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COMISIÓN OCEANOGRÁFICA INTERGUBERNAMENTAL
(de la UNESCO)

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UNESCO, París, 25-28 de junio de 2024

Punto **4.4** del orden del día provisional

EXAMEN TRIENAL DEL GRUPO DE TRABAJO DE LA COI SOBRE LAS NECESIDADES DE LOS USUARIOS Y LAS CONTRIBUCIONES A LOS PRODUCTOS DEL GEBCO (2024)

Resumen

Mediante la circular nº 2981 de la COI, se restableció el Grupo de Trabajo sobre las Necesidades de los Usuarios y las Contribuciones a los Productos del GEBCO con miras a la realización de la evaluación periódica del GEBCO relativa a las necesidades de los usuarios, de conformidad con las decisiones EC-XLIX/4.4 (2016) y A-31/3.5.1 (2021).

Las principales tareas del Grupo de Trabajo son las siguientes: i) recopilar, integrar y evaluar las necesidades de los usuarios para orientar la elaboración de los productos presentes y futuros del GEBCO; y ii) estudiar formas de reforzar las contribuciones de los programas de la COI y las actividades de los Estados Miembros a los datos y productos del GEBCO. A fin de recabar información se preparó una encuesta, cuyos resultados se resumen en el presente documento.

Tras un examen detenido por parte de los órganos rectores de la Organización Hidrográfica Internacional (OHI) y la COI, las conclusiones de este informe se comunicarán a la OHI y al Comité de Orientación sobre el GEBCO para que adopten medidas de seguimiento.

La decisión propuesta lleva la referencia EC-57/4.4 en el documento de decisión revisado de la reunión (documento IOC/EC-57/AP Prov. Rev.).

Introducción

1. El Mapa Batimétrico General de los Océanos (GEBCO) de la OHI-COI es un proyecto conjunto de la Organización Hidrográfica Internacional (OHI) y la COI de la UNESCO. Su objetivo es proporcionar el conjunto de datos batimétricos mundiales de referencia de dominio público más autorizado, basado en toda la información disponible facilitada gracias al interés, la participación, el apoyo y el esfuerzo de los científicos, los institutos, los centros de investigación, los particulares, el sector y los servicios hidrográficos nacionales, que aportan datos y conocimientos especializados al programa sin costo alguno en interés de la ciencia, la seguridad y el medio ambiente. Se puede consultar más información sobre la gobernanza y las actividades de GEBCO en la siguiente dirección: https://www.gebco.net/.

2. El GEBCO proporciona datos batimétricos mundiales, que son indispensables para comprender la topografía del fondo oceánico. Esta información es fundamental para distintos estudios oceanográficos, como la geología marina, las tendencias de la circulación oceánica y la cartografía de hábitats, por citar algunos. La COI se basa en datos batimétricos precisos para apoyar sus actividades científicas y de investigación. A su vez, muchas actividades de observación e investigación oceánicas realizadas en el marco de la COI tienen la ventaja de aumentar la recopilación de datos batimétricos y complementar los productos y servicios del GEBCO. Esta colaboración contribuye a impulsar el conocimiento científico, promover la gestión sostenible del océano y afrontar los retos relacionados con el medio marino.

3. En 2014, los Estados Miembros de la COI decidieron que la COI debía participar en mayor medida en el GEBCO y posteriormente, en 2016, se decidió establecer un mecanismo periódico para evaluar las necesidades de los usuarios en relación con los productos del GEBCO, desde el punto de vista de la COI, y determinar formas de reforzar las posibles contribuciones de la COI a los datos y productos del GEBCO, desde el punto de vista de la comunidad oceanográfica y de los usuarios finales marítimos en general (decisión EC-XLIX/4.4 del Consejo Ejecutivo).

