Guidance for creating WMO Core Profile Metadata in version 1.3

Introduction

Metadata records, by providing the product information that will allow WIS users to discover access and retrieve products, have a very important role in the WMO Information System (WIS). Metadata has to adhere to standards (such as standard vocabularies, and standard schemas) to ensure product definition homogeneity, and to contribute to making systems interoperable. There are a number of metadata standards that address the needs of meteorological and hydrological communities. The WIS "discovery" metadata standard (for dataset discovery catalogues), is called the "WMO Core Profile 1.3". It is a profile of the ISO 19115:2003 metadata standard, with its associated ISO 19139 XML mapping. ISO19115 is a complex standard, and the creation of high quality ISO19115 metadata records can require both organizational expertise and subject expertise, in order to describe an object, and its context for use.

This guidance documentation is intended for metadata authors or product/infrastructure specialist who would like to create WMO Core Profile 1.3 (WMCP) metadata records for making their datasets discoverable within the WMO Information System (WIS) catalogue(s). It will also assist those who wish to create high quality WIS metadata records for data that will be ingested and distributed by a WMO GISC.

This Guidance documentation suite is composed of the present document, and associated WMO Core Profile Templates (see Section 0 References) which can be used to create individual metadata records, or to automate the creation of several records. It also provides a set of recommendations to be followed, in order to provide the right level / granularity of product information in the WMO Core Profile metadata records.

References

WMOCore Profile 1.3 Template XML records:

Template records containing PLACEHOLDERS (to be replaced with content) are available from http://wis.wmo.int/MD-Templates

A valid example XML record, containing example field content (to be replaced) is also available there.

WMO WIS Wiki Page:

http://wis.wmo.int/MD_Index

WMO Core Profile documentation:

Part 1: http://wis.wmo.int/WCMPpart1
Part 2: http://wis.wmo.int/WCMPPart2

This GUIDANCE WMO Core Profile documentation suite:

http://wis.wmo.int/MD_Index or http://wis.wmo.int/WIS-Manual (for a summary of changes)

Additional WMCP Metadata Examples (for particular product types):

http://wis.wmo.int/MD-Examples

WIS Discovery Metadata

WMO Core Profile Presentation

The WMO Core Profile (WMCP) v1.3, while sometimes referred to as "discovery" metadata, is also aimed at providing catalogue users with sufficient information for them to decide on the suitability of the data, and to provide access to, or details on how to access the data. Some of the information contained in a WMCP metadata record is vital for optimizing the searching functionality offered by the WIS Product catalogues. In the WIS, users typically need to search one of the WIS catalogues, for discovering and accessing products.

A "discovery" metadata record has to contain the following components of information, to help users understand that product: What, When, Where, Who, How. A summary overview is provided below, and details are provided in Section 9.1.

(a) Product Information:

- **What**: This is the product content, and it is mainly defined by the Product Title and the Product Abstract fields, though additional fields can also be used. The information in the title and abstract is very important because the Product Title and Abstract are indexed by any Product catalogue, and thus searchable. In addition, the title and part of the abstract are presented to users, in the search results of each WIS Catalogue, and so good content here can assist users' efficiency in their "search, view search results, and decide" activity.

- **When**: This is the temporal coverage of the dataset or product, and is captured in the "temporal extent" section of the metadata record. It is possible to describe on-going, finite, or 'rolling window' datasets.

- **Where**: This is the geospatial extent of the dataset, describing which geographical area(s) the product covers, over the Earth or atmosphere. It can be the full Earth, a region or a specific place. In the WMCP, if the data is geographical, the metadata record must define as at least one bounding box with latitude-longitude coordinates, but that information can also be enhanced by using geographical identifiers for geographical regions, features (such as coastlines) and the like.

- **Who**: This is the contact details of the organization that is responsible for the product; the contact details of the organization responsible for the metadata, and (optionally) the name of the party that should be "cited", when referencing the data. It's possible, but not necessary for the same party to be responsible for both the metadata and data.

- **How - Data access and use**: This information is composed of the distribution information, but also includes the data policy, or terms and conditions for accessing the product. Most of the time, the distribution section offers a URL linking to a data access service. The data access service might require registration, and /or might offer sub-select/sub-sampling of the product. Currently, users wishing to access information that has the Data Policy (shown in

"ResourceConstraints") of “WMOAdditional” must be registered with their regional GISC. Data with a Data Policy of "WMOEssential" can be accessed wihout restriction. Users wishing to set up a “subscription” service, however, must register, regardless of the type of information they require.

(b) **WIS necessary technical information**: Section 9.2 of this document defines the set of information required, to have a functioning, distributed WIS infrastructure. This includes, for instance, the WIS unique identifier for each metadata records.

WMO Core Profile and ISO standard

The WMO Core Profile 1.3 is a customization, also called a profile, of the more generic ISO 19115 discovery metadata standard. It allows the meteorological community to better define meteorological products (terrestrial, Earth observations, numerical weather predictions model outputs). The ISO 19115 structure is detailed and complex, because it was designed to accommodate a wide range of information resource types. The WMO Core Profile, as well as providing more targeted searching, aimed to remove the need to understand some of those intricacies of ISO19115. This Guide aims to simplify the knowledge needed by users who are starting to create WMO Core Profile v.1.3 metadata records.

WMO Core Profile Metadata Granularity and Scope

One difficulty, when creating a metadata record, is to understand what level of detail of a dataset should be described, in the record for a particular product/dataset. Some products of the same type are continuously produced, during the life time of a satellite, or as model forecast outputs. Creating a new metadata record for each individual satellite instrument measurement granule (produced every three minutes), or for each forecast run (produced three times a day) would make the WIS catalogues' content grow at a huge rate, and the thousands of new metadata records would contain the same information, apart from the measurement time. This would dramatically damage the catalogue search experience, and would make it difficult to find products.

To solve that problem, the creation of one metadata record for an entire “collection” of "like" products is generally recommended, provided that effective searching, and other WIS infrastructure needs are not compromised. An example of "like" products is where each observation product only varies within one or two dimensions (time, geographical position, etc.), while still coming from the same measurement instrument or station.
An example of this approach is the EUMETSAT Meteosat Second Generation (MSG) Seviri Level 1.5 dataset which includes all the level 1.5 radiances over the entire MSG mission with a global coverage, and is described by one unique metadata record. The user discovering this product collection, via the WIS portals, is re-directed to a EUMETSAT service offering sub-sampling capacities for selecting the interesting time period and geographic region.

That said, it is up to the data provider to decide what is a valid collection. To assist, IPET-MDRD has defined, in the Annex Section 12 (**Collection Definition Criteria**), a set of “granularity” criteria to consider when defining a collection metadata record.

WIS product Categories

Two forms of information (and corresponding transport protocols) are used in WIS catalogues:

(a) **GTS-delivered data**. This is mainly, but not exclusively, traditional WMO 'bulletins';

(b) **Non-GTS-delivered data**. This can include both data stored as files, and data as services.

(a) The first category is governed by the set of regulations described in the *Manual on the GTS* (WMO-No. 386), including the bulletin header (abbreviated header line) which identifies a bulletin like ISMS01 AMMC.

Metadata records for GTS bulletin datasets need to follow a set of additional rules, and require an understanding of the GTS regulations. Non-bulletin files can also be distributed via the GTS.
The most notable feature is the store-and-forward delivery mechanism for bulletins and other data on the GTS. This is the reason that there used to be no URL for a bulletin - once a bulletin is delivered, it is not retained for later reference.

Today, GISCs serve bulletins issued in the past 24 hours, but the common practice is still that a metadata record for bulletins does not include the access URL(s).

(b) The second category includes datasets described and searchable from the WIS catalogues, but which are served from the different responsible organizations, via their own infrastructure and data access services. WMO Core Profile (WMCP) 1.3 metadata records for this second category have to follow a minimum set of rules, to stay compliant with the standard. This is a subset of the rules which apply to GTS-served data.

Typically, these metadata records include a URL for access to the data.

This guide provides extensive support for creating the different information parts of a metadata record, for both non-GTS and GTS delivered datasets. When necessary, an additional section for creating metadata records for GTS bulletins has been added, in each information category (e.g. Product information abstract).

COMPLIANCE to additional metadata standards

This guide provides information to help create metadata records that comply with WMO Core Metadata Profile (**WMCP**) v.1.3. The WMCP Profile is based on ISO-19115 (Geographic information — Metadata standard). ISO 19115 provides two profiling mechanisms:

(i) Recommending a more constrained use of ISO19115 (either by recommending use of less fields, making an optional element mandatory, or constraining the expected content of a field) - to suit the needs of a particular community; and

(ii) In addition to (i), defining additional non-ISO19115 fields (and field content) to be added to any record.

Examples of type (i) ISO19115 profiles, in addition to the WMCP, include the INSPIRE Metadata Profile (Infrastructure for Spatial Information in the European Community), the North American Profile, the Australian and New Zealand Metadata Profile (ANZLIC) and UK GEMINI. An example of (ii) is the Marine Community Profile. For more information see also http://www.dcc.ac.uk/resources/metadata-standards/iso-19115.

Each ISO19115 profile defines specific rules that should be met. For example, to comply with the INSPIRE metadata profile, the additional requirements to be met include the provision of one keyword from the general environmental multilingual thesaurus (GEMET), a lineage statement and a conformance statement to Regulation (EC) No. 1205/2008.

The content of a WMO Core Profile 1.3 metadata record, defined following this current guide, can be extended, so that the record also supports additional profiles (such as, for instance, INSPIRE or ANZLIC). In such a case, the metadata author is required to implement any additional requirements specified in the corresponding profile's documentation. The extended WMO Core Profile 1.3 metadata record can still be published on the WIS.

WMO Core Profile - Validation Tools

Metadata publishers are required to ensure that created metadata records conform to relevant technical specifications. For example, XML documents need to be well-formed, schema-valid, and conformant with other requirements imposed by the specifications.

A set of ISO and WMCP validation tools can be used, to ensure that a created WMO Core Profile record is correctly formatted (syntactically and semantically), and can be ingested by a GISC.

In most cases, to validate metadata, the metadata author will need a local copy of the metadata record, or the URL of the metadata file, and offer the local location or URL in an online service, or with a locally installed validation software.
Online validation services can automatically evaluate the content of the metadata in terms of the completeness, accuracy and conformance. Some validation tools, such as the one developed by NOAA (http://www.ngdc.noaa.gov/docucomp/recordServices) may give a score based on different aspects including content and quality of metadata.

It is recommended to test the metadata with one of the available tools. It is also always possible to seek assistance from your Principal GISC.

Below is a list of web services and tools used to validate WMO Core Profile 1.3 and ISO 19115/19139 metadata records.

WMO Core Profile 1.3 validation services/tools:

- **NOAA's WMO validation service**: http://www.ngdc.noaa.gov/docucomp/validationServicesWmo

- **GeoNetwork-ANZMEST, with WMO Core Profile Validation**

- https://sourceforge.net/projects/anzmest/files/bom-releases/
  This directory has the Bureau of Meteorology releases of ANZMEST 2.10.x (based on GeoNetwork), which includes WMO Core Profile 1.3 editing and validation tool. For instructions on running the software and validation, see the WIS Wiki page on validation tools [below]

WIS Wiki page on validation tools : http://wis.wmo.int/MD-Validate

ISO 19115/19139 validation services/tools:

- NOAA ISO validation page: http://www.ngdc.noaa.gov/docucomp/recordServices
- GeoNetwork-ANZMEST – BOM branch
- https://sourceforge.net/projects/anzmest/files/bom-releases/ (includes 19115:2006, 19115:INSPIRE)

Principles of metadata management on the WIS

The Global Information System Centres (GISCs) are responsible for the management of metadata. According to the WMO technical regulations, each GISC shall:

- Provide a comprehensive metadata catalogue with discovery services for all National Centres (NC) and Data Collection and Production Centres (DCPC) data content across the WIS,
- Support the Search and Retrieve via URL protocol (SRU),
- Ensure the synchronization of metadata among GISCs, using the OAI-PMH protocol,
- Support user's identification and authorization, including in terms of metadata maintenance,
- Provide metadata publishing facilities: Using Uploading/Harvesting metadata publishing or on-line Metadata editing to allow Metadata author creating metadata records.

How to publish metadata?

- Metadata could be published at DCPC or GISC level,
- Find which GISC you belong to (i.e. which is your principal GISC). The official reference of WIS centres (GISCs and affiliated DCPCs and NCs, areas of responsibility) is the Annex VII to the WMO Technical Regulations, *Manual on WIS* (WMO-No. 1060), ***Annex B Approved WIS Centres***. The list of GISCs, and related links, is also available online on WMO portal: https://www.wmo.int/pages/prog/www/WIS/centres/index_en.php. The procedure to be used for metadata management (account creation, editing facilities, ...) may vary between centres, but will usually be via the GISC portal (at least, as a first point of contact),
- Proceed to registering on your principal GISC (this could be done online, depending on GISC's capabilities or policies), after which you will be assigned a username and a role,
- Publish your metadata via your principal GISC: In order to publish your metadata records, use the appropriate method among those allowed by the GISC (import/insert metadata, or harvest metadata using OAI-PMH).
  Note: For a limited number of records, it is typically also possible to use a GISC's online editing services.

For more comprehensive information regarding the WIS and publishing metadata on the WIS, please consult the WIS Manual (http://wis.wmo.int/WIS-Manual).

Generating WMO Core Profile METADATA

This guide is intended to help product specialists create WIS metadata records which are compliant with the WMO Core Profile 1.3. It provides practical guidance on key information needed in WMCP metadata creation (such as describing how, and where, to insert the necessary product information into a template record, and the WIS specific information required in the XML metadata record), while abstracting (as much as possible) the WMO Core Profile standard, the ISO 19115 standard and its XML mapping (ISO 19139).

The current guide defines [in Section 9: "Necessary Information to create a WMO Core Profile "] a set of recommendations for adding each individual piece of information regarding a product (title, abstract, data responsible party, data access, etc.).

This guide uses an **XML template** based approach. A metadata author consulting this guide should use a copy of the **Template xml record**(s) [the url to access these is indicated in the "References" section of this document) in conjunction with this Guide, especially Section 9. "Necessary Information to create a WMO Core Profile ".

The template-based approach allows a person without any knowledge of ISO 19115 to create an XML WMO Core Profile metadata record populated with the key information needed to make the record easily searchable and accessible within a WIS portal.

The template files can also be used as the foundation for building a web-based editing tool where the user completes a web form, and the content is used to overwrite the placeholders, and create the final WMO Core Profile 1.3 compliant metadata record.

