Impact beyond research: Financing Blue Growth

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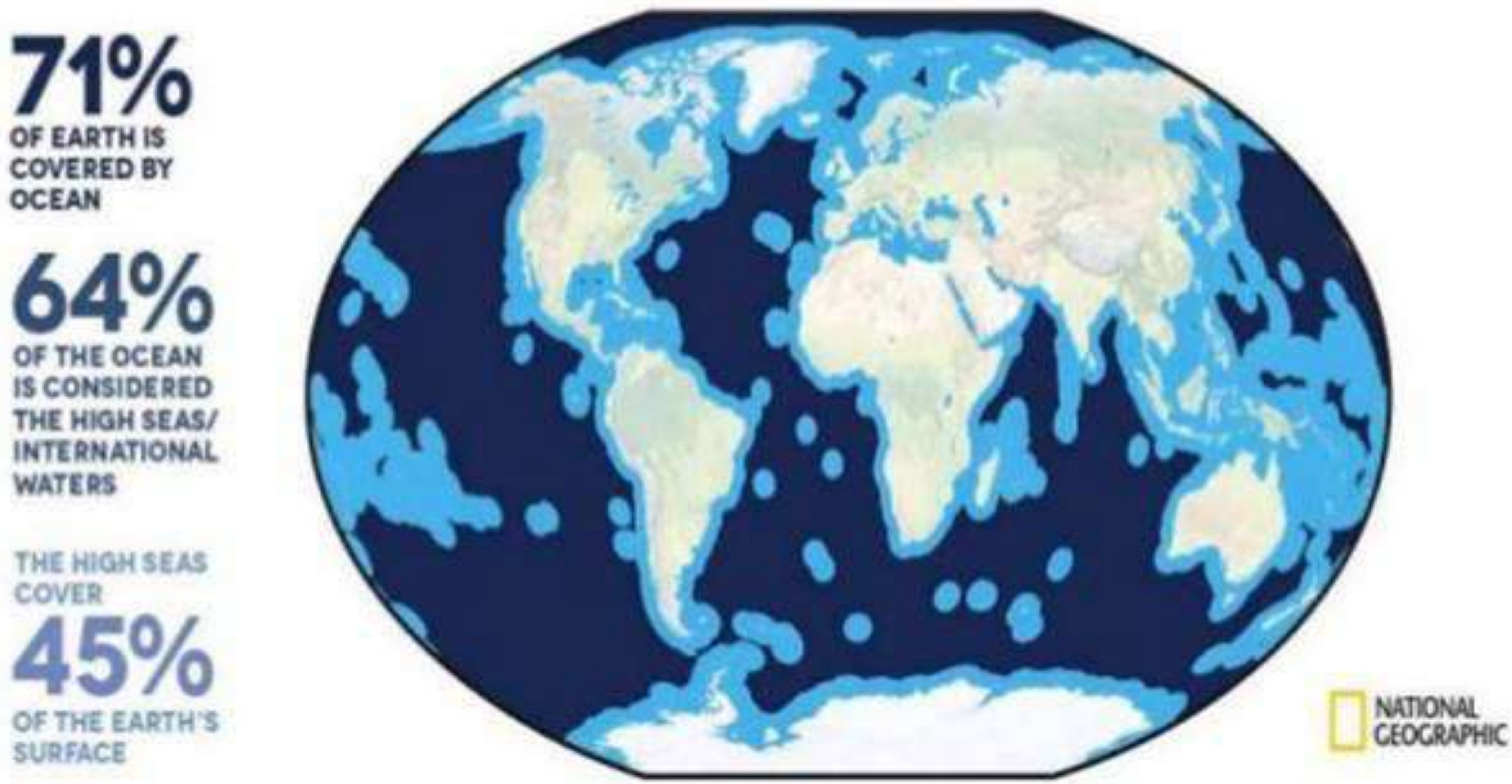
Introduction

- Finance Experience
- Global Ocean Trust
- LSE IGA Blue Finance Initiative
- EU Engagement (SenseOcean, AtlantOS, etc)
- Innovative Finance for the High Seas
- Blue Natural Capital and Sustainable Growth

