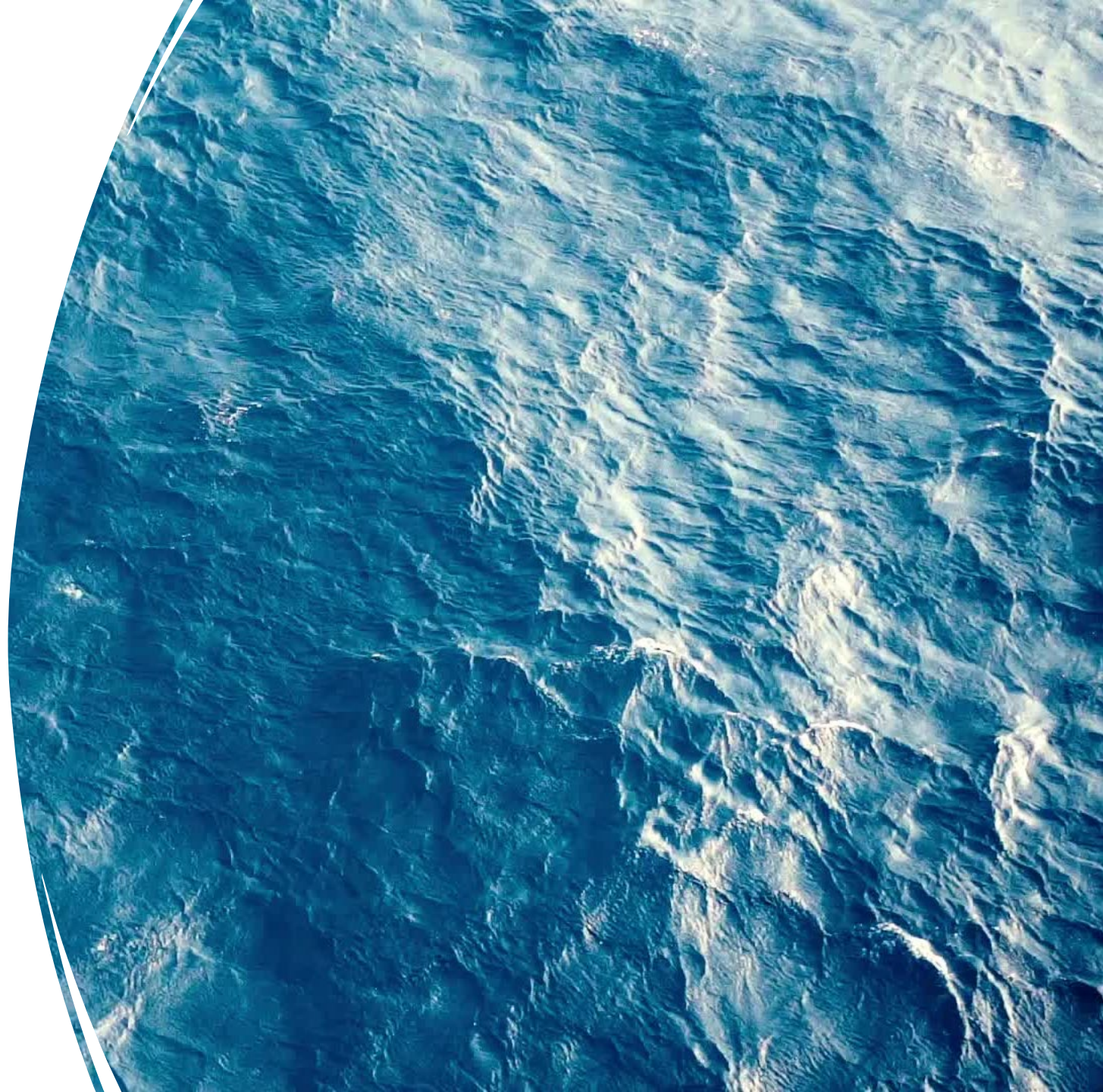




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## WG 159: DeepSeaDecade Roadmap for a Standardised Global Approach to Deep-Sea Biology for the Decade of Ocean Science for Sustainable Development

Co-leads: Ana Hilário (PT), Kerry Howell (UK)





**2021  
2030** United Nations Decade  
of Ocean Science  
for Sustainable Development

## Evolved into the steering committee of Challenger 150 (endorsed by the IOC as a Decade programme in June 2021)

### What is Challenger 150?

- It is a global cooperative devoted to delivering the science we need to sustainably manage the deep ocean.
- It is a vehicle for coordination of deep-sea biological research globally towards a set of common objectives.

