



IHB File No. S1/5015 & S3/2513

CIRCULAR LETTER 34/2016
21 July 2016

RECENT DEVELOPMENTS RELATED TO THE IHO-IOC GEBCO PROJECT

References:

- A. IHO CL 63/2015 dated 27 August - *Review by the Intergovernmental Oceanographic Commission on its Role and Involvement in the GEBCO Project*;
- B. IHO CL 11/2016 dated 01 March - *Request for Shallow Water Bathymetric Data*.
- C. GEBCO Letter dated 21 April 2016 - *Invitation to attend the XXXIII GEBCO Guiding Committee (GGC), Joint Technical Sub-Committee on Regional Undersea Mapping (SCRUM), Technical Sub-Committee on Ocean Mapping (TSCOM) and the GEBCO Bathymetric Science Day Meetings - Valparaiso, Chile, 10-14 October 2016*

Dear Hydrographer,

1. This Circular Letter draws the attention of IHO Member States to recent developments related to the GEBCO (General Bathymetric Chart of the Oceans) Project that is conducted under the joint governance of the IHO and the Intergovernmental Oceanographic Organization (IOC) of UNESCO.

IOC Review of the role and involvement of IOC in the GEBCO Project

2. Through Reference A, the Directing Committee informed IHO Member States that the 28th Session of the IOC Assembly, which met in June 2015, had decided to establish a Review Group to consider the role and involvement of IOC in the GEBCO Project. The Review Group comprised representatives of IOC Member States and one expert each from the GEBCO Guiding Committee, and relevant IOC technical and regional subsidiary bodies. It was chaired by Dr Alexander Postnov (Russian Federation), Vice-Chair of the IOC.

3. The Review Group delivered its report of the “IOC Role in Support of the General Bathymetric Chart of the Oceans (GEBCO) Project, State of Progress in the Associated Review” to the 49th Session of the Executive Council of the IOC which met in Paris, France from 7 to 10 June.

4. The Review Group reported that the majority of the IOC technical and regional subsidiary bodies were interested in the GEBCO products and found them useful for their relevant activities. In view of these conclusions, the Review Group recommended that IOC should continue its involvement in the GEBCO project and collect and integrate the IOC user requirements to GEBCO products, on a regular basis. The Executive Council expressed the concern that the level of active involvement by the IOC in the GEBCO project has diminished and noted that the project relies mainly on support from the IHO. The representative of the Directing Committee intervened in the discussion and stated the IHO position as articulated in Reference A.

5. The Executive Council of the IOC then decided:

- to enhance the IOC’s involvement in the GEBCO project;
- to establish an IOC Working Group on user requirements and contributions to GEBCO products tasked to collect, integrate and assess the user requirements to GEBCO products; and

- to address ways of potential contributions to GEBCO data and products.

Further details are available in Part 3 of the IOC Executive Council Draft Summary Report, provided in Enclosure 1. The final report will be posted on the IOC website when available.

GEBCO Forum for Future Ocean Floor Mapping

6. A Forum for Future Ocean Floor Mapping organized by the GEBCO Guiding Committee (GGC), under the joint auspices of the IHO and the IOC and supported by the Nippon Foundation of Japan was held in Monaco from 15 to 17 June.

7. The GEBCO Forum opened at the Musée océanographique in Monaco with approximately 200 delegates from a wide community of participants, including hydrographers, oceanographers, cartographers, and representatives from industry, science and academia. Seven IHO Member States were represented by their national Hydrographers and senior representatives from a number of other IHO Member States' Hydrographic Offices were also present. The Forum was honoured by the presence of His Serene Highness Prince Albert II of Monaco, who opened the Forum and inaugurated the associated GEBCO and Nippon Foundation poster displays. During his address Mr Yohei Sasakawa (Chairman of the Nippon Foundation) challenged the delegates to complete mapping the ocean floor by 2030. Opening addresses were delivered by President Ward and Dr Thorkild Aarup, representing the Executive Secretary of the IOC. These addresses were followed by thought-provoking presentations by Dr Robert Ballard, Dr Larry Mayer, Mr David Heydon, Mrs Kristina Gjerde, Ms Jyotike Virmani and Mr Bjorn Valving. Mr Simon Winchester, notable author and raconteur, closed the first day with his observations on the history and significance of the oceans to mankind.

8. The second day of the Forum consisted of four panel sessions which addressed:

- the use of bathymetry: the deep ocean perspective,
- the use of bathymetry: the coastal perspective,
- new tools and techniques in ocean mapping, and
- mapping the world ocean floor.

These panel sessions generated active participation with all aspects of the four themes being explored through wide-ranging comments and discussions. These sessions led into a third day consisting of four focus group sessions, which explored the issues raised on the second day and discussions on how to take the key items forward to develop a roadmap for the next 10-15 years of GEBCO activity and to provide input to the Forum communiqué.

9. Contracting a professional public relations (PR) company by the organizers, ensured that the lead into the Forum and the Forum itself received good media coverage, see Enclosure 2 for full details. This included such reporting as the BBC News Science and Environment article at Enclosure 3. A full Forum communiqué was issued a week after the event which is provided in Enclosure 4. Further articles will be generated as progress and events occur, including a GEBCO Seafloor 2030 vision supported by the Nippon Foundation. The Forum and post-Forum activity will be discussed at the next meetings of the GEBCO Guiding Committee and two associated Sub-Committees – the Technical Sub-Committee on Ocean Mapping (TSCOM) and the Sub-Committee on Regional Undersea Mapping (SCRUM) – to which representatives of all IHO Member States are welcome to attend (see Reference C).

10. Future GEBCO related meeting dates of note are:

- SCUFN meeting, 19-23 September 2016, in Boulder, Colorado, USA;
- TSCOM and SCRUM meetings, 10-11 October 2016 in Viña del Mar, Chile;
- GEBCO Science Day, 12 October 2016 in Viña del Mar, Chile;
- GEBCO Guiding Committee meeting, 13-14 October 2016 in Viña del Mar, Chile;
- 29th session of the IOC Assembly at UNESCO Headquarters in Paris, France preceded by a one-day session of the Executive Council (50th session), dates to be decided between 19 and 30 June 2017.

Full details of all GEBCO meetings, including the Forum, are available from the IHO website (www.iho.int > Committees & WG > IRCC > GEBCO).

Polar Mapping Workshop

11. The GEBCO Forum was preceded by a Polar Mapping Workshop held in the IHO Headquarters on 12 and 13 June. Around 40 ocean mappers, scientists, cartographers and hydrographic surveyors gathered to discuss ways to progress new editions of the International Bathymetric Chart of the Southern Ocean (IBCSO) and the International Bathymetric Chart of the Arctic (IBCA). The Chairs of the Arctic Regional Hydrographic Commission (ARHC), Mr Denis Hains, Hydrographer-General of Canada, and the Hydrographic Commission on Antarctica (HCA), President Robert Ward, gave presentations on the current state of charting and the problems caused due to the lack of bathymetric data for the regions.

Nippon Scholars' Workshop

12. The polar mapping workshop was followed by a day of briefings for graduates of the Nippon Foundation Ocean Mapping course at the University of New Hampshire, USA. Approximately 45 alumni students were welcomed to the IHB by President Robert Ward, before receiving briefings on the Forum and their role in it. Mr Yohei Sasakawa joined the alumni for part of their meeting.

Conclusion

13. The developments described above all highlight the continuing relevance of ocean mapping activities for the IHO as a whole, as well as for Regional Hydrographic Commissions and national Hydrographic Offices (HOs). HOs are invited in particular to consider attending GEBCO meetings, nominating suitable candidates when vacancies occur in GEBCO organs and providing input, through their national IOC representation as appropriate, to the new IOC Working Group on GEBCO. They are encouraged also to contribute actively to the GEBCO Project by promoting in general the provision of bathymetric data or metadata to the IHO Data Centre for Digital Bathymetry and by making shallow water bathymetry available in particular (see Reference B).

On behalf of the Directing Committee

Yours sincerely,



Mustafa IPTES
Director

Enclosures:

1. IOC Executive Council Draft Summary Report Part 3.
2. Forum PR report (*in English only*).
3. BBC News Science and Environment article (*in English only*).
4. Forum communiqué (*in English only*).

Restricted distribution



IOC/EC-XLIX/3 Pt.3
Paris, 6 July 2016
Original: English

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of UNESCO)

Forty-ninth Session of the Executive Council
Paris, 7-10 June 2016

SUMMARY REPORT

Part 3

(Agenda items 4.3.3, 4.4, 5–8)

4. STRATEGIC DEVELOPMENTS

4.3 FOLLOW-UP TO THE UN PARIS CLIMATE CHANGE CONFERENCE, 2015 AND OTHER UN OCEAN-RELATED PROCESSES

4.3.3 IOC Contribution to a new International Instrument under UNCLOS on Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdictions

1. Mr Ariel Troisi (Argentina), IOC Vice-chair, introduced this item. He reported on the recent developments related to the negotiations of a new legally-binding instrument to conserve and sustainably use marine biodiversity in areas beyond national jurisdiction (the High Seas and the Area) under the UN Convention on the Law of the Sea (UNCLOS).