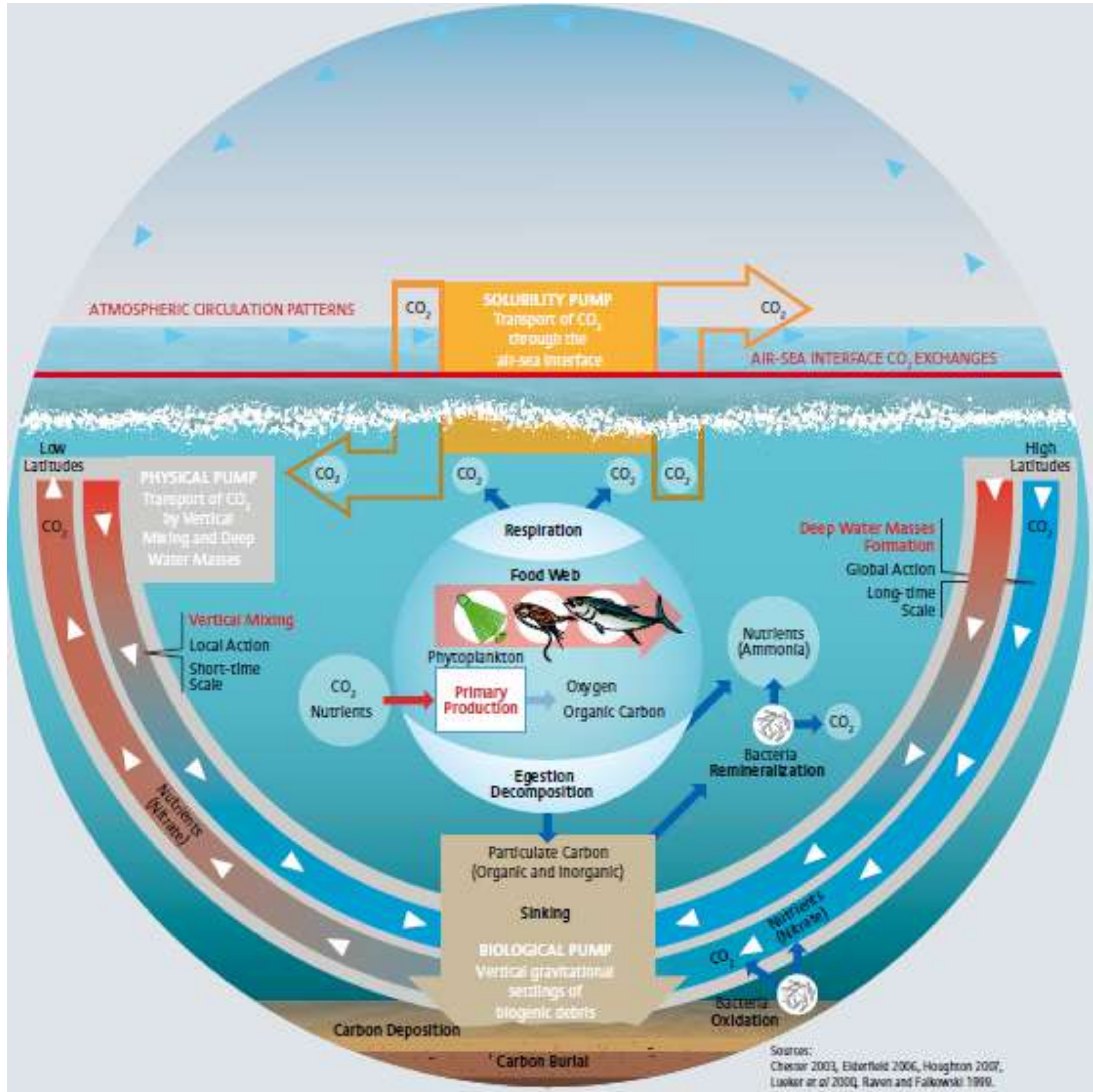
The Global Ocean seen by policy makers



http://ocean.nationalgeographic.com/ocean/explore/pristine-seas/creating-marine-reserves/

