Copernicus and Polar Regions Industry Workshop 7/11/2018

Workshop Report

Prepared for:

European Commission - DG GROW

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1 INTRODUCTION

Polar applications are not a new subject for discussion. Internationally, the subject has gained considerable attention from institutions such as the World Meteorological Organisation (WMO) through its Global Climate Observing System (GCOS). In 2016, the European Union even adopted an integrated EU Policy for the Arctic, aiming to contribute to a stable, safe, sustainable and prosperous Arctic. The European Space Agency (ESA), from its side, touches upon the topic via its Climate Change Initiative (CCI) and Polaris.

For Copernicus, the **Copernicus Polar and Snow Cover Applications User Requirements Workshop** of 23 June 2016 welcomed a series of users, service providers, representatives from the scientific community, the European Commission, ESA, EUMETSAT and industry representatives, to gather a set of requirements to be fulfilled by the evolution of the Copernicus Space Component. This process was finalized by the work of the **Polar Expert Group in Spring/Summer 2017**, which has made an analysis providing a list of requirements and priorities, including the required space technologies to achieve this, in a series of two reports. These activities contribute to the general exercise in which the requirements for the evolution of the Copernicus Space Component are defined.

This workshop was an opportunity to present the roadmap of Copernicus in this area and to raise awareness concerning the defined offer of products and services for the industry and related stakeholders. The sequence of discussions was based on the EU Arctic Policy objectives, which identify three policy areas:

1. Climate Change and Safeguarding the Arctic Environment (livelihoods of indigenous peoples, Arctic environment)

2. Sustainable Development in and around the Arctic (exploitation of natural resources e.g. fish, minerals, avoiding oil and gas spills), « Blue economy », safe and reliable navigation (NE Passage…)

3. International Cooperation on Arctic Issues (scientific research, EU and bilateral cooperation projects, fisheries management/ecosystems protection, commercial fishing)

81 people registered for the workshop, and 67 people attended the workshop. The agenda is available in Annex 1.

2 OPERATIONAL CONCLUSIONS

2.1 Conclusions of the workshop

The Workshop aimed at presenting the Copernicus offer with Polar relevance and detailing the roadmap towards the implementation of future Copernicus capabilities vis-à-vis the requirements expressed in previous workshops and further elaborated in the two reports of the Polar Expert Group. As a consequence, the event focus has not been so much on requirements, but rather on the way to progress in accordance with the indications and the objectives of the EU Arctic Policy. An Arctic-dedicated family of Sentinels might, along with the existing Sentinels and the other Expansion missions proposed, pave the way to the evolution of Copernicus and its success.

It is necessary to speak of « families of missions » in order to stress the long-term operational commitment taken by the Copernicus programme once a new set of observation capabilities is made available. This point has been raised several times in the course of the workshop, and includes obviously the continuation of the current families of Sentinels.

The workshop has shown a significant number of operational applications, which probably would not exist, or at least would not have the same level of success without Copernicus. The attendance and active participation of several operational entities around the Arctic ocean and surrounding seas has to be highlighted.

Sentinel-1 (as well as Radarsat, Terrasar, Tandem X, Cosmo-Skymed, Cryosat-2, MODIS) data are used throughout, along with important contributions from Sentinel-2 and -3. Outside Copernicus, passive microwave data are used, and there is a pronounced worry about the continuity of these data, today available from non-European sources for which continuity is in doubt. This applies as well to the passive microwave radiometry mission, which was defined as one of the six high-priority candidate missions for Copernicus.

Improved spatial resolution and temporal resolution (e.g. several observations per day) are required, a gap that can be filled if the proposed Polar expansion missions will be funded. Nevertheless, international cooperation and integration of data coming from Contributing Missions are seen as fundamental.

It goes without saying that this availability of data (in large quantities and delivered in a reliable and continuous way) sustains scientific research in polar areas way beyond what could have been expected only three decades ago, or even less. Climate research, polar oceanography and meteorology (the research part) are profiting, and will even more take advantage in the future of the detailed knowledge of the Arctic and Antarctic systems made possible thanks to Copernicus data and information.

The contribution of the Copernicus services, in particular CMEMS and C3S, should not be underplayed. CMEMS, in particular, is developing tailored products for the arctic oceans. The role played by these products will improve with future availability of new observations and the development of more performing and innovative modelling techniques and algorithms. They will become also in the polar areas the backbone upon which applications will grow and expand.

