



World Meteorological Organization

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UPDATE ON WIGOS AND THE ROLLING REVIEW OF REQUIREMENTS

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OVERVIEW

1. Current Status of WIGOS

- CBS (Ext) 2014
- ICG-WIGOS-4
- WMO Cg-17

2. Current state of OSCAR

- OSCAR/Requirements
- OSCAR/Space
- OSCAR Surface
- Gap analysis tool



WIGOS Implementation Phase (2016-2019)

- ★ Implementation of WIGOS decided by Cg-16 (2011)
- ★ Key deliverables for Cg-17 (May/June 2015):
 - ★ [Draft WIGOS Part of WMO Technical Regulations \(link to English version\)](#)
 - ★ [Draft "Manual on WIGOS" \(link to English version\)](#)
 - ★ Metadata Standards
 - ★ [Draft WIGOS Metadata Standards \(link to English version\)](#)
 - ★ Regional Implementation Plans
 - ★ [Plan for the Pre-Operational Phase of WIGOS \(2016-19\)](#)
- ★ Many elements will follow later
 - ★ Guidance material
 - ★ Quality management
 - ★ National Implementation Plans
 - ★ ...
 - ★ (Actual implementations)



Current Activities and Status

- **ICG-WIGOS** oversees implementation, representation from
 - All Technical Commissions
 - All Regional Associations
- Three Task Teams under ICG-WIGOS:
 - **Regulatory Material (TT-WRM)**
 - Technical Regulations, Manual on WIGOS have been drafted, reviewed by TCs, endorsed by CBS for submission to CG-17; will now be sent out to all WMO Members for mandatory review
 - **Metadata (TT-WMD)**
 - Feeding into Regulatory Material, but at a slower pace; TT-WMD has developed the initial version of the WIGOS Metadata Standards, now being refined (TT-WMD-3 in Geneva December 2-4 2014)
 - **No satellite expertise on TT-WMD!**
 - **Quality Management (TT-WQM)**
 - Team meeting in Geneva April 23-24; initial focus on monitoring of observational data quality
 - Workshop on Observational Data Quality Monitoring, Dec. 10-12 2014



WMO Commission for Basic Systems, Extraordinary Session in Asuncion, Paraguay, September 2014

Meeting information (documents, presentations, etc.) available [here](#)

✦ Concerning WIGOS, the Commission was briefed on

- ✦ Draft Regulatory Material (Technical Regulations, Vol. I part on WIGOS, and Manual on WIGOS)

 - ✦ Recommended for approval by Cg-17 in May-June 2015

- ✦ Draft WIGOS Metadata Standards (link to presentation [here](#))

 - ✦ Session took note of this; will be incorporated in “Guide to WIGOS” to be developed after Cg.17

- ✦ Draft WIGOS Station Identifiers (link to presentation [here](#))

 - ✦ Included in Manual on WIGOS, and as such recommended for approval; briefed separately since this is a major new initiative, aimed at resolving both technical and political issue regarding allocation of stations IDs



WIGOS Metadata Standard (draft)

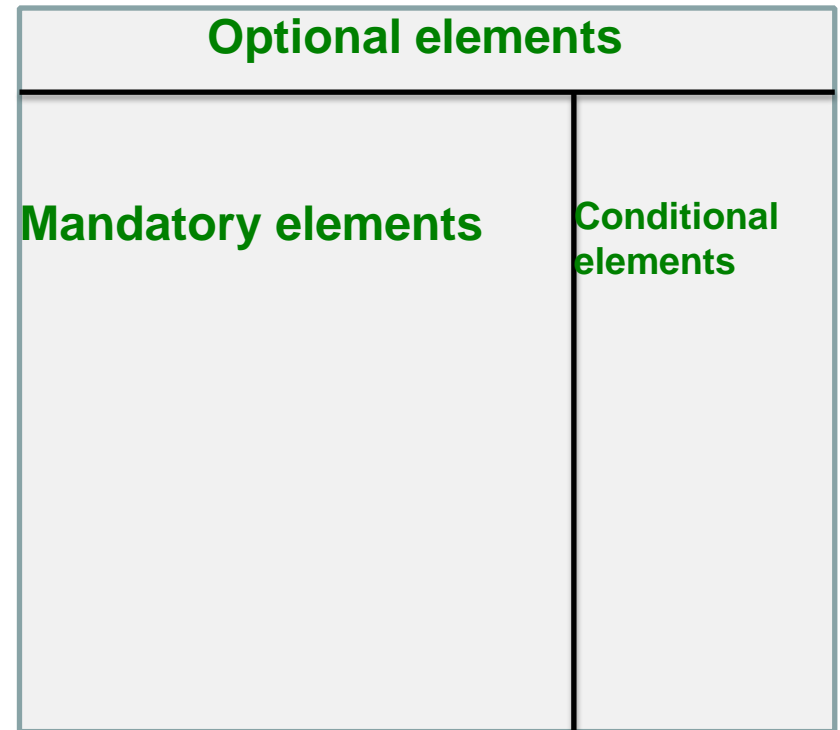
Metadata elements are grouped by categories