A three-dimensional view: integrating ecosystems, marine carbon dioxide flux and other biogeochemical interactions

- Carbon flux controlled by currents, surface temperatures and biological processes (photosynthesis and respiration)
- Marine ecosystems sequester carbon and provide storage in biomass/ sediments

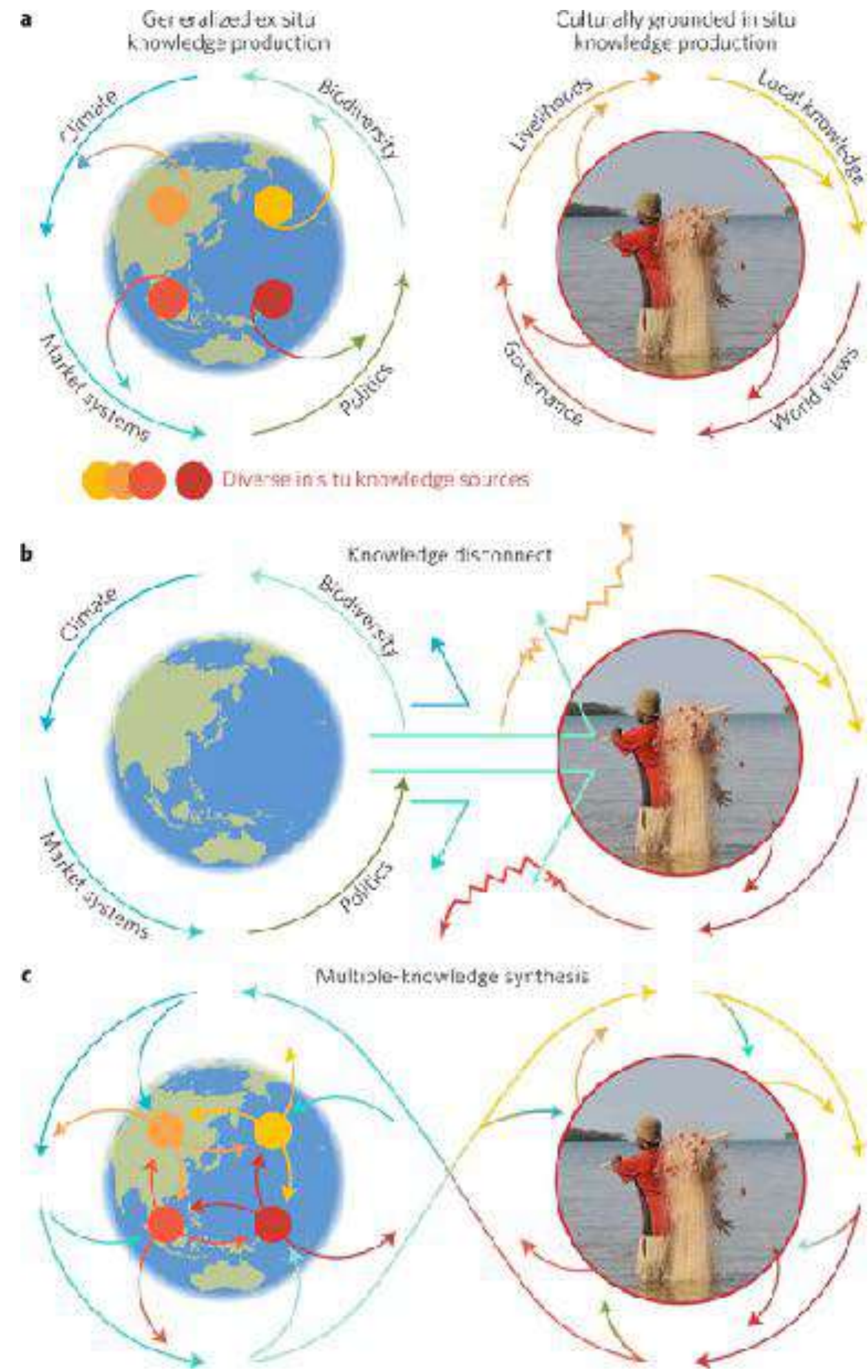


Source: Fish Carbon: Exploring Marine Vertebrate Carbon Services (2014)

