

The Global Ocean Science Report 2020 - Much more than SDG indicator 14.a.1

Charting Capacity for
Ocean Sustainability

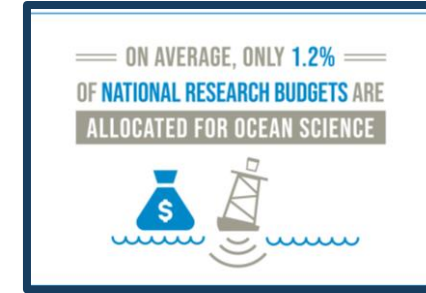
Kirsten Isensee
Intergovernmental Oceanographic Commission of UNESCO

From SDG 14 to indicator 14.a.1



SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Target 14.a - Increase scientific knowledge, develop research capacity and transfer marine technology,



Indicator 14.a.1 - Proportion of total research budget allocated to research in the field of marine technology

Contributions to the GOSR2020

The Global Ocean Science Report 2020
literally a global endeavour:

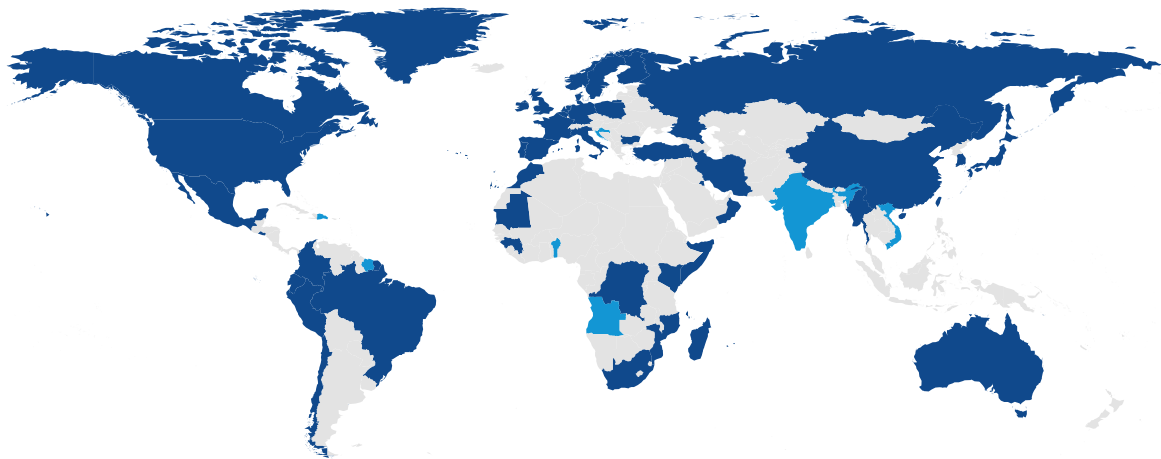
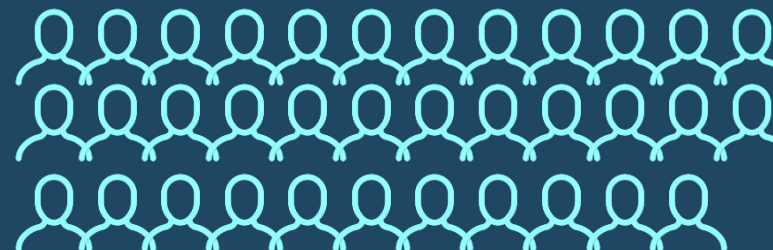


Figure ES.1. Global map indicating the Member States that responded to the GOSR2020 questionnaire (dark blue); countries where data from the GOSR2017 are used in the GOSR2020 assessments are shown in light blue. Sources: GOSR2017 and GOSR2020 questionnaires.

45 Member States answered the GOSR2020 questionnaire, and many more are presented in bibliometric, technometric and gender specific analyses.



Editorial Board: 12 (5 female, 7 male) members from 12 countries



Authors: 35 authors – experts from all 5 IOC electoral groups



Review: 19 internal and external reviewers, incl. UN, academia, governmental representatives...

Plus many more who made this possible....

GOSR2020 more than just a document

250 pages serving as a resource for policymakers, academics and other stakeholders seeking to assess progress towards the Sustainable Development Goals of the UN 2030 Agenda

Executive Summary – highlighting some of the key findings and main conclusions (all UNESCO languages)

GOSR portal – place to access and update data

<https://gosr.ioc-unesco.org/>



Global Ocean Science Report 2020

Charting Capacity for Ocean
Sustainability



United Nations
Educational, Scientific and
Cultural Organization



Intergovernmental
Oceanographic
Commission



Sustainable
Development
Goals

Questionnaire online – facilitating input

Global Ocean Science Report

Home About Contact mithun English

<p>PART A ⓘ</p> <p>RESPONDENT DETAILS</p> <p>Edit data</p>	<p>PART B ⓘ</p> <p>OCEAN SCIENCE GOVERNMENTAL ORGANIZATION AND GENERAL INFORMATION</p> <p>Add data</p>	<p>PART C ⓘ</p> <p>OCEAN SCIENCE SPENDING</p> <p>Add data</p>	<p>PART D ⓘ</p> <p>NATIONAL RESEARCH CAPACITY AND INFRASTRUCTURE</p> <p>Add data</p>
<p>PART E ⓘ</p> <p>OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE</p> <p>Add data</p>	<p>PART F ⓘ</p> <p>CAPACITY DEVELOPMENT AND TRANSFER OF MARINE TECHNOLOGY</p> <p>Add data</p>	<p>PART G ⓘ</p> <p>SUSTAINABLE DEVELOPMENT</p> <p>Add data</p>	

NEW feature developed in cooperation with IODE – basis for GOSR data portal

65 questions in 7 parts

Available as pdf as well

Available in 3 languages English, French, Spanish

Questionnaire - inviting MS to contribute



INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
COMMISSION Océanographique INTERGOUVERNEMENTALE
COMISION OCEANOGRÁFICA INTERGUBERNAMENTAL
МЕЖПРАВИТЕЛЬСТВЕННАЯ ОКЕАНОГРАФИЧЕСКАЯ КОМИССИЯ
اللجنة الدولية الحكومية لعلوم المحيطات
政府间海洋学委员会

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IOC Circular Letter No 2729
(Available in English, French, Russian, Spanish)

IOC/R/KI/SA/ss
3rd September 2018

To : National Official Coordinating Bodies for liaison with IOC

cc. : Permanent Delegates/Observer Missions to UNESCO of IOC Member States
National Commissions for UNESCO of IOC Member States
Chair and Vice-Chairs of IOC and Major Subsidiary Bodies

Subject: Invitation to contribute information for the compilation of the second edition of the IOC Global Ocean Science Report (GOSR-II)

With this letter I would like to invite all IOC Member States to contribute to the Global Ocean Science Report II (GOSR-II) online questionnaire. The questionnaire seeks to gain information about current ocean science capacity in your country. Your response will be used for the production of the second edition of the GOSR (cf. [Global Ocean Science Report](#) for more information on the report) and its related Data Portal under construction.

