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STATE OF THE PLANET Discussions

Spreading the Message: Capacity Development and Ocean Literacy

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Abstract. Ocean literacy and capacity development aim to bridge knowledge gaps at various levels and ocean forecasting is the engine that can support the overcoming of such limits, easing the connections between science and society through data and information. Ocean literacy focuses on understanding the fundamental reason behind ocean processes – the "know-why" that brings awareness of human impacts on our ocean and supports more informed decision-making, disseminating knowledge about the importance of preserving, protecting and sustaining the marine environment. Capacity development, on the other side, offers processes to enhance abilities and skills for implementing solutions, achieving goals and supporting collaboration. This review discusses ocean literacy activities as driven by IOC-UNESCO to support Sustainable Development Goals for increasing knowledge and awareness of climate change and marine resources. It also offers an overview of primary frameworks for capacity development in ocean science through education, training and community exchanges, describing existing initiatives from global to regional scale. These frameworks are constantly evolving and must continue to be refined, particularly in identifying the best approaches, evaluating the impact on such initiatives and increasing their efficiency and effectiveness.

1 Introduction

This contribution addresses the notions of 'ocean literacy' and 'capacity development' within the ocean forecasting field. Ocean literacy and capacity development are catch-all terms encompassing many concepts at once, addressing multiple targets, and engaging numerous stakeholders i.e., decision-makers, scientists, public or private sector individuals, non-governmental organizations, start-ups, teachers and students, etc. It is, therefore, quite logical but nonetheless complex, that each notion holds many definitions (Aantjes et al., 2022); agreeing on one is the first step to foresee. In the present document, ocean literacy will be understood as defined by the Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO): "an understanding of the ocean's influence on you and your influence on the ocean". Similarly, the OECD defines capacity development as "the process whereby people, organizations and society as a whole unleash, strengthen, create, adapt and maintain capacity over time" (OECD, 2008). While these definitions can lead to infinite objectives, both ocean literacy and capacity development are focusing on one overarching objective: bridging knowledge gaps at the individual, organisational and societal levels. Whether it is between science and society, science and policy, or even within different science fields, disseminating and strengthening knowledge is the primary goal to achieve. A strong interdependence exists between the notions, with ocean literacy focusing on apprehending the 'know-why' and the capacity development on enhancing the 'know-

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how'. This contribution will be dedicated to mapping the landscape of current ocean literacy and capacity development activities within the ocean forecasting field.

2 Ocean Literacy

2.1 Definition and initial steps

The Ocean Literacy concept emerged in the United States of America (USA) some twenty years ago with the very concrete "Ocean Literacy Framework" developed in 2002 by a collaborative team involving scientists and educators in the ocean sciences education community, within the National Marine Educators Association (NMEA), and with NOAA and the Lawrence Hall of Science (University of California, Berkeley) having a leadership role. Due to the lack of ocean-related subjects in formal education, they formed a group of ocean scientists and education professionals and initiated a comprehensive framework to encourage the inclusion of ocean sciences into national and state standards, and for more teaching about the ocean from kindergarten to the last year of secondary school.

This massive collaborative endeavour succeeded to build consensus that Ocean Literacy is an essential component of science literacy (Strang, Schoedinger, and deCharon 2007). This Framework process resulted in seven overarching ideas called the essential principles of Ocean Literacy and 44 fundamental concepts (45 from 2013) that elaborate on each principle (Figure 1).

This 'ocean literacy framework' has been elaborated by the many scientists and educators of NMEA and is based on practical and research-based documents meant to influence learning and teaching about the ocean throughout schools, museums, aquariums, science centres, parks, and other informal learning spaces.

Among the foundational documents of the Ocean Literacy Framework, we can highlight:

- The Ocean Literacy Scope and Sequence for Grades K-12 (National Marine Educators Association, 2010), a series of instructional tools (free and online) providing guidance to educators to help their students achieve a full understanding of the ocean.
- The International Ocean Literacy Survey (IOLS) serves as a community-based measurement tool that allows the comparison of levels of ocean knowledge across time and location (Fauville et al., 2019).

From the beginning, Ocean Literacy was aligned with the objectives of environmental education as defined by UNESCO in 1975: Awareness, Attitude, Skills, Participation (Fauville et al., 2019).

