WORLD METEOROLOGICAL ORGANIZATION
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COMMISSION FOR BASIC SYSTEMS
OPEN PROGRAMMME AREA GROUP ON
INTEGRATED OBSERVING SYSTEMS

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

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OBSERVING SYSTEM DESIGN AND EVOLUTION

STATUS OF OSCAR

(Submitted by the Secretariat)

SUMMARY AND PURPOSE OF DOCUMENT

The document provides information on the status of the WIGOS Operational
Information Resource (WIR), which includes as one of its components the
Observing System Capability Analysis and Review Tool (OSCAR), i.e. the
WMO database of observational user requirements and observing systems
capabilities.

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.

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References: OSCAR - http://www.wmo.int/oscar

Appendix: **A.** Types of observing platforms for OSCAR/Surface

           B. Foreseen Responsibilities of WMO and MeteoSwiss with regard to OSCAR
development, long term maintenance and operations

           C. Standards and Practices to be Referenced in SORT

DISCUSSION

1. **The WIGOS Operational Information Resource (WIR)**

1.1.   The WIGOS Operational Information Resource (WIR) is being developed as specified by the WIGOS framework Implementation Plan (WIP) to be operational from 2016 onwards. WIR project corresponds to WIP activity 7.1.1.

1.2.   The WIR is a web-based platform[1] and tool designed to provide WIGOS stakeholders[2] with all relevant information on the operational status and evolution of WIGOS and its observing components, the operational requirements of WIGOS, including standards and recommended practices and procedures used in the WIGOS framework, and their capabilities to meet observational user requirements of all WMO Application Areas[3]. The WIR provides a mechanism for matching specific needs (capacity building, gaps, etc) with resources (via knowledge sharing, donor contributions etc).

1.3   The WIR is accessible via a centralized point (web portal), and is meant to provide seamless access to the following information components:

- **The Portal**: A web portal with access to general information (e.g. strategy, implementation, benefits, impacts) and to the other components of the WIR;
- **The "Standardization of Observations" Reference Tool (SORT)**: A tool linking to information on WIGOS standards and recommended practices and procedures;
- **The Observing Systems Capabilities Analysis and Review tool (OSCAR)**: A tool for Rolling Review of Requirements (RRR) process, network design and planning, providing information on observational user requirements and observing systems capabilities, including description of WIGOS component observing systems (i.e. observational metadata), and linkages to existing databases (e.g. WMO Country Profile database, when applicable).

2. **Status of WIR**

The WIR was formally launched in May 2013 by the Executive Council. The status of the WIR sub-components is provided below.

2.1.   **Status of the Portal:**

The web portal for the WIR has been developed and is accessible via www.wmo.int/wigos/wir. Most required pages have been developed. However, the following pages or parts are yet to be developed:

- Information on Standardization, System Interoperability, and Data Compatibility

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1   Accessible through a WMO web portal
2   Members (including observing network decision makers / managers / supervisors, observational data users), Technical Commissions (e.g. implementation coordination groups) and Regional Associations
3   The 12 WMO Application Areas are: global NWP, high-resolution NWP, nowcasting and very short-range forecasting, seasonal to inter-annual forecasting, aeronautical meteorology, ocean applications (including marine meteorology), atmospheric chemistry, agricultural meteorology, hydrology, climate monitoring, climate applications, and space weather

- • Information on Data Discovery, Delivery and Archival
- • Status of WIGOS implementation in the Regions, by the Technical Commissions, and by Members.
- • Link to OSCAR/Surface (once developed)
- • Link to SORT (once developed)

2.2.   Status of SORT:

2.2.1.   The functional specifications of SORT have been discussed within the WMO Secretariat, as well as with the CIMO President. The functional specifications document was then finalized by the Secretariat. A simple taxonomy is proposed, and it is also planned to use existing vocabularies to index words of documents to be referenced in the SORT: (i) the International Meteorological Vocabulary (IMV[4]), and (ii) the BIPM International Vocabulary of Metrology (IVM[5]).

2.2.2.   Sections of documents to be referenced in SORT will have to include metadata tags (keywords) according to the defined taxonomy. The plan is to associate metadata to documents Table of Contents entries according to an agreed granularity (say about 100 entries referenced in each document). One of the challenges once the SORT will be operational will be to keep consistency between the documents themselves (i.e. the text content) and the metadata. This will be best dealt with if the editors of the documents can edit both the text and the metadata with the same tool. Technical options are under investigation to allow this (e.g. using Typéfi[6] add on in Microsoft Word to allow edition of the metadata in a word document). Initially (i.e. by Cg-17 in 2015), a limited number of standards would be referenced in SORT as listed in Appendix C.