Template-based principle

The Template xml files are metadata records encoded as xml. These contain PLACEHOLDERS, that is: GENERIC-TEXT that should be replaced with information related to the specific product that the WIS discovery metadata record describes.

Placeholders in the 2 template files are all in capital letters, in the form of, for instance:

```
ADD-CREATION-DATE*M or PRODUCT-TITLE*M.        i.e.    <xml field name>ADD-ORGANISATION-
                                NAME*M</xml field name>
```

The 2 **Template** WMCP xml metadata records are "WMCPv1.3 _MAND-**Template**.xml" and "WMCPv1.3 _OPTandMAND-**Template**.xml" (see Section 0: References, for its access url).

There is also a "WMPv1.3 _OPTandMAND-**Content**.xml" file, which has example content, rather than the placeholders. This latter is a valid WMCP record, which can be added into any editor, and then modified, or can be manually edited.

As well as PLACEHOLDERS, the two Template files contain hints and comments, formatted as follows:

```
<!--  this is a comment : use this XML block, if …..., otherwise, remove it    -->
```

Metadata content discussed in this Guidance document (and for which there are placeholders) includes all mandatory WMCP content, and some key content that is optional. The optional elements can be one of the following:

(i) Highly recommended [*HR]

(ii) Conditionally mandatory [*C]

(iii) Likely to be needed [*O]
*(As noted elsewhere, other ISO19115 elements, while not mentioned in the WMCP v1.3 documentation, may also be deemed useful, and **can** be used within a WMCP record. An example might be the DataQuality section, or the SupplementalInformation field. For reasons of brevity, however, these have been omitted from this document.)*

An example of (iii) is Section 9.1.7 Geographic Identifier.

An example of (ii) is Section 9.1.6 Geographic Bounding Box (which is only mandatory if the dataset is geospatial) or Section 9.1.10 Data Policy, which, while OPTIONAL, is mandatory if the product is GTS data.

An example of (i) is Section 9.1.5 Product Temporal Information, which, while OPTIONAL, is highly recommended.

Note that many optional <<subsections>> of a WMCP record contain elements which are mandatory **only if** that subsection is used. These are marked with "-MW", meaning "mandatory within subsection".

An example of that is the .. 'identifier'/'authority'/'title', as shown on lines 53-57, in the ANNEX's hierarchical list of fields (and in excerpt below), where 'identifier' is optional ([0..n]), and even if it is used, 'authority' is optional ([0..n]); however, if 'authority' **is** used, then 'title' is mandatory ([1..1]).

```
53 _ ._ ._ ._ ._ .identifier_ ._ .ISO[0..n]
54_ ._ ._ ._ ._ ._ .MD_Identifier
55_ ._ ._ ._ ._ ._ ._ .authority_ ._ .ISO[0..1]
56_ ._ ._ ._ ._ ._ ._ ._ .CI_Citation
57_ ._ ._ ._ ._ ._ ._ ._ ._ .title_ .char_ ._ .ISO[1..1]
```

(Excerpt from ANNEX, Section 13)

The cardinality notation of [x..y] indicates the minimum and maximum allowable times that the element may be used, within that part of the hierarchy/tree. For instance: [0..n] means that the element is optional, but can also be used any number of times; the notation of [1..2] means that it is mandatory, and may be used a maximum of two times. Refer to the ANNEX for a hierarchical list of the main elements mentioned in this document, and their cardinality. ***Placeholders for WMCP mandatory content end with *M.***

The "WMOCoreProfile1.3 _OPTandMAND-**Template**.xml" file contains placeholders for all mandatory and optional elements that have been mentioned in this Guidance document. The "WMOCoreProfile1.3 _MAND-**Template**.xml" file contains placeholders for all mandatory elements mentioned in this Guidance document.

Where the metadata author chooses not to populate an **optional** field, then ***the related xml block (as indicated in the comments in the 2 template files) should be removed.***

A metadata author can, by following placeholders in the Template file, and the guidance recommendations in Section 9: [" Necessary Information to create a WMO Core Profile "], replace the different PLACEHOLDERS, and follow the <!-- comments --> in the template file, to create a WMO Core Profile 1.3 compliant record.

The 2 template WMCP xml metadata records, with only the placeholders, can be used as a starting template record for automating the generation of metadata records.

Necessary Information to create a WMO Core Profile COMPLIANT METADATA Record

Section 9 describes the information components needed, to build a meaningful metadata record. For each individual component, it includes:

- ***TEMPLATE Value:*** the template XML record's placeholder value(s), which are to be replaced;
- A summary of the type of information (from the metadata creator) that should replace the placeholder;
- ***Necessity:*** whether the component is always mandatory, conditionally mandatory, highly recommended or is optional, within WMO Core Profile 1.3;
- ***XPath:*** its location within the WMCP XML metadata record; and
- Example XML for that component, containing example content, instead of the Placeholder(s).

The metadata creator should, while reading the documentation, open the relevant metadata template record, and find the corresponding placeholder(s), which are to be replaced by the relevant product information.

For each component, this Guidance document offers a description of what is generally required for a Product, followed, where relevant, by details of what is required in a WMCP record for GTS Bulletin-specific metadata.

Product Information

Product Title

9.1.1 Product Title	
TEMPLATE Value:	ADD-PRODUCT-TITLE*M, ADD-ALTERNATE-TITLE*O
Information:	Product Name
Necessity:	Mandatory for WMO Core Profile 1.3
Category:	Product information
XPath:	/gmd:MD_Metadata/gmd:identificationInfo/*/gmd:citation/*/gmd:title/*/text() (Line 45 in ANNEX, Section 13)

The Product Title and the Product Abstract are the two most relevant elements in the WCMP metadata record, in the context of the WIS Product catalogues, as those two elements are presented to the users in the search results and product description page. They therefore need to focus on highlighting the product's key characteristics, to assist users searching for relevant products.

The title should be as specific about the product as is possible. If the product only contains one parameter, for instance, this can be stated in the title; however, if the product contains many parameters, then a

more general term should be used in the title, and the parameters stated elsewhere in the metadata record (the abstract and/or the keywords). For a satellite product offering one main data parameter, the title will typically define which parameter is contained in the product, and from which instrument or instrument type it originates. For instance “AMSR-2 Sea Surface Temperature” or “SLSTR L1B radiances and brightness temperatures”.

Below is an example:

```
<gmd:identificationInfo>
   <gmd:MD_DataIdentification>
      <gmd:citation>
         <gmd:CI_Citation>
            <gmd:title>
               <gco:CharacterString>AMSR-2 Sea Surface Temperature</gco:CharacterString>
            </gmd:title>
            <gmd:alternateTitle>
               <gco:CharacterString>
               AMSR-2 Sea Surface Temperature SST
               </gco:CharacterString>
            </gmd:alternateTitle>
           . . . . . .
          </gmd:CI_Citation>
        </gmd:citation>
         . . .. .
   </gmd:MD_DataIdentification>
</gmd:identificationInfo>
```

- **Title for GTS bulletins**

The title for a GTS bulletin should also aim to be specific about the product, describing, as much as possible, the type of observation, and including the bulletin code or identifier, and original distributor (e.g. "from XXX").

For instance:

```
<gmd:identificationInfo>
    <gmd:MD_DataIdentification>
      <gmd:citation>
        <gmd:CI_Citation>
          <gmd:title>
            <gco:CharacterString>Sea level observations data [ SZPS01 ] for the South Pacific area.  CREX
encoded. Every 3 minutes or as required (available from AMMC).</gco:CharacterString>
```

```
        </gmd:title> …
```

Product Abstract

9.1.2 Product Abstract	
TEMPLATE Value:	ADD-PRODUCT-ABSTRACT*M
Information:	Abstract describing the product
Necessity:	Mandatory for WMO Core Profile 1.3
Category:	Product information
XPath:	*/gmd:MD_Metadata/gmd:identificationInfo/*/gmd:abstract/*/text()*

The product abstract is important in the context of the WIS catalogues, as it is part of the product information that is presented in the search results page. It should describe aspects which the data producer judges as important, and which will enable potential users to understand the key characteristics of, and nature of the product, so that they more quickly judge the suitability of that product for their needs.

The following structure of the abstract is recommended, in order to create a more coherent and homogenous set of data product descriptions, on the WIS. Having product abstracts structured similarly will help users who are comparing related and different data products.

The product abstract should complement the title by more accurately explaining the title's content, and should provide further detail, where appropriate, describing the product and in particular the source of the data (such as the instrument type or model when applicable), the coverage, production frequency (hourly, every 3 minutes, etc.), the data processing level (near real-time, derived, quality controlled), the available formats, and the data access services when relevant.

Below are typical abstracts for

(a) A NWP product:

Title: Copernicus Atmosphere Service MACC-IFS near real-time 5-day forecast of global black carbon aerosol concentration

Abstract: This service provides pre-operational daily forecasts up to 5 days of global black carbon aerosol using the IFS-LMD aerosol model. The product black carbon aerosol mixing ratios at 60 model levels. There are two forecasts per day, with base times of 00:00UTC (5-day forecast) and 12:00UTC (1-day forecast). Forecast steps are available at 3-hourly intervals and the spatial resolution is 0.75x0.75 degree. The forecast fields are generated in GRIB.

(b) A Satellite Observation Product

Title: IASI Atmospheric Temperature Water Vapour and Surface Skin Temperature - Metop

Abstract: The Atmospheric Temperature, Water Vapour and Surface Skin Temperature (TWT) product contains the vertical profiles of atmospheric temperature and humidity, with a vertical sampling at 101 pressure levels, and surface skin temperature. The vertical profiles are retrieved from the IASI sounder measurements (of IASI L1C product) together with collocated microwave measurements (AMSU & MHS 1B) when available. The main objective of the Infrared Atmospheric Sounding Interferometer (IASI) is to provide high-resolution atmospheric emission spectra to derive temperature and humidity profiles with high spectral and vertical

resolution and accuracy. Additionally it is used for the determination of trace gases, as well as land and sea surface temperature, emissivity and cloud properties. The products are provided at the single IASI footprint resolution (which is about 12 km with a spatial sampling of about 25 km at Nadir). The quality and yield of the vertical profiles retrieved in cloudy IFOVs is strongly related to the cloud properties available in the IASI CLP product and the availability of collocated microwave measurements.

More examples for Metadata Titles and Abstracts can be found in the WIS Wiki http://wis.wmo.int/WIS-MD-Examples

Abstract for GTS bulletins

For the SMPS02 bulletin:

Title: SMPS02 SYNOP reports (pressure, wind and temperature) –South Pacific area; Available from NZKL (WELLINGTON/KELBURN) at 00, 06, 12 and 18 UTC

Abstract:

This bulletin dispatches synoptic data (pressure, temperature and wind) every 6 hours, starting at 0 UTC. The bulletin includes reports from the following stations: 91823 (NIUE AERO AWS) and 91962 (PITCAIRN ISLAND AWS).

Data Type: Surface data - Main synoptic hour - South Pacific area.

Actual data parameters sent include: Pressure, Pressure reduced to mean sea level, 3 hour pressure-change, characteristic of pressure change (increasing/decreasing), temperature (dry-bulb and dewpoint), wind direction, and wind speed.

Format: FM 12 (SYNOP, Report of surface observation from a fixed land station). (Refer to WMO No.306 - Manual on Codes for the definition of WMO international codes)

---- The SMPS02 TTAAii Data Designators decode (2) as:
T1 (S): Surface data.
T2 (M): Main synoptic hour.
A1A2 (PS): South Pacific area.
(2: Refer to WMO No.386 - Manual on the GTS - Attachment II.5)

Metadata Responsible Party

9.1.3 Metadata Responsible Party	
TEMPLATE Value:	ADD-METADATA-CONTACT-ORGANISATION-NAME*M; ADD-ADDRESS-STREET*O; ADD-CITY*O; ADD-REGION*O; ADD-POSTCODE*O; ADD-COUNTRY*O; ADD-EMAIL-ADDRESS*HR ; ADD-ORGANISATION-WEBSITE*O.
Information:	Responsible party for the created metadata record
Necessity:	Mandatory for WMO Core Profile 1.3
Category:	Administrative information
XPath:	*/gmd:MD_Metadata/gmd:contact/gmd:CI_ResponsibleParty*

This element describes the contact details (address, telephone, email) of the party responsible for the metadata. For example:

```
<gmd:MD_Metadata>
   …. .. .. .
   <gmd:contact>
        <gmd:CI_ResponsibleParty>
            <gmd:organisationName>
                <gco:CharacterString>EUMETSAT</gco:CharacterString>
            </gmd:organisationName>
            <gmd:contactInfo>
                <gmd:CI_Contact>
                    <gmd:address>
                        <gmd:CI_Address>
                            <gmd:deliveryPoint>
                                <gco:CharacterString>EUMETSAT Allee 1</gco:CharacterString>
                            </gmd:deliveryPoint>
                            <gmd:city>
                                <gco:CharacterString>Darmstadt</gco:CharacterString>
                            </gmd:city>
                            <gmd:administrativeArea>
                                <gco:CharacterString>Hessen</gco:CharacterString>
                            </gmd:administrativeArea>
                            <gmd:postalCode>
                                <gco:CharacterString>64295</gco:CharacterString>
                            </gmd:postalCode>
                            <gmd:country>
                                <gco:CharacterString>Germany</gco:CharacterString>
                            </gmd:country>
                            <gmd:electronicMailAddress>
                                <gco:CharacterString>ops@eumetsat.int</gco:CharacterString>
                            </gmd:electronicMailAddress>
                        </gmd:CI_Address>
                    </gmd:address>
                    <gmd:onlineResource>
                        <gmd:CI_OnlineResource>
                            <gmd:linkage>
```

```
                                <gmd:URL>http://www.eumetsat.int</gmd:URL>

                            </gmd:linkage>

                        </gmd:CI_OnlineResource>

                    </gmd:onlineResource>

                </gmd:CI_Contact>

            </gmd:contactInfo>

            <gmd:role>

                <gmd:CI_RoleCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#MD_ScopeCode" codeListValue="pointOfContact">pointOfContact</gmd:CI_RoleCode>

            </gmd:role>

        </gmd:CI_ResponsibleParty>

    </gmd:contact>
```

Product Responsible Party

9.1.4 Product Responsible Party	
TEMPLATE Value:	ADD-PRODUCT-RESPONSIBLE-PARTY-ORGANISATION-SHORTNAME*M, ADD-PRODUCT-RESPONSIBLE-PARTY-EMAIL*HR
Information:	Organization responsible for the product described in the metadata record
Necessity:	Mandatory for WMO Core Profile 1.3
Category:	Product Information
XPath:	*/gmd:MD_Metadata/gmd:identificationInfo/*/gmd:pointOfContact/gmd:CI_ResponsibleParty*

