|  |  |
| --- | --- |
| **World Meteorological Organization****Inter-Commission Coordination Group on WIGOS** **Eighth Session**Geneva, Switzerland, 24-26 January 2019 | **ICG-WIGOS-8/Doc 4.3(5)**  |
| Submitted by:TT-WMD/Secretariat18.01.2019**DRAFT 1** |

#

#

**4. STATUS OF THE PRIORITY AREAS IMPLEMENTATION OF THE PLAN FOR THE WIGOS PRE-OPERATIONAL PHASE (PWPP)**

**4.3(5) WIGOS Metadata**

|  |
| --- |
| **Summary and purpose of document**The document provides the status of the WIGOS Metadata implementation, as part of priority area No. 3 of the PWPP. |

**Action proposed**

The session will be invited to review the progress made, and particularly to advise on the Conclusions, Actions and Recommendations from the 7th session of the ICG-WIGOS Task Team on WIGOS Metadata (TT-WMD-7), as well as on how to proceed further in this priority area.

**References:**

\_\_\_\_\_\_\_\_\_\_\_\_

**4.3(5). WIGOS Metadata**

**4.3.1(5) Background**

According to the Plan for The WIGOS Pre-Operational Phase (PWPP) the third priority area is the “Further development of the WIGOS Information Resource (WIR), with special emphasis on the operational deployment of the OSCAR databases”.

The review and update of the WIGOS Metadata Standard (WMDS), which has been developed by the ICG-WIGOS Task Team on WIGOS Metadata (TT-WMD), is a critical activity as the OSCAR/Surface is a practical tool for the implementation of the WMDS that follows its structure and definitions. On the other hand the TT-WMD has also developed the WIGOS Metadata Representation (WMDR) which is a data model/XML schema based on the WMDS that allowed the development of a Machine-to-machine application for the exchange of WIGOS metadata with OSCAR/Surface. TT-WMD has also defined and populated code tables in support of the WMDS that are critical for the use of the Application Programming Interface (API).

**4.3.2(5) Progress achieved since ICG-WIGOS-7**

(a) New draft edition of the WMDS (WMO-No. 1192) with proposed changes to the obligations of metadata elements, as well as updates to some definitions and notes; Some of the proposed changes resulted from the feedback from various communities, from representatives of WMO Technical Commissions and Programmes in TT-WMD, as well as from the users community via the new ICG-WIGOS Task Team on OSCAR Development (TT-OD) that has worked closely with TT-WMD at their back-to-back (partially overlapping) sessions from 26-30 November 2018.

(b) Contributions to the new draft edition of the Manual on WIGOS (WMO-No. 1160) with some updates particularly to the Appendix 2.4 regarding the historical phased approach of the implementation.

(c) The further development and update of the WMDS code tables, most of which are now in a sufficient shape to be fully used and integrated into OSCAR/Surface, with the exception of the (longest) code table (1-01) that describes all the observed variables, which is under discussion for harmonization with the Inter-Programme Expert Team on Observing Systems Design and Evolution (IPET-OSDE).

(d) The further development and update of the WMDR to version 1.0 has been released in December 2018 – See document 4.3(1) for more details. The OSCAR/Surface API currently supports the release candidate 1.0RC9 that differs in a few details. The API will be updated to support both, version 1.0RC9 and version 1.0, as soon as the latter has been approved by CBS.

(e) Provided some recommendations to TT-OD on how to improve the implementation of the WMDS in OSCAR/Surface.

**4.3.3(5) Issues and challenges**

The TT-WMD has struggled with its membership, since some representatives have retired, stepped down or passed away, and were not replaced (JCOMM, AMDAR, CCl); On the other hand, the Task Team on WMDR, under the Inter-Programme Expert Team on Data Representation Development (IPET-DD-TT-WMDR) which is the team expected to develop and maintain the WMD schema, has not been active.

The lack of a reliable system for online cooperative and tracking of document versioning, has been a challenge for the last few years, e.g. for the evolution of the code tables. Finally, towards the end of 2018 GitHub was proposed, as a more suitable alternative to GoogleDocs and MyAlfresco, and agreed by TT-WMD-7 to be used for that purpose. Github is a widely used tool mainly in support of code development in distributed teams. The members of the various teams already mentioned, TT-WMD, IPET-DD-TT-WMDR and IPET-OSED, but also of the Inter-Programme Expert Team on Codes Maintenance (IPET-CM), will have to familiarize themselves with and use it for the evolution and maintenance of the WMDS and its code tables.

