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WMO Executive Council (EC73) approves and endorses key decisions



The World Meteorological Organization held its 73rd Executive Council (EC) meeting virtually from 14 to 25 June, focusing on strengthening and scaling up weather, climate, water and environmental-related services to meet ever-growing needs. Some of the major decisions taken at the meeting included:

Updating WMO's data policy – EC endorsed a [unified policy on the international exchange of Earth system data](#) to help Members to meet the explosive growth in demand for weather, climate and water services as the world grapples with the dual challenges of climate change and of increasingly frequent extreme weather events. The draft data policy resolution will now be submitted for adoption at the World Meteorological Congress extraordinary session (Cg-Ext) scheduled for October 2021. It paves the way for a sweeping update of policies on the free and unrestricted exchange of data – the bedrock of WMO since it was established more than 70 years ago. The WMO Unified Policy for the International Exchange of Earth System Data is based on WMO's strategic integrated Earth system approach to all monitoring and prediction of weather, climate, water and related environmental phenomena, and will serve as the foundation of a wider push to strengthen the global observing networks and help overcome regional disparities.

Closing the gap in the global observing system – EC approved a resolution setting out detailed provisions for a Global Basic Observing System, the implementation of which will guarantee exchange of a minimum supply of critically needed surface-based observations from all Members into the global Numerical Weather Prediction (NWP) systems that provide the basis for all weather, climate and related Earth system services. While GBON will provide economic benefits estimated conservatively at over US\$ 5 billion per year, based on expected improvements in weather prediction alone, WMO recognizes that the implementation of this network will be

challenging for many of the least resourced Members. The proposed Systematic Observations Financing Facility (SOFF) therefore aims to provide the necessary financial and technical support for Least Developed Countries and Small Island Developing States to support the implementation of GBON, but in terms of filling the current gaps in observational data coverage and to help sustain the operation of the observing network in the long term.

A plan of action for hydrology – The [WMO Vision and Strategy for Hydrology and its associated Action Plan](#) were endorsed by EC, reflecting the need to improve water monitoring and management in the face of the challenges of water stress, water-related hazards and water quality. The Action Plan presents in detail the activities needed to fulfil the eight long-term ambitions that should guide the development of WMO initiatives relevant to water up to 2030. A second EC resolution paves the way for Cg-Ext to issue a Water Declaration on the need to accelerate progress towards Sustainable Development Goal 6 on water and sanitation, and to support Members in designing and implementing resilient systems that will help to mitigate climate change impacts in water, food and energy nexus. In this regard, WMO is spearheading a Water and Climate Coalition – a community of multi-sectoral actors, guided by high-level leadership and focused on integrated water and climate action.

WMO Governance Reform – EC approved the Evaluation Plan of the Constituent Bodies and considered the impact of COVID-19 on the functioning of the organization. Approved were a set of recommendations to be adopted by Cg-Ext on the Comprehensive Review of the WMO Regional Mechanisms and Approaches as part of the second phase of the WMO Reform. The recommendations are intended to enhance the efficiency and effectiveness of the regional associations and increase intra and inter-regional cooperation, partnerships and resources mobilization. Specifically, the recommendations will lead to enhanced implementation of Congress and EC decisions by WMO Members; better engagement with the United Nations system, regional economic commissions, and regional organizations; strengthened capacity of the WMO regional offices to coordinate regional partnerships and activities; strengthened engagement of the private sector and academia; and more effective support and capacity development of WMO Members.

The outcomes of this EC helped sharpen WMO contributions to the global agenda on disaster risk reduction, sustainable development and climate change.

Several awards were also given including:

International Meteorological Organization (IMO) Prize selected [Professor In-Sik Kang](#) from the Republic of Korea as the 66th IMO Prize winner. The award cites Prof. Kang's scientific achievements,

particularly in the field of climate modelling and prediction, and his pioneering contributions to operational and research climate centres, and for nurturing next-generation scientists, including from developing countries. He has published more than 170 papers in scientific journals.

Professor Dr Vilho Väisälä Award for an Outstanding Research Paper on Instruments and Methods of Observation was awarded to Julian Gröbner (Switzerland) and Natalia Kouremeti (Switzerland) for their paper entitled "[The Precision Solar Spectroradiometer \(PSR\) for direct solar irradiance measurements](#)" published in *Solar Energy* 185 (2019), p. 199-210.

Professor Dr Vilho Väisälä Award for the Development and Implementation of Instruments Methods of Observation in Developing Countries was awarded to Duong Van Khanh, Do Huy Duong, Nguyen Xuan Tuan, and Mai Hai Tung (Viet Nam) for their paper entitled "Automation solution to manage technical operations and transfer the real-time information from manual stations of Meteorological and Hydrological in Viet Nam" published in *Viet Nam Journal of Hydro-Meteorology*, No. 691, dated 25 July 2018.

