

# **COMMISSION ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)**

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## **Submissions from entities in the United Nations system, international organizations and other stakeholders on their efforts in 2025 to implement the outcomes of the WSIS**

### **Submission by**

World Meteorological Organization

This submission was prepared as an input to the report of the UN Secretary-General on "Progress made in the implementation of and follow-up to the outcomes of the World Summit on the Information Society at the regional and international levels" (to the 29<sup>th</sup> session of the CSTD), in response to the request by the Economic and Social Council, in its resolution 2006/46, to the UN Secretary-General to inform the Commission on Science and Technology for Development on the implementation of the outcomes of the WSIS as part of his annual reporting to the Commission.

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# **World Meteorological Organization (WMO) Submission to WSIS Report 2025**

## **Part 1: Executive Summary**

1. WMO Information System 2.0 (WIS 2.0) implementation is a significant step in global data sharing. The report below summarizes the progress, capacity-building efforts, and key outcomes of the WIS 2.0 transition, with relevance to WMO's WSIS implementation.
2. WIS 2.0 entered its operational phase on January 1, 2025, marking a "historic transition in global data sharing". This new system is set to ultimately replace the Global Telecommunication System (GTS), which has been the WMO's data-sharing backbone since 1971.
3. Built on open standards and Internet of Things (IoT) technologies, WIS 2.0 provides a modern, real-time data-sharing framework. Its cloud-ready architecture and use of open standards eliminate the necessity for specialized equipment and expensive local infrastructure. This makes robust data sharing capabilities more accessible, especially for developing countries, Least Developed Countries (LDCs), and Small Island Developing States (SIDS).
4. The WIS 2.0 collaboration is supported by a robust Global Infrastructure, which is jointly operated by eleven nations: Brazil, Canada, China, France, Germany, Japan, the Republic of Korea, Morocco, Saudi Arabia, the United Kingdom, and the United States. This collective effort ensures efficient data access, seamless exchange, enhanced discoverability, and continuous monitoring.
5. WIS 2.0 enhances the way countries access and exchange Earth system data, including atmospheric, oceanic, hydrological, cryospheric, and other critical environmental observations.
6. The number of WMO Members exchanging data through WIS 2.0 has more than doubled, growing from 30 in 2023 (during the pre-operational phase) to 67 as of the second quarter of 2025. This means a third of WMO's 193 membership is now using the system.

## **Part 2: Analytical overview**

7. **Key Tool for Implementation:** The "WIS 2.0 in a box" (WIS2Box) is a critical software developed by WMO and released as Free and Open-Source Software (FOSS). It provides a reference implementation of a WIS 2.0 node. It is designed as a simple, low-cost solution for WIS 2.0 implementation, with a specific focus on LDCs, SIDS, and developing countries. WIS2Box supports capacity development by offering a free, open environment to experiment with and implement WIS 2.0 technical specifications and related open standards. It is also an excellent tool for training professionals in managing and operating a WIS 2.0 node.

8. **Supporting Members' Capacity Development:** Capacity development is a core pillar of the WIS 2.0 implementation strategy. In just two years, WMO has delivered training to over 90 countries, starting in Namibia in March 2023 and expanding across Africa, Asia, the Pacific, Latin America, and the Caribbean. Training has been conducted in English, Spanish, and French, with plans to extend support in Russian. This hands-on approach has resulted in over 70 countries and territories successfully implementing a WIS 2.0 node to enable data exchange.
9. **Regional uptake:** Region IV (North America, Central America and the Caribbean) shows the highest uptake at 64%. Regions I (Africa) and III (South America) also exceed the global average, standing at 38% and 42%, respectively. Regions V (South-West Pacific), VI (Europe), and II (Asia) lag, with adoption rates of 18%, 24%, and 26% respectively.

## Challenges

10. **Digital Divide and Connectivity** Internet connectivity is the essential backbone for modern weather services. However, many WMO Members, particularly LDCs, SIDS, and Landlocked Developing Countries (LLDCs), still face severe bandwidth limitations, deepening the digital divide. About a fifth of WMO Members operate with unstable internet connectivity. Also, 12% of Members are restricted by very low bandwidth speed (less than 10 Mbps), which severely limits their data exchange capacity. The majority of these constrained Members are LDCs, SIDS, or LLDCs. This limitation burdens National Meteorological and Hydrological Services (NMHS) at all stages of their value chain. All NMHS with connectivity limited to less than 10 Mbps and two-thirds of those limited to under 50 Mbps flagged their bandwidth as insufficient to support operations.
11. **Data Management Systems** Centralized, interoperable data management systems are vital for NMHS to ensure data quality, streamline access, and enhance exchange. While 58% of Members report operating with such a system, about a fifth are still missing the capability to sustainably and effectively store and manage their data. This gap is most visible in Regions I, II, III, and V, where approximately a quarter of Members face this constraint. Members without centralized systems rely on manual processes, limiting their ability to efficiently access, integrate, and share data, which hinders their contribution to and benefit from initiatives like WIS 2.0.

## Part 3: Innovation and Progress, plans

12. The growing WIS 2.0 network is enhancing the capabilities of NMHS and playing a key role in supporting the global Early Warnings for All initiative. Through WIS 2.0 implementation, countries are better equipped to deliver timely, actionable, and life-saving information, strengthening resilience to extreme weather and climate-related hazards.
13. **Case Study: Digital Transformation in Africa** African NMHSs face challenges due to data fragmentation caused by the diversity of Automatic Weather Station (AWS) types using proprietary formats. To streamline data ingestion from heterogeneous AWS systems, WMO Regional Office in Africa in collaboration with NORCAP developed the Automated Data Loader (ADL) in 2023. ADL is a flexible, plugin-based framework that automates the ingestion of observation data into WIS 2.0 nodes,

such as WIS2Box, by using vendor-specific plugins to handle the nuances of each AWS type. Over the last two years, ADL has been operationalized in six African Members: Burkina Faso, Seychelles, Ghana, Chad, South Sudan, and Mali, helping them address AWS network fragmentation.

14.       **Case Study: The Caribbean** The success in WMO Region IV is a direct reflection of targeted capacity building. Caribbean SIDS face high risks from extreme weather, and historically, limited infrastructure and the complexity of the GTS restricted their ability to share real-time observation data and issue localized warnings. The Caribbean Meteorological Organization (CMO), in collaboration with WMO, organized a regional training workshop on WIS 2.0, providing hands-on instruction in setting up the WIS2Box. As a direct outcome, 12 countries successfully deployed a WIS 2.0 node and began publishing national observational data to the global system. The WIS2Box allowed for "rapid and cost-effective scaling".

15.       **Future Workshops** WMO is organizing five WIS 2.0 implementation workshops in 2025, with one already held in Oman for Arabic-speaking countries in April, and one in China for Asian countries in September. Additional workshops are planned for Turkey (Europe), Moscow (Russian-speaking countries), and Nairobi (Africa).

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WMO Secretariat  
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