**4.3.4(5) Conclusions, Actions and Recommendations from TT-WMD-7**

Below is the full list of the conclusions, actions and recommendations from TT-WMD-7 (28-30 November 2018, Geneva, Switzerland), which are structured according to the order of its agenda items.

2. REPORT OF THE CO-CHAIRS

RECOMMENDATION for ICG-WIGOS: to review the ToRs and membership of TT-WMD, in terms of representativeness, particularly regarding the marine and the climate communities.

ACTION for TT-WMD: to review and to complete the WIGOS Metadata Standard (WMDS) Code Tables; The Secretariat and MeteoSwiss have recently started using GitHub to manage the changes to the WMDS code tables. INFORMATION POST TT-WMD-7: The EC-69 baseline of the code tables was released, which will facilitate greatly the approval process of the changes proposed since then.

RECOMMENDATION for Secretariat: to coordinate the review and completion of the list of observed variables (code table 1-01), as well as the list of methods of observation (5-02).

RECOMMENDATION for TT-OD: to discuss with the Norwegian Institute for Air Research (NILU), in coordination with the OSCAR/Surface Development Team, how to push metadata from NILU into OSCAR/Surface.

RECOMMENDATION for TT-OD: to assist in creating a scheme whereby WIGOS Station Identifiers can be mapped to Digital Object Identifiers (DOIs) to be minted and displayed by OSCAR/Surface, following requirements from some communities (GAW, GCW).

4. REPORTING/FEEDBACK FROM OTHER TEAMS/COMMUNITIES

4.1. Expert Teams/Task Teams

4.1.1. Task Team on WIGOS Station Identifiers (TT-WSI-1)

CONCLUSION: TT-WMD-7 reviewed the definitions of the WMDS obligations (Mandatory/Conditional/Optional) and agreed to keep them as they are.

ACTION for TT-WMD: to make it more explicit that “Mandatory and Conditional = *shall*” and that “Optional = *should*”, to become clear that optional elements are really important metadata in support of enabling adequate use of observations.

4.1.2. Task Team on OSCAR Development (TT-OD-1)

INFORMATION: Key messages from TT-OD for TT-WMD:

 - Users must be included as key stakeholders when agreeing improvements to the Standard;

 - Recommendations for easy to use templates for different stations/types;

 - OSCAR is the reference implementation of the WMDS, so close liaison between TT-OD and TT-WMD is essential in advising the OSCAR project teams;

RECOMMENDATION for Secretariat and for OSCAR/Surface Project Team: to update the Guide to WIGOS for consistency with the OSCAR/Surface “Users Guide” (the Guide to WIGOS can be updated by the Secretariat anytime).

RECOMMENDATION for TT-OD: the notion of quality and quality control of critical metadata in OSCAR/Surface should be made clear to users, e.g. as advise/warnings on the Website.

RECOMMENDATION for ICG-WIGOS: to keep both teams TT-OD and TT-WMD active and working together; Feedback from the OSCAR/Surface users comes via TT-OD and feedback from Commissions and Programmes comes via their representatives in TT-WMD.

4.2.2. Marine observations managed by JCOMMOPS

ACTION for TT-WMD: to draft a recommendation for the Guide to WIGOS that metadata generation should be part of the technical specifications for the procurement of marine observing equipment, in order to ensure that metadata is produced and exchanged operationally.

4.2.3. Weather Radar observations

RECOMMENDATION for TT-OD and Secretariat: to promote the increasing of registered radars and Members in the WMO Radar Database (WRD), for example, the OSCAR/Surface training events could be used for that.

RECOMMENDATIONS for TT-OD and OSCAR/Surface Development Team: to ensure consistency and uniqueness of the WIGOS Station Identifiers (WSI) registered in WRD and to test the XML API to transfer metadata from WRD into OSCAR/Surface.

4.2.4. Space-based observations

RECOMMENDATION for ICG-WIGOS: to discuss the evolution of OSCAR/Space with the Space programme and to communicate the plans for its maintenance and evolution – currently, there is a gap in the OSCAR/Space in terms of WMDS for satellite observations.

RECOMMENDATION for ICG-WIGOS: to have one team in charge of the maintenance and evolution of both OSCAR/Surface and OSCAR/Space to optimize the efforts for developing both systems and use the WMDS as their unique source of information.

4.2.5. GCW

CONCLUSION: The need to go through the PRs is an obstacle for the scientific community to provide metadata; TT-WMD recognized the benefit of GCW (and other communities) managing metadata directly.