2.2.3.   A consultant has now been recruited to propose technical implementation solutions, and to undertake the necessary technical developments.

2.3   Status of OSCAR:

2.3.1.   The observational user requirements module of OSCAR (OSCAR/Requirements), and the Space-based observing system capabilities module (OSCAR/Space) are operationally available on line since 2011 and September 2012 respectively, and now widely used.   Further developments were made to OSCAR/Requirements in 2013 in response to ET-EGOS-7 recommendations[7], user feedback, e.g. to qualify the "horizontal coverage" and the "decadal stability", and improve the user and editor interfaces. In OSCAR/Space, a complete overhaul of Earth Observation instrument assessments was performed, as well as an initial assessment of more than 200 space weather instruments.

2.3.2   In terms of platform, OSCAR and three other online resources developed by the Space Programme (VLab website, Product Access Guide and SATURN) are currently hosted by a private operator, Infomaniak. For an overall cost around 200 CHF a year. this ensures 24/7 availability and independence from the IT infrastructure of the

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4   http://wmo.multicorpora.net/MultiTransWeb/Web.mvc
5   http://www.bipm.org/utils/common/documents/jcgm/JCGM_200_2012.pdf
6   http://www.typefi.com/
7   See Annex IX of ET-EGOS-7 Final Report, Outstanding issues concerning the RRR Database, and their status in IPET-OSDE1 document No. 5, Appendix B.

Secretariat. The WMO Secretariat has engaged negotiations with MeteoSwiss in order to rewrite OSCAR and operate it in the MeteoSwiss IT infrastructure instead of Infomaniak, to develop the surface module, and to establish a long term partnership for the OSCAR Platform operations and maintenance. The decision to migrate OSCAR to MeteoSwiss was made on the assumption that an operational met. service like MeteoSwiss is better fit for operating such a system than a specialized company or than the WMO Secretariat, which has very limited resources in terms of IT, both in terms infrastructure and human resources. Yet the WMO will continue to specify the functional requirements, and control the content of the database. In addition, plans are to ensure the operational continuity and further development of the OSCAR. The negotiations with MeteoSwiss have been successful, and it is now planned to undertake the necessary developments in two phases:

- Phase 1 (By Cg-17, May 2015):
    - Adapting OSCAR/Requirements for operation in the MeteoSwiss environment (this module will continue to operate at Infomaniak during this phase in order to assure its linkage with OSCAR/Space which will remain at the WMO Secretariat initially)
    - Developing OSCAR/Surface for basic observing network types (see list in the Appendix A)
    - Developing a critical review (analysis) module
- Phase 2 (by 2017):
    - Adapting OSCAR/Space to the MeteoSwiss environment
    - Complementing OSCAR/Surface with the missing observing network types (see list in the Appendix A)
    - Integrating the Space and Surface into the critical review module

2.3.2. A Memorandum of Understanding is under preparation, and will clarify the roles and responsibilities of the WMO Secretariat, and MeteoSwiss. The responsibilities as foreseen are listed in Appendix B.

2.3.3 Some points to be noted:

1. The RRR databases are one of the tangible and visible "successes" of WIGOS to date and therefore the continuous support must be secured. It is to assure sustainability of OSCAR that such a collaboration with MeteoSwiss through MoU is proposed. The long term resource requirement has been a key element of the negotiations with MeteoSwiss and both Organizations are willing to make sure these can be met. For operations, maintenance, and future evolutions of OSCAR, WMO is planning to spend about CHF 80,000 from its Regular Budget (RB), and seek extra-budgetary resources (XB) committed to an OSCAR line item in the WIGOS Trust Fund. XB contribution from WMO Members are expected to reach the level of at least CHF 50,000 per year. The financial resources will be used on an approximate 50%/50% basis for the operations of OSCAR in partnership between MeteoSwiss (operations and future evolutions of OSCAR) and the WMO Secretariat (quality monitoring and coordination with Members).

2. OSCAR/Requirements needs to be further promoted as the unique repository of observations requirements from WMO. Therefore effort should continue to be made during the "transition period" to update requirements of applications that

have only be marginally addressed so far, such as agricultural meteorology, hydrology, aeronautical meteorology, or to include new requirements for example GCW requirements as discussed in IPET-OSDE.

