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| **World Meteorological Organization**  **EXECUTIVE COUNCIL**  **Sixty-Eighth Session** Geneva, 15 to 24 June 2016 | **EC-68/Doc. 8.1** |
| Submitted by: Chairperson  21.VI.2016  **APPROVED** |

**AGENDA ITEM 8: DATA PROCESSING, MODELLING AND FORECASTING**

**AGENDA ITEM 8.1: SEAMLESS DATA-PROCESSING AND FORECASTING**

# SUMMARY

**DECISIONS/ACTIONS REQUIRED:**

Adopt draft Decision [8.1/1](#_Title_of_the) *– Towards implementation of seamless Data-processing and Forecasting* *System*.

**CONTENT OF DOCUMENT:**

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**DRAFT DECISION**

**Draft Decision 8.1/1 (EC-68)**

**IMPLEMENTATION OF THE SEAMLESS DATA-PROCESSING AND FORECASTING sYsTEM**

the executive council,

**Recalls** the decision by the World Meteorological Congress, at its seventeenth session (Cg-17), through Resolution 11 (Cg-17), to initiate a process for the gradual establishment of a future enhanced integrated and seamless WMO Data-processing and Forecasting System, in light of the conclusions of the first World Weather Open Science Conference (WWOSC-2014, Montreal, Canada, August 2014);

**Recalls further** that Cg-17 requested the Executive Council to formulate Terms of Reference for this process, and a description of the set of products the system should produce, for consideration by the eighteenth session of the World Meteorological Congress (Cg-18) in 2019;

**Notes** that the Cg-17 decision was also based on the recognition of the following factors:

(1) The rapidly evolving transformations in the practice of operational numerical weather prediction (i.e. cascading process from global to regional and national levels and Ensemble Prediction Systems (EPS)) facilitating the move to a seamless Data-Processing and Forecasting System (DPFS);

(2) The enhanced application of the Cascading Forecasting Process (from global to regional to national levels) to mitigate the growing technology gap in operational forecasting between NMHSs of developed and developing countries (including LDCs and SIDSs), by increasing the availability and developing capacity to use advanced technology, information and products, especially in Multi-hazard Early Warning Systems (MHEWS);

(3) The emerging sophisticated requirements of users in practically all sectors such as aeronautical, marine, agriculture, health, and public weather services;

(4) The need to move to impact-based forecasting and risk-based warnings which require consideration of non-conventional information such as vulnerability and exposure in the operational process;

**Acknowledges** that seamless spans over several dimensions including:

(1) Time (nowcasting, through weather forecasts for days and weeks ahead to long-range forecasts on seasonal and up to multi-annual scales);

(2) Disciplines (hydrology: flood, inundation, and water management; marine and coastal: wave and storm surge; air quality and sand and dust storm; natural resources, energy, tourism, transport, etc.);

(3) Prediction of non-weather-related elements, including the assessment of likelihood and probabilities of impacts and risks associated with hazards taking into account vulnerability and exposure information to support risk-based decision-making;

**Acknowledges further** that a seamless Global Data-processing and Forecasting System (GDPFS), an evolution of the existing GDPFS, would be more agile and adaptable to support Application Programmes (e.g. AeM, AgMet, MMO, and PWS) and to provide not only prediction of weather-related elements but also products that support impact-based forecasts and warnings, taking into account vulnerability and exposure information to support risk-based decision-making;

**Recalls** that Cg-XVI (2011) adopted the outline for a revised *Manual on the GDPFS* (WMO-No. 485) through Resolution 6 (Cg-XVI), wherein it decided that this Manual is the single source of technical regulations for all operational data-processing and forecasting systems operated by WMO Members;

**Notes** with appreciation the CBS effort in initiating the work, in collaboration with other technical commissions, to address Resolution 11 (Cg-17) by developing an outline of an Implementation Plan and a White Paper on the seamless Data-Processing and Forecasting System;

**Notes further** the research contribution to the development of a seamless Global Data-processing and Forecasting System;

