World Meteorological Organization

Weather • Climate • Water

ICG-WIGOS Task Team on WIGOS Metadata (TT-WMD)

Members

B. Howe (chair, CIMO), K. Monnik (CBS), J. Swaykos (JCOMM),
Tony Boston (CHy), N.N. (CCl),
S. Taylor (CAeM), J. Klausen (CAS)

WMO

R. Atkinson, S. Foreman

Summary of Work of TT-WMD

- 1 physical and 12 remote meetings
- Draft semantic standard
  for WIGOS metadata is near completion.
- Profiling (sub-setting) of standard proposed to facilitate use for applications demanding less comprehensive metadata.
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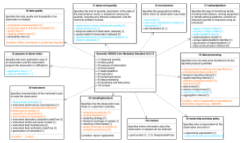
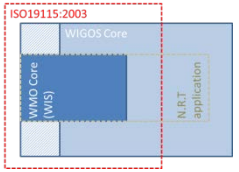
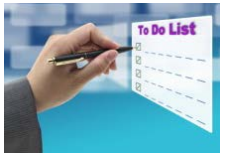






Terms of Reference

In accordance with guidance and recommendations of Cg-XVI, EC and ICG-WIGOS-1:

1. **To identify the information that is needed to allow the majority of users to use WIGOS observations in appropriate contexts and in a defensible way**;
2. To **create the WIGOS Core Metadata Standard that allows the essential information to be exchanged unambiguously**, regardless of the format used for the transfer;
3. To define a mechanism for maintaining the WIGOS Core Metadata Standard, including how metadata might be provided that is additional to the Core and coordinate with the ICG-WIGOS Task Team on Regulatory Material (TT-WRM) on any appropriate documentation as needed for WIGOS related Manual(s) and Guide(s);
4. To implement within the WIGOS Core Metadata Standard, and the WMO Core Metadata Profile, a **standard method of providing users with an indication of the quality of the data**, and to do so in a way that distinguishes with the quality management of the data ("**quality of the observation**") and ensuring that the user is able to identify which applications the data are suitable for (**"classification" of the observation**");
5. To coordinate regularly with the ICG-WIGOS as needed and report at least annually to the ICG-WIGOS on the progress;
6. To complete its tasks and hand over additional requirements to its successor (if required) in time for approval by Cg-17.

Principles for WIGOS Metadata

- Include the information that enables users to make adequate use of observational data *[also for climate applications]*
- Every piece of metadata *shall* have date/time information associated with it
- All metadata associated with internationally exchanged data *shall* be made available
- Metadata *shall* be updated in a timely manner to support adequate interpretation of data
- Standard *should* be applicable to all disciplines
- Standard *should* be forward-looking but also respect legacy (e.g., Vol. A)
- Standard *should* be acceptable to all Members
- Standard *should* be applicable for all Members

Activities of TT-WMD

- 1 physical meeting (TT-WMD-1) in March 2012
- 12 teleconferences so far
- Presentation at CAS-XVI
- Informal reviews within CIMO, CHy, BoM, MeteoSwiss, …

