World Meteorological Organization

WMO Integrated Global Observing System
WIGOS NEWSLETTER

April 2021 Volume 7, Number 2

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1. Relevant outcomes from the third part of first Session of the Infrastructure Commission Virtual Session, 12-16 April 2021

The third part of the first session of the Infrastructure Commission (INFCOM) was held from 12 to 16 April 2021 in five virtual sessions of three hours each. A record number of 512 accredited representatives participated at the Session. From the connected accredited delegates 31% were female and 69% male. Despite the challenge of the pandemic, which forced the Session to be held virtually, it could successfully achieve its objectives and adopt fifteen resolutions, twelve decisions and seven recommendations to the Executive Council.

Historical Recommendation on WMO Unified Policy for the International Exchange of Earth System Data was adopted by the Session, paving the way for adoption by 2021 Extraordinary Congress of the new data policy. The Session also adopted WMO Position Paper on Satellite Data Requirements for global Numerical Weather Prediction (NWP) as an effort to establish the necessary space-based data complementing the Global Basic Observing Network (GBON). These, together with recommendation on the GBON adopted at INFCOM-1 Part II are expected to substantially enhance the amount of data being exchanged internationally in support of Earth System prediction and monitoring, and NWP in particular. Financial instruments such as the Systematic Observations Financial Facility (SOFF) will complement these initiatives allowing the least developed Countries to align with the GBON and to benefit from enhanced Global Data-Processing and Forecasting System (GDPFS) products.

A side event on WIGOS Tools took place on 14 April 2021 – See the Session website for further details.

The Session also adopted the following decisions and recommendations of relevance to WIGOS:

- Recommendation on the update of WIGOS Technical Regulations (WMO-No.49) and Manual (WMO-No.1160) reflecting GBON requirements, Evolving user needs and practices, Regional Basic Observing Network (RBON) requirements regarding weather radars, the list of Global Climate Observing System (GCOS) Essential Climate Variables, the Implementation Plan of WMO Hydrological Observing System phase II, and changes needed for consistency with the WMO Reform.
- Recommendation on the update of the Guide to WIGOS (WMO-No. 1165), mainly reflecting changes regarding the implementation of WIGOS Station Identifiers in response to Resolution 35 (Congress 18) for the following programmes/systems: Global Cryosphere Watch (GCW), Global Ocean Observing System (GOOS), Global Atmosphere Watch (GAW), and WMO Radar Database (WRD).
- Recommendation on update of WIGOS Indicators to provide regular quantitative assessment of the progress achieved in the national implementation and operation of WIGOS by Members.
- Recommendation on Regional WIGOS Centres (RWCs) audit process, providing draft process for designation, assessment, reconfirmation of RWCs.
- Decision on the plan for a Global Demonstration Project on Uncrewed Aircraft Systems (UAS) in Operational Meteorology. The project is expected to demonstrate the ability of UAS to meet requirements associated with at least two key gaps: (i) Boundary layer profiling from small UAS; and (ii) upper troposphere observations and provision of drop-sonde soundings from high-altitude UAS.
- Resolution to replace the current concepts of CIMO Testbeds and CIMO Lead Centres by a single concept, the Measurement Lead Centre, as a centre of excellence that provides testing and exploration of surface-based in-situ and remote sensing instruments, guidance on standardization of instrument performance, on techniques and methods of integration and operation, and advice on potential for implementation and cost effective operation.
- Resolution on the designation and performance-monitoring process for Measurement Lead Centres with associated evaluation criteria.
- Two decisions on the designation of (i) the WMO Testbed for Ground-based Integrated Meteorological Observation, Changsha (China), and (ii) the WMO Lead Centre on Marine Meteorological Science Experiment Base, Bohe (China).
- Recommendation on strengthening Regional Instrument Centres (RICs), including a process for their designation, assessment, reconfirmation.

