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**DATA EXCHANGE AND THE WMO INFORMATION SYSTEM VERSION 2.0**

**(provided by WMO)**

**DATA EXCHANGE AND THE WMO INFORMATION SYSTEM (WIS) WIS 2.0**

The WMO Global Telecommunication System (GTS) maintains a continuous real-time exchange of data, providing observations to the global Numerical Weather Prediction (NWP) centers, and disseminating processed observations and NWP products to National Meteorological Services (NHMSs). The WMO Information System (WIS) was implemented to enhance the GTS by providing Web based discovery and data pull capabilities. However, with the move to an Earth System approach, and with increasing volumes of data across the different domains, the GTS and WIS are increasingly limited. For example, due to the use of message switching systems and routing tables in the GTS, the routing tables become ever more complex and difficult to maintain with each addition of new data types. With the ever increasing variety and volume of data the GTS architecture is unsustainable.

To address the limitations of the GTS, the WIS is undergoing an evolution, both to overcome the known limitations but also to meet the requirements of the new WMO Unified Data Policy and the implementation of the WMO Global Basic and Regional Basic Observing Networks (GBON and RBON). The new Version WIS 2.0 of WIS will be based on open standards and use the public communications infrastructure such as the World Wide Web. The main components of the WIS2.0 are:

* WIS2 node (data publisher)
* WIS2 Global Broker
* WIS2 Global Cache
* WIS2 Global Discovery Catalogue
* WIS2 Global Monitoring

The WIS2nodes (data publishers) manage, curate and provide access to one or more datasets. For each dataset, a publisher provides:

1. Discovery metadata
2. An API end point or Web-service to access (or interact with) the dataset
3. Notification messages advertising the availability of new data and metadata.

The WIS2.0 Global Broker(s) provide a high availability messaging service. The global brokers subscribe to the WIS2 nodes to receive updates when new data and metadata become available. These messages are then republished to the subscribed Global Caches who in turn download and cache the data. Once cached the Global Caches publish a notification that the data are ready for access, with the notifications routed to users via the Global Brokers.

The WIS2.0 Global Cache(s), likewise, provide a high availability data caching and download service. As noted above, on receipt of a message from a Global Broker the Global Cache will download a copy of the data via the Publishers web-service or API. Access to the cached data is then made available to users via high-availability and high-bandwidth services.

The WIS2.0 Global Discovery Catalogue(s) maintain, and make available, searchable catalogues of all the WIS2.0 discovery metadata for the datasets made available by the Publishers. This includes the facility to manually search and download data using the catalogue as well as the facility to automate the task and to use machine-based software agents. The catalogue entries will include links to subscription based services to receive updates as well as to links to the datasets for non real time access.

The design of the WIS2.0 architecture is intended to reduce the burden of managing data subscriptions and data access on the data producer, instead shifting the load to a few large scale, high availability services. At the same time, the benefits of the publication / subscription data exchange model are maintained, with the additional step via the global services adding only minimal latency compared to direct access. Access to data from Producers with limited bandwidth will be improved.

From an ocean data provider perspective the main requirements to exchange data on the WIS2.0 are:

* Registration as a WIS2 node
* Publication of WIS 2.0 discovery metadata (using the OGC-API Records standard), including selection of applicable data policy (WMO Core or WMO Recommended)
* Advertisement of the availability of new data via MQTT notifications
* Provision of a Web-service or API to give access to the data, both in real time and in delayed mode.

Further information on the WIS2.0 can be found on the WMO website at:

<https://community.wmo.int/en/activity-areas/wis/wis2-implementation>

A webinar on the WIS2.0 will also be hosted by the Global Ocean Observing System (GOOS) Observations Coordination Group (OCG) for the ocean observing community and given by the WMO Secretariat. Further information can be found via the link below:

<https://www.goosocean.org/index.php?option=com_oe&task=eventCalendar&ID=34&Itemid=131>