



# Europe's Arctic Course

Workshop on the Future of Space Cooperation in the Arctic Region

8 December 2010



## WORKSHOP SUMMARY REPORT

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### Introduction

Global warming affects the Arctic region more than any other place on Earth. It is estimated that, with the current trend in ice melting, new shipping routes between the Atlantic and the Pacific could be open in the next decade. Similarly, Arctic natural resources are becoming more accessible for commercial exploitation. But as the ice is retreating and human activities in the region rise, the need for space infrastructures is becoming more obvious to guarantee the safety of navigation and communication and to monitor the sustainability of natural resources exploitation.

More than 45 experts from 12 countries attended the workshop on "Europe's Arctic Course - The future of Space Cooperation in the Arctic Region" organised by the European Space Agency (ESA) and the Institute for Environmental Security (IES) at ESA headquarters in Paris on 8 December 2010. Attended by both scientists and policy makers the meeting aimed at providing an opportunity for experts from ESA Member States to express their needs and to receive updated information on EU Arctic policy developments. Challenges and opportunities were chosen to be approached from two perspectives: the environment and climate change issues on one hand, the support for increased human activity in the Arctic region on the other hand.

### Global Significance of the Arctic Region

With temperature increases twice as big as the global average, the high Arctic is an early warning region for climate change and Greenland glacier melt will profoundly affect sea level rise around the world. The thawing of permafrost will be both a major source of global greenhouse gas emissions and a threat to the infrastructures (pipelines, buildings, roads) located in the permafrost zone.

Scientists arrive from all over the world to study the processes, notably at the University Centre on the Norwegian archipelago of Svalbard, where the world's northernmost settlements are based. Svalbard already hosts researchers from 20 countries, with a fast-growing representation of Asian scientists.

Economically, the Arctic is a gold mine. It is believed to hold between 20-30% of the world's undiscovered oil and gas resources and it contains high quantities of minerals and marine resources. Once they become free of ice, the Northwest Passage and the Northeast Sea shipping Route will radically change trade in the Northern hemisphere providing shortcuts of several thousands kilometres compared to traditional trade routes.

Five countries share a territorial border with the Arctic Ocean: Canada, Denmark (Greenland), Norway, Russia and the USA. Although they are trying to settle their territorial differences in a closed circle, the Arctic Region is wider and in particular the EU and China are demonstrating their interest in the region. As Professor Paul Arthur Berkman of the Scott Polar Research Institute, University of Cambridge noted, a major challenge is how to define the right balance between national and common interests<sup>1</sup>.

### **EU Interests in the Arctic**

Europe and Arctic destinies are inextricably linked. On the one hand, EU activities have a deep impact on Arctic ecosystems and environment; on the other hand, EU economic interests in the Arctic are currently significant and likely to rise in the near future. On the whole, Arctic challenges and opportunities will have significant repercussions on the life of European citizens for generations to come.

As a global actor within the United Nations Framework Convention on Climate Change (UNFCCC), and one of the main architects of the idea of an internationally binding agreement to mitigate climate change, the EU sees the Arctic as an early warning observatory for global warming. However, the EU's interest in the Arctic goes beyond its scientific value and was made explicit in the Council's conclusions on the "European Union and the Arctic Region" published in December 2008. Three priorities were outlined: 1) protecting and preserving the Arctic in unison with its population; 2) promoting sustainable use of resources and; 3) contributing to enhanced Arctic multilateral governance.

Stewart Arnold, policy officer in the office of Diana Wallis, MEP and Vice President of the EP, explained that the European Parliament report on "A Sustainable EU Policy for the High North" will likely be submitted to a vote in plenary at the beginning of 2011. Interest from MEPs for the Arctic has grown over the

months, Arnold said, and some of their views reflected in the report relate to issues such as oil drilling, governance structures, demilitarisation, access to information and the needs for safety for European shipping and tourist industries. It was mentioned that the role of scientific data to feed into the legislative process is important.

### **Ecological Implications of Human Activities in the Arctic?**

While climate change is generally recognised as a major threat to Arctic's ecosystems many uncertainties remain regarding the impact of human activities on biodiversity, fisheries, forestry or Arctic indigenous peoples and local livelihoods.