**Endorses** the Vision for the Seamless Data-processing and Forecasting System, as provided in the Annex;

**Decides** to establish a Steering Group (following the request by Cg-17), chaired by the president of CBS and comprising representatives of technical commissions and regional associations, and the chairperson and co-chairperson of the CBS OPAG on Data-processing and Forecasting Systems (DPFS), with the following Terms of Reference, which will be reviewed at EC-69 as necessary:

(1) Provide guidance and monitor the development of the process for the gradual establishment of a future enhanced integrated and seamless WMO Data-processing and Forecasting System, based on the achievements of the World Weather Watch (WWW);

(2) Manage the integration of new components in the GDPFS, including addressing synergies with and requirements of all WMO Programmes and Regions, through active consultations with technical commissions and regional associations;

(3) Develop a description of the set of products the system should produce;

(4) Complete the Implementation Plan for the process for consideration by EC-69;

**Encourages** advanced GDPFS Centres to pilot a seamless Data-processing and Forecasting System, following the approach described in the White Paper, and share with all Members the results and lessons learnt in order to improve the process;

**Acknowledges** that this is work in progress and adjustments may be necessary through consultations with Members and constituent bodies;

**Requests** CBS to consult widely with Members and to work towards tabling the White Paper along with the Implementation Plan for consideration by EC-69;

**Requests** the Secretary-General to:

(1) Continue to provide support to CBS in its effort to address Resolution 11 (Cg-17), in consultation with other technical commissions and regional associations;

(2) Assist Members in sensitizing their governments for the need to move towards the implementation of seamless data-processing and forecasting systems;

**Urges** Members to also provide full support to the Secretary-General and CBS for addressing successfully Resolution 11 (Cg-17).

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Annex: 1

**Annex to draft Decision 8.1/1 (EC-68)**

**VISION FOR the Seamless data-processing and forecasting System**

 The GDPFS will be an effective and adaptable monitoring and prediction system to enable Members and partners in supporting decision-makers to take better-informed decisions.

 The GDPFS will facilitate the provision of impact-based forecasts and risk-based warnings through partnership and collaboration.

 The GDPFS will do so through the sharing of weather, water, climate and related environmental data, products and services in a cost-effective, timely and agile way, with the effect of benefitting all WMO Members, while also reducing the gaps between developed and developing Members.

One may imagine the GDPFS in 2031, 16 years later:

 The overall accuracy of state-of-the-art global prediction models have improved enough to add 1.5 days of overall predictability, if the historical rate of progress of one day per decade is sustained: The goal set by Jule Charney and others when they launched GARP in the 1970s was achieved. Global models have resolutions below 5km, and mesoscale models significantly below 1km, down to a few tens of meters in urban areas for example.

 The sub-seasonal time scales are achieved, ensembles have routinely hundreds of members, shared between many global centers, and forecast products provide accurate and detailed information on such things as closed water budgets over most watersheds, wind, temperature and air quality information in urban street canyons and outwards to the surrounding country side, finely detailed agromet information from hourly cycles to seasonal, precise storm surges and wind damage estimates for cyclone landfall, sea state, including rogue waves, and dangerous shore currents, telecommunications and electricity blackouts from solar eruptions form the surface to satellites orbital heights, toxic algae blooms , pest migrations, etc.

 Most or even all this information are accessible as a public good product to all WMO Members, and their partners, and most of this information is available either in raw format, or directly as impact information. It is disseminated and presented in accordance with users formats, and using point-to-point or, increasingly, cloud to point communication broadband technologies. It is quality controlled, validated and have metadata information associated, and in the case of forecast information, it is verified. Imbedded in the design of the system is a two-way feedback real-time communication capacity between the provider and the receiver of the data.

 The system has evolved through partnership agreements that allow it to absorb or carry information produced either by the private sector, or by other closely related organizations to the traditional NMHSs.

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1. \* On a PC, in MS Word 2010 go to “**View**” and tick the “**Navigation Pane**” checkbox in the “**Show**” section. In MS Word 2007 or 2003, go to “**View**” > “**Document Map**”. On a Mac, go to “**View**” > “**Navigation Pane**” and select “**Document Map**” in the drop-down list on the left. [↑](#footnote-ref-1)