#	Category	Description
1	observed quantity	Specifies the basic characteristics of the observed quantity and the resulting data sets.
2	purpose of observation	Specifies the main application area(s) of the observation and the observing program(s) the observation is affiliated to.
3	data quality	Specifies the data quality and traceability of the observation.
4	environment	Describes the geographical environment within which the observation is made. It also provides an unstructured element for additional meta-information that is considered relevant for adequate use of the data and that is not captured anywhere else in this standard.
5	data processing and reporting	Specifies how raw data are transferred into the reported physical quantities and reported to the users.
6	sampling and analysis	Specifies how sampling and/or analysis are used to derive the reported observation or how a specimen was collected
7	station/platform	Specifies the environmental monitoring facility, including fixed station, moving equipment or remote sensing platform, at which the observation was made.
8	method of observation	Specifies the method of observation and describes characteristics of the instrument(s) used to make the observation. If multiple instruments used to generate the observation, then this category should be repeated.
9	ownership and data policy	Specifies who is responsible for the observation and owns it.
10	contact	Specifies where information about the observation or dataset can be obtained.



WIGOS Metadata Standard (draft)

- ★ Obligations for Members to report metadata elements:
 - ★ All the 'mandatory',
 - ★ All the 'conditional' (whenever the condition is met)
 - ★ the 'optional', according to the observing system or the application area



Principles for WIGOS Metadata

- ★ Must enable users to make adequate use of observational data [*also for climate applications*]
- ★ Must include timestamp for every piece of metadata
- ★ Data providers must make metadata available for all internationally exchanged data
- ★ Data providers must update metadata in a timely manner
- ★ The WIGOS Metadata Standard must be
 - ★ applicable to all disciplines
 - ★ forward-looking but also respect legacy (e.g., Vol. A)
 - ★ acceptable to all Members
 - ★ applicable by all Members



CBS Summary (Asuncion September 2014)

- ★ CBS was generally very supportive of WIGOS and the various initiatives
- ★ Regulatory material was presented, along with draft metadata standards and a new system for station identifiers
- ★ The migration of RBSN and RBCN to a new RBON was also discussed (not included in this presentation)
- ★ New WIGOS monitoring system for both availability and quality of observational data (not included here);
Workshop in Geneva December 10-12 2014
- ★ Caveat: The compressed schedule for the Session with only 4 working days meant that relatively little time was available to discuss any given element in detail



Regional WIGOS Implementation Plans

- ★ Draft R-WIPs developed for all WMO Regions by Regional WIGOS Task Teams of WGs, typically helped along by dedicated regional (or sub-regional) WIGOS Workshops
- ★ Regions II, III, IV, V and VI have approved their R-WIPs plan
- ★ Region I to follow in February 2015
- ★ Analogous to WIP, the key section is Section II, listing the same ten KAA also found in the R-WIPs
- ★ Regional Working Structures to oversee and coordinate implementation are still developing, and differ from Region to Region



OSCAR

- ★ The RRR is supported by three key databases of **OSCAR**, the *Observation Systems Capabilities and Review* tool :
 - ★ **OSCAR/Requirements**, in which “technology free” requirements are provided for each application area, expressed in units of geophysical variables, not measurands
 - ★ **OSCAR/Space**, listing the capabilities of all satellite sensors (whether historical, operational or planned)
 - ★ **OSCAR/Surface**, list surface-based capabilities (still in development)

<http://www.wmo-sat.info/oscar/>



OSCAR/Requirements

- ★ **The following** requirements are listed for each of the 12 application areas:
 - ★ Spatial (horizontal and vertical) and temporal resolution, uncertainty, data latency, required coverage area, source, and level of confidence
 - ★ Each requirement is expressed in terms of three separate values:
 - ★ Threshold (observations not useful unless this is met)
 - ★ Break-through (optimum cost-benefit ratio)
 - ★ Goal (exceeding this provides no additional benefit)
- ★ OSCAR/Requirements information content is assembled by CBS and other WMO Interprogram Expert Teams and Task Teams (e.g. this one), and is informed by the wider community e.g. through the WMO Impact Workshops (every four years) engaging the NWP and data assimilation community; see

http://www.wmo.int/pages/prog/www/OSY/Meetings/NWP5_Sedona2012/Final_Report.pdf



OSCAR/Space

- ✦ Information about all satellite sensors (past, present and future)
 - ✦ Instrument type, measurement technique
 - ✦ Instrument characteristics (mass, power, data rate)
 - ✦ Programmatic information, e.g. agency, measurement program, operating period, heritage, etc.
 - ✦ Orbit, coverage, repeat frequency, resolution
 - ✦ Capabilities, expressed in terms of geophysical variables that can be derived from the measurements provided by the sensor, listed in order of decreasing fidelity