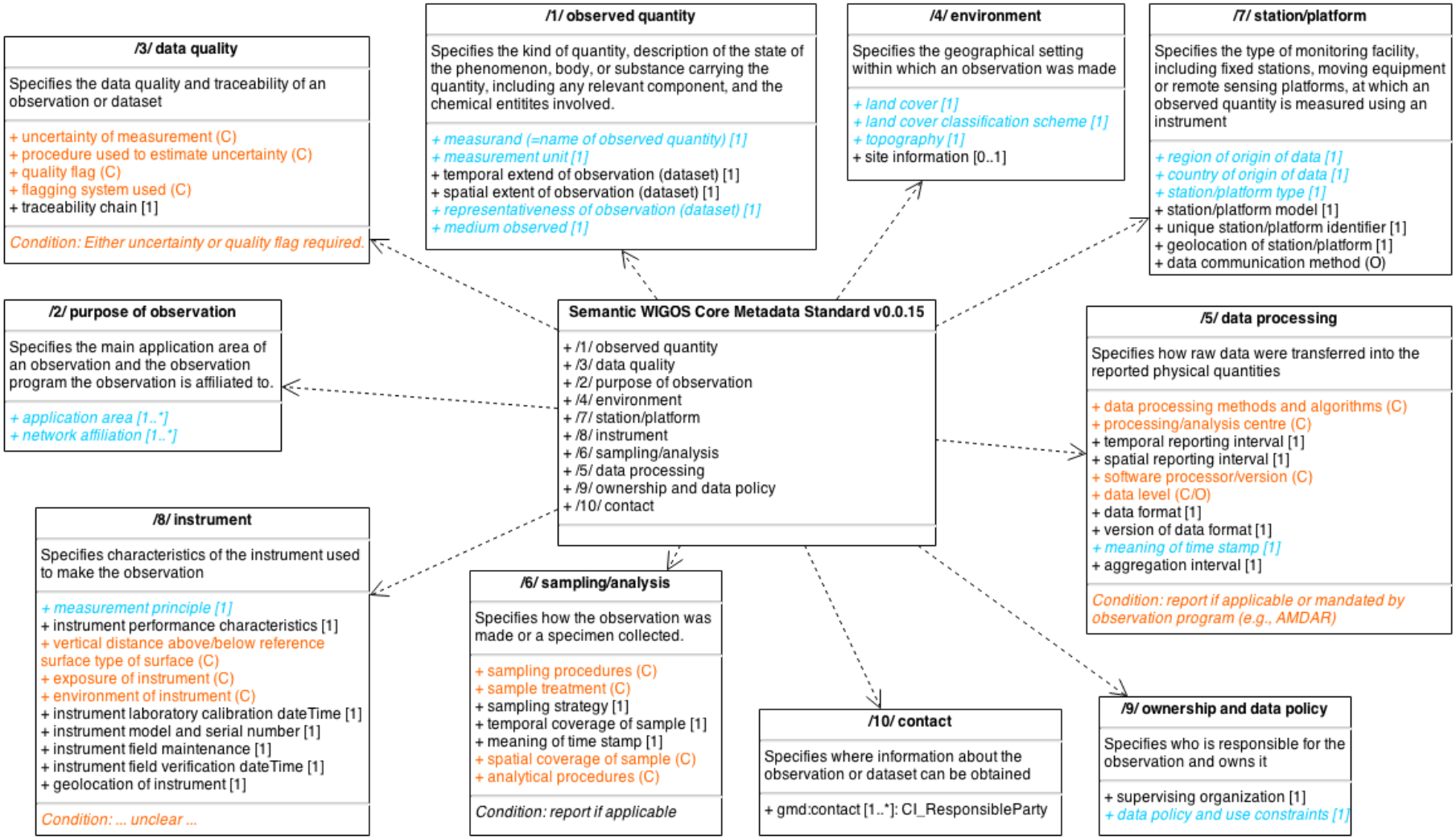
Results

- Comprehensive semantic standard *[for climate applications]* near completion
- Independent assessments by members of TT-WMD came to fairly unanimous agreement on the mandatory character of the elements proposed *[for climate applications]*

WIGOS Metadata Categories

#	Category	Description
1	observed quantity	The specification of a measurand requires knowledge of the kind of quantity, description of the state of the phenomenon, body, or substance carrying the quantity, including any relevant component, and the chemical entities involved. [VIM3, 2.3].
2	purpose of observation	Specifies the main application area(s) of an observation and the observation program an observation is affiliated to.
3	data quality	Specifies the data quality and traceability of an observation or dataset.
4	environment	Specifies the geographical setting within which an observation was made.
5	data processing	Specifies how raw data are transferred into the reported physical quantities.
6	sampling and analysis	Specifies how the observation was made or a specimen collected.
7	station/platform	Specifies the environmental monitoring facility, including fixed station, moving equipment or remote sensing platform, at which an observed quantity is measured using an instrument.
8	instrument	Specifies characteristics of the instrument(s) used to make the observation.
9	ownership and data policy	Specifies who is responsible for the observation and owns it.
10	contact	Specifies where information about an observation or dataset can be obtained.

WIGOS Metadata Standard UML



Blue italic: code lists expected; orange: conditional or optional

Independent Assessment of 'MCO'

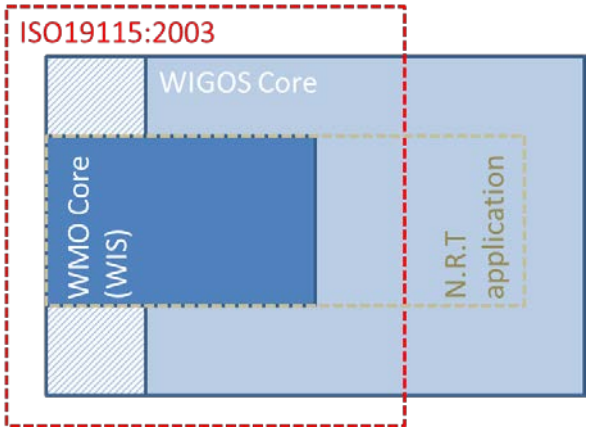
Perspective		WMD	GAW	CIMO	CHy	JCOMM	CBS			
1	**Observed Quantity** The specification of a measurand requires knowledge of the kind of quantity, description of the state of the phenomenon, body, or substance carrying the quantity, including any relevant component, and the chemical entities involved. [VIM3, 2.3].									
1-01	Name of observed quantity, **measurand**	M	M	M	M	M	M			
1-02	**measurement unit,** unit of measurement	M	M	M	M	M	M			
1-03	**temporal extent** of observed quantity	M	M	M?	M	M	M			
1-04	**spatial extent** of observed quantity	M	M	M	M	M	M			
1-05	Volume/Area/catchment represented by observed value	M	M	M	M	M	M			
1-06	observed medium	M	M	M	M	M	M			
2	**Purpose of observation** Specifies the main application area of an observation and the observation program an observation is affiliated to.									
2-01	Application area(s)	M	M	M	M	M	M			
2-02	Network affiliation	M	M	M	M	M	M			
3	**Data quality** Specifies the data quality and traceability of an observation or dataset									
3-01	uncertainty of measurement	C	C	O	C	C	C			
3-02	Reference to procedures used	C	C	O	C	C	C			
3-03	quality flags	C	C	O	C	M	C			
3-04	quality flagging system	C	C	O	C	M	C			
3-05	traceability chain	M	M	O	O	M	O			

