



Measurement metadata collection: Experience with WIGOS and ESA-CCI formats in the frame of GAIA-CLIM H2020 project

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GAIA-CLIM WP1 “Geographical capabilities mapping”



The goal of this GAIA-CLIM WP is to identify the geographical capabilities and gaps in the existing surface-based and sub-orbital observing systems at the European and at the global scale for the characterization of EO measurement performance.

Specific goals in the DoA are:

- To document and define system properties for each layer in a ‘system of systems’ approach to enable rigorous EO data characterization.
- To provide a geographical identification, at European and at the global scale, of current surface-based, balloon-based and airborne observing capabilities on an ECV by ECV basis for parameters which can be obtained using space-based observations from past, present and planned satellite missions.
- Preparation for the creation of a “Virtual Observatory” of ground based and satellite data by establishing common formats for metadata.
- Provision of a 3D tool for the online visualization of the current surface-based observing capability to facilitate the selection of the best available ensemble of station records for the satellite CAL/VAL, with respect to several parameters (e.g. time, space and vertical coverage).
- To provide a rigorous scientific assessment of geographical gaps in the system of systems of surface-based and sub-orbital observing capabilities by both: designing and implementing advanced geo-statistical approaches; and using existing global chemistry models.



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Metadata formats

- 3 metadata "standards" have been considered for GAIA-CLIM measurement metadata:
 - WIGOS
 - CERIF (suggested by ENVRIPLUS H2020 project)
 - ESA-CCI (CF1.6 metadata convention)

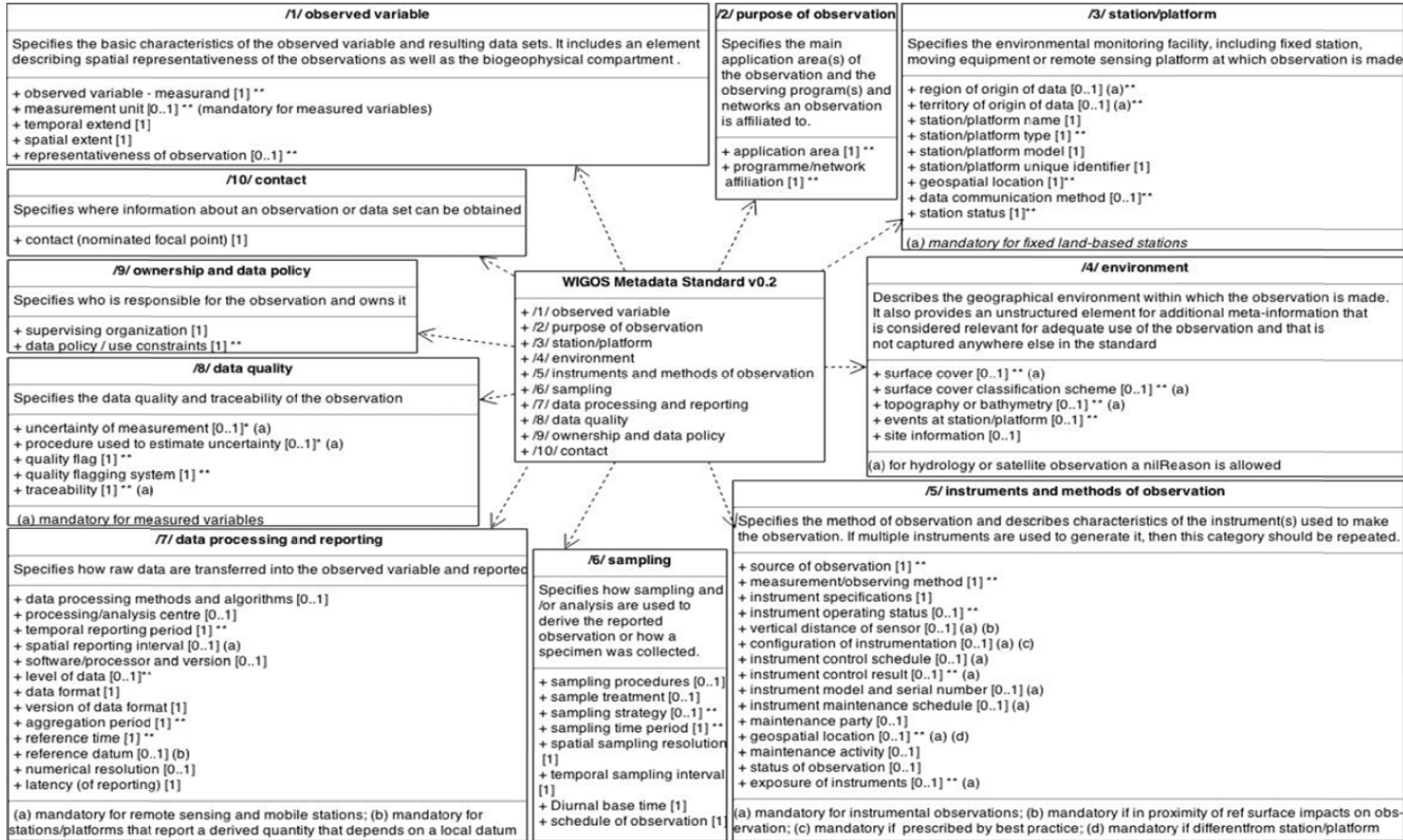




WIGOS metadata format



WIGOS



WIGOS metadata format



WIGOS

GAIA-CLIM has implemented a scheme XSD Wigos-like covering all sections provided (yesterday we got the first draft of the XML-schema file from D. Lowe, BoM needs some time to revise it)

advantages

Compliant standard made by WMO

Very precise scheme and quite homogeneous rules to fill in the metadata file reducing the “*degrees of freedom*” in the metadata collection.