### Objectives

- Capacity development and knowledge sharing
- Generate ocean data
- Build ocean understanding
- Increase use of ocean knowledge



# Regional Scientific Research Working Groups



North Atlantic  
South & Central Atlantic  
Western Tropical Atlantic  
Indian Ocean  
Mediterranean  
North East Pacific  
Central Pacific  
North West Pacific  
South East Pacific  
South West Pacific  
Arctic  
Antarctic

- coordinate research
- prioritise areas for study
- support development of new funding bids
- ensure the data gaps are filled
- build capacity in deep-sea science
- liaise with regional stakeholders on research needs
- support the development of science to end user pathways.

# Technical Scientific Research Working Groups



- Develop and agree standards on measurements and methods for biological research.
- Consider novel technological developments and their potential application to the field.
- Support data / sample archiving pathways.
- Develop training materials.

## Spotlight

In July 2022, the NW Pacific RSR-WG organised a well-attended online scientific workshop, showcasing expert talks on

- The Regional Biodiversity of Hadal Trenches
- Molecular Approaches in Deep-Sea Hydrothermal Vents and Seeps
- Abyssal Plain Biogeochemistry.

Following talks, we held discussions about how the NW Pacific RSR-WG can work across scales—locally, regionally and globally—to

- Address our knowledge gaps in the deep-sea,
  - Help early career scientists develop their expertise, and
  - Strengthen collaborations and connections with stakeholders
- Grow throughout the **UN Decade of Ocean Science** and beyond.



### The COBRA Project

Earlier this year, our partner project, the **Crustal Ocean Biosphere Research Accelerator (COBRA)**, designed and delivered a Master Class ([cobrapubpub.org](https://cobrapubpub.org)) for early career researchers (ERCs) on deep-sea expedition leadership. This 13-week virtual program trained twelve globally-distributed and diverse ERCs in the "nuts and bolts" of expedition leadership. By the end of the Master Class, all participants reported feeling ready to propose and lead deep-sea expeditions! We cannot wait to see these new leaders in action, as we need their talents and passions more than ever. The program's high application demand attests to the vital need for this training and COBRA is gearing up plans for a second iteration to meet the needs of the ERC community. Learn more about COBRA at <https://cobra.bigelow.org>.

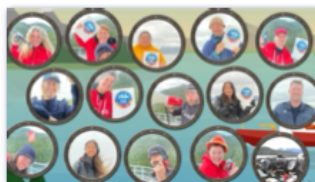
**COBRA**  
CRUSTAL OCEAN BIOSPHERE  
RESEARCH ACCELERATOR

### Clean Ocean Laboratory

During the UN Ocean Decade Clean Ocean Laboratory event, **Challenger 150** member **Professor Angelika Brandt** from the **Senckenberg Society for Nature Research** in Germany, opened and closed the core event: a presentation on the important and immediate problems posed by ocean pollution, problems we will all have to face throughout the **Decade** and beyond. During this core event, we highlighted our commitment to achieving the following goals by 2030:

- Establish working groups capable of providing regional-level advice on methods to measure and report pollution in the deep sea
- Build up capacity to measure and report deep sea pollution
- Double the number of nations adopting the use of the defined standards
- Advocate for the consideration of deep-sea science in both policy development and conservation initiatives

Dr Saskia Brix from our partner project **IceDivA** hosted the **Floating Classroom Satellite Activity**. The team broadcast live from onboard R/V Sonne to the **Senckenberg Museum**, showcasing deep-sea research to build the clean ocean future we want.



To learn more about the **Challenger 150 Ocean Decade Programme**: visit our website <https://challenger150.world> or contact:

**Prof Kerry Howell** at the **University of Plymouth, UK** ([kerry.howell@plymouth.ac.uk](mailto:kerry.howell@plymouth.ac.uk)), or

**Dr Ana Hilário** at the **University of Aveiro, Portugal** ([ahilario@ua.pt](mailto:ahilario@ua.pt))



## A UN Ocean Decade Program



# CHALLENGER 150

Our network of deep-sea scientists spans the globe, with 12 **Regional Scientific Research Working Groups (RSR-WGs)** covering the global ocean. The amazing scientists in these groups

liaise with regional stakeholders to identify and prioritise research needs. These essential partnerships allow us to coordinate scientific research activities to identify and fill data gaps. Our regional working groups help build regional capacity in deep-sea science, moving research to policy and action.