2. The new instrument currently under negotiation will address environmental impact assessments and area-based management tools, including the establishment of marine protected areas. It will also provide a governance mechanism that regulates access to and benefit sharing derived from marine genetic resources. Capacity development and transfer of marine technology are also being considered to serve all its future Parties including developing countries.

3. The Vice-chair reported on the outcome of the first meeting of the Preparatory Committee (PrepCom) that met in New York (28 March-8 April 2016). Many items currently under discussion in the PrepCom touch on several areas of IOC's competency, particularly the use of the best available scientific information as the basis for management decisions and conservation policies, the application of IOC Criteria and Guidelines for the Transfer of Marine Technology as a guiding principle as well as the potential contribution of the Ocean Biogeographic Information System as an effective global platform for the sharing of research data and information. He further pointed out those key assets through which the Commission could provide support to the Member States in preparing for and contributing to the discussions underway: capacity development strategy, IODE/OBIS, IOC Criteria and Guidelines on Transfer of Marine Technology, best practices on Marine Spatial Planning, and IOC as international cooperation mechanism in marine scientific research.

4. The Executive Council commended the work of the Secretariat and the clear message and the presentation provided by the Vice Chair Mr Ariel Troisi.

5. GEBCO highlighted the sparsity of bathymetric data in areas beyond national jurisdiction and requested to be involved when biogeographic data needed to be combined with bathymetry.

6. At the initiative of France, Germany and U.K., the Council discussed the modalities for establishing an intersessional working group on the IOC relevant issues related to the United Nations Preparatory Committee, as well as its Terms of Reference. There was strong consensus for the importance of IOC involvement in the process, including high-level representation at PrepCom meetings. The Council advised that the intersessional working group would examine the possible contribution (not vision) of IOC in the process, and would provide a mechanism for Member States to support the participation of the IOC representative in the PrepCom. The working group is open to all Member States, chaired by an IOC officer and is tasked to present a report to the 29th session of the IOC Assembly.

7. The representatives of 13 Member States and one observer took the floor. The following Member States chose to provide records of their plenary intervention on this agenda item for the informational annex to the meeting report: Argentina, Canada, Chile, China, the Philippines, South-Africa and GEBCO.

8. The Executive Council adopted Decision EC-XLIX/4.3.3 below.

**Conservation and sustainable use of marine biological diversity
of Areas Beyond National Jurisdiction (ABNJ)**

The Executive Council,

Recalling Resolution 69/292 adopted by the United Nations General Assembly on 19 June 2015,

Having considered document IOC/INF-1338 on IOC potential contribution to a new international instrument under the United Nations Convention on the Law of the Sea (UNCLOS) on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction and the document IOC/EC-XLIX/2 Annex 9 Rev. on the contribution to the future of the IOC: Executive roadmap,

Takes note of and welcomes the active role of the Commission in the United Nations Preparatory Committee established by UNGA Resolution 69/292, particularly in areas related to marine scientific research, capacity development and transfer of marine technology, as well as to data and information management;

Invites IOC Member States to support the role of the Commission and its possible contributions in the meetings of the Preparatory Committee (PrepCom) by integrating, as far as possible, these elements into their preparation and statements;

Decides to establish an intersessional working group on the IOC relevant issues related to the United Nations Preparatory Committee established by UN General Assembly Resolution 69/292, with terms of reference provided in Annex 1;

Calls upon IOC Member States to actively participate and fully support this intersessional working group in its assigned tasks;

Requests the IOC Executive Secretary to co-ordinate the work of the intersessional working group to be undertaken by correspondence and facilitate the work of the intersessional working group as defined in its terms of reference;

Requests the IOC Executive Secretary, or the IOC Chair, or a designated IOC Officer to represent the IOC in the sessions of the Preparatory Committee on behalf of the IOC.

Annex to EC-XLIX, Dec.4.3.3

**Terms of Reference of the Intersessional Working Group on the IOC relevant
issues related to the United Nations Preparatory Committee**

Purpose

The Working Group shall examine the possible contribution of the IOC in relation to the United Nations Preparatory Committee on the conservation and sustainable use of biological diversity in areas beyond national jurisdiction (BBNJ PrepCom) particularly in areas related to marine scientific research, capacity development and transfer of marine technology, as well as data and information management, with a view to informing the participation of the IOC representative in the BBNJ process.

The Working group shall prepare a report for the 29th Session of the IOC Assembly.

Composition

- (i) An IOC Officer is chairperson;
- (ii) Open to all IOC Member States.

Working arrangements

- (i) The Working Group will conduct the majority of its business by electronic means;
- (ii) The initial electronic exchange should be before the second session of the BBNJ PrepCom and a progress report will be circulated by the chair to Member States periodically.

4.4 IOC ROLE IN SUPPORT OF THE GENERAL BATHYMETRIC CHART OF THE OCEANS (GEBCO) PROJECT, STATE OF PROGRESS IN THE ASSOCIATED REVIEW

9. The chair of the review group with regard to IOC's roles and involvement in the GEBCO project, Dr Alexander Postnov (Russian Federation), Vice-chair, introduced this item. He presented the objectives of the group and informed the Executive Council of the results of the review process conducted during the intersessional period. As per Decision IOC-XXVIII, 6.2(II), the group had been requested to:

- (i) Generally, consider IOC's role and involvement in the GEBCO project, and specifically identify the user needs in bathymetry from the relevant IOC programmes and regional subsidiary bodies in relation to the GEBCO bathymetric dataset and products;
- (ii) Consider IOC's role and involvement in the GEBCO project, based upon needs identified under (i) above;
- (iii) Recommend key elements for future governing mechanism of the GEBCO project in relation to IOC's role and involvement.

10. In accordance with its terms of reference, the review group was comprised of representatives of IOC Member States (IOC Circular Letter, 2589) and one expert each from the GEBCO Guiding Committee, and relevant IOC technical and regional subsidiary bodies (namely, GOOS, GLOSS, JCOMM, IODE, TOWS-WG, IOCAFRICA, IOCARIBE and WESTPAC).

11. The Review Group received 16 answers to the questionnaire survey carried out to collect inputs concerning potential and existing user needs for GEBCO datasets and products. The review group evaluated the results of the survey in IOC/EC-XLIX/2 Annex 8 and Addendum, focusing on the relevance of the existing GEBCO products to relevant IOC activities, user's needs for GEBCO datasets and products, relevant capacity development needs, and possible cooperation among GEBCO and IOC technical and regional subsidiary bodies.

12. The Review Group concluded that the majority of the IOC technical and regional subsidiary bodies were interested in the GEBCO products and found them useful for their relevant activities. In this light, the Review Group recommended that IOC should continue its involvement in the GEBCO project and collect and integrate the IOC user requirements to GEBCO products, on a regular basis.

13. The Executive Council stressed the significance of IOC's enhanced involvement in the GEBCO project, which produces bathymetric data and products indispensable to activities promoted by IOC and its Member States. The Executive Council further stressed the importance of contributions made by IOC and Member States to GEBCO activities.

14. The Executive Council expressed the concern that the level of active involvement by IOC in the GEBCO project has diminished and noted that the project relies mainly on support from IHO. The Executive Council appreciated the need to reinforce IOC's support. The Executive Council also emphasized the need to increase visibility of the GEBCO project

within IOC such as through creating IOC's web page dedicated to the GEBCO project with a link to the GEBCO website. The statement of the IHO Director is included in Annex ____).

15. The representatives of 15 Member States and three organizations took the floor. The following Member States and organizations chose to provide records of their plenary intervention on this agenda item for the informational annex to the meeting report: Canada, China, Japan, Pakistan, Republic of Korea, Turkey, GEBCO, IODE and WMO.

16. The Executive Council adopted Decision EC-XLIX/4.4 below.

**IOC Role in Support of the General Bathymetric Chart of the Oceans (GEBCO)
Project, State of Progress in the Associated Review**

The Executive Council,

Having examined documents IOC/EC-XLIX/2 Annex 8 and Addendum,

Recalling decision IOC-XXVIII/6.2(II) on the review of IOC's role and involvement in the General Bathymetric Chart of the Oceans (GEBCO),

Noting the finding of the Review that GEBCO's "traditional" and "shallow water" products are indispensable to IOC activities,

Further noting the conclusion of the review group with regard to IOC's role and involvement in the GEBCO Project,

Decides to:

- (i) Enhance the IOC involvement in the GEBCO project;
- (ii) Establish a regular working group tasked to collect, integrate and assess the user requirements to GEBCO products; and
- (iii) Address ways of potential contributions to GEBCO data and products;

Encourages Member States to:

- (i) Cooperate to advance basin-scale, campaign mapping and accelerate the delivery of GEBCO objectives and general knowledge of the ocean; and
- (ii) Facilitate GEBCO capacity development including training opportunities;

Requests the Executive Secretary to:

- (i) Convey this decision to the International Hydrographic Organization (IHO) and the GEBCO Guiding Committee;
- (ii) Establish the working group in accordance with the terms of reference of the working group contained in the Annex to this decision, in consultation with IHO and GEBCO Guiding Committee; and
- (iii) Explore the possibility of seeking additional funds to GEBCO, including extrabudgetary sources.