ACTION for TT-WMD: to review the metadata obligations and related references in the Guide to WIGOS (Chapters on WIGOS Metadata and on WIGOS Data Partnerships), to check if additional guidance is needed for partners to insert metadata into OSCAR/Surface.

RECOMMENDATION for TT-OD: to develop the requirements for a tool to report on the completeness of metadata available in OSCAR against the WMDS, which is important to encourage increased adherence to WMDS.

RECOMMENDATION for ICG-WIGOS: the harmonization of vocabularies across various communities is desirable but very challenging and will take time and resources, so the priority should be on the coordination with WIS and other WMO teams in order to have clear definitions. ACTION for TT-WMD: to continue to engage with IPET-OSDE and IPET-CM and other relevant teams in harmonizing the lists of variables and other code tables.

CONCLUSION: the engagement with the science community should be done in small steps; The metadata provided to the GCW portal should be transferred to OSCAR/Surface using the API.

ACTION for SECRETARIAT: to assess the feasibility of GCW to provide metadata directly to OSCAR/Surface, to fully utilize its capabilities.

RECOMMENDATION for GCW/Polar groups: to invite WMO/WIGOS representatives to attend relevant GCW/Polar meetings, to improve collaboration and cooperation across communities.

4.2.6. GAW

CONCLUSION: The need to go through the PRs is an obstacle for the scientific community to provide metadata; TT-WMD recognized the benefit of GAW (and other communities) managing metadata directly.

INFORMATION: NextGEOSS project (Horizon 2020) has funded much of the development of the XML parser of OSCAR/Surface.

4.2.7 Hydrology

RECOMMENDATION for WHOS together with TT-OD: to investigate machine-to-machine provision of WIGOS metadata from WHOS to OSCAR/Surface using Plata Basin stations as test case.

4.2.8. GCOS/Climate

ACTION for TT-WMD: to discuss the outcomes from the GCOS Task Team on Lightning Observations for Climate Applications (TT-LOCA), including the requirements for metadata for lightning observations;

ACTION for Secretariat: to circulate the outcomes of TT-LOCA.

RECOMMENDATION for TT-OD: to specify the requirements for a feature of OSCAR/Surface to inform the Programme Managers about changes made to their stations by the NFPs, and to work with OSCAR/Surface Development Team on analysis and synthesis of the log files.

RECOMMENDATION for Secretariat: to encourage Members to register more Centennial Stations in OSCAR/Surface and to use the guidance material on the assigning of WIGOS Station Identifiers (WSI) if needed.

RECOMMENDATION for TT-OD: to develop a consistent definition of search criteria to identify stations with common characteristics (“station classes”) – it was recognized that “Station class” as an artefact coming from Vol.A should not be managed as a feature/attribute of a station, but must be derived from the documentation of observations made at a station.

CCl related issues:

 - ACTION for TT-WMD: to update the guidance material on the use of the WMDS element "cluster" to allow to “chain” stations, in order to facilitate concatenating of data sets based on metadata from various stations - the following use case was used: a station that “moves” from one place to another, with the new one “replacing” the previous one; RECOMMENDATION forTT-OD: to specify requirements that can be implemented and propose these to the OSCAR/Surface development team;

- RECOMMENDATION for CCL: to work more closely with TT-WMD in relation to the new "Climate Observation Quality" classification to be possibly added to the WMDS;

- RECOMMENDATION for CCL: to provide detailed information on the issue of "Data provenance" for possible consideration in the context of the WMDS;

- RECOMMENDATION for Secretariat to invite Singapore to participate in the effort of mapping the WMDS and the Climate Data Management Systems (CDMS), including the implementation of WSIs.

5. REVIEW OF AMENDMENTS TO WIGOS REGULATORY AND GUIDANCE MATERIAL

5.1. Technical Regulations

5.1.1. Basic Documents No. 2 (WMO-No. 49, Volume I – General Meteorological Standards and Recommended Practices, Part I – WIGOS)

5.1.2. The Manual on WIGOS (WMO-No. 1160)

RECOMMENDATION for the WIGOS Editorial Board: to eliminate the concepts of dynamic and static metadata; What needs to be recognized is that there are different rates at which metadata can change – Some metadata changes more rapidly and regularly than others.

RECOMMENDATION for the WIGOS Editorial Board: to accept the edits to the Manual on WIGOS proposed by TT-WMD, contained in the Annex to this document, in track-changes.

5.2. The Guide to WIGOS (WMO-No. 1165)

RECOMMENDATION for the WIGOS Editorial Board: to accept the edits in track-changes.

