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Metadata and data models in the WMO Information System

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It is fifty years since the inauguration of the World Weather Watch, through which the WMO (World Meteorological Organization) has coordinated real time exchange of information between national meteorological and hydrological services. At the heart of the data exchange are standard data formats and a dedicated telecommunications system known as the GTS – the Global Telecommunications System.

Weather and climate information are now more complex than in the 1960s, and increasingly the information is being used across traditional disciplines. Although the modern GTS still underpins operational weather forecasting, the WMO Information System (WIS) builds on this to make the information more widely visible and more widely accessible.

The architecture of WIS is built around three tiers of information provider. National Centres are responsible for sharing information that is gathered nationally, and also for distributing information to users within their country. Many of these are national weather services, but hydrology and oceanography centres have also been designated by some countries. Data Collection or Production Centres have an international role, either collating information from several countries, or generating information that is international in nature (satellite operators are an example). Global Information System Centres have two prime responsibilities: to exchange information between regions, and to publish the global WIS Discovery Metadata Catalogue so that end users can find out what information is available through the WIS.

WIS is designed to allow information to be used outside the operational weather community. This means that it has to use protocols and standards that are in general use. The WIS Discovery Metadata records, for example, are expressed using ISO 19115, and in addition to being accessible through the GISCs they are harvested by GEOSS. Weather data are mainly exchanged in formats managed by WMO, but WMO is using GML and the Open Geospatial Consortium's Observations and Measurements standard (O&M) as tools to expand the availability of its information. The first output of this is a representation of aviation weather information in XML so that it can be used by the International Civil Aviation Organization alongside other operational information that is also expressed in XML. The approach being taken is to align the underpinning logical data model of the WMO's Table Driven Code Forms that are used for operational weather forecasting with the structures of O&M, so that it is possible to transform data into the most relevant format for the application.