2.2 Mapping Ocean Literacy Activities

This ocean literacy movement born in the USA has quickly spread around the world with the development of worldwide networks meant to promote Ocean Literacy, and to name a few: The International Pacific Marine Educators Network (2007), the European Marine Science Educators Association (2012), the Canadian Network for Ocean Education (2013), the Asia

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Marine Educators Association (2016). Meanwhile, Ocean Literacy conferences and meetings have been convened in Portugal, Japan, Belgium, Chile, Australia, Fiji, Italy (…).

Figure 1: The seven Essential Principles of Ocean Literacy

Ocean Literacy is a focus of unique international commitments such as the European Union's Galway (2013) and Belem (2017) statements on scientific cooperation among countries that border the Atlantic and the UN Decade of Ocean Science for Sustainable Development (2021-2030) for which Ocean Literacy is both the Challenge #10 and a priority "for paving the way towards the ocean we want by 2030" (IOC/UNESCO, 2021). Ocean Literacy has further been identified as one of the seven key domains of action determining the success of reaching a sustainable and scientifically informed ocean governance (Claudet, 2021).

However, the game changer in the Ocean Literacy landscape is also UNESCO/IOC "Ocean Literacy for All, a toolkit" (Santoro et al., 2017) and the Ocean Literacy Portal: "If we are to succeed in achieving SDG14, we must build a global constituency for the ocean." Several national reports have been produced over the last decade that document the centrality of the ocean, coasts, and seas to the economy, environment, and quality of life. They emphasize the need for increased "ocean literacy to improve economic stability and national security, and to allow society to understand critical issues associated with important ocean-related topics spanning ecology, trade, energy exploration, climate change, biodiversity, the ocean, and human health, and developing a sustainable future".

Even if most ocean scientists and education professionals have recognised the need to define a strategy to make ocean science a component of formal education curricula, the targeted audience of Ocean Literacy must be much broader than young citizens: Ocean Literacy targets should include policymakers and economic players who also impact ocean health. To illustrate, in March 2022, UNESCO/IOC called all Finance Sector professionals for an introductory module to present what is Ocean Literacy and the connection the ocean has with the Finance Sector. Ocean literacy programs and projects, until now, have been mainly focusing on developing resources, lesson plans and activities targeting Science, Technology, Engineering and

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Mathematics (STEM) education. UNESCO/IOC proposes to go beyond that and proposes that Ocean Literacy should be transformative and inclusive. “Individuals are encouraged to be responsible actors who resolve challenges, respect cultural diversity and contribute to creating a more sustainable world” (Santoro et al., 2017).

To reach this ambition, UNESCO/IOC proposes three Learning objectives for SDG 14 “Life below Water” that are going beyond mere knowledge and awareness:

- Cognitive Learning Objectives, related to knowledge such as “The learner knows the basic premise of climate change and the role of the oceans in moderating our climate”.
- Socio-Emotional Learning Objectives, related to emotion and empathy, such as “The learner is able to empathize with people whose livelihoods are affected by changing fishing practices”.
- Behavioural Learning Objectives, related to the influence of behavioural change, such as “The learner can campaign for expanding no-fish zones and marine reserves and for their protection on a scientific basis”.

By doing so, UNESCO/IOC creates a new fundamental pillar of Ocean Literacy, Ocean Citizenship: “One of the challenges of ocean literacy is to define ways to encourage behavioural change to foster the creation of ocean citizenship. Ocean citizenship describes a relationship between human beings' everyday lives and the health of the coastal and marine environment. As such, individuals have a responsibility to make informed lifestyle choices to minimize this impact.” (Santoro et al., 2017).

Ocean Literacy is not only a matter of creating awareness and knowledge about the ocean but also a way to change the behaviour of individuals towards the ocean. “Behavior change rarely occurs as a result of simply providing information.” In this sense, both formal and non-formal ocean education endeavours should be conceived as “transdisciplinary forms of ocean literacy. Ocean literacy initiatives should not only be confined to ocean science, but should also include experiential learning, knowledge of personal and social responsibility, and understanding of the roles of governance and communication in moving from knowledge to action” (Santoro et al., 2017).

