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# IPET-MDRD - representation of Climate and WIGOS metadata

## Introduction

1. IPET-MDRD (the Inter-Programme Expert Team on Metadata and Data Representation Development) is responsible for guiding the development of new types of data representation for WMO. A team consisting of experts from IPET-MDRD, TT-WMD and ET-CDMS met in Melbourne, Australia, from 22-25 June 2015. The objectives of the meeting were to:

* develop a common understanding within the team of a range of issues surrounding the development of a logical data model to underpin future exchange of meteorological observations data, together with the context of how that observation was made (metadata); and
* using this common understanding, to agree on a work plan to further develop the logical data model and to demonstrate its effective use.

1. The team considered existing climate metadata databases and how they were used, together with examples of metadata use from other application areas. They also considered work already undertaken, including the WaterML2 and METCE logical data models, that could be re-used as components of the formal data model for WIGOS and climate metadata.
2. The draft final report of the meeting records the conclusions and work plan of the meeting [[1](http://wis.wmo.int/file=1607)].
3. In order to meet all the requirements, the data model had to be able to represent not only the metadata themselves, but (optionally) permit them to be directly associated with observed values (for example, so that the relevant observation metadata could be included in a file of temperatures).
4. Although the WIGOS metadata standard only requires that each metadata item should be time stamped, the team decided to use an approach similar to that of OSCAR that divides the time series of metadata into “segments” during which the key metadata elements remained unchanged; although this complicated the structure, it reduced the overall amount of information to be provided and maintained.
5. Annex 1 shows a diagrammatic representation of the high level structure that the team is investigating for the WIGOS and station metadata representation.
6. Once the “logical data model” has been defined, it will be possible to extract automatically the XML specifications that would enable data exchange. However, although this would also enforce some of the conditions on the content that are in the definition of the WIGOS metadata standard, additional manual work would be required to allow computers automatically to enforce others (particularly those that required the contents of the data to be examined).

## Time line for development

1. The team felt the following time line to be challenging but achievable:

* November 2015: Draft of logical data model released to Technical Commisions for confirmation that it meets their essential needs;
* January 2016: draft data model available for review by WMO community;
* March 2016: technical facilities to test data encoded in the standard available to the team;
* March 2016: End of period of review by WMO community;
* June 2016: technical documentation available for submission to CBS-16 for inclusion in Manual on Codes Vol I.3;
* Nov 2016: CBS approval;
* May/June 2017: EC approval.

## Issues for clarification

1. Mapping the WIGOS Metadata Specification to a data model requires the contents of the WIGOS standard to be defined in greater detail that the document approved by seventeenth Congress provides. In many cases the data model would initially cater for these using either a free text entry, or by allowing a mix of free text and documents. The team noted that these might be areas where domain specific extensions to the standard could be developed in the future.
2. How will the authoritative source for observation metadata be defined and identified? (This issue also arose at the meeting on satellite metadata, 29 Septemer to 1 October 2015).
3. The concepts of “instruments” and “sensors” were unclear, and a decision was needed on whether both were needed, and on the relationship between them. In some cases, instruments consisted of a number of instruments that could be further nested. Although not a logical problem, in practice storage and exchange would become unwieldy if these could be nested to an arbitrary depth. The team needed guidance on whether nesting was required (and if so, how deeply) and whether sensors and instruments could be considered (for the purposes of metadata) to be the same.
4. The team recommended that the data format should be represented by a code table.
5. The team noted that there needed to be a very responsive governance process for extending code tables, particularly in the early days of operational use of the WIGOS metadata standard.
6. Specifications of quality needed further work before suitable data representations could be developed.

## References

[1] Provisional Final Report of IPET-MDRD-2 (<http://wis.wmo.int/file=1607>)

## Recommended Text

A team of experts from IPET-MDRD, TT-WMD and ET-CDMS met in June 2015 to develop a work plan for creating the data representation for WIGOS and climate metadata. They developed an initial structure that would be tested and further developed in 2015, opened for review late in 2015, and the final version prepared by June 2016 for submission to CBS-16.

TT-WMD asked Mr Klausen and Mr Monnik to continue to work with the team developing data representations, and in particular to work by correspondence with that team and TT-WMD to resolve issues on the intended content of WIGOS metadata that arose from the need to be specific in the type of information to be represented.

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## Annex 1: Initial draft data model

