|  |  |  |
| --- | --- | --- |
| WORLD METEOROLOGICAL ORGANIZATION COMMISSION FOR BASIC SYSTEMS OPAGs on DPFS and PWS  **Severe Weather Forecasting Disaster Risk Reduction Demonstration Project**  **SWFDP – South Pacific Project**  **Meeting of the Regional Subproject**  **Management Team**  Honiara, Solomon Islands, 25-27 August 2016 |  | DPFS-PWS/RAV-SWFDDP-RSMT/Doc. 3.2(2)  (23.VIII.2016)  \_\_\_\_\_\_\_  Agenda item : 3.2  ENGLISH ONLY |

**Report by the Japan Meteorological Agency**

**on its contribution to SWFDP**

*(Submitted by the Japan Meteorological Agency)*

##### Summary and purpose of document

This document provides information on the contribution of the Japan Meteorological Agency to the Severe Weather Forecasting Demonstration Project.

##### Action Proposed

The meeting is invited to review the information provided (JMA) and to give feedback.

**Reference:** -

# Introduction

1.1 JMA has been participating in the Severe Weather Forecasting Demonstration Project (SWFDP) as a global centre of numerical weather prediction (NWP) and satellite since 2009. As of August 2016, JMA participates in sub-regional projects in South Pacific Islands (RA V), the Severe Weather Forecasting and Disaster risk reduction Demonstration Project (SWFDDP), and those of Southeast Asia, Bay of Bengal and Central Asia (RA-II).

1.2 JMA’s contributions to SWFDP consist of product services of NWP and satellite, software application (SATAID) service and training activities.

# NWP systems and products, including probabilistic information

2.1 JMA provides SWFDP with NWP products of its three operational models: 1) the Global Spectral Model (GSM), with resolution of TL959L100, run four times a day (at 00, 06, and 18UTC up to 84 hours and at 12UTC up to 264 hours), 2) the global ensemble prediction system for one-week forecast (WEPS), run twice a day at 00 and 12UTC up to 11 days and 3) the Global Wave Model (GWM), run four times a day (at 00, 06, and 18UTC up to 84 hours and at 12UTC up to 264 hours).

2.2 The model specifications and details are described in *Outline of the Operational Numerical Weather Prediction at the Japan Meteorological Agency* and *the Joint WMO Technical Progress Report on the Global Data Processing and Forecasting System and Numerical Weather Prediction Research Activities*, available at http://www.jma.go.jp/jma/jma-eng/jma-center/nwp/nwp-top.htm.

2.3 The list of the products of GSM, WEPS and GWM for SWFDDP is found in ANNEX 1. Products of GSM with 00UTC initial runs are limited to 84 hours, while those with 12UTC initial runs cover 5 day forecast range.

2.4 JMA started to operate the Wave Ensemble System (WENS) in June 2016, whose products are planned to be made available for the Project in the second quarter of 2017. The new products are ensemble mean, 3rd quantile, maximum wave heights, probability of wave height over 2, 3, 4, 5, 6 m, ensemble spread and box plot and exceeding probability at stations (as map products). The Global Wave Model (GWM) was also enhanced with new parameters, which will be made available to SWFDP as GRIB format model outputs: windsea height, period, direction and swell height, period, direction.

2.5 JMA supports projects for using multi-model ensemble forecasting in the Project, as part of research to operation activities following the GIFS-TIGGE project. Tropical cyclone ensemble forecasts and occurrence probability of extreme events are provided to some of SWFDP sub regional projects, in collaboration with the Met Office.

# Satellite operation and products

3.1 JMA has been operating a series of Geostationary Meteorological Satellites (GMSs), also known as Himawari (sunflower), since 1978. The latest satellites of Himawari series are Himawari-8 and -9, launched in October 2014 and planned within 2016, respectively, replacing MTSAT-1R (Himawari-6) and MTSAT-2 (Himawari-7) series. Himawari-8 and -9 are equipped with 3 visible, 3 near infrared and 10 infrared bands.

3.2 Himawari-8/9 imagery and products are distributed and disseminated through four main channels: HimawariCloud, HimawariCast, GISC Tokyo WIS Portal (SATAID Service) and Web-based quick look.