The 2021 WMO Research Award for Young Scientists was awarded to Dr Hoang-Minh Nguyen (Viet Nam) for his paper entitled "[An approach for improving the capability of a coupled meteorological and hydrological model for rainfall and flood forecasts](#)" published in the *Journal of Hydrology*, 577, 2019, 124014.

Symposium on Lightning and Lightning Safety Awareness



Lightning is the most common weather hazard encountered in the world (Christian et al., 2003). To better understand lightning risk and improve safety, the first [Symposium on Lightning and Lightning Safety Awareness](#) was hosted jointly by the Caribbean Meteorological Organization (CMO) and WMO on 19 to 20 May. The symposium was attended by 131 participants from 28 countries in the Americas, Caribbean, and Europe. International experts from WMO Regions III (South America), IV (North America, Central America, Caribbean) and VI (Europe) shared information on lightning impacts, lightning safety education and awareness, medical impacts of lightning and injury prevention, lightning protection, spatial and temporal distribution of lightning, lightning detection, weather forecast and climate applications.

Many deaths and injuries as well as damage to property are caused by lightning each year – more than 4 000 deaths per year according to studies of 24 countries and global estimates of 6 000 to 24 000 deaths annually (Holle, 2016). Yet, many people have little knowledge of how to avoid lightning's harmful effects, which include long-term debilitating symptoms. Lightning parameters, such as flash density, peak in the tropics. So, the economies of least developed tropical countries, such

as those in the Caribbean and Central America, suffer property loss from lightning fires, damage of electrical and electronic systems, downtime due to service outages, data losses and power quality problems. Lightning, therefore, can hinder sustainable development.

Lightning should be included in disaster risk management because it threatens the lives and wellbeing of large populations of people and livestock and is a persistent hazard in certain regions. For example, Jamaica and Belize have the most reported lightning-related deaths among CMO Member States and Lake Maracaibo in Venezuela has the global flash density maximum.

Lightning activity generally peaks in late summer months, during the mid-afternoon to evening, and in mountainous areas. Prediction of lightning flashes over Jamaica out to 54 hours correlates well with various convective indices and persistence. Variations in lightning parameters, detected by ground sensors and the GOES Lightning Mapper, can be applied to severe weather and tropical cyclone forecasting, which is especially valuable to the Caribbean and the Inter-Americas. At climate scales, El Niño Southern Oscillation (ENSO) modulates seasonal lightning. Lightning, which is expected to increase as warmer oceans produce more intense thunderstorms, also produces NO_x, a greenhouse gas. Therefore, lightning has been classified as an essential climate variable (Aich et al. 2018). However, lightning data for climate applications are limited and are being augmented with historical "thunder days".

Deaths and injuries from lightning are preventable. Medical experts shared that most injuries are from ground current (40%) and side flashes (20-30%), hence the need for actions to reduce exposure. The symposium, therefore, provided outreach to the most affected sectors including agriculture, fishing, energy and outdoor recreation as well as the experiences of regional lightning networks such as the Central American network. The National Lightning Safety Council in the United States has helped to reduce lightning deaths with safety awareness campaigns and slogans such as "When Thunder Roars Go Indoors"; with a similar message in Spanish, "Si escucha un trueno, vaya adentro", and the commemoration of International Lightning Safety Day annually, on 28 June.

The Symposium contributed to WMO's commitment to save lives and property and reduce the economic impact of natural hazards by building partnerships among the operational and research communities, public and private sector stakeholders, and the general public. Attendees included officials from National Meteorological Services, the media, agriculture, energy, aviation, outdoor recreation, fisheries, health, education, etc. Open discussion enabled knowledge exchange and initiation of collaborations. A post-event survey is helping lead organizers, Dr Arlene Laing, CMO, and Mr Rodney Martinez, WMO, understand what was gained from the Symposium and develop plans for the next steps, such as the formation of an ad-hoc regional working group on lightning.

Kiribati Framework for Weather, Climate and Ocean Services

In commemoration of the 2021 World Meteorological Day theme "The Ocean, Our Climate and Weather" – translated into Gilbertese: "Te Marawa, Taaran Kanoan boong ao Kanoan te bong" – the Kiribati Meteorological Service (KMS) launched its Strategic Plan and Framework for Weather, Climate and Ocean Services and Action Plan for the period of 2021-2025.