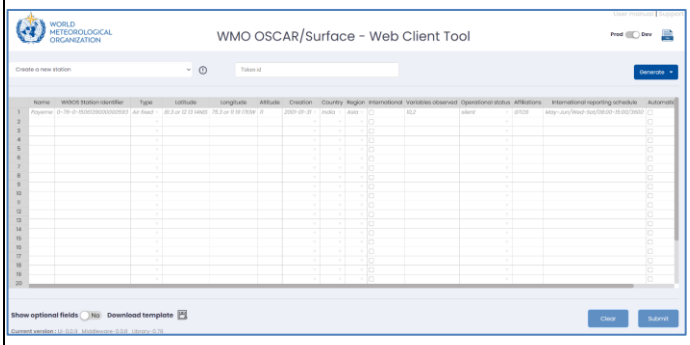
2. New releases of WIGOS tools (OSCAR/Surface and WDQMS)

OSCAR/Surface

A new release 1.6.0 of OSCAR/Surface (https://oscar.wmo.int/surface) was launched on 23 March 2021, which includes several improved functionalities, such as: the removal of uniqueness of station name and the automatic closure (i.e. end date) of metadata fields associated with other metadata that are set to be closed. Together with release 1.6.0 two major new features were introduced, the Station Templates and the Web Client Tool.

The Station Templates were developed through a WMO project, following OSCAR/Surface user requirements identified by the former Task Team on OSCAR Development, in order to provide an easy way to manually register new stations of the most frequent types. The approach was to provide users with simple forms containing as few as possible of the mandatory fields for a specific station type and to automatically calculate other fields in the background based on the user inputs. Currently four different station templates are available, from the "Management" tab in OSCAR/Surface: "SYNOP stations", Automatic Weather Stations (AWS), "Pilot stations" and "Radiosonde stations". Since the templates were implemented in a modular way, more station templates could be added easily in the future for other station types. The templates contain the functionality to register a new station and to save it in OSCAR/Surface. A new interface for entering the reporting schedule of observations was also added as part of the templates and in the generic edit form of OSCAR/Surface as well, to provide a more intuitive layout to create schedules.

Another tool that was introduced together with release 1.6.0 is the Web Client Tool (https://oscar.tools.wmo.int/web-client).



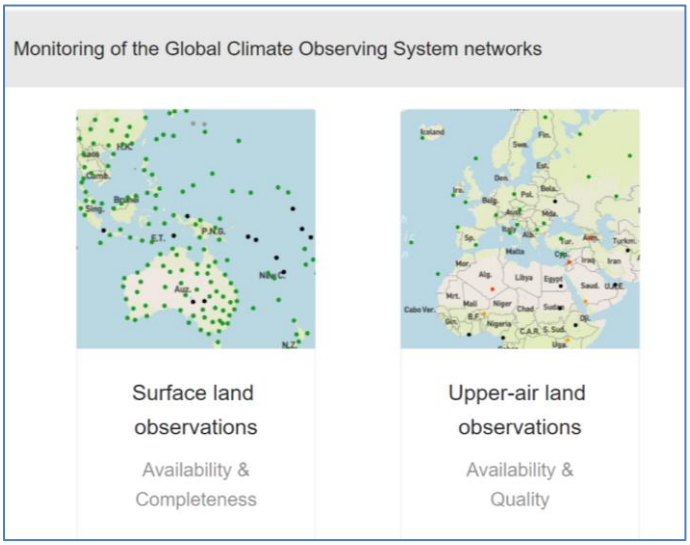
The OSCAR/Surface Web Client Tool interface

This external application can be used to perform batch operations on stations metadata in OSCAR/Surface, which means that operations can be applied to several stations at a time instead of having to manually enter information for each station separately. The application performs changes to the XML file of stations, using the official OSCAR/Surface Application Programming Interface (API) and uploads them again via a queuing system. OSCAR/Surface National Focal Points (NFP) and Metadata Editors (ME) can use the application to create new stations, to change/add WIGOS station identifiers (WSI), to change schedules or to add programme/network affiliations.

WDQMS-Webtool

Versions 1.3 and 1.3.1 of the WIGOS Data Quality Monitoring System (WDQMS) webtool (https://wdqms.wmo.int) were released on Thursday 26 November 2020 and Tuesday 30 March 2021. In these new releases a new module for the monitoring of climate observing networks was implemented, in addition to the near-real-time Numerical Weather Prediction (NWP) based monitoring module. This new module provides monitoring results of the Global Climate Observing System (GCOS) networks based on data collected from the GCOS monitoring centres for both the GCOS Upper-Air Network (GUAN – release 1.3) and the GCOS Surface Network (GSN – release 1.3.1).

The GUAN component monitors the availability and quality of upper-air observations, while the GSN component monitors the availability and completeness of monthly CLIMAT messages – all results displayed are based on monitoring information collected from GCOS monitoring centres.



