

WIGOS Metadata: XML profiles & expected information flow

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WMO OMM

World Meteorological Organization
Organisation météorologique mondiale

Outline

- Background and Motivation
 - WIGOS metadata Standard
 - WIGOS metadata representation
- Expected information flow
 - Stations already exist in GAWSIS-OSCAR/Surface
 - Station does not exist in GAWSIS-OSCAR/Surface
- Example XML templates



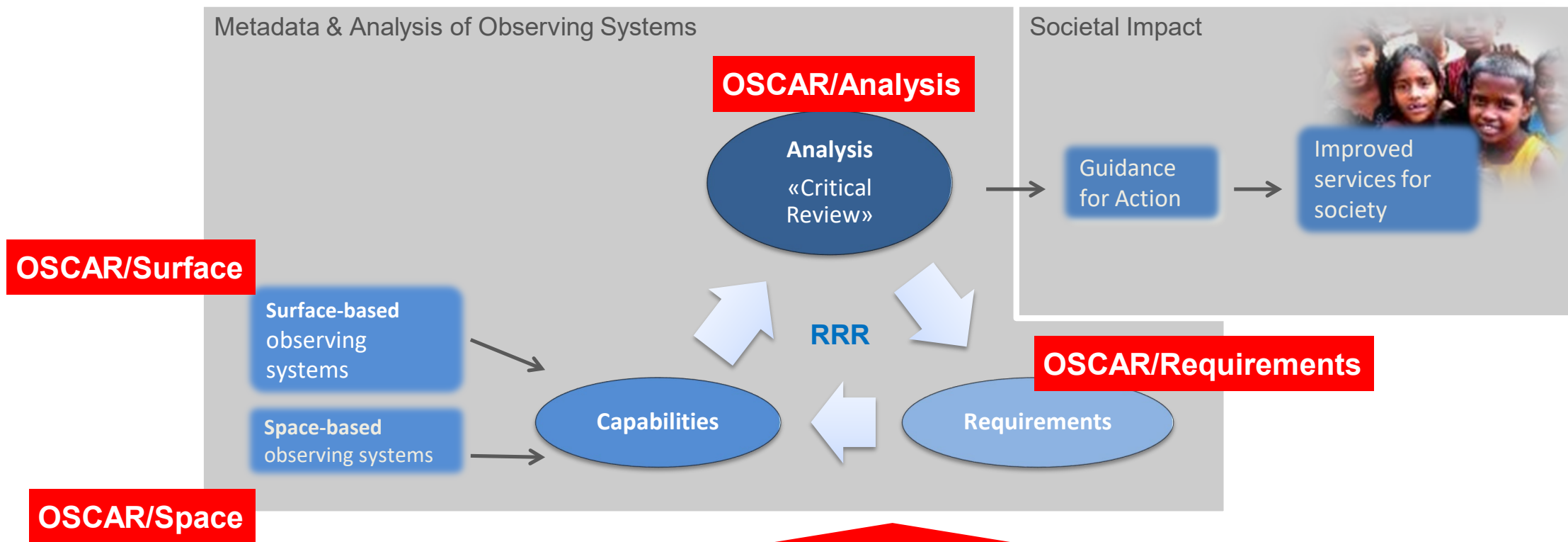
OSCAR

Observing Systems
Capability Analysis
and Review Tool



RRR and OSCAR

Evolve observing systems rationally → WIGOS “Rolling Review of Requirements” Process



Enable adequate use of observational data → Operational Meteorology, Climatology, Public Health, ...