4. La primera evaluación se realizó en 2017 (IOC/EC-LI/2 Anexo 7), la siguiente en 2021 (IOC/A-31/3.5.1.Doc) y la actual en 2024. En la evaluación de este año (anexo I), se ha procurado en particular comprender las necesidades de los usuarios de los Estados Miembros y las organizaciones gubernamentales que tienen interés en los productos del GEBCO, así como las del sector y las organizaciones de la sociedad civil. Mediante la circular nº 2981 de la COI, se creó un Grupo de Trabajo con miras a llevar a cabo la evaluación del GEBCO relativa a las necesidades de los usuarios con carácter trienal. El Grupo de Trabajo estuvo presidido por el Vicepresidente de la COI, Sr. Juan Camilo Forero Hauzeur. En el anexo II del presente documento figura la composición del Grupo de Trabajo.

5. Para facilitar la recopilación de información, se elaboró un cuestionario que se distribuyó mediante la circular nº 2989 de la COI. Los destinatarios del cuestionario eran los representantes de los Estados Miembros y las instituciones que trabajan con productos de cartografía oceánica, así como los funcionarios y expertos de los órganos subsidiarios técnicos y regionales pertinentes de la COI y las alianzas regionales del GOOS. Además, el cuestionario se distribuyó a través de la amplia red del proyecto Seabed 2030 de la Nippon Foundation y el GEBCO para llegar a las instituciones y el sector no gubernamentales. El equipo del proyecto Seabed 2030 de la Nippon Foundation y el GEBCO, que prestó apoyo a lo largo de todo el proceso, resumió los resultados de la encuesta que se describen en este documento, que se presentaron al Grupo de Trabajo en una reunión telemática celebrada el 16 de mayo de 2024. Las conclusiones de este informe se comunicarán a la OHI y al Comité de Orientación sobre el GEBCO para que adopten medidas de seguimiento.

Resumen de las conclusiones principales

6. En total, se recibieron 59 respuestas de 39 países para el cuestionario, cuya fecha límite de respuesta era el 19 de abril de 2024, lo que representa las opiniones de una amplia comunidad internacional de organismos gubernamentales, círculos académicos, el sector y los particulares. En el anexo III del presente documento figura la lista de las instituciones que respondieron a la encuesta.

7. En cuanto a la diversidad (tipo de organismo y región de origen), se dispone de los siguientes datos:

Tipo de organismo	Origen geográfico (Grupos de la COI)
Gubernamentales, otros (24)	Grupo 1 (América del Norte y Europa Occidental) 23
Organismos hidrográficos gubernamentales (10)	Grupo 2 (Europa Oriental y Federación de Rusia) 1
Universidades (12)	Grupo 3 (América Central y del Sur y el Caribe) 8
Sector (8)	Grupo 4 (Asia y Oceanía) 12
ONG (4)	Grupo 5 (África y Oriente Medio) 13
Otros (1)	

8. En general, los encuestados apoyan sin reservas al GEBCO, pues más del 90 % valora los conjuntos de datos de batimetría de cuadrícula del GEBCO, más del 70 % los servicios web del GEBCO y más del 60 % los nombres de los accidentes geográficos submarinos y los aspectos de desarrollo de capacidades de la labor del GEBCO.

9. Se mostró mucho menos interés en la disponibilidad de productos en papel o en la obra *The History of GEBCO*.

10. Una elevada proporción de los encuestados deseaba disponer de productos de mayor resolución, y se expresó un interés considerable en ampliar el alcance de los productos de datos del GEBCO para incluir un mayor número de parámetros y capas de datos, a pesar de que algunos de estos aspectos no forman parte de las competencias actuales del GEBCO.

11. Los encuestados desearon que se ofreciera una mayor variedad de formatos de archivo y una mejor compatibilidad con los programas informáticos más avanzados utilizados en el sector geoespacial, en particular herramientas de visualización más satisfactorias. La mayoría de los encuestados expresaron su preocupación por la seguridad en las zonas costeras y las zonas económicas exclusivas, al ser más conscientes de los riesgos que corren las infraestructuras submarinas debido a agentes hostiles.

12. La creación de un grupo internacional de usuarios de datos de los fondos marinos es una de las opciones más solicitadas, ya que ayudaría a transferir competencias y fomentar el intercambio de conocimientos y el desarrollo de capacidades. Además, se acogería con satisfacción la organización de sesiones y talleres de formación especializada.

