

WIGOS Data Quality Monitoring System (WDQMS)

The need for a data quality monitoring system



WMO OMM

World Meteorological Organization

Organisation météorologique mondiale

Credits to MSC and ECMWF

Purpose of Weather Observations

The overall purpose of taking weather observations is to provide weather and climate information in sufficient detail to meet the needs of many different users, including the safety and well being of the public.

Meteorological observations are important to so many activities, that several governmental and corporate organizations are involved in collecting them on a regular basis.



Observed data

Observed data is the foundation for all the products and services of a modern weather service.

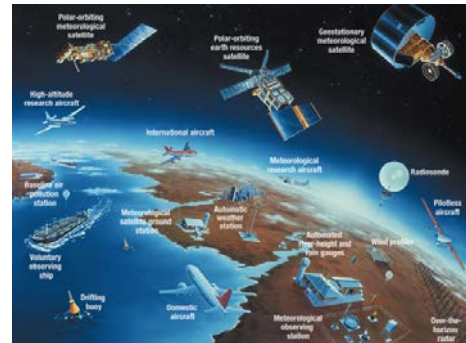
Observed data is used in an almost limitless number of ways:

- The data is used to describe what is present weather (example: the temperature is 20°C).
- The data can also be used to describe past weather and climate (climatology example: the normal temperature for this date using 30 years of records is 22°C).
- The data is raw input for use by humans and computers in numerical weather prediction.

Weather Observations and Forecasts

Meteorological observations are essential in preparing weather and climate forecasts. For the diagnosis and short-term prognosis of weather elements, meteorological personnel use:

- Surface observations
- Satellite observations
- Radar observations
- Upper air observations



From these observed data, computers produce near real-time weather analysis maps and apply physical laws and mathematical equations to develop forecast maps for various time frames. Forecasters use these computer generated products to produce alerts and forecasts for the public.

Meteorological networks

Considerable thought and effort is needed to design networks in order to ensure they can observe data in a manner consistent with intended uses. The overall goal is to ensure the observed data is:

- Accurate
- Representative
- Of known quality
- Comparable with the data obtained from other networks / countries.

The optimum geographical distribution of the network should be based on sound scientific principles. For many networks, detailed site analyses are needed to ensure instrumentation can be installed in accordance with national and international specifications. The instruments themselves must be sufficiently accurate to meet all requirements in a cost-effective manner.

Data Quality

To ensure that the data meets all needs, efforts are made to acquire, transmit, and archive observations with the greatest precision and consistency possible, taking into account the costs involved. Data must be as accurate as possible before it is used or archived. Observed data can be subject to errors due to:

- Human error
 - Misreading an instrument (example: thermometer readings).
 - Mistakes in transposition or data entry
- Sensor error
- Sensor failure
- Software issues in the processing, coding, or transmission of the data.

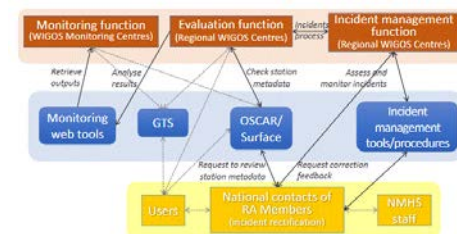
Various means are used to "quality assure" the data.

Near real-time monitoring - WDQMS

- WMO monitoring of conventional observations has been based on monthly reports produced by Lead Centres following the recommendations in Attachment II.9 of WMO Manual GDPFS (WMO, Manual on the GDPFS 2010) Global Data-processing and Forecasting System
- WMO has launched an initiative to modernise the monitoring of the surface-based component of WMO Integrated Global Observational System (WIGOS).
- The goal is to move towards a near-real-time (e.g. daily) monitoring of the status of the Global Observation System (GOS) in terms of data availability, timeliness and data quality, which would help WMO to take actions, namely reporting back to data providers to have the problem fixed in a timely manner ➔ **WIGOS Data Quality monitoring System (WDQMS)**



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Thank you

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