World Oceans Day



WMO joined the United Nations to mark World Oceans Day on 8 June with the theme “Life and Livelihoods”. The Day’s events highlighted the wonders of the ocean and how it is our life source, supporting humanity and every other organism on Earth, and emphasized what we can do to create sustainable and inclusive livelihoods for all who depend on it.

WMO plays a significant role in supporting Members to protect lives, livelihoods and property from the dangers of climate and weather-driven marine and coastal hazards, for people along the coast and at sea. To mark the day, WMO launched the new **WMO Oceans** webpage which provides a summary of the breadth of WMO’s ocean activities. It also features the new **WMO Ocean video** narrated by United Nation’s Secretary-General’s Special Envoy for the Ocean, Ambassador Peter Thomson. A **WMO web news** on World Oceans Day highlighted the vital role of WMO in ocean science for sustainable development. On World Oceans Day, submissions involving WMO’s co-sponsored entities – World Climate Research

Programme (WCRP), Global Ocean Observing System (GOOS) and OceanOps – were formally endorsed as Decade activities.

WMO celebrated the ocean theme for the second time this year as **the Ocean, our Climate and Weather** was also the theme of World Meteorological Day on 23 March. A dedicated “Ocean” themed issue of the **WMO Bulletin** was published on that day to mark the event. World Met Day was a formally endorsed contribution from WMO to the UN Decade of Ocean Science for Sustainable Development 2021 to 2030.

WMO has also been appointed as a Nominating Agency for **The Earthshot Prize**: the most prestigious global environmental prize in history, designed to incentivize change and help repair our planet over the next ten years. The Prize aims to turn the current pessimism surrounding environmental issues into optimism by highlighting the ability of human ingenuity to bring about change and by inspiring collective action. For World Oceans Day, ocean and climate-related Earthshot videos were also shared to encourage WMO Members and stakeholders to consider submitting proposals for the Earthshot Prize. Ideas can be sent to earthshotprizeinfo@wmo.int.

The official UN World Oceans Day virtual event produced in partnership with **Oceanic Global** also took place on 8 June. This inclusive event had a stream of entertainment and discussions to raise global awareness of the benefits that humans derive from the ocean and using its resources sustainably. The WMO Ocean video was also featured in the official UN World Oceans Day virtual event, in the UN-Oceans segment. The event had over 270 000 participants logged in worldwide and it was followed in 175 UN Member States.

Kiribati is one of the most vulnerable countries to climate change in the Pacific Region with clear and evident impacts of climate change in the frequent occurrence of extreme weather events and in sea-level rise that is affecting its water resources, people’s livelihoods and their health. Effective and precise weather observations, alongside relevant research and services are more critical than ever. According to a statement made by His Excellency, Taneti Mamau, President of the Republic of Kiribati and responsible for the KMS, “The Kiribati Meteorological Service Strategic Plan & Framework for Weather, Climate and Ocean Services 2021-2025 is a guidance in moving forward the Met Office and its functions. More importantly, the strategies and actions embedded within the plan contribute to Pillar 2 of the Kiribati Vision in 20 Years, known as KV20 on the Peace and Security target which suggests that all weather and climate monitoring systems will be advanced and completed by 2036 with an emphasis on improved early warning systems.”

In line with these priorities, the WMO-led Climate Risk Early Warning System (CREWS) Pacific SIDS Project saw the need to support KMS in preparing its Strategic Plan and Framework to govern and guide its everyday services and early warning efforts for its people and communities.

This activity demanded a lot of effort and commitment from KMS Director, Mr Ueneta Toorua, and his team, as well as the WMO-recruited consultant Mr Bapon Fahkrudin. They effectively overcame challenges presented by COVID-19 restrictions by using creative methods of

consultation, including online discussions and presentations prior to community consultations with relevant stakeholders. This worked well for Kiribati, whose committed and strong team on the ground understood the processes, their objectives and purposes. The team took ownership of the development of the plan and framework, while at the same time creating awareness of their work within the community. Kiribati is the first Pacific Island country to develop such a framework and plan, becoming a role model for similar initiatives in the entire region. The launch of the KMS Strategic Plan, Framework and Action Plan represents a significant achievement for both WMO and the Republic of Kiribati. The plan was signed by Mr Igam M. Moaniba, the Secretary of the Office of Te Beretententi (Office of the President).

This achievement has been made possible with support from the CREWS Initiative through the CREWS Pacific SIDS Project. Together with WMO, they continue to support the Pacific Island Countries in the development of their Strategic Plans and Frameworks for Weather, Water and Climate Services.