The questionnaire was developed by the IOC Secretariat in close cooperation with the GOSR-II Editorial Board (more information about the GOSR-II Editorial Board composition and Terms of References can be found [here](#)).

This circular letter is in pursuance to Decision IOC-XXIX/5.1, in which IOC Member States at the 29th session of the IOC Assembly in 2016 recognized the needs for systematic, continuous and long-term data compilation on their ocean science capacity; and Decision IOC/EC-LII/4.3, in which the IOC Executive Council at its 51st session this year encouraged each Member State to contribute actively to the second edition of the report by providing relevant data and information through the GOSR Data Portal and, in particular, by contributing actively to the GOSR-II questionnaire.

Member States are encouraged to use the information available from the best authoritative sources in their country, including ocean science institutions and national coordinators of ocean science programmes. As an example, regarding data management and data services (Part E of the questionnaire), the national IODE focal point in your country is well placed to contribute data and

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IOC Circular Letter No 2744
(Available in English, French, Russian, Spanish)

IOC/R/SA/KI/SS
16 November 2018

To : National Official Coordinating Bodies for liaison with IOC

cc. : Permanent Delegates/Observer Missions to UNESCO and
National Commissions for UNESCO of IOC Member States
Chair and Vice-Chairs of IOC and Major Subsidiary Bodies

Subject: Follow-up to the preparation of the second edition of the IOC Global Ocean Science Report (GOSR-II): new deadline

I am writing to follow up on our recent IOC Circular Letter 2729 dated 3 September by which I called for the contribution of all IOC Member States to the preparation of the second edition of the Global Ocean Science Report and related data portal and solicited your intermediary to coordinate the compilation of the information in a dedicated online survey (<https://gosr.ioc.unesco.org/en/>) by 18 November.

To date, only a few number of Member States have designated a national focal point for GOSR-II. Please note that only one access per Member State was given to ensure validation and unity of the source of information. In the case of Member States who have not designated a national focal point for GOSR-II, the unique access to the questionnaire was given to the IOC focal point. In this regard I remind you that the online questionnaire is available in English, Spanish and French. The GOSR-II questionnaire can also be downloaded in pdf format only for the purpose of facilitating consultations at the national level. Since September the Secretariat has had constructive exchanges with GOSR focal points and is building a community of practice necessary considering the innovative character of the survey. I encourage you to contact our GOSR team to let us know of any technical difficulties, questions and delay in progress to date. Kirsten Isensee: k.isensee@unesco.org and Salvatore Arco: s.arco@unesco.org are available to receive your comments and questions.

Mindful of the difficulty of the task for Member States and of the need to gather the broadest possible representation of countries, the deadline to contribute information through the online questionnaire is extended to 15 February 2019.

Last July, the IOC Executive Council in its decision IOC/EC-LII/4.3 reaffirmed the importance of GOSR as the main mechanism to measure progress towards the achievement of Sustainable Development Goal (SDG) 14, Target 14.a (SDG indicator 14.a.1) and recognized that investments

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Two IOC CL inviting MS to designate a focal point and contribute

Questionnaire - inviting MS to contribute

In addition:

Direct communication with MS focal points,
Involvement of IOC Chair and Vice Chairs,
Head of IOC Sub-Commissions encouraged to address the respective MS directly,
Presentations at IOC Sub-Commissions' meetings and IODE 25,

Problems encountered:

Online questionnaire not suitable for national consultations
Focal points email are not correct
Delayed communication between focal points and scientists
Questionnaire too difficult? But we know not easy therefore nobody did it before and the exercise is and will continue to be difficult. – IOC Secretariat offered/offers help

- I. The findings of ocean science have direct implications for sustainable development policies and are applied in the management strategies and action plans of multiple societal sectors.
 - II. Funding for ocean science is largely inadequate; this lack of support undermines the ability of ocean science to support the sustainable provision of ocean ecosystem services to humanity.
 - III. Women in ocean science continue to be underrepresented, particularly in the highly technical categories.
 - IV. Recognition of young ocean scientists, and the level of support offered to them, differs widely among countries.
- I. The technical capacity of ocean science remains unequally distributed among countries and regions; this imbalance is further accentuated by short-term or ad hoc funding for ocean science.
 - II. The number of ocean science publications worldwide continues to increase, especially in countries of Eastern and South-Eastern Asia.
 - III. Countries are inadequately equipped to manage their ocean data and information, which hampers open access and data sharing.
 - IV. The GOSR process offers a systematic approach to measure ocean science capacity internationally (SDG target 14.a).

GOSR2020 Ocean science human capacity

National numbers of ocean science researchers vary between <1 to >300 employees per million inhabitants – these ratios do not relate directly to GDP.