This element contains the contact details of the organization responsible for the product. A minimum of a name and an e-mail address are required, and the role should be "pointOfContact".

```
<gmd:MD_Metadata>
   …·· ·· ·· ·
 <gmd:identificationInfo>
   <gmd:MD_DataIdentification>
      <gmd:citation>
       ·· ·· ·· ·· ·
      </gmd:citation>
      ·· · · · · · ·
      <gmd:pointOfContact>
         <gmd:CI_ResponsibleParty>
            <gmd:organisationName>
                <gco:CharacterString>EUMETSAT</gco:CharacterString>
            </gmd:organisationName>
            <gmd:contactInfo>
```

```
                <gmd:CI_Contact>
                    <gmd:address>
                        <gmd:CI_Address>
                            <gmd:country>
                                <gco:CharacterString>Germany</gco:CharacterString>
                            </gmd:country>
                            <gmd:electronicMailAddress>
                                <gco:CharacterString>ops@eumetsat.int</gco:CharacterString>
                            </gmd:electronicMailAddress>
                        </gmd:CI_Address>
                    </gmd:address>
                    <gmd:onlineResource>
                        <gmd:CI_OnlineResource>
                            <gmd:linkage>
                                <gmd:URL>http://www.eumetsat.int</gmd:URL>
                            </gmd:linkage>
                        </gmd:CI_OnlineResource>
                    </gmd:onlineResource>
                </gmd:CI_Contact>
            </gmd:contactInfo>
            <gmd:role>
                <gmd:CI_RoleCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#MD_ScopeCode" codeListValue="pointOfContact">pointOfContact</gmd:CI_RoleCode>
            </gmd:role>
        </gmd:CI_ResponsibleParty>
    </gmd:pointOfContact>
```

Temporal Extent

9.1.5 Product Temporal Information	
TEMPLATE Value:	ADD-TEMPORAL-INFORMATION *HR ADD-TEMPORAL-INFORMATION-startDate*HR, ADD-TEMPORAL-INFORMATION-endDate*HR
Information:	Time period to which the product applies
Necessity:	Optional for WMO Core Profile 1.3
Category:	Product information
XPath:	*/gmd:MD_Metadata/gmd:identificationInfo/*/ gmd:extent/*/gmd:temporalElement/*/gmd:extent/*

This element describes the period of time that the available product covers. Where the product has a clear start and end date, and where the entire set of data is available, the specific start Date and end Date should both contain a date or dateTime. The date information is constructed as YYYY-MM-DD; while the date and time information is constructed as YYYY-MM-DDTHH:MM:SSZ (for UTC time). For example: 2016-04-17T13:42:54Z.

The following temporal Extents examples are described:

(a) **[DateX]** to **[DateY]** e.g. start Date:2005-10-01 end Date:2014-10-20

(b) **[DateX]** to **[Now]** e.g. start Date:2005-10-01 end Date:Now

(c) **[Now]** plus **[period]** e.g. start Date:now end Date:after duration: P1M (+1 month)

Where it is not possible to accurately capture (using start Date, end Date and duration) in the temporalExtent, then record details that are as close as possible, and then explain it in words, using the "description" field.

(a) [DateX] to [DateY] e.g. start Date:2005-10-01 end Date:2014-10-20

The following example shows a dataset with a known start date and a known end date

```
<gmd:temporalElement>
  <gmd:EX_TemporalExtent id="boundingTemporalExtent">
    <gmd:extent>
      <gml:TimePeriod gml:id="boundingTemporalExtentPeriod">
        <gml:beginPosition>2005-10-01</gml:beginPosition>
        <gml:endPosition>2014-10-20</gml:endPosition>
      </gml:TimePeriod>
    </gmd:extent>
  </gmd:EX_TemporalExtent>
</gmd:temporalElement>
```

(b) [DateX] to [now] e.g. start Date:2005-10-01 end Date:now

It is also possible to describe an on-going dataset with a known start date, but no known end Date. In that case, then end Date should contain the attribute of indeterminatePosition=”now”. For instance, where a dataset is from 2005-10-01 onwards, it would be encoded as follows :

```
<gmd:temporalElement>
  <gmd:EX_TemporalExtent id="temporalExtent">
    <gmd:extent>
      <gml:TimePeriod gml:id="boundingTemporalExtentPeriod">
```

```
        <gml:beginPosition>2005-10-01</gml:beginPosition>
        <gml:endPosition indeterminatePosition="now"/>
      </gml:TimePeriod>
    </gmd:extent>
  </gmd:EX_TemporalExtent>
</gmd:temporalElement>
```

The temporalExtent **options**, for a timePeriod, include beginPosition, endPosition and duration, e.g.:

```
<gml:beginPosition>    ..          …        …</gml:beginPosition>
<gml:endPosition>     ..           …          …</gml:endPosition>
<gml:duration> ..   …  …</gml:duration>
```

For a timePeriod, the **begin** and **end** Positions must always be included, and **duration** is optional.

The encoding of duration [(- or +) PnYnMnDTnhnmns] allows the expression of time intervals such as:

> A number of years (nY), and/or months (nM), and/or (nD) days, or hours (nh), or minutes (nm), or seconds (ns), where "n" represents a number.
>
> For example: a duration of 4 hours is expressed as **P0Y0M0DT4h0m0s** or **PT4h** Note that duration can be expressed as either the long form (eg P0Y5M0DT0h0m0s) or short form, but the short form must include "T" for intervals of hours, minutes or seconds (e.g. P5M is 5 months, PT5m is 5 minutes).
>
> For more information on encoding a 'duration', see the "Durations" segment, at https://en.wikipedia.org/wiki/ISO_8601.

(b) [Now] plus [period] e.g. start Date:now end Date:after duration: P0Y0M7DT0h0m0s (+7 days)

For a dataset which is ongoing (that is, new data is continuously produced), but for which only the latest file is available (e.g. data is only ever available for a "rolling" window of time), the temporaExtent should reflect the period covered by the available data, in this case, the period that the latest file covers.

For instance, where only the latest file is ever available, and the latest file is a forecast for the next 7 days, it would be encoded as follows:

```
<gmd:temporalElement>
   <gmd:EX_TemporalExtent>
      <gmd:extent>
         <gml:TimePeriod>
            <gml:description>Next 7 days only</gml:description>
            <gml:beginPosition indeterminatePosition="now"/>
```

```
            <gml:endPosition indeterminatePosition="after"/>
            <gml:duration>P7D</gml:duration>
         </gml:TimePeriod>
      </gmd:extent>
   </gmd:EX_TemporalExtent>
</gmd:temporalElement>
```

Geographic Information

9.1.6 Geographical Information	
TEMPLATE Value:	(ADD-GEOSPATIAL-INFORMATION*C) ADD-BBOX-VALUE-WEST*M--MW, ADD-BBOX-VALUE-EAST*M-MW, ADD-BBOX-VALUE-SOUTH*M-MW, ADD-BBOX-VALUE-NORTH*M-MW
Information:	Geographic coverage of the product, as a bounding box in Latitude/Longitude
Necessity:	Conditional - Is Mandatory for WMO Core Profile 1.3, if the data is geographical
Category:	Product Information
XPath:	*/gmd:MD_Metadata/gmd:identificationInfo/*/gmd:extent/*/gmd:geographicElement/ gmd:EX_GeographicBoundingBox/*/*/text() [having 4 elements]*

Geographical area covered by the data product. The geographical area is described as a bounding box with latitude and longitude in decimal degrees.

The following example shows the XML for a dataset's bounding box information :

```
<gmd:geographicElement>
   <gmd:EX_GeographicBoundingBox id="boundingGeographicBoundingBox">
      <gmd:westBoundLongitude>
         <gco:Decimal>-180</gco:Decimal>
      </gmd:westBoundLongitude>
      <gmd:eastBoundLongitude>
         <gco:Decimal>180</gco:Decimal>
      </gmd:eastBoundLongitude>
      <gmd:southBoundLatitude>
         <gco:Decimal>-90</gco:Decimal>
      </gmd:southBoundLatitude>
      <gmd:northBoundLatitude>
         <gco:Decimal>90</gco:Decimal>
      </gmd:northBoundLatitude>
```

```
   </gmd:EX_GeographicBoundingBox>
</gmd:geographicElement>
```

Bounding boxes that cross the 180 degree meridian can be differentiated from bounding boxes that do not, by the following rule:

- In a dataset that does not cross the 180 degree meridian, the western-most longitude shall always be less than the eastern-most longitude;
- Conversely, if a bounding box crosses the 180 degree meridian, then the western-most longitude shall be greater than the eastern-most longitude.

Other constraints on geographic bounding boxes:

- Geographic points shall be designated with the northern-most and southern-most longitudes equal, and the western-most and eastern-most longitudes equal;
- Except for a geographic point, the total longitudinal span shall be greater than zero, and less than or equal to 360 degrees;
- The northern-most latitude shall always be greater than or equal to than the southern-most latitude;
- Longitude and latitude shall be recorded in a coordinate reference system that has the same axes, units and prime meridian as WGS84.

Geographic Identifier

9.1.7 Geographic Identifier	
TEMPLATE Value:	(ADD-GEOGRAPHIC-IDENTIFIER INFORMATION *O) ADD-GEOGRAPHIC-IDENTIFIER-THESAURUS-NAME*O, ADD-GEOGRAPHIC-IDENTIFIER-CODE*C-MW
Information:	Geographic Identifier indicating the zone covered on earth by the product
Necessity:	Optional
Category:	Product Information
XPath:	*/gmd:MD_Metadata/gmd:identificationInfo/*/gmd:extent/*/gmd:geographicElement/*/gmd:geographicIdentifier/gmd:MD_Identifier/code/*/text()*

Optional geographic identifier, indicating the area covered by the product. This can be used when the identifier is a well-known (within a targeted user community) or codified acronym for an area (such as a region), or feature (such as a water storage, coastline section, etc.). If the GeographicIdentifier block is used, then a code must be provided.

The GeographicIdentifier can be expressed in 2 ways:

(a) With just the Geographic Identifier Code, and a link to the related Codelist [Authority])

```
<gmd:extent>
   <gmd:EX_Extent id="geographicExtent">
      <gmd:geographicElement>
```

```
        <gmd:EX_GeographicDescription id="SouthAustralia__allGensRegister">
           <gmd:geographicIdentifier>
              <gmd:MD_Identifier>
                 <gmd:code>
                    <gco:CharacterString>
                          South                                  Australia                                  (SA)
                           (http://find.ga.gov.au/FIND/profileinfo/anzlic-allgens.xml#SA )
                    </gco:CharacterString>
                 </gmd:code>
              </gmd:MD_Identifier>
           </gmd:geographicIdentifier>
        </gmd:EX_GeographicDescription>
     </gmd:geographicElement>
  </gmd:EX_Extent>
</gmd:extent>
```

(b) With the Geographic Identifier Code, as well as a link to the related Codelist (via "Citation").

```
<gmd:extent>
   <gmd:EX_Extent id="geographicExtent">
      <gmd:geographicElement>
         <gmd:EX_GeographicDescription id="SouthAustralia__allGensRegister">
            <gmd:geographicIdentifier>
               <gmd:MD_Identifier>


                  <gmd:authority>
                     <gmd:CI_Citation>
                        <gmd:title>
                           <gco:CharacterString>
                           ANZLIC Geographic Extent Name Register

                            (http://find.ga.gov.au/FIND/profileinfo/anzlic-allgens.xml )

                           </gco:CharacterString>
                        </gmd:title>
                        <gmd:alternateTitle>
                           <gco:CharacterString>
                           ANZLIC         AllGens         /         subcategory:         anzlic-sla_2001edition
                           </gco:CharacterString>
```

```
                        </gmd:alternateTitle>

                        <gmd:date>

                           <gmd:CI_Date>

                              <gmd:date>

                                 <gco:Date>2011-10-25</gco:Date>

                              </gmd:date>

                              <gmd:dateType>

                                 <gmd:CI_DateTypeCode
codeList="http://www.isotc211.org/2005/resources/Codelist/gmxCodelists.xml#CI_DateTypeCode"
codeListValue="revision">revision</gmd:CI_DateTypeCode>

                              </gmd:dateType>

                           </gmd:CI_Date>

                        </gmd:date>

                     </gmd:CI_Citation>

                  </gmd:authority>



                  <gmd:code>

                     <gco:CharacterString>South                    Australia                    (SA)
                           (http://find.ga.gov.au/FIND/profileinfo/anzlic-allgens.xml#SA )

                     </gco:CharacterString>

                  </gmd:code>



               </gmd:MD_Identifier>

            </gmd:geographicIdentifier>

         </gmd:EX_GeographicDescription>

      </gmd:geographicElement>

   </gmd:EX_Extent>

</gmd:extent>
```

Station Identifiers for GTS bulletins

References in WIS metadata records, to Stations for a GTS bulletin, should point to WIGOS station identifiers (available through OSCAR/surface), and should be provided as keywords. See: **Section 9.1.8 (ii)**.

Descriptive keywords

9.1.8 Descriptive Keywords

Descriptive keywords are additional "controlled" terms which further classify (and so increase searching accuracy for) the products. The following general rules apply, for keywords in a WMCP record:

- Terms from the same keyword thesaurus/codelist, and of the same KeywordTypeCode, shall be grouped into a single instance of the <gmd:descriptiveKeywords> class;
- All WMO Core Profile metadata records shall have a least one WMO CategoryCode keyword, and the related KeywordTypeCode will be 'theme';
- All WMCP records for GTS data must contain a keyword from the WMO_DistributionScopeCode codelist, and it must be accompanied by the KeywordTypeCode of "dataCentre";
- A WMP metadata record describing data for global exchange via the WIS* shall indicate the scope of distribution using the keyword “GlobalExchange” of type “dataCentre”;
- Where data is related to WMO stations, the related WIGOS Station Identifiers should be recorded as keywords, see 9.1.8 (iii);
- Any 'Data parameter' term added as a keyword should be accompanied by the KeywordTypeCode of "dataParam".

WMO Category Code Keyword

9.1.8 (i) WMO CategoryCode Keyword	
TEMPLATE Value:	WCMP-WMO-CATEGORY-CODE*M
Information:	One or more WMO Category keywords, for classifying the product.
Necessity:	Mandatory for WMO Core Profile 1.3
Category:	Product Information
XPath:	*/gmd:MD_Metadata/gmd:identificationInfo/ */gmd:descriptiveKeywords/*/gmd:keyword/*/ text()* */gmd:MD_Metadata/gmd:identificationInfo/ */gmd:descriptiveKeywords/*/ gmd:type/*/@codeListValue=”theme”* */gmd:MD_Metadata/gmd:identificationInfo/ */gmd:descriptiveKeywords/*/gmd:thesaurusName/ */ gmd:title/*/ text() =“WMO_CategoryCode*

Any WMO Core Profile metadata record shall have a least one WMO CategoryCode keyword, and the related KeywordTypeCode will be 'theme'.

