

A Blueprint for a Decade to Study Deep-Sea Life

The UN Decade of Ocean Science for Sustainable Development

The Ocean Decade will commence on the **1st January 2021**, and represents an ambitious global effort to deliver "the science we need for the ocean we want". The roadmap for the Ocean Decade, published in 2018, recognizes **the deep sea as a frontier of science and discovery**, calling for research to advance understanding of deep-sea ecosystems, their functions, vulnerabilities, and services to society. The scientific community is asked to engage with the Ocean Decade, and develop plans and / or programmes to help deliver the objectives of the Decade (Fig. 1).

The deep-sea biology community, via the Scientific Committee on Ocean Research WG 159, and Deep Ocean Stewardship Initiative Decade WG, answered this call and have **considered what is needed to address the Ocean Decade objectives**, set out in the Ocean Decade Implementation Plan (<https://www.oceandecade.org/resource/109/Summary---Version-20-of-the-Ocean-Decade-Implementation-Plan>). We have **developed a series of recommendations** (Fig 1) to serve as a reference point for deep-sea researchers wishing to engage with the Ocean Decade.

However, we contend that **a new coordinated ten-year programme** to enact our recommendations is essential if we are to move to a more sustainable future for our deep ocean. We propose **'Challenger 150'** and call on the deep sea biology community to help make this happen.

Challenger 150 - Proposed UN Ocean Decade Programme for deep-sea biological research

- Following in the footsteps for the Census of Marine Life, it requires **an unprecedented level of international cooperation** and collaboration to develop and implement a global scale programme designed to achieve the Ocean Decade Outcomes.
- The *Challenger 150* Programme aspires to be **deep-sea biology's moon shot**, building on the Census of Marine Life, and of similar scale to the Nippon Foundation-GEBCO Seabed 2030 programme, or long running initiatives like the International Ocean Drilling Programme.
- The project aims to:**
 - serve our community in raising the global profile of deep-sea biological research
 - significantly advance understanding of deep-sea life
 - contribute to achievement of the Ocean Decade objectives and move us from 'the deep ocean we have' to 'the deep ocean we want' (Fig 1)



What is it?

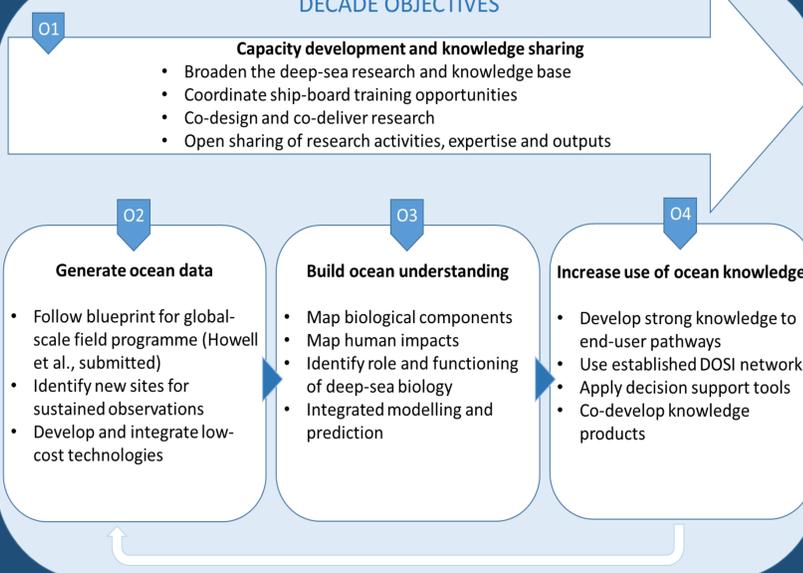
- This is a shared endeavour** – a cooperative of research, no one organisation owns it and there are no closed doors, this programme can only work if people think it is worthwhile and want to make it happen.
- SCOR working group and DOSI Decade working group have together studied the requirements of the Ocean Decade, discussed possible approaches, and now **drafted a roadmap for participating projects** to follow (Fig 1) as well as a **blueprint for a global scale field programme** (Fig 2, Howell et al., submitted).
- We are asking people to **make the Challenger 150 Programme happen**. Senior researchers can you commit to following the blueprint as far as possible through your own research projects over the next 10 years? **[Sign up below]**. ECR and PhD students can you bring your ideas, skills and knowledge.
- If you think you can help please **sign up to DOSI Decade Working Group (see below)** so we have a single email list to reach all who share this vision and begin to coordinate, strategically plan, and steer the course of *Challenger 150*.

