

## **GUIDANCE FROM THE CHAIRPERSON OF OPAG IOS**

*(Submitted by Jochen Dibbern, Chair ICT-IOS, Anthony Rea, Co-chair)*

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### **Summary and Purpose of Document**

To provide guidance to ET-SUP-8 from the perspective of ICT-IOS and inform on the outcomes of recent relevant meetings, in particular IPET-OSDE-1 and ICT-IOS-8.

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### **ACTION PROPOSED**

The eighth session is invited to:

- (a) Note the information provided.

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- Appendices:** A. Science questions outlined by the Rapporteurs on Scientific Evaluation of Impact Studies (R-SEIS).
- B. Proposed split of responsibility within WMO for the management of OSCAR

## **DISCUSSION**

### **Introduction**

1. The Expert Team on Satellite Utilisation and Products exists within the broader context of the Commission for Basic Systems (CBS). More broadly, satellite observations fall under the banner of the WMO Integrated Observing System (WIGOS).
2. Since the last meeting of ET-SUP in November 2012, the most relevant meetings have been:
  - (i) the third Session of the Inter-Commission Coordination Group on the WMO Integrated Global Observing System (ICG-WIGOS), held from 10-14 February 2014 in Geneva;
  - (ii) the Inter-Program Expert Team on Observing System Design and Evolution (IPET-OSDE) in Geneva on March 31 to April 3 2014; and
  - (iii) the Integration-Coordination Team on Integrated Observing Systems (ICT-IOS-8) on April 7 to 10, 2014.
3. Additional information how the activities of the ICG-WIGOS may impact the work of this team is provided in the following section.

### **WIGOS Aspects Relevant to ET-SUP**

4. ICG-WIGOS discussed the document and recommended that the Observing System Network Design (OSND) Principles developed under the auspices of IPET-OSDE should further elaborated by IPET-OSDE-1, and after endorsement by ICT-IOS-8 be incorporated in due course into the Manual on WIGOS.
5. ICG-WIGOS recommended the development of a "Vision for WIGOS in 2040" and requested CBS to lead this development, with involvement of the other TCs. The target for approval should be Cg-XVIII (2019), following endorsement by CBS-16 (2016). This was also discussed during the last CBS Management Group meeting in January 2014, and IPET-OSDE further discussed this issue.
6. The recent agreement to move the management of the RRR database (OSCAR) from the WMO Secretariat to MeteoSwiss was discussed by ICG-WIGOS in detail. The RRR databases are an important component of WIGOS and have gained enormous visibility through the excellent work of the Secretariat. They are becoming very widely used and they should be promoted as the unique repository of observation requirements. The RRR databases are one of the tangible and visible "successes" of WIGOS to date, and therefore continuous support must be secured.
7. The draft WIGOS Guide and the revised Manual on the Global Observing System are key items of regulatory material for WMO members. Although most of the material pertaining to satellites has been moved from the Manual on the GOS to the WIGOS manual, ET-SUP is requested to review the remaining material in the GOS Manual that relates to volcanic ash measurement.
8. The timeline to develop WIGOS technical regulations is linked to the upcoming meetings of CBS (Extraordinary Session) in September 2014 and Congress in June 2015. Changes to the WIGOS and GOS Manuals need to be finalised by the end of May.

### **IPET-OSDE:**

8. The First Session of the Inter-Programme Expert Team on Observing System Design and Evolution (IPET-OSDE) of the Commission for Basic Systems (CBS) Open Programme Area Group (OPAG) on Integrated Observing Systems (OPAG-IOS) was held at the WMO Headquarters in Geneva, Switzerland from 31 March to 3 April 2014 and was chaired by the Chair of the IPET-OSDE, Dr John Eyre (United Kingdom).

9. As part of the Rolling Review of Requirements (RRR) process, the Team reviewed the status of the WMO database of observational user requirements and observing systems capabilities, which has been integrated into the Observing System Capability Analysis and Review tool (OSCAR). The operational management of OSCAR, from an ICT perspective, is being handed over to Meteo-Swiss.

10. Also in the context of RRR, the Team reviewed the status of the Statements of Guidance (SoGs) for WMO Application Areas. The Team reviewed the current activities regarding observing system studies, with emphasis on the design of future observing systems contributing to WIGOS. It considered proposals for new studies to be promoted by the IPET-OSDE, and it agreed to propose a new list by June 2014. The Team also discussed cost-benefit studies for observing systems. It developed the elements of a strategy for assessing the cost-effectiveness of observing systems, and it agreed to provide guidance on how such a strategy might be developed further.

12. The meeting discussed the need to develop a new vision for the global observing system(s), possibly in 2040, to replace the current Vision for the GOS in 2025, and take into account WIGOS requirements. The Team agreed that realistically, progress could be made with regard to the WIGOS component observing systems only, and therefore proposed that the name of the Vision should be Vision for WIGOS component observing systems in 2040. The Team also agreed that as soon as the new Vision in 2040 is adopted, the Vision for the GOS in 2025 should continue to be kept in force until 2025.