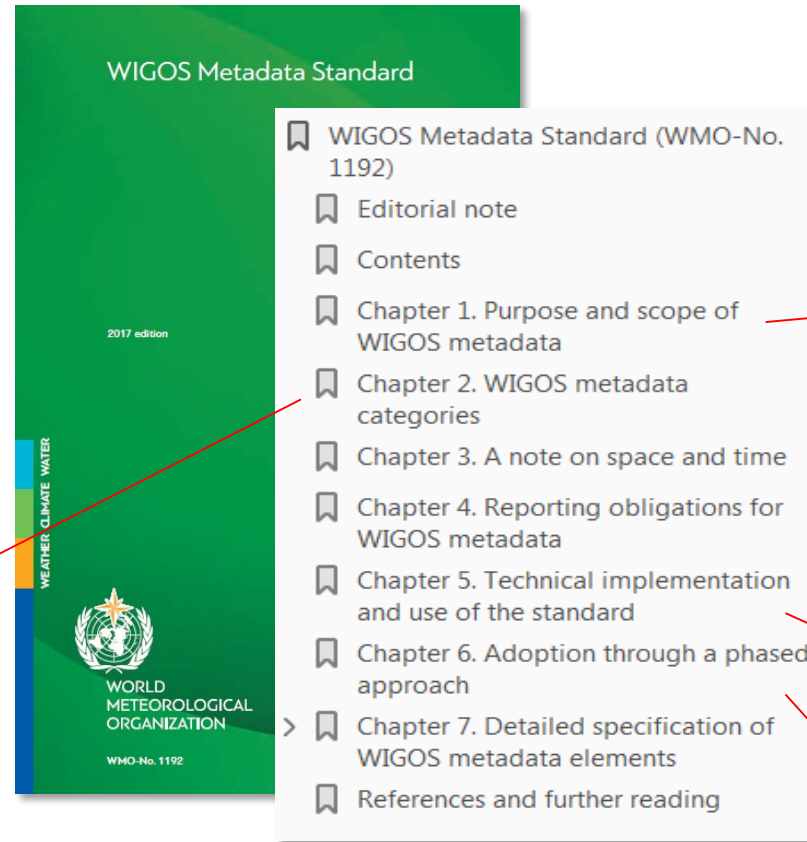


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WIGOS Metadata Standard

Approved by WMO Cg-17 (2015, revised 2019)

1. Observed variable
2. Purpose of observation
3. Station/ platform
4. Environment
5. Instruments & methods of observation
6. Sampling
7. Data processing and reporting
8. Data Quality
9. Ownership and Data Policy
10. Contact



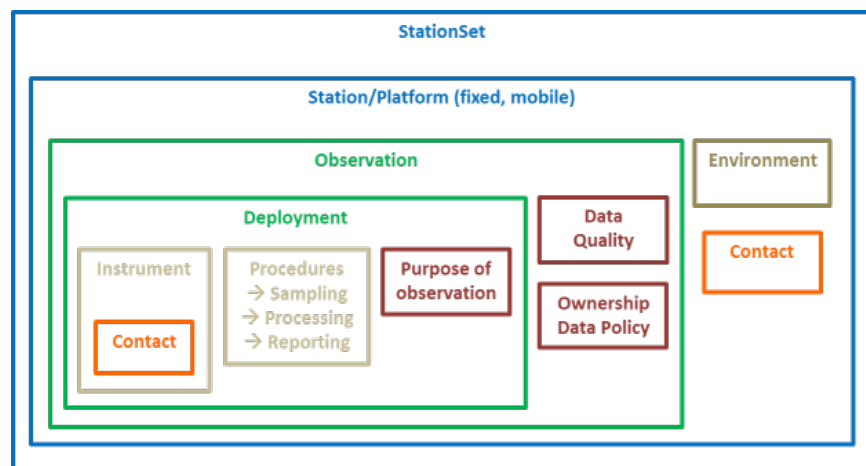
- Land, ocean, space
- Fixed, mobile observing facilities
- In-situ, remote-sensing instruments
- Physical, chemical, biological, hydrological observations
- Weather, climate, warnings, ...

