W O R L D M E T E O R O L O G I C A L O R G A N I Z A T I O N

CONSULTATIVE MEETINGS ON HIGH-LEVEL POLICY ON SATELLITE MATTERS

ELEVENTH SESSION

GENEVA, SWITZERLAND

19 MAY 2011

FINAL REPORT

REPORT

1. ORGANIZATION OF THE SESSION

The President of WMO, Dr A.I. Bedritskiy, opened the session at 09h00 on 19 May 2011 and welcomed the participants (See list in Appendix I).

He recalled that cooperation and collaboration among all contributors to the space-based GOS were essential for WMO and its Members to efficiently address issues like climate change, water resources, disaster mitigation, and many of the other Societal Benefit Areas (SBAs) identified by the Group on Earth Observations (GEO). The WMO GOS should provide the National Meteorological and Hydrological Services (NMHSs) with the means to address the continuously evolving needs of their own constituencies in all these areas.

The President stressed that much needed to be done in the perspective of the Global Framework for Climate Services (GFCS) that emerged from the Third World Climate Conference (WCC-3). We need to strengthen our monitoring programmes - both space-based and ground-based, increase our research efforts, and start the transition to sustained climate monitoring. As international collaboration and coordination have played a remarkable role to enable implementation of weather monitoring from space, we now need a similar commitment to extend this effort to monitoring climate from space. This eleventh session should give high-level policy guidance on satellite matters particularly in reference to developing an architecture for monitoring climate from space. Associated with the development of the Vision to 2025 for the GOS, the Executive Council confirmed the high-level goal that there should be no gap in the satellite-based climate records and the homogeneity of such records should be secured in accordance with the GCOS Climate Monitoring Principles (GCMPs). The Council also recalled the importance of ensuring data exchange, of inter-calibration of satellite sensors to ensure global consistency of space-based datasets, and of the SCOPE-CM effort towards delivery of sustained climate products.

In conclusion, the President thanked all the Organizations represented in CM-11 as well as the Secretariat, for the accomplishments to date, and he invited the meeting to focus its attention on the highest-priority, most strategic issues such as the important role that space agencies play in monitoring climate from space, and how we might better leverage our coordination mechanisms to exploit these assets.

The agenda was approved as contained in Appendix II.

2. ACTIONS DERIVING FROM CM-10

The session was informed on the status of recommendations originated at the tenth session of the Consultative Meetings on High-level Policy on Satellite Matters (CM-10), and noted with satisfaction that all recommendations had been addressed.

3. WMO SPACE PROGRAMME ACTIVITY REPORT

The session was informed on activities conducted by the Space Programme since CM-10 with respect to the following areas:

- Expansion and coordination of the space-based Global Observing System (GOS) including implementation of the WMO Vision of the GOS in 2025, support to the Rolling Review of Requirements (RRR) process, and Global Space-based Inter-calibration System (GSICS);
- Support to data accessibility including the Integrated Global Data Dissemination Service (IGDDS) and the Regional ATOVS Retransmission Service (RARS);
- User information and training activities; and
- Space Weather.

The report included an updated description of the objective and scope of the space programme, which was subsequently submitted to the WMO Congress for adoption, and an overview of the organization and staff resources of the Space Programme Office.

The attention of CM-11 was raised in particular to the following developments, issues or challenges:

- Need to ensure user preparedness in the relevant WMO Regions for new geostationary programmes to become available in 2015-2018;
- Need to reach full operational status of new missions in afternoon orbit : FY-3B, then NPP and ultimately JPSS, with routine data availability and usability;
- Planned inclusion of sounder data from FY-3B, METOP/IASI, NPP/CRIS into the RARS system;
- Ongoing formulation of data access requirements at the regional level, to be extended to RA V;
- Continued expansion of DVB-S dissemination services in all regions, including potential evolution of GEONETCast-America upon termination of EUMETCast-America, and a potential pilot service over the Pacific as a collaboration between Australia and the USA;
- Virtual Laboratory, with the need to continue voluntary funding of the VLab Technical Support Officer;
- The need to raise awareness of WMO Members on Space Weather impacts, the benefit of WMO coordinating activities in this area, in particular in the perspective of the emerging requirements from ICAO, and the recommendation from a Congress Side Event to develop a coordinated strategy with Regional Associations including a training component.