Ocean Literacy programmes cannot be merely “global” but rather “regionalised” and adapted to the very landscape of each learner, not only to raise the necessary emotional attachment but also to provide relevant and customized learnings: “Looking to future work it is hoped that ocean literacy will embrace all subjects, not only science but also art, music, archaeology, culture, geography and that definitions, principles and concepts will be adapted and developed to make it relevant locally” (Santoro et al., 2017). This regional approach to Ocean Literacy leads to the inclusion of traditional knowledge of indigenous people and communities such as in the Arctic Sea and Small Island Developing States (SIDS).

In that sense, the Ocean Decade Network is a notable initiative, as it references numerous ocean literacy activities taking place in different regions, at various scales, all in the same place. The UN Decade Challenge 10 particularly focuses on ocean literacy, aiming at “Changing humanity’s relationship with the ocean”, i.e., “ensure that the multiple values and services of the ocean for human wellbeing, culture, and sustainable development are widely understood, and identify and overcome barriers to behaviour change required for a step change in humanity’s relationship with the ocean”. For example, the UN Decade Programme Ocean Literacy With All (OLWA) hosts a dozen of UN Decade-endorsed Ocean literacy projects and builds

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networks and partnerships to advance toward an ocean-literate society through the development of local, regional and global activities. Furthermore, the platform counts more than 300 endorsed actions related to ocean literacy, widely ranging from art initiatives to educational programs, conservation projects and awareness-raising activities for specific audiences (children, coastal communities, fishermen, etc.).

The Evolution of ocean literacy: A new framework for the United Nations Ocean Decade and beyond ocean knowledge into meaningful behaviour change and action for ocean sustainability (McKinley and Burdon, 2020) proposes the following ten dimensions of ocean literacy, with a view to more accurately encapsulating the human-ocean relationship: Knowledge, Awareness, Attitude, Behaviour, Activism, Communication, Emotional Connections, Access and Experience, Adaptive capacity, Trust and Transparency.

We can yet consider that all digital experiences: oculus rift, virtual reality, or gamified mobile applications (Leitao et al., 2021) based on science-based ocean forecasts and regional indicators provided by OceanPrediction should be very useful for future Ocean Literacy programmes not only for engaging citizens but also for convincing policymakers and economic players (Calil et al., 2021).

2.3 Impact measurement of Ocean Literacy

Despite international efforts towards Ocean Literacy since the year 2000, it has been difficult to show the progress and impacts of the Ocean Literacy movement. The need for a shared measurement tool has emerged across the Ocean Literacy Framework communities formed since 2002. A few global and regional initiatives have been launched over the last fifteen years, and while they have brought many new elements, they do not yet make it possible to measure the impact of the numerous and immense collaborative efforts around the world.

Two of them can be cited:

- The International Ocean Literacy Survey (IOLS) project is an unfunded and collaborative effort, initiated in 2015 to address this challenge. The IOLS is a community-based measurement tool that allows the comparison of levels of ocean knowledge among 15- to 17-year-olds across time and location. The IOLS includes multiple choice questions addressing the ideas about the ocean described by the Ocean Literacy Framework. The IOLS has already gone through two rounds of field testing. The results from the second test, provide evidence that the IOLS is valid and reliable, and has a single-factor structure across 17 languages and 24 countries as presented in the publication “Development of the International Ocean Literacy Survey: measuring knowledge across the world” (Fauville et al, 2019).

  Extracted from the publication, a few methodological components are described below:

  - The IOLS was originally designed in English and translated by volunteer researchers into 16 languages (Catalan, Croatian, Danish, Dutch, French, German, Greek, Italian, Japanese, Norwegian, Polish, Portuguese, Simplified Chinese, Spanish, Swedish, and Traditional Chinese).
  - This process of translation served two purposes: to create versions of the instrument for use in other languages and to function as a systematic review of the items themselves.

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- At the end of August 2016, The IOLS V2 was made available online.
- The authors made use of a wide range of mailing lists, private and professional social media platforms, and newsletters to invite educators to share the survey with their colleagues and to administer it to their 16–18-year-old students around the world in the appropriate language for the population.
- Between August 2016 and October 2016, 6871 individuals agreed to be in the study.
- The fourth version was completed in early 2019, with 7900 respondents participating in the survey. Results are described in a paper published and presented in 2020 (Chen et al. 2020).

