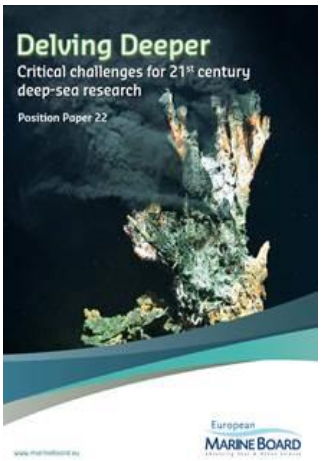
Understanding the deep sea is key to a sustainable blue economy

A new European Marine Board paper calls for major progress in deep-sea research to underpin future management and exploitation of living and non-living deep-sea resources.



A multi-disciplinary group of European researchers spanning natural science, socio-economics and law have joined forces to assess the current landscape of deep-sea research and investment in Europe. Once considered remote and inaccessible, commercial interest to exploit the deep sea[1] is rising due to economic drivers and technology developments. However, exploitation activities in the deep sea remain highly contentious, particularly regarding the potential risks and environmental impacts associated with such activities. A consultation of deep-sea stakeholders spanning academia, industry and NGOs has identified deficiencies in basic knowledge of deep-sea systems which, if not addressed, could hinder ecosystem-based management of the deep sea and in turn limit the sustainability of the emerging deep blue economy.

The findings are published in a new European Marine Board (EMB) position paper titled 'Delving Deeper: Critical challenges for 21st century deep-sea research.' The paper explores the mismatch between the rising demand and capability to exploit deep-sea resources and the lack of scientific knowledge and regulatory frameworks to effectively manage this vast area, much of which falls in areas beyond national jurisdiction (ABNJ). *"The lack of baseline data for deep-sea ecosystems identified by the report has a direct bearing on the Environmental Impact Assessment (EIA) process….without continued efforts to produce basic underpinning science, regulation and governance of the deep sea will remain an exercise on paper rather than knowledge-driven decision making. Our results show that everyone recognizes the need for this from science to industry*," explains Professor Alex Rogers, lead author and Chair of the working group.

The blue economy is already going deeper with up to 40% of the world's fishing grounds now in waters deeper than 200m. And yet this may be just the beginning with emerging activities such as mining the seabed for mineral and biological resources rising high on international political agendas[2]. The paper assesses these existing and emerging opportunities in the deep sea and identifies future deep-sea research priorities needed to address societal, environmental and governance challenges. It concludes with eight high-level goals and associated action areas for deep-sea research ranging from assessing drivers, pressures and impacts in the deep sea to promoting transparency and appropriate governance of deep-sea resources.

[1] Defined in this report as that part of the ocean deeper than 200m

[2] Leaders' Declaration, G7 Summit, 7-8 June 2015

The paper also highlights the need to investigate alternatives such as recycling of rare earth elements that could minimize environmental impact in the deep sea and in turn help Europe's transition to a circular economy. Other scientific challenges in terms of funding, infrastructure and human capacities were also examined. Whilst Europe is leading in many areas of deep-sea technology development (e.g. miniaturized sensors and ultra-deep gliders), availability of large infrastructure (e.g. ocean-going ships) and state-of-the-art technical equipment is not matching the growing needs of the deep-sea scientific and wider stakeholder cmmunity, e.g. with respect to the monitoring of deep waters for the European Marine Strategy Framework Directive.

An overarching recommendation of the paper is that, to support Blue Growth, European public research funding investments should target fundamental scientific research of the full deep-sea system and the establishment of environmental baselines. Where possible, this should be done in a timeframe that will complement and keep track with industrial expansion in the deep sea. Professor Jan Mees, Chair of the EMB, sums up the problem: "*What is clear is that technology development and commercial interest is moving at a pace that outstrips the ocean governance discussions and the generation of new knowledge through scientific research. If commercial activities are to proceed, it is imperative that we develop a much greater knowledge and understanding of the deep sea*."

Notes to editors

The European Marine Board supported the trans-disciplinary expert working group (EMB WG Deep Sea Research Jan. 2014 to Sept. 2015). Position paper 22 is officially launched on the evening of **1 September 2015** as an official side-event of the 14th Deep Sea Biology Symposium (31 August – 4 September 2015, Aveiro, Portugal). Download at: http://www.marineboard.eu/publications-full-list

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Suggested reference: Rogers, A.D., Brierley, A., Croot, P., Cunha, M.R., Danovaro, R., Devey, C., Hoel, A.H., Ruhl, H.A., Sarradin, P-M., Trevisanut, S., van den Hove, S., Vieira, H., Visbeck, M. (2015) Delving Deeper: Critical challenges for 21st century deep-sea research. Larkin, K.E., Donaldson, K. and McDonough, N. (Eds.) Position Paper 22 of the European Marine Board, Ostend, Belgium. 224 pp. ISBN 978-94-920431-1-5

The European Marine Board (established in 1995) is Europe's foremost think tank for marine science policy. Established in 1999, it is a partnership of major national marine science institutes, research funding agencies and national consortia of universities, facilitating enhanced cooperation between European organizations involved in marine science towards development of a common vision on the research priorities and strategies for marine science in Europe. In 2015, the Marine Board represents 36 member organizations from 19 countries (www.marineboard.eu).

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