Notes:

1. This is a first draft only. It’s for discussion.
2. Overview of key model packages:
   1. Codelists – mapped from specification.
   2. Collection – high level ‘container’ which can contain other objects as required.
   3. Environmental Monitoring Facility – site/facility. Has deployment record
   4. Logging – support for logs for Sites and Sensors (to record events, maintenance, calibration etc.)
   5. Deployment – record of instrument/sensor deployment at facilities.
   6. Process – details around Data Processing Method, Reporting Procedure, Sampling Regime and link to the Deployment Record.
   7. Instruments – details around the instrument/sensors (see point 2 below)
3. Comment: Ambiguity around instrument versus sensor. Needs resolving.
4. Comment: Data Quality elements not yet addressed.
5. Comment: Some clarity required around some elements, particularly spatial/temporal and resolutions. Needs discussion.
6. Comment: Where to put surface cover type elements.
7. Comment: Recommend using a codelist for data formats.

Table 1. Names and Definition of Elements

An asterisk (\*) denotes the element is required for the WIGOS Rolling Review of Requirements (RRR) process. A hash sign (#) denotes that it is acceptable to record a "mandatory" element with a value of nilReason (that indicates that the metadata is either “unknown”, or “not applicable”, or “not available”).

| **Category** | **Id** | **Name** | **Definition** | **MCO** | **Phase** | **FROM**  **CODELIST** | **APP SCHEMA IMPLEMENTATION** |
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| Observed variable | 1-01 | Observed variable – measurand | Variable intended to be measured or observed or derived, including the biogeophysical context | M\* | 1 | Y | om:OM\_Observation/om:ObservedProperty |
| 1-02 | Measurement unit | Real scalar quantity, defined and adopted by convention, with which any other quantity of the same kind can be compared to express the ratio of the two quantities as a number [VIM3, 1.9] | C\* | 1 |  | This would normally be delivered in the om:Result.  Need to decide where best to add this (it could be added as a property of the ReportingProcedure or the Collection. |
| 1-03 | Temporal extent | Time period covered by a series of observations inclusive of the specified date-time indications (measurement history) | M\* | 1 |  | OM\_Observation/phenomenonTime |
| 1-04 | Spatial extent | Typical georeferenced volume covered by the observations | M\* | 1 |  | OM\_Observation/featureOfInterest/ SF\_SpatialSamplingFeature.shape |
| 1-05 | Representativeness | Spatial extent of the region around the observation for which it is representative | O | 2 | Y | Collection/representativeness |

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| Purpose of observ. | 2-01 | Application area(s) | | Context within, or intended application(s) for which the observation is primarily made or which has/have the most stringent requirements | M\* | 1 | Y | Collection/applicationArea |
| 2-02 | | Programme/Network affiliation | The global, regional or national Programmes/network(s) that the station/platform is associated with | M | 1 | Y | Collection/programAffiliation |