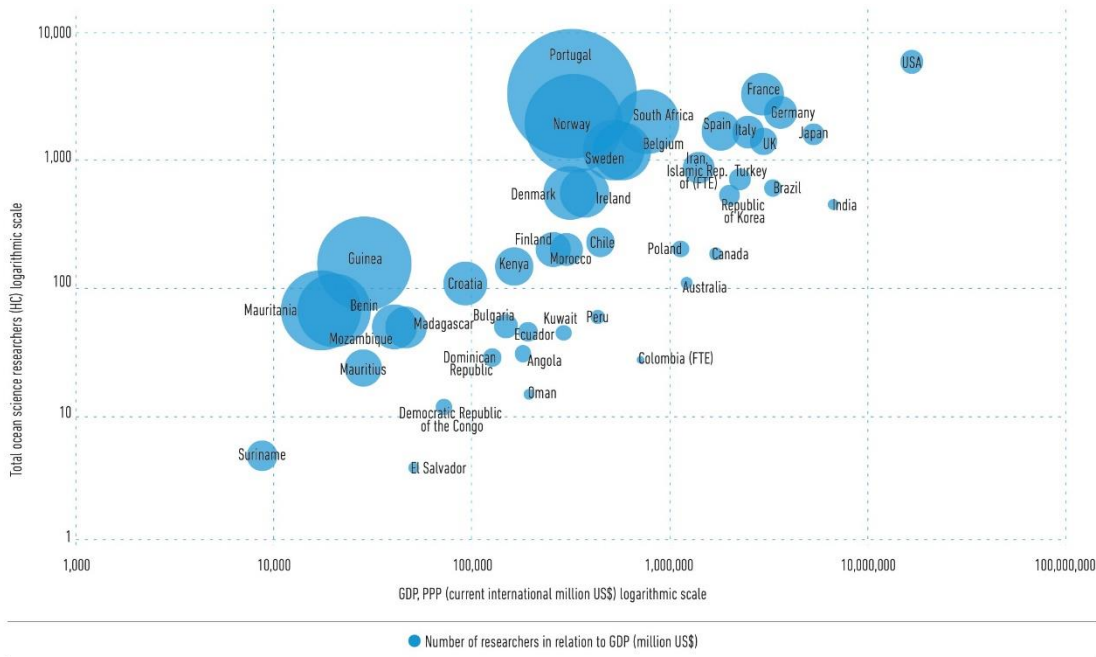


Figure ES.3. Number of national ocean science researchers (HC) in relation to the GDP purchasing power parity (PPP) (current million US\$) extracted for each country and year. The size of the bubble is proportional to the ratio of researchers vs GDP for each country.
Sources: Data based on the GOSR2017 and GOSR2020 questionnaires (researchers) and the Global Economic Monitor (GDP, current million US\$, seasonal adjustment), available at the World Bank Databank.

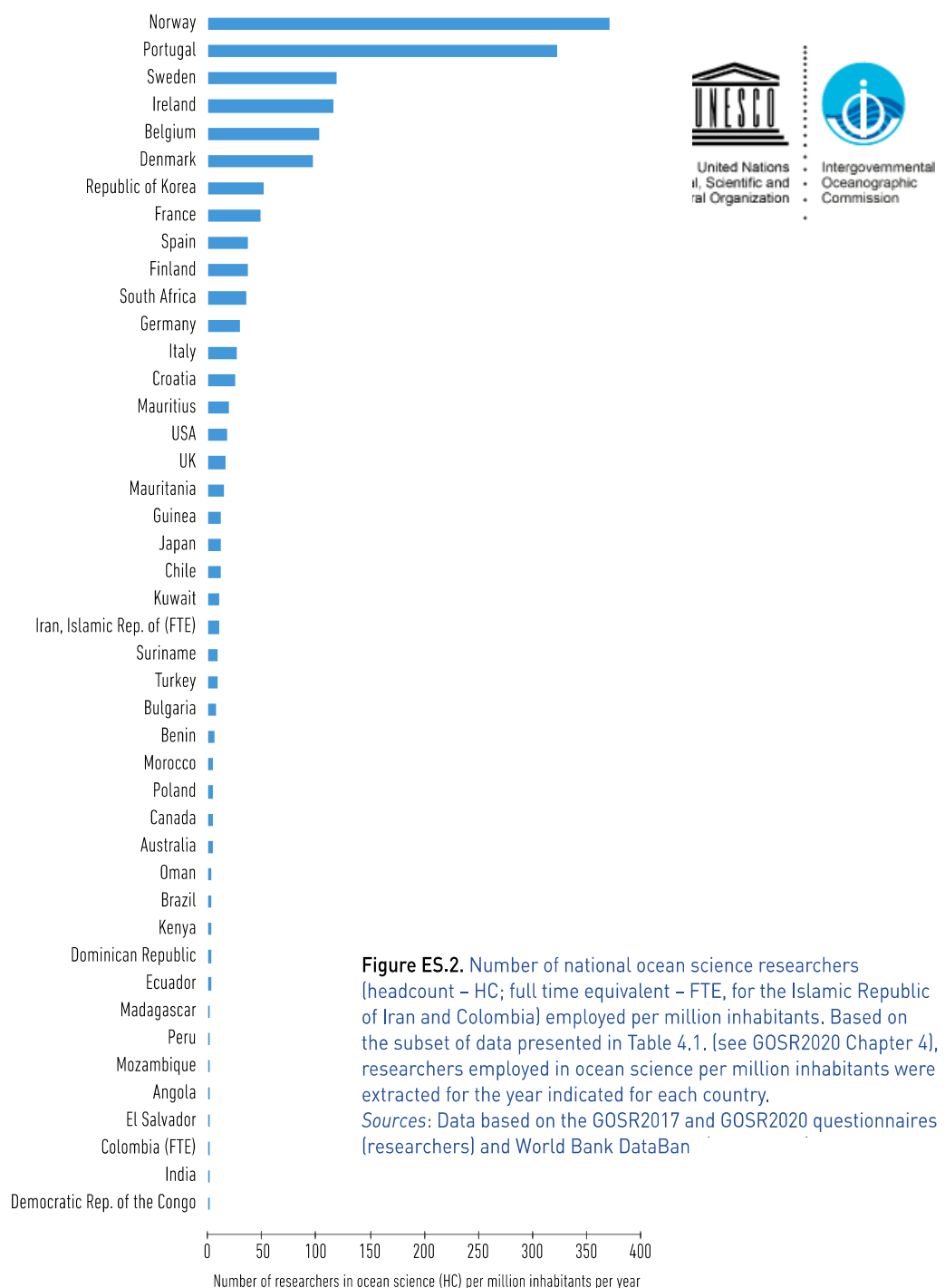


Figure ES.2. Number of national ocean science researchers (headcount – HC; full time equivalent – FTE, for the Islamic Republic of Iran and Colombia) employed per million inhabitants. Based on the subset of data presented in Table 4.1. (See GOSR2020 Chapter 4), researchers employed in ocean science per million inhabitants were extracted for the year indicated for each country.
Sources: Data based on the GOSR2017 and GOSR2020 questionnaires (researchers) and World Bank Databank.

Gender equality in ocean science is far from having been achieved but the challenge to reach it is realistic.

Female researchers account for 39% of global ocean scientists, 10% higher than the global share of female researchers in natural sciences.

Female ocean scientists are increasingly talking to the world. Female participants account for 29% to 53% of total conference participants, depending on ocean science category and region.

