

Summary and Conclusions

Brussels Thematic Workshop on Polar Marine Ecosystems Research: Strategic directions for the European Research Area

EUR-OCEANS Consortium Flagship for Polar Ecosystem Change and Synthesis (PECS)

Helmholtz Association, Brussels Office, 29 May 2013

Our polar marine ecosystems strategy (distributed to the European Commission in March 2013) underpins this workshop, identifying the significant role of biological components of polar oceans in both regional and Earth System scale processes, and highlighting why research on **both Arctic and Antarctic ecosystems** should form a significant component of Horizon 2020.

This workshop¹ demonstrated that the polar oceans are not just remote locations with unique biodiversity; they have significant global ecological and economic importance, especially regarding fisheries, mineral/hydrocarbon resources and shipping routes. Polar Regions are major drivers of climate and biogeochemical cycles, influencing the entire planet. Owing to their sensitivity, polar ecosystems are changing rapidly and as such are powerful indicators of unprecedented global and regional climate change. Each pole is important in its own right, but there are many parallel issues and lessons-to-learn providing a strong case for a **bipolar approach** in understanding the role of Polar Regions in the Earth System.

Although the Polar Regions have differing political pressures and governance² Europe has a **commitment to ensure effective stewardship** of both through its obligations as signatories to the various international treaties and agreements³ that seek to ensure the Polar Regions are appropriately protected, managed and recognised at the global scale.

Our presentations illustrated why research on polar marine ecosystems is crucial in understanding the implications of the changing poles for economies and human well-being in Europe and beyond. We condensed the key issues into **three priority questions** that encompass biodiversity, climate change, increased commercial activity, food security, new technologies and sustainability:

1. What are the main **drivers** of change in polar marine ecosystems?
2. How does **change** affect the interactions between polar marine ecosystems and biogeochemical cycles?
3. How can climate change and increased commercial activities be accounted for in **sustainable management** of polar ocean resources?

We stressed that the scale of these questions is **beyond the current capacity** of individual researchers, individual scientific disciplines, national policies and national programmes. The EU now needs to **capitalise on its investment and success** in polar marine ecosystems research, infrastructure and technologies to date, together with the unprecedented level of multidisciplinary and international cooperation generated in recent years⁴ (e.g. under FP6/FP7 and the International Polar Year), and historically (e.g. under the International Geophysical Year). The EU polar marine ecosystem community now needs the support for **unparalleled scientific leadership** and **integration** in understanding and predicting future change.



Horizon 2020 is an opportunity for Europe to address these globally important questions through:

- **A large-scale multidisciplinary research** programme on polar ocean ecosystems that integrates international scientific expertise and capacity, focusing on drivers, comparisons and projections of change. Through this (please refer to our workshop presentations for details), we will:
 - **Determine** the impacts of change on ecosystem structure (including studies on sea-ice distribution, ocean warming, changing ocean circulation, ocean acidification, nutrient availability, food web processes, past and future harvesting);
 - **Compare** the effects of change within and between both poles;
 - **Project** future change scenarios and interpret their consequences.
- **A strategic approach** with focused and agreed priority research areas, methodologies and analyses (e.g. multidisciplinary cruises, long-term observations, modelling efforts, etc);
- **Coordination of research activities** through international efforts that support, integrate and add value to national capabilities;
- **Active engagement with stakeholders** (e.g. policy makers, resource managers, educators, industry, consumers) resulting in European leadership in sustainable management and policy.

Without such dedicated actions at the European level the present fragmentation of globally important polar research cannot be overcome. Europe has a major role to play in marine ecosystem research at both poles. We fully support European leadership in polar marine ecosystem science, policy and integration.

The EUR-OCEANS Consortium Flagship for Polar Ecosystem Change and Syntheses (PECS)

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¹This document complements the Strategy and presents the summary and conclusions of the Workshop. The text was prepared on behalf of the EUR-OCEANS Consortium Flagship for Polar Ecosystem Change and Syntheses (PECS) by Rachel Cavanagh, Nadine Johnston and Eugene Murphy, British Antarctic Survey; Stig Falk-Petersen, University of Tromsø; Paul Treguer, INSU-CNRS; Dieter Wolf-Gladrow, Alfred Wegener Institut; and Cynan Ellis-Evans, UK Arctic Office; and supported by Roberto Azzolini, European Polar Board; and Paola Campus, European Science Foundation. A complete list of workshop participants is available as a separate document.

²Under international law, no country currently owns the North Pole or the region of the Arctic Ocean surrounding it. However, a number of countries bordering the Arctic Ocean have submitted claims in accordance with the UN Convention on the Law of the Sea ([UNCLOS](#)) to extend their continental shelf areas. The approval of these claims will lead to a considerable reduction of the 'areas beyond national jurisdiction' in the Arctic Ocean. No claim to territorial sovereignty in Antarctica shall be asserted while the present Treaty is in force. Currently, 50 countries are Party to the Antarctic Treaty, of which 29 have consultative status.

³These include global Conventions, such as CBD or UNFCCC, and regional, intergovernmental organisations such as OSPAR and NEAFC and advisory bodies such as ICES in the Arctic and The Antarctic Treaty (and associated agreements including its environmental protocols, CCAMLR and CCAS).

⁴The Framework Programmes (e.g. FP6 EUR-OCEANS NoE and its legacy the [EUR-OCEANS Consortium](#), including [PECS](#)) have enabled multidisciplinary networks of EU polar scientists to lead globally important analyses of polar ecosystems and drive international activities addressing significant science challenges (e.g. Integrating Climate and Ecosystem Dynamics in the Southern Ocean, [ICED](#), programme). These partnerships were further strengthened during the International Polar Year (2007-8, planned by the International Council for Science).