Aircraft-based Observations Introduction Session for RA IV

On 18 May, a virtual introductory session was held for Regional Association IV (RA IV) on Aircraft-based Observations (ABO) and the WMO-IATA Collaborative AMDAR Programme (WICAP). A total of 62 participants from 18 WMO Members (17 of them from RA IV) joined the session.

The opening remarks of the President of RA IV, Mr Evan Thompson, highlighted the ongoing regional reform process and the importance of these types of regional technical activities to promote new ways of working in the Regional Associations. Mr Thompson also emphasized the importance of acquiring aircraft meteorological data to ground stations, to be processed and used to produce better weather predictions on different time scales, within the framework of the WMO-IATA Collaborative AMDAR Programme (WICAP).

Ms Minna Huuskonen (WMO Secretariat) provided a general introduction of the concept and benefits of ABO, the Aircraft Meteorological Data Relay (AMDAR) programme and WICAP, explaining the importance of upper-air observations for the WMO Integrated Global Observing System (WIGOS), in support of several WMO application areas. Ms Huuskonen also presented the status of AMDAR data availability and coverage and provided details on the aims and key aspects of WICAP, including data policy and organizational roles.

Mr Brent King (International Air Transport Association, IATA) explained to the meeting participants the current and envisioned role of IATA in WICAP and AMDAR development and its benefit for airlines, listing participating airlines worldwide as well as highlighting the potentiality of new airlines to participate in the programme. Mr Brent also presented IATA's involvement strategy as well as the WICAP next steps as of May 2021.

Mr Curtis Marshall (National Weather Service, United States of America) described the experiences of the AMDAR Programme in the USA. Mr Marshall first offered terminology and jargon relevant to the meeting, and then described the US ABO Programme in terms of its relationship with the regional and global programmes, history, operational configuration and structure, to finally close with some lessons learned. The impact of COVID-19 was also reported, as well as planned activities concerning North America and the WMO Regional Association III.

Mr Juan Carlos Ramos Soto (Servicio Meteorológico Nacional, SMN) presented experiences from the Mexico AMDAR Programme, including history, benefits, agreements and contracts, and participating airlines. Mr Ramos described the relationship SMN-Aeromexico and the process of transmission and use of AMDAR data to improve numerical weather forecasts. Finally, some statistics of the operation of the AMDAR programme in Mexico during 2019 were shared.

Mr Frédéric Lenormand (Meteorological Service Canada) provided background and experiences on the Canadian AMDAR Programme, highlighting its priorities, its impact on data assimilation for forecasting purposes and current status, as well as the impacts associated with COVID-19. The presentation ended with issues, lessons learned and planned next steps by the Canadians.

In reference to future opportunities and plans for the RA IV Regional AMDAR Programme, Ms Huuskonen described a proposal for a roadmap over the period of 2021-22 with actions for the establishment and development of a regional AMDAR programme under the WICAP framework.

An active and technically valuable question-and-answer segment closed the session with the aim of further informing and engaging RA IV Members in the regional component of this important programme. The reference material and presentations are available [online](#).

Integrating Climate Risk Information into Climate Action



In a world that is looking less likely to stay within 2 °C of global warming compared to the pre-industrial levels, individuals need to make choices between a range of possible actions. To do so, they require information on past, present and potential future climate conditions. On 2 June, WMO hosted a webinar exploring how climate information can enhance climate action.

Mr Chris Hewitt of the Met Office (United Kingdom) addressed the role of climate information in climate action planning, highlighting the importance of user engagement and the challenges faced by climate service providers. Methods and tools for integrating climate science information into climate action were further explored by Mr Guillermo Podesta, an independent scholar from Argentina, who provided an inspiring overview linking climate information to societal benefits and value. Regional examples of climate risk information supporting climate action were presented by Mr Jorge Vazquez-Aguirre of the University of Veracruz and Mr Rupa Kumar Kolli of the Indian Institute of Tropical Meteorology.

The webinar attracted many who work on integrating climate science information into policy processes and documents such as National Adaptation Plans (NAPs) and Nationally-Determined Contributions (NDCs). Thus, the 200 participants included a wide range of professionals and students from more than 80 institutions in 48 countries.

The webinar was organized by WMO as part of a collaborative project with the Korea Meteorological Administration (KMA). Mr Max Dilley (Director of Climate Services, WMO Secretariat) introduced the project to the audience, explaining its aims – to strengthen the delivery of global and regional climate services. Mr Yinka Adebayo (Director of Education and Training, WMO Secretariat) highlighted that the project will deliver a training package for trainers through the WMO Regional Training Centres (RTCs), which will greatly contribute to increasing the number of trainers available to support regionally-based capacity development activities.