A question has been raised about the benefits policy makers can draw from this growing flow of information (in quantity and quality), with particular reference to the EU Arctic Policy. The overall impression is that the connection is not as strong and as effective as it should be: there is room for improvement and for a better systematic feedback.

As a way of conclusion, the importance of the Polar areas is recognised for a long list of good reasons. The attention of policy makers has already produced important guidelines. The feedback from the operational and scientific use of Copernicus data to policy makers has to be continuous and must find reflection in the formulation and application of the policies. Currently, operational users rely upon Copernicus data and services massively. The reliability and continuity of observations and of delivery of service products is an asset, which makes Copernicus a key contributor for Polar observation and monitoring.

The contribution of Copernicus to all the various aspects of polar research is already enormous. It will grow even further with

- Guaranteed (enhanced) continuity of current observations and service products
- Expansion Missions for the Polar Regions

Copernicus shall include dedicated Polar missions amongst its future observation capability.

2.2 Key Takeaway messages

- Forecasting of conditions (risk indicators for activities, ice extent, maritime conditions, weather…) to people in the field is a major domain for service provision
- Operational service provision (both upstream by Copernicus and with downstream operators) has to include the ability to provide advice to users through active helpdesks and contact points for expert advice
- User interface technology access in the Arctic varies widely, and information/product dissemination to users has to be carefully tailored to be effective
- While DIAS and other cloud platforms are increasingly finding traction, also less demanding outlets (e.g. requiring less bandwidth and mobile solutions) need to be found
- A comprehensive understanding of processes in the Arctic has to rely on a wide range of information sources, satellites, in-situ networks and ancillary sources including feedback from human actors on the ground (e.g. crowdsourced), and the role of services is to combine these
- Links between Copernicus and research infrastructures could be strengthened
- Innovative downstream opportunities for services and data collection are growing as more full, free and open information becomes available

3 ANNEX II: WORKSHOP AGENDA

09:30 - 10:00	Registration and welcome coffee
10:00 - 11:00	**SESSION 1:** Welcome and introduction - the Institutional Framework • Mr. Philippe Brunet (Director, Space Policy, Copernicus and Defence, DG GROW, European Commission) • Mr. Heino Nau (DG MARE, European Commission) • Mr. Vincent Toumazou (DG GROW I2, European Commission)
11:00 - 11:15	Coffee break
11:15 - 12:30	**SESSION 2:** Space and Data Infrastructure for Polar Applications **Chair:** Vincent Toumazou (DG GROW I2, European Commission) • Mr. Craig Donlon (ESA) • Mr. Bojan Bojkov (EUMETSAT) • Ms. Tanja Zegers (DG GROW I1, European Commission) • Mr. Nick Hughes (KEPLER) **Q&A**
12:30 - 13:30	Lunch
13:30 - 14:45	**SESSION 3:** Polar applications of Copernicus *Climate change & safeguarding the Arctic environment* **Chair:** Peter Breger (DG GROW I2, European Commission) • Mr. Carlo Buontempo (ECMWF – C3S) • Mr. Andrew Shepherd (University of Leeds) • Ms. Matilde Brandt Kreiner (Danish Meteorological Institute) • Mr. Stef Lhermitte (EarthMapps / TUDelft) • Ms. Paola Belingheri (IceKing GmbH) **Q&A**
14:45 - 15:00	Coffee break

15:00 - 16:15 **SESSION 4:** Polar applications of Copernicus

Sustainable development in and around the Arctic

Chair: Peter Breger (DG GROW I2, European Commission)

- Mr. Gilles Garric (Mercator Océan)
- Mr. Snorre Greil (Icelandic Coast Guard)
- Mr. Jani Poutiainen (Finnish Meteorological Institute)
- Mr. Lars-Anders Breivik (Norwegian Meteorological Institute)
- Mr. Stefan Hendricks (Drift + Noise Polar Services)

Q&A

16:15 - 17:15 **SESSION 5:** Polar applications of Copernicus

International cooperation on Arctic issues

Chair: Peter Breger (DG GROW I2, European Commission)

- Mr. Vincent Jean Paul B. Drouin (National Land Survey of Iceland)
- Mr. Shridhar Jawak (University Centre in Svalbard)
- Ms. Ingibjörg Jónsdóttir (University of Iceland)

Q&A

17:15 Wrap up and conclusions

COPERNICUS & POLAR REGIONS INDUSTRY WORKSHOP

7 NOVEMBER 2018 BRUSSELS