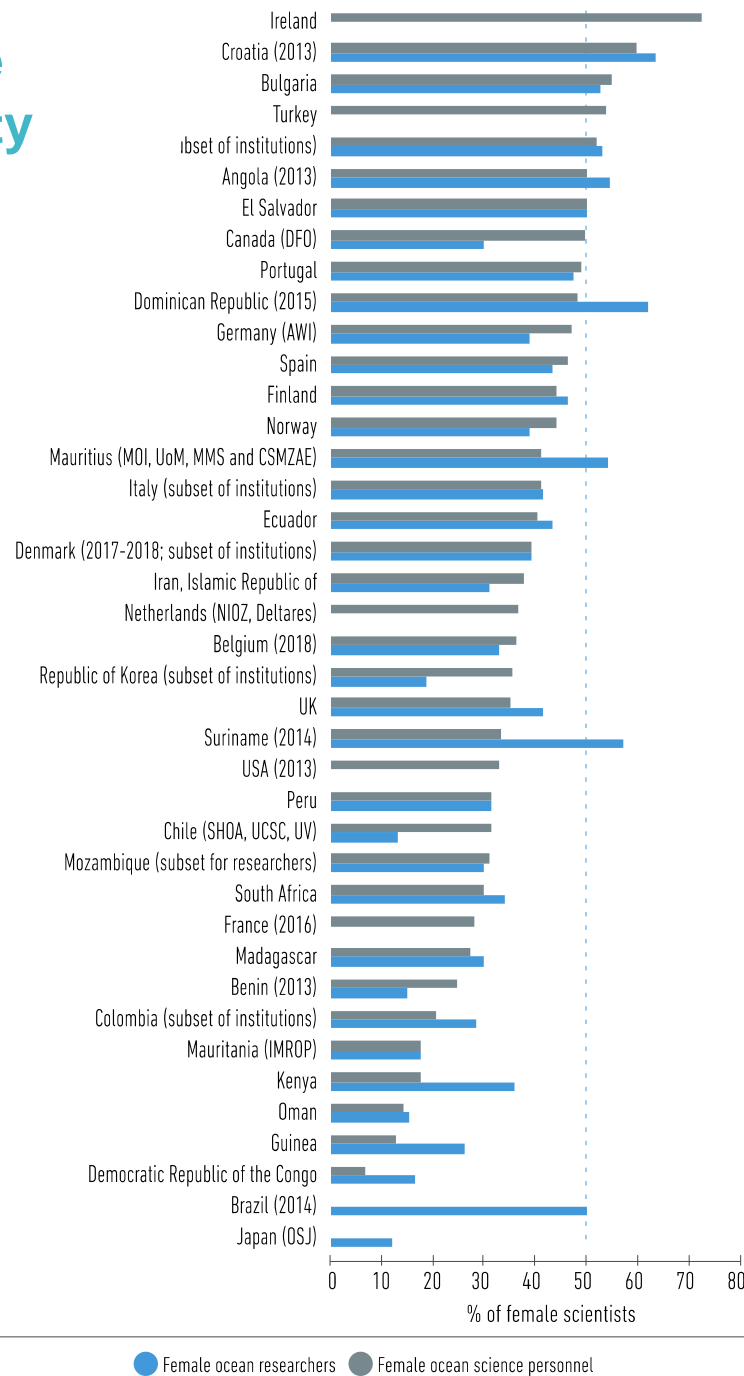


Figure ES.4. Proportion (% of total HC) of female ocean science personnel and female ocean researchers in 2017. In the absence of data for 2017, the latest available year is shown in brackets (see Chapter 4).
Sources: Data based on the GOSR2017 and GOSR2020 questionnaires.

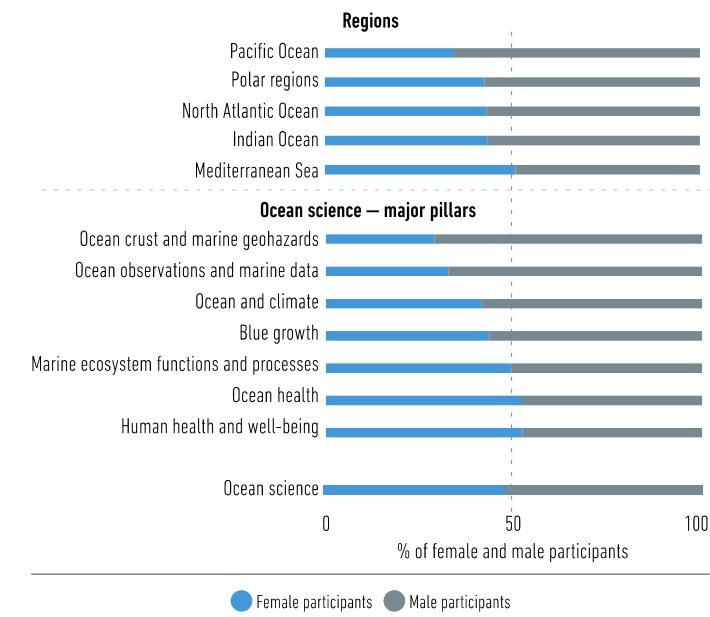


Figure ES.5. Proportion (%) of female and male participants at international scientific conferences/symposia held from 2015 to 2018. Upper section focuses on regional conferences/symposia; lower section on topic-specific conferences/symposia.
Source: Selected lists of participants in international scientific ocean science conferences/symposia held from 2015 to 2018.

GOSR2020 Ocean science generates both knowledge and applications

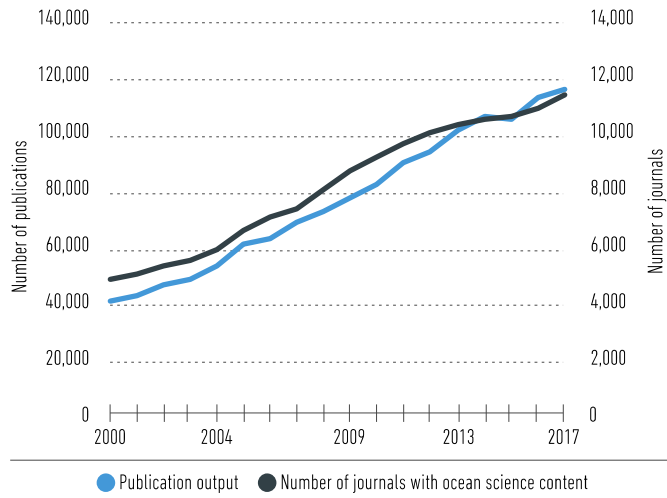


Figure ES.7. Global yearly trend in number of peer-reviewed ocean science publications (blue) and number of journals with content in ocean science (black) between 2000 and 2017.
Source: Authors Chapter 5, based on bibliometric analysis of Scopus (Elsevier) data 2000–2017 by Science-Metrix/Relx Canada.