13. Varios encuestados propusieron recompensar e incentivar el intercambio de datos, en particular cuando ello pudiera alentar al sector a difundirlos más ampliamente.

14. Durante la reunión del Grupo de Trabajo, se formularon nuevas recomendaciones para integrar las necesidades y prioridades de desarrollo de capacidades del GEBCO en la Estrategia de Desarrollo de Capacidades de la COI y en mecanismos de ejecución como la Academia Mundial

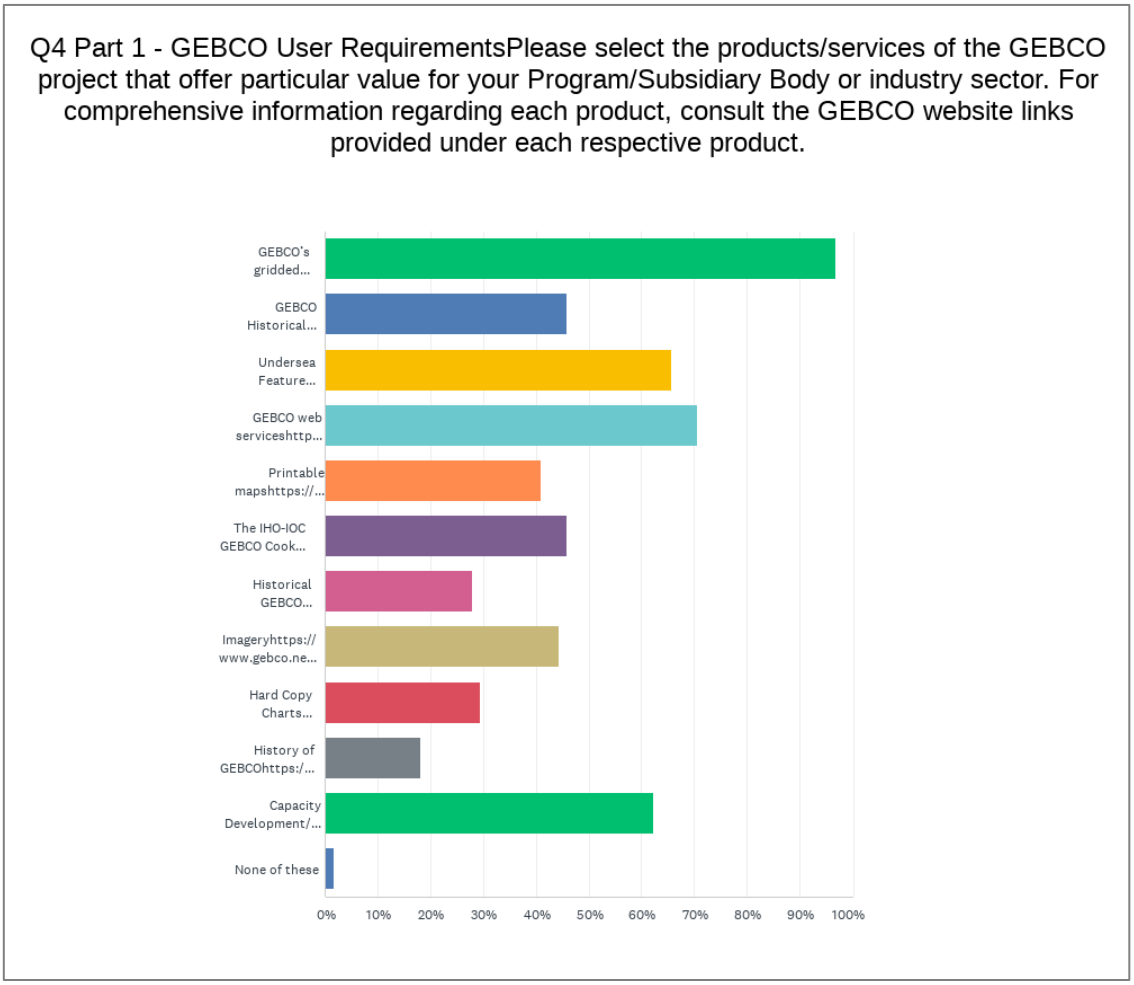
OceanTeacher. También se puso de relieve la conexión de la infraestructura de datos del GEBCO con el Sistema de Datos e Información Oceanográficos de la COI.