OSCAR/Surface *(under development)*

- ★ **Provides** metadata for all surface-based observational capabilities under WIGOS (WMO and co-sponsored observing systems)
 - ★ Surface stations
 - ★ Upper-air stations
 - ★ Aircraft data
 - ★ Buoys
 - ★ Radars
 - ★ ...
- ★ Highly heterogeneous dataset, multiple owners and operators
- ★ Will contain (at least) two levels of “capabilities”
 - ★ **Actual**; based on NWP receipt of real-time observations
 - ★ **Notional**; based on information from system operators

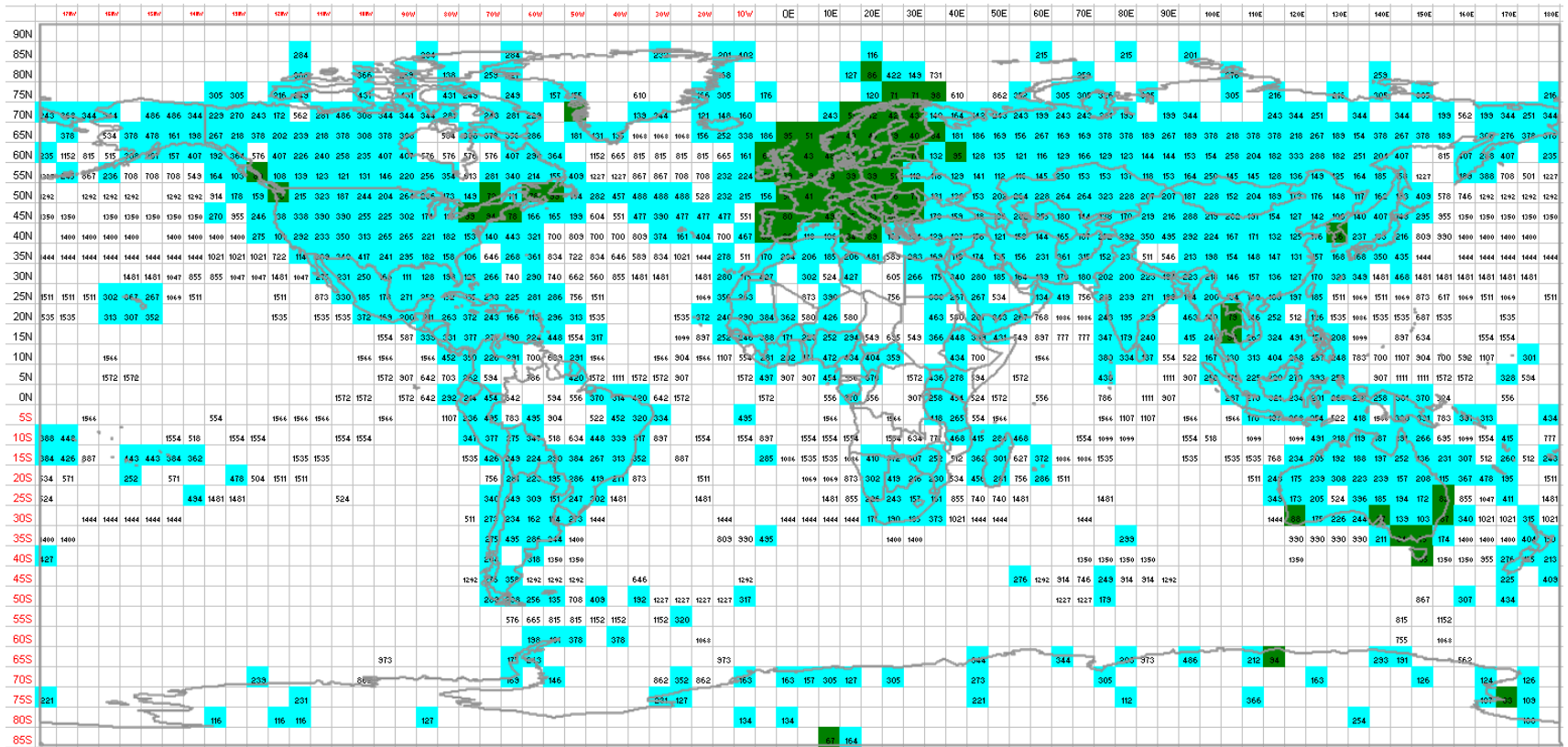


Gap analysis module (still in design phase)

- ✦ Quantitative tool that matches observational data requirements against observational capabilities
- ✦ Based on selection of requirement and pertinent observational capabilities, tool can illustrate whether or not different levels of requirement is met (by area or region)



Surface pressure measurement capabilities against WMO requirements (“capability” based on data received by ECMWF)



Implementation Status

- ★ **OSCAR/Surface; under development by Meteo-Suisse**
- ★ **OSCAR/Requirements; prototype operational in the WMO Secretariat; to be transferred to Meteo-Suisse (Phase 1)**
- ★ **OSCAR/Space, prototype operational in the WMO Secretariat; to be transferred to Meteo-Suisse (Phase 2)**

- ★ Close collaboration between WMO and Meteo-Suisse on developing, hosting and maintaining the OSCAR databases
- ★ Meteo-Suisse to implement and operate
- ★ WMO to be responsible for the information content





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Thank you for your attention

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