**CELEBRATING**  
**RESEARCH**  
**15**  
**OCEAN**  
**5**  
**CRUISES**  
**BASINS**

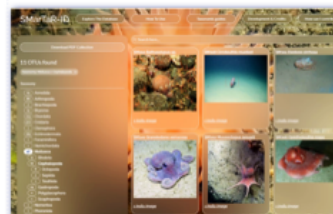
Our new **Litter Recording Working Group** is developing standards for recording marine litter in the deep sea. By aligning our methods with those used on land and in shallow water, we will ensure we can combine our knowledge.



This year we established two **technical scientific research working groups (TSR-WGs)**:

- Megafaunal Image-Based Working Group
- Litter Recording Working Group

Our **Megafaunal Image-Based Working Group** is developing methods, tools and training materials to raise standards in animal identification and data



collection in image analysis. Working with our project partner: **One Ocean Hub**, this year, we saw the launch of the **Standardised Marine Taxon Reference Image Database (SMarTaR-ID)**. This potent tool helps people identify deep-sea animals from images using consistent naming conventions.

**2**  
**TECHNICAL**  
**WORKING**  
**GROUPS**

**WELCOMED**  
**7**  
**DEEP-SEA**  
**PROJECT**  
**PARTNERS**

We are delighted to welcome the following projects into the Challenger 150 programme.

- One Ocean Hub (<https://oneoceanhub.org>)
- Deep-Ocean Genomes Program (<https://www.whoi.edu/press-room/news-release/earth-biogenome-project>)
- SMARTEX - Seabed Mining & Resilience To Experimental Impact (<https://noc.ac.uk/projects/smartex>)
- COBRA - Crustal Ocean Biosphere Research Accelerator (<https://cobra.bigelow.org>)
- AleutBio - Aleutian Trench Biodiversity Studies ([shorturl.at/dflouz](https://shorturl.at/dflouz))
- IceDivA - Icelandic marine Animals meet Diversity

along latitudinal gradients in the deep sea of the Atlantic (<https://www.iceage-project.org>)

- MAREANO (<https://www.mareano.no/en>)

## Activities since previous report to SCOR

1. Established partnerships with research ship providers REV Ocean and Schmidt Ocean Institute.
2. Obtained commitments of dedicated ship time for capacity building every year for 10 years from REV Ocean.
3. Placed 10 early career researchers in co-chairing roles with a mentor to help build generational science capacity.
4. Established 2 Scientific Research Working Groups: deep sea litter, imagery data standards with a further two in discussion: deep sea animal traits, Ecosystem modelling
5. Grown our partnership through actively seeking new members from developing nations to help build deep sea science capacity globally.
6. Carried out 15 research cruises in 4 ocean basins (Arctic, North Atlantic, South-West Pacific, North East Pacific)
7. Hosted events under the Ocean Decade's laboratory events (predicted ocean and clean ocean)
8. Welcomed 7 formally endorsed projects: Deep-Ocean Genomes Program, One Ocean Hub Research Programme, SMARTEx, Cobra, AleutBio, IceDivA. MAREANO

## Terms of references

1. To develop a global plan for survey / sampling deep-sea ecosystems to underpin deep-sea research for the UN Decade of Ocean Science. **COMPLETE**
2. To agree on methods and standards for the acquisition of biological data, including the role of existing and novel technologies. **In development** Established 2 technical working groups. Both groups have met twice this year. Two other groups are being formed.
3. To develop habitat-specific approaches for survey / sampling the deep-sea ecosystem, that integrate the global approaches developed under ToRS 1 and 2 but allow greater specialisation. **COMPLETE**
4. To integrate ToRs 1-3 with wider efforts under the Global Ocean Observing System (GOOS) via the Deep Ocean Observing Strategy (DOOS). **In development:** Outline provided in Howell et al. (2020a, b), we continue to engage with DOOS on all activities.

Howell KL, Hilario A, et al. (2020a) A Blueprint for an Inclusive, Global Deep-Sea Ocean Decade Field Program. *Frontiers in Marine Science*, 7, (5), 1-25.

Howell KL, Hilario A, et al. (2020b) A decade to study deep-sea life. *Nature Ecology & Evolution*, 33.

## Terms of references

5. To actively facilitate efforts to build capacity in developing nations for deep-sea science. **In development:** In addition to our achievements listed above that pertain to capacity development our members have participated in a global survey of capacity development needs for deep-sea science undertaken by the Ocean Discovery League (ODL); operationalization of the regional working groups;

NEXT STEPS: to hold a meeting of the SCOR working group to discuss the ODL report findings and to task our regional working group leads with development of a plan of action for regionally focused capacity building.