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| Station/platform | 3-01 | Region of origin of data | WMO Region | C\* | 1 | Y | EMF/wmoRegion |
| 3-02 | Territory of origin of data | Country or territory name of the location of the observation | C\* | 1 | Y | EMF/countryOrTerritoryName |
| 3-03 | Station/platform name | Official name of the station/platform | M | 1 |  | EMF/gml:name |
| 3-04 | Station/platform type | A categorization of the type of environmental monitoring facility at which an observed variable is measured | M\* | 2 | Y | EMF/facilityType |
| 3-05 | Station/platform model | The model of the monitoring equipment used at the station/platform | M\*# | 3 |  | EMF/facilityModel |
| 3-06 | Station/platform unique identifier | A unique and persistent identifier for an environmental monitoring facility (station/platform), which may be used as an external point of reference | M\* | 1 |  | EMF/gml:identifier |
| 3-07 | Geospatial location | Position in space defining the location of the environmental monitoring station/platform at the time of observation | M\* | 1 |  | EMF/geospatialDomain |
| 3-08 | Data communication method | Data communication method between the station/platform and some central facility | O | 2 | Y | EMF/communicationMethod |
| 3-09 | Station Status | Declared reporting status of the station | M | 1 | Y | EMF/facilityStatus |
| Environment | 4-01 | Surface cover | The observed (bio)physical cover on the earth’s surface in the vicinity of the observation | C | 3 | Y | EMF/surfaceCover |
| 4-02 | Surface cover classification scheme | Name and reference or link to document describing the classification scheme | C | 3 | Y | EMF/surfaceCoverClassification |
| 4-03 | Topography or bathymetry | The shape or configuration of a geographical feature, represented on a map by contour lines | C | 3 | Y | EMF/topography |
| 4-04 | Events at station/platform | Description of human action or natural event at the station or at the vicinity that may influence the observation | O | 2 |  | EMF/siteLog/SiteLog/logEntry/EventReport |
| 4-05 | Site information | Non-formalized information about the location and its surroundings at which an observation is made and that may influence it | O | 2 |  | EMF/additionalSiteInformation |
| Instruments and methods of observation | 5-01 | Source of observation | The source of the dataset described by the metadata | M | 1 |  | om:OM\_Observation/procedure/DataProcessingMethod/sourceOfObservation |
| 5-02 | Measurement/observing method | The method of measurement/observation used | M# | 1 |  | om:OM\_Observation/procedure/DataProcessingMethod/measurementMethod |
| 5-03 | Instrument specifications | Intrinsic capability of the measurement/observing method to measure the designated element, including range, stability, precision, etc. | M\*# | 1 |  | InstrumentSpecification/instrumentCapability |
| 5-04 | Instrument operating status | The status of an instrument with respect to its operation | O | 3 |  | Deployment/instrumentOperatingStatus |
| 5-05 | Vertical distance of sensor | Vertical distance of the sensor from a (specified) reference level such as local ground, or deck of a marine platform at the point where the sensor is located; or sea surface | C\* | 1 |  | Deployment/heightAboveLocalReferenceSurface |
| 5-06 | Configuration of instrumentation | Description of any shielding or configuration/setup of the instrumentation or auxiliary equipment needed to make the observation or to reduce the impact of extraneous influences on the observation | C# | 3 |  | Deployment/configuration |
| 5-07 | Instrument control schedule | Description of schedule for calibrations or verification of instrument | C | 3 |  | Sensor/controlSchedule |
| 5-08 | Instrument control result | The result of an instrument control check, including date, time, location, standard type and period of validity | C# | 3 |  | SensorLog/logEntry (logEntry is a ControlCheckReport) |
| 5-09 | Instrument model and serial number | Details of manufacturer, model number, serial number and firmware version if applicable | C# | 3 |  | Sensor/serialNumber  Sensor/modelNumber  Sensor/manufacturer  Sensor /firmwareVersion |
| 5-10 | Instrument routine maintenance | A description of maintenance that is routinely performed on an instrument | C# | 3 |  | Sensor /maintenanceRoutine |
| 5-11 | Maintenance party | Identifier of the organization or individual who performed the maintenance activity | O | 2 |  | SensorLog/logEntry/MaintenanceReport/maintenanceParty |
| 5-12 | Geospatial location | Geospatial location of instrument/sensor | C\* | 2 |  | Sensor /location |
| 5-13 | Maintenance Activity | Description of maintenance performed on instrument | O | 3 |  | Sensor /logEntry/MaintenanceReport/description |
| 5-14 | Status of observation | Official status of observation | O | 3 |  | Deployment/observationStatus |
| 5-15 | Exposure of instruments | The degree to which an instrument is affected by external influences and reflects the value of the observed variable | C | 2 | Y | Deployment/exposure |
| Sampling | 6-01 | Sampling procedures | Procedures involved in obtaining a sample | O | 3 |  | SamplingRegime/samplingProcedureDescription |
