

COMMISSION FOR BASIC SYSTEMS
OPEN PROGRAMME AREA GROUP ON
INTEGRATED OBSERVING SYSTEMS

ITEM: 6.5

**IMPLEMENTATION-COORDINATION TEAM
ON INTEGRATED OBSERVING SYSTEM
(ICT-IOS)**
Eighth Session

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REPORTS OF THE OPAG-IOS EXPERT TEAMS AND RAPPORTEURS

**REPORT OF THE EXPERT TEAM ON SATELLITE UTILIZATION AND PRODUCTS
(ET-SUP)**

(Submitted by Anthony Rea (Australia), Chair, ET-SUP)

SUMMARY AND PURPOSE OF DOCUMENT

This document provides a report of the work of the Expert Team on Satellite Utilization and Products (ET-SUP) since the seventh Session of the ICT-IOS, together with subsequent progress, and recommendations.

ACTION PROPOSED

The Meeting is invited to note the information contained in this document when discussing how it organises its work and formulates its recommendations.

Appendix A Terms of Reference of the Expert Team on Satellite Utilization and Products (ET-SUP)

Appendix B Updated Work Plan with status of the Expert Team on Satellite Utilization and Products (ET-SUP)

DISCUSSION

1. Introduction

1.1 The seventh session of the Expert Team on Satellite Utilization and Products (ET-SUP) was convened in Geneva, Switzerland from 27 to 30 May 2013.

1.2 The primary objective of the session was to advance the work programme defined by the World Meteorological Organization (WMO) Commission for Basic Systems (CBS) as concerns in particular the promotion of access and use of satellite data by WMO Members in support of all WMO programmes and WMO co-sponsored programmes. In particular, the Team framed its consideration within the context of the key initiatives of the WMO Information System (WIS), the WMO Integrated Global Observing System (WIGOS) and the Global Framework for Climate Services (GFCS).

1.3 A key area of focus for the meeting was the Sustained Coordinated Processing of Environmental Satellite Data (SCOPE) for Nowcasting (SCOPE-Nowcasting) initiative; the pilot projects were reviewed and refined across the broad application areas defined within the concept including basic nowcasting, volcanic ash products for aviation, precipitation and dust products. SCOPE-Nowcasting was also discussed in the joint session with the Expert Team on Satellite Systems (ET-SAT) composed of satellite agency representatives, which provided some guidance on refinement of the pilots.

1.4 The meeting also considered the results of the WMO 2012 Survey on the Use of Satellite Data, making a number of recommendations for future surveys and setting goals for analysis of the survey results by the team. This analysis will form guide the future work of the Team, in particular around training and capacity development efforts.

1.5 The meeting recognised the value of regional efforts to gather satellite data requirements and also acknowledged the complementary nature of these efforts to the globally-focused activities of ET-SUP. The Team made a number of recommendations to ensure that regional and global efforts are coordinated to provide the best possible outcome.

1.6 Among its other major outcomes, the session:

- Identified a number of issues relating to satellite data formats and recommended future work to address these;
- Provided guidance for accessing and using new satellite capabilities;
- Discussed, and provided guidance to, advancing global data dissemination through the Integrated Global Data Dissemination Strategy (IGDDS), the Regional ATOVS Retransmission Services (RARS) and GEONETCast;
- Reviewed a number of case studies for the application of satellite data in support of climate services in the initial priority areas of the GFCS, and with reference to the Architecture for Climate Monitoring from Space, and set out a programme of work for expanding these case studies;

- Discussed important developments in user training and capacity building, including the Virtual Laboratory for Education and Training in Satellite Meteorology, the GOES-R Proving Ground programme, Committee on Space Research (COSPAR) activities, and in relation to space weather-related applications.

1.7 Arising from the recommendations of ET-SUP-7 a meeting of the ad hoc SCOPE-Nowcasting Working Group was held on 19-22 November 2013 at WMO, Geneva.

1.8 The session achieved its major goals, which were to:

- Review the SCOPE-Nowcasting concept;
- Review and refine each of the pilot projects with regard to the criteria established at ET-SUP-7; and
- Prepare an action plan for the next 3-5 years for each of the pilot projects.

1.9 Major outcomes of the meeting were:

- Revisions to four of the pilot projects and rejection of one that did not meet essential criteria;
- A joint session with the WMO/IUGG Volcanic Ash Scientific Advisory Group; and
- The organisation of a Volcanic Ash Satellite Intercomparison Workshop to establish the optimal way forward for unified volcanic ash products.