- The Blue Survey: Validation of an instrument to measure ocean literacy among adults (Paredes-Coral et al., 2022). The study was funded by the European Union Programme ERASMUS. Given that previous studies were mostly meant to capture the knowledge dimension only and essentially amongst the youth, the Blue Survey produced an international comparative online instrument meant to measure ocean literacy in adult populations and to assess the influence of different cognitive, and behavioural factors to better orientate and improve ocean literacy initiatives. Responses were obtained from March to May 2020, reaching professionals linked to marine and maritime careers working for the industry. The survey link was sent by email and shared through social media networks.

From a total of 453 participants, 251 complete responses were used in the analysis. The results support previous research findings which suggest that ocean literacy is a complex and multi-dimensional concept and that measurement instruments for ocean literacy should go beyond the classic cognitive and awareness approach and should also incorporate attitudinal and behavioural dimensions (Paredes-Coral et al., 2022).

3 Capacity development

3.1 Mapping capacity development activities

3.1.1 What activities range behind capacity development?

Capacity development is a polysemic notion, which only broadens when considering that “components of capacity include knowledge, skills, systems, structures, processes, values, resources and powers that, taken together, confer a range of political, managerial and technical capabilities” (Shackeroff, Theisen et al. 2016). Numerous activities can be thus implemented under the notion of capacity development; this study has attempted to categorize them into the following framework: higher education, continuous training (not only for students, but also professionals at any stage of their careers), and community exchanges (Figure 2). Capacity development ranges in size, degree of specificity and technicality: from massive online courses to tailored mentoring, from public information to higher education, and from individual opportunities to professional networking, and best-practices exchanges.

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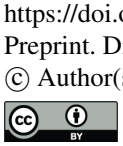

Figure 2: Framework for capacity development activities in ocean science

3.1.2 The priority target audience of ocean science capacity development

The United Nations Decade of Ocean Science for Sustainable Development (hereafter 'UN Ocean Decade') has made capacity development one of its main priorities, a key for delivering "the ocean we want" (UNESCO/IOC, 2020). Strengthening countries' capacities in building and sustaining ocean observing systems is decisive to inform and guide policymaking, and to develop and implement international agreements for a sustainable ocean (Miloslavich et al., 2018). The ninth challenge of the UN Ocean Decade is thus seeking to "ensure comprehensive capacity development and equitable access to data, information, knowledge and technology across all aspects of ocean science and for all stakeholders" (UNESCO/IOC, 2021). The equity principle is crucial here, as the Global Ocean Science Report demonstrated over the years the extent to which inequalities persist in ocean science, whether in geographical, gender, or generational representations (IOC-UNESCO, 2017; IOC-UNESCO, 2020).

Indeed, studies tend to demonstrate that capacities are continuously larger in developed regions than in developing regions, as it is possible to see in Figure 3 analysing the number of ocean science publications per country. Also, scientific cooperation across regions, despite intensifying, remains too limited within developed countries from Europe, North America, and Asia (Uku et al., 2020). Strengthening the capacities of these groups, while pursuing to a larger extent developing ocean science skills and knowledge of all, is the two-fold aim of capacity development in the UN Ocean Decade.

When it comes to gender and generational imbalances, the Global Ocean Science Report demonstrated that women and young ocean scientists continue to be underrepresented in ocean science (Black 2020; Uku et al. 2020), as shown in Figure 4 and Figure 5.

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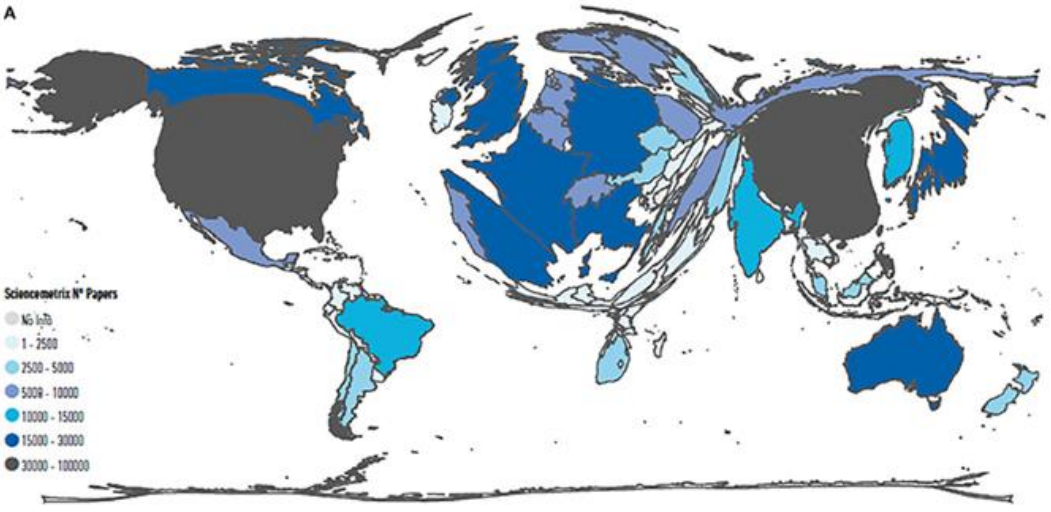

