

Polar Space Task Group - PSTG

Context:

As part of CEOS action 152-6, Yves Crevier of the Canadian Space Agency, has attended the first PSTG meeting and has offered to represent CEOS interests and ascertain the possible role of CEOS-level support to and participation in PSTG-related activities.

Background:

The PSTG is a successor of the successful International Polar Year Space Task Group (IPY-STG), established for the purpose of Space Agency planning, processing and archiving of the IPY Earth Observation legacy dataset. The Polar Space Task Group (PSTG) is established under the auspices of the World Meteorological Organization's (WMO) Executive Council Panel of Experts on Polar Observations Research and Services (EC-PORS). It has been proposed that a suitable reporting mechanism shall be established to inform the Committee on Earth Observation Satellites (CEOS), the Coordination Group for Meteorological Satellites (CGMS) and the WMO Consultative Meetings on High-Level Policy on Satellite Matters (CM) on relevant PSTG progress and issues. The Canadian Space Agency (CSA) has been asked to provide the necessary linkages with CEOS.

The PSTG mandate is to provide coordination across space agencies to facilitate acquisition and distribution of fundamental satellite datasets and to contribute to the development of specific derived products in support of cryospheric scientific research and applications. Benefits from the growing constellation of polar orbiting satellites will be realized by mobilising the unique and complementary capabilities of each of the respective participating Agencies, whether research and development or operationally oriented.

The agreed upon functional requirements are:

- Assemble disciplinary science requirements for polar and cryospheric research uniquely addressable with spaceborne systems through regular and broad interaction with the science community.
- Through iteration amongst the planning and processing activities of the participating space agencies, develop a concise, prioritized list of observational objectives based on:
 - efficient use of the international constellation of satellites;
 - operating mandates of each space agency;
 - satisfying science objectives best served by coordinating agency activities.
- Regularly assess and revise observation acquisitions and acquisition plans
- Review and update to the extent possible the observation priorities over time
- Develop plans to use shared resources for processing and distributing data and data products
- Establish subgroups addressing specific coordination issues
- Encourage participation by all interested space agencies

Kick-Off meeting – WMO, Geneva. October 13-14, 2011.

Agencies present at the meeting were ASI, CNES, CSA, DLR, ESA, EUMETSAT, INPE, NOAA, and USGS. The meeting was also attended by various representatives of programmes within WMO (Global Atmospheric Watch, Space Programme and World Climate Research Programme). The secretariat of PSTG is provided by the WMO Space Programme Office. The list of PSTG members can be found in Appendix 1

The objectives of the first meeting were to:

- Review the successes of IPY-STG
- Discuss existing polar science policy framework and related documents to define strategic foci of PSTG
- Agree on Terms of Reference and review mandate
- Present current and future agencies' capacities
- Discuss potential strategic focus areas and high level implementation plan.

Issues pertinent to CEOS:

- Expected role of CEOS and CGMS agencies: It is recognized that the poles are regions that are significantly affected by the impact of anthropogenic changes in the climate. Over the past few decades, scientists say that the poles have experienced twice the rate of warming as the rest of the Earth. One of the important focuses of the Science community involved in polar science is to understand how and why the poles are so noticeably affected by climate change. Since the late '70s, Earth observation satellites have provided a privileged vantage point for the monitoring and repeat observation of the poles. Long term archive datasets as well as new thematically coherent acquisitions could help in answering the above questions. Space agencies, coordinated under CEOS and CGMS, are already contributing resources, via their own activities and programs, to polar science and observing needs. However, current contributions are not coordinated and only partially contribute to a comprehensive set of observing requirements in support of overarching issues of global significance for the Poles. The collaborative framework established under the PSTG seeks at focusing collective observation activities on a set of pre-approved science priorities articulated by the science communities. PSTG will allow space agencies to collectively and coherently respond to the observation requirements essential to understand the impact of climate change over the poles. As its mandate indicates, the PSTG members are required to facilitate acquisition and distribution of fundamental satellite datasets and to contribute to or support development of specific derived products in support of cryospheric scientific research and applications. This means that participating space agencies will have to allocate resources towards the achievement of tangible results.
- Time horizon for outcomes: Following the successful IPY-STG, the re-establishment of the PSTG and its linkage with EC-PORS is phased to coincide with the four-year cycle of the WMO Congress (i.e. 2011 (Cg-XVI) and 2015 (Cg-CVII)). EC-PORS is specifically tasked with the establishment of the WMO Global Cryosphere Watch (GCW). Thus, the initial working term of PSTG will foresee a 3-year interval of activities between 2011 and 2014, with the goal to review progress and working mandate prior to the deadline for inputs to the WMO Congress in 2015.

