

**WMO OMM**

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Organisation météorologique mondiale
Organización Meteorológica Mundial
Всемирная метеорологическая организация
المنظمة العالمية للأرصاد الجوية
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Annex: 1

Subject: Amendments to the *Manual on the WMO Integrated Global Observing System* (WMO-No. 1160), 3.2.2 Global Basic Observing Network

Action required: To provide the WMO Secretariat with your feedback on the draft document by **17 September 2021**

Dear Sir/Madam,

In 2019, the World Meteorological Congress at its eighteenth session (Cg-18) adopted [Resolution 34 \(Cg-18\)](#) – Global Basic Observing Network, which initiated the design of a Global Basic Observing Network (GBON) to better meet the current and future observational requirements for global numerical weather prediction and climate reanalysis.

The Congress requested that the Commission for Observation, Infrastructure and Information Systems (INFCOM) draft the corresponding provisions of the *Manual on the WMO Integrated Global Observing System* (WMO-No. 1160) relating to the implementation of the Global Basic Observing Network in order to clarify the international requirements for the exchange of observations and the respective obligations of Members in this regard.

In accordance with Resolution 34 (Cg-18), the amendments to the *Manual on the WMO Integrated Global Observing System*, section 3.2.2 Global Basic Observing Network, have been developed by INFCOM and were endorsed by the Executive Council at its seventy-third session (EC-73) (14–25 June 2021). The Executive Council recommended that the amendments to the *Manual on the WMO Integrated Global Observing System*, section 3.2.2 be adopted by the Extraordinary Session of the World Meteorological Congress in 2021 (Cg-Ext(2021)), with effect from 1 January 2023, as explained in [EC-73/Doc. 4.2\(2\)](#), available in [PROVISIONAL REPORT \(Approved documents\)](#) page of the [EC-73 session website](#).

The draft GBON provisions provided in the annex to Draft Resolution 4.2(2)/1 (EC-73) are reproduced in the [annex](#) to this letter for easy reference.

The purpose of this letter is to make you aware that the draft GBON provisions are now open for comments in accordance with the [General Provisions of the Technical Regulations](#) (WMO-No. 49), Volume I, which state that any amendments to the *Technical Regulations* submitted by Members or by constituent bodies should be communicated to all Members at least three months before they are submitted to Congress.

To: Permanent Representatives of Members with WMO

cc: Hydrological Advisers

You are kindly invited to provide your comments on or edits to the draft GBON provisions (amending the document with the Track Changes feature active) to the WMO Secretariat: Anthony Rea, Director, Infrastructure Department (area@wmo.int), with a copy to Lars Peter Riishojgaard, Director, Earth System Branch, Infrastructure Department (Iriishojgaard@wmo.int) and Igor Zahumensky, Scientific Officer (izahumensky@wmo.int) at your earliest convenience, but not later than **17 September 2021**. This timeline will allow the relevant individuals to review and to incorporate, as appropriate, modifications to the draft GBON provisions proposed by Members during this review period prior to Cg-Ext(2021) as requested by EC-73.

Given the technical content of the document, you may wish to call on relevant experts in your country to assist you in the review. If you do so, before your experts start the review, they are strongly encouraged to familiarize themselves with the [Introduction to the Manual](#), which explains purpose and scope of the Manual, and with the [General Provisions of the Manual](#), which provide explanatory material on the overall architecture and purpose of the *Technical Regulations* and an explanation of various types of Regulations included in the *Technical Regulations*. EC-73 approved the draft amendments to the [Manual on the WMO Integrated Global Observing System](#), which can be found on the [PROVISIONAL REPORT \(Approved documents\)](#) page of the [EC-73 session website](#).

I would like to thank you for your important contribution to this review. Should you or your experts require additional information or clarification about this process, please do not hesitate to contact the WMO Secretariat contacts listed above.

Yours faithfully,



Dr Wenjian Zhang
for the Secretary-General

Annex to draft Recommendation 4.2(2)/1 (EC-73)

3. ATTRIBUTES SPECIFIC TO THE SURFACE-BASED SUBSYSTEM OF WIGOS**3.2.2 Global Basic Observing Network**

~~Note: This section will be developed on the basis of Resolution 34 (Cg-18) Global Basic Observing Network.~~

3.2.2.1 The Global Basic Observing Network (GBON) shall be a subset of the surface-based subsystem of WIGOS, used in combination with the space-based subsystem and other surface-based observing systems of WIGOS, to contribute to meeting the requirements of Global NWP, including reanalysis in support of climate monitoring.