Science and People Nature Ecology & Evolution SSN 2397-334X (online)

a. Ex situ and culturally grounded in situ perspectives generate different but complementary knowledge systems that can guide sustainable resource management.

b, Policy and management driven by ex situ perspectives: approaches that are primarily driven by ex situ perspectives often deliver knowledge in ways that disrupt or conflict with in situ worldviews and well-being, thereby limiting potential for positive interplay between ex situ and in situ knowledge systems. **c**, Policy and management recognizing local perspectives: approaches recognizing and respecting in situ as well as ex situ knowledge systems can lead to more effective syntheses and enduring on-the-ground impact. Credit: photograph, Nicolas Pascal, Blue finance.

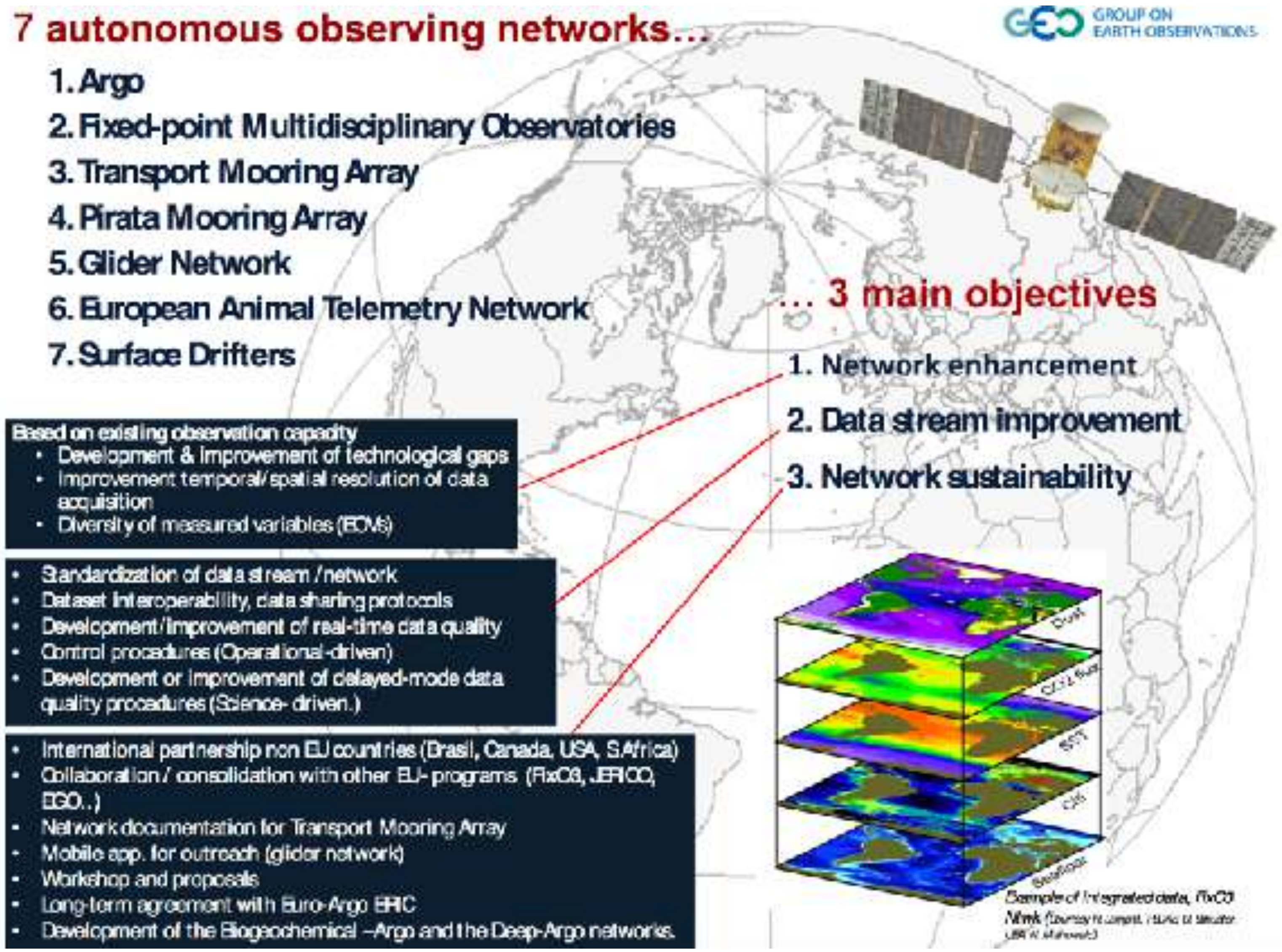


Specific Interventions

- Addressing the global commons through science, politics, law, economics and civil engagement
- Initiatives that target specific marine ecosystems
- Efforts relating to identified threats
- Narratives of connectivity
- Raising the ocean profile

LSE

Ocean Data Infrastructure



https://www.atlantos-h2020.eu/download/Media/posters/AtlantOS-A0-Poster-WP3-Autonomous-Ocean-Observation-Networks-HQ.pdf

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SUPPLEMENT ARTICLE

Innovative financing for the High Seas

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Abstract

1. Innovative financing, that is the development of new funding sources and mechanisms including from the private sector, can be used to deliver promising ocean conservation opportunities. Capital markets are increasingly accessible for sustainable development and climate finance, and are gaining traction for biodiversity conservation. Such financing concepts could also be applied in the High Seas. Drawing on natural capital economics as a way to ascribe economic value, specific marine investment opportunities can be identified and made accessible to new financiers and funding processes.
2. International waters cover nearly half of the planet's surface, yet governance deficiencies have meant that marine habitats and ecosystems are rapidly deteriorating. Improved governance through the proposed Marine Biodiversity Implementing Agreement discussed under the 1982 UN Convention on the Law of the Sea and delivery of the Sustainable Development Goals, in particular ocean goal 14, will require additional financial support for High Seas solutions, including for the effective management of marine reserves.