Monitoring of the Global Climate Observing System (GCOS) networks

These new releases also implemented additional functionalities:

- The display of NWP-based surface observation monitoring results from stations that are reporting in BUFR, using only the WIGOS Station Identifier, i.e. stations that do not have a traditional 5-digit WMO ID is now available.
- A new feature to the download option that has been requested by WDQMS web tool users, i.e., complement the station identification with information on the ISO country code. Therefore, the field "country code" (three-letter country codes defined in the International Standards Organization 3166-1) has been included as an additional column in the CSV files downloaded from the map.

3. Kick-off of the Regional WIGOS Centre Southern Africa

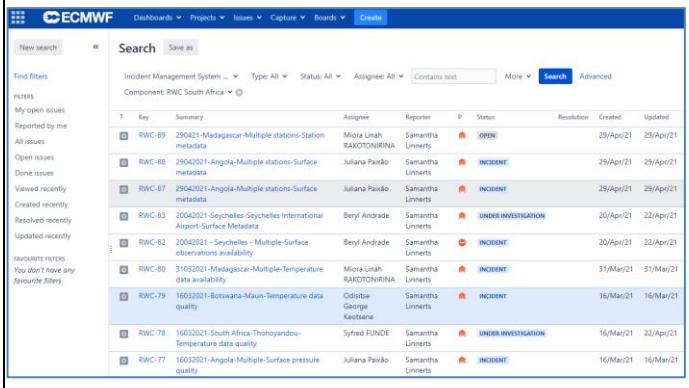
The Regional WIGOS Centre (RWC) Southern Africa officially commenced its pilot phase operations on 1st March 2021.This is in accordance with what was agreed at the Permanent Representatives (PR) Meeting of Southern African Development Community (SADC) Members on the Operation of RWC-Southern Africa which was held online on 9th February 2021.

Most of the PRs of SADC Members attended the meeting, or were represented by their high-level officers, as well as most of the National Focal Points on WIGOS Data Quality Monitoring System (WDQMS). The President of Regional Association I, Dr Daouda Konaté, and a representative from the SADC Secretariat as well as representatives from WMO Secretariat also attended the meeting, both from the Infrastructure Department (Dr Lars Peter Riishojgaard, Deputy Director) and from the Regional Office for Africa (Dr. Amos Makarau, Director).

The participants at the meeting also agreed that the commitment of Members is needed for the continuity of RWC operations. The meeting summary report that includes details such as programme, participants, etc, can be found on the WIGOS website at: The PRs Online Meeting of Southern African Development Community Members on the Operation of Regional WIGOS Centre (RWC) Southern Africa.

According to the South Africa's application to establish a RWC for SADC countries, this centre performs the two mandatory functions of RWC, i.e. metadata management function and WDQMS function, as well as optional functions in the form of technical assistance to affiliated Members related to the operation of WIGOS tools.

Since the start of operations, the RWC Southern Africa has raised and followed up more than twenty incident tickets, related to metadata management and to quality of observational data within the region, through the Incident Management System for RWC. The RWC Southern Africa is also actively providing online coaching to WDQMS NFPs and OSCAR/Surface NFPs of SADC Member countries.



Incident tickets under the RWC-Southern Africa

4. Online training course on OSCAR/Surface, contributing to enhancing the Data Exchange under the SEE-MHEWS-A project

Development of the South-East European Multi-Hazard Early Warning Advisory System (SEE-MHEWS-A) is a joint effort between WMO, National Meteorological and Hydrological Services (NMHS) of the region and leading European organizations in the fields of meteorology, hydrology and disaster risk reduction. Project participating countries have extended their cooperation with agreeing on Policy on the Exchange of Hydrological and Meteorological Data, Information, Forecasts and Advisories under the SEE-MHEWS-A. This Policy provides technical and conceptual principles required to promote data, information, forecast, and warning exchange and interoperability within the region. The signatories of the Policy agreed to exchange all available observations in addition to those 631 stations data they already share routinely via the Global Telecommunication System (GTS). This will allow an access to a large quantity of additional observations to be utilized for various project purposes, such as numerical weather prediction data assimilation and verification, hydrological modelling and nowcasting. Currently, over 500 additional stations are part of this data exchange, providing regularly 25,000 additional daily observations. These additional observations are collected in the Central Observational Database (CODB) for SEE-MHEWS-A hosted by the ECMWF, where a progressive increase in the amount of observations is expected once more countries start to contribute with additional data.