Annex to IOC/EC-XLIX, Dec.4.4

**Terms of Reference of the IOC Working Group on user requirements
and contributions to GEBCO products**

Mandate

The Working Group shall:

- (i) Collect, integrate and assess the user needs and requirements to GEBCO data and products.

- (ii) Facilitate and guide the use of GEBCO datasets and products through the user communities that represent relevant IOC technical and regional subsidiary bodies.
- (iii) Identify potential contributions to GEBCO data and products.

The Working Group shall take into account:

- (i) The goals of the IHO-IOC GEBCO Project;
- (ii) Capacity-development needs in relation to GEBCO products;
- (iii) Possible ways to strengthen cooperation between GEBCO and IOC technical and regional subsidiary bodies and GOOS Regional Alliances;
- (iv) Possible mechanism to identify user needs in GEBCO datasets and products and provide input to GEBCO Guiding Committee.
- (v) Possible contributions of data from Member States to GEBCO.

Modus operandi

The bulk of the Working Group's work will be done by correspondence, co-ordinated by the Executive Secretary IOC.

The Working Group should work, where appropriate, in close cooperation with GEBCO Guiding Committee.

The Working Group will produce a document assessing and summarizing the needs and requirements and potential contributions of the IOC community in bathymetric data and products.

The assessment will be conducted every two years, unless otherwise decided.

The document reporting the assessment is reviewed and finalized by IOC governing bodies and forwarded by the Executive Secretary to the Secretariat of the International Hydrographic Organization and GEBCO Guiding Committee.

Membership

The Working Group shall consist of:

- (i) Experts nominated by chairs of relevant IOC technical and regional subsidiary bodies and GOOS Regional Alliances.
- (ii) Experts nominated by the chair of GEBCO Guiding Committee.
- (iii) Experts nominated by interested IOC Member States.

The Chair shall be elected by the Working Group members.

The representative of the International Hydrographic Organization / other partners and stakeholders may participate in activities of the Working Group on a specific item, if deemed appropriate.

5. THE FUTURE OF THE IOC: PILLARS OF WORK

17. The Chair, Professor Peter M. Haugan, introduced this item.

18. He reminded the Council that the IOC Assembly at its 28th session decided that the inter-sessional work on this subject should continue under the leadership of the IOC Officers with a view of providing a fully developed document with recommendation to the IOC Executive Council at its present session (Decision IOC-XXVIII/4).

19. In response to the decision, at their joint meeting with the IOC Management Team (5-8 January 2016, Gilleleje, Denmark), the Officers gave comprehensive consideration to IOC achievements, present status and long-term objectives. Two documents were produced from the meeting: (i) an IOC roadmap with annexes on messages on IOC and proposal for A

Second International Decade of (Integrated) Ocean Exploration, 2021-2030 (IOC/EC-XLIX/2 Annex 9 Rev.); and (ii) a 'Synthesis of IOC development, work and results: opportunities and coincidences 1960–2015', by Gunnar Kullenberg which complements the Roadmap (IOC/INF-1337).

20. The Chair invited active participation of Member States in the work of the sessional Working Group on the Future of IOC in order to further advance and improve the proposals prepared in the intersessional period and to provide strategic guidance to the Officers and to the Secretariat in their future work on fully developed proposals for the next session of the IOC Assembly in 2017.

21. Professor Haugan presented the main outcomes of the sessional working group on this issue including the main points from the Roadmap that needed further revision. The latter comprised development of a plan for an ocean decade, clarification of the IOC messages with respect to decision-makers, with emphasis on sustained observations and uniqueness of IOC role, the development of a communication strategy and increased interaction with Member States between governing body sessions. He also highlighted the contributions made and decisions taken during the session on the four global frameworks/agreements, "pillars of work" of the Commission (SDGs, SAMOA Pathway, Sendai Framework for DRR, Paris Agreement/UNFCCC) as important elements in the discussion.

22. Finally, he reminded the Council that the request made by the President of the General Conference of UNESCO to provide a contribution to the follow-up to the assessment of the governance of governing bodies of UNESCO by the end 2016 would alone justify that intersessional work should continue and that a mechanism to enable Member States to continuously reflect and exchange on highly strategic subject for the IOC be maintained. In this context, the Chair reported that the meetings of the sessional working group, which he co-chaired with vice-chair Ariel Troisi from Argentina, were attended by 19 Member States and 2 observers. He informed the Executive Council that the working group also considered document IOC/EC-XLIX/2 Annex 10 which explores general governance issues including additional ways of increasing the efficiency and effectiveness of preparing and organising the work of the IOC governing bodies. He emphasized that the sessional working group benefitted from a presentation by the co-chairs from Norway and the Philippines of the open-ended Working Group on the governance of UNESCO, who participated in the first meeting of the working group and clarified the context and scope of this exercise. The ensuing exchange of views was highly constructive and informative, concluding with a consensus on the value of continuing this dialogue with a view of ensuring that the IOC specific role and status within UNESCO is adequately addressed.

23. Eight Member States and one observer took the floor to unanimously congratulate the co-chairs of the sessional working group on the quality of the discussions and the constructive and inclusive approach to this highly important strategic issue. Member States expressed their appreciation of the clarity of the Chair's synthesis presentation, which included a comprehensive overview of the issue of the IOC functional autonomy and was fully consistent with the IOC Statutes and Rules of Procedure. They also praised the contribution of the former Executive Secretary Gunnar Kullenberg in preparing the extremely useful synthesis of IOC's development from 1960 to 2015.

24. The Executive Council considered that the considerable work done in the intersessional period, further enriched by sessional discussions, provides an excellent foundation for developing a full-fledged proposal for the next session of the Assembly, in order to ensure IOC's effectiveness and visibility in addressing the top priorities of the international development agenda. The recent acknowledgement by the G7 of the importance of global ocean observations represents an opportunity to strengthen the role of IOC and its contribution to sustainable development through GOOS. Many speakers highlighted the importance of string outreach and communication for attaining the IOC goals

and objectives. All Member States agreed on the need to continue and further enhance intersessional work to allow collective reflection and commitment, commensurate with the importance of the work to be done.

25. The following Member States and one organization chose to provide records of their plenary intervention on this agenda item for the informational annex to the meeting report: Colombia, Republic of Korea, and WMO.

26. The Executive Council adopted Decision EC-XLIX/5 below.

The Future of IOC: Pillars of work

The Executive Council,

Recalling previous decisions on this subject, and in particular EC-XLVII/Dec.4 (2014) and IOC-XXVIII/Dec.4 (2015),

Having examined document IOC/EC-XLIX/2 Annex 9 Rev.,

Recognizing that the United Nations 2030 Agenda for Sustainable Development, and in particular its Sustainable Development Goal 14 which calls to “conserve and sustainably use the oceans, seas and marine resources for sustainable development”, constitutes an essential point of reference for IOC’s future engagement with its Member States as well as for its programmatic presence at the global, regional and country levels,

Acknowledging the need for the IOC to take a comprehensive look at its objectives, priorities, operations and funding in the context of its Medium-Term Strategy, 2014-2021, to ensure it is able to effectively support its Member States in achieving the commitments towards the Goals for sustainable developments by 2030, as well as the goals and objectives emerging from other internationally agreed frameworks like the Sendai Framework for Disaster Risk Reduction, the SIDS Accelerated Modalities Of Action [S.A.M.O.A.] Pathway and the COP21 Paris Agreement under the United Nations Framework Convention on Climate Change,

Having considered the presentation by the IOC Chair of the work accomplished by the Officers and the Secretariat since the 28th session of the IOC Assembly (18–25 June 2015) and the document IOC/INF-1337,

Noting the consensus reached by IOC Member States that the IOC Governing Bodies should maintain in their agendas an item and mechanism to enable Member States to continuously reflect and exchange ideas on this highly strategic and important subject,

Noting also the input by Member States and the decisions on the four global frameworks/agreements taken by this Executive Council (SDGs, Samoa Pathway, Sendai Framework for DRR, Paris Agreement/UNFCCC),

Expresses its appreciation to Professor Peter M. Haugan and to the IOC Officers for their leadership and guidance to the Secretariat in the intersessional period;

Endorses the course of action proposed in the “Roadmap”, including the Concept note: A Second International Decade of (Integrated) Ocean Exploration, 2021-2030;

Acknowledges the work done by the Officers and the Secretariat in developing the messages to be addressed to specific audiences about the societal benefits of IOC’s mission, programmes and activities as presented in Appendix I to document IOC/EC-XLIX/2 Annex 9 Rev.;

Encourages the Chair, the Officers and the Executive Secretary to finalise these messages taking into account the discussions at this session of the Executive Council, to share them with Member States through a circular letter and to convey these messages widely and in a timely fashion to UNESCO and other United Nations organizations;