15. Para futuras evaluaciones de las necesidades de los usuarios del GEBCO, el Grupo de Trabajo recomendó que los resultados fueran más detallados a fin de determinar las necesidades por tipo de usuarios o por grupos regionales.

16. El Grupo de Trabajo acogió con agrado la mayor variedad de los encuestados con respecto a la edición anterior de 2021, aunque destacó la falta de respuestas por parte de programas específicos de la COI.

ANNEX I – Detailed Analysis *(English only)*

1. **GEBCO User Requirements. Ranking of products/services of the GEBCO project that offers particular value to end-users.**



The survey responses were plotted, the graph above indicates the most used GEBCO product are:

1. GEBCO's gridded bathymetric data sets

https://www.gebco.net/data_and_products/gridded_bathymetry_data/

2. Followed by GEBCO web services
https://www.gebco.net/data_and_products/gebco_web_services/ and

3. Undersea Feature Names

https://www.gebco.net/data_and_products/undersea_feature_names/

2. **Order of priority for existing products of the GEBCO project that your Program/IOC Subsidiary Body/Organization/Industry Sector is most inclined to utilize, and least inclined to utilize**

The respondents listed their preference in order of utilization. The table below summarises the findings

Most 1	GEBCO's gridded bathymetric data sets

Most 2	Undersea Feature Names
Most 3	GEBCO Web Services
Most 4	IHO-IOC GEBCO 'Cook Book'
Least 1	History of GEBCO
Least 2	Historical datasets
Least 3	Historical charts
Least 4	Hard copy charts

3. **Improvement of GEBCO products – Areas where specific GEBCO products might warrant enhancement from a technical standpoint. This could pertain to aspects such as accessibility, format, coverage, spatial resolutions, and supplementary services, among others.**

GEBCO's gridded bathymetric data sets	● Improve the spatial resolution and accuracy of the gridded datasets ● Additional effort is needed in improving data quality and resolution in shallow areas ● Enhance accessibility by providing more user-friendly interfaces for data download and visualization ● The gridded bathymetric datasets could be made available in other commonly used file formats. ● Where higher quality aggregated surfaces are available (e.g. from national or continental programs), they should be included. ● More data validation is required by directly measure depths ● Provide more metadata e.g. (number of soundings per grid node, standard deviation, number or data sources per grid node) ● Areas of data gaps needs to be clearly identified ● Other supplementary services to be considered to add value bathymetric dataset
GEBCO Historical Datasets	● Standardize historical data formats to ensure compatibility with modern data processing tools and systems. ● Provide comprehensive documentation and metadata for historical datasets to facilitate proper utilization and interpretation
Undersea Feature Names	● Ensure consistency and accuracy in undersea feature names across different datasets and versions. ● Include polygon vector layer for larger areas

	● Implement standardized naming conventions and guidelines for undersea features to enhance clarity and interoperability
GEBCO web services	● Web Services could be improved my offering more services such as (masked WMS of source data to determine coverage, and higher resolution display)
Printable maps	● Recommended to improve the quality and resolution of printable maps to support high-quality printouts. ● Enable customization options for printable maps, allowing users to select specific regions, layers, and information to be included
The IHO-IOC GEBCO Cook Book	● The Cook book is to be updated more frequently ● Update the Cook Book with the latest methodologies and best practices for bathymetric data processing and analysis. ● Provide tutorials and training materials to help users effectively utilize the 'Cook Book' resources
Historical GEBCO Charts	● Digitizing and geo-referencing historical charts to facilitate their integration with modern GIS software and analysis workflows. ● Improving metadata to meticulously document the origin and precision of historical chart data, and creating tools for comparative analysis between historical charts and contemporary datasets. ● Access to historical datasets in easy to use formats
Imagery	● Improve the spatial resolution and accuracy ● Integrate high-resolution satellite imagery with bathymetric data to provide a comprehensive view of the seafloor ● Imagery to be made available in other commonly used file formats ● Provide more metadata on imagery
Hard Copy Charts	● Ensuring consistency and accuracy between digital and hard copy chart versions ● Include relevant metadata and information on chart sources and data quality. ● Provide guidelines for chart interpretation
History of GEBCO	● Incorporate multimedia elements such as archival photos and videos to enrich the narrative, and highlighting key milestones and achievements in GEBCO's history.