JMA informed the meeting that the operation of current MTSAT satellites and the preparation for the future Himawari generation, fortunately, had not been affected by the disaster that struck Japan with the earthquake and associated tsunami. At this point, many participants expressed both their sympathy to the people of Japan, and their commendation with how the disaster was handled.

CMA emphasized the progress made in data accessibility through data exchange with EUMETSAT, the evolution from FengYunCast to CMACast, and the information of the user community through the first Asia-Oceania Meteorological Satellite Conference. It was stated also that FY-3B, although part of a preoperational series, was operationally available and that data would be made available to all WMO Members; furthermore, FY-2C stationed at 123.5°E was used occasionally for rapid-scan.

4. GCOS SATELLITE MATTERS

The Director of the GCOS Secretariat, Dr Carolin Richter, gave an overview on space based climate observations related to the objectives of the GCOS programme since CM-10. The eleventh session considered and supported the following five GCOS recommendations:

Recommendation I: It is recommended that space agencies participate at the open review process and ensure the implementation of the tasks implied in the 2011 update of supplemental details to the satellite based component of the 2010 updated GCOS implementation plan.

Recommendation II: It is recommended that space agencies support any follow-up on initiatives with regard to the evaluation of GCOS ECV data sets. The support of this assessment process would be considered as a contribution to the GCOS Improvement and Assessment Cycle.

Recommendation III: It is recommended that space agencies continue to closely cooperate with GCOS on future progress reports with regard to the actions of the Implementation Plan and on reviewing the adequacy of observing systems for climate.

Recommendation IV: It is recommended that space agencies support the improvement of in situ networks through all domains (atmosphere, ocean and land), needed for validation and ground truth for space based observations, supporting also the concept of reference and super site networks discussed

in the 2010 updated GCOS implementation plan. Space agencies should feed back their requirements for ground-truth observations to the GCOS expert panels.

Recommendation V: It is recommended that space agencies take part in future regional workshops and that they assist in encouraging regional cooperation at those meetings. Space agencies should support actions proposed in the updated GCOS regional action plans, specifically with regard to space based climate observations on a regional scale.

With reference to Recommendation IV, CMA stressed the importance of ground truth validation and indicated its willingness to contribute to such activities.

J. Purdom (USA) noted the increased number of ECVs requiring satellite observation and underscored that the availability of two programmes in AM (EUM + CMA) and in PM (CMA + USA) provided a good prospect for continuity. He noted the capabilities of future geostationary systems to support climate monitoring especially through hyperspectral measurements providing spectrally resolved radiance measurements over time and with constant viewing angle.

EUMETSAT thanked the GCOS Secretariat for the status report and indicated its intention to contribute to the GCOS Trust Fund.

5. PROGRESS REPORT ON SUSTAINED CO-ORDINATED PROCESSING OF ENVIRONMENTAL SATELLITE DATA FOR CLIMATE MONITORING (SCOPE-CM)

The session was informed on progress of the Sustained Co-Ordinated Processing of Environmental satellite data for Climate Monitoring (SCOPE-CM) initiative, including development, and application of a Maturity Index. It was noted that each of the five projects has tested the Maturity Matrix (presented at CM-10) for satellite product generation, particularly as it pertains to the generation of climate-quality products. Suggestions and modifications to the descriptions of selected cells in the matrix were made. Effort is still being made to enlist a project in either the oceanic or terrestrial domains. Information presented under this agenda item also served as background material for the architecture discussion, as SCOPE-CM has been identified as one of the key components for an end-to-end system for monitoring climate from space.

Dr Tillmann Mohr welcomed the progress and suggested that a pilot project be proposed in relation within the oceanic domain, particularly based on altimetry data.

Action 1: WMO Secretariat, in consultation with Jason partners, to consider a SCOPE-CM Pilot Project for ocean altimetry.

EUMETSAT confirmed its strong commitment to support SCOPE-CM both as the Secretariat, and as a participant. In particular EUMETSAT intends to pursue the generation of the albedo product.

CMA wished to support SCOPE-CM and proposed nominating an expert at the SCOPE-CM Executive Panel.

JMA underscored the importance and its support to the project, and emphasized the long-term dimension that is essential for climate monitoring.