The WMO CategoryCode list of terms is occasionally revised. For the latest list of terms, see:

http://wis.wmo.int/2012/codelists/WMOCodeLists.xml#WMO_CategoryCode

At the time of writing, the WMO_CategoryCode list of terms includes:

WMO_CategoryCode	**Term**
WMO_CategoryCode_weatherObservations	weatherObservations
WMO_CategoryCode_weatherForecasts	weatherForecasts
WMO_CategoryCode_meteorology	Meteorology
WMO_CategoryCode_hydrology	Hydrology
WMO_CategoryCode_climatology	climatology
WMO_CategoryCode_landMeteorologyClimate	landMeteorologyClimate
WMO_CategoryCode_synopticMeteorology	synopticMeteorology

WMO_CategoryCode	Term
WMO_CategoryCode_marineMeteorology	marineMeteorology
WMO_CategoryCode_agriculturalMeteorology	agriculturalMeteorology
WMO_CategoryCode_aerology	aerology
WMO_CategoryCode_marineAerology	marineAerology
WMO_CategoryCode_oceanography	oceanography
WMO_CategoryCode_landHydrology	landHydrology
WMO_CategoryCode_rocketSounding	rocketSounding
WMO_CategoryCode_pollution	pollution
WMO_CategoryCode_waterPollution	waterPollution
WMO_CategoryCode_landWaterPollution	landWaterPollution
WMO_CategoryCode_seaPollution	seaPollution
WMO_CategoryCode_landPollution	landPollution
WMO_CategoryCode_airPollution	airPollution
WMO_CategoryCode_glaciology	glaciology
WMO_CategoryCode_actinometry	actinometry
WMO_CategoryCode_satelliteObservation	satelliteObservation
WMO_CategoryCode_airplaneObservation	airplaneObservation
WMO_CategoryCode_observationPlatform	observationPlatform
WMO_CategoryCode_spaceWeather	spaceWeather
WMO_CategoryCode_atmosphericComposition	atmosphericComposition
WMO_CategoryCode_radiation	Radiation

The example encoding below, for a satellite product, uses the terms "satelliteObservation" and "meteorology" as keywords from the WMO_CategoryCode thesaurus/codelist:

```
<gmd:descriptiveKeywords>
  <gmd:MD_Keywords>
    <gmd:keyword>

      <gco:CharacterString>satelliteObservation</gco:CharacterString>
    </gmd:keyword>

    <gmd:keyword>

      <gco:CharacterString>meteorology</gco:CharacterString>
    </gmd:keyword>
    <gmd:type>
       <MD_KeywordTypeCode             xmlns="http://www.isotc211.org/2005/gmd"             codeListValue="theme"
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#MD_KeywordTypeCode">Theme</MD_KeywordTypeCode>
    </gmd:type>
    <gmd:thesaurusName>
       <gmd:CI_Citation>
         <gmd:title>
            <gco:CharacterString>WMO_CategoryCode</gco:CharacterString>

         </gmd:title>
         <gmd:date>
           <gmd:CI_Date>
              <gmd:date>
                 <gco:Date>2016-04-01</gco:Date>
              </gmd:date>
               <gmd:dateType>
```

```
                  <gmd:CI_DateTypeCode                                    codeListValue="publication"
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#CI_DateTypeCode"/>
               </gmd:dateType>
            </gmd:CI_Date>
          </gmd:date>
        </gmd:CI_Citation>
    </gmd:thesaurusName>
  </gmd:MD_Keywords>
</gmd:descriptiveKeywords>
```

WMO Distribution Scope Keyword

9.1.8 (ii) WMO Distribution Scope Code Keyword	
TEMPLATE Value:	ADD-DISTRIBUTION-SCOPE*C
Information:	Scope of distribution of data within the WMO Information System.
Necessity:	Conditional. Mandatory for WMO Core Profile 1.3, for GTS data.
Category:	Product Information
XPath:	*/gmd:MD_Metadata/gmd:identificationInfo/*/gmd:descriptiveKeywords/*/gmd:keyword/*/text()* */gmd:MD_Metadata/gmd:identificationInfo/*/gmd:descriptiveKeywords/*/gmd:type/*/@codeListValue="dataCentre"* */gmd:MD_Metadata/gmd:identificationInfo/*/gmd:descriptiveKeywords/*/gmd:thesaurusName/*/gmd:title/*/text() ="WMO_DistributionScopeCode"*

Any WMCP record for GTS data must contain a DistributionScopeCode keyword. The scope of distribution, for data within WIS, shall be expressed as a keyword, using a term from the "WMO_DistributionScopeCode", and that keyword shall have a **KeywordTypeCode** of "datacentre". The keyword will be one of the following terms (from the controlled vocabulary called "WMO_DistributionScopeCode"):

- GlobalExchange,
- RegionalExchange,
- OriginatingCentre.

A WIS Discovery Metadata record describing data for global exchange via the WIS shall have a keyword "GlobalExchange", of KeywordTypeCode "dataCentre", from the thesaurus of "WMO_DistributionScopeCode"; it must also include a term from both the WMO_DataLicenseCode and WMO_GTSProductCategoryCode within the resourceConstraints section of the record (see Section 9.1.10, for details).

The GTS (Global Telecommunication System) is the part of the WIS that is concerned with rapid, near-real time information exchange. GISCs are required to retain at least 24h of information exchanged globally using the GTS.

The keyword term from the codelist called WMO_DistributionScopeCode is used to indicate whether the product described by a metadata record is or isn't delivered via the GTS and GISCS, and, within the GTS, whether it is exchanged globally or regionally.

- Metadata marked **GlobalExchange** or **RegionalExchange** describes data delivered via the GTS. Data is transmitted from an originating NC/DCPC to the principal GISC, distributed to all (or some) GISCs, then placed on the GISC caches;

- Metadata marked **RegionalExchange**, is for data that, while transmitted on the GTS, might be simply exchanged between two WMO Members (by bilateral agreement). Some example data are regional warnings, or voluminous NWP products;

- The metadata marked **OriginatingCentre** indicates 'non-GTS data', and includes, for instance, data delivered to users from a DCPC.

Below is an example for 'globally exchanged' GTS data:

```
<gmd:descriptiveKeywords>

    <gmd:MD_Keywords>

        <gmd:keyword>

            <gco:CharacterString>GlobalExchange</gco:CharacterString>

        </gmd:keyword>

        <gmd:type>

            <gmd:MD_KeywordTypeCode
codeList="http://wis.wmo.int/2012/codelists/WMOCodeLists.xml#MD_KeywordTypeCode"
codeListValue="dataCentre">dataCentre</gmd:MD_KeywordTypeCode>

        </gmd:type>

        <gmd:thesaurusName>

            <gmd:CI_Citation>

                <gmd:title>

                    <gco:CharacterString>WMO_DistributionScopeCode
[http://wis.wmo.int/2012/codelists/WMOCodeLists.xml]</gco:CharacterString>

                </gmd:title>

                <gmd:date>

                    <gmd:CI_Date>

                        <gmd:date>

                            <gco:Date>2012-06-27</gco:Date>

                        </gmd:date>

                        <gmd:dateType>

                            <gmd:CI_DateTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/codelist/gmxCodel
ists.xml#CI_DateTypeCode" codeListValue="revision">revision</gmd:CI_DateTypeCode>

                        </gmd:dateType>

                    </gmd:CI_Date>

                </gmd:date>

            </gmd:CI_Citation>

        </gmd:thesaurusName>
```

```
    </gmd:MD_Keywords>

</gmd:descriptiveKeywords>
```

WIGOS Station Identifier Keyword

9.1.8 (iii) WIGOS Station Identifiers Keywords	
TEMPLATE Value:	ADD-WIGOS-STATION-IDENTIFIER-CODE*O; ADD-WIGOS-STN-ID-CODE-AUTHORITY*O;
Information:	Where a product includes data from Stations which have been assigned a WIGOS Station Identifier, include these as keywords
Necessity:	Optional for WMO Core Profile 1.3
Category:	Product Information
XPath:	*/gmd:MD_Metadata/gmd:identificationInfo/*/gmd:descriptiveKeywords/*/gmd:keyword/*/text()* */gmd:MD_Metadata/gmd:identificationInfo/*/gmd:descriptiveKeywords/*/gmd:type/*/* *@codeListValue="place"* */gmd:MD_Metadata/gmd:identificationInfo/*/gmd:descriptiveKeywords/*/gmd:thesaurusName/*/* *gmd:title/*/text()="WMO WIGOS Station Identifiers"*

Where products include data from Stations which have been assigned a WIGOS Station Identifier, include these as keywords. Where metadata records previously included WMO Station numbers as keywords, the WIGOS Station Identifier should now be used. The related **KeywordTypeCode** should be "place".

Below is example encoding of WIGOS Station Identifiers, as keywords

```
<gmd:descriptiveKeywords>
   <gmd:MD_Keywords>
       <gmd:keyword>

         <gco:CharacterString>
          0-20000-0-94287;      CAIRNS      AERO      [      http://data.wmo.int/wigosid=0-20000-0-94287      ]
         </gco:CharacterString>
      </gmd:keyword>
       <gmd:keyword>

         <gco:CharacterString>
          0-20000-0-94374;    ROCKHAMPTON        AERO    [    http://data.wmo.int/wigosid=0-20000-0-94374    ]
         </gco:CharacterString>
      </gmd:keyword>
       <gmd:keyword>

         <gco:CharacterString>
          0-20000-0-94294;     TOWNSVILLE     AERO     [     http://data.wmo.int/wigosid=0-20000-0-94294     ]
         </gco:CharacterString>
      </gmd:keyword>


       <gmd:type>
          <gmd:MD_KeywordTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/codelist/gmxCodel
ists.xml#MD_KeywordTypeCode"                                    codeListValue="place"</gmd:MD_KeywordTypeCode>
       </gmd:type>

       <gmd:thesaurus>
          <gmd:CI_Citation>
             <gmd:title>
                  <gco:CharacterString>WMO WIGOS Station Identifiers</gco:CharacterString>

             </gmd:title>


              <gmd:date>

                 <gmd:CI_Date>
```

```
                    <gmd:date>

                       <gco:Date>2016-06-25</gco:Date>

                    </gmd:date>

                 <gmd:dateType>

                     <gmd:CI_DateTypeCode
codeList="http://www.isotc211.org/2005/resources/Codelist/gmxCodelists.xml#CI_DateTypeCode"
codeListValue="revision">revision</gmd:CI_DateTypeCode>

                 </gmd:dateType>

              </gmd:CI_Date>

           </gmd:date>


       </gmd:CI_Citation>
    </gmd:thesaurus>
  </gmd:MD_Keywords>
</gmd:descriptiveKeywords>
```

Data Parameters

9.1.8 (iv) Data Parameter Keyword	
TEMPLATE Value:	ADD-DATA-PARAMETER*O
Information:	Data parameter keywords, for classifying the product.
Necessity:	Optional for WMO Core Profile 1.3
Category:	Product Information
XPath:	*/gmd:MD_Metadata/gmd:identificationInfo/*/gmd:descriptiveKeywords/*/gmd:keyword/*/text()* */gmd:MD_Metadata/gmd:identificationInfo/*/gmd:descriptiveKeywords/*/gmd:type/*/@codeListValue="dataParam"*

Where feasible, a list of the data parameters may be added as keywords. These should be added under a separate 'descriptiveKeywords' block, and should use the **KeywordTypeCode** of 'dataParam'.

Below is example encoding of a Data Parameter as a keyword.

```
<gmd:descriptiveKeywords>
   <gmd:MD_Keywords>
      <gmd:keyword>

         <gco:CharacterString>Dewpoint temperature</gco:CharacterString>

      </gmd:keyword>

       <gmd:type>
          <gmd:MD_KeywordTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/codelist/gmxCodel
ists.xml#MD_KeywordTypeCode"               codeListValue="dataParam">dataParam</        gmd:MD_KeywordTypeCode>
       </gmd:type>


       <gmd:thesaurus>
          <gmd:CI_Citation>
```

```
            <gmd:title>
               <gco:CharacterString>WMO    Grib2    parameter    list    http://codes.wmo.int/grib2/codeflag/4.2/
</gco:CharacterString>
            </gmd:title>

             <gmd:date>

                <gmd:CI_Date>

                   <gmd:date>

                      <gco:Date>2016-06-25</gco:Date>

                   </gmd:date>

                <gmd:dateType>

                   <gmd:CI_DateTypeCode
codeList="http://www.isotc211.org/2005/resources/Codelist/gmxCodelists.xml#CI_DateTypeCode"
codeListValue="revision">revision</gmd:CI_DateTypeCode>

                </gmd:dateType>

             </gmd:CI_Date>

          </gmd:date>


      </gmd:CI_Citation>
    </gmd:thesaurus>
  </gmd:MD_Keywords>
</gmd:descriptiveKeywords>
```

Product Sample Visualization URL

9.1.9 Product Sample Visualization URL	
TEMPLATE Value:	ADD-PRODUCT-IMAGERY-URL*O
Information:	URL to a sample data visualization
Necessity:	Optional for WMO Core Profile 1.3, but used by WIS Portal to display products
XPath:	*/gmd:MD_Metadata/gmd:identificationInfo/*/gmd:graphicOverview/*/gmd:fileName/*/text()*

The addition of a link to the product visualization is suggested, when possible. The display of related linked images can make the products more attractive for end users.

Below is an example, based on EUMETSAT Seviri Level 1.5.

```
<gmd:graphicOverview>
   <gmd:MD_BrowseGraphic>
      <gmd:fileName>

         <gco:CharacterString>http://navigator.eumetsat.int:80/smartEditor/preview/msg-level-1-
5.jpg</gco:CharacterString>
      </gmd:fileName>
      <gmd:fileDescription>
         <gco:CharacterString>preview</gco:CharacterString>
      </gmd:fileDescription>
      <gmd:fileType>
         <gco:CharacterString>jpg</gco:CharacterString>
      </gmd:fileType>
   </gmd:MD_BrowseGraphic>
</gmd:graphicOverview>
```

Data Policy Information

Data Policy Information	
TEMPLATE Value:	ADD-DATA-POLICY-CODE*C
Information:	Data usage and limitations to access the resource
Necessity:	Mandatory for WMO Core Profile 1.3, for data intended for Global Exchange on the GTS. Otherwise, highly recommended, since the absence of a policy can result in users assuming that there are no limitations on Data use. To avoid uncertainty, where there ARE no limitations, use the Data Policy of "NoLimitation".
Category:	Product Information
XPath:	*/gmd:MD_Metadata/gmd:identificationInfo/*/gmd:resourceConstraints/gmd:MD_LegalConstraints/*↘ {complex content}, including ↘ */gmd:otherConstraints/*/text()=WMO_DataLicenseCode* and ↘ */gmd:otherConstraints/*/text()=WMO_GTSProductCategoryCode*

The Data Policy category is used to specify the conditions under which the data products can be accessed and used. Completing the data policy section of a WMO Core Profile metadata record is very dependent on the type of data, data policy and the different ways that the data is being distributed. For those reasons, and to minimize the complexity of this section, three representative examples, covering some typical data policies - are presented below.

