

WORLD METEOROLOGICAL ORGANIZATION

**Further development of the WMO mechanism for
recognising long-term observing stations**

12-14 November 2019

Hong Kong, China

FINAL REPORT



1. Opening

The meeting was opened at 10 a.m. on Tuesday, 12 November 2019. The Director of the Hong Kong Observatory (HKO), Mr CM Shun, warmly welcomed meeting participants at HKO.

Mr Peer Hechler, Scientific Officer, Climate and Water Department, WMO Secretariat welcomed participants on behalf of the Secretary-General; he highlighted the importance of long-term observations and the appreciation of Members for the implementation of the WMO recognition mechanism for long-term observing stations (further referred to as ‘the mechanism’). Mr Hechler expressed his gratitude to HKO, its Director and staff for hosting this meeting.

Mr TC Lee, representative of HKO to the meeting, welcomed the participants and reflected on the importance for the HKO Headquarters to be recognised as WMO centennial observing station.

Meeting participants introduced themselves during a *tour de table*.

2. Organisation of the meeting

Participants agreed to run the meeting collectively. The agenda for the meeting (see Annex 1) was adopted with no revisions. The meeting agreed on its hours of work and other practical arrangements. The list of participants is presented in Annex 2.

Meeting presentations, documents and references can be accessed here: <https://public.wmo.int/en/events/meetings/further-development-of-wmo-mechanism-recognizing-long-term-observing-stations>

Meeting outcomes will be reflected on WMO’s centennial observing stations website: <https://public.wmo.int/en/our-mandate/what-we-do/observations/centennial-observing-stations>

3. WMO centennial stations initiative: Status and lessons learnt

Mr Hechler presented the current status of the mechanism with 140 recognised observing stations from 47 countries covering all continents. He also addressed some lessons learnt to be discussed later in the meeting.

Mr Lee presented the history of HKO with a special focus on its long-term observations followed by a tour through the observatory including the centennial observing site.

A brief discussion addressed the current WMO reform and potential implications. Mr Hechler referred to Resolution 23 (Cg-18) that paves the way for the mechanism.

4. Detailed review of the recognition criteria

Ms Maria Carmen Beltrano discussed the results of a survey among Italian recognised centennial stations, most of which do not operate under the Italian National Meteorological Service.

Participants reviewed the recognition criteria including the self-assessment template in detail. Suggested amendments to and modifications of the criteria are provided in Annex 3.

The following aspects were raised during the discussion:

- The importance and success of the mechanism is closely linked to the availability of the centennial stations' observational data and metadata. The meeting addressed this linkage by i) recommending a new mandatory criterion number 10 (see Annex 3) and ii) requesting station operators to assign a WIGOS Station Identifier and provide station minimum metadata according to criterion 3 (see Annex 3) in OSCAR prior to the submission of candidate stations. These substantial modifications of the recognition criteria will be tabled at EC-72 (2020) for endorsement.
- Subject to EC approval, operators of already recognized centennial stations will be informed of the modifications that will be applied for the routine re-assessments of the station recognition every ten years.

The meeting also suggested amending the aims of the mechanism by incorporating data quality (amendment highlighted in **bold**):

- To raise awareness of existing long-term observations and its importance;
- To help maintaining long-term observing sites;
- To promote standards and good practices for sustainable meteorological observations, **thereby facilitating improved data quality**;
- To encourage data rescue and sharing of long-term time series data and its use for climate variability and change analyses.

Eventually, participants noted the inclusion of the upcoming WMO publication on 'Measurement Quality Classifications for Surface Observing Stations on Land' as a reference to criterion 7 (see Annex 3).

5. Improving the recognition process

The meeting discussed the current recognition process and agreed on the following aspects:

- The current process performs very well
- Improved timing of the issuance of the WMO call for candidate stations and streamlined recognition criteria (see Annex 3) will lead to a shorter time period between WMO call release and endorsement of successful candidate stations by EC or World

Meteorological Congress (WMO call issuance by end of year, deadline for nominations: mid-February, Advisory Board assessment throughout March, EC or Cg document drafting in April, EC or Cg decision in May/June)

- The Advisory Board can handle around 100 station nominations per year under the current resource scheme
- The meeting suggests to handle 75+ (and perhaps 50+) years observing stations recognitions voluntarily under national schemes, using slightly adapted recognition criteria. Recognition documentation should be signed by the Permanent Representative with WMO. The Advisory Board will make relevant guidance available to Members.
- Meeting participants noted a well-balanced representation of expertise within the current Advisory Board
- It is suggested to continue with the current Advisory Board membership and adapt member affiliations and ToR according to WMO reform implementation.