6. PROGRESS REPORT ON DEVELOPMENT OF A SPACE-BASED ARCHITECTURE FOR CLIMATE MONITORING

The session reviewed the progress made since CM-10 in the development of an architecture for climate monitoring from space. The Director of the Space Programme, Ms Barbara Ryan, recalled the international policy framework that calls for coordinated climate monitoring. With guidance from CM-10, the WMO Space Programme developed an outline and concept document for such an architecture and has subsequently coordinated with both CEOS and CGMS. Some building blocks exist but may not address the entire spectrum of activities needed, and global coordination can be strengthened in selected areas. Following a WMO/GCOS-sponsored Continuity and Architectural Requirements for

Climate Monitoring Workshop, an *ad hoc* Writing Team comprised of members from CGMS, CEOS and the WMO Space Programme was formed.

The Chair of the Writing Team, Dr Mark Dowell, briefed the session on the scope, content, timelines and milestones of the strategy document. He explained that the team was keen to undertake this work in a very open spirit to reflect the input from the global community without restricting it to the agencies or organizations to which they belong. The report would first evaluate the status of requirements, the state of the art of observation and product generation, the status of calibration activities and available gap analyses. It would explain the interdependency between research and operations, and then analyze the functions to be comprised in a logical architecture to meet the requirements. This logical architecture being a prerequisite for addressing a physical architecture. The report would propose a way forward including case studies, stewardship analysis, and would lead to an iterative effort to "walk" decision makers through mapping their own plans to the overall scheme. An implementation plan towards a physical architecture would then be developed. The draft report would be reviewed by GCOS, WCRP and GEO and, once finalized, submitted to CGMS and CEOS plenary meetings towards the end of 2011.

Additional guidance and support was sought from the session to advance the development efforts.

The eleventh session was invited in particular:

- To note the development of an initial WMO concept document for an architecture for climate monitoring from space, which has been communicated to the WMO Congress (Version.1.1);
- To note progress on collaborative efforts to prepare a report describing a coordinated strategy for an architecture for climate monitoring from space; and
- To review draft Resolution (3.7/1) for consideration by the Sixteenth WMO Congress (Cg-XVI).

Mr Ivan Petiteville (ESA) underlined that the joint document should fit the needs of a broad community in the context of GEO, beyond WMO.

Mr Michel Jean (Canada) expressed strong support to the approach and suggested extending the review process to a wider community, particularly those in the biodiversity and ecosystem realms.

Mr Alexander Frolov (Russian Federation) also supported the process and suggested higher attention be given to the review and stressed the principle of open data exchange.

Mr Charles Baker (USA) applauded the WMO initiative to mobilize a number of organizations on this matter and recommended to place this effort in the framework of a GEO Task co-led by WMO.

Dr Lars Prahm (EUMETSAT) recalled that the Writing Team was established on a best effort basis with a diversified range of organizations, and encouraged to pursue along these lines.

Dr Yang Jun (CMA) supported this approach and noted the need for a governance mechanism among the various components. He recommended that this governance be exerted through the WMO Space Programme. Furthermore, CMA expressed readiness to contribute to the further work of the Writing Team if there was an opportunity to do so.

The Director of the WMO Observing and Information Systems Department (D/OBS), Dr Wenjian Zhang, congratulated the team for the progress made. He recalled the need to take into account the GFCS and supported the view to broaden the review process. Dr Mohr (WMO) commended the cooperative spirit among the space agencies that allowed this progress, under the leadership of Dr Dowell. Dr Lars Peter Riishojgaard, WMO OPAG-IOS Chair, recalled that the Writing Team was established on a voluntary basis and supported the view that it could be enlarged and its outcome submitted for broad review.

Dr Dowell clarified that the review by GCOS, WCRP and GEO was a first internal review, but that the report was intended to undergo a wider review once submitted to CEOS and CGMS. Ms Ryan

noted that individual organizations may seek review at this stage and commented that the WMO Expert Team on Satellite Systems (ET-SAT) has expressed interest in reviewing the report.