Figure 3: Distorted world map showing each country scaled in proportion to the number of ocean science publications. Different colours indicate a different number of publications. Source: Global Ocean Science Report, 2017

3.1.3 Capacity development, from global initiatives to regional activities

In early 2023, UNESCO/IOC launched the Ocean CD-Hub[1] to openly share worldwide ocean-related capacity development opportunities, posted by any stakeholder willing to contribute. The platform classifies the opportunities into different types, responding to the diversity of activities enounced above. The Ocean CD-Hub also allows sorting the opportunities through regions and stakeholders. Out of 422 referenced opportunities currently, more than two-thirds are proposed by academic and research stakeholders, or by international and intergovernmental agencies. The remaining activities are proposed by governmental parties, private sector stakeholders, nonprofit and philanthropic organizations. These results may evolve as the platform continues to develop, yet it still provides a clear indicator of the main actors involved in ocean science capacity development.

UNESCO/IOC is furthermore organizing its capacity development activities through the 'Ocean Teacher Global Academy' (OTGA) of the International Oceanographic Data and Information Exchange (IODE) programme and through the IOC Sub-Commissions and Regional Committees (Claudet et al., 2020; Miloslavich et al. 2018).

OTGA courses have a specific focus on IOC's Member States' training needs, with special attention to developing countries (but not only) and ensure during the applications' selection a gender-balanced representation in its courses, as per UNESCO's gender policies. An endorsed project of the UN Decade, OTGA has developed a strong international network of local universities and research institutes, acting as regional training centres (Figure 5.3-6). These centres develop courses addressing regional training needs, aligned with IOC's policies and guidelines. Additionally, it enables training in the regionally relevant languages and resorting to in-field experts. OTGA, with the European Copernicus Marine Service and EUMETSAT, also

[1] https://oceancd.org/

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organizes regular online courses to train future teachers (Supporting Marine-Earth Observations Educators) and therefore multiply its impact over time.

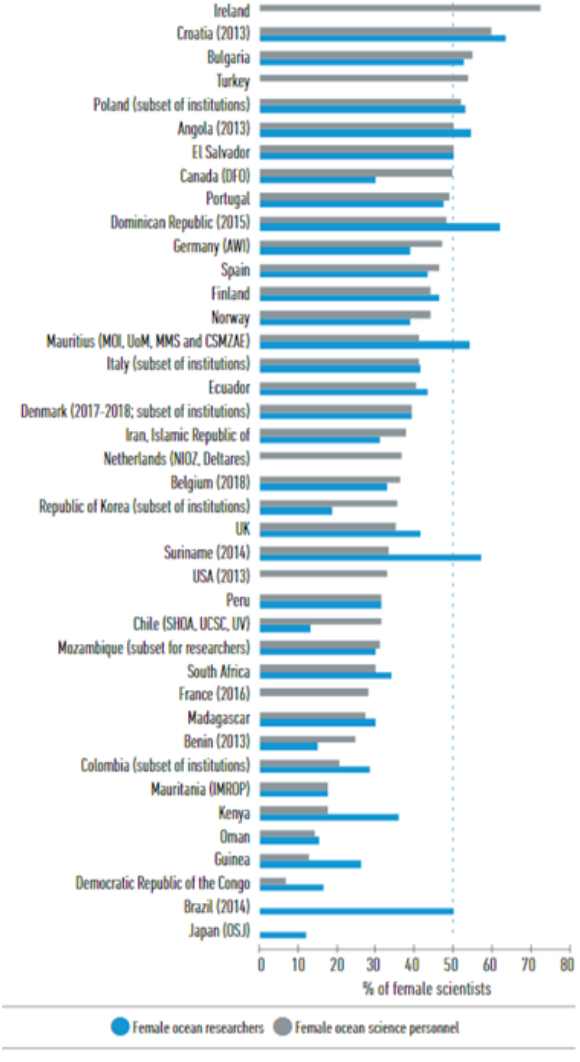

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Figure 4: Proportion of female ocean science personnel and female ocean researchers in 2017 per country, in %. Source: Global Ocean Science Report, 2020.

