

**INTERGOVERNMENTAL OCEANOGRAPHIC
COMMISSION (of UNESCO)**

**WORLD METEOROLOGICAL
ORGANIZATION**

**JOINT WMO-IOC TECHNICAL COMMISSION
FOR OCEANOGRAPHY AND MARINE METEOROLOGY**

First Session of the Data Management Coordination Group
(Paris, 22-25 May 2002)

METADATA EXCHANGE

This document reviews recent WMO CBS activities related to WMO Metadata standards. It also includes a document on meteorological data and XML, which was submitted to the WMO CBS Meeting of Expert Team on Data Representation and Codes (Prague, April 2002).

The group will be invited to review the information provided in the light of possible future JCOMM requirements for the use of XML for ocean data and metadata exchange. It should, in particular, consider the possibilities for enhancing coordination with CBS for the development of a marine XML.

1. WMO METADATA STANDARDS

1.1 The CBS Expert Team on Integrated Data Management at its first meeting (Geneva, November 2001) reviewed existing metadata standards that could be applicable to WMO. The team agreed that, with some effort, the draft ISO standard Geographic Metadata (19115) could be applied to WMO requirements.

1.2 The ISO 19115 specifies a process where a community can adopt parts of the standard that it feels are relevant (including the "Core Elements") and also extend the elements, keywords and code table instances to suit that community. The team noted that the WMO might need to accept more than one such "Community Profile" for the different WMO Programmes, but that there should be a Community Core Profile which could be adopted by all of WMO, with the potential for further extensions where necessary. With this process in mind the team developed a draft "WMO Community Core Metadata" profile. The draft will be refined at the next meeting of the team in mid May.

WMO Community Core Metadata Profile (WMO Core Metadata)

Required Elements			
Generic Name	ISO Field/Class Name and Reference Lines	Occurrence 1 - unique, N - many	Definition
Title	CI_Citation.title (360)	1	Name of the dataset
Identifier	CI_Citation.identifier (365) and identifierType (366)	1	Unique identifier for the dataset
Reference Date	CI_Date.date (394) and dateType (395)	N	Reference date for the dataset (could be creation, publication or revision date)
Responsible party	CI_ResponsibleParty (374-379)	N	Identification of and means of communication with person(s) and organizations associated with the dataset. As a minimum, role code of "originator" should be defined.
Abstract	MD_Identification.Abstract (25)	1	Brief narrative summary of the contents of the dataset
Keywords	MD_Keywords (53-55)	N	Keywords, their type and reference source (a defined WMO thesaurus)
Geographic Extent	EX_GeographicExtent (339-349)	N	Geographic area covered by the dataset (can be bounding box, polygon or geographic identifiers (names of areas, ISO 19112))
Topic Category	MD_DataIdentification.topicCategory (41)	N	Numeric code for the discipline covered by this dataset. Acceptable code values already defined within the ISO standard as code table B.5.27.
Temporal Extent	Ex_TemporalExtent (350-351 and reference to ISO 19108)	N	Time Period covered by the dataset
Metadata Language	MD_Medadata.language (3)	1	Language of this metadata item
Metadata character set	MD_Medadata.characterSet (4)	1	Character set of this metadata item (Default of ISO 10646-1)
Metadata Point of Contact	MD_Metadadata.contact (8) > CI_ResponsibleParty (374-379)	N	Party responsible for this metadata item
Metadata date stamp	MD_Metadadata.dateStamp (9)	1	Date that this metadata item was created

Access rights or restrictions	MD_Constraints (67-77)	N	Restrictions on the access and use of the resource or metadata (Could specify WMO Additional Data as free text or could expand code list B.5.24 to include this item)
Distribution mechanisms	MD_Distribution (271-273)	N	Information about the methods and formats to be used in the distribution of this dataset
Processing level	LI_Lineage (82-85)	N	Information about the level of processing applied to the dataset
Elements that should be defined whenever applicable			
Dataset Language	MD_DataIdentification.language (39)	N	Language(s) used in the dataset, if applicable.
Character Set	MD_DataIdentification.characterSet (40)	1	Character set used in the dataset, if applicable
Additional Optional Elements			
Spatial Resolution	MD_DataIdentification.spatialResolution (38)	N	Factor that provides a general understanding of the spatial density of the data in the dataset (e.g. grid spacing)
Spatial representation type	MD_DataIdentification.spatialRepresentationType (37)	N	Method used to spatially represent data in the dataset
Reference System	MD_ReferenceSystem (187-188)	N	Information about the reference systems used (temporal, coordinate and geographic)
Vertical Extent	Ex_VerticalExtent (354-358)	N	Vertical domain of the dataset
On-line resource	CI_OnlineResource (396-402)	N	Location (address) for on-line access using a Uniform Resource Locator address or similar addressing scheme such as http://www.statkart.no/isotc211
Metadata file identifier	MD_Metadata.fileIdentifier (2)	1	Unique identifier for this metadata item
Metadata standard name	MD_Metadata.metadataStandardName (10)	1	Name of the metadata standard (including profile name) used
Metadata standard version	MD_Metadata.metadataStandardVersion (11)	1	Version (profile) of the metadata standard used
Validity Time	MD_Usage (62-66)	N	Specific date or time ranges that the dataset is valid