1.10 ET-SUP has continued to make progress between meetings through regular WebEx meetings that are conducted quarterly or as required. These meetings are used to review progress against action items and address specific issues as required. Meetings were held on 3 September 2013, 13 March 2014. Specific meetings on SCOPE-Nowcasting were held on 25 April 2013, 12 November 2013 and 25 March 2014.

2. Achievements

2.1 In relation to its Terms of Reference, the ET-SUP achieved the following:

1. *ToR (a):*
 - The 2012 WMO Survey on the Use of Satellite Data was published in May 2013; and
 - ET-SUP members considered the results of the survey, making a number of recommendations for future surveys and setting goals for analysis of the survey results by the team. The next survey should probe all technical aspects of the satellite data value chain, and space weather should be covered more thoroughly; and

2. *ToR (b):*

- ET-SUP identified a number of issues relating to satellite data formats and organised participation by members in working groups to address these; and
- ET-SUP has reviewed and provided guidance for users on accessing and using new satellite capabilities, in particular the Product Access Guide and OSCAR.

3. *ToR (c):*

- ET-SUP made recommendations to Regional Satellite Data Requirement Groups, resulting in revised reporting arrangements, including ET-SUP, and new Chairs being designated in region III/IV (Luiz Machado (INPE), David Bradley (Env Canada)) and V (Agnes Lane); and
- SCOPE-Nowcasting was taken from a concept to initiation of a number of pilots, with a meeting of the ad hoc Working Group held in Geneva in November 2013.

4. *ToR (d):*

- The Product Access Guide concept was revised and the Guide further developed to an online prototype;
- ET-SUP acknowledged of the importance of RARS, and recommended that the programme should be continuously supported and developed;
- ET-SUP identified a number of issues relating to DVB dissemination of satellite data, in particular the lack of such capability for much of RA-V; and
- ET-SUP supported and encouraged a number of VLab training initiatives and collaboration with COSPAR.

5. *ToR (e):*

- ET-SUP has maintained a list of satellite data access points, processing and analysis software tools on the WMO Space Programme webpage. This includes an updated list of VLab-relevant tools;
- The Regional Requirements-gathering groups were highlighted to satellite operators through the ET-SUP/ET-SAT joint session and at CGMS-42.

6. ToR (f):

- Further developing SCOPE Nowcasting from a concept, and refining pilot projects (ad hoc steering group meeting Nov 2013);
- ET-Sup has continued to monitor SCOPE-CM as a key contribution to the architecture for monitoring climate from space;
- Members of ET-SUP advertised OSCAR tool which has gathered wide acceptance across the broader Earth Observation from Space community; and
- An updated version of the Product Access Guide was released in 2013. The guide has been further developed and operators have made products available.

7. ToR (g):

- Training gaps were identified through the user survey and through interaction with Regional Requirements groups;
- A Training Workshop on advanced geostationary data was held on 7-8 October 2013 at Australian VLab Centre of Excellence in conjunction with the Asia-Oceania Meteorological Satellite Users Conference;
- An International Training Course on Aeronautical Meteorological Services was conducted on 16 - 27 July 2014 at VLab CoE in Beijing; and
- A VLab/COSPAR training event is planned for 21 July – 1 August 2014 at Tver University, Russian Federation.

8. ToR (h):

- Joint session with ET-SAT held during ET-SUP-7; and
- The use of a template was proposed for agencies to provide summaries to joint ET-SAT/ET-SUP sessions to facilitate more efficient transfer of information.

9. ToR (i):

- Followed up on ET-SAT/ET-SUP joint session with a significant user focus at CGMS-42, with three presentations in Plenary by the ET-SUP Chair.

3. Issues

In addition to the issues covered by Recommendations in Section 4, the Expert Team on Satellite Utilization and Products (ET-SUP) has identified the following issues for consideration by the ICT-IOS:

3.1 WMO Integrated Global Observing System (WIGOS) and contribution to the WIGOS Framework Implementation Plan (WIP)

3.1.1 Getting real-time access to satellite data remains a challenge for many users. ET-SUP has been addressing the need for improved information on the technical details of how to access satellite data from new satellites, including early information in advance of the launch or during commissioning phase, as well as software pre-processing tools. There remains a significant gap for some users around the dissemination of data in near-real time, handling of different data formats/metadata, and the visualisation of these data.

3.1.2 Support by satellite operators is required to maintain the Product Access Guide on the WMO SP webpage, intended to allow guided and harmonized online access to satellite-derived products and datasets. WMO Secretariat is developing an online Satellite User Readiness Navigator portal (SATURN) to assist users in preparing for the upcoming generation of meteorological geostationary satellites, and support by agencies for this is equally needed.