3. For projects to be attractive to funders they need to be clearly structured and deliver quantifiable benefits. A comprehensive ocean data infrastructure could be put in place to support large-scale marine conservation monitoring cost-effectively. This infrastructure could serve also other ocean users, thereby defraying the cost and could be delivered through public–private partnerships. Development finance and climate finance provide examples for relevant pathways for such integrated approaches.
4. Existing efforts to find additional funding for ocean solutions can be enhanced through the range of specific innovative ocean finance mechanisms that are identified. These offer the prospect of long-term support.
5. This review draws on progress made at the IUCN World Conservation Congress in Honolulu, Hawai'i in September 2016 and builds on the momentum created by the Paris Agreement and the Sustainable Development Goals.

KEYWORDS

acidification, climate change, ecosystem services, high seas, marine protected area, ocean, UNCLOS

1 | INTRODUCTION

The High Seas play a key role in sustaining life on Earth and provide vital ecosystem services (Rogers, Sumaila, Hussain, & Baulcomb, 2014) such as the provision of food, the generation of oxygen and the capture of carbon. Over-exploitation, pollution, introduced species, habitat loss and climate change threaten the sustainability of these services. Ocean areas beyond national jurisdiction cover almost half of the surface of the planet, yet receive very limited funding for their protection (Global Ocean Commission, 2016). Activities in the High Seas are managed individually or by sectoral bodies, with limited consideration for cumulative or synergistic impacts or for the need for coordinated, connected and comprehensive conservation of marine species and habitats (Druel & Gjerde, 2014). While Parties to the Convention on Biological Diversity (CBD) recognize the importance of large international sea areas as 'ecologically or biologically significant areas' (EBSA) (Freestone, 2014), regional agreements and mandates to protect marine biological diversity cover only a small