| 6-02 | Sample treatment | Chemical or physical treatment of sample prior to analysis | O | 3 |  | SamplingRegime/samplingTreatment |
| 6-03 | Sampling strategy | The strategy used to generate the observed variable | O\* | 1 |  | SamplingRegime/samplingStrategy |
| 6-04 | Sampling time period | The period of time over which a measurement is taken | M# | 3 |  | SamplingRegime/samplingTimePeriod |
| 6-05 | Spatial sampling resolution | Spatial resolution refers to the size of the smallest observable object. The intrinsic resolution of an imaging system is determined primarily by the instantaneous field of view of the sensor, which is a measure of the ground area viewed by a single detector element in a given instance in time | M# | 2 |  | SamplingRegime/samplingResolution [MEASURE]  AND  SamplingRegime/samplingResolutionDescription  [DESCRIPTION] |
| 6-06 | Temporal sampling interval | Time period between the beginning of consecutive sampling periods | M | 3 |  | SamplingRegime/temporalSamplingInterval |
| 6-07 | Diurnal base time | Time to which diurnal statistics are referenced | M | 1 |  | SamplingRegime/diurnalBaseTime |
| 6-08 | Schedule of observation | Schedule of observation | M | 1 |  | SamplingRegime/scheduleOfObservation |
| Data processing and Reporting | 7-01 | Data processing methods and algorithms | A description of the processing used to generate the observation and list of algorithms utilized to derive the resultant value | O | 3 |  | DataProcessingMethod/dataProcessingDescription |
| 7-02 | Processing/analysis center | Center at which the observation is processed | O | 2 |  | DataProcessingMethod/processingCenter |
| 7-03 | Temporal reporting period | Time period over which the observable variable is reported | M\* | 1 |  | ReportingProcedure/temporalReportingPeriod |
| 7-04 | Spatial reporting interval | Spatial interval at which the observed variable is reported | C\* | 1 |  | ReportingProcedure/spatialReportingLevel |
| 7-05 | Software/processor and version | Name and version of the software or processor utilized to derive the element value | O | 3 |  | DataProcessingMethod/softwareDetails |
| 7-06 | Level of data | Level of data processing | O | 2 |  | ReportingProcedure/levelOfData |
| 7-07 | Data format | Description of the format in which the observed variable is being provided | M | 3 |  | ReportingProcedure/dataFormat |
| 7-08 | Version of data format | Version of the data format in which the observed variable is being provided | M | 3 |  | ReportingProcedure/dataFormatVersion |
| 7-09 | Aggregation period | Time period over which individual samples/observations are aggregated | M | 2 |  | Again, encoding of time period and codelist is not clear here. See also 7-03. Needs discussion |
| 7-10 | Reference time | Time base to which date and time stamps refer | M | 2 | Y | ReportingProcedure/referenceTime |
| 7-11 | Reference datum | Reference datum used to convert observed quantity to reported quantity | C | 1 |  | ReportingProcedure/referenceDatum |
| 7-12 | Numerical resolution | Measure of the detail in which a numerical quantity is expressed | O | 3 |  | ReportingProcedure/numericalResolution |
| 7-13 | Latency (of reporting) | The typical time between completion of the observation or collection of the datum and when the datum is reported | M | 3 |  | ReportingProcedure/latency |
| Data quality | 8-01 | Uncertainty of measurement | Non-negative parameter, associated with the result of a measurement, that characterizes the dispersion of the values that could reasonably be attributed to the observation/measurand | C\*# | 2 |  | NOT DONE YET:  logical place is OM\_Observation/om:resultQuality  Agreed in the meeting that these elements should be mapped to ISO 19157 quality elements. |
| 8-02 | Procedure used to estimate uncertainty | A reference or link pointing to a document describing the procedures / algorithms used to derive the uncertainty statement | C\*# | 2 |  | As above |
| 8-03 | Quality flag | An ordered list of qualifiers indicating the result of a quality control process applied to the observation | M# | 2 |  | As above |
| 8-04 | Quality flagging system | Reference to the system used to flag the quality of the observation | M# | 2 |  | As above |
| 8-05 | Traceability | Statement defining traceability to a standard, including sequence of [measurement standards](http://gaw.empa.ch/glossary/glossary.html#5.1) and [calibrations](http://gaw.empa.ch/glossary/glossary.html#2.39) that is used to relate a [measurement result](http://gaw.empa.ch/glossary/glossary.html#2.9) to a reference [[VIM 3 2.4.2]](http://gaw.empa.ch/glossary/glossary.html#1) | C\*# | 2 |  | As above |
| Ownership and data policy | 9-01 | Supervising organization | Name of organization who owns the observation | M | 2 |  | OM\_Observation/parameter.name=”supervisingOrganisation” (constraint on Collection class) |
| 9-02 | Data policy/use constraints | Details relating to the use and limitations surrounding data imposed by the supervising organization | M\* | 1 |  | OM\_Observation/parameter.name=”dataUseConstraints” (constraint on Collection class) |
| Contact | 10-01 | Contact (Nominated Focal Point) | Principal contact (Nominated Focal Point, FP) for resource | M | 1 |  | Collection/pointOfContact |