# JMA’s product services

4.1 JMA has been operating a dedicated website for SWFDP, launched in November 2010, at http://www.wis-jma.go.jp/swfdp/ra5\_swfddp\_spi.html. This website provides various map products of GSM and EPS, as well as specialized satellite products tailored to participants of SWFDP, including the Heavy Rainfall Potential Areas.

4.2 NWP model outputs are provided through the GISC Tokyo website, at http://www.wis-jma.go.jp/data/select, as part of services of a WMO Information System (WIS) Data Collection or Production Centre (DCPC), to facilitate various processing and applications using GRIB format model outputs.

4.3 JMA operates the HimawariCloud service for Himawari imagery and products distribution, which is an internet cloud service specifically for NHMSs to facilitate distribution of large amount of data for users who have broadband internet access. Data sets of Himawari imagery in Himawari Standard Data, Portable Network Graphics (PNG), High-Rate Information Transmission (HRIT) and Network Common Data Form (NetCDF, only for target observation area) formats are available. Details are available at http://www.data.jma.go.jp/mscweb/en/himawari89/cloud\_service/cloud\_service.html.

4.4 JMA also operates the HimawariCast service mainly for Himawari imagery and products dissemination. HimawariCast is a data broadcast service through a communication satellite, which provides Himawari High-Rate Information Transmission (HRIT) and Low-Rate Information Transmission (LRIT) satellite imagery, as well as SATAID format GSM forecasts and observation data. Details are available at http://www.data.jma.go.jp/mscweb/en/himawari89/himawari\_cast/himawari\_cast.html.

4.5 As another web service, web-based quick look provides several map products of Himawari-8, such as RGB imagery and Heavy Rainfall Potential Areas for specified small areas.

4.6 The SATAID Service includes SATAID format data service (see section 5.3).

# Satellite Animation and Interactive Diagnosis (SATAID) Service

5.1 SATAID Service, jointly provided by JMA’s RSMCs Tokyo Typhoon Center and Geographical, and Meteorological Satellite Center, consists of SATellite Animation and Interactive Diagnosis (SATAID) application tool and SATAID format data, available at the SATAID Service portal at http://www.wis-jma.go.jp/cms/sataid/.

5.2 SATAID (Satellite Animation and Interactive Diagnosis) is a set of CAL software for MS-Windows that enables visualization and manipulation of satellite imagery, NWP (numerical weather prediction) products and various observation data. The SATAID package includes automatic data downloader of satellite imagery and NWP products, which are helpful for NHMSs to use SATAID software in their operational work. A set of software applications is available at: http://www.wis-jma.go.jp/cms/sataid/app/download/.

5.3 SATAID format data are provided through internet (from the SATAID Service portal). Data available are satellite imagery of Himawari-8, GSM forecasts, sea surface temperature (SST) and observation data (SYNOP, SHIP, METAR, TEMP and ASCAT sea-surface wind), for several predefined subareas. Details are available at <http://www.wis-jma.go.jp/cms/sataid/data/>. SATAID format GSM forecasts and observation data are also available through HimawariCast (see section .4.4), and a sample source code for converting HRIT format Himawari imagery to SATAID format is provided at <http://www.data.jma.go.jp/mscweb/en/himawari89/space_segment/spsg_sample.html>, for users who wish to use SATAID tool with data received through HimawariCast.

# Training activities

6.1 JMA hosts and contributes to various training events, focusing on satellite and NWP product use, as well as public weather services. In addition to SWFDP training workshops to which JMA has been sending lecturers, JMA conducts various training events, some of which are conducted in collaboration with the World Meteorological Organization (WMO) and the Japan International Cooperation Agency (JICA).

6.2 JMA is coordinating projects with WMO and JICA to install HimawariCast receiving systems in National Meteorological and Hydrological Services (NMHSs) followed by on-site training events, for the purpose of ensuring reception and the use of satellite imagery for the operational meteorological services even in an unstable internet environment.

6.3 JMA hosts several regular training events, including the Japan International Cooperation Agency’s group training course, the Typhoon Committee’s Regional Specialized Meteorological Centre (RSMC) attachment training and training events of the Asia Oceania Meteorological Satellite Users’ Conference (AOMSUC).