- Example 1: Non GTS Product, with a policy of no constraints on use or distribution;
- Example 2: Non GTS Product, with a policy applicable in the WMO context;
- Example 3: GTS Data, Intended for Global Exchange.

For a more comprehensive documentation, please refer to the documentation of the WMO Core Profile contained in the Manual on WIS.

When adding the data policy information, two different parts of the metadata record have be filled:

- The **resourceConstraints** part, which contains the data policy information; and
- The **scope of distribution** part: using one of the terms: 'GlobalExchange', 'RegionalExchange' or 'OriginatingCentre' (to be inserted as a keyword, as explained in Section 9.1.8 (ii)).

Each of the 3 examples below present the first part of the above information (**resourceConstraints**), that is to be added.

Within the the **resourceConstraints** section, the DataLicenseCode term is added into an 'otherConstraints' field; and an explanation of the Data Policy is typically added to an additional 'otherConstraints' field.

```
/gmd:MD_Metadata/gmd:identificationInfo/*/gmd:resourceConstraints/gmd:MD_LegalConst
raints/gmd:otherConstraints/*/text()
```

Allowable terms from the DataLicenseCode include: "WMOAdditional", "WMOEssential", "WMOOther" or "NoLimitation". All of these terms are defined at http://wis.wmo.int/2012/codelists/WMOCodeLists.xml#WMO_DataLicenseCode

Example 1 details: Non GTS Product, with a policy of no constraints on use or distribution

Publicly available datasets are datasets where no conditions and restrictions apply, on data access and data usage.

The 'useLimitation' field in the 'resourceConstraints' block should contain “No conditions apply”, and an 'otherConstraints' field should contain the phrase “NoLimitation”.

```
<!-- Example of publicly available, unrestricted data -->

<gmd:resourceConstraints>

  <gmd:MD_LegalConstraints>

    <!--  add useLimitation with ..No conditions apply..  -->

    <gmd:useLimitation>

      <gco:CharacterString>No conditions apply</gco:CharacterString>

    </gmd:useLimitation>

    <gmd:useConstraints>

      <!--  Restriction code have to point to WMOCodeLists.xml -->

<gmd:MD_RestrictionCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodelists.xml#MD_RestrictionCode"

         codeListValue="otherRestrictions">otherRestrictions</gmd:MD_RestrictionCode>

    </gmd:useConstraints>

    <!--  otherConstraints with ..NoLimitation..  -->

    <gmd:otherConstraints>

      <gco:CharacterString>NoLimitation</gco:CharacterString>

    </gmd:otherConstraints>

  </gmd:MD_LegalConstraints>

</gmd:resourceConstraints>
```

In addition, the **scope of distribution** would also ideally be stated (as a keyword), and for non GTS products it should be 'OriginatingCentre'

```
<!-- Scope of distribution for non GTS products: OriginatingCentre -->

<gmd:descriptiveKeywords>

  <gmd:MD_Keywords>

    <gmd:keyword>

      <!--  keyword OriginatingCentre applies for DCPC Data -->

      <gco:CharacterString>OriginatingCentre</gco:CharacterString>
```

```
    </gmd:keyword>

    <gmd:type>

      <gmd:MD_KeywordTypeCode
           codeList="http://wis.wmo.int/2012/codelists/WMOCodeLists.xml#MD_DistributionScopeCode"

           codeListValue="dataCentre">dataCentre</gmd:MD_KeywordTypeCode>

    </gmd:type>

    <gmd:thesaurusName>

      <gmd:CI_Citation>

        <gmd:title>

          <gco:CharacterString>WMO_DistributionScopeCode,      WMOCodelists      dictionary      Version      1.3
[http://wis.wmo.int/2012/codelists/WMOCodeLists.xml#WMO_DistributionScopeCode]</gco:CharacterString>

        </gmd:title>

    .. .. .. etc    (see Section 9.1.8 (ii) for full details
```

Example 2 details: Non GTS Product, with a policy applicable in the WMO context

This example describes a data product that is not distributed on the GTS, and which has a single data policy applicable in the WMO context. Note that policies that are applicable in the WMO context (and therefore flagged, in an 'otherConstraints' field, with the term "WMOOther") will be presented by the GISCs to the users when they discover the data. GISCs have no obligations to show the other data policies.

A term from the **WMO_DataLicenseCode** codelist, http://wis.wmo.int/2012/metadata/version_1-3/WMOCodelists.xml#WMO_DataLicenseCode, should be added to an 'otherConstraints' field.

Note: The Data Policy term of "WMOOther" can also be used for data that is delivered via the GTS.

```
<gmd:resourceConstraints>

  <gmd:MD_LegalConstraints>

    <!--   Add useLimitation to indicate the limitations of usage for the data  -->

      <gmd:useLimitation>

        <gco:CharacterString>Disclaimer - While every effort has been made to ensure that these data are
accurate and reliable within the limits of the current state of the art, OrganisationX cannot assume liability
for any damages caused by any errors or omissions in the data, nor as a result of the failure of the data to
function on a particular system. OrganisationX makes no warranty, expressed or implied, nor does the fact of
distribution constitute such a warranty.

        </gco:CharacterString>

      </gmd:useLimitation>

      <gmd:accessConstraints>

<gmd:MD_RestrictionCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#MD_RestrictionCode"   codeListValue="copyright">copyright</gmd:MD_RestrictionCode>

      </gmd:accessConstraints>

      <gmd:accessConstraints>
```

```
         <gmd:MD_RestrictionCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#MD_RestrictionCode"   codeListValue="otherRestrictions">otherRestrictions</gmd:MD_RestrictionCode>

      </gmd:accessConstraints>

      <gmd:useConstraints>

        <gmd:MD_RestrictionCode

codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#MD_RestrictionCode"   codeListValue="copyright">copyright</gmd:MD_RestrictionCode>

      </gmd:useConstraints>

      <gmd:useConstraints>

         <gmd:MD_RestrictionCode

codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#MD_RestrictionCode"  codeListValue="otherRestrictions">otherRestrictions</gmd:MD_RestrictionCode>

      </gmd:useConstraints>

      <!--  Add WMOOther, to signal that the policy is applicable in the WMO Context -->

      <gmd:otherConstraints>

         <gco:CharacterString>WMOOther

Ordnance Survey Open Data License [https://www.ordnancesurvey.co.uk/docs/licences/os-opendata-licence.pdf]
         </gco:CharacterString>

      </gmd:otherConstraints>

   </gmd:MD_LegalConstraints>

</gmd:resourceConstraints>
```

The scope of distribution, using the term 'OriginatingCentre' would also, ideally, be added (as a keyword).

Please refer to the example encoding of 'scope of distribution', provided (above) under Example 1 above, or in Section 9.1.8 (ii).

Example 3 details: GTS Data, Intended for Global Exchange

This example describes data distributed via the GTS and available from the cache at a GISC. For data that are delivered via the GTS, the data policy term to be added to the 'otherConstraints' field can only be "WMOAdditional" or "WMOEssential" – both of these terms are defined at http://wis.wmo.int/2012/codelists/WMOCodeLists.xml#WMO_DataLicenseCode.

In the example below, the code is 'WMOEssential'.

WMO data policies (licence conditions) are defined by Resolution 40 (Cg-XII), Resolution 25 (Cg-XIII) and Resolution 60 (Cg-17) for data and products. Free and unrestricted basis data are "WMOEssential"; data classed as having a data policy of "WMOAdditional" have restrictions on commercial activities. Operational meteorological information for aviation is not included in these resolutions, but is controlled by ICAO; these data are an example of "WMOOther" data.

Only one term from the **WMO_DataLicenseCode** may be used, within a metadata record. As well as assigning one of these terms, it is expected, where the term used is "WMOOther" or "WMOAdditional", that further clarification of thelLicence constraints will also be provided (either directly in the metadata record, or else via a URL).

For data circulating on the GTS, "WMOAdditional" is used to qualify products under the “WMO Additional” data policy, "WMOEssential" is used for products made available under the “WMO Essential” data policy, and "WMOOther" can be applied (where applicable) for other products , regardless of whether the data is being delivered via the GTS/GISC or otherwise.

Where data is for GlobalExchange on the GTS (which is signified by the WMO_DistributionScopeCode Keyword), both a **WMO_DataLicenseCode** and a **WMO_GTSProductCategoryCode** term must be provided, under ResourceConstraints.
The choice of terms, from the **WMO_GTSProductCategoryCode** codelist, are: "GTSPriority1", "GTSPriority2", "GTSPriority3", "GTSPriority4".

Below is the resourceConstraints element for a "WMOEssential" GTS product, intended for global exchange:

```
<!--   Data intended for WMOEssential data intended for Global exchange -->

<gmd:resourceConstraints>

   <gmd:MD_LegalConstraints>

      <gmd:useLimitation>

        <gco:CharacterString>Data is near realtime, and is not quality controlled. License conditions apply, as
indicated below</gco:CharacterString>

      </gmd:useLimitation>

      <!--   MD_RestrictionCode to be ‘otherRestrictions’ -->

      <gmd:accessConstraints>

<gmd:MD_RestrictionCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#MD_RestrictionCode" codeListValue="copyright">copyright</gmd:MD_RestrictionCode>

      </gmd:accessConstraints>

      <gmd:accessConstraints>

         <gmd:MD_RestrictionCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#MD_RestrictionCode"   codeListValue="otherRestrictions">otherRestrictions</gmd:MD_RestrictionCode>

      </gmd:accessConstraints>

      <gmd:useConstraints>

        <gmd:MD_RestrictionCode

codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#MD_RestrictionCode"   codeListValue="copyright">copyright</gmd:MD_RestrictionCode>

      </gmd:useConstraints>

      <gmd:useConstraints>

         <gmd:MD_RestrictionCode
```

```
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#MD_RestrictionCode"  codeListValue="otherRestrictions">otherRestrictions</gmd:MD_RestrictionCode>

      </gmd:useConstraints>



      <!-- Add WMO Data policy and GTSPriority -->

      <gmd:otherConstraints>

         <gco:CharacterString>WMOEssential      A    definition    of    "WMOEssential"    is    available    at:
http://wis.wmo.int/2012/codelists/WMOCodeLists.xml#WMO_ DataLicenseCode </gco:CharacterString>

      </gmd:otherConstraints>

      <gmd:otherConstraints>

         <gco:CharacterString>GTSPriority2</gco:CharacterString>

      </gmd:otherConstraints>

   </gmd:MD_LegalConstraints>

</gmd:resourceConstraints>
```

In addition, the scope of distribution of "GlobalExchange" has to be added, as a keyword (with KeywordTypeCode of "dataCentre").

```
<!-- keyword for stating the scope of distribution: Global Exchange   -->

<gmd:descriptiveKeywords>

  <gmd:MD_Keywords>

    <gmd:keyword>

      <gco:CharacterString>GlobalExchange</gco:CharacterString>

    </gmd:keyword>

    <gmd:type>

      <gmd:MD_KeywordTypeCode
           codeList="http://wis.wmo.int/2012/codelists/WMOCodeLists.xml#MD_DistributionScopeCode"

           codeListValue="dataCentre">dataCentre</gmd:MD_KeywordTypeCode>

    </gmd:type>

  .. .. .. etc   (see Section 9.1.8 (ii), for full example
```

Distribution Information

9.1.11 Distribution Information	
TEMPLATE Value:	ADD-URL-TO-DATA-ACCESS-SERVICE*HR-MW, ADD-DISTRIBUTOR-SHORTNAME*HR (e.g.:EUM), ADD-DISTRIBUTOR-EMAIL-ADDRESS*HR, ADD-FORMAT-NAME*O-MW, ADD-FORMAT-VERSION*O-MW
Information:	Resource format, distributor information, and resource transfer options (urls)
Necessity:	Highly Recommended for WMO Core Profile 1.3
Category:	Product Information
XPath:	*/gmd:MD_Metadata/gmd:distributionInfo/*/gmd:distributionFormat/*/gmd:formatDistributor/*/* {complex content}, including

	↘*distributorContact/gmd:CI_ResponsibleParty/* ↘*distributorTransferOptions/*/gmd:online/*	and

Below is an example for a GRIB product made available via FTP server (distributor details are not included in this snippet, for readability, but are included in the TEMPLATE record)

```
<gmd:distributionInfo>
    <gmd:MD_Distribution>
        <gmd:distributionFormat>
            <gmd:MD_Format>
                <gmd:name>
                    <gco:CharacterString>GRIB</gco:CharacterString>
                </gmd:name>
                <gmd:version>
                    <gco:CharacterString>FM 92 GRIB Edition 2</gco:CharacterString>
                </gmd:version>
                <gmd:specification>
                 <gco:CharacterString>http://www.wmo.int/pages/prog/www/WMOCodes.html</gco:CharacterString>
                </gmd:specification>
            </gmd:MD_Format>
        </gmd:distributionFormat>
        <gmd:transferOptions>
            <gmd:MD_DigitalTransferOptions>
                <gmd:onLine>
                    <gmd:CI_OnlineResource>
                        <gmd:linkage>
                            <gmd:URL>ftp://data-portal.ecmwf.int/</gmd:URL>
                        </gmd:linkage>
                        <gmd:protocol>
                            <gco:CharacterString>WWW:DOWNLOAD-1.0-ftp--download</gco:CharacterString>
                        </gmd:protocol>
                        <gmd:name>
                            <gco:CharacterString>ECMWF DCPC FTP Server</gco:CharacterString>
                        </gmd:name>
                        <gmd:description>
```

```
                            <gco:CharacterString>WMO Information System download service through ECMWF
DCPC</gco:CharacterString>

                        </gmd:description>

                        <gmd:function>

                            <gmd:CI_OnLineFunctionCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#CI_OnLineFunctionCode" codeListValue="download">download</gmd:CI_OnLineFunctionCode>

                        </gmd:function>

                    </gmd:CI_OnlineResource>

                </gmd:onLine>

            </gmd:MD_DigitalTransferOptions>

        </gmd:transferOptions>

    </gmd:MD_Distribution>

</gmd:distributionInfo>
```

Party to be cited

9.1.12 Cited Party Information	
TEMPLATE Value:	ADD-CITED-RESPONSIBLE-PARTY-ORGANISATION*O-MW
Information:	Party that should be cited as the 'originator' [that is, data-author], for the resource
Necessity:	Optional for WMO Core Profile 1.3
Category:	Product Information
XPath:	*/gmd:MD_Metadata/gmd:distributionInfo/*/gmd:citation/*/gmd:citedResponsibleParty/gmd:CI_ResponsibleParty/* {complex content}

Where the data owner wishes to be cited, in references made to their data, they can stipulate this in the citedResponsibleParty block, using a role of 'originator'

Below is an example:

```
<gmd:identificationInfo>

<gmd:MD_DataIdentification>

   <gmd:citation>

      <gmd:CI_Citation>

         …. .. .. ..

         <gmd:citedResponsibleParty>

            <gmd:CI_ResponsibleParty>

                <gmd:organisationName>

                    <gco:CharacterString>EUMETSAT</gco:CharacterString>

                </gmd:organisationName>

                <gmd:role>
```

```
                    <gmd:CI_RoleCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#MD_ScopeCode" codeListValue="pointOfContact">originator</gmd:CI_RoleCode>

                </gmd:role>

             </gmd:CI_ResponsibleParty>

          </gmd:citedResponsibleParty>

          <gmd:otherCitationDetails>

              <gco:CharacterString>Add other citing instructions here</gco:CharacterString>

          </gmd:otherCitationDetails>
            .. .. .. ..

        </gmd:CI_Citation>

     </gmd:citation>
      .. .. .. ..

   </gmd:MD_DataIdentification>

</gmd:identificationInfo>
```

Additional details on how the item should be cited can be added to the 'otherCitationDetails' block.