3. The current OSCAR/Requirements and OSCAR/Space have been developed by the WMO Space Programme office at the WMO Secretariat; and Mr Nils Hettich (German JPO) who now left the Secretariat for another position has contributed greatly to its development. We are very grateful to him and to Germany for his contributions. OSCAR/Space is very popular with more than 150 external visits a day in average. Current consideration is to keep the existing OSCAR/Requirements and OSCAR/Space operational mode unchanged during the transition period in order to avoid a loss of credibility for WIGOS. The overall consistence between these two components with OSCAR/Surface component will be considered at the Phase I together with the overall architecture design, and these evolutions will then be included in Phase 2.

4. MeteoSwiss is also in charge of developing and implementing an evolution of GAWSIS. Having MeteoSwiss also develop and operate the future OSCAR provides the opportunity to integrate the two systems, and enhance WIGOS integration.

3. Outcome of ICG-WIGOS-3 with regard to the WIR

3.1   At its third Session, Geneva, Switzerland, 10-14 February 2014, the Inter-Commission Coordination Group on WIGOS (ICG-WIGOS), congratulated MeteoSwiss and the WMO Secretariat for the excellent progress achieved with regard to the plans for developing OSCAR.

3.2   The Group agreed that it would be useful to provide WIGOS information through the WIR in WMO languages, in particular for the information delivered via the portal component of WIR. The Group requested the Secretariat to investigate what sections could be translated, to estimate the cost, and to seek solutions for the funding in the next WMO financial period. The Group also agreed that the portal should link to WIGOS related portals and WebPages developed by the Regional Associations, and Members.

3.3   The Group agreed that OSCAR should be the repository of a sub-set of the WIGOS metadata; in particular those on observing system capabilities that are required for the RRR process, and those which are requirement for operational use such as the planned evolution of WMO No. 9, Volume A. The remaining metadata will have to be collected, maintained, and archived by Members. The Group requested the TT-WMD to clarify what metadata shall be included in OSCAR, and which ones shall be mandatory.

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APPENDIX A

TYPES OF OBSERVING PLATFORMS FOR OSCAR/SURFACE[1]

The table below provides the list of observing platform types to be considered for recording their platform/instrument metadata in OSCAR/Surface. The last column indicates in which OSCAR development phase[2] these should be included.

Abbrev	Name of Platform Type	Code	Metadata Type	Approximate number of operational stations[3]	Information provided by	Current source(s) or plans	OSCAR development phase[2]
Syn	Surface synoptic station	0001	Point	4500	Members, EUMETNET	Vol. A[4]	1
Clim	Surface climatological station	0002	Point	3000	Members, EUMETNET (potentially)	Vol. A[4]	1
AWS	Automatic Weather Station	0003	Point	5000	Members, EUMETNET	Vol. A[4]	1
Radiation	Radiation station	0050	Point	600	Members, and possibly other groups	GAWSIS[5] and WRDC[6] and BSRN[7]	1
UA	Upper-air synoptic and reference station	0100	Point[8]	1500	Members, EUMETNET	Vol. A/Catalogue of radion-sondes[4] GUAN lead centre[9]	1
ASAP	Automated	0110	Low	30	Members,	Under development[10]	2

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1   List to be completed as needed
2   Phase 1: 201306-201504; Phase 2: 201504-201704
3   Number of operational stations at a time, whether current (e.g. buoys) or planned (e.g. WHYCOS). Number of stations to record in the database shall be higher as historical stations have to be recovered as well. This number will depend on the average life-time of the stations, and replacement and deployment strategies.
4   http://www.wmo.int/pages/prog/www/ois/volume-a/vola-home.htm ; http://www.wmo.int/pages/prog/www/ois/rbsn-rbcn/rbsn-rbcn-home.htm
5   http://gaw.empa.ch/gawsis/
6   http://wrdc.mgo.rssi.ru/
7   http://www.bsrn.awi.de/
8   Although making vertical profiles, the station is regarded as a point (snapshot for mobiles) in the OSCAR metadata framework. Metadata will then include information about vertical range, and capabilities in each layer where observations are made with the type of instrument.
9   http://gosic.org/content/guan-data-access