Encourages Member States to use these common messages as a reference to assist them in raising the profile of the mandate and work of the IOC and related capabilities in fostering a common national approach in intergovernmental fora;

Further requests the Executive Secretary, in close consultation with the Officers, to explore ways of increasing IOC's strategic and functional visibility using a range of communication tools, and its contribution to the 2030 Sustainable Development Goals consistent with IOC's vision and report back to the IOC Assembly at its 29th session;

Also requests the Executive Secretary to pursue the efforts of clarification of the IOC's special role and status within UNESCO, namely by liaising with UNESCO's Director-General, in order to ensure the appropriate institutional positioning of the Commission within UNESCO, as a substantive intergovernmental body with functional autonomy, including in all UNESCO communication and documents;

Entrusts the Officers of the Commission, in consultation and with the support of IOC Member States, with the mission of further clarifying the special status of IOC within UNESCO in particular in connection with the ongoing process of the open-ended Working Group on governance, procedures, and working methods of UNESCO and dependent funds, programmes and entities, and of exploring, in consultation with the Member States, of means of ensuring to the Commission the required institutional and operational sustainability, including the possibilities offered by Article 10 of the IOC Statutes;

Decides that the inter-sessional work on this subject should continue under the leadership of the IOC Officers engaging participation by Member States at least electronically, if not also by an inter-sessional meeting, with a view of providing a fully developed document with recommendations for adoption by the IOC Assembly at its 29th session in 2017.

6. ADMINISTRATION, FINANCE AND MANAGEMENT

6.1 REPORT BY THE CHAIRPERSON OF THE FINANCIAL COMMITTEE

27. The Chair of the Financial Committee reported to the Executive Council on the results of the Committee's review of the Report on Budget Execution 2014-2015 and outline of 2016-2017 budget and Draft Programme and Budget for 2018-2021, in accordance with Rule of Procedure 8.1(c). He informed the Executive Council that the Financial Committee had several very productive meetings and thanked the Member States that participated in its consensual in-depth discussions in the spirit of constructive collaboration. He then made a detailed presentation of the draft resolution prepared by the Financial Committee for consideration by the Executive Council (Annex ____).

28. The Executive Council expressed its high appreciation to Vice-Chair Ariel Troisi for his extremely efficient and inclusive way of directing the work of the Financial Committee, allowing the Committee to accomplish its major tasks in a short period of time. Member States were in agreement on the importance of continuing to advocate the value of IOC's work in the context the international sustainable development agenda with their representatives to UNESCO governing bodies in order to ensure that the Commission is allocated adequate resources, including in the context of the new approach to budgeting through Structured Financial Dialogue.

29. The representative of one Member State took the floor. The following Member States chose to provide records of their plenary intervention on this agenda item for the informational annex to the meeting report: _____.

30. The Executive Council adopted Resolution EC-XLIX.2 submitted by Argentina, Australia, Belgium, Brazil, Canada, China, Ecuador, France, Germany, India, Japan, Kenya, Korea (Republic of), Norway, Portugal, Russian Federation, Senegal, South Africa, UK, and USA.

Financial Matters of the Commission

The Executive Council,

Having examined documents IOC/EC-XLIX/2 Annex 2, IOC/EC-XLIX/2 Annex 2 Addendum and IOC/EC-XLIX/2 Annex 3,

Confirms that the IOC budget for 2014–2015 has been executed in accordance with the approved Programme and Budget for 2014–2015 (37 C/5, US\$ 507 M Expenditure Plan) and the workplans endorsed by the IOC Executive Council at its 47th Session (IOC/EC-XLVII/2 Annex 3 Rev.) through Resolution EC-XLVII.2;

Recognizes the efforts of the IOC Executive Secretary to maintain programme continuity under the challenging circumstances related to the reduced cash flow experienced by UNESCO for the second biennium and which led to the reduction of the IOC budget from US\$ 12,026,200 in the approved Programme and Budget for 2014–2015 (37 C/5) to US\$ 8,643,600 under the US\$ 507 M expenditure plan for 2014–2015 (or 72% of the 37 C/5 approved);

Expresses its appreciation to the Director-General of UNESCO for the additional allocation of US\$ 500,000 from the Emergency Fund, as approved by the Executive Board of UNESCO at its 196th Session in April 2015, and for the further reinforcement of the IOC budget through reallocation of regular programme resources from other parts of UNESCO's budget in June 2015;

Welcomes the programmatic allocation of these additional resources by the IOC Executive Secretary consistent with the guidance provided by the IOC Assembly at its 28th session in 2015;

Notes that these reinforcements brought the total resources available for regular programme operational budget to \$3,088,921, or 80% of the 37 C/5 approved (fully-funded);

Confirms that the workplans for 2016-2017 as presented in Part II of document IOC/EC-XLIX/2 Annex 2 are fully consistent with Resolution XXVIII-3 of the IOC Assembly;

Expresses its appreciation to the IOC Executive Secretary for the development of a Complementary Additional Programme (CAP) of Extrabudgetary Resources (Proposals for 2016–2017) contained in document IOC/EC-XLIX/2 Annex 2 Addendum;

Requests the IOC Executive Secretary to further develop this document by including proposals in support of IOCINDIO and the implementation of the Draft Communications Advisory Report for the Intergovernmental Oceanographic Commission of UNESCO (2016-2020);

Expresses its thanks to Member States who have already contributed to the CAP, and;

Urges all Member States to provide voluntary contributions for the financing of the CAP, preferably to the IOC Special Account;

Approves the budgetary appropriations for 2016-2017 under the IOC Special Account as contained in Annex 1 to this Resolution, in accordance with Article 4.1 of the Financial Regulations applicable to the Intergovernmental Oceanographic Commission;

Authorizes the IOC Executive Secretary to transfer funds up to the maximum of 15% of the total approved allocation, when necessary, between the appropriation lines of the IOC Special Account and to report on all such transfers to the IOC Governing Bodies, in accordance with Article 4.3 of the Financial Regulations;

Expresses its appreciation to the IOC Executive Secretary for the useful and pertinent analysis of programme outcomes presented in the IOC Strategic Results Report in order to allow Member States to review and reassess the programmatic objectives, including possible reorientation, reinforcement or termination;

Endorses the approach to the preparation of the Draft Programme and Budget for 2018–2021 as proposed in document IOC/EC-XLIX/2 Annex 3, as consistent with the priorities set in Resolution XXVIII-3 of the IOC Assembly, the high level objectives defined in the IOC Medium-Term Strategy, 2014–2021, and the consensus emerging from the 'Future of IOC' documents and discussions;

Adopts the following wording of the IOC Expected Result for 2018-2021: 'Science-informed policies for reduced vulnerability to ocean hazards, for the global conservation and sustainable use of oceans, seas and marine resources, and increased resilience and adaptation to climate change, developed and implemented by Member States, towards the realization of Agenda 2030'.

Invites the Director-General of UNESCO to:

- (i) consider further reinforcement of IOC in the current biennium to enable the Commission to address current and emerging priorities, including those related to the implementation of the 2030 Sustainable Development Goals;
- (ii) ensure that resources allocated to the IOC in the Draft 39 C/5 be clearly identified in the appropriation resolution and maintained at no less than the current level in both the fully-funded and the reduced scenarios, if applicable;
- (iii) fully implement the 38 C/Resolution 104 adopted by the General Conference of UNESCO at its 38th session in November 2015, which requests the Director-General '*when preparing draft document 39 C/5, to review all documents and related references in accordance with the Statutes of the Intergovernmental Oceanographic Commission (IOC) so that they conform with those Statutes, particularly taking into account the intergovernmental nature and functional autonomy which the Commission enjoys in UNESCO*';
- (iv) ensure a visible and substantial inclusion of the Commission's programme and budget in the Draft 39 C/5, under IOC's own designation and outside Major Programme 2, consistent with the intergovernmental nature and functional autonomy of IOC within UNESCO;

Requests the IOC Executive Secretary to:

- (i) prepare a fully developed Draft Programme and Budget for 2018–2021 (Draft 39 C/5), including a comprehensive implementation strategy through a conceptual framework of functions, performance indicators and benchmarks, to be submitted to the IOC Assembly at its 29th session, based on discussions and decisions of this session of the Executive Council and in close consultation with the Officers of the Commission;
- (ii) support the work of the Intersessional Financial Advisory Group by providing timely information on the UNESCO budgetary planning process;

Urges IOC Member States to:

- (i) continue to advocate to the UNESCO Director-General and the Governing Bodies of UNESCO the importance of IOC as a body with functional autonomy within UNESCO, focusing in particular on the value that IOC provides to UNESCO and to the sustainable development of coastal areas and islands;
- (ii) support the reinforcement and the positioning of the IOC, consistent with its Statutes, in the consultation process for the UNESCO Draft Programme and Budget for 2018–2021 (Draft 39 C/5);

Further requests the Intersessional Financial Advisory Group to provide guidance to the Executive Secretary in preparing the Draft Programme and Budget for 2018–2021 (Draft 39 C/5);

Invites the Chairperson of the IOC to forward this Resolution to the Director-General of UNESCO.