4. Among areas of enhancement suggested above, which ones do you think that IOC needs to provide additional resources or capacity?

- Expanding coverage and improving accessibility of bathymetric data sets, especially in remote and less explored regions,

- Expanding web services and developing interactive tools for data visualization and analysis

- Standardizing naming conventions and maintaining a comprehensive feature names database

5. Details on the users of GEBCO products within your Program/IOC Subsidiary Body/national authorities/Organization/Industry Sector. Please describe for which activities users currently use GEBCO products? Describe your requisites and specifications regarding GEBCO products. This may include delineating mapping needs in specific maritime areas, specifying desired product types, resolution criteria, preferences for web services, and any additional datasets deemed pertinent.

- GEBCO grid is used as an input for various kinds of modelling e.g. tsunami and hydrodynamic. The grid is also useful in survey planning and environmental management activities.

- Another application involves incorporating both the GEBCO grid and undersea feature names into the cartographic production process.

6. **Perception of how users would like to use GEBCO products in future. [Are there new, emerging activities where GEBCO products can be used in innovative ways?]**

- Having a more interactive web service with more data layers with the ability to easily extract various datasets in different formats

- High-resolution bathymetric data sets can be helpful in identifying suitable locations for marine protected areas, offshore infrastructure projects, and aquaculture zones while minimizing environmental impacts

- Ability to utilise GEBCO grid as inputs to machine learning (AI) systems for event predictions

7. GEBCO is now providing data products for waters of less than 200m depth, as well as the long-established deep-water data. For data shallower than 200m, who are the key users of GEBCO products, and for what activities do they use GEBCO products in your Program/Subsidiary Body/Organization/Industry Sector?

- The data shallower than 200m are critical for tsunami assessment, hazard maps and numerical modelling of coastal processes

- GEBCO products for various activities such as navigation during research cruises, environmental monitoring, identification of Undersea features, and identification of trawl able areas.

- Data products are also used by hydrographic offices, offshore windfarms, cables and pipeline companies for survey planning.

8. How do the users intend to utilize shallow water GEBCO products? What specific types of products related to shallow waters would you envision the GEBCO project generating? Please add detail on the requisites, specifications, and impediments concerning GEBCO products. This may include delineating mapping needs in particular maritime regions, desired product types, product resolution requirements, web services preferences, among others.

- Data products utilised in coastline definition and maritime boundaries, S-130 connection to web services will be very beneficial

- Data is utilized for pre-survey studies where enhanced resolution of the bathymetric data holds significance

- With shallower and more precise data, tsunami and coastal models will be more accurate

- Perhaps GEBCO would consider incorporating mechanisms to integrate higher-resolution national products into the GEBCO product suite, such as multi-resolution products or tiled zoom features.

9. **Does your country and / or organization have any concerns over accessing or sharing data that was collected from inside the Exclusive Economic Zone?**

Most of the respondents had concerns about data collected in EEZ due to national security issues.

10. **Are there any products of ocean mapping activities from which your Program/Subsidiary Body/Organization/Industry Sector would benefit other than those already currently developed under GEBCO data and products? Is there a desire for access to processed point data sets beyond those that GEBCO currently provide?**

Respondents have either answered YES, NO and some have skipped this question.