11. IPET-OSDE reviewed the progress of actions against the Evolution of the Global Observing System Implementation Plan (EGOS-IP). A number of responsibilities were placed on Expert Teams, including ET-SUP, for reviewing progress against key performance indicators for the EGOS-IP. ET-SUP will need to review the relevant actions during its eighth session.

## **ICT-IOS-8**

12. The eighth session of ICT-IOS was held last week. This meeting is the management group for all the expert Teams within OPAG-IOS and is attended by the expert team chairs. The work programs of the teams, and their progress against their objectives, are presented at the meeting. The meeting is also an opportunity to review the work programs. As this was not done prior to ICT-IOS-8, I recommend that ET-SUP undertake this review during the eighth session.

13. The 5th WMO Data Impacts Workshop was held in November 2013. A subsequent workshop is proposed to be held in 2015. In preparation for this workshop, the Rapporteurs on Scientific Evaluation of Impact Studies have prepared a number of science questions to be addressed at the workshop. These are provided at Appendix I.

14. The meeting reviewed the status of the operational and research Space-based component of the GOS as well as latest development of the Global satellite intercalibration. The Team noted the long list of present and planned Earth Observation missions reported by space agencies to the WMO Space Programme, and it commented that data from some of these missions were not available or planned to be available to WMO Members. The Team asked the Chairperson in his report to CBS to remind Members that, for a space-based observing system (incl. operational and R&D satellites) to be a contributor to WIGOS, it is essential that its data are made available to the WMO community and in a timely manner.

15. The meeting discussed what Expert Team or Group should be responsible for overseeing the functional specifications, and development of the Observing System Capability Analysis and Review Tool (OSCAR). The meeting reviewed the proposal from the IPET-OSDE in this regard, and agreed with the responsibilities proposed in Appendix II, and to be submitted to CBS and the ICG-WIGOS. ICT-IOS requested the OPAG-IOS Expert Teams to reflect OSCAR related activities in their respective workplans. In particular, the Team agreed that the Expert Teams had a role to play with regard to the maintaining the quality of the OSCAR database.

## APPENDIX I

**PROPOSED TOPICS FOR NWP IMPACT STUDIES RELEVANT TO THE EVOLUTION OF  
GLOBAL OBSERVING SYSTEMS**

*(as approved by ICT-IOS-8, 10 April 2014)*

<b>Short name: Full name</b>	<b>Science question</b>
<b>Surface-based</b>	
<b>S1MarinePs:</b> Surface pressure over ocean	What density of surface pressure observations over ocean is needed to complement high-density surface wind observations from satellites
<b>S2AMDAR:</b> Coverage of AMDAR	What are the priorities for expansion of the network? How does the impact vary over the globe? Provide guidance for AMDAR optimisation.
<b>S3Radar:</b> Radar observations	What are the impacts of current radar observations, including radial winds and reflectivities?
<b>Space-based</b>	
<b>S4SatLand:</b> Satellite sounding over land and ice	What is the impact of new developments in the assimilation of radiance data over land and sea ice?
<b>S5Sounders:</b> Impact of multiple satellite sounders	What benefits are found when data from more than one passive sounder are available from satellites in complementary orbits, e.g. the current unprecedented availability of four hyper-spectral sounders.
<b>S6AMVs:</b> AMVs	Based on evidence from current AMV impacts, which AMV characteristics should be enhanced for the next generation of GEO satellites? What are the impacts of recent new types of AMVs such as MISR-AMV?

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**General**

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<b>S7PBL:</b> Observations of the PBL for regional / high-resolution NWP	What should be the focus of improvements for observations of the planetary boundary layer (PBL) in support of regional and high-resolution NWP? Which variables and what space-time resolution?
<b>S8UA:</b> Regional upper-air network design studies	Upper-air network design studies such as those that have been performed for the European composite observing system (EUCOS) are required also in other regions, especially in Region I where the basic networks are under pressure.
<b>S9AdjEns:</b> Application of adjoint and ensemble methods	What insights can be gained from adjoint and ensemble-based impact measures tailored for applications such as severe weather, aviation and energy? Specific impact metrics may be required.
<b>S10Ocean:</b> Impact in ocean-coupled assimilation	Which ocean observations are particularly important for NWP? Investigate the role of ocean observations in coupled atmosphere-ocean data assimilation with a focus on the 7-14 day range.
<b>S11Land:</b> Impact in land-coupled assimilation	Which land-surface observations are particularly important for NWP? Investigate the role of surface observations in coupled atmosphere-land data assimilation with a focus on the 7-14 day range.
<b>S12</b> Time frequency	What is the required time frequency of observations? Consider AMDAR, GEO satellites and ground-based remote sensing observations (such as Doppler radar, wind profiler, ground based GNSS receivers) for regional and global NWP.
<b>S13</b> Atmospheric composition	Study observation impact in atmospheric composition and air quality applications.
<b>S14</b> OSSEs	Observing system simulation experiments are encouraged in support of satellite system design criteria such as orbit configurations..