The President expressed his congratulations for the progress made by the group. He noted as a conclusion that there was now a roadmap for defining the architecture for monitoring from space. He stated that a new paradigm was being developed for sustainable development, in the light of evolving climate needs. For example, the biosphere evolution is an important element as it affects the carbon cycle. Since the monitoring effort is wider than for weather monitoring only, it would require even more coordination, and WMO has an important role in this respect.

Action 2: CM agencies to further develop the space architecture plans by continued participation in the interagency effort.

7. FINAL PREPARATION FOR CG-16

The Director of the WMO Space Programme recalled that the Congress document on the WMO Space Programme (Cg-XVI/Doc.3.7) would be presented at the Sixteenth WMO Congress on Friday afternoon, 20 May 2011. The timing of CM-11 had been chosen to enable the session to provide feedback to the Congress, for example in reinforcing, if relevant, one or another aspect of the WMO Space Programme in Document 3.7. She proposed, and it was agreed, that the Statement from the Space Weather Side Event be brought to Congress as an addendum to Doc 3.7.

Regarding the draft resolution on the architecture, Dr Brent Smith (NOAA) recalled the role of GEO and proposed a new sentence “coordinated activities to be led by WMO with CEOS and others as a GEO Task”. EUMETSAT wished to see the completion of the work of the Writing Team before commenting on a way forward.

The Director of the GEO Secretariat, Dr Jose Achache, felt the need to clarify the articulation of this effort with WIGOS and GEOSS. As an observer in the Consultative Meetings, he suggested that the articulation with GEOSS be clarified in the document to be developed by the Writing Team.

Mr Petiteville (ESA) supported NOAA’s and GEO’s views that the architecture would have a better construct if placed in the framework of GEOSS given the linkage with a number of SBAs including e.g. ecosystems.

8. ANY OTHER BUSINESS

Mr Frolov thanked all CM members who had sent their congratulations to the Russian Federation for the 50th anniversary of the first man in space. He informed all participants that the next CGMS meeting, to be hosted by ROSHYDROMET and ROSCOSMOS, will be held in St Petersburg, Russian Federation from 3-7 October 2011.

Mr Baker expressed congratulations of the United States to Dr Bedritskiy as Chairman of the Consultative Meetings, and as President of WMO, for his leadership. He also thanked Dr Prahm for his strong contribution over the years as Director General of EUMETSAT. Dr Mohr underscored how Dr Bedritskiy had been instrumental in establishing the Consultative Meetings, as well as the Space Programme, and had attended every CM since he was President. He emphasized the collaborative spirit that enabled the tremendous achievements within the Space Programme. D/OBS then presented a quick overview of the achievements of CM over the years. Dr Sue Barrell, on behalf of the WMO Commission on Basic Systems (CBS) commended Dr Bedritskiy for his action, as satellite observations are the backbone of meteorological and climate activities.

Dr Bedritskiy thanked all members for their participation and collaboration, emphasizing the essential contribution of space agencies. He thanked, in particular the members who have supported the early work of the Space Programme, namely Drs Mohr, and John Zillmann. He wished every success to the participants for the continuation of these activities.

9. CLOSURE OF THE SESSION

The session was closed at 12h45 on Thursday, 19 May 2011.

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WORLD METEOROLOGICAL ORGANIZATION

WMO (CM-11/Doc. 1.2(1)
(29.III.2011)

CONSULTATIVE MEETINGS
ON HIGH-LEVEL POLICY ON SATELLITE MATTERS

ITEM: 1.2

ELEVENTH SESSION

GENEVA, SWITZERLAND, 19 MAY 2011

Original: ENGLISH

AGENDA

1. ORGANIZATION OF THE SESSION
   1.1 Opening of the session
   1.2 Adoption of the agenda
2. ACTIONS DERIVING FROM CM-10
3. WMO SPACE PROGRAMME ACTIVITY REPORT
4. GCOS SATELLITE MATTERS
5. PROGRESS REPORT ON SUSTAINED CO-ORDINATED PROCESSING OF ENVIRONMENTAL SATELLITE DATA FOR CLIMATE MONITORING (SCOPE-CM)
6. PROGRESS REPORT ON DEVELOPMENT OF A SPACE-BASED ARCHITECTURE FOR CLIMATE MONITORING
7. FINAL PREPARATION FOR CG-16
8. ANY OTHER BUSINESS
9. CLOSURE OF THE SESSION