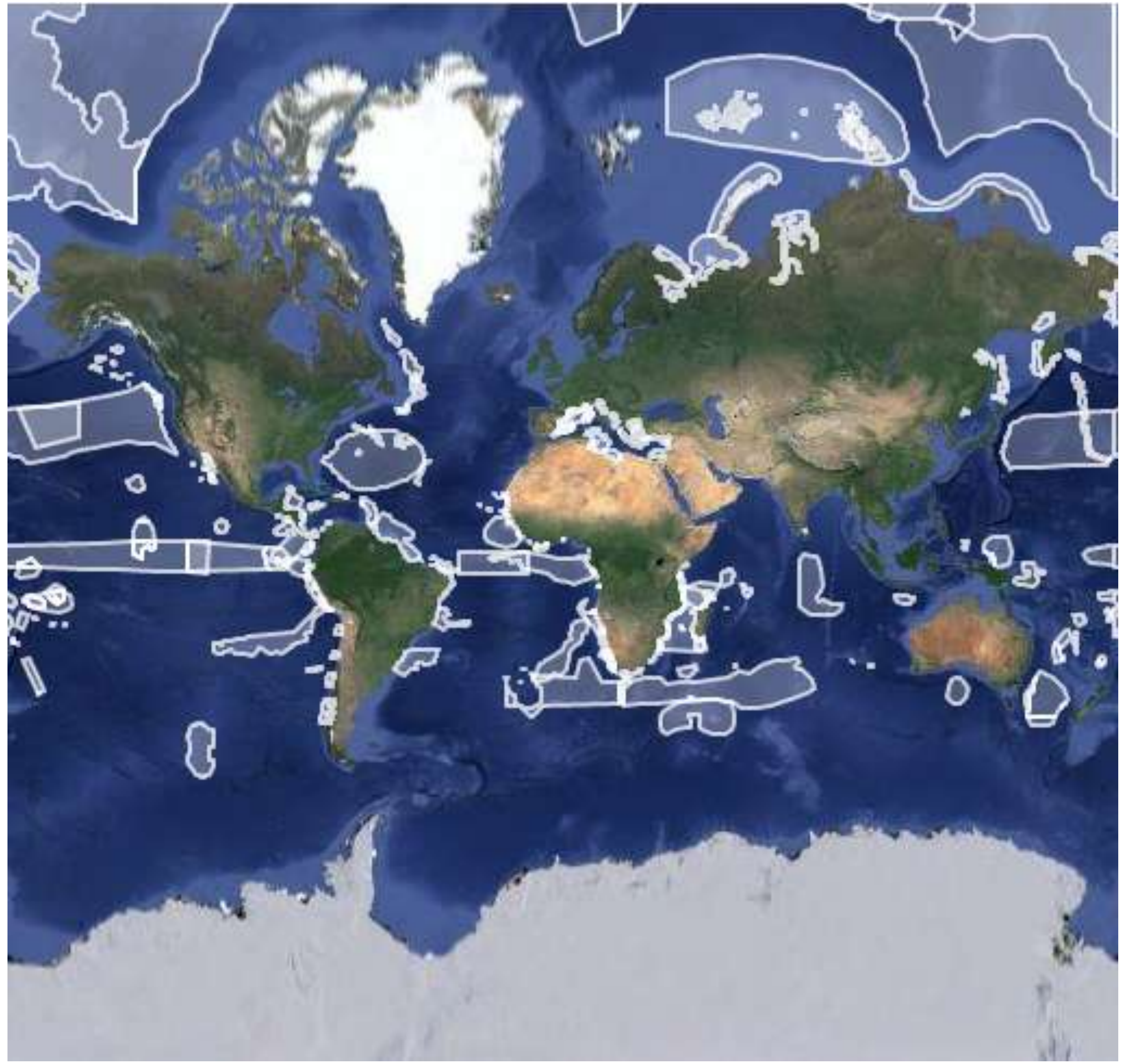
Science and Conservation

Fig. 2 | Examples of habitat degradation occurring in marine ecosystems that have the potential to impact on global climate through changes to carbon storage, and transfer of energy and moisture to the atmosphere. Note, illustrations of the effect of habitat change on carbon, energy and moisture balance for each ecosystem are not comprehensive; for example, mangrove loss will result in increased emissions as well as reduced evapotranspiration. Credits: mangroves, Everglades National Park, Florida; seagrass, Andre Seale/Alamy Stock Photo; sea ice, NASA/Sinead Farrell; deforestation, Cyril Ruoso/Minden Pictures; turbid shallows, NASA.