	Shipboard Aerological Profiler (ASAP)		speed mobile[8]		EUMETNET		
WP	Wind profiler	0150	Point[8]	300	Members, EUMETNET	TBD within the WIGOS Core metadata MeteoSwiss in charge of EUMETNET WPs	1
RSPS	Remote sensing profiling station	0101	Point[8]	300	Members, EUMETNET (potentially)	TBD within the WIGOS Core metadata	2
Aircraft	Aircraft meteorological station	0200	High speed mobile	3000	Members, EUMETNET	Under development by AMDAR Panel & ET-ABO[11]	1
GAW	Global Atmospheric Watch station	0300	Point	1000	TBD	GAWSIS[5]	1
Lightning	Lightning detection system station	0400	Point	1000	Members	TBD within the WIGOS Core metadata Private companies in charge of running these systems (e.g. Vaissala, Meteorage …)	2
Hydro	Hydrological station	0500	Point	1000	TBD	WHYCOS[12]	1
			Point	TBD		All operational hydrological stations (TBD)	2
Ground_hyd	Ground water station	0501	Point	TBD	TBD	TBD	2
W_Radar	Weather radar station	0600	Polygon	1000	Members, EUMETNET	WMO Weather Radar Database (hosted by Turkey)[13]	1

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10   http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=10472
11   See Appendix V of Final Report of the WMO AMDAR Panel Session 15 at
      http://www.wmo.int/pages/prog/www/GOS/ABO/AMDAR/panel/reports/AMDAR_Panel_XV_Final_Report.pdf. See also discussed metadata format at
      http://www.wmo.int/pages/prog/www/OSY/Meetings/AMDAR-Panel-15/INF.4.4.4(1)_AO_Metadata_Requirements_Workshop_June_2012.doc – Contact point at WMO
      Secretariat: Dean Lockett (dlockett@wmo.int)
12   http://www.whycos.org/whycos/
13   http://wrd.mgm.gov.tr/default.aspx

RW_Radar	Road weather station	0700	Polygon	TBD	Members	TBD within the WIGOS Core metadata	2
Aero	Aeronautical meteorological station	0800	Point	3500	Members	Vol. A[4]	1
				TBD	ICAO	METAR producing stations using ICAO station identifiers	2
Agro	Agricultural meteorological station	0900	Point	500	TDB	Vol. A[4]	1
Urban	Urban meteorological station	1000	Point	TBD	Members,	TBD within the WIGOS Core metadata	2
DB	Drifting buoy station	2000	Low speed mobile	2000	JCOMMOPS	TBD with JCOMMOPS (2000 DBs yearly)	1
MB	Moored buoy station	2010	Point	200	JCOMMOPS	TBD with JCOMMOPS (200 MBs)	1
Ship	Ship station	2020	Low speed mobile	4000	JCOMMOPS E-SURFMAR	WMO Publication No. 47[14] SOOP Metadata[15] ASAP: See ASAP in this table	1
RV	Research Vessels	2025	Low speed mobile	1000	JCOMMOPS	TBD with JCOMMOPS	2
Rigs	Ocean rigs and other fixed platform station	2030	Point	500	JCOMMOPS	TBD with JCOMMOPS & DBCP	2
ASS	Automatic sea station (fixed and mobile)	2040	Point, Mobile	1000	JCOMMOPS	TBD with JCOMMOPS & DBCP	2
Float	Profiling float	2050	Low	4000	JCOMMOPS	Argo Information Centre	1

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14 Formal copy: http://www.wmo.int/pages/prog/www/ois/pub47/pub47-home.htm; Informal copy more up to date and complete to be used:
   http://esurfmar.meteo.fr/doc/vosmetadata/index.php
15 http://www.jcommops.org/soop/soop_report.html ; and http://www.jcommops.org/doc/metadata/submission_format.html - Note: report has not been routinely produced in the last
   3 years; suggest to contact the SOT Technical Coordinator, Mr Martin Kramp (mkramp@jcommops.org)at JCOMMOPS for details.

			speed mobile[8]			(AIC)[16] at JCOMMOPS	
Prof_Glider	Ocean sub-surface glider	2060	Low speed mobile[8]	200	JCOMMOPS	TBD with JCOMMOPS[17]	2
Surf_Glider	Ocean surface glider	2070	Low speed mobile	200	JCOMMOPS	TBD with JCOMMOPS[18]	1
Tide_gauge	Tide gauge station	2080	Point	1000	GLOSS	TBD with IOC and GLOSS[19] for the sea-level stations monitored by the Sea level stations monitoring facility[20], and the GLOSS Core Network[21] (normally included in the facility above)	1
			Point	500	GLOSS	TBD with IOC and GLOSS[22] for the PSMSL[23], and the University of Hawaii Sea Level Centre[24] for the real-time sea level stations (may overlap with stations managed as part of phase 1)	2
Tsunameter	Tsunameter	2090	Point	200	JCOMMOPS	TBD with JCOMMOPS[18]	1
AOD	Aerosol Optical		Point		NASA	WMO, Aeronet	2