3.2 Observational requirements for the Global Framework for Climate Services (GFCS)

ET-SUP continues to provide guidance to SCOPE-CM which is an important element of the space-based observation component of the GFCS. Satellite data streams are now reaching a level of maturity, and have a sufficient length of record, that climate applications are possible. It has proven a challenge to engage the ocean and land communities in additional SCOPE-CM pilot projects, e.g. in the area of ocean altimetry. In the 2012-2014 period, it is planned to strengthen the linkages to these communities.

3.3 WMO Quality Management Framework (QMF)

Progress in this area, through ET-SUP, has been limited. However, ET-SUP recognises that the implementation of the framework for space-based systems and product generation will facilitate improved user acceptance and uptake.

3.4 Capacity Building

3.4.1 ET-SUP has identified dissemination and visualisation as significant impediments to users extracting the maximum value from satellite data streams. Whilst user awareness of new missions has improved, and global coverage has also improved, accessing satellite data in near-real time and integrating these data with other data streams remains a challenge.

3.4.2 ET-SUP has attempted to drive increased user awareness of satellite capabilities and, through the VLab Centres of Excellence, has supported a number of capacity-

building initiatives. The 2012 User Survey identified training as a significant impediment to uptake of satellite data.

3.5 SCOPE-Nowcasting

This initiative has made modest but significant progress towards harmonizing data streams / products. The initiative has been publicised at CGMS-42 and the 4th Asia-Oceania meteorological Satellite Users Conference. As a result, satellite operators are engaged and have commenced work on pilot projects. A key challenge is building a link to user communities which will be progressed through the Regional Requirements groups and the SWFDP community.

3.6 Regional Satellite Requirements Mechanisms

In view of the effectiveness of regional satellite requirements coordination mechanisms, ET-SUP recommended that these be strengthened by collocating region-based satellite user conferences, regional training events (covering satellite systems, data utilization, software and tools), and meetings of regional satellite data requirements groups. Maintaining these mechanisms in all Regions requires additional support by Members, satellite operators and WMO secretariat.

3.7 Other issues

None to report.

4. Recommendations

No recommendations are proposed by the Expert Team on Satellite Utilization and Products (ET-SUP) to ICT-IOS and the CBS-Ext.(2014).

5. Proposal for the Terms of reference of the Expert Team / the Rapporteur

No changes are proposed by the Expert Team on Satellite Utilization and Products (ET-SUP) to its Terms of Reference at this point.

6. Work plan

The updated Work Plan with status for the Expert Team on Satellite Utilization and Products (ET-SUP) for the period 2012-2014 is at Appendix B.

APPENDIX A

TERMS OF REFERENCE OF THE EXPERT TEAM ON SATELLITE UTILIZATION AND PRODUCTS (ET-SUP)

Last updated: 22/11/2013

(Approved by CBS-XV)

- (a) Monitor the progress of satellite data availability and use by WMO Members, related issues and expectations, with the aim to publish findings and recommendations in a WMO document;
- (b) Provide advice and support to the development and implementation of WIGOS, from a satellite user's perspective and coordinate with ET-SAT and IPET-OSDE on the evolution of the space-based component of Global Observing Systems;
- (c) Initiate and promote activities to improve the availability of operational and R&D satellite data according to user needs, monitor these activities in close coordination with the relevant working group's, regional associations and with WIS activities;
- (d) Review present and future R&D satellite data and products including their availability and potential applications, and provide advice with a view of increased utilization by WMO Members;
- (e) Review, and assist in addressing, the needs of WMO Members and regional associations for information regarding satellite capabilities and in particular access to and utilization of satellite data and products;
- (f) Promote development and harmonization of satellite data and products responding to WMO Members' needs;
- (g) Keep under review the needs of WMO Members for training in satellite meteorology and related fields, and engage with the Management Group of the Virtual Laboratory for Education and Training in Satellite Meteorology (VLab) to address these needs, towards full utilization of satellite data from operational and R&D satellites, in accordance with the 2009–2013 Virtual Laboratory Training Strategy;
- (h) Holding joint and/or overlapping meetings with ET-SAT as appropriate, to facilitate interaction between users and providers of satellite systems, data and products;
- (i) Coordinate with ET-SAT with a view to making recommendations and receiving input on matters, such as the exchange, management, and archiving of satellite data and products, radio frequency utilization, as well as education and training and other appropriate capacity-building measures related to the use of satellite data in all WMO Programmes.