A critical component of the data exchange and data assimilation is the availability of observational metadata, which needs to me registered in OSCAR/Surface. In addition to organizing the regular exchange of data under the SEE-MHEWS-A, the countries are working on registering those additional stations in OSCAR/Surface. To support this activity, WMO organized an online training course on OSCAR/Surface on 15th, 16th and 18th March 2021 for the National Focal Points and some technical staff from the NMHSs.

The course was conducted mostly via the WMO Moodle platform (https://etrp.wmo.int/), after a webinar type introductory session, and aimed at providing the participants with necessary skills and knowledge for efficiently registering new stations in OSCAR/Surface. The course was attended by 17 participants from 15 countries of the region, most of them have completed all the training modules. Since the start of the course, 175 new stations that are currently part of the SEE-MHEWS-A data exchange have been registered in OSCAR/Surface. The course feedback from the participants was very positive, showing that a training course in such an online/purely digital and autonomous format can be a success, which is encouraging for the planning of future similar events in other regions.

5. WMO online Training Workshop on Transition to Automated Ground-based Measurements for Regional Association I

The WMO online Training workshop on Transition to Automated Ground-based Measurements for Regional Association I (RA I, Africa) Members, focusing on the transition of manual to automated measurements and related network aspects, was conducted online from 22 to 25 March 2021, using the MS Teams platform and WMO Moodle platform. The workshop comprised four sessions of two-hours each held over four consecutive days.

The target audience for the workshop was managers responsible for planning, designing and decision-making regarding measurements systems and observation network management within RA I. On average, 15 participants, from 13 countries, nominated by their Permanent Representatives, attended the workshop each day.

The objective of the workshop was to introduce participants to instrument upgrades, changes and transitions – preparing for success. At the same time, it was important to also recognize that there are instances where a technical solution has been predefined for a National Meteorological and Hydrological Service. An expected outcome from the workshop was that it gives Members the ability to have an informed conversation with all stakeholders, including partner organisations, on all aspects of the data chain from observations, data processing and data management to information systems, services and products, as well as related human resource aspects rather than simply the provision of Automatic Weather Stations (AWS).

The workshop covered a wide range of material in a short time and topics included: Network Planning, Project Planning and Management, People Change, Risk Analysis and the WMO generic AWS Tender Specification. One day was given over to a practical planning exercise where the participants were split into three groups with facilitators to merge learning with experiences. A short “Transition Strategy” video, the Expert Team on Transition to Modern Measurement (ET-TMM) have been working on, was also presented for the first time. Each workshop topic generated excellent discussion among the participants.

Participants feedback was positive and indicates that the topics were well chosen, and the delivery well made. A number of improvements have been suggested and discussed by ET-TMM, as the team looks forward to organizing a similar workshop for RA V Members, and possibly also for other RAs, at a date yet to be confirmed.

6. Future Operationalization of GAW and integration with INFCOM

At the ninth virtual INFCOM Management Group meeting on 21 April 2021 Greg Carmichael, the chair of the Environmental Pollution and Atmospheric Chemistry Scientific Steering Committee that governs the Global Atmosphere Watch (GAW), presented the infrastructure components of GAW and the connections between GAW and INFCOM were discussed. Some key points of the discussion related to WIGOS are given here.

Greg Carmichael explained that GAW provides international leadership in research and capacity development in atmospheric composition observations and analysis through (i) maintaining and applying long-term systematic observations of the chemical composition and related physical characteristics of the atmosphere; and (ii) emphasizing quality assurance (QA) and quality control (QC), delivering integrated products and services related to atmospheric composition of relevance to society. GAW builds on partnerships involving contributors from 100 countries (including many contributions from the research community). There are about 80 variables included in the GAW Programme (combined in 6 focal areas: greenhouse gases, reactive gases, total atmospheric deposition, aerosols, stratospheric and total ozone and UV Radiation). Infrastructure components of GAW include observations, quality assurance, data and metadata management, and modelling. Four of the eight implementation areas in the GAW Implementation Plan 2016-2023 relate directly to INFCOM activities: (i) Observations (surface, satellite, mobile platforms); (ii) Quality Management Framework; (iii) Data Management; and (iv) Modelling and Re-Analysis.