XML schema & API

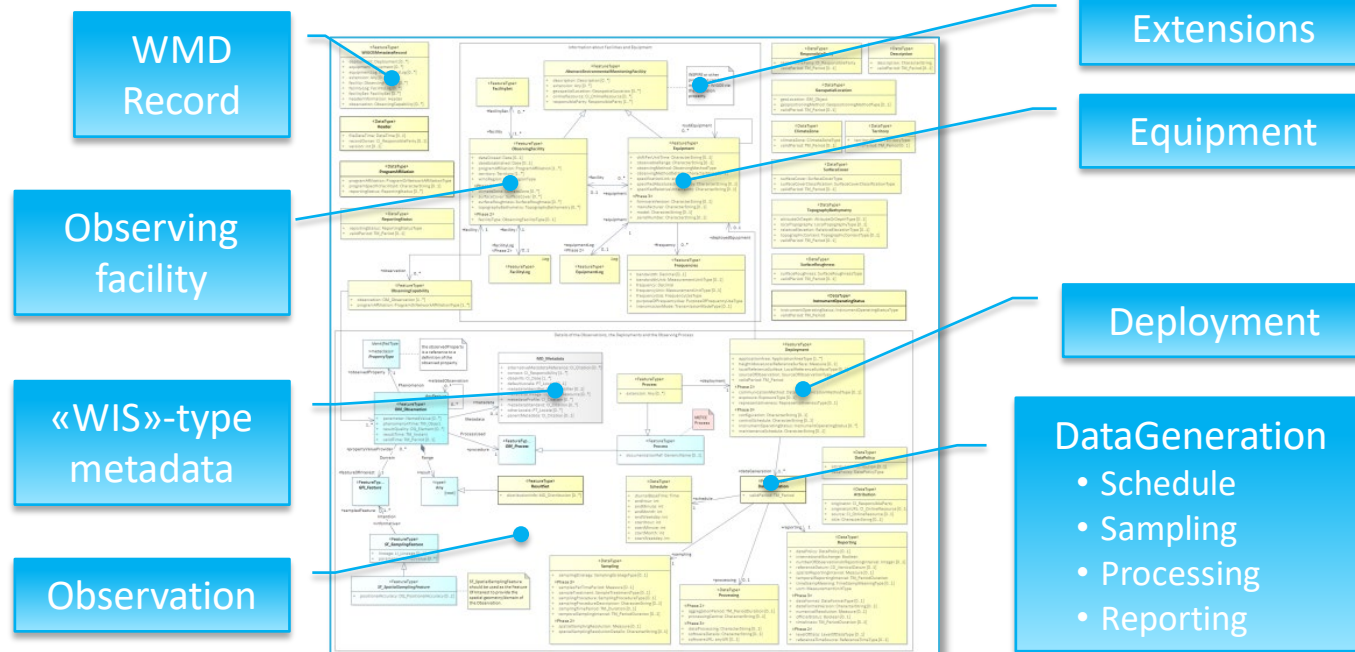
2016 - 2020

https://library.wmo.int/doc_num.php?explnum_id=10109

WIGOS Metadata Representation



1. Observed variable
2. Purpose of observation
3. Station/ platform
4. Environment
5. Instruments & methods of observation
6. Sampling
7. Data processing and reporting
8. Data Quality
9. Ownership and Data Policy
10. Contact

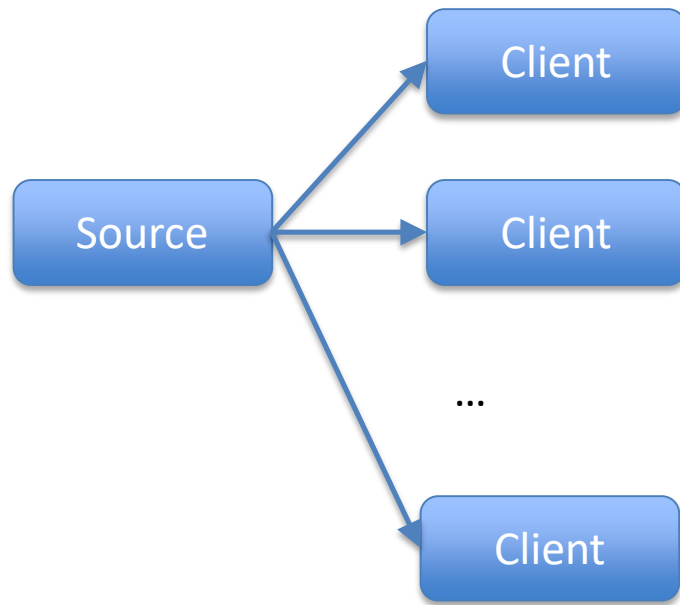


```
<?xml version="1.0" encoding="UTF-8"?>
<wmdr:WIGOSMetadataRecord xsi:schemaLocation="http://def.wmo.int/wmdr/2017 file:///C:/svn/wmdr/branches/development/wmdr.xsd" xmlns:wmdr="http://def.wmo.int/wmdr/2017" xmlns:sams="http://www.opengis.net/samplingSpatial/2.0" xmlns:sam="http://www.opengis.net/sampling/2.0" xmlns:gmd="http://www.isotc211.org/2005/gmd" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:wigos="http://www.wigos.wmo.int/2008">
  <wmdr:headerInformation owns="false">
    <wmdr:Header>
      <wmdr:headerInformation>
        <wmdr:facility>
          <wmdr:ObservingFacility gml:id="_0-20008-0-JFJ">
            <gml:description>The high alpine research station Jungfraujoch is situated on a mountain saddle between the
              surrounded by highly industrialized regions at much lower altitudes. This special geographical situation of
              layer to the free troposphere.</gml:description>
            <gml:identifier codeSpace="http://wigos.wmo.int/2008/0/JFJ">http://wigos.wmo.int/2008/0/JFJ</gml:identifier>
            <gml:name>Jungfraujoch</gml:name>
          </wmdr:ObservingFacility>
        </wmdr:facility>
      </wmdr:headerInformation>
    </wmdr:Header>
  </wmdr:headerInformation>
  <wmdr:Observation>
    <wmdr:Deployment>
      <wmdr:Instrument>
        <wmdr:Instrument>
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        </wmdr:Instrument>
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    </wmdr:Deployment>
    <wmdr:Sampling>
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          </wmdr:Sampling>
        </wmdr:Sampling>
      </wmdr:Sampling>
    </wmdr:Sampling>
  </wmdr:Observation>
  </wmdr:WIGOSMetadataRecord>
```