3.2.2.2 Members shall establish and manage the GBON.

Notes:

1. Global NWP provides an essential backbone for all products and services provided by all WMO Members. The geographically relevant component of the GBON provides an essential base component within each Regional Basic Observing Network (see 3.2.3 below).
2. GBON is based on a global design and the implementation is monitored globally.
3. GBON is designed to respond primarily to those Global NWP requirements that are currently not met, or fully met, by space-based systems.
4. The specification for GBON is laid out in provisions 3.2.2.7 - 3.2.2.20. These are derived from the observational requirements for Global NWP that are recorded in the OSCAR/Requirements database together with an analysis of the operational technologies for collecting such observations and availability of observations from other sources. The technical assessment is conducted for the World Meteorological Congress by the Commission for Observation, Infrastructure and Information Systems (INFCOM).
5. The list of GBON stations/platforms is drawn from the list of all available stations/platforms in the WIGOS as registered in OSCAR/Surface by the Members. The identification of the subset to be proposed for GBON designation is based on the specification of GBON listed below. The list of GBON stations/platforms is elaborated in collaboration between the Members and INFCOM.

3.2.2.3 Members shall maintain the continuous operation of those stations/platforms that are designated as contributors to GBON.

Note: The designation process is defined in 3.2.2.22-3.2.2.23 below and further detailed in the *Guide to the WMO Integrated Global Observing System* (WMO-No. 1165).

3.2.2.4 Members shall strive to design, install, manage, and operate stations within their networks in an environmentally sustainable fashion.

3.2.2.5 Members shall make available internationally through WIS all GBON observations in real time or near-real time according to the overall WMO data policy.

3.2.2.6 If a Member finds that the horizontal resolution required according to one or more of provisions 3.2.2.7 - 3.2.2.18 is not practically achievable for the observing network within parts of their territory, e.g. in uninhabited and remote areas, the Member shall inform the Secretary-General of the reasons as per Article 9(b) of the WMO Convention, and paragraph 6 of "GENERAL PROVISIONS".

3.2.2.7 Members shall maintain the continuous operation of a set of surface land observing stations/platforms that observe, at a minimum, atmospheric pressure, air temperature, humidity, horizontal wind, precipitation and snow depth.

located such that the GBON has a horizontal resolution of 200 kilometres or higher for all of these variables, with an hourly frequency.

Notes:

1. The precipitation observation means an hourly accumulation.
2. The *Guide to Instruments and Methods of Observation* (WMO-No. 8), Volume II provides details on measurement of snow.
3. A horizontal resolution of 200 km or higher means that stations/platform are spaced not more than 200 km apart on average.
4. Many manual stations/platforms observe less frequently than hourly; these nevertheless provide a valuable contribution to the GBON.
5. The provisions do not imply that every station/platform must measure all the variables listed, but that the network as a whole delivers observations at the required horizontal resolution for all the variables.

3.2.2.8 Members should operate surface land observing networks/platforms at horizontal resolutions of 100 km or higher.

3.2.2.9 Where Members operate networks as described in 3.2.2.7 and 3.2.2.8, Members shall make the observations of these networks available internationally according to 3.2.2.5.

3.2.2.10 Members shall maintain the continuous operation of a set of surface marine meteorological observing stations/platforms within their Exclusive Economic Zone that observe, at a minimum, atmospheric pressure and sea surface temperature located such that where opportunity exists, GBON has a horizontal resolution of 500 kilometres or higher, over the marine areas of their jurisdictions, for these variables, with an hourly frequency.

Note: For Small Island Developing States where the surface area of the Exclusive Economic Zone is significantly larger than the land surface area, the provision applies to the entirety of the area of observing responsibility.

3.2.2.11 Members should facilitate other Members to make surface marine meteorological observations within their Exclusive Economic Zone, subject to the data being shared internationally according to 3.2.2.5.