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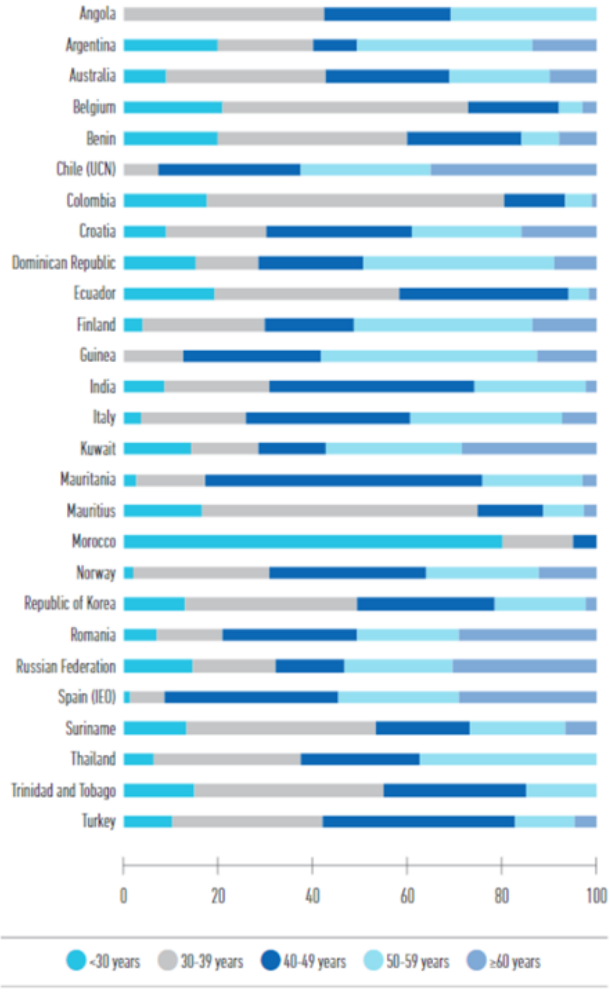

Figure 5: Age repartition of ocean science researchers, in %. Source: Global Ocean Science Report, 2017

The Ocean Decade Network[2] is another global platform sharing numerous capacity development opportunities, as it references all Decade Actions, Contributions, Programmes and Projects; for example, the abovementioned OTGA initiative is an endorsed action under the UN Decade. The platform enables to sort the activities by UN Decade Challenges, and, relevant to the capacity-development scope of this section, we can mention the Challenge 9 "Skills, knowledge and technology for all" aiming to "ensure comprehensive capacity development and equitable access to data, information, knowledge and technology across all aspects of ocean science and for all stakeholders." and the Challenge 7 "Expand the Global Ocean Observing System" working to "ensure a sustainable ocean observing system across all ocean basins that delivers accessible, timely, and actionable data and information to all users.". The platform is further organised in thematic Groups to exchange with peers, among which one is dedicated to capacity development.