WMDR
XSD
XML



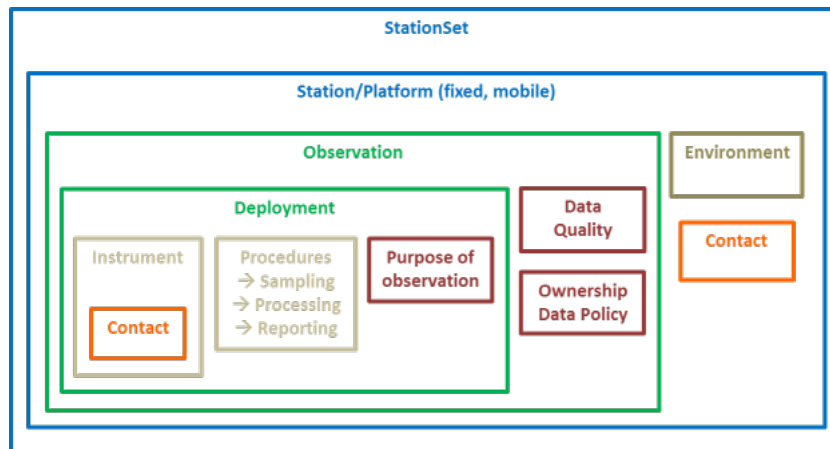
Expected information flow in a distributed system



- Provide *common information* from a central place
- Provide *specific information* from a dedicated maintainer (federation)
- Edit information only at the source
- Consume and display information wherever useful

Desired information flow between OSCAR/Surface and (GAW) Data Centers

- OSCAR/Surface is **SOURCE**
 - Station Information
 - Environment
 - Program/network affiliations
 - **Contacts**
- Data Center is **SOURCE**
 - Observations
 - Variables
 - Instruments incl. location
 - Method, Procedures
 - Data periods available
 - Schedules
 - **Data quality**
 - **Data policy**
 - **Instrument PIs**



OSCAR/Surface role 'Data Centre'

- Is a machine-to-machine role
- Can add
 - Add new stations, incl. program/network affiliation
 - Always: need WIGOS Station Identifier (WSI)
 - For GAW Global, Regional, Contributing: need GAW Identifier (GAWID)
 - Add/edit observations, deployment history
 - Need gml:id to identify/edit observation
 - Add/edit contacts
 - Identified by e-mail, name
- Can not
 - edit station characteristics

Payerne (Switzerland)
Part of Payerne (PAYERNE (6610-0))
in WMO Region VI - Europe

- > Station characteristics
- > Observations / measurements
- > Station contacts
- > Bibliographic references
- > Documents

Station exists in GAW/SIS-OSCAR/Surface

- Download station XML file, find gml:id(s)
- Updates
 - Check if observation (variable + geometry) exists → get gml:id and use
 - Check if deployment exists → get gml:id and use
- Additions
 - Add new observation(s) and deployment(s) → provide gml:id for future use

OAI/PMH provider & API endpoints

- OSCAR/Surface WMDR XML station representations at
 - <https://oscardepl.wmo.int/oai> (test environment)
 - <https://oscar.wmo.int/oai/> (production environment)
- Useful OSCAR/Surface endpoints
 - https://oscar.wmo.int/surface/rest/api?_wadl → capabilities
 - <https://oscar.wmo.int/surface//rest/api/wmd/download/0-20008-0-MKN>
 - <https://oscar.wmo.int/surface/rest/api/referenceData/program-tree>
 - <http://oscar.wmo.int/surface//rest/api/search/wigos?WIGOSStationIdentifier=0-20000-0-06679,0-20008-0-MKN>