3.2.2.12 Members shall maintain the continuous operation of a set of upper-air stations/platforms over land that observe, at a minimum, temperature, humidity and horizontal wind, with a vertical resolution of 100 m or higher, twice a day or better, up to a level of 30 hPa or higher, located such that GBON has a horizontal resolution of 500 kilometres or higher for these observations.

Notes:

1. Radiosonde systems currently provide the primary means for collecting such observations.
2. A vertical resolution of 100 m or higher means that observations are spaced and reported not more than 100 m apart in the vertical on average.
3. Upper-air observations obtained over remote/isolated islands have particularly high impact on Global NWP skill, and continued operation of these stations/platforms are of high priority for GBON.

3.2.2.13 Members should operate networks of upper air stations/platforms providing horizontal resolutions of 200 km or higher.

3.2.2.14 Members should operate a subset of the selected GBON upper-air observing stations/platforms that observe temperature, humidity and horizontal wind up to 10 hPa or

higher, at least once per day, located such that, where geographical constraints allow, GBON has a horizontal resolution of 1000 kilometres or higher, for these observations.

3.2.2.15 Members shall operate a set of upper-air stations/platforms that observe temperature, humidity and horizontal wind, with a vertical resolution of 100 m or higher, twice a day or better, up to 30 hPa or higher, located such that, where opportunity exists, GBON has a horizontal resolution of 1000 kilometres or higher over the marine areas of their jurisdictions, for all these observations.

Note: For Small Island Developing States where the surface area of the Exclusive Economic Zone is significantly larger than the land surface area, this provision applies to the entirety of the area of observing responsibility.

3.2.2.16 Where networks described in 3.2.2.13 – 15 are operated, 3.2.2.5 shall apply.

3.2.2.17 Members should make available aircraft meteorological observations of temperature, humidity (where available) and horizontal wind from aircraft ascents and descents, with 300 m or higher vertical resolution with a temporal frequency of at least hourly.

3.2.2.18 Members should make available aircraft meteorological observations of temperature, humidity (where available) and horizontal wind, with a horizontal resolution of 100 kilometres or higher, while at level flight.

3.2.2.19 Members should make available hourly remote sensing profiler observations of temperature (where available), humidity (where available) and horizontal wind with a vertical resolution of 100 m or higher.

3.2.2.20 Members operating observing networks/platforms at higher density than specified above under the provisions 3.2.2.7 - 3.2.2.19 should make available what is observed at least hourly.

Note: 15 kilometres is the current goal of global NWP requirements.

3.2.2.21 Members shall make available the metadata of their GBON observing stations/platforms in accordance with the provisions of section 2.5.

3.2.2.22 Each Member shall designate at a minimum the required number of surface stations and the required number of upper air stations as per 3.2.2.7-3.2.2.10 and 3.2.2.12-3.2.2.16 as their contribution to GBON.

Notes:

1. The INFCOM will undertake an initial GBON implementation analysis that will provide, for each Member, the number of surface stations and the number of upper air stations that are required for the Member to meet their obligations under 3.2.2.7-3.2.2.10 and 3.2.2.12-3.2.2.16.
2. For each Member, the INFCOM will review their designated contribution as per 3.2.2.21 and assess whether it meets the requirements specified in 3.2.2.7-3.2.2.10 and 3.2.2.12-3.2.2.16, and will inform the Member in writing of its findings.
3. See Note 3 below 3.2.2.12.

3.2.2.23 Members shall register the stations in OSCAR/Surface and identify that these stations belong to the GBON.

3.2.2.24 Members shall routinely monitor GBON performance across the network to identify non-conformance with the designed performance.

Note: Guidance on data quality monitoring, evaluation and incident management is detailed in the *Guide to the WMO Integrated Global Observing System* (WMO-No. 1165), Chapter 8.

3.2.2.25 Members shall acknowledge, document and rectify any identified non-conformance at one of their stations/platforms within time frames agreed by the WMO Executive Council or the World Meteorological Congress.

*Note: Details on relevant time frames and processes are provided in the *Guide to the WMO Integrated Global Observing System* (WMO-No. 1165).*

3.2.2.26 Members shall formally notify the Secretary-General, at least three months in advance, of their plan to discontinue the operation of their stations/platforms.