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| **WORLD METEOROLOGICAL ORGANIZATION****COMMISSION FOR BASIC SYSTEMSOPAG on DPFS****MEETING THE REGIONAL SUBPROJECT MANAGEMENT TEAM (RSMT) OF THE SEVERE WEATHER FORECASTING DEMONSTRATION PROJECT (SWFDP) IN SOUTHEAST ASIA**Ha Noi, Viet Nam, 20-23 November 2017 |  | WDS-DPFS/RAII/SeA-SWFDP-RSMT /Doc.4.1(4)(17.XI.2017)\_\_\_\_\_\_\_Agenda item: 4.1ENGLISH ONLY |

SWFDP’s CASCADING FORECASTING PROCESS

**CONTRIBUTIONS OF THE EUROPEAN CENTRE FOR MEDIUM-RANGE WEATHER FORECASTS (ECMWF)**

*(Submitted by the ECMWF)*

##### Summary and purpose of document

This document contains a summary of the activities of ECMWF which support WMO. ECMWF contributes to several SWFDP regional subprojects, providing access to graphical products on its website and training.

##### Action Proposed

The meeting is invited to review and consider this information to update the Regional Subproject Implementation Plan (RSIP) for SWFDP-Southeast Asia.

**Annex: -**

**Reference(s):** -

**SWFDP’s Cascading Forecasting Process:**

**Contributions of the European Centre For Medium-Range Weather Forecasts (ECMWF)**

ECMWF works closely with the WMO, with which it has a formal [co-operation agreement](https://www.ecmwf.int/sites/default/files/wmo.pdf). In May 2017 ECMWF ws designated a World Meteorological Centre (WMC). The WMC designation confirms that all the associated requirements in the three main areas listed below have been met :

* Global deterministic numerical weather prediction
* Global ensemble numerical weather prediction
* Global numerical long-range prediction

ECMWF contributes to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) as a Global Centre. In this project ECMWF provides access to its global HRES and ENS forecast products as part of the cascading forecast approach to support national meteorological services in developing and least-developed countries. ECMWF provides graphical products for the domains of each regional project as required for early warnings of high impact and extreme weather events, e.g. ensemble probabilities and high-resolution forecasts for wind, precipitation and temperature, as well as tropical cyclone tracks.

Participants in the SWFDP SE Asia can access the  ECMWF forecast charts for their project on ECMWF website (password required).

SWFDPs have a training component and ECMWF has been present at most of the training events organised by WMO to provide in depth knowledge of its products. Such knowledge allows forecasters to use ECMWF products more effectively in their daily forecasting activities. Moreover, in 2016 Mr Nguyen Thanh Tung spent a year at ECMWF on the WMO Fellowship programme. The placement provided training and hands-on experience to enhance his professional competence and enable him to make an essential contribution to the development of his country.

Mr Nguyen Thanh Tung investigated and documented biases and characteristics of high-resolution (HRES) and ensemble (ENS) rainfall forecasts for up to six days ahead using a dataset of observations covering the Vietnamese territory. He also be looked at tropical cyclone forecasts and their performance for South East Asia.

ECMWF Integrated Forecasting System (IFS) is continuously improved. We would like to mention two major changes in the model:

* In March 2016, ECMWF introduced a new model cycle of the IFS into operations. The cycle represented a significant step forward in accuracy and resolution and, at a grid spacing of 9 km (HRES) , it is currently the highest-resolution global forecasting system in the world. The main change is an increase in horizontal resolution in most parts of the forecasting system. For high-resolution forecasts (HRES) and ensemble forecasts (ENS) the grid-point resolution ws roughly doubled to 9 km and 18 km, respectively
* In November 2016 the model change included a dynamic sea-ice model and an increase in the resolution of the ocean model. Introducing interactive sea ice also makes it possible to predict changes in sea-ice cover during the forecast. In the previous model version, sea-ice cover was left static up to forecast day 15. The resolution increase of the ocean model used in ensemble forecasts, from 1 degree and 42 layers to 0.25 degrees and 75 layers, meant that small-scale ocean circulation features are better captured and coastlines are better resolved than previously

ECMWF also contributes to WMO committees, working groups and expert groups, especially on issues relating to the World Weather Watch. ECMWF hosts an archive of ensemble forecasts from 10 global centres to support the [WMO TIGGE project](http://www.ecmwf.int/en/research/projects/tigge). This project seeks to improve high-impact weather forecasts by strengthening international collaboration between operational centres and academia. The forecast data is freely available to all users for research purposes. Moreover, ECMWF is developing an archive for extended-range (subseasonal) forecasts to support the WMO Subseasonal to Seasonal Prediction Project.

ECMWF runs as entrusted entity by the European Commision, two Copernicus services : amtospheric monitoring ([CAMS](https://atmosphere.copernicus.eu)) and climate change ([C3S](https://climate.copernicus.eu)). Datasets from CAMS and C3S are freely available