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Submissions from entities in the United Nations system and elsewhere on their efforts in 2017 to implement the outcome 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 21st 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.

World Meteorological Organization (WMO) Submission to WSIS Report 2017

Part 1: Executive Summary

1. The World Meteorological Organization (WMO) is committed to promoting and supporting the implementation of ICTs for improving the global, regional and national production, exchange and distribution of information, forecasts and warnings on weather, climate, and water. In this way, WMO contributes to the World Summit on the Information Society (WSIS) action line on e-environment and its call "to establish monitoring systems, using ICTs, to forecast and monitor the impact of natural and man-made disasters, particularly in developing countries, LDCs and small economies."

2. ICT systems that collect weather, climate and water information from around the globe underpin the delivery of information to the public, businesses and governments. They also support the production of analyses and forecasts. WMO continues to develop its WMO Information System (WIS) to allow and facilitate wider accessibility to this information.

3. In addition to improving climate change monitoring and related applications, WMO seeks to link WIS and ICTs with the data needs of the five priority areas of the Global Framework for Climate Services: Agriculture and food security, Water, Disaster Risk Reduction, Health and Energy.

4. The successful development of the Severe Weather Forecasting Demonstration Project continues to evolve in eight geographical regions. Arrangements and techniques developed through this project allow decision makers in countries with less developed infrastructure to take advantage of high-value meteorological analyses and predictions generated around the world, thereby reducing the impact on life and property of severe weather events.

5. ICTs are being harnessed by national weather services around the world to improve the services they offer to citizens. The demand for accessible and accurate services will continue to grow in the years ahead. To respond effectively to the new human vulnerabilities and socio-economic trends of the 21st century, national weather services need greater recognition from policymakers and to be further integrated into national development plans. This will help ensure that all countries reduce the risks an maximize the opportunities linked to weather, climate and water, towards implementation of the 2030 Agenda for Sustainable Development.

Part 2: Analytical overview

1. WMO achieves its objectives by facilitating international agreement among National Meteorological and Hydrological Services (NMHSs) around the world. Challenges to the use of ICT collaboration tools for this purpose include great variability in the quality of ICT infrastructure available to various countries, low uptake of tools that are not a part of the daily working environment of the collaborators, and security constraints that restrict some organizations' access to collaboration web sites. The most effective techniques for collaboration remain email lists, wikis and, where time zone differences permit, telephone conferences.

2. The WMO Information System (WIS) provides a major upgrade to the way weather services and their partners manage, share and transmit weather, climate, water, marine and related environmental information. WIS exploits the most recent advances in information and communication technologies and reduces the costs of exchanging information. For the first time, and unlike the closed and private Global Telecommunications System that it builds upon, WIS gives users outside the meteorological community free access to an expanded range of information. As a result, WMO can now collaborate more fully with United Nations and other international partners on implementing common programmes and activities, such as the Global Framework for Climate Services.

3. In 2015, the Seventeenth World Meteorological Congress noted that the effectiveness of WIS in exchanging information critical for saving lives is sometimes limited by restrictions preventing some countries from accessing equipment needed for full participation in WIS. It therefore passed resolution 31 (Cg-17) classifying telecommunications between WIS centres as an essential service for creating and distributing data, products, warnings and advisories for the protection of life and property. The sixth Coordination Meeting of the World Weather Information Service (WWIS) language hosts, held in November 2017, decided that a recent campaign to contact Members and encourage them to enhance their participation in WWIS would be followed up in the future. It also decided that warnings and alerts in the Common Alerting Protocol (CAP) format issued by Members would be incorporated for the same purpose.

4. Climate information and services rely on data to conduct analytical studies, feed model predictions and calibrate other types of data, such as data from remote-sensing platforms. This requires longer term observations and data of higher quality than data used for ordinary weather forecasting systems. WMO seeks to ensure that these criteria are met at global and national levels, using best-available technologies, standards and tools. WMO is currently leveraging WIS by developing the functional architecture of the GFCS/Climate Service Information System (CSIS). CSIS functions include managing historical data and providing climate forecasts, long-term change predictions and projections.

5. The WMO Workshop on Information Management was organized by the WMO Commission for Basic Systems and the WMO Commission for Climatology in October. It reviewed existing experience, standards and guides/guidelines on data management developed by WMO Programmes and other organizations, identified common elements of best practices and the new requirements of

Programmes, and provided guidance on the development of a WMO-wide guide on information management. It agreed on principles underpinning information management and related systems to ensure easy and timely access, quality assurance and transparency and licensing (guidance for the information management component of WIS). The Workshop identified and agreed on minimum requirements for interoperability between information management systems at the national, regional and global levels and between WMO programmes. The workshop also advised on partnerships with other organizations for managing non-meteorological data.