Resource Update frequency

9.1.13 Resource Update Frequency Information	
TEMPLATE Value:	ADD-PRODUCT-UPDATE-FREQ-PERIOD*O, ADD-PRODUCT-UPDATE-FREQ-CODE*O-MW
Information:	Frequency of resource update
Necessity:	Optional for WMO Core Profile 1.3
Category:	Product Information
XPath:	*/gmd:MD_Metadata/gmd:identificationInfo/*/gmd:resourceMaintenance/*/gmd:maintenanceAndUpdateFrequency/*

If the Resource Update frequency block is used, then the *MD_MaintenanceFrequencyCode* is mandatory.

The example below is for a product which is available every 6 hours, starting at 3 UTC

```
<gmd:resourceMaintenance>

   <gmd:MD_MaintenanceInformation>

      <gmd:maintenanceAndUpdateFrequency>

         <gmd:MD_MaintenanceFrequencyCode                                    codeListValue="irregular"
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/codelist/gmxCodel
ists.xml#MD_MaintenanceFrequencyCode"/>

      </gmd:maintenanceAndUpdateFrequency>

      <gmd:userDefinedMaintenanceFrequency>

         <gts:TM_PeriodDuration>PT6H</gts:TM_PeriodDuration>

      </gmd:userDefinedMaintenanceFrequency>

      <gmd:maintenanceNote>
```

```
        <gco:CharacterString>ADD-PRODUCT-UPDATE-FREQ-NOTE      (e.g.   Instances  of  bulletin  SIKB20NGTT  are
available every 6 hours starting at 03 UTC)</gco:CharacterString>

      </gmd:maintenanceNote>

   </gmd:MD_MaintenanceInformation>

</gmd:resourceMaintenance>
```

Mandatory WIS Technical Information

In addition to those mandatory elements included on section 9.1 above, the following information is required:

Metadata Record Unique Identifier

9.1.14 Metadata Record	Unique Identifier
TEMPLATE Value:	ADD-WMCP-IDENTIFIER*M
Information:	Unique Identifier for individual WIS Discovery Metadata Records
Necessity:	Mandatory for WMO Core Profile 1.3
Category:	WIS Technical Information
XPath:	*/gmd:MD_Metadata/gmd:fileIdentifier/*/text()*

The WCMP UID (fileIdentifier) should be structured as

urn:x-wmo:md:DataProviderInternetDomainName::ProductUID

where:

"**:**" is used as a separator;

urn:x-wmo:md: is mandatory;

DataProviderInternetDomainName:: designates the citation authority based on the reversed Internet domain name of the data-provider organization (e.g. int.eumetsat, gov.noaa) – note the recommended use of two colons "**::**";

ProductUID is a unique identifier with a structure defined by the organization responsible for the metadata record.

Examples:

UID for Roshydromet MTVZA-GY Level 1C data Meteor-M N2:

urn:x-wmo:md:planet.iitp.ru:EO:ROSHDAT:METEOR-M:MTVZA-GY

EUMETSAT Meteosat Seviri Level 1.5:

urn:x-wmo:md:int.eumetsat:EO:EUM:DAT:MSG:HRSEVIRI

Unique Identifier for GTS products

Additional rules apply, for metadata records describing products distributed in the GTS. The file identifier for bulletin metadata has the following structure:

```
urn:x-wmo:md:int.wmo.wis::{uid}
```

where {uid} is a unique identifier derived from the GTS bulletin or file name.

Further background, on constructing a fileIdentifier for products distributed on the GTS, is available in the WMCP v.1.3, Part 1, Section 9.2 ("Identifiers for metadata describing data published for global exchange").

An example File Identifier for a Deutscher Wetterdienst Numerical Weather Prediction Model, GTS Bulletin is:

```
urn:x-wmo:md:int.wmo.wis::HTXC85EDZW
```

An example File Identifier Meteo France Numerical Weather Prediction Model is:

```
urn:x-wmo:md:int.wmo.wis::FR-meteofrance-toulouse,GRIB,ARPEGE-75N10N-60W65E_C_LFPW
```

Metadata modification DateStamp

9.1.15 Metadata Modification DateStamp	
TEMPLATE Value:	ADD-METADATA-LAST-MODIFICATION-DATE*M
Information:	Last modification date of the metadata record
Necessity:	Mandatory for WMO Core Profile 1.3
Category:	WIS Technical Information
XPath:	*/gmd:MD_Metadata/gmd:dateStamp*

This is the metadata record's latest modification date, and is a DATETIME. It has the following date pattern: **YYYY-MM-DDThh:mm:ss**, for example 2015-12-29T11:45:55.

Product Creation Date

9.1.16 Creation Date	
TEMPLATE Value:	ADD-PRODUCT-CREATION-DATE*M
Information:	Creation date of the product
Necessity:	Mandatory for WMO Core Profile 1.3
Category:	WIS Technical Information
XPath:	*/gmd:MD_Metadata/gmd:identificationInfo/*/gmd:citation/*/gmd:date/*/* ↘ */gmd:date/*/text()* *and* ↘ */gmd:dateType/*/@codeListValue="creation"*

This is the product Creation date, and has the following date pattern: **YYYY-MM-DD** or **YYYY-MM-DDThh:mm:ss.**

For instance:

```
<gmd:date>
   <gmd:CI_Date>
      <gmd:date>
         <gco:Date>2015-03-23</gco:Date>
      </gmd:date>
```

```
      <gmd:dateType>
         <gmd:CI_DateTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodel
ists.xml#CI_DateTypeCode"                                                    codeListValue="creation"/>
      </gmd:dateType>
   </gmd:CI_Date>
<gmd:date>
```

Technical Document

More details on the WMO Core Profile Metadata can be found at http://wis.wmo.int/MD_Index

Annex

Glossary

- CGMS: Coordination Group for Meteorological Satellites
- CGMS-WMO TFMI: CGMS-WMO Task Force on Metadata Implementation
- GTS: Global Telecommunication Network
- WMO IPET-SUP: WMO Inter-Programme Expert Team on Satellite Utilization and Products
- WIS: WMO Information System
- GISC: Global Intercommunication System Centre
- DCPC: Data Collection and Production Centre
- NC: National Centre
- WMCP: WMO Core Profile
- ISO 19115: http://www.iso.org/iso/catalogue_detail?csnumber=26020

Collection Definition Criteria

This part of the document defines criteria and elements to consider, when creating a metadata record representing a collection of products.

To understand the notion of collection, it is important to distinguish between a dataset and a temporal subset of a dataset. As well, the availability of meteorological data is often transient (e.g. observations, forecasts, NWP products), and continuously updated. A dataset is typically seen as an aggregate of temporal "instances"/subsets of the same dataset (the collection) and, as explained below, metadata for a dataset is not typically set at "instance" level. This is so, even when a new instance/subset of a dataset is produced daily, and when only the latest day of data is ever available (in that case, the temporalExtent of the dataset is "latest 24 hours only").

Additional criteria can be considered, when creating the collection metadata record include :

(a) Size of dataset instances.

An important thing to consider, in terms of Dataset granularity, is how the dataset instances will be made available to end users. For instance, push or pull services, with filter capabilities or not.

Numerical model X output could be seen as a 4 and even 5-D dataset (latitude, longitude, Z, time, reference time). It is possible to set granularity at this level, but the amount of data will be huge, and it will not be possible to exchange the whole dataset, using 'push' mode: Such large scale granularity of data

is ideally provided via download (or publish-subscribe) services with sub setting capabilities (e.g. WCS, or "Direct" download INSPIRE services).

When the data provider is not able to implement such services, and when only pre-defined datasets or time-windows are made available (i.e., the use case of datasets for global exchange on the WIS) the granularity may have to be finer.

For example, the French high resolution model, AROME, is split into two daily subsets:

Dataset 1 : AROME 0°01 FRANCE - 00h-23h

Dataset 2 : AROME 0°01 FRANCE - 24h-45h

Where Dataset 1 covers hourly steps H to H+23h and Dataset 2 covers hourly steps H+24 to H+45.

The granularity of the subsets is chosen according to the size of the instances to be exchanged, and the size of the granules (500 Mb, 1Gb, ...) should be compatible with the bandwidth available for data exchange. Note that it is also possible to define an aggregate of the two subsets, for instance:

Dataset 0 : AROME 0°01 FRANCE, where Dataset 0 is an aggregation of Dataset 1 and Dataset 2.

(b) Content consistency

It is recommended, if possible, to not blend multiple data categories or topics in the same dataset, resulting in an heterogeneous aggregate.

For example an aggregate of satellite observations, and weather forecasts would not typically make sense (unless they had been combined for a particular purpose); whereas an aggregate of pollution and water pollution data makes sense, especially if the data processing has been similar and the data license is the same.

More generally, dataset heterogeneity in terms of content can result in very generalized descriptions in the metadata, which will, in turn, affect data discoverability on the WIS.

(c) Update frequency, other temporal characteristics

The refresh-rate of data also has to be taken into account, in terms of dataset granularity, because this will have an impact on catalogues.

Setting the dataset/metadata granularity at the "temporal instance" level, instead of "time series" level, would require the generation (automatically) of a lot of metadata records, and the update of catalogues in near real-time. It would also present difficulties in synchronizing metadata records among the GISCs, especially through harvesting processes. Such a large number of metadata records would also make it difficult for users to find the information they were seeking.

For instance, a "French WMO Resolution 40 Essential SYNOP" dataset could be seen as a temporal "series", and, provided that the entire dataset continues to be available, the discovery metadata should be provided at this level, and not at "temporal instance" level (e.g. "French WMO Resolution 40 Essential SYNOP 2016-04-07T12:00:00Z").

It is also recommended to not blend data of different refresh-rates in the same dataset, because it will not be possible to specify the update frequency in discovery metadata records.

(d) Data policy and distribution scope

A dataset shall be homogeneous in terms of data policy, including WMO distribution policy, which is described through WMO_DistributionScopeCode, WMO_DataLicenseCode, WMO_GTSProductCategoryCode and MD_RestrictionCode code lists.

The definition of the WCMP 1.3 mentions, in section 9.3 of Appendix C Part 1 of the Manual on WIS, that:

> "The presence of more than one WMO Data Policy in a single metadata record yields an ambiguous state, a WIS Discovery Metadata record describing data for global exchange shall declare only a single Data Policy".

Beyond WCMP 1.3 compliance, it is not easy to describe multiple data policies in a same metadata record, and if a dataset is heterogeneous in terms of data policy, the implementation of these policies by the services may be difficult.

(e) Spatial extent

Except for global datasets, a coarse granularity is likely to affect the discoverability of data on the basis of spatial criterion, especially if the effective areas where data is available are disjoint. For example synoptic observations for the French Overseas Departments of Guyana, Martinique, Reunion, Guadeloupe are dispatched in different datasets.

Field hierarchy and cardinality

Below is a nested list of fields likely to be used in an WMCP record, together with their cardinality.

Cardinality is denoted by [x..y]. Where the cardinality is preceded by "ISO" then the cardinality in the WMCP is the same. Where it is different, the cardinality for both ISO and WMCP is appended to the element name.

As noted in Section 8.1, many optional <<subsections>> of a WMCP record contain elements which are mandatory **only if** that subsection is used. An example of that is the .. 'identifier'/'authority'/'title', as shown on lines 53-57, in the following hierarchical list of fields (and see excerpt below), where 'identifier' is optional [0..n], and even if it is used, 'authority' is optional [0..n]; however, if 'authority' **is** used, then 'title' is mandatory [1..1].

```
53 _ ._ ._ ._ ._ .identifier_ ._ .ISO[0..n]
54_ ._ ._ ._ ._ ._ .MD_Identifier_ ._ .
55_ ._ ._ ._ ._ ._ ._ .authority_ ._ .ISO[0..1]
56_ ._ ._ ._ ._ ._ ._ ._ .CI_Citation_ ._ .
57_ ._ ._ ._ ._ ._ ._ ._ ._ .title_ .char_ ._ .ISO[1..1]
```

(Excerpt from ANNEX, Section 13)

The cardinality notation of [x..y] indicates the minimum and maximum allowable times that the element may be used, within that part of the hierarchy/tree.