Ecologically or Biologically Significant Marine Areas

Science suggests that approx. 1/3 of the global ocean needs to be protected by appropriate area-based measures.

The Convention on Biological Diversity EBSA workshops have identified a number of critical marine areas.



Source: www.Cbd.int/ebsa

Marine sensors for the 21st century

14 LIFE BELOW WATER

CONSERVE AND SUSTAINABLY USE THE OCEANS, SEA AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

SUSTAINABLE DEVELOPMENT GOALS

SenseOCEAN provides the instrumental tools to monitor progress towards achievement of United Nations Sustainable Development Goal 14

To effectively assess progress towards Goal 14, we must be able to measure the health of the oceans on an ongoing basis. The vastness of the oceans means this is a huge challenge. SenseOCEAN is enabling measurement of the oceans through the development of in situ sensors for a range of parameters that can be deployed over long time periods on a variety of platforms.

For more information about the SenseOCEAN project, please go to:

www.senseocean.eu

SenseOCEAN is a Collaborative Project funded by the European Union 7th Framework Programme (FP7/2007–2013) under grant agreement No. 614141

How can we monitor progress towards the achievement of SDG 14?

The challenges

Greenhouse gases

Greenhouse gas emissions are driving climate change. The oceans absorb CO_2 but not without some impact. N_2O can be released from the oceans.

Ocean acidification

As the oceans absorb more CO_2, the water becomes more acidic, lowering the pH and changing ocean chemistry. Marine life which has evolved over millions of years may not be able to adapt at the speed of the change.

Ocean deoxygenation

Lack of O_2 in the oceans could impact ocean productivity, nutrient cycling and marine life. Marine plants, fish and organisms struggle to survive in 'oxygen minimum zones', areas which are increasing in size and number.

Eutrophication

An excess of nutrients due to e.g. industrial and farm run-off can lead to excessive growth of plants and algae. Decomposition of the algae consumes oxygen in the water. Oxygen is vital for fish and shellfish to survive.

Marine biodiversity

Marine systems are complex, all species are an integral part of the ecosystem performing specific functions. Biodiversity is crucial for human well-being and economic development.

SenseOCEAN tools

N_2O & pCO_2 sensors

Optode sensors for CO_2 and electrochemical sensors for CO_2 and N_2O.

Electrochemical CO_2 sensor

pH sensor

Lab on chip and optode sensors

pH lab on chip sensor in demonstration tank

Oxygen sensor

Optode sensors

Nutrients sensors, FRRf

Electrochemical and lab on chip sensors for phosphate, nitrate and silicate. Fast Repetition Rate fluorimetry measures primary productivity.

Fluorescence sensor

Measures a range of parameters key in assessing ecosystem health.

These sensors will be integrated into a multiparameter sensor system that can be deployed on many platforms (e.g. observatories, AUVs). Common communications systems, electronics, data systems are being used to enable cost effective mass production.