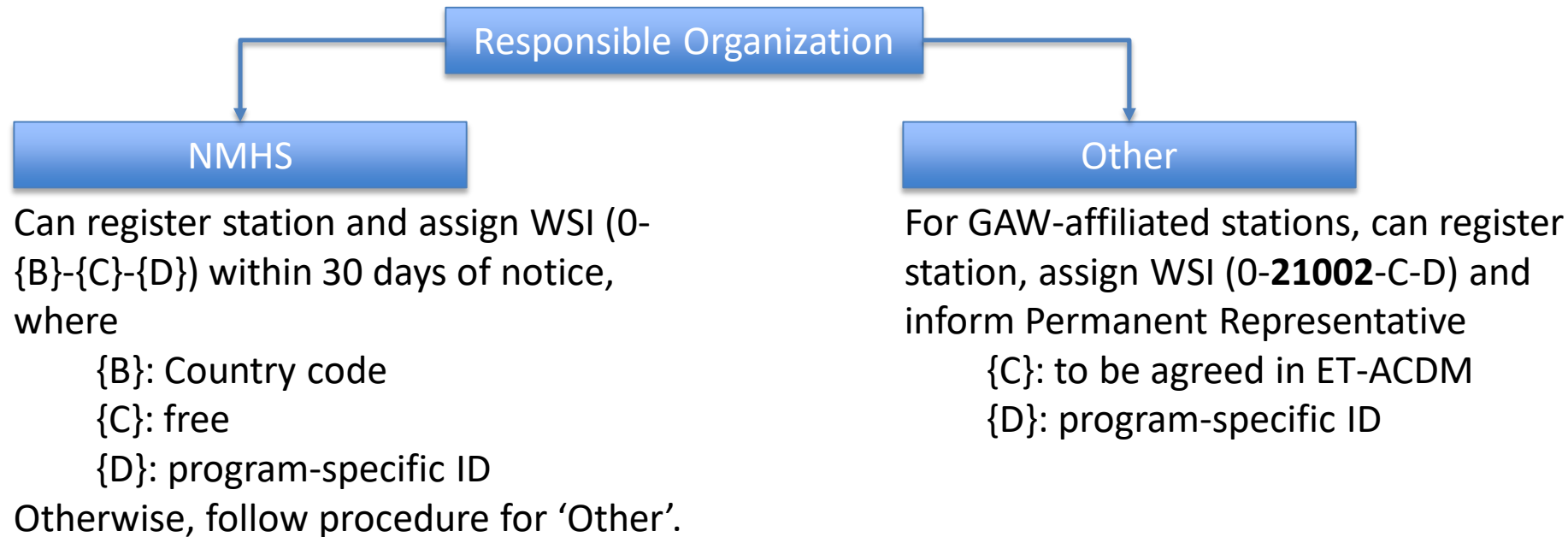
Station not in GAW SIS-OSCAR/Surface ...

- Always verify station does not yet exist in GAW SIS-OSCAR/Surface or in the vicinity (~1 km radius) → Check in OSCAR/Surface, GAW SIS only shows subset
- Ideally, stations should be registered in GAW SIS-OSCAR/Surface **before** data submissions are accepted by a data archive
 - For GAW Regional, Local stations, this is part of the application process and WDCs are requested to honor this requirement.
- For stations known to an archive but not to GAW SIS-OSCAR/Surface
 - Establish if another data archive host (other) data from the same station
 - Work with the station so that the responsible organization performs the registration, ideally through the NMHS, ideally using XML if there are many. If they cannot do the registration, ...