Global ocean science outputs are continuously rising (with regional differences emerging).

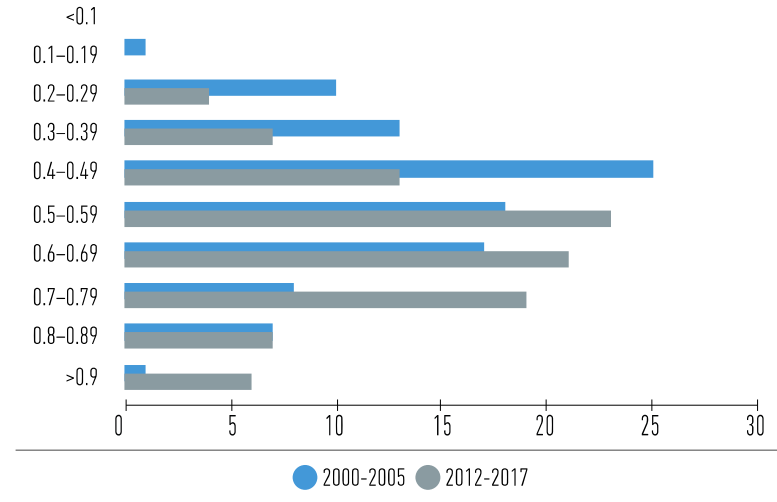


Figure ES.9. Changes in international co-publication rate of the 100 most publishing countries during the periods 2000–2005 and 2012–2017.
Source: Authors Chapter 5, based on the bibliometric analysis of Scopus (Elsevier) data 2000–2017 by Science-Metrix/Relx Canada.

Competitive ocean science is driven by international partnerships.

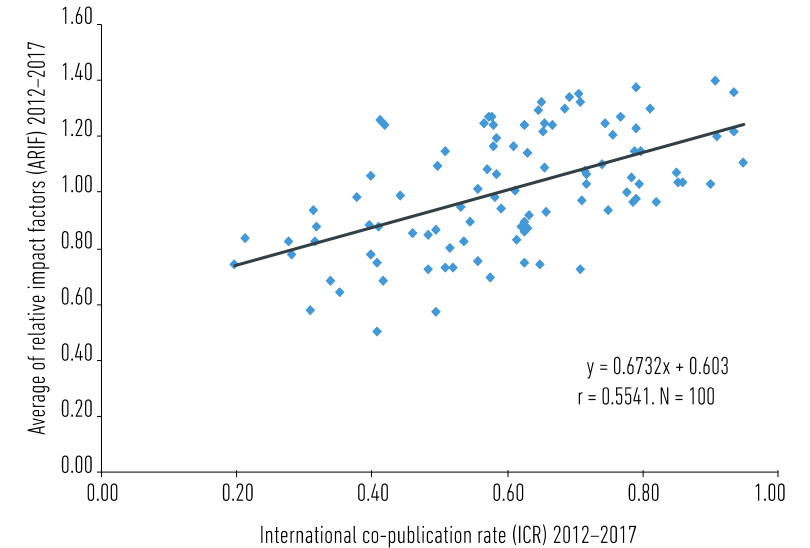


Figure ES.10. Comparison of ICR and average of relative impact factors (ARIF) of the ocean science community and ocean practitioners.
Source: Authors Chapter 5, based on the bibliometric analysis of Scopus (Elsevier) data 2012–2017 by Science-Metrix/Relx Canada.

International collaboration results in a higher quality of work.