Annex 1 to Resolution EC-XLIX.2

Budgetary appropriations for 2016–2017 under the IOC Special Account

ER/Function/Activity Title	2016-2017 BUDGET (Proposal)	Budget code
ER 4 - Scientific understanding of ocean and coastal processes bolstered and used by Member States to improve the management of the human relationship with the ocean		
Function A. Foster ocean research to strengthen knowledge of ocean and coastal processes and human impacts upon them	526,000	
WCRP	176,000	191ORS2038.1
Ocean Carbon & Acidification	200,000	191ORS2038.2
Impact of climate change on ocean and coastal ecosystems	150,000	191ORS2038.3
Function B. Maintain, strengthen and integrate global ocean observing, data and information systems	1,900,000	
GOOS Work Plan	400,000	191OSD2038.1
GCOS	100,000	191OSD2038.2
Perth Programme Office	400,000	191OSD2038.3
IIOE-2 (developing capacities for sustained observations)	250,000	191OSD2038.4
JCOMM Observations	200,000	191OSD2038.5
IODE & OBIS core systems	100,000	191OSD2038.6
JCOMMOPS	450,000	193JCS2038
Total ER 4	2,426,000	
ER 5 - Risks and impacts of tsunamis and other ocean-related hazards reduced, climate change adaptation and mitigation measures taken, and policies for healthy ocean ecosystems developed and implemented by Member States		
Function C. Develop early warning systems and preparedness to mitigate the risks of tsunamis and ocean-related hazards	1,950,000	
ICG NEAMTWS	100,000	191EWS2038.1
ICG PTWS	100,000	191EWS2038.2
ICG CARIBE-EWS	150,000	191EWS2038.3
TOWs & inter-regional coordination	100,000	191EWS2038.4
JTIC	100,000	191EWS2038.5
GLOSS - tsunami	250,000	191EWS2038.6
Research & monitoring on algal events	100,000	191EWS2038.7
JCOMM Services	200,000	191EWS2038.8
IODE & OBIS products & services	100,000	191EWS2038.9
IOTWS ICG Secretariat	750,000	193ICG2038
Support assessment and information to improve the science-policy interface	350,000	
WOA	100,000	191AIP2038.1
Science for reducing nutrient enrichment	100,000	191AIP2038.2
Climate change adaptation in coastal zones	150,000	191AIP2038.3
Total ER 5	2,300,000	
ER 6 - Member States' institutional capacities reinforced to protect and sustainably manage ocean and coastal resources		
Enhance ocean governance through a shared knowledge base and improved regional cooperation	1,045,000	
IOC Governance (representation & intersessional coordination)	100,000	191RCG2038.1
IOCARIBE (office support & intersessional coordination)	105,000	191RCG2038.2
IOCAFRICA (office support & intersessional coordination)	105,000	191RCG2038.3

ER/Function/Activity Title	2016-2017 BUDGET (Proposal)	Budget code
WESTPAC (office support & intersessional coordination)	105,000	191RCG2038.4
IOCINDIO (intersessional coordination)	30,000	191RCG2038.7
UN partnerships, global governance, policy and outreach	400,000	191RCG2038.5
ICAM & Marine Spatial Planning	200,000	191RCG2038.6
Develop the institutional capacity in all of the functions above, as a cross-cutting function	750,000	
IOC Capacity development & transfer of marine technology & GOSR	250,000	191ICD2038.1
IOCAFRICA Capacity development workplans	100,000	191ICD2038.2
IOCARIBE Capacity development workplans	100,000	191ICD2038.3
WESTPAC Capacity development workplans	200,000	191ICD2038.4
IODE & OBIS Training and Education	100,000	191ICD2038.5
Total ER 6	1,795,000	
TOTAL	6,521,000	

6.2 PREPARATION OF THE TWENTY-NINTH SESSION OF THE ASSEMBLY AND NEXT SESSIONS OF THE EXECUTIVE COUNCIL

31. The Executive Secretary introduced this item. He recalled that the present session had been scheduled over a period of 3.5 days with a quarter of a daily plenary working time dedicated to activities of the World Oceans Day. The length of the session of the IOC governing bodies has decreased regularly since 2012 to reach six working days plus one-day Ocean Science Forum for a session of the Assembly and 3.5 days for a session of an Executive Council. This has been made possible by the constant evolution of our methods of work. The Assembly in its decision IOC-XXVIII/11.4 confirmed the 29th session of the Assembly for a duration of six working days at UNESCO Headquarters in June 2017, preceded by a one-day session of the Executive Council acting as the steering committee of the Assembly and an Ocean Science Day.

32. Taking into account the importance to IOC of the first Triennial Conference on Oceans and Seas from 5 to 9 June 2017 in Fiji (Fiji Summit), room reservation at Headquarters have been secured for the period 19-30 June 2017.

33. The Executive Council is aware of the scheduling conflict with the last days of Ramadan, but unfortunately is unable to alter the proposed dates of the Assembly due to tight scheduling restrictions within UNESCO headquarters. All considerations will be given to members to accommodate their needs, including providing a designated prayer room.

34. The Executive Council cautioned that the restricted length of the governing body sessions, enacted in response to limited financial resources, was detrimental to free discussion opportunities and in-session debate.

35. The Council regretted that the relevant working document IOC/EC-XLIX/2 Annex 10 on the UNESCO Governance audit and its draft decision were not discussed in plenary. In particular, there was some discussion on the approach and timeline for preparing a contribution to the work of the General Conference Working Group on this issue. A consensus was reached on extending the consultation on this issue to all Member States during the intersessional period and on reporting the results to the next session of the Executive Council preceding the Assembly in 2017¹. The Council agreed to include in

¹ At the time of the writing of the report, the Terms of reference of the open-ended working group on governance, procedures and working methods of the governing bodies of UNESCO provide only indicative dates for six meetings of the group scheduled from April 2016 to June 2017.

decision 6.2, an extended consultation process to respond to the UNESCO review and external audit and agreed that further discussion of governance and working methods should be included in the agenda of the next Assembly.

36. Addressing the list of future IOC Memorial Lectures topics, the Member States were encouraged to suggest additional topics, including for the IOC Ocean Science Day 2017. The Executive Secretary will invite the Member States, via Circular Letter, to submit suggestions for IOC memorial lectures and IOC Ocean Science Day for consideration by the Officers at their January 2017 and 2018 meetings, taking account of geographic and gender balance.

37. Dr Ryabinin thanked the Member States and Partners that sponsored events and services during the session: Japan, Mr Craig McLean (USA), Marine Technology Society, and SCOR.

38. The representatives of seven Member States took the floor. The following Member States chose to provide records of their plenary intervention on this agenda item for the informational annex to the meeting report: Japan and Turkey.

39. The Executive Council adopted Decision EC-XLIX/6.2 below.

**Preparation of the Twenty-ninth Session of the Assembly
and Next Sessions of the Executive Council**

I

The Executive Council,

Recalling decision IOC-XXVIII/11.4 of the Assembly on the length and organisation of its 29th session,

Having considered the dates of important meetings to take place in June 2017, in particular the Triennial Conference on Oceans and Seas from 5 to 9 June 2017 in Fiji,

Noting that no invitation for hosting the Assembly outside UNESCO HQ was expressed and that no substantial funding was proposed that would enable the holding of a session with a duration better commensurate to the needs of the agenda of an Assembly,

Expressing thanks to the Member States and Partners for their sponsoring of side events and services that have notably supported recent sessions of IOC Governing Bodies and the organisation of the IOC Ocean Science Day in particular,

Decides to hold:

- (i) The 29th session of the Assembly for a duration of six working days at UNESCO Hq at dates to be decided with the Officers from 19 to 30 June 2017, preceded by a one-day session of the Executive Council (50th session);
- (ii) The 51st session of the Executive Council for a duration of 3.5 days in June 2018;

II

Taking note of document IOC/EC-XLIX/2 Annex 10 that could not be sufficiently discussed during this session,

Recalling 38 C/Resolution 101,

Requests the Executive Secretary and the Officers of the Commission to initiate a broad and inclusive consultation process with Member States in order to prepare a proposal on governance, including the working methods and procedures of the Commission in the context of the review conducted by the open-ended Working Group established by the 38th session of the General Conference of UNESCO and the April 2016 audit of the IOC by UNESCO's external auditor for the consideration by the IOC Assembly in 2017;

Decides to convene a meeting of an open-ended working group on this issue during the next session of the IOC Executive Council to examine the results of the consultation process and formulate recommendations to the IOC Assembly at its 29th session, with a view to submitting the results of these consultations to the Open-ended working group on governance of UNESCO;

Further decides to include the item on the governance and the working methods and procedures of the Commission in the agenda of the next sessions of the IOC Executive Council and the IOC Assembly in 2017.