For instance the notation:

[0..n] means that the element is optional, but can also be used any number of times;

[1..2] means that it is mandatory (there must be at least one), and may be used a maximum of two times.

```
1   MD_Metadata_ ._ .ISO[1..1]
2   _ .fileIdentifier_ .char_ ._ . WMO[1..1] , ISO[0..1]
3   _ .language_ .char_ ._ .ISO[0..1]
4   _ .characterSet_ .CODE:MD_CharacterSetCode_ ._ .ISO[0..1]
5   _ .parentIdentifier_ .char_ ._ .ISO[0..1]
6   _ .hierarchyLevel_ .char_ ._ .ISO[0..n]
7   _ .hierarchyLevelName_ .char_ ._ .ISO[0..n]
8
9   _ .contact_ ._ .ISO[1..n]
10  _ ._ .CI_ResponsibleParty
 see lines 66-99, for all fields available for CI_ResponsibleParty
11  _ ._ ._ .individualName_ .char_ ._ .ISO[0..1]
12  _ ._ ._ .organisationName_ .char_ ._ .ISO[0..1]
13  _ ._ ._ .contactInfo_ ._ .ISO[0..1]
14  _ ._ ._ ._ . CI_Contact_ ._ .
15  _ ._ ._ ._ . _ .address_ ._ .ISO[0..1]
16  _ ._ ._ ._ ._ . _ .CI_Address_ ._ .
17  _ ._ ._ ._ ._ ._ . _ .electronicMailAddress_ .char_ ._ .ISO[0..n]
18  _ ._ ._ .role_ .CODE:CI_RoleCode_ ._ .ISO[1..1]
19
20  _ .dateStamp_ .DATETIME_ ._ .ISO[1..1]
21    _ .metadataStandardName_ .char_ ._ .ISO[0..1]
22  _ .metadataStandardVersion_ .char_ ._ .ISO[0..1]
23    _ .dataSetURI_ .char_ ._ .ISO[0..1]
24     ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
25  _ .spatialRepresentationInfo_ ._ .ISO[0..n]
26  _ ._ .MD_GridSpatialRepresentation
27  _ ._ ._ .numberOfDimensions_ .integer_ ._ .ISO[1..1]
28  _ ._ ._ .axisDimensionProperties_ ._ .ISO[1..1]
29  _ ._ ._ ._ .MD_Dimension_ ._ .
30  _ ._ ._ ._ ._ .dimensionName_ .CODE:MD_DimensionNameTypeCode_ ._ .ISO[1..1]
31  _ ._ ._ ._ ._ .dimensionSize_ .integer_ ._ .ISO[1..1]
32  _ ._ ._ ._ ._ .resolution_ .SCALE_ ._ .ISO[0..1]
33  _ ._ ._ ._ ._ .dimensionName_ .CODE:MD_DimensionNameTypeCode_ ._ .ISO[1..1]
34  _ ._ ._ ._ ._ .dimensionSize_ .integer_ ._ .ISO[1..1]
35  _ ._ ._ ._ ._ .resolution_ .SCALE_ ._ .ISO[0..1]
36  _ ._ ._ .cellGeometry_ .CODE:MD_CellGeometryCode_ ._ .ISO[1..1]
37  _ ._ ._ .transformationParameterAvailability_ .Boolean_ ._ .ISO[1..1]
38     ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
39
```

```
40      _ .identificationInfo_ ._ .ISO[1..n]
41      _ ._ .MD_DataIdentification_ .
42
43      _ ._ ._ .citation_ ._ .ISO[1..1]
44      _ ._ ._ ._ .CI_Citation_ ._ .
45      _ ._ ._ ._ ._ .title_ .char_ ._ .ISO[1..1]
46      _ ._ ._ ._ ._ .alternateTitle_ .char_ ._ .ISO[0..n]
47      _ ._ ._ ._ ._ .DATE_ ._ .ISO[1..n]
48      _ ._ ._ ._ ._ ._ .CI_Date_ .
49      _ ._ ._ ._ ._ ._ ._ .DATE_ .DATETIME_ ._ .ISO[1..1]
50      _ ._ ._ ._ ._ ._ ._ .dateType_ .CODE:CI_DateTypeCode_ ._ .ISO[1..1]
51      _ ._ ._ ._ ._ .edition_ .char_ ._ .ISO[0..1]
52
53      _ ._ ._ ._ ._ .identifier_ ._ .ISO[0..n]
54      _ ._ ._ ._ ._ ._ .MD_Identifier_ ._ .
55      _ ._ ._ ._ ._ ._ ._ .authority_ ._ .ISO[0..1]
56      _ ._ ._ ._ ._ ._ ._ ._ .CI_Citation_ ._ .
    see lines 43-111, for all fields available for CI_Citation
57      _ ._ ._ ._ ._ ._ ._ ._ ._ .title_ .char_ ._ .ISO[1..1]
58      _ ._ ._ ._ ._ ._ ._ ._ ._ .alternateTitle_ .char_ ._ .ISO[0..n]
59      _ ._ ._ ._ ._ ._ ._ ._ ._ .DATE_ ._ .ISO[1..n]
60      _ ._ ._ ._ ._ ._ ._ ._ ._ ._ .CI_Date_ .
61      _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .DATE_ .DATE_ ._ .ISO[1..1]
62      _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .dateType_ .CODE:CI_DateTypeCode_ ._ .ISO[1..1]
63      _ ._ ._ ._ ._ ._ ._ ._ .code_ .char_ ._ .ISO[1..1]
64
65      _ ._ ._ ._ ._ .citedResponsibleParty_ ._ .ISO[0..n]
66      _ ._ ._ ._ ._ ._ .CI_ResponsibleParty_ ._ .
67      _ ._ ._ ._ ._ ._ ._ .individualName_ .char_ ._ .ISO[0..1] *C
68      _ ._ ._ ._ ._ ._ ._ .organisationName_ .char_ ._ .ISO[0..1] *C
69      _ ._ ._ ._ ._ ._ ._ .positionName_ .char_ ._ .ISO[0..1] *C
70
71      _ ._ ._ ._ ._ ._ ._ .contactInfo_ ._ .ISO[0..1]
72      _ ._ ._ ._ ._ ._ ._ ._ .CI_Contact_ ._ .
73
74      _ ._ ._ ._ ._ ._ ._ ._ ._ .phone_ ._ .ISO[0..1]
75      _ ._ ._ ._ ._ ._ ._ ._ ._ ._ .CI_Telephone_ ._ .
76      _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .voice_ .char_ ._ .ISO[0..n]
77      _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .facsimile_ .char_ ._ .ISO[0..n]
78
79      _ ._ ._ ._ ._ ._ ._ ._ ._ .address_ ._ .ISO[0..1]
80      _ ._ ._ ._ ._ ._ ._ ._ ._ ._ .CI_Address_ ._ .
```

```
81    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .deliveryPoint_ .char_ ._ .ISO[0..n]
82    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .city_ .char_ ._ .ISO[0..1]
83    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .administrativeArea_ .char_ ._ .ISO[0..1]
84    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .postalCode_ .char_ ._ .ISO[0..1]
85    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .country_ .char_ ._ .ISO[0..1]
86    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .electronicMailAddress_ .char_ ._ .ISO[0..n]
87
88    _ ._ ._ ._ ._ ._ ._ ._ ._ .onlineResource_ ._ .ISO[0..1]
89    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ .CI_OnlineResource_ ._ .
90    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .linkage_ .URL_ ._ .ISO[1..1]
91    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .protocol_ .char_ ._ .ISO[0..1]
92    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .applicationProfile_ .char_ ._ .ISO[0..1]
93    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .name_ .char_ ._ .ISO[0..1]
94    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .description_ .char_ ._ .ISO[0..1]
95    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .function_ .CODE:CI_OnLineFunctionCode_ ._ .ISO[0..1]
96
97    _ ._ ._ ._ ._ ._ ._ ._ ._ .hoursOfService_ .char_ ._ .ISO[0..1]
98    _ ._ ._ ._ ._ ._ ._ ._ ._ .contactInstructions_ .char_ ._ .ISO[0..1]
99    _ ._ ._ ._ ._ ._ ._ .role_ .CODE:CI_RoleCode_ [1..1].
100
101   _ ._ ._ ._ ._ .presentationForm_ .CODE:CI_PresentationFormCode_ ._ .ISO[0..n]
102
103   _ ._ ._ ._ ._ .series_ ._ .ISO[0..1]
104   _ ._ ._ ._ ._ ._ .CI_Series_ .
105   _ ._ ._ ._ ._ ._ ._ .name_ .char_ ._ .ISO[0..1]
106   _ ._ ._ ._ ._ ._ ._ .issueIdentification_ .char_ ._ .ISO[0..1]
107   _ ._ ._ ._ ._ ._ ._ .page_ .char_ ._ .ISO[0..1]
108   _ ._ ._ ._ ._ .otherCitationDetails_ .char_ ._ .ISO[0..1]
109   _ ._ ._ ._ ._ .collectiveTitle_ .char_ ._ .ISO[0..1]
110   _ ._ ._ ._ ._ .ISBN_ .char_ ._ .ISO[0..1]
111   _ ._ ._ ._ ._ .ISSN_ .char_ ._ .ISO[0..1]
112
113
114   _ ._ ._ .abstract_ .char_ ._ .ISO[1..1]
115   _ ._ ._ .purpose_ .char_ ._ .ISO[0..1]
116   _ ._ ._ .credit_ .char_ ._ .ISO[0..n]
117   _ ._ ._ .status_ .CODE:MD_ProgressCode_ ._ .ISO[0..n]
118
119   _ ._ ._ .pointOfContact_ ._ .ISO[0..n]
120   _ ._ ._ ._ .CI_ResponsibleParty_ ._ .
121   _ ._ ._ ._ ._ .individualName_ .char_ ._ .ISO[0..1]
122   _ ._ ._ ._ ._ .organisationName_ .char_ ._ .ISO[0..1]
```

```
123    _ ._ ._ ._ ._ .positionName_ .char_ ._ .ISO[0..1]
124    _ ._ ._ ._ ._ .contactInfo_ ._ .ISO[0..1]
125    _ ._ ._ ._ ._ ._ .CI_Contact_ ._ .
126    _ ._ ._ ._ ._ ._ ._ .phone_ ._ .ISO[0..1]
127    _ ._ ._ ._ ._ ._ ._ ._ .CI_Telephone_ ._ .
128    _ ._ ._ ._ ._ ._ ._ ._ ._ .voice_ .char_ ._ .ISO[0..1]
129    _ ._ ._ ._ ._ ._ ._ ._ ._ .facsimile_ .char_ ._ .ISO[0..1]
130    _ ._ ._ ._ ._ ._ ._ .address_ ._ .ISO[0..1]
131    _ ._ ._ ._ ._ ._ ._ ._ .CI_Address_ ._ .
132    _ ._ ._ ._ ._ ._ ._ ._ ._ .deliveryPoint_ .char_ ._ .ISO[0..1]
133    _ ._ ._ ._ ._ ._ ._ ._ ._ .electronicMailAddress_ .char_ ._ .ISO[0..1]
134    _ ._ ._ ._ ._ .role_ .CODE:CI_RoleCode_ ._ .ISO[1..1]
135
136    _ ._ ._ .resourceMaintenance_ ._ .ISO[0..n]
137    _ ._ ._ ._ .MD_MaintenanceInformation_ .
138    _ ._ ._ ._ ._ .maintenanceAndUpdateFrequency_ .
           CODE: MD_MaintenanceFrequencyCode_ ._ .ISO[1..1]
139    _ ._ ._ ._ ._ .userDefinedMaintenanceFrequency_ .TM_PeriodDuration_ ._ .ISO[0..1]
140    _ ._ ._ ._ ._ .updateScopeDescription_ ._ .ISO[0..n]
141    _ ._ ._ ._ ._ ._ .MD_ScopeDescription_ .
142    _ ._ ._ ._ ._ ._ ._ .dataset_ .char_ ._ .ISO[1..1]
143    _ ._ ._ ._ ._ .maintenanceNote_ .char_ ._ .ISO[0..n]
144
145    _ ._ ._ .graphicOverview_ ._ .ISO[0..n]
146    _ ._ ._ ._ .MD_BrowseGraphic_ .
147    _ ._ ._ ._ ._ .fileName_ .char_ ._ .ISO[1..1]
148    _ ._ ._ ._ ._ .fileDescription_ .char_ ._ .ISO[0..1]
149    _ ._ ._ ._ ._ .fileType_ .char_ ._ .ISO[0..1]
150
151    _ ._ ._ .descriptiveKeywords_ ._ WMO[1..n]    .ISO[0..n]
152    _ ._ ._ ._ .MD_Keywords_ .
153    _ ._ ._ ._ ._ .keyword_ .char_ ._ .ISO[1..n]
154    _ ._ ._ ._ ._ .type_ .CODE:MD_KeywordTypeCode_ ._ .ISO[0..1]
155    _ ._ ._ ._ ._ .thesaurusName_ ._ .ISO[0..1]
156    _ ._ ._ ._ ._ ._ .CI_Citation_ ._ .
   see lines 43-111, for all fields available for CI_Citation
157    _ ._ ._ ._ ._ ._ ._ .title_ .char_ ._ .ISO[1..1]
158    _ ._ ._ ._ ._ ._ ._ .DATE_ ._ .ISO[1..1]
159    _ ._ ._ ._ ._ ._ ._ ._ .CI_Date_ ._ .
160    _ ._ ._ ._ ._ ._ ._ ._ ._ .DATE_ .DATE_ ._ .ISO[1..1]
161    _ ._ ._ ._ ._ ._ ._ ._ .dateType_ .CODE:CI_DateTypeCode_ ._ .ISO[1..1]
162
```

```
163    _ ._ ._ .resourceSpecificUsage_ ._ .ISO[0..n]
164    _ ._ ._ ._ .MD_Usage_ .
165    _ ._ ._ ._ ._ .specificUsage_ .char_ ._ .ISO[1..1]
166    _ ._ ._ ._ ._ .userDeterminedLimitations_ .char_ ._ .ISO[0..n]
167    _ ._ ._ ._ ._ .userContactInfo_ ._ .ISO[1..n]
168    _ ._ ._ ._ ._ ._ .CI_ResponsibleParty_ ._ .
   see lines 66-99, for all fields available for CI_ResponsibleParty
169     _ ._ ._ ._ ._ ._ ._ .individualName_ .char_ ._ .ISO[0..1]
170    _ ._ ._ ._ ._ ._ ._ .organisationName_ .char_ ._ .ISO[0..1]
171    _ ._ ._ ._ ._ ._ ._ .role_ .CODE:CI_RoleCode_ ._ .ISO[1..1]
172
173    _ ._ ._ .resourceConstraints_ ._ .ISO[0..n]
174    _ ._ ._ ._ .MD_Constraints_ . ISO[0..n]
175    _ ._ ._ ._ ._ .useLimitation_ ._ .ISO[0..n]
176    _ ._ ._ ._ .MD_LegalConstraints_ . ISO[0..n]
177    _ ._ ._ ._ ._ .useLimitation_ .char_ ._ .ISO[0..n]
178    _ ._ ._ ._ ._ .accessConstraints_ .CODE:MD_RestrictionCode_ ._ .ISO[0..n]
179    _ ._ ._ ._ ._ .accessConstraints_ .CODE:MD_RestrictionCode_ ._ .ISO[0..n]
180    _ ._ ._ ._ ._ .useConstraints_ .CODE:MD_RestrictionCode_ ._ .ISO[0..n]
181    _ ._ ._ ._ ._ .useConstraints_ .CODE:MD_RestrictionCode_ ._ .ISO[0..n]
182    _ ._ ._ ._ ._ .otherConstraints_ .char_ ._ .ISO[0..n]
183    _ ._ ._ ._ ._ .otherConstraints_ .char_ ._ .ISO[0..n]
184    _ ._ ._ ._ .MD_SecurityConstraints_ . ISO[0..n]
185    _ ._ ._ ._ ._ .useLimitation_ .char_ ._ .ISO[0..n]
186    _ ._ ._ ._ ._ .classification_ .CODE:MD_ClassificationCode_ ._ .ISO[1..1]
187    _ ._ ._ ._ ._ .userNote_ .char_ ._ .ISO[0..1]
188    _ ._ ._ ._ ._ .classificationSystem_ .char_ ._ .ISO[0..1]
189    _ ._ ._ ._ ._ .handlingDescription_ .char_ ._ .ISO[0..1]
190
191    _ ._ ._ .aggregationInfo_ ._ .ISO[0..n]
192    _ ._ ._ ._ .MD_AggregateInformation_ .
193
194    _ ._ ._ ._ ._ .aggregateDataSetName_ ._ .ISO[0..1]
195    _ ._ ._ ._ ._ ._ .CI_Citation_ ._ .
   see lines 43-111, for all fields availablefor CI_Citation
196    _ ._ ._ ._ ._ ._ ._ .title_ .char_ ._ .ISO[1..1]
197    _ ._ ._ ._ ._ ._ ._ .DATE_ ._ .ISO[1..1]
198    _ ._ ._ ._ ._ ._ ._ ._ .CI_Date_ ._ .
199    _ ._ ._ ._ ._ ._ ._ ._ ._ .DATE_ . DATE _ ._ .ISO[1..1]
200    _ ._ ._ ._ ._ ._ ._ ._ ._ .dateType_ .CODE:CI_DateTypeCode_ ._ .ISO[1..1]
201
202    _ ._ ._ ._ ._ .aggregateDataSetIdentifier_ ._ .ISO[0..1]
```

```
203    _ ._ ._ ._ ._ ._ .MD_Identifier_ .
204    _ ._ ._ ._ ._ ._ ._ .authority_ ._ .ISO[0..1]
205    _ ._ ._ ._ ._ ._ ._ ._ .CI_Citation_ ._ .
   see lines 43-111, for all fields available for CI_Citation
206    _ ._ ._ ._ ._ ._ ._ ._ ._ .title_ .char_ ._ .ISO[1..1]
207    _ ._ ._ ._ ._ ._ ._ ._ ._ .DATE_ ._ .ISO[1..1]
208    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ .CI_Date_ ._ .
209    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .DATE_ . DATE_ ._ .ISO[1..1]
210    _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .dateType_ .CODE:CI_DateTypeCode_ ._ .ISO[1..1]
211    _ ._ ._ ._ ._ ._ ._ .code_ .char_ ._ .ISO[1..1]
212
213    _ ._ ._ ._ ._ .associationType_ .CODE:DS_AssociationTypeCode_ ._ .ISO[1..1]
214    _ ._ ._ ._ ._ .initiativeType_ .CODE:DS_InitiativeTypeCode_ ._ .ISO[0..1]
215
216    _ ._ ._ .spatialRepresentationType
217    _ ._ ._ ._ .MD_SpatialRepresentationTypeCode
                                                    CODE:
MD_SpatialRepresentationTypeCode  ISO[0..n]
218
219    _ ._ ._ .spatialResolution_ ._ .ISO[0..n]
220    _ ._ ._ ._ .MD_Resolution_ ._ .ISO[ ..]
221    _ ._ ._ ._ ._ .equivalentScale_ ._ .ISO[1..1]
222    _ ._ ._ ._ ._ ._ .MD_RepresentativeFraction_ .
223    _ ._ ._ ._ ._ ._ ._ .denominator_ .integer_ ._ .ISO[1..1]
224
225    _ ._ ._ .language_ .char_ ._ .ISO[1..n]
226    _ ._ ._ .characterSet_ .CODE:MD_CharacterSetCode_ ._ .ISO[0..n]
227    _ ._ ._ .topicCategory_ .CODE:MD_TopicCategoryCode_ ._ .WMO[1..n]   ISO[0..n]
228    _ ._ ._ .environmentDescription_ .char_ ._ .ISO[0..1]
229
230    _ ._ ._ .extent_ ._ .ISO[0..n]
231    _ ._ ._ ._ .EX_Extent_ .
232    _ ._ ._ ._ ._ .description_ .char_ ._ .ISO[0..1]
233    _ ._ ._ ._ ._ .geographicElement_ ._. .ISO[0..n]        (Mandatory, if data is
geospatial)
234    _ ._ ._ ._ ._ . _ . EX_GeographicBoundingBox_
235    _ ._ ._ ._ ._ . _ ._ .westBoundLongitude_ .DECIMAL_ ._ .ISO[1..1]
236    _ ._ ._ ._ ._ . _ ._ .eastBoundLongitude_ . DECIMAL_ ._ .ISO[1..1]
237    _ ._ ._ ._ ._ . _ ._ .southBoundLatitude_ . DECIMAL_ ._ .ISO[1..1]
238    _ ._ ._ ._ ._ . _ ._ .northBoundLatitude_ . DECIMAL_ ._ .ISO[1..1]
239
240
241    _ ._ ._ ._ ._ .geographicElement_ . ISO[0..n]
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_ ._ ._ ._ ._ ._ .EX_GeographicDescription_ .
_ ._ ._ ._ ._ ._ ._ .extentTypeCode_ ._ .Boolean_ ._ .ISO[0..1]
_ ._ ._ ._ ._ ._ ._ .geographicIdentifier_ ._ .ISO[1..1]
_ ._ ._ ._ ._ ._ ._ ._ .MD_Identifier_ .
_ ._ ._ ._ ._ ._ ._ ._ ._ .code_ .char_ ._ .ISO[1..1]

_ ._ ._ ._ ._ .temporalElement_ ._ .ISO[0..n]
_ ._ ._ ._ ._ ._ .EX_TemporalExtent_ .
_ ._ ._ ._ ._ ._ ._ .extent_ ._ .ISO[1..1]

_ ._ ._ .supplementalInformation_ .char_ ._ .ISO[0..1]
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_ .**referenceSystemInfo**_ ._ .ISO[0..n]
_ ._ .MD_ReferenceSystem_ .
_ ._ ._ .referenceSystemIdentifier_ ._ .ISO[0..1]
_ ._ ._ ._ .RS_Identifier_ .
_ ._ ._ ._ ._ .authority_ ._ .ISO[0..1]
_ ._ ._ ._ ._ .code_ .char_ ._ .ISO[1..1]
_ ._ ._ ._ ._ .codeSpace_ .char_ ._ .ISO[0..1]
_ ._ ._ ._ ._ .version_ .char_ ._ .ISO[0..1]
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_ .**contentInfo**_ ._ .ISO[0..n]
_ ._ .MD_CoverageDescription_ .
_ ._ ._ .attributeDescription_ ._ .ISO[1..1]
_ ._ ._ ._ .RecordType_ ._ .
_ ._ ._ .contentType_ .CODE:MD_CoverageContentTypeCode_ ._ .ISO[1..1]
~~~~~~