GOSR2020 Ocean science generates both knowledge and applications

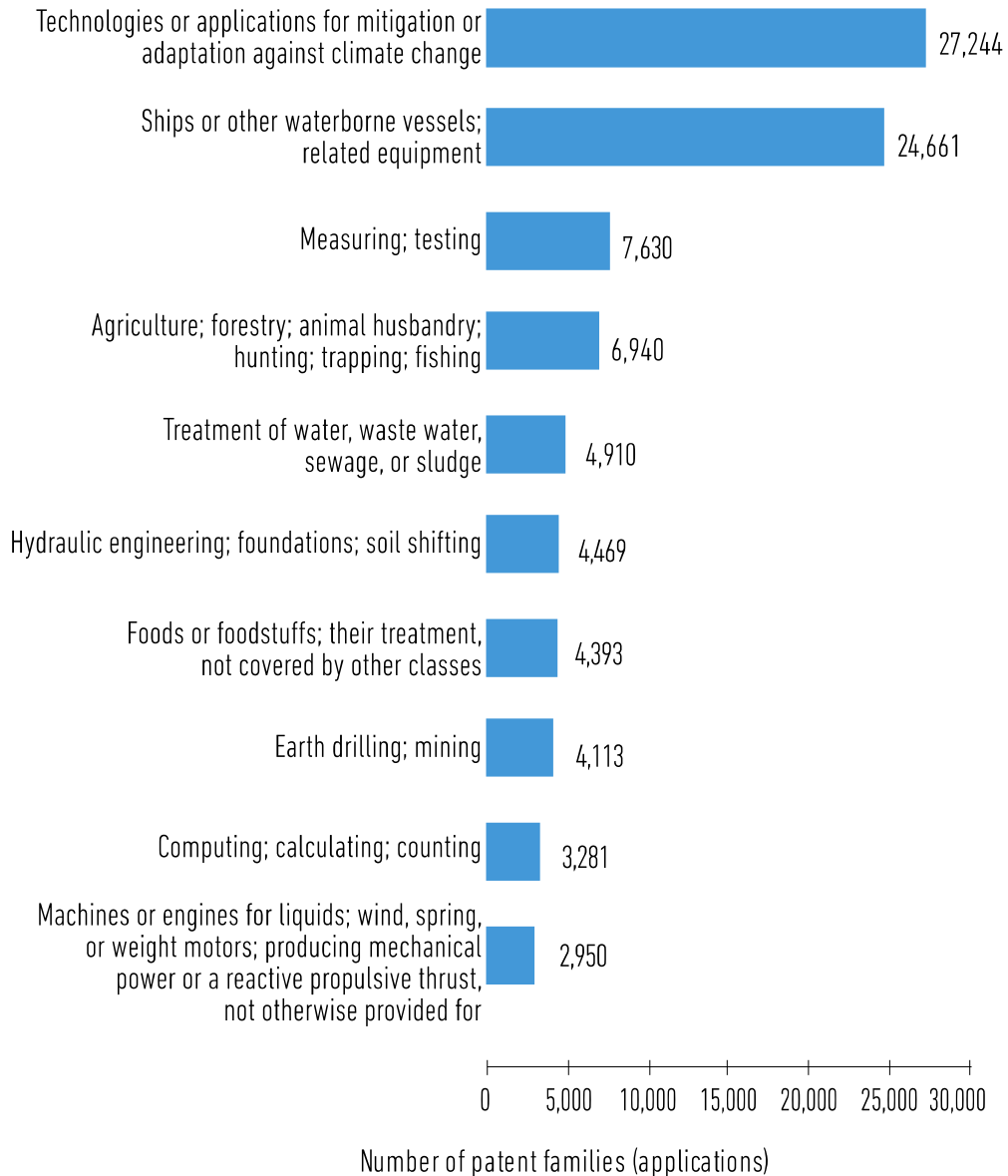


Figure ES.11. Top 10 most frequent CPC technical field classes in the total number of ocean science patent families (applications) using fractional counts.

Source: Based on the technometric analysis of 2000–2018 data provided by the United States Patent and Trademark Office, the European Patent Office, the Korean Intellectual Property Office, the Japan Patent Office and the China National Intellectual Property Administration by Science-Metrix/Relx Canada.

Ocean science findings are converted into applications for society ‘Technologies’ or ‘Applications for mitigation’ or ‘Adaptation to climate change’ are the most frequent ocean science-related technologies in the Cooperative Patent Classification (CPC).

This reflects the increasing recognition of the ocean’s role in regulating the climate and the negative impact of anthropogenic change on ocean health. Ocean science discoveries feed into nearly all sectors of the economy.



GOSR2020 Marine Technology

Access to technical infrastructure required for ocean science remains unequally distributed. Countries in the southern hemisphere only have limited access to ocean science technologies and infrastructure.

Access to the open ocean is not a given. More than a third of this global research fleet is maintained by the USA. Based on information obtained for 920 research vessels, local and coastal research is the primary purpose of 24% of these research vessels in 35 countries, 8% of the vessels operate at regional, 5% at international and 11% at global scale

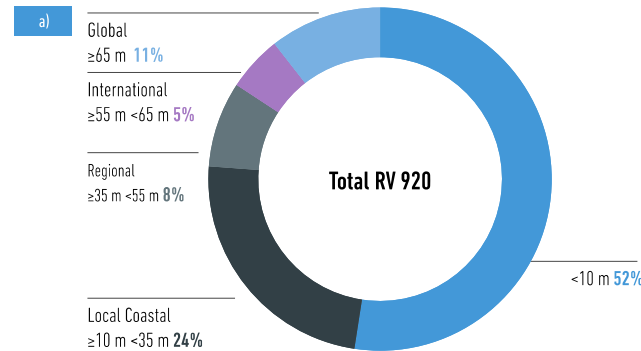
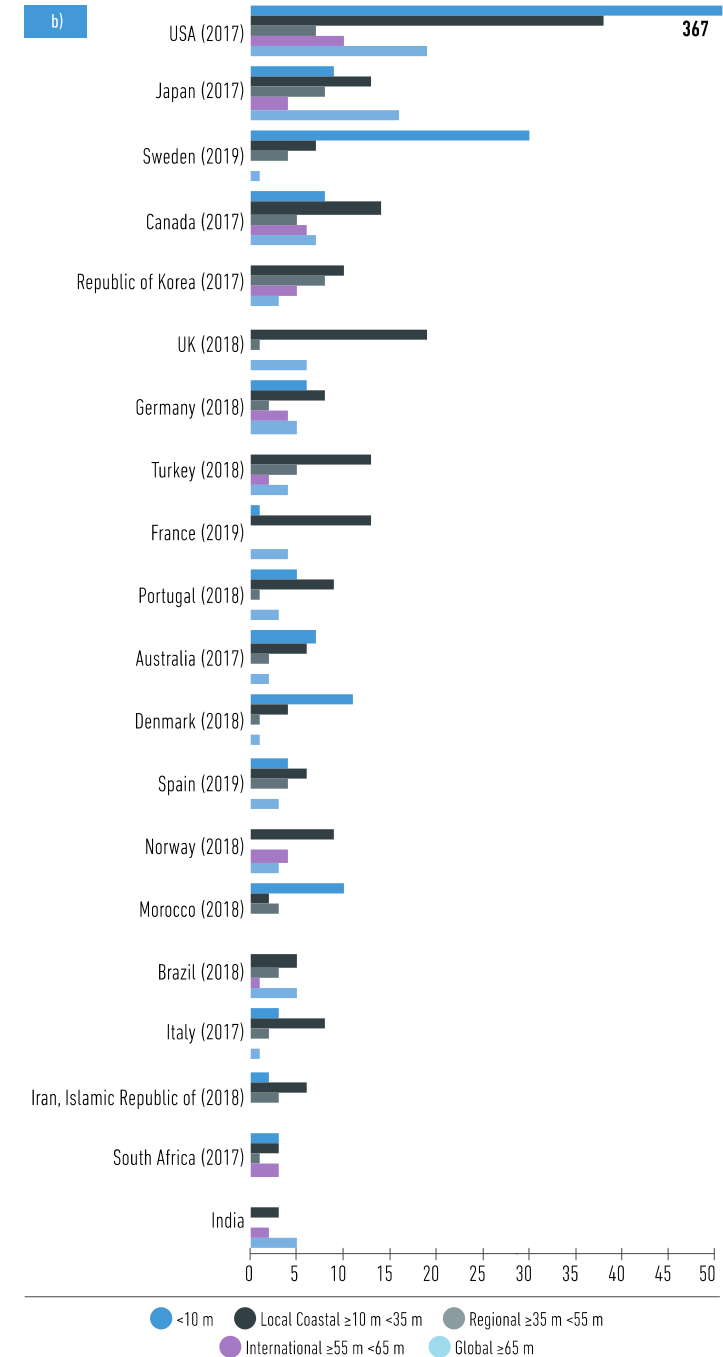


Figure ES.18. Number of nationally maintained RVs (a), classified by ship size. Detailed information is provided for the top 20 countries only (b). Sources: Data based on the GOSR2017 and GOSR2020 questionnaires.