Strengthening of severe weather forecasting capabilities in West and Central Africa

A two-week Training Workshop on Severe Weather and Impact-Based Forecast and Warning Services for countries in West and Central Africa was held online from 25 May to 3 June. This activity of the WMO Severe Weather Forecasting Programme (SWFP) gathered more than 45 operational forecasters from the National Meteorological and Hydrological Services (NMHSs) of 16 countries in the sub-regions to

receive training on Numerical Weather Prediction (NWP) products and early warning system tools, including Impact-based Forecast and Warning Services (IBFWS).

The workshop, held with support from the Climate Risk and Early Warning Systems (CREWS) initiative, addressed the capacity building needs of the NMHSs of countries involved in SWFP and CREWS funded projects in West and Central Africa. It consisted of self-study modules and daily “live sessions” that were simultaneously interpreted in French and English. Experts and lecturers were provided by several World Meteorological Centres (WMCs) – ECMWF, Washington (NOAA/NCEP) and Exeter (Met Office, UK) – – and Regional Specialized Meteorological Centres (RSMCs) and other institutions – Meteo France, RSMC Dakar, RSMC Barcelona, RSMC Pretoria and the University Corporation for Atmospheric Research (UCAR)’s COMET Program (MetEdu).

During the workshop, forecasters were trained to interpret NWP products, to use Ensemble Prediction System (EPS) outputs and to use satellite-based information to help with nowcasting severe and high impact weather events. They gained an understanding of the basic concept of IBFWS, its benefits to an NMHS and the steps for implementing it, including the paradigm shift necessary for an NMHS to adopt in implementing IBFWS in terms of collaboration with the Disaster Management Authorities and other stakeholders such as the media, and health sector. They were also introduced to the Common Alerting Protocol (CAP) standard and the WMO Register of Alerting Authorities.

The event helped to improve the skills of the operational forecasters with tools and products for early warning services and will thereby also contribute to the effectiveness of emergency preparedness, response and recovery efforts while reducing the impacts of extreme events on vulnerable people and on their livelihoods in West and Central Africa.

The SWFP aims to provide operational support for Multi-hazard Early Warning Services (MHEWS) at sub-regional and national levels. Information on the Programme and its projects is available [online](#).

Blended Group Training on Numerical Weather Prediction

The WMO Regional Training Centre (RTC) Indonesia, hosted by the Agency for Meteorology, Climatology and Geophysics of the Republic of Indonesia (BMKG), launched the online part of a Blended Group Training on Numerical Weather Prediction (NWP) on 20 May. The online theory-focused first phase of the two-part course ran until

2 July. The follow-up on-campus phase in the RTC premises is scheduled in 2022, conditions permitting. The on-campus part will consolidate the theoretical knowledge and conduct the practical curricula, which are difficult to instruct online.

The course attracted 38 NMHS staff whose scientific work relates to NWP and who desired to improve their understanding of high-resolution NWP, including model configuration, physical parameterization, operating environment, post-processing techniques, visualization of model output, verification techniques and applications. The course explores the NWP systems of Weather Research and Forecasting (WRF) models and Consortium for Small-scale Modelling (COSMO) and emphasizes simulations of mesoscale weather systems. The course is expected to enhance national capacity on the application of NWP models for the tropics in operational weather services.

The participants represented 14 WMO Members, 10 from the South-West Pacific (WMO Region V), 2 from Asia (WMO Region II) and 2 from Africa (WMO Region I). Through this training, BMKG contributes to supporting regional capacity development programmes in NWP implementation for South-West Pacific Members. Similar blended NWP courses are planned in RTC Algeria for African Francophone Members; in RTC Egypt for African and Asian Anglophone and Arabic speaking Members; and in RTC India also for Asian Members. In addition, courses for South America (WMO Region III) and North America, Central America and the Caribbean (WMO Region IV) are still in the planning phase with Regional Offices and RTCs.



Obituary

An obituary for Yuri Sarkisovich Tsaturov, a prominent Russian statesman and a well-known expert in the field of environmental monitoring and control, is available in the [online version](#) of MeteoWorld.

Newly Issued

Regional Association IV (North America, Central America and the Caribbean) - Eighteenth session: Abridged final report with resolutions, WMO No.1265, ISBN 978-92-63-11265-1. Available in [English](#).

We welcome your comments about MeteoWorld and look forward to hearing from you: editor@wmo.int

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World Meteorological Organization

7 bis, avenue de la Paix, PO Box 2300
CH-1211 Geneva 2, Switzerland
Tel.: +41 (0) 22 730 83 14 / 83 15
Fax: +41 (0) 22 730 80 27
Internet: public.wmo.int