DRAFT

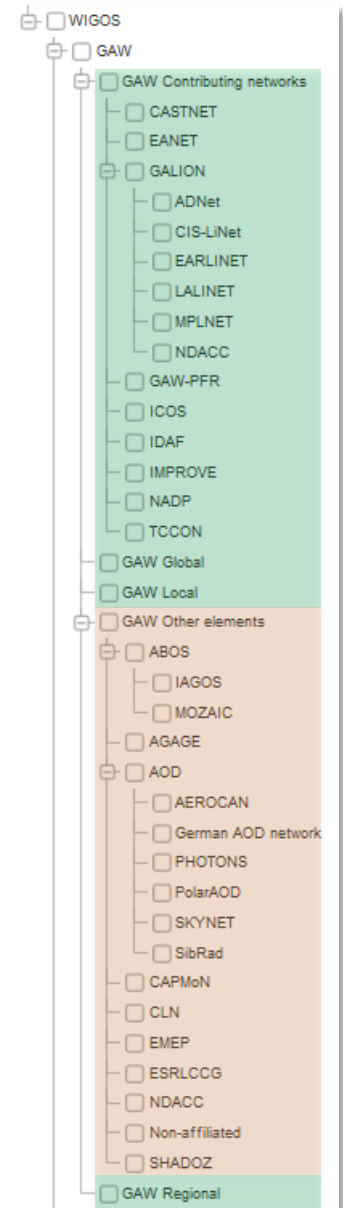
WIGOS Station Identifier / GAWID

- Governance depends on who's responsible (Res 35 Cg-18)



{D}:

- GAW Global, Regional, Local, Contributing → 3-letter GAWID
- GAW Other → Anything allowed



Example XML templates

- Tailored XML files that limit the information in the file to what needs to be transmitted, e.g.
 - no station characteristics, but only reference to facility
 - Information for a new observation
 - Information to update an existing deployment
- Some examples exist (but do not necessarily cover your use case)
 - <https://github.com/wmo-im/wmdr/tree/master/examples>
- Examples can be turned into templates by using placeholders instead of real content, and creating XML file using a scripting engine.

Example XML templates: Instrument catalogue

- <https://github.com/joergklausen/oscar-instrument-catalogue/blob/master/instrument-catalogue-template.xml>

```
54 lines (54 sloc) | 2.94 KB
Raw Blame

1 <?xml version="1.0" encoding="UTF-8"?>
2 <wmdr:WIGOSMetadataRecord xmlns:wmdr="http://def.wmo.int/wmdr/2017" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:gmd="http://www.isotc211.org/2005/gmd" xmlns:gco="http://www.is
3   <wmdr:headerInformation xmlns="false">
4     29       </wmdr:recordOwner>
5     30     </wmdr:Header>
6     31   </wmdr:headerInformation>
7     32   <wmdr:equipment>
8     33     <wmdr:Equipment gml:id="uuid-{{ instrument['uuid'] }}">
9     34     <gml:identifier codeSpace="http://codes.wmo.int/wmdr/ObservedVariableAtmosphere-{{ instrument['observedVariable'] }}">{{ instrument['observedVariable'] }}</gml:identifier>
10    35     <wmdr:responsibleParty>
11    36       <wmdr:ResponsibleParty>
12    37         <wmdr:responsibleParty>
13    38           <gmd:CI_ResponsibleParty>
14    39             <gmd:role></gmd:role>
15    40             </gmd:CI_ResponsibleParty>
16    41           </wmdr:responsibleParty>
17    42         </wmdr:ResponsibleParty>
18    43       </wmdr:responsibleParty>
19    44     <wmdr:manufacturer>{{ instrument['manufacturer'] }}</wmdr:manufacturer>
20    45     <wmdr:model>{{ instrument['model'] }}</wmdr:model>
21    46     <wmdr:observingMethod xlink:href="http://codes.wmo.int/wmdr/ObservingMethodAtmosphere-{{ instrument['observingMethod'] }}">{{ instrument['observingMethod'] }}</wmdr:observingMethod>
22    47     <wmdr:observableRange>{{ instrument['observableRange'] }}</wmdr:observableRange>
23    48     <wmdr:specifiedAbsoluteUncertainty>{{ instrument['specifiedAbsoluteUncertainty'] }}</wmdr:specifiedAbsoluteUncertainty>
24    49     <wmdr:specifiedRelativeUncertainty>{{ instrument['specifiedRelativeUncertainty'] }}</wmdr:specifiedRelativeUncertainty>
25    50     <wmdr:driftPerUnitTime>{{ instrument['driftPerUnitTime'] }}</wmdr:driftPerUnitTime>
26    51     <wmdr:specificationLink>{{ instrument['specificationLink'] }}</wmdr:specificationLink>
27    52   </wmdr:Equipment>
28    53 </wmdr:equipment>
29    54 </wmdr:WIGOSMetadataRecord>
```