Workshop Conclusions

Space and the Arctic Workshop, Stockholm 20 -21 October, 2009

Under the auspices of the Swedish presidency of the European Union

Purpose

Temperatures in the Arctic are rising at an unprecedented rate. The warmer climate, advances in technology and demand for natural resources are leading to increased human activity. As well as new opportunities this enhanced activity creates new risks to those working and living in the area and to the unique natural environment. In order to set out proposals for the EU's contribution to meeting these challenges, the European Commission adopted a Communication on "The European Union and the Arctic Region" in November 2008. The Communication defines three main policy objectives - Protecting and preserving the Arctic in unison with its population - Promoting the sustainable use of resources - Contributing to enhanced Arctic multilateral governance. Ensured continuity of space observations was proposed as an action to reach the policy objectives. On 8 December 2008 the EU's General Affairs Council welcomed this Communication as "a first layer of an EU Arctic policy". Objective of the Stockholm Workshop was to build on earlier achievements developed in regional areas and highlighted examples as a basis for building the necessary infrastructure in the Arctic.

Conclusions

Because of the Arctic's remoteness, harsh environment and low population density, orbiting satellites offer cost-effective solutions to monitor the environment, facilitate navigation and communication, enhance marine safety and environmental protection and support a sustainable use of resources. A number of these solutions have been tested in research programmes supported by Member States individually and collectively through the European Space Agency and European Union research programmes as well as EUMETSAT operational programmes. Based on this experience a number of conclusions can be drawn

1. The advances in Arctic sciences made possible by Earth observations have led to a better understanding of climate change and its consequences to the Arctic environment.
2. The Arctic Council's Arctic Marine Shipping Assessment (AMSA) 2009 Report is strategic guide and policy document of importance to determine future space assets to support enhanced marine safety and environmental protection in the Arctic Ocean.
3. Baltic regional infrastructures and applications are examples that could be further explored and developed for a sustainable exploitation of the Arctic.

4. Current Earth Observation satellites provide good monitoring of sea-ice concentration and extent as well as the arctic land environment. The GMES Sentinel missions is a means to continue and improve operational sea- ice and iceberg monitoring and as input to essential climate variables. ESA polar orbiting satellites ERS-1 and 2 and Envisat, replaced and complemented by the planned Sentinel missions, will ensure continuity of observations. Having both Sentinel 1a and b in orbit as soon as possible is essential to obtain the needed revisit time required by operational services for navigation and search and rescue.
5. Meteorological satellites in geo-stationary orbits lack coverage in the far North. This not only restricts the accuracy of weather forecasts in the region but also limits information on climate change. Meteorological satellites in polar-orbit for monitoring the Polar Regions such as EUMETSAT Polar Satellite Programme including the Satellite Application Facilities, will contribute to an increased coverage of the Arctic
6. It is essential to continue research and development of new satellite sensors complementary to in-situ observation infrastructure and surveys. By monitoring precise changes in the thickness of the polar ice caps and floating sea-ice the upcoming Cryosat-2 mission can answer essential questions on the changing Arctic environment. Enhanced sea-ice thickness measurements are also a key to effective and safe ice navigation in the future.
7. The geostationary orbits of most communication satellites limit coverage in the far North. An extension of high bandwidth communication to these regions would allow a better quality of life for those living and working in the North and a more immediate transfer of information on conditions to those outside.
8. Further development and improvement of satellite-based navigation services in the Arctic region is required to support the foreseen increase in nautical traffic through the North East and North West passage. Their possible application for Air Traffic Management should also be considered.
9. The continuation of the ESA GNSS evolution program and in particular the activity on Arctic Testbed needs to be secured.
10. Automatic Identification System receivers mounted on satellites have the potential to provide a good overview of maritime traffic (ship monitoring) in the Arctic that can enhance navigational safety and support risk assessments.
11. International partners are already planning special-purpose missions for Arctic communication and observation. Any European capability should complement and not duplicate these efforts.
12. A governance mechanism is required to foster international cooperation on service provision.

Recommendations

Based on discussions during the workshop, the participants invite

a. The European Commission to consider the needs of the Arctic when assessing the results of the preparatory action on receiving Automatic Identification Systems from space.

b. The European Commission to ensure that proposals for future operational GMES satellites and services, address the special needs of the Arctic (sea ice, icebergs, snow, glaciers, ice sheets and permafrost)

c. ESA to review communication satellites coverage and determine solutions that can improve the situation following priorities identified with all involved parties.

d. ESA and EUMETSAT to review the coverage of meteorological missions and to identify the necessary priorities and technical solutions for weather forecast.

e. All partners concerned Research and Development efforts, especially addressing issues such as monitoring of ice features, permafrost, biodiversity etc.

f. Scientists and operational users to continue dialogues in order to accelerate the development of operational decision support and early warning systems

g. The European Commission, ESA, and Member States to sustain continuous observations ensuring long term data records to support climate monitoring. The European Space Agency and EUMETSAT should discuss the possibility of joint programmes with international partners.

h. The EU, ESA, EUMETSAT and their Member States as well as other involved parties to support and implement a fully open and “obstacle” free data access policy and infrastructure.

i. ESA to check the requirements of the Sustaining Arctic Observing Networks for measurements from space.

j. Industry to establish and adopt common guidelines and best practices to improve safety, security and manage the environmental impact of their activities in the Arctic by making further use of satellite-based geo-information products to monitor operations in the fields of oil & gas, shipping and tourism.

Given the high costs and long lead items to develop new space systems, these actions should begin immediately.