11. **If Yes to above, please describe what kind of new products you would like to see.**

- It would be highly beneficial to have the capability to effortlessly download processed, cleaned point data at the maximum available resolution for user-defined areas of interest
- Would be helpful to have seafloor classification maps that provide information about the composition and characteristics of the seafloor substrate
- Interactive maps and virtual reality environments offer immersive experiences for users to explore underwater landscapes and features in three dimensions (3D). These visualization products play a crucial role in enhancing public outreach and education and facilitating marine science communication

12. **Apart from the IOC consultation process, kindly propose any mechanisms for discerning user needs and requirements regarding GEBCO data and products, and subsequently conveying them to GEBCO, from the perspective of your Program/Subsidiary Body/Industry Sector? This may encompass mechanisms for enhancing collaboration with GEBCO as well.**

- Creating a specialized User Advisory Group consisting of representatives from your Program/Subsidiary Body/Industry Sector, along with other pertinent stakeholders such as scientists, researchers, government agencies, and industry partners. This group will provide a forum for stakeholders to express their needs, requirements, and feedback regarding GEBCO data and products. Regular meetings, workshops, and surveys will be organized to collect input and insights from members of the advisory group.
- Formalizing partnership and collaboration agreements between your Program/Subsidiary Body/Industry Sector and GEBCO to promote enhanced collaboration and communication. These agreements will delineate mutual objectives, roles, responsibilities, and commitments for both parties, including frameworks for sharing data, resources, and expertise, as well as coordinating joint initiatives and projects.

13. **Contributions to GEBCO Products. Has your Program/IOC Subsidiary Body/Country/Organization/Industry Sector contributed towards GEBCO data and products?**

Respondents have either answered YES, NO and some have skipped this question.

14. **If Yes to above, please describe in more detail what has been contributed.**

- Crowd Source Bathymetry
- Bathymetric data (indirectly in EEZ in European and Caribbean Seas) through EMODnet contribution
- Private sector data sharing through Seabed 2030
- Printable maps are created by GEBCO folks with financial support of Korean Government
- Each country of the OCEATLAN Regional Alliance is contributing in different ways to GEBCO

- SHOA nautical charts (2010) Basin delimitation polygons (2018) SHOA nautical charts for Magallanes (2019) Track of navigation 2014 and 2015 years (2020) High resolution bathymetry, Piloto Pardo Mount (2022) High resolution bathymetry, Guyot and Mount O'Higgins (2024)

- Most of the deep-water survey data from NOAA scientific field programs are shared back to IHO to be included in GEBCO products

- Some entities/individuals conduct annual quality control checks and offer feedback on the Undersea Feature Names product, while also actively engaging in various working groups dedicated to advancing SCUFN's initiatives.

15. If you contributed data to GEBCO, which options did you choose for data sharing?

Most common selections were:

- Data for public access - Data sent direct to the IHO Data Centre for Digital Bathymetry hosted by NOAA

- Data for public access - Data sent via Seabed 2030 centres

- Followed by Data for GEBCO use only - data provided via GEBCO's data holding centre at the British Oceanographic Data Centre (BODC**)**

16. If 'other'- please describe

- Seabed 2030 routinely download data from the AusSeabed data portal.

- EMODnet contribution

- UN Entities and Intergovernmental Organisations

17. If you do not currently contribute data, is there any potential for you to contribute in the future? If no, please explain why. Please also provide suggestions/requirements to facilitate future contributions

- Enhanced future contributions could be facilitated by ensuring that data providers perceive the process as rewarding, with clear identification of their contribution

- Possibility to share some data collected during transit during hydrographic surveys in order to improve GEBCO data quality (Royal Moroccan Navy)

- This topic is predominately under review as hydrographic office or navy in certain countries have the authority to permit data release and sharing

18. Please suggest any potential new approaches that could be tried to facilitate and augment the contribution of bathymetric data collected by scientific or other endeavours to GEBCO.

- Promote collaboration among scientific communities, industry partners, and government agencies to undertake collaborative bathymetric mapping initiatives in underexplored or remote marine areas. Combine resources, expertise, and equipment to gather high-resolution bathymetric data through ship-based surveys, autonomous underwater vehicles (AUVs), unmanned surface vessels (USVs), or airborne LiDAR systems. Coordinate data collection endeavours to achieve comprehensive coverage and avoid redundant efforts.