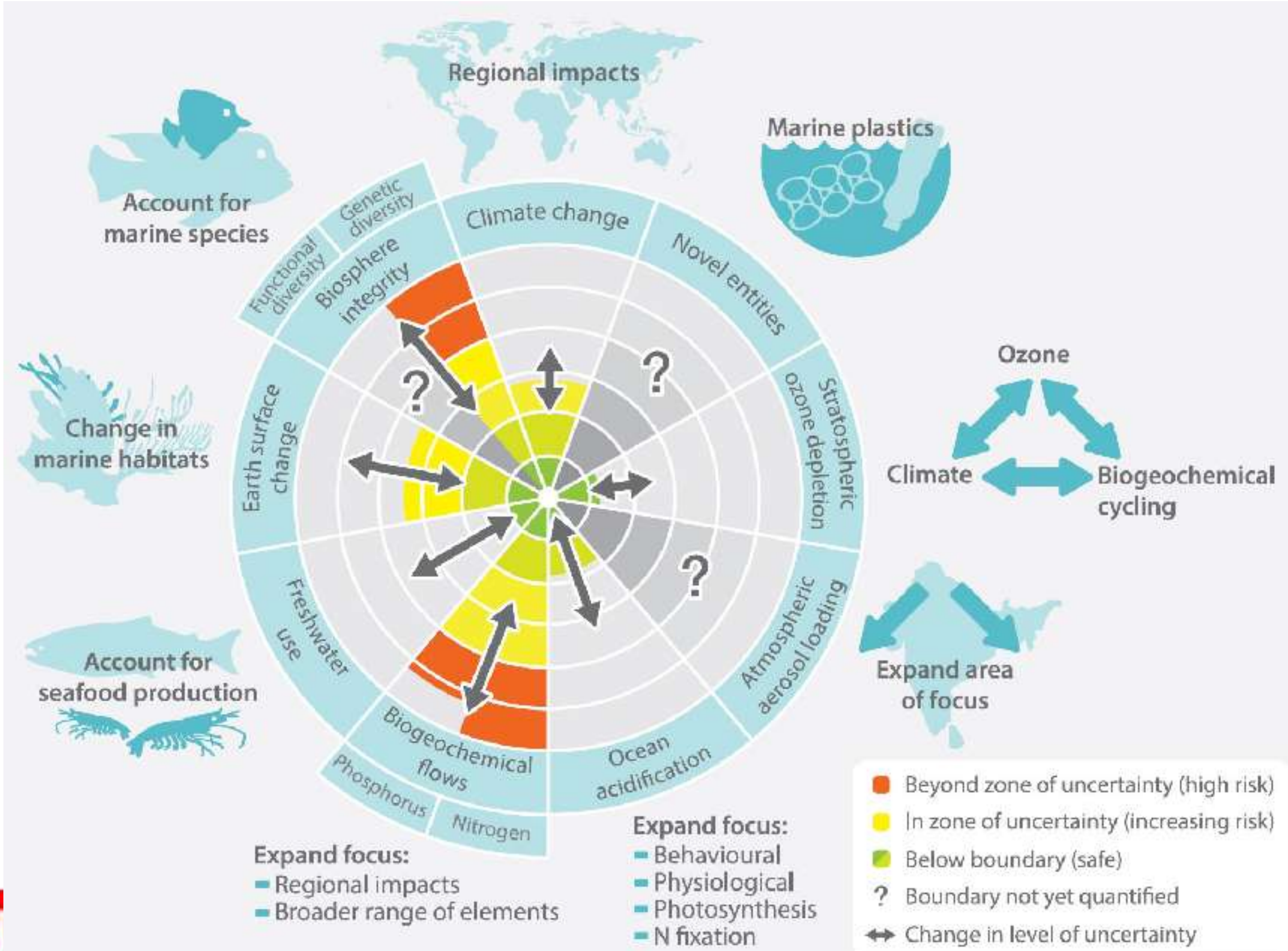
Blue Growth Opportunities

- Food Security and the New Marine Bio-Economy
- Water Quality and Human Health: Clean Beaches
- Ocean Risk and Coastal Resilience Infrastructure
- Clean tech and renewable marine energy
- Sensors, data and ecosystems

Planetary boundaries for a blue planet

Kirsty L. Nash, Christopher Cvitanovic, Elizabeth A. Fulton, Benjamin S. Halpern, E. J. Milner-Gulland, Reg A. Watson & Julia L. Blanchard

Nature Ecology & Evolution **1**, 1625–1634, 2017



Key Points

- A pro-active ocean resilience strategy is required to deal with ocean degradation, protecting natural abundance and ocean ecosystems.

- Effective ocean governance requires on a legal regime that allows protection at scale through global ocean observation infrastructure.

- Ocean monitoring needs sufficient granularity for modelling and enforcement, it also helps to optimise other ocean uses.

- Public-private partnerships offer ways to ocean investment.

- Financing requires dedicated institutions, a new Ocean Sustainability Bank could provide knowledge, focus and innovation.

Conclusions

- Ocean research has most impact if linked to societal goals and wider sources of finance
- Blended and integrated approaches are needed
- Governance, technology and finance innovation are coming together with science and research
- Ocean solutions require an narrative and scale

http://www.lse.ac.uk/iga/initiatives/blue-finance