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**SEVERE WEATHER FORECASTING AND DISASTER
RISK REDUCTION DEMONSTRATION PROJECT
(SWFDDP)**

Agenda item: 7.1

**A REGIONAL SUBPROJECT OF SWFDP IN RA V
REGIONAL SUBPROJECT MANAGEMENT TEAM**

WELLINGTON, NEW ZEALAND
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ENGLISH ONLY

JMA Contribution to SWFDDP in RAV

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Summary and purpose of document

This document summarizes the planned contribution of Japan Meteorological Agency to the SWFDDP in RA V.

Action Proposed

The meeting is invited to note the contents of the information contained in the document and to comment on how the proposed resources will help to support the aims of the subproject.

Annex: - ANNEX 1 : Availability of Minimum Required NWP Products from Global Centres (JMA)

Reference(s): - INFO.5 "Letter from Japan Meteorological Agency" submitted to the first meeting of RSMT of SWFDDP in RA V
http://www.wmo.int/pages/prog/www/DPFS/Meetings/RA_V_SWFDDP_Wellington_2009/documents/INFO_5.pdf

1. Introduction

- 1.1 Japan Meteorological Agency (JMA) is a national meteorological service in Japan. JMA monitors the earth's environment and forecast natural phenomena related to the atmosphere, the oceans and the earth. JMA is also a sole national authority responsible for issuing weather/tsunami warnings and advisories. JMA plays a vital role in natural disaster mitigation and prevention activities in the country through cooperation and coordination with relevant authorities, including the media, the disaster management and civil protection authority (DMCPA) and the public users.
- 1.2 JMA engages in international cooperation activities to meet Japan's international obligations and to promote partnerships with National Meteorological and Hydrological Services. JMA is an active member of WMO and has been serving as a Regional Specialized Meteorological Center (RSMC) with both geographical and specialized activities such as typhoon forecasts and environmental emergency response.
- 1.3 JMA has been developed and operated a suite of numerical weather prediction (NWP) systems, including a global deterministic model and a weekly ensemble prediction system to support the activities for disaster prevention and mitigation and weather and climate services.
- 1.4 JMA showed our intention to participate in the regional subproject in South Pacific Islands, Regional Association V: Severe Weather Forecasting and Disaster risk reduction Demonstration Project (SWFDDP) at the first meeting of the Regional Subproject Management Team (Wellington, 21-24, Sep., 2009) (ref. INF.5 submitted to this meeting). However, a dedicated web page of JMA hasn't been opened to make special contributions to SWFDDP although a variety of our NWP products are available through GTS, our website on Internet and so on.
- 1.5 The dedicated webpage for SWFDDP is almost ready to open for participating centres to fully attend the subproject from the full demonstration phase.

2. JMA contribution to SWFDDP in RA V

- 2.1 JMA operates the Global Spectral Model (GSM; TL959L60) four times a day (at 00,06, and 18UTC with a forecast time of 84 hours and at 12UTC with a forecast time of 216 hours)
- 2.2 The complete list of the available products of GSM for SWFDDP RA V is found in ANNEX 1. The products of forecasts from 00UTC and 12UTC initials are available. It is noted that the products of 00UTC runs are limited to 84 hour forecasts because of the forecast range. The products of 12UTC runs fully cover 5 day forecast range essential for the operation of SWFDDP RA V.
- 2.3 All products are provided by images with both low and high resolutions on the dedicated webpage of JMA for SWFDDP RA V, that will be linked from the MetConnect Pacific webpage. This webpage is opened free from password-protection.
- 2.4 JMA also operates the global ensemble prediction system for one-week forecast (WEPS). It runs once a day at 12UTC and the forecast range is 9 days. At present, the uncertainty of an initial field is considered only in the northern hemisphere and tropics (20S-90N). Therefore, the products of the probabilistic forecasts in the southern hemisphere are not qualified enough for operational use.

2.5 It is scheduled that WEPS will add the initial perturbation in the southern hemisphere before March 2011. The products of probabilistic forecasts will be provided as soon as possible after the quality of these products is ensured.

3. Other JMA international services for NMHSs

3.1 Satellite Animation and Interactive Diagnosis (SATAID) Tool

3.1.1 SATAID (Satellite Animation and Interactive Diagnosis) is a set of CAL software for MS-Windows that enables the use of a range of meteorological data with a focus on satellite imagery. The latest version of SATAID and related programs can be downloaded from the SATAID Program Page (<http://mscweb.kishou.go.jp/VRL/sataid/program.htm>).

3.1.2 JMA also coordinates a WMO Information System (WIS) pilot project to facilitate the utilization of satellite imagery and numerical weather prediction (NWP) products, in cooperation with NHMSs in RA-II and RA-V. This project features JMA's SATAID software, which enables users to process and display satellite and NWP data using a local personal computer.