16 ftp://ftp.jcommops.org/Argo/Status/argo_all.txt - See with Technical Coordinator of Argo, Mr Mathieu Belbéoch (belbeoch@jcommops.org) at JCOMMOPS for possible new format to include more metadata fields.
17 See with Technical Coordinator of Argo, Mr Mathieu Belbéoch (belbeoch@jcommops.org) at JCOMMOPS.
18 See Technical Coordinator of the DBCP, Ms Kelly Stroker (kstroker@jcommops.org) at JCOMMOPS
19 http://www.gloss-sealevel.org/
20 http://www.ioc-sealevelmonitoring.org/
21 http://www.gloss-sealevel.org/network_status/glosscorenetwork10.html
22 http://www.gloss-sealevel.org/
23 http://www.psmsl.org/
24 http://www.soest.hawaii.edu/UHSLC/

	Depth						
GSWS	Ground based space weather observing systems		Point			WMO	2

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APPENDIX B

**FORESEEN RESPONSIBILITIES OF WMO AND METEOSWISS
WITH REGARD TO OSCAR DEVELOPMENT, LONG TERM MAINTENANCE AND
OPERATIONS**

Role and responsibilities of MeteoSwiss

The contribution of MeteoSwiss in this collaboration with WMO will be restricted to the technical and operational level. MeteoSwiss shall undertake the following tasks during the OSCAR project development:

- Lead the project development, in collaboration with the designated project manager at WMO, and designate a project leader;
- Collaborate with WMO in further specifying the technical requirements of OSCAR (lead: MeteoSwiss)
- Develop and implement, on a technical level, the OSCAR system according to the project goals; and
- Inform WMO on milestones achieved and major deviations from the project plan.

MeteoSwiss shall be responsible of the following for the long-term operations of OSCAR:

- Operate the system according to the agreed service level ('best effort') [system operator];
- Manage and implement change requests from WMO (with a specified ceiling on effort);
- Propose future evolutions of the system and;
- Inform WMO on any issues concerning this collaboration.

Role and Responsibilities of the WMO

WMO will be responsible of the following with regard to OSCAR project development:

- Collaborate with MeteoSwiss in further specifying the project goals and functional requirements of OSCAR (lead: WMO);
- Provide human resources, including project lead and requirements engineer, in support of the project;
- Establish the necessary conditions and WMO-internal support for the migration of the "Requirements", "Space" and "Vol A" components of OSCAR to MeteoSwiss;
- Establish agreements with the data owners and/or operators of external data sources regarding operational delivery of metadata needed for OSCAR; and
- Inform MeteoSwiss on milestones achieved and major deviations from the project plan;

WMO shall be responsible of the following for the long-term operations of OSCAR:

- WMO shall establish a line item into the WIGOS Trust fund dedicated to the operations, maintenance, and future evolutions of OSCAR. WMO shall seek

contributions from WMO Members to the WIGOS Trust Fund for OSCAR; such contributions shall then be earmarked to OSCAR;

- 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;
- 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;
- Ensure the cooperation of the external (machine-to-machine) data providers;
- Propose future evolutions of the system; and
- Inform MeteoSwiss on any issues concerning this collaboration.

Both the WMO and the MeteoSwiss logo shall appear on the OSCAR web pages to reflect the shared responsibility with regard to OSCAR.

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APPENDIX C

STANDARDS AND PRACTICES TO BE REFERENCED IN SORT

	Concerned standards	*Priority[1]*	*Granularity*	*Number of elements to reference*
Global	WMO No. 49 (Technical Regulations) WMO No. 8 (CIMO Guide) WMO No. 544 (GOS Manual) WMO No. 488 (GOS Guide) WMO 558 (Manual to MMS) WMO 571 (Guide to MMS)	High	Chapter	<40 34 13 34 <20 <20 Total <161
WIGOS Regulatory materials	WIGOS Technical Regulations WIGOS Manual WIGOS Guide	Medium	Chapter	<20 <40 <40 Total <100
Regional	Regional practices of WMO Technical Regulations relevant to the following publications:	Medium	Document	<200
National	To be proposed by Members	Low	Document	TBD
Other	GAW Reports 97, 143, 160, 164, 171, 183, 185, 190, 191, 192, 194, 195, 200, 201, 204, GCOS Monitoring Principles	Medium	Document	15 1

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1 Priority: <u>High</u> = information content to be referenced in the database by 2015; <u>Medium</u>: information content to be referenced in the database soon after 2015; and <u>Low</u>: information content to be referenced in the database after 2015 once the materials listed under the Medium priority have been referenced.