

World Meteorological Organization

Weather • Climate • Water

Information modelling within IPET-MDRD

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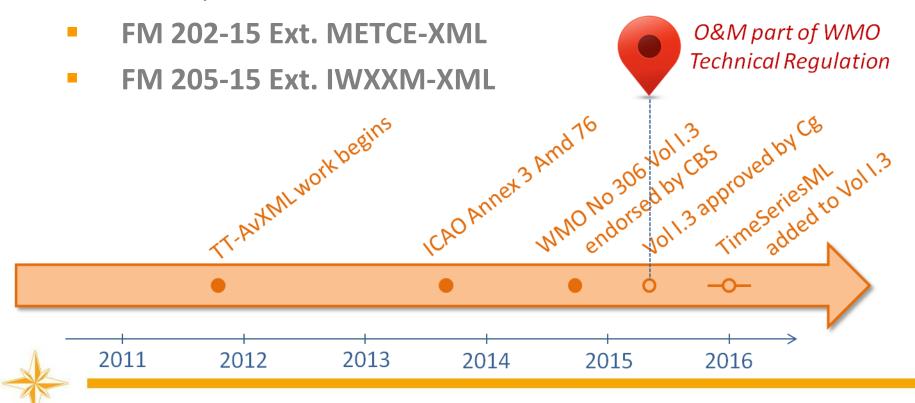
IPET-MDRD summary: Data models and formats

- 1. WMO logical data model "Modéle pour l'Échange des informations sur le Temps, le Climat et l'Eau" (METCE) <u>established</u>.
- 2. Building on METCE, IWXXM GML Application Schema and XML code form delivered for civil aviation in response to ICAO Annex 3 Amendment 76; scope includes TAF, METAR/SPECI and SIGMET.
- 3. WMO Codes Registry delivered to enable WMO code tables to be used with new XML code forms.
- Documentation for new XML code forms published as new volume of Manual on Codes (WMO No. 306 Vol I.3) and associated Guide; awaiting approval from Cg.
- 5. More work anticipated to support ICAO Annex 3 Amendment 77.
- 6. OGC WaterML2 Part 1 Timeseries (<u>OGC #10-126r4</u>) to be included in WMO No. 306 Vol I.3 once refactored to separate generic timeseries model as TimeseriesML under OGC process (2015).
- 7. GML Application Schema for WIGOS observation metadata (as defined in anticipated WIGOS Core Metadata Specification; draft) to be developed again building on METCE.
- 8. GML Application Schema for surface-based climate observations to be developed as profile of WIGOS observation metadata Application Schema.



WMO and O&M convergence

- WMO tasked by ICAO to deliver GML application schema for aeronautical meteorology data exchange
- WMO (TT-AvXML) adopt model-driven approach based on O&M; new code forms include



WIGOS Metadata

... should describe the observed quantity, the conditions under which it was observed, how it was measured, and how the data has been processed, in order to provide data users with confidence that the use of the data is appropriate for their application. GCOS (Global Climate Observing System) Climate Monitoring Principle #3 describes the relevance of metadata as:

"The details and history of local conditions, instruments, operating procedures, data processing algorithms and other factors pertinent to interpreting data (i.e., metadata) should be documented and treated with the same care as the data themselves."