Profiling of WIGOS Metadata Standard

- Specify sub-sets of standard for particular application areas, e.g.
  - Particular science projects
  - Climate
  - Air Traffic
  - NWP Assimilation
  - Warnings
  - Road Forecasts

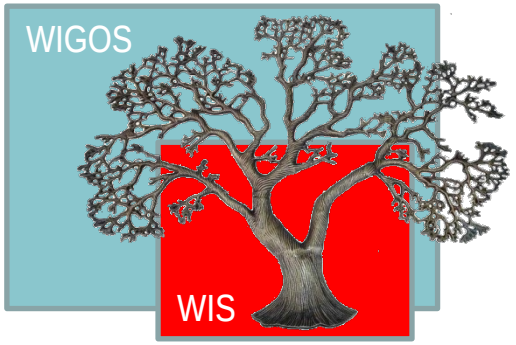
Metdata demands

- Profiling makes standard more manageable at the risk of precluding future data use.
- Profiles must not simply eliminate the “difficult elements”

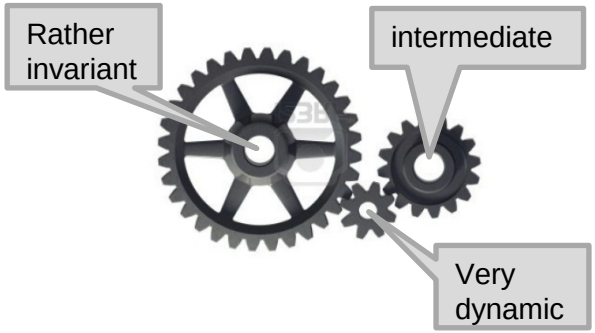


Considerations for WIGOS Metadata

- Generation
  - Various levels of granularity



- Transmission
  - Various intervals for (incremental) update



- Access and use
  - By humans (researchers, managers, the public)
  - By machines (services)

Open Issues I

- Need support from all TCs (incl. CCl, CAgM) as well as EC-PORS and satellite operations
- An observation may serve for various applications with different metadata requirements. Future applications are often not known at time of observation.
  - Does ICG-WIGOS support profiling of standard for different application areas in full consideration that certain future applications (mostly climate) may be jeopardized?
- The current semantic standard needs to be formalized in a next step. ISO and OGC offer packages for certain categories, but perhaps not all.
  - ICG-WIGOS is requested to decide on who should advance this. IPET-MDRP? TT-WMD? The two together?

Open Issues II

- Interoperability requires certain fixed vocabularies (e.g., variable names, Station IDs). Various stakeholders exist: WMO, GEO, EU, CEOS, etc.
  - Who drives the process of establishing governance?
  - Who takes responsibility for hosting and maintaining vocabularies?
- Metadata elements have different life cycles. Ideally, every observation needs to be accompanied with comprehensive metadata, but that is impractical.
  - When and how should what metadata elements be updated?
  - Where should comprehensive metadata records be archived?
- What is the role of OSCAR in managing / archiving / utilizing WIGOS metadata?

Work Plan

- Refer to doc 4.2 Appendix 2

Appendix 2

TT-WMD Work Plan

TT-WMD ACTION PLAN FOR THE PERIOD XI.2012 TO VI.2015

Version	Date	Comments
1	23/11/2012	Action plan developed at TT-WMD-01
2	15/3/2013	TT-WMD-01
X	31/01/2014	

No.	Task	Deliverable/Activity	Deadline (if not stated end of month)	Responsible	Status*	Comment
0	Produce proposed definition of contents of WIGOS Core metadata	Initial version of WIGOS Core metadata	15 March 2013	Howe	Complete 15/3/2013	TT-WMD-1 achieved this
1	Define Initial Observation Types to be described	All WIGOS observational data types have been listed (the purpose of the list is to design a robust model for observation metadata, so although it may not be possible to include every observation type, those in the list should ensure that the range of requirements for metadata is covered), and each assigned to a relevant TC for specification of metadata requirements (TT-WMD)	May 2013	Klausen	Task completed with sufficient coverage in the presentations for TT-WMD-1 15/3/2013	Adequate information was provided through the presentations for the meeting. No direct further list required; review of Core metadata will identify further issues.

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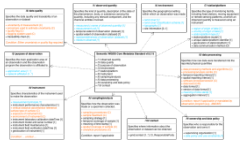

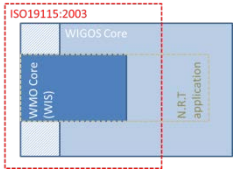

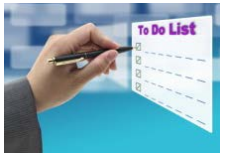

Thank you for your attention!