Challenges regarding the nature of the observational infrastructure in GAW include: (i) stations are not always proposed/registered by Permanent Representatives (PRs), (ii) stations must be registered in the GAW Station Information System (GAWSIS) (required by the Manual on WIGOS) and use GAWSIS to submit applications for affiliation with GAW; (iii) WIGOS Station Identifiers can be assigned by the Secretariat, GAW National Focal points (NFPs) and Network Focal points in addition to PRs; and (iv) interactions between GAW NFPs and OSCAR/Surface NFPs need to be established. Progress was noted; for example, observational capabilities are in general increasing, new instrumentation is being evaluated (low-cost sensors, ozone instruments), and collaboration with the contributing networks is improving. GAW provides extensive contributions to the Rolling Review of Requirements process.

It was noted that under INFCOM there are several elements/centres related to QA and instruments that are responsible for «all components of the Earth System», e.g. the Regional WIGOS Centres, and the Measurement Lead Centres. Their connection with the GAW Central Facilities has to be clarified.

The GAW Expert Team on Data Management works on enhancing data management architectures to facilitate improved metadata exchange and interoperability, data discovery and analysis. GAW data is shared through seven World Data Centres (most are DCPC in WIS) and Data Centres of the contributing networks. Metadata is available through GAWSIS which is a part of OSCAR/Surface. Data have to be submitted to the data centres within 1 year since performance of measurements. Near Real Time data delivery remains a challenge for the research community.

The situation is complex within GAW and there are a lot of interactions with INFCOM including OSCAR/Surface and WIGOS Station Identifiers.

The GAW Symposium 2021 is planned to take place virtually from 28 June to 3 July and it will have a dedicated session on observations; The deadline for abstract submission is 15 May 2021.

7. Announcements

7.1 WMO Online Training Workshop on Quality, Traceability and Compliance – General Metrology and Temperature, for RICs and RMICs

WMO is organizing an online Training Workshop on Quality, Traceability and Compliance – General Metrology and Temperature, for Regional Instrument Centres (RICs) and Regional Marine Instrument Centres (RMICs) in mid-June 2021.

The training workshop will cover general topics such as metrology in meteorology, interlaboratory comparisons, competencies of laboratory personnel, terminology and vocabularies, with a particular focus on calibration and measurement uncertainties and temperature sensors calibration. The training workshop will comprise five sessions of two-hour sessions each. The first four sessions will be held over four consecutive days (8 – 11 June 2021), while the wrapping-up last session will follow on 15 June 2021. The training workshop will be held in English, using the MS Teams platform.

The target audience for the workshop is managers and technicians of RICs and RMICs responsible for calibrations and uncertainty calculation, particularly in the domain of temperature. It is expected that, through the workshop, participants gain ideas and knowledge for possible improvement of calibration facilities and capabilities of their laboratories towards obtaining or maintaining ISO/IEC 17 025 accreditation.

7.2 Second GCOS/WCRP Climate Observation Conference – New dates: 30 Aug – 3 Sept 2021 and new format: online

The Global Climate Observing System (GCOS), with the World Climate Research Programme (WCRP), and supported by European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) will be holding a conference that aims to assess how well the current global climate observing system supports current and near-term user needs for climate information. The outputs will provide inputs into the next GCOS implementation plan which will make recommendations to meteorological networks, major observing systems and satellite agencies and it will be presented to the UNFCCC in 2022 as a contribution towards the UNFCCC's Global Stocktake. The 2nd Climate Observations Conference will be built around the following four topics/sessions:

1. How do global climate observations support climate policies?
2. How well do current Climate Observations support the understanding of climate change and variability?
3. Networks and systems – what improvements are needed to better meet user needs?
4. Data processing, archiving and Stewardship.

The Conference Scientific Committee invites the submission of abstracts on these four themes. The deadline for submission is 14 June 2021. Information on the conference and on how to register and submit an abstract can be found at: www.eventsforce.net/gcos-coc