7. REPORT

40. The Chair of the Resolutions Committee reported to the Assembly on the work of the Resolutions Committee during the session (Annex ___ to the present report).

41. Prof. P. Haugan then invited the Executive Council to adopt, in plenary, two draft resolutions that were still pending after discussion in plenary under items 3.3.1 and 6.1.

42. The draft summary report was prepared in three parts and translated into the four IOC languages. The Executive Council was unable to complete the approval process within the time allotted for the session. Resolutions and Decisions were completed and will be posted, but the whole of parts I, II and III will be approved through correspondence, wherein heads of delegation will receive the drafts by email and will be expected to submit revisions within ten days, i.e. 23 June 2016.

43. The representative of no Member States took the floor.

8. CLOSURE

44. The Executive Council met in plenary session during less than 3.5 days from 7 to 10 June 2016, considered 25 items on its agenda and approved 19 decisions and 2 resolutions. Thirteen support meetings and 9 information side meetings took place in addition to the plenary sessions. The gender ratio of Executive Council Member States delegates and all participants, including speakers, was 3:7 (female : male). The Chair of the Commission closed the 49th Session of the Executive Council at 13:30 on Friday 10 June 2016.

**The Nippon Foundation / GEBCO Forum for Future Ocean Floor Mapping:
Report on public relations activities (June 2016)**

Ahead of the Forum for Future Ocean Floor Mapping in Monaco, Raitt Orr targeted mainstream news media, science media and maritime and ocean science press.

In March we began approaching our top priority media, including the initial contact with those who would later cover the Forum – specifically Newsweek, New Scientist, BBC, and The Economist.

1. Pre-Forum coverage

World Oceans Day fell exactly one week before the Forum and so, in advance of the Forum, Raitt Orr pursued World Ocean Day opportunities to promote the Forum. This was primarily done through a Shin Tani piece on the UNESCO website, drafted by us, which formed the base of a press release with comments from Shin.

- UNESCO: Understanding the oceans is much more than an academic exercise <http://en.unesco.org/news/shin-tani-understanding-oceans-much-more-academic-exercise?language=en>

The result of these efforts was an excellent piece, with reference to GEBCO and the Forum, in The Economist's World Oceans Day coverage as well as other pieces.

- The Economist: If the ocean was transparent – the see through sea <http://worldif.economist.com/article/12151/see-through-sea>
- Current Biology: Prose and Passion: sea floor mapping <http://proseandpassion.blogspot.co.uk/2016/06/sea-floor-mapping.html>
- Info Marine: World Oceans Day: Why Just One? <http://infomarine.net/index.php/maritime-news/85-maritime-executive/64721-world-oceans-day-why-just-one>

2. Media present at the Forum

A key part of our work was arranging for high-level journalists to come to Forum and report from Monaco. The three journalists, who Raitt Orr helped coordinate, were Roland Pease, Science reporter at the BBC, Durk Haarsma, Editor of Hydro International and Doug Main, Science correspondent at Newsweek magazine.

Roland Pease (BBC)

Roland attended the second day of the Arctic and Antarctic meeting, speaking to many attendees. In his final programme he used several interviews with GEBCO representatives and other attendees.

The quality of access given to Roland by GEBCO meant that he presented his entire Science in Action episode from Monaco, with the Forum featuring at three different points in the points in the show. His online report was key in pushing GEBCO up the agendas of other media and his angle (on a NASA style mission) was then picked up elsewhere.

- BBC Inside Science: Roland Pease reporting from Monaco for Radio 4's Inside Science <http://www.bbc.co.uk/programmes/b07fdy19>
- BBC Science in Action: Roland Pease presented a whole World Service Science in Action from Monaco and featured the forum often <http://www.bbc.co.uk/programmes/p03xr3gg>
- BBC Online: Nasa-style mission needed to map ocean floor <http://www.bbc.co.uk/news/science-environment-36565351>

Doug Main (Newsweek)

Doug has yet to file his piece for Newsweek but he was very happy with the interviews he had with GEBCO representatives and other keynote speakers. Our contact with Doug will continue until he has written his piece.

Durk Haarsma (Hydro International)

Durk filed a report that was immediately printed but the main area of activity for Raitt Orr was arranging an interview between Durk and Shin Tani. This interview was successfully held and, along with photographs taken by the GEBCO photographer, will feature in a future issue of Hydro International. We had a meeting with Durk and Robin Falconer to discuss the six page pull-out scheduled for October.

- Hydro International: Forum for Future Ocean Floor Mapping in Monaco <http://www.hydro-international.com/content/news/forum-for-future-ocean-floor-mapping-in-monaco>

Durk also sent copies of the current edition of Hydro International which were given to all attendees. This edition included the piece on GEBCO previously written and placed by Raitt Orr.

Local Monaco media

Despite limited language options, Raitt Orr pursued local media in both French and English. A camera crew from the Monaco state broadcasts, Monaco INFO, attended the forum with accreditation issued by Raitt Orr and their three-minute long piece was shown throughout July 15 – July 16 on the hourly news round-up.

- Monaco INFO (French): Monaco accueille le Forum Mondial de l'Hydrographie <https://www.youtube.com/watch?v=ZKsVLapv6j4>
- Monaco Channel (French): Le Forum for Future Ocean Floor Mapping (cartographie du plancher océanique) <http://www.monacochannel.mc/Chaines/Musee-Oceanographique-de-Monaco/Actus-et-Photos/Le-Forum-for-Future-Ocean-Floor-Mapping-cartographie-du-plancher-oceanique>

3. Forum coverage from those not in attendance

The coverage from journalists in Monaco, as well as our regular press material, helped push journalists who were not attending to cover GEBCO and the Forum, this included:

- Motherboard (VICE magazine): Why Haven't We Explored the Ocean Like Outer Space? http://motherboard.vice.com/en_uk/read/why-havent-we-explored-the-ocean-like-outer-space
- Also translated into Danish http://www.vice.com/en_dk/read/hvorfor-har-vi-ikke-udforsket-havet-som-vi-har-udforsket-det-ydre-rum

- Also translated into Spanish <http://motherboard.vice.com/es/read/por-qu-no-hemos-explorado-el-ocono-al-igual-que-el-espacio-exterior>
- Business Insider: Most of the planet isn't mapped – but a groundbreaking project hopes to change that <http://uk.businessinsider.com/most-ocean-floor-not-mapped-2016-6>
- Sience.Mic: We still haven't mapped most of the Ocean – but that could be about to change <https://mic.com/articles/146707/we-still-haven-t-mapped-most-of-the-ocean-but-that-could-be-about-to-change#.7LgCn3PeD>
- Yahoo (.Mic): We still haven't mapped most of the Ocean – but that could be about to change <https://www.yahoo.com/news/still-havent-mapped-most-ocean-174205119.html>
- Awesome Ocean: Haven't we already mapped the ocean floor <http://awesomeocean.com/2016/06/23/mapping-the-ocean-floor/>
- The Inertia for Good: Scientists Say Mapping Our Ocean Floors Would Cost \$3 Billion <http://www.theinertia.com/environment/scientists-say-mapping-our-ocean-floors-would-cost-3-billion/>
- Short News: Nasa-style mission needed to map ocean floor <https://www.youtube.com/watch?v=aWuhPc96jKE>
- Azula: Here's What It Would Cost to Finally Map the Ocean Floor <http://www.azula.com/cost-mapping-ocean-floor/>

4. Coverage still to come

As well as the Newsweek item, which is still being written, we will be following up with several contacts who were interested but unable to attend. This includes:

- New Scientist, we previously worked closely with a commissioning editor at the New Scientist who commissioned someone to write
- Lloyd's List, who have previously been interested in some aspects of GEBCO's work.
- The Guardian and Kate Ravillious, Kate writes a regular online column for The Guardian and was very interested in writing about GEBCO in one of her regular columns.
- The Economist, we said to the Economist that we would follow up with information and a briefing on the outcome of the Forum for any follow-up they do their World Oceans Say piece.

5. Other support

Alongside arranging for the media to attend and cover the Forum, Raitt Orr also helped with printed material and the PowerVote app.

Printed material

Using an existing relationship with a UK based production house, Raitt Orr took over the design and printing of various items. Specifically:

- Six banner stands – five for the Forum and one for The Nippon Foundation.
- 28pp A4 programme – with contributions from several people on the committee this was printed and shipped from London.
- 8pp A5 programme – a smaller version of the 28 page document this was also printed and shipped from London.
- Folded A5 pocket guide – as requested by Robin this was designed and printed in London.
- Document folders – These were printed and shipped from London.

- Artwork and design time for the PowerVote icons and alternative logos, used on the bags and other places.
- Drafting and advice on various Forum speeches

None of the above was part of our original brief from GEBCO.

Ahead of the printed material we worked with everyone to agree a design and the content for a provisional programme sent to all attendees.

PowerVote

Raitt Orr was able to assist with the PowerVote app, primarily as a point of contact for PowerVote with GEBCO and GEBCO with the app.