[2] https://forum.oceandecade.org/

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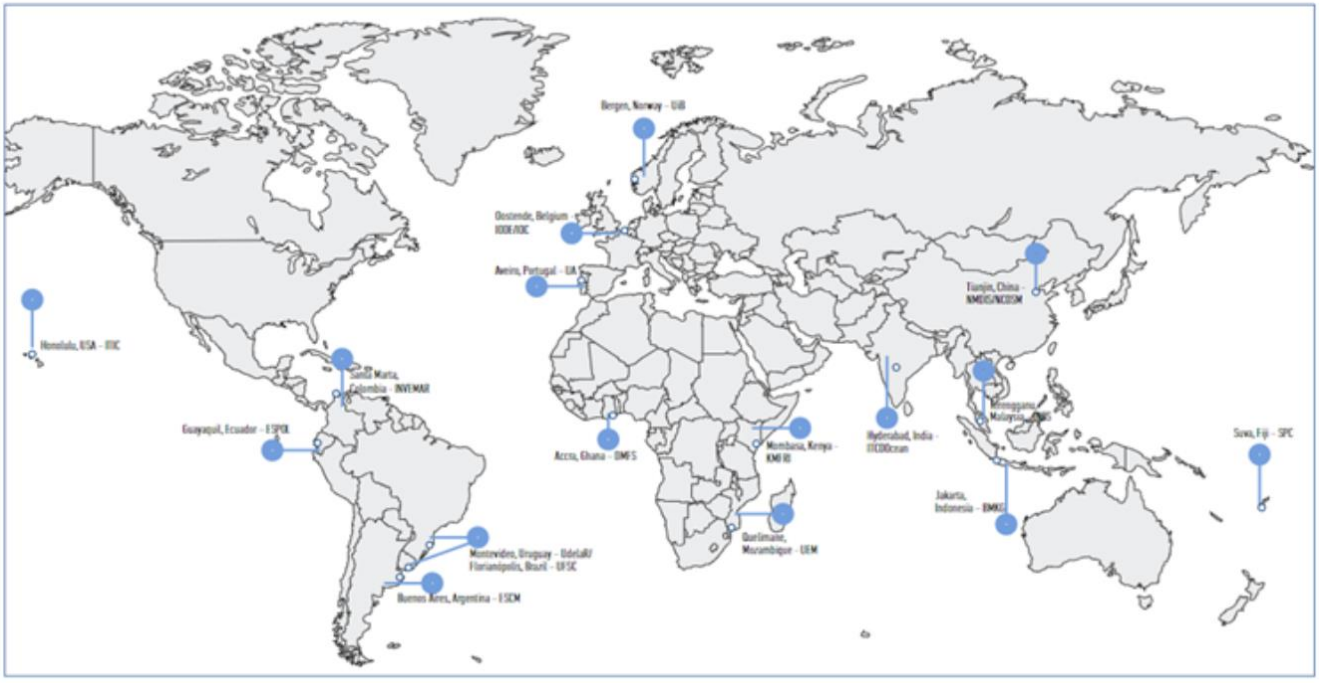

240 **Figure 6: OTGA regional training centres and specialized training centres in 2020. Source: IODE**

Moreover, the Global Ocean Observing System (GOOS) programme, which is coordinated by UNESCO/IOC, the World Meteorological Organisation (WMO), the UN Environment Programme (UNEP) and the International Science Council (ISC), is composed of 15 regional alliances, organizes regional capacity development activities. The GOOS 2030 Strategy insists further, stressing that capacity development is a high priority to support increasing ocean observation capabilities in every
245 country and reach an integrated ocean observing system by 2030 (IOC-UNESCO, 2019). In 2022, GOOS publishes a Guide on "Implementing Operational Ocean Monitoring and Forecasting Systems", aiming to promote their development and strengthening worldwide (Alvarez Fanjul, et al., 2022). This technical publication delivers international standards and best practices across the whole value chain, which makes it a reference document for capacity development in ocean forecasting.

Besides IOC's engagement in capacity development, numerous other actors are proposing activities at the global level. The
250 present study will not attempt to dress an exhaustive list but rather will highlight a few examples below.

- The European Copernicus Marine Service regularly organizes online training workshops to teach how to access and use its data. Each training is dedicated to a specific region, whereas the European basins or the other continents, and it endeavours to present local examples of data usage for a sustainable ocean. Each training is followed up by a Q&A webinar shortly after, and with a survey to collect feedback and further understand future needs. Besides, the
255 Copernicus Marine Service also proposes on-demand mentoring initiatives, tailored to specific audiences, from a week-long course in 2023 for the MSc Ocean, Atmosphere and Climate Sciences (Oceanography & Applications track) in Cotonou, Benin, to on-demand mentoring and hackathons for entrepreneurs.