6. Adapting the recognition mechanism to hydrological and marine observing sites

Messrs Joel Cabrie and Jianqing Yang discussed prospects of recognition of long-term marine and hydrological observations, respectively. Meeting discussions revealed excellent prospects for tide gauge and moored buoys observations as well as discharge and water level observations. Messrs Cabrie and Yang will facilitate discussions within their communities with the aim of drafting recognition mechanisms and criteria for marine and hydrological long-term observing sites based on the existing mechanism and criteria. Meeting participants suggested broadening the Advisory Board ToR and composition in the future to allow for assessments of marine and hydrological candidate sites by Advisory Board sub-groups with the aim of joint proposals for long-term (centennial) station/site recognition for endorsement by EC or Congress.

7. Broader aspects of the centennial stations initiative

Participants discussed various aspects around the current centennial stations initiative of which the following are highlighted below:

- Consider color-coding current centennial observing stations according to their data availability status on the WMO centennial stations website. Global data centres are expected to have an interest in monitoring data availability from centennial observing stations due to their uniqueness.
- A couple of editorial suggestions have been made to improve the WMO centennial stations website. Also, a general update is needed to reflect the WMO reform implications.
- There are advantages and disadvantages attached for station operators to a potential UNESCO World Heritage recognition of centennial observing stations. Current statutes of UNESCO allow for national site nominations only. Meeting participants agreed to support relevant national initiatives by providing scientific value assessments.

- Meeting participants highlighted the importance of OSCAR as the single metadata repository for centennial observing stations and highly welcomed the inclusion of a centennial stations sub-category in OSCAR. Centennial station operators will be requested to populate OSCAR.
- Various means of communication have been discussed to promote the WMO centennial stations initiative within and beyond the NMHS community including WMO Bulletin, conferences and meetings, WMO Statement on the Status of the Global Climate etc.
- The meeting discussed and confirmed the applicability of the current mechanism to centennial upper air observations and agreed to mention this aspect explicitly in the next WMO call for candidate stations.

8. Recommendations and conclusions, next steps

Meeting recommendations and conclusions according to the above paragraphs have been summarised on a daily basis by Mr Hechler. A third call for centennial station nominations will be issued by the end of 2019 largely based on the current recognition criteria with editorial updates and clarifications. Substantial changes to the recognition criteria will be tabled at EC-72 for future implementation. Proposals for marine and hydrological station/site recognition mechanisms will be tabled upon availability to the next EC or Congress session.

9. Any other business

Mr Bruce Hartley highlighted the importance of the centennial stations initiative to attract data rescue resources.

10. Closure

Mr Hechler thanked all participants for their active engagement and noted that the meeting aims and goals have been achieved. He also expressed warm thanks to the Director of HKO, Mr CM Shun, Mr Lee and HKO staff for their excellent hospitality. Mr Lee thanked the participants for travelling to Hong Kong, China and holding the meeting at HKO premises.

The meeting was closed on Thursday, 14 November at 2:32 p.m.

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Agenda

1. Opening
2. Organisation of the meeting
3. WMO centennial stations initiative: Status and lessons learnt
4. Detailed review of the recognition criteria
5. Improving the recognition process
6. Adapting the recognition mechanism to hydrological and marine observing sites
7. Broader aspects of the centennial stations initiative
8. Recommendations and conclusions, next steps
9. Any other Business
10. Closure

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Hong Kong, China, 12-14 November 2019

LIST OF PARTICIPANTS

Mr Joel Cabrie

Australian Bureau of Meteorology
GPO Box 1289
VIC 3001 Melbourne
Australia
Tel: +613 9669 4651
E-mail: joel.cabrie@bom.gov.au

Ms Maria Carmen Beltrano

Via Alfredo Berasini N.24
Olevano Romano
Italy
Tel: +39 339 3676443
E-mail: mariacarmen.beltrano55@gmail.com

Mr Timothy Oakley

Met Office
FitzRoy Road
EX1 3PB Exeter
United Kingdom
Tel.: +44 7467338780
E-mail : tim.oakley@metoffice.gov.uk

Mr Tsz-cheung Lee

Hong Kong Observatory
134A Nathan Road
Kowloon
Hong Kong, China
Tel.: +852 2926 8360
E-mail : tclee@hko.gov.hk

Mr Jianqing Yang

Ministry of Water Resource
2 Lane 2, Baiguang Road
Xicheng District
Beijing
China
Tel: +86 13811986055
E-mail: jianqing.yang@mwr.gov.cn

Mr Bruce Hartley

Meteorological Service of New Zealand
30 Salamanca Road, Kelburn
Wellington
New Zealand
Tel.: +64 4 4700700
E-mail : bruce.hartley@metSERVICE.com