_ .**distributionInfo**_ ._ .ISO[0..1]
_ ._ .MD_Distribution_ .
_ ._ ._ .distributionFormat_ ._ .ISO[0..n]
_ ._ ._ ._ .MD_Format_ .
_ ._ ._ ._ ._ .name_ .char_ ._ .ISO[1..1]
_ ._ ._ ._ ._ .version_ .char_ ._ .ISO[1..1]
_ ._ ._ ._ ._ .amendmentNumber_ .char_ ._ .ISO[0..1]
_ ._ ._ ._ ._ .specification_ .char_ ._ .ISO[0..1]
_ ._ ._ ._ ._ .fileDecompressionTechnique_ .char_ ._ .ISO[0..1]

_ ._ ._ ._ ._ .formatDistributor_ ._ .ISO[0..n]
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284 _ ._ ._ ._ ._ ._ .MD_Distributor_ .
285 _ ._ ._ ._ ._ ._ ._ .distributorContact_ ._ .ISO[1..1]
286 _ ._ ._ ._ ._ ._ ._ ._ .CI_ResponsibleParty_ .
    see lines 66-99, for all fields available for CI_ResponsibleParty
287 _ ._ ._ ._ ._ ._ ._ ._ ._ .individualName_ .char_ ._ .ISO[0..1]
288 _ ._ ._ ._ ._ ._ ._ ._ ._ .organisationName_ .char_ ._ .ISO[0..1]
289 _ ._ ._ ._ ._ ._ ._ ._ ._ .role_ .CODE:CI_RoleCode_ ._ .ISO[1..1]
290 _ ._ ._ ._ ._ ._ ._ .distributorTransferOptions_ ._ .ISO[0..n]
291 _ ._ ._ ._ ._ ._ ._ ._ .MD_DigitalTransferOptions_ .
292 _ ._ ._ ._ ._ ._ ._ ._ ._ .unitsOfDistribution_ .char_ ._ .ISO[0..1]
293 _ ._ ._ ._ ._ ._ ._ ._ ._ .transferSize_ .Real_ ._ .ISO[0..1]
294
295 _ ._ ._ ._ ._ ._ ._ ._ ._ .onLine_ ._ .ISO[0..n]
296 _ ._ ._ ._ ._ ._ ._ ._ ._ ._ .CI_OnlineResource_ .
297 _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .linkage_ .URL_ ._ .ISO[1..1]
298 _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .protocol_ .char_ ._ .ISO[0..1]
299 _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .name_ .char_ ._ .ISO[0..1]
300 _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .description_ .char_ ._ .ISO[0..1]
301 _ ._ ._ ._ ._ ._ ._ ._ ._ ._ ._ .function_ .CODE:CI_OnLineFunctionCode_ ._ .ISO[0..1]
302    ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
303
304 _ .dataQualityInfo_ ._ .ISO[0..n]
305 _ ._ .DQ_DataQuality_ .
306 _ ._ ._ .scope_ ._ .ISO[1..1]
307 _ ._ ._ ._ .DQ_Scope_ .
308 _ ._ ._ ._ ._ .level_ .CODE:MD_ScopeCode_ ._ .ISO[1..1]
309 _ ._ ._ ._ ._ .extent_ .
310 _ ._ ._ ._ ._ .levelDescription_ ._ .ISO[0..n]
311 _ ._ ._ ._ ._ ._ .MD_ScopeDescription_ .
312 _ ._ ._ ._ ._ ._ ._ .dataset_ .char_ ._ .ISO[1..1]
313 _ ._ ._ .lineage_ ._ .ISO[0..1]
314 _ ._ ._ ._ .LI_Lineage_ .
315 _ ._ ._ ._ ._ .statement_ .char_ ._ .ISO[0..1]
316
317 _ ._ ._ ._ ._ .processStep_ ._ .ISO[0..n]
318 _ ._ ._ ._ ._ ._ .LI_ProcessStep_ .
319 _ ._ ._ ._ ._ ._ ._ .description_ .char_ ._ .ISO[1..1]
320 _ ._ ._ ._ ._ ._ ._ .rationale_ .char_ ._ .ISO[0..1]
321 _ ._ ._ ._ ._ ._ ._ .source_ ._ .ISO[0..n]
322 _ ._ ._ ._ ._ ._ ._ ._ .LI_Source_ .
323 _ ._ ._ ._ ._ ._ ._ ._ ._ .description_ .char_ ._ .ISO[0..1]
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324   _ ._ ._ ._ ._ ._ ._ ._ ._ .sourceCitation_ ._ .ISO[0..1]
325   _ ._ ._ ._ ._ ._ ._ ._ ._ ._ .CI_Citation_ ._ .
326
327   _ ._ ._ ._ ._ .source_ ._ .ISO[0..n]
328   _ ._ ._ ._ ._ ._ .LI_Source_ .
329   _ ._ ._ ._ ._ ._ ._ .description_ .char_ ._ .ISO[0..1]
330      ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
331
332   _ .metadataConstraints_ ._ .ISO[0..n]
333   _ ._ .MD_Constraints_ .
334   _ ._ ._ .useLimitation_ .char_ ._ .ISO[0..n]
335   _ ._ .MD_LegalConstraints_ .
336   _ ._ ._ .useLimitation_ .char_ ._ .ISO[0..n]
337   _ ._ ._ .accessConstraints_ .CODE: MD_RestrictionCode_ ._ .ISO[0..n]
338   _ ._ ._ .useConstraints_ .CODE: MD_RestrictionCode
339   _ ._ ._ .otherConstraints_ .char_ ._ .ISO[0..n]
340      ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
341
342   _ .applicationSchemaInfo_ ._ .ISO[0..n]
343   _ ._ .MD_ApplicationSchemaInformation_ .
344   _ ._ ._ .name_ ._ .ISO[1..1]
345   _ ._ ._ ._ .CI_Citation_ ._ .
see lines 43-111, for all fields available for CI_Citation
346   _ ._ ._ .schemaLanguage_ .char_ .
347   _ ._ ._ .constraintLanguage_ .char_ ._ .ISO[1..1]
348      ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
349
350   _ .metadataMaintenance_ .
351   _ ._ .MD_MaintenanceInformation_ ._ .ISO[0..1]
352   _ ._ ._ .maintenanceAndUpdateFrequency_ .
                             CODE:MD_MaintenanceFrequencyCode_ ._ .ISO[1..1]
353   _ ._ ._ .dateOfNextUpdate_ .DATE_ ._ .ISO[1..1]
354   _ ._ ._ .userDefinedMaintenanceFrequency_ .PERIODDURATION_ ._ .ISO[0..1]
355   _ ._ ._ .updateScope_ .CODE:MD_ScopeCode_ ._ .ISO[0..1]
356   _ ._ ._ .updateScopeDescription_ ._ .ISO[0..n]
357   _ ._ ._ ._ .MD_ScopeDescription_ ._ .ISO[0..n]
358   _ ._ ._ ._ ._ .dataset_ .char_ .
359   _ ._ ._ .maintenanceNote_ .char_ ._ .ISO[1..1]
360      ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
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