8. WIGOS related Events/Meetings

8.1 Recent Events/Meetings

- ☞ The Permanent Representative's Meeting of Southern African Development Community (SADC) Members on the Operation of Regional WIGOS Centre (RWC) Southern Africa, 9 February 2021, online.
- ☞ Eighteenth Session of the Regional Association IV (North America, Central America and the Caribbean), RA IV-18, 8–11 February 2021, online.
- ☞ Statement on the low-cost sensors for atmospheric composition, 16 February 2021, online
- ☞ Fifth virtual meeting of the Expert Team on WIGOS Tools (ET-WT), 24 February 2021, online.
- ☞ WMO/HMEI (Association of Hydro-Meteorological Equipment Industry) Information Day for the Industry, 10 March 2021, online.
- ☞ First meeting of the GCOS Surface Reference Network (GSRN) task team, 24 March 2021, online.
- ☞ Eighteenth Session of the Regional Association I (Africa), RA I-18, 18–19 March 2021, online.
- ☞ Workshop on Transition to Automated Land Surface Measurement, 22-25 March 2021, online.
- ☞ Systematic Observations Financing Facility (SOFF) - First Funders Forum, 24 March 2021, online.
- ☞ Tenth Executive Council Panel of Experts on Polar and High Mountains Observations, Research, and Services (EC-PHORS), 29-30 March 2021, online.
- ☞ Sixth virtual meeting of the Expert Team on WIGOS Tools (ET-WT), 7 April 2021, online.

☞ 2020 GSICS (Global Space-based Inter-Calibration System) Annual Working Group Meeting, 29 March – 2 April 2021, online.

☞ Part III of first Virtual Session of the Commission for observation, infrastructure and information systems (INFCOM-1 Part III), 12-16 April 2021, online.

☞ Coordination Group for Meteorological Satellites, Working Group Sessions, 12-30 April 2021, online.

☞ GCOS Joint Panels Meeting 17-23 April, online.

☞ Ninth virtual meeting of the INFCOM Management Group, 21 April 2021.

☞ Second meeting of the GCOS Surface Reference Network (GSRN) task team, 28-29 April 2021, online.

8.2 Coming Events/Meetings

☞ Seventeenth session of the Regional Association II (Asia), 25-26 May 2021, online.

☞ Executive Council - Seventy-third Session (EC-73), 14-25 June 2021, online.

☞ Coordination Group for Meteorological Satellites, CGMS-49 Plenary, 19 – 21 May 2021, online.

☞ WMO Online Training Workshop on Quality, Traceability and Compliance – General Metrology and Temperature, for RICs and RMICs, 8-11 and 15 June 2021, online.

☞ Systematic Observations Financing Facility (SOFF) – Second Funders Forum, 28 June 2021, online.

☞ GAW Symposium 2021, 28 June – 2 July 2021, online.

☞ WMO Technical Conference on Meteorological and Environmental Instruments and Methods of Observation (TECO 2021), Paris, France (Oct 2021) – to be confirmed.

☞ 13th International Pyrheliometer Comparison and the 5th Filter-Radiometer Comparison and 3rd International Pyrgeometer Comparison, Davos, Switzerland (27 September - 15 October 2021).

9. New WIGOS related publications

❖ GAW Report No. 258/WCC-Empa Report No. 18/2, 2020 - Research Infrastructure Quality Assurance - System and Performance Audit of Surface Ozone, Carbon Monoxide, Methane, Carbon Dioxide and Nitrous Oxide at the Global GAW Station Mace Head, Ireland, November 2018

❖ GAW Report, 260. Report of the first Integrated Global Greenhouse Gas Information System (IG3IS) Symposium and User Summit - Geneva, Switzerland, 13-15 November 2018

❖ GAW Report No. 262: WCC-Empa Report No. 20/2, 2021 Research Infrastructure Quality Assurance – System and Performance audit of Surface Ozone, Carbon Monoxide, Methane, and Carbon Dioxide at the Global GAW Station Sonnblick, Austria, July 2020

❖ Commission for Observation, Infrastructure and Information Systems Interim Abridged Final Report of the First Session Virtual Session 9-13 November 2020

❖ Report of the Twelfth GCOS Reference Upper Air Network Implementation Coordination Meeting (GRUAN ICM-12) Virtual Session 16-20 November 2020 - GCOS-No. 237

❖ WIGOS Technical Report- No. 2021-01 - The Benefits of Aircraft-based Observations and AMDAR to Meteorology and Aviation

❖ Stories of Success - Piloting a Regional Early Warning System for Increased Resilience in the Lake Victoria Region, 2021 (HIGHWAY project)

❖ OSCAR/Surface User Manual Release 1.6.0

❖ OSCAR/Surface Web Client Tool: Overview Version 1.0

❖ Systematic Observations Financing Facility (SOFF): Report for First Funders' Forum

Thanks to:

Andrew Harper
and
Mike Molyneux

for their contributions to this issue of the Newsletter