Mr Ezekiel Hausfather

University of California, Berkeley
102 Baker St Apt B
San Francisco
USA
Tel.: +1 917 520 9601
E-mail : hausfath@gmail.com

WMO SECRETARIAT

**World Meteorological Organization
7bis, avenue de la Paix
Case postale 2300
1211 Geneva 2 Switzerland**

Mr Peer Hechler

Scientific Officer
Data Management Applications Division
(DMA)
Climate and Water Department (CLW)
Tel.: +41 22 730 8224
E-mail: phechler@wmo.int

Consolidated recognition criteria (amendments and modifications in purple)
WMO centennial observing stations - Criteria self-assessment template

Important notes:

- Station operators are encouraged to **provide sufficient information in the ‘References/Remarks’ column** to facilitate the assessment by the Advisory Board. Station operators are encouraged to attach additional documentation and photos to be made available publicly, however, this additional information is not core to the assessment.
- Information in the self-assessment template **MUST BE TYPED** (handwritten information cannot be processed).
- Station operators are invited to consider **filling the template in English language** in order to accelerate the recognition assessment.
- The correctness of the **information provided in the template is under the sole responsibility of the station/network operator**. The Advisory Board performs its assessment based on the completed template considering additional global information. The information provided by the station operator in the template **will be made available publicly for user review**.
- Station operators **shall assign a WIGOS Station Identifier** to all nominated stations **and populate OSCAR with the minimum station metadata** according to criterion 3 below.

1. Current Station Information

Station name		
Start of observations (year)		
WMO Station Code (if available) ; WIGOS Station Identifier and other current station identifiers, where available		
Station latitude and longitude¹		
Station elevation¹ (meter above MSL)		
Country/Place		
WMO Region		
Institution		
Name of contact person		Email address

¹ Cf. Guide to Instruments and Methods of Observation (WMO-No. 8) – *Coordinates of the station*

2. Mandatory criteria

Criteria	Compliance (Yes/No)	References/Remark
1.The observing station was founded at least 100 years ago, observing at least one meteorological element since then, and is in operation as an observing station at the date of nomination.		
2.Periods of inactivity of the observing station shall not exceed 10 % during the last 100 years (excluding periods of armed conflicts and natural disasters).		
3.The minimum station metadata for the full duration of station operation shall contain actual or derived geographical coordinates including elevation, known changes of station name and/or station identifier, identified meteorological element(s) and its unit(s) as well as the observing schedule(s).		
4.The observing station has not been subject to known relocations, which have affected the climatological characteristics. Any known observing station relocation or change in the measurement technique have not significantly affected the climatological time-series data. <i>Note: Documented data homogenization for the observing station is considered compliant with criterion 4.</i>		
5.All historic observational data and metadata have been digitally archived or are rescued, or will be rescued in order to prevent them from deterioration of the medium (cf. Guidelines on Data Rescue). Members shall be requested to share information of the amount of data to be rescued including related their plans for data rescue, if applicable.		
6.The observing station shall be operated according to WMO observing standards according to the Manual on the WMO Integrated Global Observing System (WMO-No. 1160) and the Guide to Instruments and Methods of Observation (WMO-No. 8). <i>Note: Explanatory information shall should be provided for those centennial observing stations that do not meet current WMO observing standards for historic reasons, but have been measuring under unchanged conditions (e.g. cages on north facing building facades for temperature measurements etc) for more than one hundred years.</i>		
7.The current environment of a centennial observing the observing station has been shall be classified, or will be classified, according to the siting classification defined in the Guide to Instruments and Methods of Observation (WMO No. 8). Members shall be requested to share i) the metadata attached to results of the siting classification in the appropriate WMO Metadata repository (currently OSCAR ²) or ii) their plans to classify the observing station, if applicable for the nomination process and any future re-nomination.		
8.The observed and measured data shall be subject to routine quality control procedures according to as per current WMO guidelines and practices. The quality control processes as well as its results shall be well documented. <i>Note: A brief description of the routine quality procedures at the observing station shall be included in the References/Remarks column.</i>		
9.Members shall do their utmost to maintain nominated stations according to the above recognition criteria.		
10. Historic observation data and metadata have been made available for scientific research, consistent with Resolutions 40 (Cg-12) and 60 (Cg-17), or will be made available. Members shall share their plans for data availability, if applicable.		

² Observing Systems Capability Analysis and Review Tool, cf. oscar.wmo.int

3. Desirable criteria

Criteria	Compliance (Yes/No)	References/Remark
Free and unrestricted data access should be granted to the data including respective metadata. [definition cf. Resolution 40 (Cg-XII); http://www.wmo.int/pages/about/Resolution40_en.html]		
Observing station time series data should be subject to quality control.		
Observing station time series should be subject to homogeneity testing and homogenization, if applicable.		