- Notes:**
1. The proposed WMO standard would provide a definition for directory searches and exchange and would not specify how the information should be archived or presented to users.
 2. The core elements listed above define a minimum set of information required to exchange data for WMO purposes and are not exhaustive. To fully meet the requirements of all WMO Programmes for metadata, application of far more comprehensive standards would be required. Although the draft ISO standard might include all of the elements essential for WMO this can not be determined unless a detailed analysis of WMO metadata requirements is undertaken.

2. XML STRUCTURES FOR REPRESENTING METADATA (agenda item 5)

2.1 XML is rapidly becoming a standard for exchanging information between applications, as well as for providing information on which the formatting of data for display in a browser may be defined. Industry standards are being defined to allow the exchange of information

between applications using the XML standard, with the expectation that many business transactions will use XML as their standard means of data exchange.

2.2 There are many possible ways of representing WMO metadata in XML. To ensure interoperability the experts have developed a preliminary framework for mapping the proposed metadata standard into XML. This framework will be reviewed at the team meeting in May.

3. KEYWORDS FOR DESCRIBING WMO DATASETS

3.1 As part of the development of standards for a WMO catalogue of datasets, the ET on Integrated Data Management has developed a draft list of keywords that could be used to describe WMO datasets. The latest draft of this list is reproduced in the table below.

Please note that the following is a list of single keywords. These words would be combined within a keyword list (e.g. daily maximum temperature) to describe the content of datasets available for exchange.

Comments or suggestions for additional entries should be sent to Vargas_S@gateway.wmo.ch

(any number)	Chemistry	Direction	Glacial
Aerosol	Climate	Dissolved	Global
Aerosols	Climatology	Divergence	GPS
Agriculture	Cloud	Droplet	Ground
Air	Clouds	Drought	Growing
Altitude	Component	Dry	Gust
Amount	Condensation	Dynamics	Heating
Analyses	Conductivity	Electricity	Height
Analysis	Cooling	Elevation	Hour
Anomaly	Cores	Energy	Hourly
Anomalies	Cover	Equivalent	Humidity
Applied	CREX	Erosion	Hurricane
Atmospheric	Crop	Evaporation	Hydrology
Aviation	Cyclone	Evapotranspiration	Hydrometeorology
Biometeorology	Daily	Events	Ice
Boundary	Day	Extent	Imagery
Brightness	Days	Extremes	Index
BUFR	Degree	Forecast	Instruments
Bulb	Depth	Forestry	Land
Ceiling	Dew	Freeze	Laser
Change	Diffusion	Frost	Layer
Layers	Ozone	Rainfall	Space
Level	Paleoclimatology	Rate	Spectral
Lifted	Period	Ratio	Speed
Lightning	pH	Reflectance	Stability
Long	Phenomena	Reflectivity	Storms
Marine	Physics	Relative	Stratopause
Maximum	Point	Remote	Stratosphere
Micrometeorology	Pollution	Rings	Stratospheric
Minimum	Potential	Salinity	Sunshine
Mixed	Precipitable	Satellite	Surface
Mixing	Precipitation	Sea	Swell
Model	Present	Sedimentation	SYNOP
Modification	Pressure	Sensing	System
Monthly	Properties	Short	Temperature
Mountain	Quality	Size	Tendency
Nuclei	Radar	Snow	Thickness
Normals	Radiance	Snowfall	Tide

Observation	Radiation	Soil	Topography
Ocean	Radiative	Soils	Track
Oceanography	Radiological	Solar	Transport
Oxygen	Rain	Soundings	Tree
Tropopause	Type	Virtual	Weather
Troposphere	Upper	Vorticity	Wind
Tropospheric	Use	Water	Yield
Turbidity	Vapour	Wave	
Turbulence	Volume	Waves	

[See document ET/DR&C2/Doc. 6(1) - Meteorological data and XML]