The first role for Raitt Orr was in the design. We worked with our designer and Pauline Weatherall to change the design, bringing it into line with the rest of the Forum material. After this design was agreed, speaker and panellist bios were sent to Raitt Orr and then on to PowerVote.

Ninon Dunan, from PowerVote, attended the Forum and Raitt Orr worked with her in Monaco to help her when we could.

Photography

Raitt Orr hired a GEBCO photographer who took photographs throughout the three days and has given a huge bank of images for GEBCO to use for the future. These images were directed by Raitt Orr and are now owned by GEBCO. They have been used by many partner organisations, with GEBCO credited.

Patrick Orr

24 June 2016

Science & Environment

Nasa-style mission needed to map ocean floor

By Roland PeaseBBC Radio Science Unit

- 17 June 2016
- From the section Science & Environment
- Share
-



Image copyright GOOGLE EARTH

Image caption: The blue areas have not been mapped with the most modern, high resolution technologies

Ocean experts have called for international action to generate the kinds of maps of global seabeds that space missions have already returned for the Moon and Mars.

The call to "map the gaps" comes from GEBCO, the General Bathymetric Chart of the Ocean, a body first set up in 1903 to compile maps from naval surveys around the world.

But more than a century on from the first international charts, vast expanses of the ocean are still represented by just a single point where an ancient mariner threw a lead-weighted rope over the ship side.

Only 5% of the seafloor has been mapped by modern methods. Even around the UK, a nation with a long maritime history, almost a third of the coast is unsurveyed. The entire Moon, in contrast, is known to a resolution of 7m, thanks to satellite mapping.

"It's a matter of commitment," complains Larry Mayer, director of the Center for Marine Science and Coastal Engineering at the University of New Hampshire, a world-leading centre of oceanographic expertise.

"We could map the entire deep oceans for \$3bn - no more than a single Mars mission."

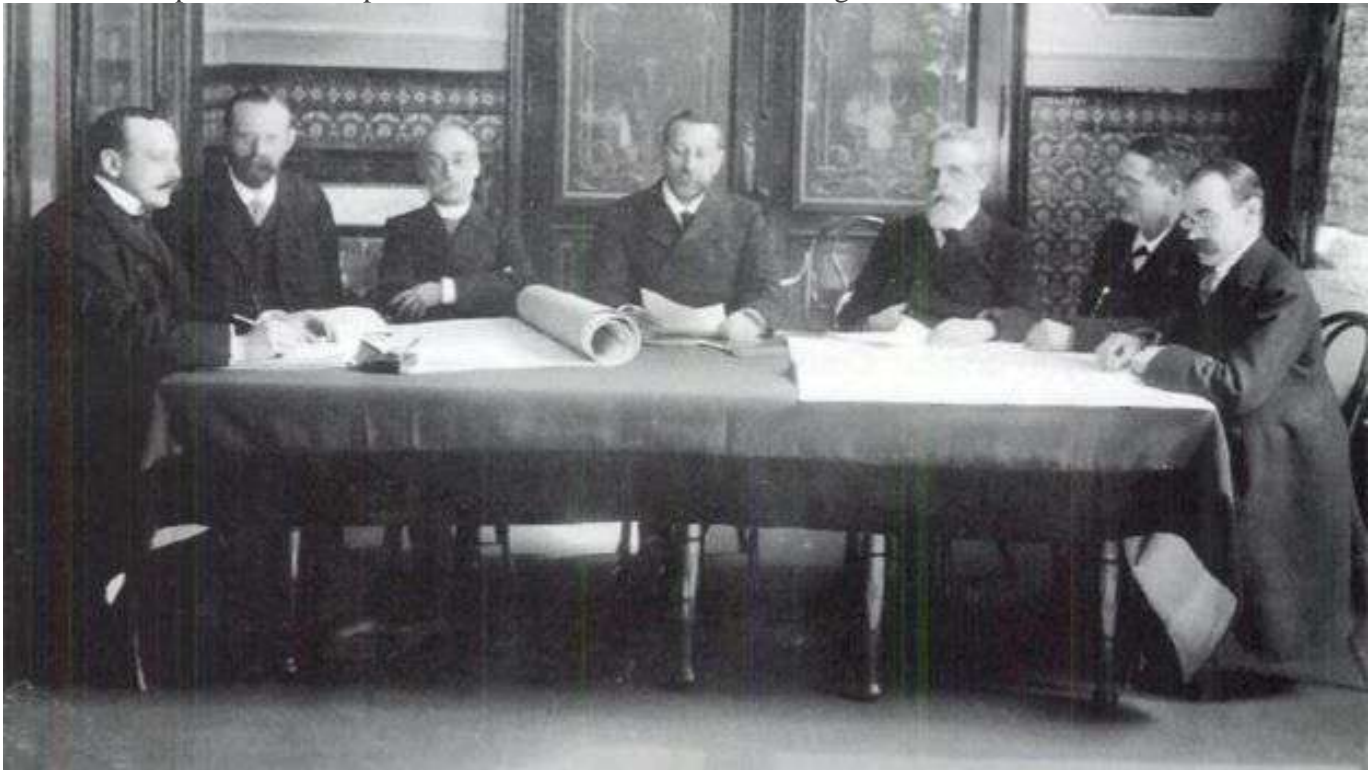


Image copyright COLLECTION MUSÉE OCÉANOGRAPHIQUE DE MONACO

Image caption: The founding meeting of GEBCO, from 1903, led by HSH Prince Albert I of Monaco

As another participant quipped, the community is "stuck between ability and utility." Existing maps are principally produced to support shipping - to find safe routes for maritime traffic from super tankers and trawlers to leisure craft. Detailed measurements of the ocean bottom are possible, but who would pay for it.

David Heydon, who founded the submarine mining company Nautilus Minerals and directs another exploration outfit, DeepGreen Resources, argues: "The land we live on is one-third of the planet - it's rare. The other two-thirds are more than 3,000m under the water. It'd be crazy not to understand it."

The question is how it would be used.

"How can you build offshore wind farms, lay submarine cables, forecast storm surges, if you don't know the shape and depth of your coastal regions," asks Robert Ward, president of the International Hydrographic Organization, who is enthusiastic about a big scale-up of current efforts.

The problem comes down to time and cost. If London were underwater, it would take weeks to map using conventional echo-sounding methods, Ward explains; and several days even using the most modern multibeam methods.



Image copyright FUGRO

Image caption: The type of multibeam echosounder used in the MH370 search

Today's survey vessels cost tens of thousands of dollars a day to run. Others point out that London would simply vanish as too small to notice on many of the maps that currently exist.

Our ignorance of the seafloor came into sharp relief with the loss of the Malaysian airliner MH370.

"It went down in an area where we knew almost nothing," explains Rochelle Wigley, an oceanographer also based at the University of New Hampshire. "There was just one modern survey line across an area the size of New Zealand."

Her colleague Larry Mayer agrees: "Much of the effort that's gone into finding [MH370] has been essentially making a base map." The area has turned out to be filled with ridges and canyons spanning depths down to 7,000m, which has greatly hampered the search.

"If we'd had that base map, it would have saved months and months of time," the researcher asserts.



Image copyright L.MAYER

Image caption One solution could be the autonomous barge

The question that has dogged the debate at this week's forum is how much detail is needed.

More detail means more time and more cost. For many just a single measurement every hundred metres would be a vast improvement on what's available today, even though it would fall far short of the quality of astronomers' lunar maps. But anything worth investigating further could be followed up later with dedicated missions.

Others argue that the aim should be to beat the Moon maps, if the effort is to be attempted. Swarms of undersea robots scanning the seafloor would be needed. A tie up with the Xprize Shell Ocean Discovery Challenge (<http://oceandiscovery.xprize.org/>) seems a possibility.

Larry Mayer has a half-way proposition - a vast uncrewed barge laden with equipment that could roam the high seas autonomously for just a third of the cost of conventional missions, and never need to come into port. With the biggest sonar array ever built, and controlled remotely, it could focus in where necessary, and sweep up large areas of abyssal plains at top speed.

"It would also be available if something like an MH370 happened again," he promises, "to sail into a region where you need a high-resolution search."

Such a self-steering vessel really would resemble a Nasa space mission mapping an unexplored world. What GEBCO lacks is a Nasa-style infrastructure and budget to make it happen. Anybody got a spare billion?