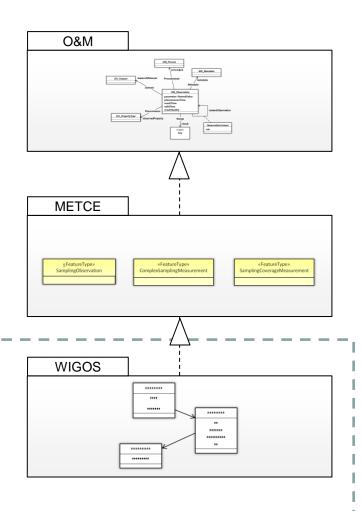
Source: WIGOS Metadata Standard v0.1

WIGOS Metadata categories

/4/ environment /1/ observed quantity /2/ purpose of observation /3/ data quality Describes the geographical environment within which the Specifies the main application Specifies the data quality and Specifies the observed quantity and the data sets generated. observations are made. It also provides an unstructured traceability of an observation or dataset area(s) of an observation and It includes an element describing the spatial element for additional meta-information that is considered the observation program(s) an representativeness of the observations as well as the + uncertainty of measurement [1] relevant for adequate use of the data and that is not captured observation is affiliated to. biogeophysical compartment the observations describe. + procedure used to estimate uncertainty [1] anywhere else in the standard + application area [0..1] ** + quality flag [1] + measurand (=name of observed quantity) [1] ** + surface cover [0..1] (a)** + network affiliation [1] ** + quality flagging system [1] + measurement unit [1] ** + surface cover classification scheme [0..1] (a) + traceability flag [1] ** + temporal extend of observed quantity [1] + traceability chain [0..1] + topography or bathymetry [0..1] (a)** + spatial extent of observed quantity [1] + exposure of instruments [0..1] ** + representativeness of observation [0..1] ** + intervention at station/platform [0..1] ** + observed medium [1] ** + site information [0..1] /10/ contact (a) for hydrology or satellite observation, a nilReason is allowed WIGOS Metadata Standard v0.1 Specifies where information about an observation or data /5/ data processing and reporting set can be obtained + /1/ observed quantity Specifies how raw data are transferred into the reported + /2/ purpose of observation + contact (nominated focal point) [1] physical quantities and reported to the users + /3/ data quality + /4/ environment + data processing methods and algorithms [0..1] /9/ ownership and data policy + /5/ data processing + processing/analysis centre [0..1] + /6/ sampling/analysis Specifies who is responsible for the observation and owns it + reporting interval (time) [1] + /7/ station/platform + reporting interval (space) [0..1] (a) + /8/ method of observation + supervising organization [1] + software/processor and version [0..1] + /9/ ownership and data policy + data policy / use constraints [1] ** + level of data [0..1]** + /10/ contact + data format [1] /8/ method of observation + version of data format [1] + aggregation interval [1] Specifies the method of observation and describes characteristics + meaning of time stamp [1] ** of the instrument(s)used to make the observation. If multiple + reference time [1] instruments need to operate in concert to arrive at an observation. + reference datum [0..1] (b) then this category should be repeated. + numerical resolution [0..1] + latency (of reporting) [1] + source of observation [1] ** + measurement principle [1] ** /7/ station/platform (a) mandatory for remote sensing and mobile stations in + observable range [1] general; (b) mandatory for stations/platforms that report a + instrument stability [0..1] (a) Specifies the environmental monitoring facility, derived quantity that depends on a local datum + vertical distance [0..1] (b) including fixed station, moving equipment or + configuration of instrumentation [0..1] (c) remote sensing platform at which an observation /6/ sampling and analysis + lab calibration interval [0..1] (a) is made. instrument lab calibration DateTime [0..1] (a) Specifies how sampling and/or analysis are used to derive the reported observation + instrument model and serial number [0..1] (a) or how a specimen was collected. + region of origin of data [0..1] (a)** + instrument field maintenance [0..1] (a) + territory of origin of data [0..1] (a)** + instrument field verification [0..1] (a) + sampling procedures [0..1] + station/platform name [1] + geospatial location [0..1] (d) + sample treatment [0..1] + station/platform type [1] ** + sampling strategy [0..1] ** + station/platform model [1] (a) mandatory for instrumental observations; (b) mandatory for + sampling time period [1] + station/platform unique identifier [1] instrumental observations and if proximity of reference surface + meaning of the time stamp [1] ** + geospatial location [1] impacts on observation; (c) mandatory for instrumental observation + spatial sampling resolution [1] ** + data communication method [0..1] and if prescribed by "best practice"; (d) mandatory for instrumental + analytical procedures [0..1] observations and if different from station/platform temporal sampling interval [1] (a) mandatory for fixed land-based stations



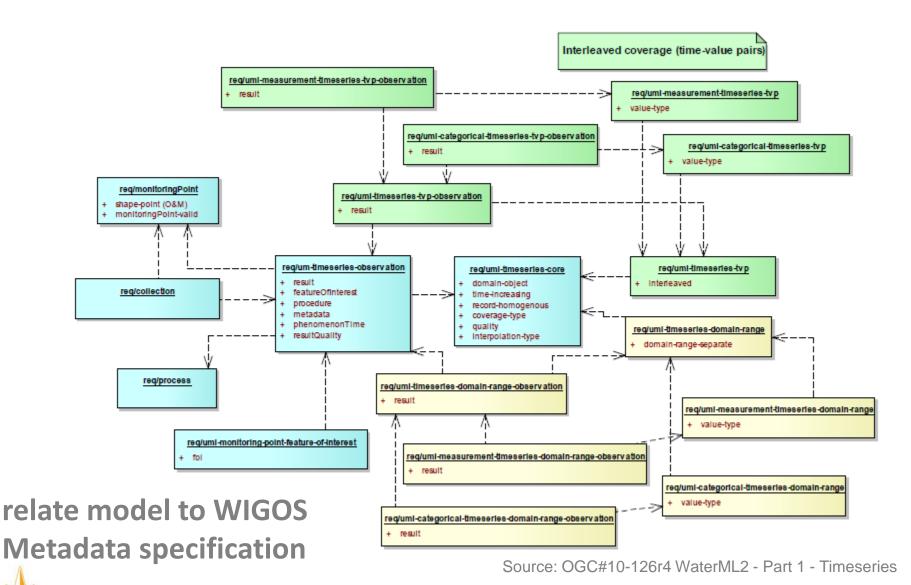
GML Application Schema for WIGOS Metadata



 IPET-MDRD to establish new Task Team to work with TT-WMD to establish a formal data model and encoding of WIGOS Metadata



Lessons learned: formal requirements model

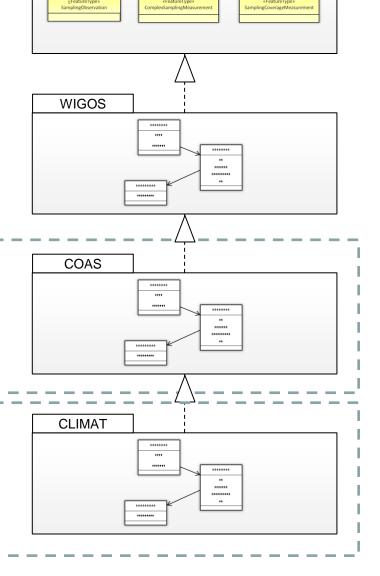


Further modelling ...

In collaboration with ET-CDMS ...

(land-surface based) Climate
 Observations Application
 Schema (COAS)

 CLIMAT message (derived from FM-71) — report of monthly values from a land station





QUESTIONS & DISCUSSION