Part 3: Innovation and Progress, plans

1. To provide guidance on the evolution of WIS to better meet the needs of users from across all WMO and partner programmes, and to embrace current trends in technology and data volumes, WMO developed the concept of WIS 2.0. WIS 2.0 will be a collaborative system of systems using Web-architecture and open standards to provide simple, timely and seamless sharing of trusted weather, water and climate data and information through services. It will provide a "virtual one-stop-shop" for weather, water and climate information and services by providing an environment in which data can be managed, documented, discoverable, accessible and easy to use. It will also standardize information management so data can be relied on.

2. In the face of increasing pressure on the use of radio spectrum from wireless technology and other applications, WMO and ITU jointly held an international seminar on the "Use of Radio Spectrum for Meteorology: Weather, Water and Climate Monitoring and Prediction" in October. It brought together experts from national meteorological services and national radio-frequency regulators. It focused on the protection and optimal use of the radio-frequency spectrum used for remote sensing of the atmosphere and the exchange of information vital for Earth observation and efforts to understand and predict climate change. The seminar also aimed to increase awareness among NMHSs of the importance of meteorology-related spectrum protection – and the growing need for NMHS participation in national and international spectrum management activities. Ahead of the seminar, ITU and WMO issued an updated Handbook on the Use of Radio Spectrum for Meteorology. The handbook provides comprehensive technical information on the use of radio frequencies by meteorological systems, including meteorological satellites, radiosondes, weather radars, wind profiler radars, space-borne remote sensing, etc.

3. A specification document on Climate Data Management Systems (CDMS) was developed to help Member States use standard and the most up-to-date systems for organizing, managing and analyzing climate data from all sources. These specifications are now included as part of the WMO/WIS regulatory material, hence constituting a new reference for managing climate data and

developing its supporting technology and systems. A CDMS developer meeting will be organized in 2018 to address IT development needs for translating the specifications into software that meets the need for various applications in meteorology and climatology.

4. A tremendous success for WMO, the Severe Weather Forecasting Demonstration Project (SWFDP) is providing most developing countries across the globe with information needed to make better decisions on mitigating the impacts of severe weather. It has also delivered improved ways of working between national, regional and global operational centres and experts, and it has established partnerships among these experts and the people responsible for planning for and managing the response to severe weather events. The SWFDP is currently active in Southern and Eastern Africa, the Bay of Bengal, Southeast Asia and Central Asia. It is being planned for West Africa, Central Africa, the Caribbean and South America. The project is expanding its scope by establishing synergies and integrating, for example, with flash flood forecasting in Southern Africa. ICT is crucial to the success of the project: global observations of the weather need to be made available, and numerical weather forecasts produced by the most advanced NMHSs need be accessible by forecasters in participating nations, who may also need training in the interpretation of Numerical Weather Prediction products and in how to perform verifications (as part of the NMHSs' quality management framework). ICT also facilitates communication between forecasters and decision makers, helping to build long-lasting relationships.

5. Providing an agreed authoritative source of weather information is crucial to the successful management of weather-related events. ICT has a role to play in making the authoritative source as accessible, if not more so, than other sources. Even those weather services with the most developed ICT infrastructures have to work hard to maintain this position. The WMO Weather Information Service, hosted by Hong Kong (China), delivers authoritative web-based weather forecasts for cities around the world using information provided from the national weather service of each participating country. The related smart phone applications were updated in 2013, and the main web site is being reviewed to improve functionality. Other countries are collaborating with other service providers. In Uganda the weather service is working with a mobile telephony provider to deliver an SMS warnings service to reduce the loss of life among fishermen on Lake Victoria. Neighbouring Tanzania is building on this experience to provide a similar service to support fishers, farmers and the transport industry and is also cooperating with community radio to enhance the penetration of messages, a series of achievements under the WMO Public Weather Service (PWS) Programme through the WDS/Service Delivery Division. The improvement of the warnings themselves in this project is being addressed through a Severe Weather Forecasting Demonstration Project covering six Eastern African countries. To improve the effectiveness and efficiency of weather, climate and water related alerting systems worldwide, WMO has encouraged its Members to adopt the Common Alerting Protocol (CAP) as the key standard for the achievement of the goal of all-hazards, all-media public alerting. WMO works via the PWS Programme, with the International

Telecommunication Union (ITU) in promoting CAP implementation worldwide by organizing international workshops and in-country implementation projects as well.

6. An International Workshop on Cataloguing and managing information on Extreme Weather, Climate Water and Space Weather Events was held in November. The workshop participants agreed on a list of events having a potentially high impact on people, infrastructure and societies. This list will constitute a reference for assessing loss and damages. A set of unique identifiers will be proposed for international use in tracking and monitoring these events. The WMO Information System will provide the infrastructure for coding information on extreme events as well as references for discovering relevant information when events occur. This facility will allow for better evaluation of the types of losses and damages associated with different types of events, identification of the most damaging events, definition of thresholds for taking action, and the investigation of trends. Such a categorization is an important prerequisite for the Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes and for the United Nations Office for Disaster Risk Reduction Global Assessment Reports on Disaster Risk Reduction. It enables NMHSs to use a standardized approach to the analysis and recording of extreme hydro-meteorological events in national databases, and it supports the international exchange and validation of these data.

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