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## PROPOSED SPLIT OF RESPONSIBILITY WITHIN WMO FOR THE MANAGEMENT OF OSCAR

1. The Eighth Session of the ICT-IOS concurred with the recommendations of the First Session of the Inter-Programme Expert Team on the Observing System Design and Evolution (IPET-OSDE-1, Geneva, Switzerland, 31 March - 3 April 2014) regarding the ownership, overall coordination mechanisms, as well as reporting requirements concerning the development and operations of OSCAR.
2. The ICT-IOS agreed to propose the following split of responsibilities within WMO to the CBS and other appropriate bodies such as the ICG-WIGOS:

<b>WMO Group or Team</b>	<b>Role</b>	<b>Reporting to</b>
ICG-WIGOS	High level guidance	EC/Cg
ICG-WIGOS TT-WMD	Definition of WIGOS core metadata	ICG-WIGOS
ICG-WIGOS TT-WRM	Related Regulatory Materials	ICG-WIGOS
ICG-WIGOS TT-QM	Related quality management	
ICT-IOS	Owner	ICG-WIGOS
IPET-WIFI	1) Overall coordination and leadership at the technical level 2) Regulatory Materials and metadata required in liaison with ICG-WIGOS and its dedicated Task Teams	ICT-IOS
IPET-OSDE	1) Functional requirements with regard to the tools required for the RRR process 2) Review content required for the RRR process	IPET-WIFI
ET-SAT <sup>1</sup>	1) Space-based observing systems capabilities	IPET-WIFI
ET-ABO <sup>2</sup>	Aircraft-based observing systems capabilities	IPET-WIFI
ET-SBO	Surface-based observing systems capabilities	IPET-WIFI
CIMO	Instrument metadata	ICG-WIGOS
JCOMM OCG	Ocean observing systems capabilities	IPET-WIFI

**Table 1:** Proposed split of responsibilities regarding OSCAR

2. ICT-IOS-8 also reviewed the role and responsibilities of the WMO with regard to OSCAR project development and long term maintenance and operations as foreseen in the MoU with MeteoSwiss, and agreed to recommend the following reporting mechanism to the CBS and ICG-WIGOS (Tables 2 and 3 below):

<b>Role and responsibility</b>	<b>Reporting to</b>	<b>IPET-OSDE comment</b>
Collaborate with MeteoSwiss in further specifying the project goals and functional requirements of OSCAR (lead: WMO)	IPET-WIFI	

<sup>1</sup> ET-SUP and IPET-OSDE have a role of reviewing OSCAR content proposed by ET-SAT

<sup>2</sup> if necessary, the ET-ABO will consult with the CIMO TT on Aircraft Based Observations (TT-ABO)

Provide human resources, including project lead and requirements engineer, in support of the project;	WMO Secretariat	
Establish the necessary conditions and WMO-internal support for the migration of the “Requirements”, “Space” and “Vol A” components of OSCAR to MeteoSwiss;	IPET-WIFI	Quality should be maintained during migration.
Establish agreements with the data owners and/or operators of external data sources regarding operational delivery of metadata needed for OSCAR	IPET-WIFI	
Inform MeteoSwiss on milestones achieved and major deviations from the project plan	WMO Secretariat	

**Table 2:** WMO responsibility and proposed reporting mechanisms for the OSCAR project development

<b><i>Role and responsibility</i></b>	<b><i>Reporting to</i></b>	<b><i>IPET-OSDE comment</i></b>
WMO shall seek contributions from WMO Members to the WIGOS Trust Fund for OSCAR; such contributions shall then be earmarked to OSCAR	ICG-WIGOS	
WMO shall establish a line item into the WIGOS Trust fund dedicated to the operations, maintenance, and future evolutions of OSCAR.	ICG-WIGOS	
Recognizing that the cost of operating, maintaining, and evolving OSCAR will be directly supported by MeteoSwiss, the WMO shall contribute financially to such cost through a contract to be established with MeteoSwiss in due course	WMO Secretariat	
Maintain the content of the OSCAR system [overall data owner] and provide human resources for quality monitoring of the system, coordination with Members contributing information to the system, reporting, and liaison with MeteoSwiss regarding maintenance, and future evolutions of the system	IPET-WIFI in consultation with IPET-OSDE	
Ensure the cooperation of the external (machine-to-machine) data providers	WMO Secretariat	
Propose future evolutions of the system	IPET-WIFI	
Inform MeteoSwiss on any issues concerning this collaboration	WMO Secretariat	

**Table 3:** WMO responsibility and proposed reporting mechanisms for the long term maintenance and operations of OSCAR