- Definition of areas of strategic foci: The PSTG has initiated the discussion on areas of strategic foci for its first contribution cycle. A preliminary list of strategic areas is provided under appendix 2. The preliminary list is based on science requirements identified by polar science authoritative groups (i.e. EC-PORS, WCRP, GCW and related forums and activities). This list is expected to evolve through a more thorough consultation process. It includes a series of science priorities that should model the observation activities to be conducted by the members of PSTG. The list was not cross-checked against agency priorities and capabilities. An “observing” strategic plan needs to be developed by the PSTG in order to understand the science requirements, to define the ways to contribute to the observation requirements (with multiple observing strategies: long term monitoring, coherent synoptic coverages, monitoring of hot spots, etc.), and how to distribute the “observation load” over the PSTG members. The PSTG strategic plan will define success indicators and provide a coherent reporting mechanism demonstrating the support of the space agencies in response to polar science activities.
- Liaison with PSTG: The liaison with the PSTG will have multiple dimensions – a) consulting, reporting and outreaching to the science and operational authoritative groups, b) reporting back to CEOS and CGMS annually on contribution and progress achieved against the strategic plan and seeking advice on way forward (mechanism to be defined), and c) collective outreach (in a synchronized fashion) to demonstrate the contribution of Space to a better understanding of climate change impacts. In terms of reporting to CEOS, it was noted that CEOS SIT may be the venue for virtual constellation-type issues, but that CEOS should determine the best way to be kept informed of these activities. PSTG could plan at a minimum to report annually to CEOS. PSTG may have to foresee cycling the responsibility for reporting, depending on the timing and location of the CEOS meetings. That way each member Agency could take responsibility of reporting on behalf of PSTG. PSTG can similarly report annually to CGMS and should consider making one report that suits both purposes, incorporating any PSTG Recommendations which need to be treated at higher level.
- Minutes of the first meeting are being produced and will be shared with the CEOS executive officer for wider distribution.
- Next meeting tentative dates are: May 15-17 or June 12-14, 2012.

In conclusion, the PSTG was formed in response to the overarching needs of the polar and cryospheric communities for coordinated space-based data. These data underpin efforts to develop a better understanding of climate change impacts on highly visible issues of environmental and socio-economic significance. The discussions at the first PSTG meeting were focused on the overarching policy framework for polar science and justified by the obvious contribution that space-based EO can make towards a better understanding of the current and future cryospheric scientific challenges. Its contribution, design and operating procedures will be defined as a function of the priority science questions, the agencies’ roles and mandates, and the mission capabilities (individual and collective) to respond to the science questions. A strategic implementation plan, including the definition of success indicators, will be developed to frame the agency contributions and align the science community expectations with the space agencies’ capabilities. Although the PSTG will operate as an independent body, advice from CEOS, CGMS and WMO will be welcomed throughout the implementation process. PSTG is expected to report on an annual basis to CEOS and CGMS in a format to be defined.

Appendix 1

List of PSTG members and agency representatives invited to the PSTG meeting:

Members of PSTG

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Appendix 2

Preliminary list of areas of strategic foci:

- Sea and glacial ice mass variability and contribution to sea level and ocean dynamics
- Glacial ice mass balance contribution to sea level
- Polar atmospheric, ocean, cryosphere and terrestrial products to facilitate improved weather, climate and environmental observation, monitoring and prediction
- Freshwater budget closure at high latitudes (snow and permafrost impact on polar hydrological cycle)
- Circumpolar changes in permafrost and terrestrial biosphere (consequences for Carbon and hydrological cycles)
- Physical and biological forcing of atmospheric chemistry in polar atmosphere
- Identifying new opportunities for integrated applications in response to emerging socio-economic issues of polar regions