GOSR2020 Investments

There are large differences in countries' investment in ocean research.

On average, only 1.7% of national research budgets are allocated for ocean science, with percentages ranging from around 0.03% to 11.8%. This is a small proportion compared to the modestly estimated US\$1.5 trillion contribution of the ocean to the global economy in 2010.

SDG indicator 14.a.1

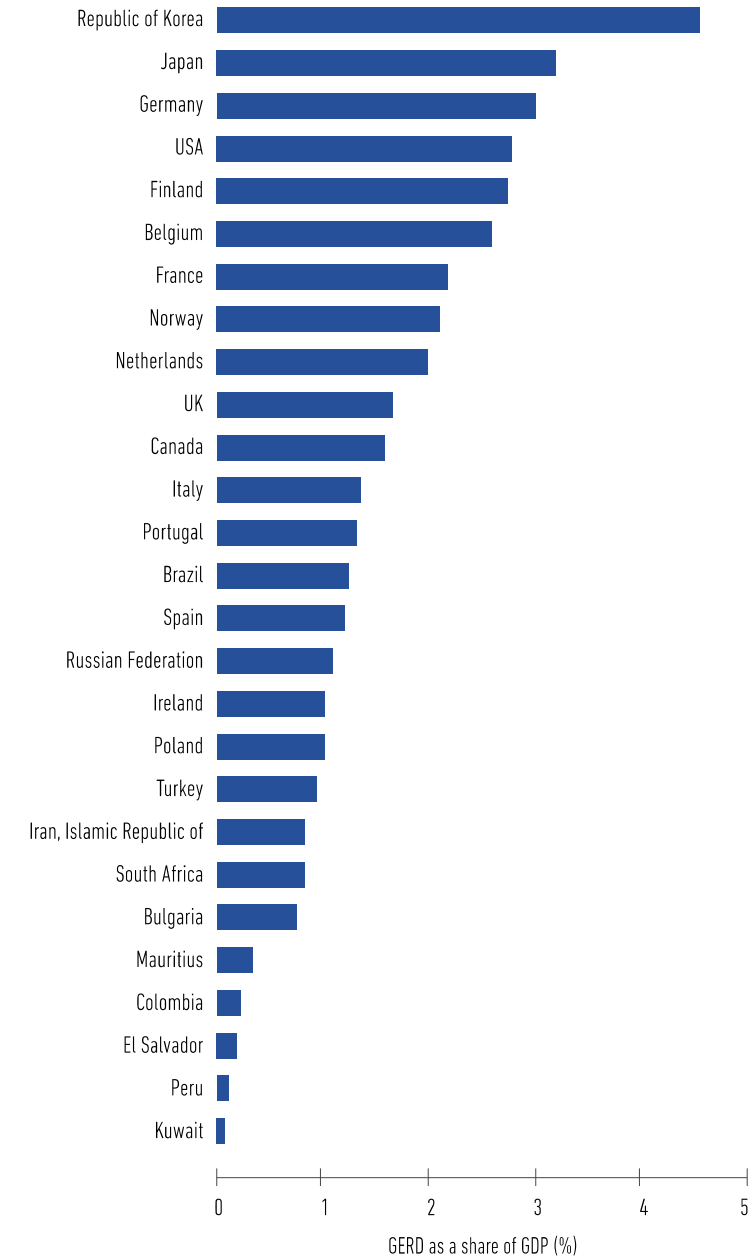
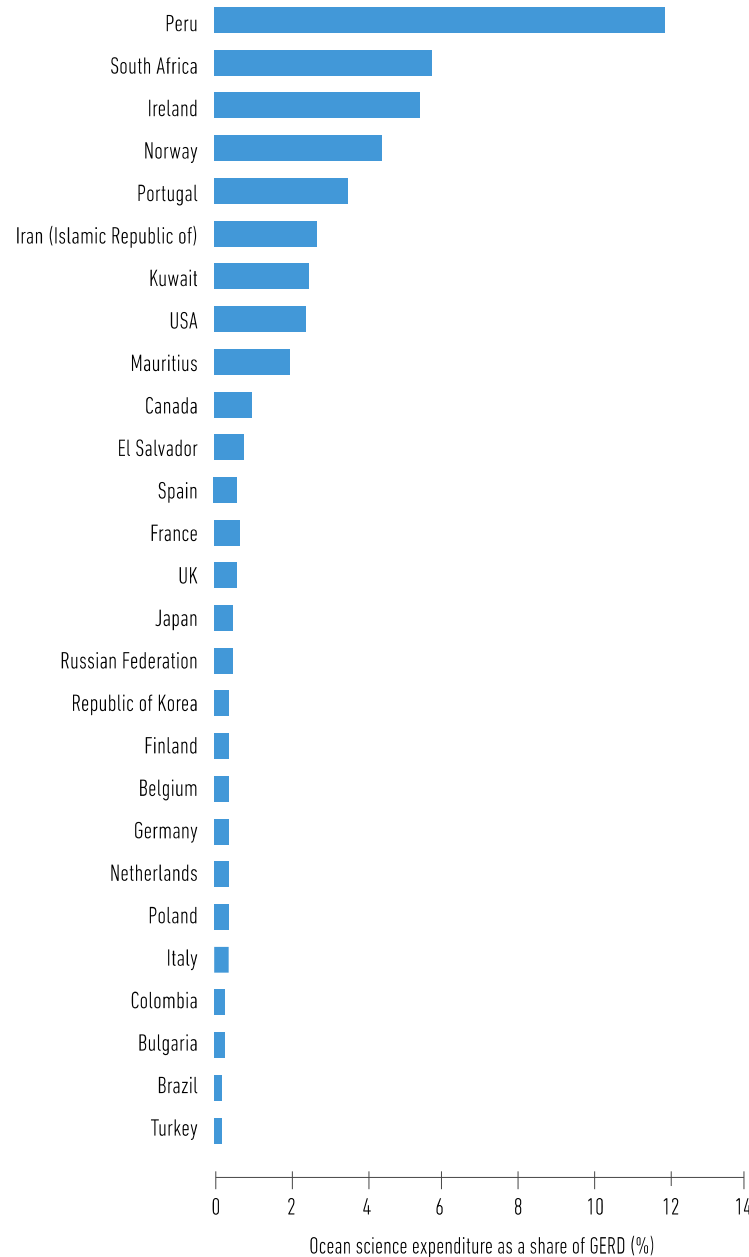


Figure ES.19. Estimates of ocean science funding as a share of GERD and GERD as a share of GDP in 2017.