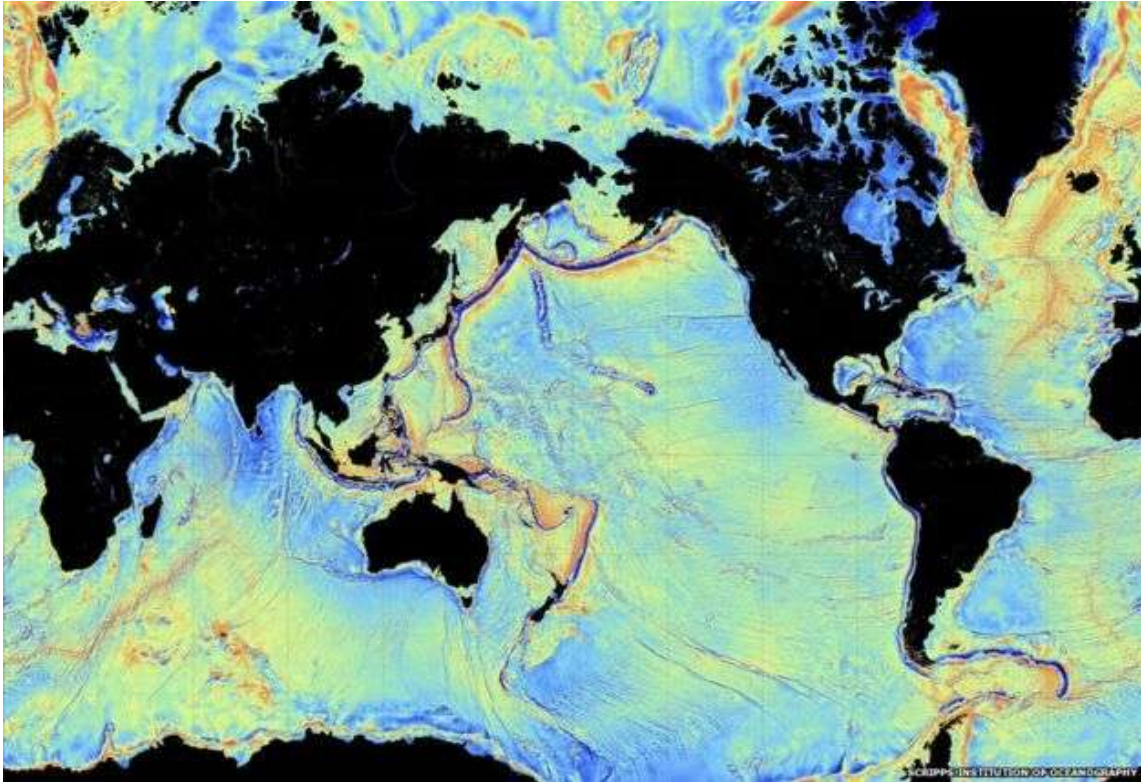


Image copyright SCRIPPS INSTITUTION OF OCEANOGRAPHY

Image caption: Satellite gravity data can do a job - but it cannot see underwater mountains less than 1.5km in height

Post Forum Communiqué

29 June 2016



MAPPING THE OCEAN FLOOR BY 2030

A meeting in Monaco of over 150 senior representatives, scientists, scholars and business associates from major ocean related organisations has endorsed the objective of Seafloor 2030 – that the comprehensive mapping of the entire ocean floor was possible by the year 2030. More than 85 per cent of the world ocean floor remains unmapped with modern mapping methods.

Tasked with the responsibility of developing a Roadmap for the Future of Ocean Floor Mapping, the meeting, held under the auspices of the General Bathymetric Chart of the Oceans (GEBCO), the world's only international organisation mandated to map the ocean floor, called for the sharing of bathymetric information to create, for GEBCO, a global baseline bathymetric database. It also called for greater access to the tools and technology, particularly for developing and coastal nations, to make a comprehensive database possible, for the sharing of data to achieve this ultimate objective.

The Forum for Future Ocean Floor Mapping (15 to 17 June) was formally opened by Prince Albert II of Monaco, great-great-grandson of Prince Albert I, who founded GEBCO in 1903. Keynote addresses were given by Robert Ward, President of the Secretariat of the International Hydrographic Organisation (IHO) and by Thorkild Aarup, representing the Intergovernmental Oceanographic Commission of UNESCO. GEBCO is a joint project of both organisations.

Addresses were also given by Bob Ballard, who discovered the wreck of the Titanic, and Simon Winchester, author of books on the Atlantic and Pacific oceans. Other keynote speakers included Larry Mayer, Director of the Center for Coastal and Ocean Mapping at the University of New Hampshire, David Heydon, Founder of DeepGreen

Resources & Nautilus Minerals, Kristina Gjerde, Senior High Seas Advisor at the International Union for the Conservation of Nature (IUCN), Jyotika Virmani, Senior Director, Energy and Environment, at XPRIZE, and Bjorn Jalving, Executive Vice President of the Kongsberg Maritime's Subsea Division.

Yohei Sasakawa, Chairman of The Nippon Foundation, which sponsored the Forum, called for collaboration for the protection and sustainable use of the world's oceans. He called for strong international support for mapping the ocean floor.

In his welcome speech, Vice Admiral Shin Tani, Chairman of GEBCO's Guiding Committee, said that the world "knows more about the topography of Mars than the Earth's seafloor".

Mr Sasakawa also announced the formation of an alumni association for the 72 GEBCO scholars from 34 countries, who have gained their Postgraduate Certificates in Ocean Bathymetry at the University of New Hampshire, to be joined by a further six scholars in September. The programme, sponsored by The Nippon Foundation, is designed to build human capacity in key coastal states by supporting the development of future maritime leaders.

After two days of intensive panel discussions and breakout sessions, participants concluded that the task of mapping the ocean floor involved a new structure for global coordination of mapping activities and gathering of all available depth measurements into a database for the compilation of a coherent bathymetric portrayal of the world's ocean floor. Thus bathymetric post-processing and analysis software, database technology, computing infrastructure and gridding techniques should be brought into the equation along with the latest developments in seafloor mapping methods.

In terms of mapping technologies, Forum delegates agreed that while echo sounding techniques were being constantly improved, the mapping of the ocean floor is only slowly increasing. This was particularly true for sea-ice covered and iceberg infested portions of the oceans – and other remote areas with sparse ship traffic such as the South Pacific. The development of unmanned vehicles was discussed. Available commercial and custom developed drones, gliders equipped with multi beam sonar, fleets of low maintenance autonomous surface or underwater vehicles and unmanned mapping barges, steered by satellite communication and an ultra-narrow beam deepwater multi beam, could all be used for different situations.

The Shell Ocean Discovery XPRIZE was currently challenging teams to develop new deep-sea technologies for autonomous, fast and high-resolution ocean mapping.

The meeting agreed that crowd sourced bathymetry – not new to GEBCO – was a powerful concept in ocean mapping with a huge potential of substantially boosting targeted mapping, specifically in shallow water. Shallow water bathymetry, derived from satellite imagery, constituted a promising technique that could be useful in remote areas where other available mapping methods are not feasible.

A pilot project between GEBCO and Google will be initiated to investigate further the application of satellite imagery derived bathymetry on a global scale, utilising GEBCO's human capacity outreach.

The present GEBCO central bathymetric database, as well as regional mapping projects under GEBCO, resides on servers of the host organisations. The sizes of these databases would increase once GEBCO targets a higher resolution global coverage, but will remain far from the amount of raw ship soundings collected at sea. As GEBCO moves towards establishing more regional projects with host organisations, there would be benefits from using a cloud based infrastructure for regional mapping projects under GEBCO.

The guiding concept and formats were discussed – with the opinion that variable grids will be more in demand as the end-user community begins to realise the option of placing bathymetric overviews of large areas – and details of smaller areas – onto one convenient database. A resolution minimum one hundred metre grid was achievable.

In essence, to achieve seafloor 2030, existing data must be identified and the remaining gaps mapped. The key to achieving this target would be greater institutional coordination between scientific research and industry combined with capacity building through the effective engagement of developing states. Political support through UN organisations and the G7 was required to increase resources for this task. Ocean mapping could complement the United Nations Atlas of the Oceans and Goal 14 of the Sustainable Development Goals (SDGs) – to conserve and sustainably use the world's oceans, seas and marine resources.

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Notes to editors:

GEBCO is a joint project of the International Hydrographic Organisation (IHO) and the Intergovernmental Oceanographic Commission (IOC) of UNESCO – the United Nations Educational Scientific and Cultural Organization – which was founded by Prince Albert I of Monaco in 1903.

The International Hydrographic Organization (IHO) was established in 1921 as the International Hydrographic Bureau (IHB). The present name was adopted in 1970 as

part of a new international Convention on the IHO adopted by the then member nations. The former name, International Hydrographic Bureau, was retained to describe the IHO Secretariat, which coordinates and promotes the IHO's programmes and provides advice and assistance to Member States. The IHO has 85 member states with 8 others in various stages of applying to join.

The UNESCO's Intergovernmental Oceanographic Commission (IOC) was established by the General Conference of UNESCO in 1960. It first met in Paris at UNESCO Headquarters in 1961. There are currently 148 Member States. The IOC promotes international cooperation and coordinates programmes in marine research, services, observation systems, hazard mitigation and capacity development in order to understand and effectively manage the resources of the ocean and coastal areas.

The Nippon Foundation, a private, non-profit foundation, was established in 1962 for the purpose of carrying out philanthropic activities, using revenue from motorboat racing. The Foundation's overall objectives include social innovation, assistance for humanitarian activities and global ocean management. Its philanthropic ideals embrace social development and self-sufficiency, and it pursues these principles by working to improve public health and education, alleviate poverty, eliminate hunger and help the disabled.