THE DEEP OCEAN WE HAVE

Current Challenges

- Pollution
- Deoxygenation
- Warming
- Acidification
- Unsustainable fishing
- Expanding human use e.g. oil and gas, mining, bio-prospecting
- Biodiversity loss
- Inequity in capacity
- Unpredicted
- Unseen

DECADE OBJECTIVES



THE DEEP OCEAN WE WANT

Decadal Outcomes

- Clean ocean
- Healthy and resilient ocean
- Productive ocean
- Predicted ocean
- Safe ocean
- Accessible ocean
- Inspiring and engaging ocean

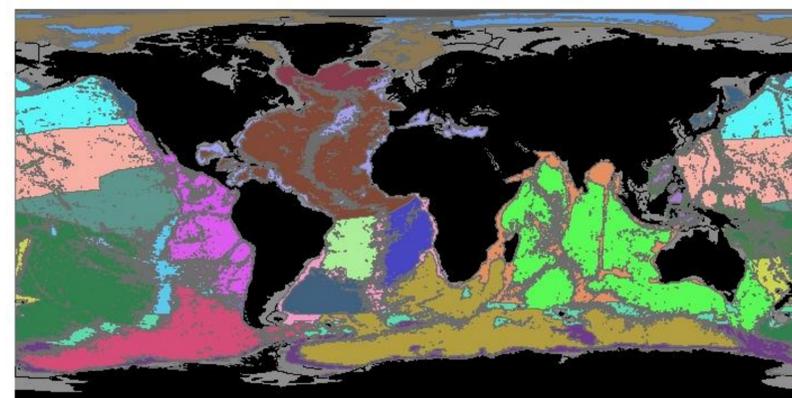
Figure 1: The Ocean Decade vision through a deep-sea biology lens, and recommendations to support the development of Actions focused on achieving the Ocean Decade objectives.

How will it work?

- Put simply Challenger 150 will bring together researchers working on different projects to try and coordinate sampling, monitoring and capacity building efforts on a global scale.
- Programme management structure, coordination and communication mechanisms all still need to be established, **can you help us shape these?**
- We anticipate that as and when projects are funded **lead PIs will be invited onto a coordination committee** to help ensure all projects are aligned as far as possible with the Programme blue print.
- To stress again **this is a community led initiative**, no one institution owns it, it belongs to anyone and everyone who gets involved.

What's in this for me?

- Increased opportunity for all:** we are stronger together than we are individually. A deep-sea focused Ocean Decade Programme will give both presence and voice to our community on the international stage. Participants may benefit in the following ways: strengthen funding bids, bring increased opportunity for funding / ship time, raise your research project profile internationally.
- Career legacy:** the Census of Marine Life helped both launch and shape the careers of many in our community. *Challenger 150* could do this for the current and new generation of scientists, so be a part of it.
- Social legacy:** deep-sea biology has issues! Help change the face of deep-sea science to a more diverse one that better represents gender, ethnicity, and geography.
- Data legacy:** If the original *Challenger* taught us anything, it's the value of archiving both data and specimens for future generations to use. Participation in *Challenger 150* will help us to leave a valuable resource for those who come after us.



GOODS bathyal provinces		GOODS abyssal provinces	
Antarctic	North Pacific	Angola and Sierra Leone Basins	Indian
Arctic	Northern North Atlantic	Argentine Basin	North Atlantic
Coos Plate	Northern North Pacific	Brazil Basin	North Central Pacific
Indian	SE Pacific Ridges	Central Pacific	North Pacific
Nazca Plate	South Atlantic	East Antarctic Indian	South Pacific
New Zealand Kermadec	Subantarctic	East Pacific Basins	West Antarctic
North Atlantic	West Pacific		West Pacific Basins

Figure 2: *Challenger 150* proposes sampling stratified by biogeographic region using GOODS biogeography (Watling et al., 2013) for benthic sampling, and Sutton et al., (2017) for pelagic sampling, depth, distance, substrate type, and anthropogenic impact – taken from Howell et al., submitted.

What do I do again?

Sign up to DOSI Decade mailing list here <http://eepurl.com/gVsSgF>. We hold regular meetings to plan the next steps, so look out for emails! If you have a funded project you think could contribute, please add to the google-sheet here <https://tinyurl.com/yxkhj84c>



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