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- The Early Career Ocean Professionals Programme (ECOP) of the UN Decade aims to support young professionals by providing them with a global network and ensuring knowledge transfer, opportunities for sharing, and collective participation in the international ocean dialogue. In 2020, the Programme launched a survey to which 1400 ECOPs replied, stating that Network & Information and Training & Mentoring were their top needs and expectations. Organized in Regional and National Nodes and Task Teams, the Programme intends to directly develop but also promote relevant training events and mentoring opportunities for their participants.
- The International Ocean Institute (IOI) is active in ocean capacity development, and particularly ocean governance, since its creation in the 1970s; it organizes (online) training courses, master programmes, summer schools, tailored workshops, offers scholarships and sponsorships, etc. The trainings are mostly targeting developing countries and focusing on regional perspectives; they are conducted at the national level through national training centres and partners, in the country's main language.
- The Partnership for Observation of the Global Ocean (POGO) and the Scientific Committee on Oceanic Research (SCOR) are two international nonprofit organizations with capacity development activities regarding ocean observation, particularly towards developing countries. Founded in 1999, POGO implements various training programs for early career scientists from developing countries, especially the 10-month operational oceanography programme of the Nippon Foundation-POGO Centre of Excellence, dedicated each year to 10 postgraduate students, or the Visiting Fellowship programme - in partnership with SCOR. The latter was founded in 1957 by the International Science Council (ISC) to foster interdisciplinary research related to the ocean. Among its capacity development activities, it particularly organises the Visiting Scholars Program, supporting ocean scientists to teach and provide mentoring in developing countries' ocean science institutions. Such partnership program (also organised by POGO some years ago) had revealed providing several long-term benefits among which avoiding a 'brain-drain' from early career scientists, enabling the visiting scientists to gain a better understanding of the existing gaps in the hosting countries, and likely increasing their willingness to pursue their involvement (Urban and Seeyave, 2021).
- Universities and academic institutions are not addressed in this study since countless of them around the world organize some capacity development activities as part of their higher education programmes; but they are, evidently, key players in training future professionals of ocean science or ocean governance (Miloslavich et al. 2018). Also, numerous capacity development activities exist at the local and regional levels, and it takes a strong knowledge of the regional organization and its main stakeholders to thoroughly identify these structures and initiatives, similar to the analysis of Marine Studies Programmes in the Pacific Islands conducted by Veitayaki and Robin South (2001).

3.2 Impact measurement of capacity development

Assessing the impact of capacity development programs is a challenging task to realize, as, similarly to ocean literacy, its impact can only be measured in the long run. There is not a commonly accepted conceptual framework to monitor capacity development impact, and multiple studies have pointed out the lack of accountability systems to measure effectiveness

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(Sterling et al. 2022; Harden-Davies et al. 2022). Yet, it is widely agreed that measuring impact is crucial and that the method to do so must be decided from the capacity development design stage. Particularly, it is important to know and set how to monitor ongoing progress throughout the implementation phase and how to evaluate the outcomes to realistically manage, evaluate and report (Miloslavich et al. 2018).

In early 2000, the OECD Development Assistance Committee (DAC) proposed a six pillars evaluation framework to assess the worth of any intervention, from a policy to an activity. These criteria should not be considered as set-in-stone but rather indicative and flexible, meant to be adapted to the intervention being evaluated. The OECD issued 2021 the first technical guide on how to apply the criteria for evaluating an intervention, including elements to consider conducting an evaluation: context, purpose, roles and power dynamics, intervention, evaluability, and timing (OECD, 2021).

Figure 7: OECD Development Assistance Committee Evaluation Criteria Framework (Source: OECD, 2021).

Six evaluation criteria detailed (OECD, 2021):

- Relevance: Whether the intervention responds to identified target audience needs, including overtime, with consideration to eventual circumstantial changes.
- Effectiveness: Whether the intervention achieved the objectives set at its start, with intended outcomes and results.
- Impact: Whether the intervention has generated a significant effect, would it be positive or not, intended or not.
- Coherence: Whether the intervention is relevant for the region/country/group/sector it is intended for, compatible with other eventual interventions.
- Efficiency: Whether the intervention is delivering timely (following a set timeframe) and cost-effective outcomes.
- Sustainability: Whether the benefits of the intervention will last in time.

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Besides an evaluating framework, measuring impact should be conducted with an agreed set of tools, whether it is quantitative or qualitative methods: surveys, case studies, outcomes mapping, random sampling, cost-benefit and cost-effectiveness analysis, stories of change, theory-based evaluation, etc. A mix of multiple approaches is needed, and evaluating the impact cannot be limited to knowing the number of trainees, or interrogating participants throughout a one-time survey: it should assess the results based on a multi-criteria analysis and over a long period, evaluating the impact at various stages.

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Competing interests

The contact author has declared that none of the authors has any competing interests.

Data and/or code availability

This can also be included at a later stage, so no problem to define it for the first submission.

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