APPENDIX B

UPDATED WORK PLAN WITH STATUS FOR THE EXPERT TEAM ON SATELLITE UTILIZATION AND PRODUCTS (ET-SUP) FOR THE PERIOD 2012-2014

No.	Task	Deliverable/Activity	Due	Responsible	Status	Comment
1	Monitor the progress of satellite data availability and use by WMO Members, related issues and expectations, with the aim to publish findings and recommendations in a WMO document	Biennial survey Analysis of responses Findings and recommendations Advice to Regional Associations on follow-up actions WMO document for publication Biennial survey	2012/2 2012/4 2012/4 2012/4 2013/1 2014	WMO SP Secretariat and ET-SUP	2012 Survey report released in May 2013 2014 Survey to be discussed at ET-SUP-8	
2	Provide advice and support to the development and implementation of WIGOS, from a satellite user's perspective and coordinate with ET-SAT and ET-EGOS on the evolution of the space-based component of Global Observing Systems;	Contribute to the evolving EGOS IP, the Manual on the GOS, the Vision for the GOS 2025, and the WIGOS IP Support WMO Programmes (both operational and research) in their satellite data and product-related needs	2012/2 and as required Continuous	ET - SUP and WMO SP Secretariat	Revision to EGOS-IP approved at ET-EGOS in May 2012	

3	<p>Initiate and promote activities to improve the availability of operational and R&D satellite data according to user needs, monitor these activities in close coordination with the relevant CGMS working group(s) and with WIS activities;</p>	<p>Promote the development and maintenance of Regional Satellite Data Requirements in all Regions, as appropriate</p> <p>Provide feedback on the progress of IGDDS and RARS</p>	<p>2012/3 Continuous</p>	<p>ET - SUP and WMO SP Secretariat, with assistance from Int'l WGs</p> <p>IGDDS and RARS implementation groups</p>	<p>Interaction with ITWG, IWWG, IPWG, IROWG, Nowcasting and other expert groups strengthened</p> <p>Partnership with SWFDP reinforced</p>	
4	<p>Review present and future R&D satellite data and products including their availability and potential applications, and provide advice with a view of increased utilization by WMO Members;</p>	<p>Review of relevance and availability of R&D satellite data, based on global/regional requirements;</p> <p>Strengthen interaction with R&D agencies in the area of altimetry, soil moisture, precipitation, and climate</p> <p>Make recommendations for improved availability, information and training, especially for developing countries</p>		<p>ET - SUP and WMO SP Secretariat</p>	<p>Participation in relevant fora initiated</p>	

5	Review and assist in addressing the needs of WMO Members for information regarding access to and utilization of satellite data and products;	Maintain a list of satellite data access points, processing and analysis software tools on WMO webpage	2012/3 (continued yearly)	ET - SUP and WMO SP Secretariat	Product Access Guide Updated	
6	Promote development and harmonization of satellite data and products responding to WMO Members' needs	Continue to provide guidance to Sustained Co-ordinated Processing of Environmental Satellite Data (SCOPE) for Climate Monitoring as a key contribution to the architecture for climate monitoring from space. Assess and further the concept of SCOPE for Nowcasting, through pilot projects Develop Product Access Guide, in coordination with satellite operators	2012/3-2013 (initial phase) 2013 (prototype)	ET - SUP and WMO SP Secretariat and responsible for the SCOPE-NWC projects	Workshop held in November 2013 4 Pilot Projects defined First version on WMO SP website	
7	Keep under review the needs of WMO Members for training in satellite meteorology and related fields, and engage with the Management Group of the Virtual Laboratory for Education and Training in Satellite Meteorology (VLab) to address these needs, towards full utilization of satellite data from operational and R&D satellites, in accordance with the 2009-2013 Virtual Laboratory Training Strategy;	Regular reviews of the VLab status, activities and plans (training resources, courses, meetings, newsletters); Support existing VLab CoEs and the establishment of new ones; Provide guidance to meet users' needs, especially from less developed Members and for the next generation of satellites;	2012/3 (continued yearly) 2013/1 2013/1 and continuing	VLMG, WMO SP Office and ET-SUP	VLMG meeting in October 2012 and virtual meeting every 3 months Candidature of CoE Morocco approved Development of guidance plan underway	

	Explore training partnerships Contribution to training resource development	2013-2014 Continuous activity		WMO-COSPAR MoU signed and joint planning of workshop initiated	
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