WMO Data Conference
Stakeholder Consultation Meeting #3

Satellite Data and WMO Data Policy:
Evolution of WMO Data Policy

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PART II

ARTICLE 2

PURPOSES

The purposes of the Organization shall be:

(a) To facilitate worldwide cooperation in the establishment of networks of stations for the making of meteorological observations as well as hydrological and other geophysical observations related to meteorology, and to promote the establishment and maintenance of centres charged with the provision of meteorological and related services;

(b) To promote the establishment and maintenance of systems for the rapid exchange of meteorological and related information;

(c) To promote standardization of meteorological and related observations and to ensure the uniform publication of observations and statistics;

(d) To further the application of meteorology to aviation, shipping, water problems, agriculture and other human activities;

(e) To promote activities in operational hydrology and to further close cooperation between Meteorological and Hydrological Services; and

(f) To encourage research and training in meteorology and, as appropriate, in related fields and to assist in coordinating the international aspects of such research and training.
Resolution-40
Meteorological and related data
12th WMO Congress in 1995

Resolution-25
Hydrological data and products
13th WMO Congress in 1999

Resolution-60
Climate data and products
17th WMO Congress in 2015
ADOPTS the following policy on the international exchange of meteorological and related data and products:

As a fundamental principle of the World Meteorological Organization (WMO), and in consonance with the expanding requirements for its scientific and technical expertise, WMO commits itself to broadening and enhancing the free and unrestricted international exchange of meteorological and related data and products;

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1 “Free and unrestricted” means non-discriminatory and without charge [Resolution 23 (EC-XLII) – Guidelines on international aspects of provision of basic and special meteorological services]. “Without charge”, in the context of this resolution means at no more than the cost of reproduction and delivery, without charge for the data and products themselves.
Annex 1 to Resolution 40 (Cg-XII)

Data and Products to Be Exchanged Without Charge and With No Conditions on Use

**Purpose**
The purpose of this listing of meteorological and related data and products is to identify a minimum set of data and products which are essential to support WMO Programmes and which Members shall exchange without charge and with no conditions on use. The meteorological and related data and products which are essential to support WMO Programmes include, in general, the data from the RBSNs and as many data as possible that will assist in defining the state of the atmosphere at least on a scale of the order of 200 km in the horizontal and six to 12 hours in time.

**Contents**

1. Six-hourly surface synoptic data from RBSNs, e.g. data in SYNOP, BUFR or other general purpose WMO Code;
2. All available *in situ* observations from the marine environment, e.g. data in SHIP, BUOY, BATHY, TESAC codes, etc.;
3. All available aircraft reports, e.g. data in AMDAR, AIREP codes, etc.;
4. All available data from upper air sounding networks, e.g. data in TEMP, PILOT, TEMP SHIP, PILOT SHIP codes, etc.;
5. All reports from the network of stations recommended by the regional associations as necessary to provide a good representation of climate, e.g. data in CLIMAT/CLIMAT TEMP and CLIMAT SHIP/CLIMAT TEMP SHIP codes, etc.;
6. Products distributed by WMCs and RSMCs to meet their WMO obligations;
7. Severe weather warnings and advisories for the protection of life and property targeted upon end-users;
8. Those data and products from operational meteorological satellites that are agreed between WMO and satellite operators. (These should include data and products necessary for operations regarding severe weather warnings and tropical cyclone warnings).
## Purpose
The purpose of this listing of meteorological and related data and products is to identify a minimum set of data and products which are essential to support WMO Programmes and which Members shall exchange without charge and with no conditions on use. The meteorological and related data and products which WMO Programmes include, in general, are daily and as many data as possible of the state of the atmosphere at or near the Earth’s surface and at severer altitudes up to 200 km in the horizontal and vertical dimensions.

### Contents
1. Six-hourly surface synoptic data, e.g. data in SYNOP, BUFR or other general purpose WMO Code;
2. All available *in situ* observations from the marine environment, e.g. data in SHIP, BUOY, BATHY, TESAC codes, etc.;
3. All available aircraft reports, e.g. data in AMDAR, AIREP codes, etc.;
4. All available data from upper air sounding networks, e.g. data in TEMP, PILOT, TEMP SHIP, PILOT SHIP, etc.;
5. The space-based network of stations recommended by the WMO for the determination of climate, e.g. data in CLIMAT and CLIMAT SHIP/CLIMAT PATH codes;
6. All data generated by CC-WSN stations of WMO associations as necessary to support WMO associations, satisfied WMO obligations, CC-WSN, and RSMCs and RSMCs to meet their WMO obligations;
7. Severe weather warnings and advisories for the protection of life and property targeted upon end-users;
8. Those data and products from operational meteorological satellites that are agreed between WMO and satellite operators. (These should include data and products necessary for operations regarding severe weather warnings and tropical cyclone warnings).
Data Challenges – there are a few .....
Pathway to here

Panel discussions
• Recognising the Annex as out of date
• Reluctance to open the Annex

