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SPACE APPLICATIONS FOR THE POLAR REGIONS - AN OVERVIEW

Abstract

It is beyond dispute now that global warming is especially tangible in the poles. Mean temperatures at the North pole increase faster than elsewhere and many effects can already be observed, such as the reduction of thickness and extent of summer sea ice in the Arctic, with records measures from satellite nearly every summer, or the melting of the permafrost. These changes lead to new challenges and opportunities, which range in the North from the confirmed opening of new maritime routes, the threat to fragile ecosystems and the traditional life of the native inhabitants, to greater use of natural resources. In the Antarctic, even if economic activities are banned, the threat to the ecosystem exists, and security and safety of research has to be ensured, as well as the ones of the tourists that are more and more tempted to visit, mainly by boat, this continent.

Both the Arctic and the Antarctic feature large, remote areas with limited accessibility, low population densities, and harsh living conditions. As needs for more observations, reliable communications and navigation means increase, space systems now provide an increasing part of the solution.

With satellites on orbits compatible with a view on the Arctic and Antarctic regions (polar or highly elliptical orbits), space systems have the potential to support more and more enhanced monitoring of the Polar regions, telecommunications, navigation or security and the Agency's programmes such as ENVISAT in the near past, now Cryosat or SMOS, and soon the Sentinels, provide already a significant contribution to e.g. ice monitoring.

With an increasing attention from the European Union to the Arctic, with a conference held under the Danish presidency of the EU, and the performance of a study on the "Contribution of Space Technologies to Arctic Policy Priorities", with the planned development of the cooperation activities with the European Polar Board in the Antarctic, the European Space Agency is currently analysing the issues at stake and possible extensions to its current programmes, such as Navigation, Earth observation and Telecommunication programmes, including the necessary technology developments and international cooperation where feasible. The status of the analysis and proposed activities will be presented.