disadvantages

- List of variable and networks not omnicomprehensive.
- Many relevant fields left as “free string variables”, like uncertainty, spatial extent,
- The sub-domain and the measured variable within the WIGOS format have not the same definition as in GAIA-CLIM (and GRUAN too) and not all the ECVs considered within the project are in the WIGOS list.
- Format too much driven by surface meteorological data, e.g. not often applicable to other techniques.





ESA-CCI format

- NetCDF format, well-known, easy to read with many tool and compilers
- Closer to what typically done by the ground based measurements community
- Compliant to **CF1.6 convention**, in line also with the modellers' standards.
- Large flexibility in the number of variable defined.

Drawback:

- Free structure: not precise rules (minimum number of variables, what is mandatory, what is optional, ...), left in the hand of the data providers.

WIGOS and ESA-CCI format have been intercompared: very difficult to reconcile the two formats, they are pretty different and their merging looks challenging (from a formal point of view any reconciling looks impossible!)



ISO19115 discovery metadata

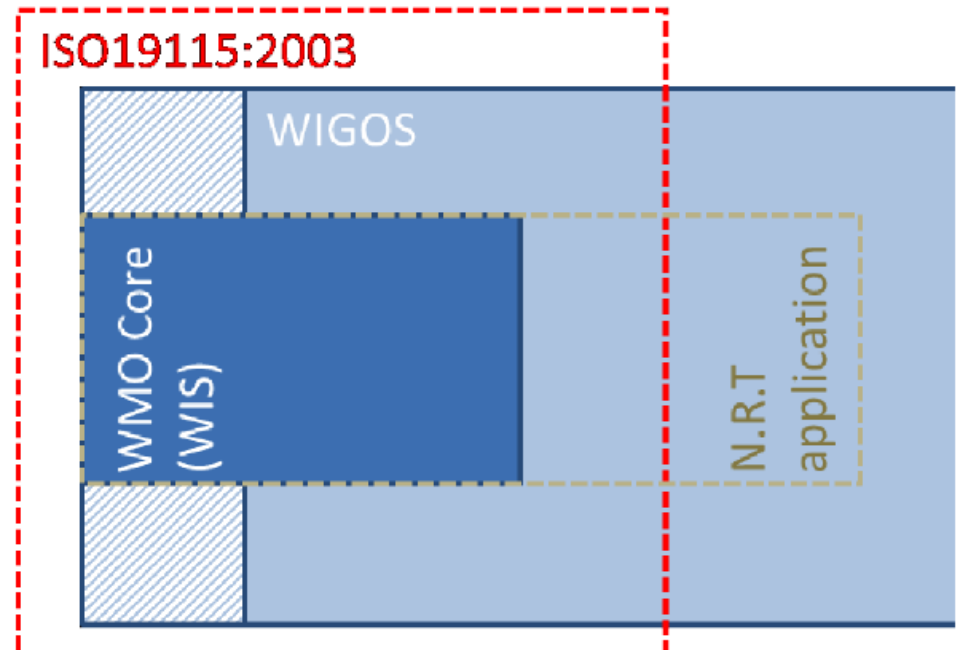


- ISO 19115 "**Geographic Information – Metadata**" is the current "best practice" standard for geospatial metadata
- very flexible format, allows to customize the metadata profile without losing of generality.

..... examples:

- Satellite: NASA Earth Science Division (ESD) Base Metadata Requirements make use of an ISO 19115 metadata profile for NASA Earth science data.
- INSPIRE (Infrastructure for Spatial Information in the European Community) metadata profile is built upon EN ISO 19115.
- The WMO Core is a profile of ISO19115.
- ESA-CCI recommends ISO19115
- GEOSS make use of ISO19115

Figure: schematic of the relationship of WIS and WIGOS metadata and the scope of the ISO19115 standard.





Interaction with WIGOS

- Very difficult at the beginning now more intensive
- For GAIA-CLIM, we have now access to the XMS WIGOS files and we are establishing a dialogue with WIGOS team to provide our feedbacks on the use of WIGOS metadata format
- Next week (May 4th), GAIA-CLIM metadata meeting will provide recommendation on the format to be adopted within the project for its Virtual Observatory
- WIGOS IPET-MDRD working meeting in Geneva in 2 weeks. One topic to be discussed is the review of the WIGOS implementation/mapping using OGC O&M prepared by BoM
- EUMETSAT is also going to experiment with the WIGOS standard and O&M mapping in the following weeks and generate some WIGOS samples for observations and compare their content with the metadata we have at the product level.





Summary

- GAIA-CLIM assessment and comparison of the metadata format will conclude by next September.
- The most likely solution for GAIA-CLIM will be to ingest all the different metadata formats in order to create a “unified list” of information that should allow the users to retrieve the measurements metadata in the desired format (e.g. WIGOS or CF1.6).
- The dialogue with WIGOS will continue to provide them with useful feedbacks in support of the WIGOS-OSCAR implementation over the next two years of project.

