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The Polar Ocean in a Warming Planet: Understanding for managing a unique resource of the Humankind

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There is no doubt that changes in the Polar Regions are of great significance at the global level, such as having far-reaching effects on atmospheric and ocean circulation.

Changes in ocean currents, temperature conditions, ice cover and reduction of permafrost regions are having impacts on marine and terrestrial ecosystems in the Arctic Regions of Europe and Northern Hemisphere. Human activity is putting pressure on the environment in these regions; maritime transport between Europe and Asia through the northern sea route and accessibility conditions to hidden Arctic resources as well as new technologies of exploitation will have a significant impact on the marine environment, on the living resources and on the regional social organization and needs. There are still unresolved issues related to national claims on continental shelf and sea areas that involve international law; in these respects science can provide crucial elements for supporting political agreements.

Such scenarios will present new opportunities for economic activities, but also risks which will result in new demands for marine management, monitoring systems, emergency response systems, search and rescue services as well as closer international cooperation. It will also require the development of an international regime based on the improvement of the present regulations on exploration, accessibility, exploitation and liability. Dialogue and international agreements based on scientific evidences and foresight are key elements for finding solutions.

On the opposite hemisphere, the ocean surrounding Antarctica plays a primary role in all global climatic processes, through the annual sea ice evolution, the circum-Antarctic circulation driving the exchange of heat between low and high latitudes and the atmospheric circulation, through the density bottom currents that affect the global Thermohaline circulation (THC), and the biogeochemical cycles that have peculiar characteristics in the icy Antarctic waters. Besides this, the marine living resources and the reservoirs of energy and bio-chemical resources (e.g. gas hydrates, bio-prospecting) have a growing strategic importance in the global economy. The Antarctic Ocean, due to its isolation and extreme climatic conditions, has always been an area of international cooperation and technological challenges in support of scientific progress.

In this scenario, the rapid environmental changes and the need of humankind for new and alternative reservoirs of food and energy to be exploited play a crucial role in understanding and managing the Polar oceans. The newly emerging opportunities and associated emerging threats for Arctic people increase the number of policy areas in which EU involvement is relevant and necessary.

In order to gain insight into the this complex scenario and into the needs in terms of research programmes and infrastructures, policy and education to manage it, the European Polar Board launched an initiative in Polar marine science. The ESF/EPB marine initiative is intended to focus on various aspect of the Polar marine environment and to indicate a strategy focused on innovative scientific and technological topics, capable of combining together different research capacities as well as political, economic and strategic objectives, toward goals of economic and social interest. Therefore, it is based on a wide and multidisciplinary participation.