3.1.3 The software download MTSAT imagery and NWP products automatically, which are helpful for NHMSs to use SATAID software in their operational work. Specification of NWP grid point values (GPV) of deterministic global model currently provided for the SATAID is written below:

Area: 125E-160W, 5N-65S

Grid interval: 1.25 degree

Elements: Rain, U, V, T, T-Td, Z, ω

(Vorticity, Potential temperature, CAPE, K-index, CIN and 1000 - 500 hPa thickness are calculated in SATAID)

Levels: surface, 1000, 925, 850, 700, 500, 400, 300, 250, 200, 150 (hPa)

Forecast time: 0 – 48 hours (6 hourly)

Initial times: 00, 06, 12, 18 UTC

3.2 High-resolution GRIB data of GSM

3.2.1 JMA has provided the high-resolution grid-point value (GPV) data of GSM in GRIB format to NMHSs as one of RSMC data services since December 2008. The resolution of GPV data is 0.25 degree grid interval in the surface level and 0.5 degree in pressure levels.

3.2.2 The high resolution GPV data are expected to be used for more detailed weather forecasting and/or as an input of regional model run as initial and/or boundary data.

3.2.3 The Detail information on this service is available from the following web page: <http://ds.data.jma.go.jp/tl959/profile.html>.

3.3 Global wave model

3.3.1 JMA operates a global wave model (GWM) once a day (12 UTC initial) and provides its GPV as one of RSMC data services, while we do not operate any global ensemble wave model. Specification of the GWM products is as follows:

Grid interval: 0.5 degree

Elements: significant wave height, prevailing wave period, prevailing wave direction

Forecast time: 0 – 84 hours (6 hourly), 96 – 192 (12 hourly)

Initial times: 00, 06, 12, 18 UTC

ANNEX 1

Availability of Minimum Required NWP Products from Global Centres (JMA)

For the South Pacific SWFDDP (product list from SWFDP RA I subproject for discussion)

Note that tbd means: to be determined

Deterministic Forecasts:	Availability			
6-hourly out to 72 hours, then 12-hourly up to 144 hours	ECMWF	UK Met	NCEP	JMA
Parameters: wind (streamlines and speed/direction), temperature, geopotential height, humidity Levels: sfc, 925mb, 850mb, 700mb, 500mb, 300mb, 200mb Purpose: General forecasting parameters to gain a perspective on the overall atmosphere. For determination of frontal system and pressure maxima locations.				YES
Parameter: vorticity Level: 500mb, 300mb Purpose: Determination of frontal and low pressure system locations. Crucial in locating potential severe weather outbreak locations. Can be used in determination of severe weather type				YES
Parameter: vertical velocity Level: 850mb, 700mb, 300mb Purpose: Determination of mesoscale patterns of rising and sinking air masses (convective updrafts)				YES
Parameter: 850mb wet bulb potential temperature Level: 850mb Purpose: Frontal position diagnosis and change in airmass				NO
Parameters: instantaneous and accumulated precipitation, minimum temperature, maximum temperature, sea level pressure, relative humidity Level: sfc Purpose: General forecasting parameters				YES except instantaneous precipitation
Parameter: 1000-500mb thickness Level: partial atmospheric column Purpose: Freezing level determination and air mass distinguishing				YES
Parameter: precipitable water Level: atmospheric column Purpose: Determination of total liquid water in the atmosphere and thus potential rainfall				YES

Parameter: convective available potential energy (CAPE), Theta-E Level: atmospheric column Purpose: Amount of energy available in the atmosphere for storm production				YES(Theta-E)
Parameter: lifted index, K index, total totals index Level: stability index Purpose: Pre-calculated indices to generalize severe weather potential				YES
Parameter: convective inhibition (CIN) Level: stability index Purpose: Strength of force preventing convective initiation. The amount of energy (frontal forcing or daytime heating) that is needed to begin convection.				NO
Parameters: significant wave height, mean wave direction and mean wave period Purpose: General sea-state forecasting parameters.				NO
Parameters: swell wave height and period, wind sea wave height and period, spectral decomposition of wave energy by range of periods Purpose: Marine forecasting parameters. Crucial in locating potential heavy swell areas.				NO
Ensemble Forecasts:				
12-hourly out to 144 hours				JMA
Probability of 6-hour accumulated precipitation exceeding 50mm and 100mm threshold value				TBD
Probability of 24-hour accumulated precipitation exceeding 100mm threshold value				TBD
Probability of 10-meter wind speed exceeding 20kt and 30kt threshold value				TBD
Probability of 850hPa Temperature Anomaly exceeding 2K, 4K, 8K threshold value				TBD
Probability of significant wave height exceeding 2 m, 4 m and 6 m threshold value				TBD
Probability of mean wave period exceeding 10 s and 15 s threshold value				TBD
Wave EPSgrams for specific sea points and associated spectra				TBD
Ensemble Prediction System meteograms for specified locations				TBD
Spaghetti diagrams for 500mb geopotential height				TBD
Spaghetti diagrams for sea level pressure				TBD

Thumbnails of probability of precipitation in excess of threshold of 50mm/6h at 6 hours intervals				TBD
ECMWF Extreme Forecast Index for precipitation and wind				TBD
Tropical cyclone occurrence and genesis probability maps				TBD
Tropical cyclone strike probability maps				TBD
Tropical cyclone forecast tracks from ensemble members, including ensemble mean, deterministic and control tracks				TBD
Tropical Cyclone Lagrangian meteograms (ECMWF)				TBD
Other REQUESTED Products:				
	Availability			
	ECMWF	UK Met	NCEP	JMA
SKEW-T logarithmic forecast plots for selected grid points based on NWP output (out to 144 hours, 12-hourly)				TBD