5.3. The WIGOS Metadata Standard (WMO-No. 1192)

6. REVIEW OF THE WIGOS METADATA STANDARD

6.1. The WIGOS Metadata semantic standard

CONCLUSION: It was agreed to keep both terms “station/platform” and “observing facility” in the WIGOS Metadata Representation WMDR/XML Schema.

ACTIONS for TT-WMD: to draft additional changes to the WMDS (WMO-No. 1192):

- to develop an annex to map different vocabularies between the WMDS and the WMDR/XML Schema;

- to add a reference/link to the WMDR/XML schema;

- to update the text about the implementation phases (chapter 5) to be consistent with the new draft edition of the Manual on WIGOS;

- to delete the implementation phases in chapter 7 of the WMDS (right-hand column);

- to remove the "Free text" mention in relation to element 6-08 in the WMDS;

- to review the definition and note of element 9-02.

CONCLUSION: It was agreed to keep the name "Station/Platform cluster" (station/platform in singular) for the new element of the WMDS, and to remain with the term “FacilitySet” in the WMDR/XML schema.

RECOMMENDATION for ICG-WIGOS: endorse the reviewed/relaxed obligations (M/C/O) for the following metadata elements, both in the WMDS and in the schema: QUESTION for ICG-WIGOS: How much should OSCAR/Surface enforce those obligations?

2-01 change from MANDATORY to OPTIONAL;

4-01 change from CONDITIONAL to OPTIONAL;

4-03 change from CONDITIONAL to OPTIONAL;

5-03 change from CONDITIONAL to OPTIONAL;

5-07 change from CONDITIONAL to OPTIONAL;

5-09 change from CONDITIONAL to OPTIONAL;

5-10 change from CONDITIONAL to OPTIONAL;

6-04 change from MANDATORY to OPTIONAL;

6-05 change from MANDATORY to OPTIONAL;

6-06 change from MANDATORY to OPTIONAL;

7-07 change from MANDATORY to OPTIONAL;

7-08 change from MANDATORY to OPTIONAL;

7-09 change from MANDATORY to OPTIONAL;

7-10 change from MANDATORY to OPTIONAL;

7-13 change from MANDATORY to OPTIONAL;

8-01 change from CONDITIONAL to OPTIONAL;

8-03 change from MANDATORY to OPTIONAL;

8-04 change from MANDATORY to CONDITIONAL;

8-05 change from CONDITIONAL to OPTIONAL;

ACTIONS for TT-WMD:

 - to develop a code table in 5-07 Instrument control schedule;

 - to investigate other licensing schemes (such as Creative Commons) and propose how to reconcile these with the current code table 9-02 (G. Aubert with T. Kralidis);

 - to test the use of the WMDS for metadata of lightning detection systems (K. Monnik);

 - to draft a code table for the satellite orbits in the schema, under GeospatialLocation (G. Aubert);

 - to send a feature request for OSCAR/Surface to support search for catchments (T. Boston)

RECOMMENDATION for ICG-WIGOS: to nominate representatives from ABOs and from JCOMM to contribute to the work of IPET-DD/TT-WMDR.

6.2. The WIGOS Metadata code tables

CONCLUSION: The workflow with Github as presented by Nina Horat (Switzerland), is the right procedure for the TT-WMD to discuss and propose changes to the Code tables, with the support from Secretariat.

ACTION for TT-WMD: revised (interim) versions of all code tables (except 1-01 and 5-02) to be inserted into Github, towards sending releases for the FastTrack procedure – These are based on a comparison (N. Horat) of proposed changes to code tables, from EC-69 approved files to “GoogleDocs” files and to OSCAR/Surface ones.

ACTIONS for SECRETARIAT:

- to encourage members to register with Github and inform back the Secretariat;

- to add all TT-WMD members to Github (a TT-WMD team has been created in Github),

- to submit the word version of the WMDS and add it to Github; Follow-up on the WMDS recommendations from TT-WMD-6 and the draft version from March 2018.

ACTION for TT-WMD: to split the WMDS code table 1-01 by "context", as the WMO master list of variables.

ACTION for TT-WMD: to harmonize the use of the entries "unknown" and "inapplicable" as nil reasons across all code tables, corresponding to recommendations from ISO/TC211.

RECOMMENDATION for ICG-WIGOS: TT-WMD expressed their concerns regarding the future work on the maintenance and evolution of the WMDS code tables and recommended closer interaction with IPET-CM, e.g. to guide the procedure for expanding the units code table, which was adopted from the Manual on Codes, but proves insufficient; and to avoid parallel development of code tables where harmonization should be the guiding principle.

\_\_\_\_\_\_\_\_\_\_