- Establish incentives and rewards for organizations and individuals to contribute bathymetric data to GEBCO. Recognize and acknowledge data contributors through citation, co-authorship, or awards. Provide financial support, research grants, or access to GEBCO resources and services as incentives for sharing high-quality bathymetric data. Foster a culture of collaboration and knowledge sharing within the bathymetric mapping community to promote data exchange and cooperation.

- Allocate resources to capacity building initiatives aimed at strengthening the skills, knowledge, and capabilities of scientists, researchers, and marine professionals engaged in bathymetric data collection and processing. Deliver training workshops, seminars, and online courses covering bathymetric mapping techniques, data management practices, and quality assurance protocols. Facilitate access to cutting-edge bathymetric surveying equipment, software tools, and analytical resources to bolster capacity development endeavours.

19. Please suggest any potential requirements and type of capacity development regarding GEBCO products from the perspective of your Program/Subsidiary Body/Industry Sector.

Though most of the respondents have skipped this question, the following were identified by some respondents:

- Provide training programs and workshops to enhance the technical skills and knowledge of professionals involved in bathymetric data collection, processing, and analysis.

- These programs could encompass workshops or courses focusing on GIS (Geographic Information Systems) software utilization, data processing techniques, and spatial analysis methods pertinent to GEBCO datasets. Facilitating collaborative research and knowledge-sharing initiatives cantered around GEBCO products would further enhance value. This could entail fostering partnerships and collaborations among stakeholders to undertake joint research projects or exchange experiences and best practices in leveraging GEBCO datasets.

20. Please suggest any supplementary factors for the assessment of contributions to GEBCO's data and products from the standpoint of your Program/Subsidiary Body/Organization/Industry Sector

Though most of the respondents have skipped this question, the following were identified by some respondents:

- In the past, TSCOM provided reports indicating the annual number of scientific articles citing GEBCO grid data and maps. It would be prudent to maintain these statistics for future reference.

- Implementing a more effective mechanism for crediting data contributors when utilizing GEBCO products.

21. Key recommendation for enhancing the GEBCO efficacy of its dissemination of seabed data to relevant stakeholders

- Continuously enhance accuracy and coverage while advocating for data sharing and open access.

- Utilize all communication channels and engage a broad range of stakeholders by leveraging GEBCO members or points of contact (POCs) in each region/country. This could involve organizing workshops or meetings across different countries to showcase improvements and products. In-person meetings are particularly effective for this purpose

- GEBCO could introduce online workshops or short-term courses, removing geographical barriers and enabling broader dissemination to individuals.

ANNEX I – List of Members of the IOC Working Group on User Requirements and Contributions to GEBCO Products

Country	Name	Institution
Australia	Ms Philippa Bricher	National Seabed Mapping. Geoscience Australia
Bangladesh	Captain Habib-Ul-Alam, (HI), NUP, PCGM, psc, BN	Bangladesh Navy Hydrographic and Oceanographic Centre (BNHOC)
China	Ms Fan Miao	National Marine Data and Information Service (NMDIS)
Colombia	Ms Yerynelys Santos Barrera	Caribbean Oceanographic and Hydrographic Research Centre. General Maritime Directorate
Colombia	Mr Juan Camilo Forero Hauzeur	Comisión Colombiana del Océano (Working Group Chair)
Ecuador	Mr Freddy Guzmán	Dirección de Hidrografía y Cartografía. Instituto Oceanográfico y Antártico de la Armada
Egypt	Ms Suxan Mohamed El Gharabawy	National Institute of Oceanography & Fisheries
Mexico	Ms Amaia Ruiz de Alegría Arzaburu	Grupo de Procesos Litorales del Instituto de Investigaciones Oceanológicas de la Universidad Autónoma de Baja California
Mexico	Mr Isaac Rodríguez Padilla	Grupo de Procesos Litorales del Instituto de Investigaciones Oceanológicas de la Universidad Autónoma de Baja California
Morocco	Captain Ayoub BELATTMANIA	Inspection de la Marine Royale
Morocco	Lieutenant de Vaisseau El Mehdi LATNI	Inspection de la Marine Royale
Norway	Mr Helge Sagen	Norwegian Marine Data Centre. Institute of Marine Research
Norway	Mr Cristian Muñoz Mas	Institute of Marine Research
Qatar	Mr. Moahemd Ahmed Al Khenji	Ministry of environment and climate change
Republic of Korea	Ms Jinju Im	Korea Hydrographic and Oceanographic Agency
Russian Federation	Ms Anastasia Abramova	Geological Institute of the Russian Academy of Sciences
Senegal	Mr Abdoul Tanor Diaw	Agence nationale des Affaires maritimes
USA	Ms Shannon Hoy	NOAA Ocean Exploration

