Environmental Laboratory
PRC	People's Republic of China
RHC	Regional Hydrographic Commission
RM	Regional Mapping
SCRUM	Interim Sub-Committee for Regional Undersea Mapping (GEBCO)
SCUFN	Sub-Committee on Undersea Feature Names (GEBCO)
SU	Stockholm University
ToR/RoP	Terms of Reference/ Rules of Procedure
TSCOM	Technical Sub-Committee on Ocean Mapping (GEBCO)
UN-GGIM	United Nations initiative on Global Geospatial Information Management
UNH	University of New Hampshire
WG	Working group