Sandra Cavalieri, Fellow at the Ecologic Institute in Berlin presented the conclusions of the report "EU Arctic Footprint and Policy Assessment". The project analysed the environmental impacts of EU production and consumption, and Arctic production for EU consumption. The report finds that the European continent is responsible for 59% of black carbon emissions settling down on the Arctic and that the EU itself emits 30% of heavy metals and 40% of acidifying gases found in the Arctic. All pollutants do not come only by air, they also accumulate in the water and are carried with the currents from Europe into the Arctic, the latter acting like the "sewer of Europe", according to one of the participants. Furthermore, Europe's current economic activities in the Arctic, such as tourism, shipping and extractive industries, are also a source of pollution.

It was recognised that many data have been gathered over several decades, even if a lot of work is still needed. Research has to be pursued; much is still to be understood and analysed. More accurate or frequent information has also to be provided. Work like that done for the Arctic footprint has to be pursued to better understand the effect of

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<sup>1</sup> The UN Convention on the Law of the Sea (UNCLOS) makes a difference between the extent of the sea floor, which is considered national interest and the high seas which are a common interest.

European and global activity on the Arctic region.

## **Commercial Exploitation of the Arctic**

The increased human activity in the Arctic region is a fact, even if the pace at which it will increase in the future is unknown. The EU itself currently imports 39% of its fish from Arctic countries and owns 60% of the Arctic infrastructure-intensive industries (share of Arctic exports from selected industries: oil, gas, diamond and metal extraction). Huge economic interests are at stake and the impact of climate change on the melting of ice will enhance the opportunities for the exploitation of Arctic natural resources. Therefore, the question was raised: is it possible to achieve a sustainable development of the region?

Another concern which was strongly reflected in the workshop relates to ensuring security and the fact that more support will be asked by those involved (e.g. access to “normal” communication means). The climatic (bad weather, darkness, ice coverage, space weather effect) and geographic conditions (remoteness from aerial support base, low density of inhabitants/visitors) imply difficult and constraining means for ensuring safety in three areas: merchant shipping and tourism, oil and gas exploration and extraction and fisheries.

Providing adequate weather forecasts, ice/iceberg conditions, communication means, ship identification systems, accurate navigation information, will have to be ensured, most likely in an international context as the overall costs might be quite high and the economic model for potential commercial services is largely unknown.

## **The Role of Space in Tackling the challenge**

It was recognised that the recourse to space systems combining earth observation, navigation and positioning and telecommunications capabilities is essential to prevent and mitigate several hazards and

areas of concern including: sea ice conditions, icebergs movements, hurricanes, permafrost melting, chemical pollution and oil spills and ocean productivity variations. “The keywords in this respect are: monitor, report, guide and remedy”, one participant said. A lot has been achieved with ERS-1/2, ENVISAT, CryoSat-2 and tomorrow the Sentinels. Data continuity must be ensured. While this is ensured for sea ice extent, measurements of sea ice thickness may be missing at the end of the CryoSat-2 scientific mission.

Geo-stationary satellites (GSS) do not offer reliable connectivity above 70-72° latitude, especially for mobile applications while there will be a need for medium to broadband communications. The planned Polar Communications and Weather (PCW) Canadian satellite was offered to be developed under international cooperation and that would greatly improve the security in the covered area. The mission objectives are to provide 1) reliable communications services above 70°N in order to ensure safety of air and marine navigation and support to Northern Communities, 2) high temporal/spatial resolution meteorological data above 50°N in support of environmental monitoring, emergency response and climate change monitoring, and 3) space weather monitoring.

## **Conclusion**

Developing a satisfactory regulation environment in the Arctic remains a primary concern for the international community to guarantee both the environmental protection of the Arctic and the sustainable exploitation of its natural resources. As noted above, promoting cooperation and preventing the outbreak of conflicts would necessarily require the establishment of the right balance between national and common interests in the Arctic.

Europe’s and the Arctic’s interdependency suggest that preserving the Arctic will only occur if the European Union is closely associated to international efforts. Furthermore, such a process will need to ensure the active participation of indigenous

peoples that have lived in this region for generations for ignoring their historical rights would not only be ethically wrong but might undermine the chances for establishing a stable and secure future in the region.

The workshop brought to light the need to bridge the existing gaps regarding information and communications in the Arctic. The deployment of space missions above the Arctic for climate change monitoring, communications and safety requirements was strongly advocated by users attending the meeting. In terms of policy making, the successful coverage of the Arctic by space technologies is expected to be useful in both the definition and implementation of policies.

Participants concluded that some of these technologies are already in place but require better coordination, long term financing and more international cooperation in order to tackle the Arctic challenges ahead.

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