Sources: Data adapted from GOSR2020 questionnaire and UNESCO Institute for Statistics database. Note that ocean science funding is not identified as such in GERD data and can be found in natural sciences and other categories.

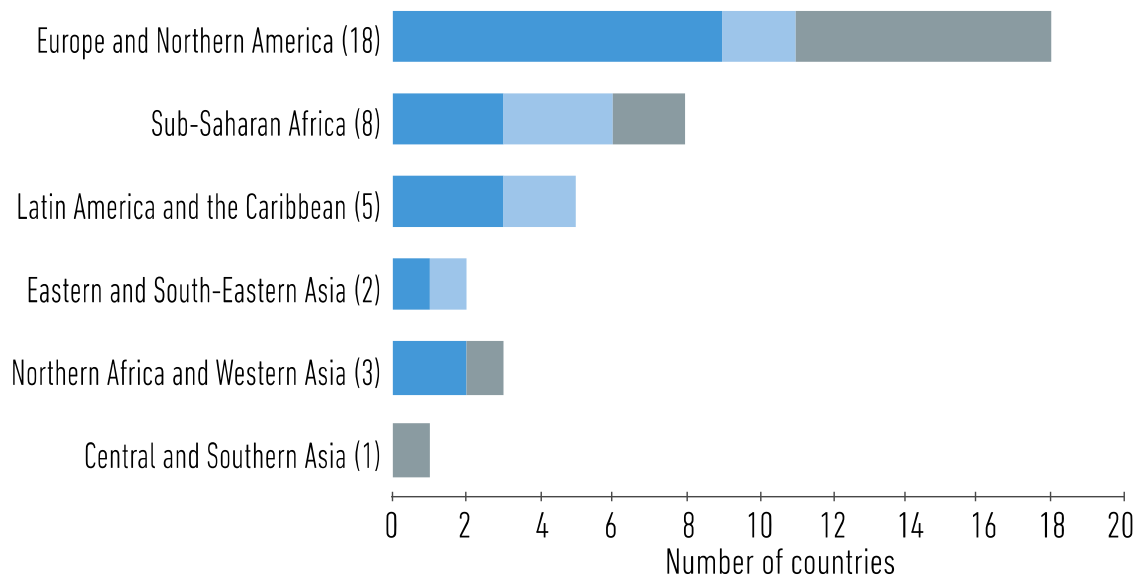
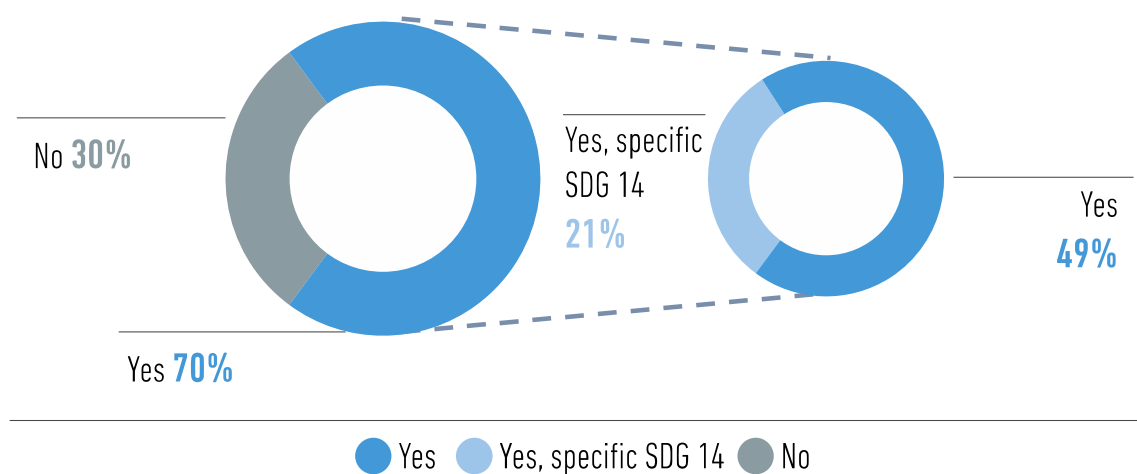


Figure ES.13. Distribution of countries that reported to have a national strategy to achieve the 2030 Agenda ('Yes') and/or SDG 14 within the different regional groups and globally, or not. Source: Data based on the GOSR2020 questionnaire.

Many countries lack a specific strategy to measure progress towards the achievement of SDG 14.



Of the 37 countries that responded to the related GOSR2020 question, over 70% have strategies and a roadmap to achieve the goals of the 2030 Agenda. However, only 21% reported that they have a specific strategy focusing on the ocean and SDG 14



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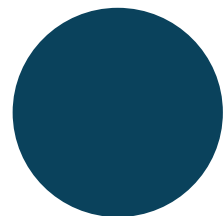


Intergovernmental
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Commission

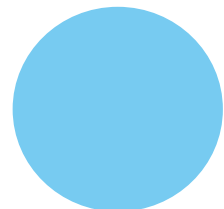
From assessing the state of ocean science to ocean science in action

- I. Enhance the current level of funding for ocean science.
- II. Establish continuous collection of internationally comparable data on investments in ocean science.
- III. Facilitate co-design of ocean science by involving ocean science information users and producers .
- IV. Promote multistakeholder partnerships in ocean science and operationalize transfer of marine technology.
- V. Move towards ocean science capacity development with the equal participation of all countries, genders and ages, embracing local and indigenous knowledge.
- VI. Develop strategies and implementation plans to support the career needs of women and young scientists.
- VII. Find solutions to remove barriers for open access to ocean data.
- VIII. Foster education and training in professions related to ocean sciences.
- IX. Assess the impact of the COVID-19 pandemic on human and technical capacity in ocean science.

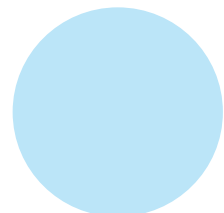
ROADMAP



Full GOSR publication in 2024/2025, preparation to start in 2023



Intermediate report to be prepared for next SDG data collection cycle: Ocean Science **Capacitytracker**



Short 10-15 questionnaire focusing on human and technical resources as well as SDG 14.a.1 and ocean science investment more general to be send to Member States 3rd quarter of 2022



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Global Ocean Science Report 2020

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