Recommendations to EC-71
• Recognising that Res 40 not fit-for-purpose
• Recommending a review of Resolution 40

Study Group on Data Issues and Policies

New WMO Data Resolution

GBON

Critical Satellite Data

CBS-Led Review – Emerging Data Issues

GBON

SOFF

CGMS Baseline
Approach for definition of Basic (Critical) Satellite Data (BSD) for NWP
Background

• New WMO Data Policy (3to1) will give high level definitions and guidelines e.g. for
  – Weather, Climate, Hydrology, Atmospheric Composition, Cryosphere, oceans, Space Weather

• Weather and Space-based Observations
  – All satellite data considered as essential for the performance and quality of numerical weather prediction output as reflected in the CGMS Baseline, subsequently adopted into the WMO Technical Regulations.
  – All data provided by the multi-purpose visible-infrared meteorological imagers flying the low-earth or geostationary orbit.

• Approach
  – Follows WIGOS 2040 Vision
  – Earth System Modelling => NWP is core for WMO application areas
  – Can be seen as the satellite equivalent to GBON => harmonisation of terminology
  – Complementary to GBON and building on the Rolling Review of Requirements
  – It is a formulation of the user needs
WIGOS 2040 Space-based component

- Describes the space- and surface based observing networks we desire to operate by 2040
- The space-based component consists of four subcomponents:
  1. Backbone system with specified orbital configuration and measurement approaches
  2. Backbone system with open orbit configuration and flexibility to optimize the implementation
  3. Operational pathfinders, and technology and science demonstrators
  4. Additional capabilities (e.g. contributions by commercial operators)

See https://community.wmo.int/vision2040
Implementation of WIGOS Vision 2040

• WMO welcomes updated CGMS baseline and CGMS commitments towards the implementation of the Vision for WIGOS in 2040

• However, this does not cover all key aspects for comprehensive Earth-System modelling, hence CEOS support is also required
Guiding Principles or Requirements

1. Make available globally all basic satellite data in real time or near real-time
2. Document instrument characteristics and processing steps
3. Engage with users and document potential impact on applications
4. Document algorithms and information to support validation (indication of maturity)
5. Provide information on data latency, data format, processing tools available
6. Provide timely pre-validated data to users
7. Provide unrestricted access to archived data
8. Plan for sustained data provision
Process

1. Introduce the approach and the BSD to the NWP community to ensure consensus at this stage.
   - GODEX-NWP has been requested to review
   - Engage with the NWP community via the NWP impact workshop
   - Including review by JET-EOSDE

2. Achieve initial feedback and preliminary endorsement from the Space Agencies, this initiated at the Space Agency Consultation workshop
   - Followed up bilaterally with the key Agencies as necessary
   - In parallel engaging with CGMS WG II and III
   - Including review by ET-SSU to be consolidated at meeting 1 December 2020

3. Present the this process to INFCOM-I Part II in November 2020

4. Present status and initial Position Paper on Basic Satellite Data at WMO Data Conference

5. Consolidate by early next year and provide BSD to INFCOM-1 Part III and EC-73 for endorsement

6. Present Position Paper to 49th CGMS Plenary late spring 2021 for endorsement
   - Update the CGMS baseline as required


8. to request the Standing Committee on Earth Observing Systems and Monitoring Networks (SC-ON) to take into account the new Position Paper and the associated updated CGMS Baseline for the revised WIGOS Manual for endorsement by the Extraordinary Congress in 2021.
An example

<table>
<thead>
<tr>
<th>Type of satellite sensors</th>
<th>Principal applications driving spatial-temporal requirements</th>
<th>Main attributes of satellite data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data from geostationary orbiting satellites (complete GEO ring with app 60 deg spacing)</td>
<td>GEO imagery Nowcasting, NWP</td>
<td>Radiance products, atmospheric motion vectors</td>
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<tr>
<td>GEO imagery</td>
<td>Nowcasting, NWP</td>
<td>Radiance products</td>
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<td>GEO sounding channels</td>
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<td>Radiance products</td>
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<tr>
<td>Data from Low-Earth orbiting satellites</td>
<td>Operational LEO VIS-IR imagery</td>
<td>Imagery from 3 sun-synchronous orbits, Atmospheric Motion Vectors</td>
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<td>Nowcasting, Ocean applications, Agricultural meteorology, NWP</td>
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<tr>
<td>LEO IR sounding data</td>
<td>Global NWP</td>
<td>Radiances from 3 sun-synchronous orbits</td>
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<tr>
<td>LEO MW sounding</td>
<td>Global NWP</td>
<td>Radiances from 3 sun-synchronous orbits</td>
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<tr>
<td>And more e.g. LEO MW Imagery, Precipitation Radar, scatterometry, RO,...</td>
<td>Global NWP</td>
<td></td>
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</tbody>
</table>
Thank you

Merci

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World Meteorological Organization
Organisation météorologique mondiale