Annex II – List of Responding institutions

Name of Program / Subsidiary Body / Member State / Organization	
Ministry of Environment And Climate Change (Respondent skipped the other infor section)	Qatar
NOAA Ocean Exploration	USA
King Abdullah University of Science and Technology	Saudi Arabia
LoveBlue-Oceanamatica	USA
National Oceanographic And Maritime Institute (NOAMI)	Bangladesh
Only Country info provided ; El Salvador	El Salvador
Ecole Nationale Supérieure des Sciences de la Mer et de l'Aménagement du Littoral (ENSSMAL)	France
Nigerian Navy Hydrographic Office	Nigeria
Portuguese Institute for Sea and Atmosphere - IPMA	Portugal
National Institute of Oceanography	Pakistan
Kenya Marine and Fisheries Research Institute	Kenya
University of Hawaii - Manoa Campus	USA
NOAA International Tsunami Information Center Caribbean Office	USA
Oceans North	Canada
Integrated Marine Observing System	Australia
Scripps Institution of Oceanography	USA
Seismic Imaging Centre Geophysics BHU Varanasi India	India
SM ASSOCIATED CONSULTING	Brasil
CoastGIS Research Institute	Senegal
National Aquatic Resources Research & Development Agency (NARA)	Sri Lanka
National Institute of Oceanography, Pakistan	Pakistan
IntelliReefs/Reef Life Foundation	USA
Coastruction	Netherlands
AGIR ASSOCIATION DE GESTION INTÉGRÉE DES RESSOURCES	Morocco
University of South Florida	USA
LDG Tahiti	Tahiti / France
Fugro	Netherlands
National Land Agency (Hydrographic Office of Jamaica)	Jamaica
Kenya Marine and Fisheries Research Institute (KMFRI)	Kenya
INOCAR	Ecuador
Geoscience Australia - National Seabed Mapping	Australia
METU	Northern Cyprus
Dawn of Future International Cultures Exchange (Wuhan) Center	China
Lagos state university	Nigeria
UNINBE/ UNIVERSITY OF NAMIBE	Namibia
PERU NAVY	Peru
Institute of Marine Affairs	Trinidad & Tobago
Flanders Marine Institute	Belgium
Indonesia National Geospatial Information Agency (BIG)	Indonesia
NOAA Center for Tsunami Research	USA
Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung	Germany
Senegal / Centre de Suivi Écologique	Senegal
Ifremer	France
Chilean Navy Hidrographic and Oceanographic Service	Chile
Royal Moroccan Navy	Morocco
Servicio de Hidrografía Naval	Argentina
ASSOCIATION INTERNATIONALE POUR LE PARTENARIAT ET L EMERGENCE EN AFRIQUE (AIPEA)/AIRGPAIRDAM/ASSOCIATION INTERNATIONALE P	France
MesoAm SDG17 Coalition Program, Reef Life Foundation, Mission Blue Partner, AVCA	USA
Met Office	UK
The Department of the Management and Exploitation of Seabed* (La Direction de la Gestion et de l'Exploitation des Fond Marins)	Senegal
University of Seoul	Republc of Korea
Ocean Exploration Trust	USA
Alcatel Submarine Networks	France
UNESCO NATIONAL COMMISSION OF THE UNITED REPUBLIC OF TANZANIA	Tanzania
Service Hydrographique et Océanographique de la Marine	France
Indonesian Center of Earthquake and Tsunami BMKG	Indonesia
Kuwait Institute for Scientific Research	Kuwait
China (National Marine Data and Information Service, NMDIS)	China
Russian Geological Institute of the Russian Academy of Sciences	Russian Federatio