WORLD METEOROLOGICAL ORGANIZATION
_____

ET-SUP-8/Doc. 6.5
(8.IV.2014)
_____

COMMISSION FOR BASIC SYSTEMS
OPEN PROGRAMME AREA GROUP ON INTEGRATED OBSERVING SYSTEMS

EXPERT TEAM ON SATELLITE UTILIZATION AND PRODUCTS

ITEM: 6

EIGHTH SESSION

GENEVA, SWITZERLAND, 14-17 APRIL 2014

Original: ENGLISH

Himawari-8/9 data distribution/dissemination plan

(Submitted by JMA)

Summary and Purpose of Document

All imagery derived from Himawari-8/9 will be distributed to NMHSs via an Internet cloud service. JMA also plans to start the HimawariCast service, by which primary sets of imagery will be disseminated to NMHSs via a communication satellite using DVB-S2 technology.

ACTION PROPOSED

The eighth session is invited to:

(a) note the current progress of Himawari-8/9 data distribution/dissemination; and

(b) provide comments, suggestions and recommendations regarding JMA's new services.

_____

DISCUSSION

Introduction

The Japan Meteorological Agency (JMA) plans to launch the world's first next-generation geostationary satellite, Himawari-8, in 2014 and to start its operation in 2015 as a replacement for MTSAT-2 (also called Himawari-7). Himawari-9 will also be launched in 2016 as a backup and successor satellite. Both satellites will be located at around 140 degrees east, and will observe the East Asia and Western Pacific regions for a period of 15 years.

Himawari-8/9 will have 16 bands, which is more than three times the 5 bands of the current MTSAT series. Three of these will be visible bands corresponding to red, green and blue to enable the creation of true-color images. Observation frequency will also be enhanced, with full-disk imagery obtained every 10 minutes. In addition, rapid scanning will be conducted in several regions, one of which will be for targeted observation of tropical cyclones.

Imagery from JMA's current operational satellite, MTSAT-2 (Himawari-7), is provided via MTSAT-1R (Himawari-6) direct dissemination through the L-band frequency High Rate Information Transmission (HRIT) and Low Rate Information Transmission (LRIT) services. Most National Meteorological and Hydrological Services (NMHSs) in the East Asia and Western Pacific regions receive this imagery using L-band antennas and receivers, and process it with dedicated systems. JMA also provides the same HRIT service imagery via the online JMA Data Dissemination System (JDDS).

Himawari-8/9 will not carry equipment for direct dissemination. Instead, all imagery derived from the satellites will be distributed to NMHSs via an Internet cloud service. JMA also plans to start the HimawariCast service, by which primary sets of imagery will be disseminated to NMHSs via a communication satellite using Digital Video Broadcasting – Satellite – Second Generation (DVB-S2) technology.

Internet cloud service

To distribute the enormous volumes of Himawari-8/9 imagery that will be produced, JMA will establish an Internet cloud service mainly for NMHSs in the East Asia and Western Pacific regions.

Table 6.5.1 shows the tentative data set to be distributed via the cloud service. Himawari Standard Data will be used to create all products related to Himawari-8/9 as master data from all 16 bands with the finest spatial resolution. The above-mentioned true-color images will be provided in Portable Network Graphics (PNG) format. For rapid scanning observation, imagery in Network Common Data Form (NetCDF) will also be created and distributed.

Each NMHS will be able to access the cloud and get data using an HTTP 1.1 client such as a Web browser or Wget. It is important to note that an Internet connection with a speed of at least 25 Mbps will be required to download all Himawari Standard Data. These data will be separately created for each band and divided into 10 segments from north to south so that NMHSs can select only the files necessary for their operation.

JMA plans to start test operation of the Internet cloud service in the spring of 2015 with distribution of Himawari-8 in-orbit-test imagery.

To support service continuity for current JDDS users, JMA plans to produce HRIT files that are compatible with current MTSAT data (see Table 6.5.2). These will feature five bands near the current MTSAT observation bands, and will be provided every 30 minutes with the same frequency as the current service.

Format	Observation area	Notes
Himawari Standard Data	Full disk Target area	- Full disk: every 10 minutes - Target area: every 2.5 minutes - 16 bands - Finest-spatial-resolution data
Portable Network Graphics (PNG)	Full disk Target area	- True-color images (composites of 3 visible bands) - Full disk: every 10 minutes - Target area: every 2.5 minutes - Same spatial resolution as Himawari Standard Data
Network Common Data Form (NetCDF)	Target area	- Every 2.5 minutes - 16 bands - Same spatial resolution as Himawari Standard Data

Table 6.5.1: The tentative data set to be distributed via the Internet cloud service

Format	Observation area	Notes
HRIT files	Full disk	- Format compatible with the current MTSAT series HRIT service - Every 30 minutes - 5 bands (VIS: 1; IR: 4) - Coarser spatial resolution than Himawari standard data

Table 6.5.2: The data set to be continuously distributed via JDDS for current users

HimawariCast service

The Internet cloud service requires high-speed Internet access, whereas the HimawariCast service is suitable for users with limited Internet access.

Table 6.5.3 shows the tentative data set to be disseminated via communication satellite. HRIT files will represent the core data of the service, and LRIT files will also be included to support current LRIT service users. Dissemination will further include meteorological data other than Himawari imagery in SATAID format. Satellite Animation and Interactive Diagnosis (SATAID) visualization software for satellite imagery enables the superimposition of various data and products, such as NWP information, in-situ observation data and ASCAT output, onto satellite imagery. SATAID is widely used by NMHSs in the East Asia and Western Pacific regions as an operational tool for daily weather analysis and forecasting due to its usefulness and convenience.

The HimawariCast receiving and processing system will include a C-band antenna system, a Low Noise Block Converter (LNB), a DVB-S2 receiver and a desktop PC with datacasting client software and visualization software. JMA will release more information on the system in due course.

JMA plans to start the HimawariCast service early in 2015 when MTSAT-2 (Himawari-7) is still in operation. MTSAT-2 imagery will be disseminated through this service in parallel with direct dissemination via MTSAT-1R (Himawari-6) until Himawari-8 becomes operational in the summer of 2015. Himawari-8 data imagery will thereafter be disseminated via the HimawariCast service.

Data type	Format	Notes
Himawari-8/9 imagery (full disk)	HRIT files LRIT files	- Format compatible with the current MTSAT series HRIT and LRIT services - Every 10 minutes - HRIT: 5 bands (VIS: 1; IR: 4) - LRIT: 3 bands (VIS: 1; IR: 2) - Coarser spatial resolution than Himawari standard data
Numerical weather prediction products (GPV)	SATAID format	- JMA Global Model (GSM) products - Every 6 hours
In-situ observations (surface stations, ships, radiosondes)	SATAID format	- Observation data collected from the East Asia and Western Pacific regions
ASCAT ocean surface wind (EUMETSAT)	SATAID format	- Originally provided by the EUMETSAT Ocean and Sea Ice Satellite Application Facility (OSI SAF) and converted into SATAID format by JMA

Table 6.5.3: The tentative data set to be disseminated via communication satellite

JMA website

For general public use, JMA provides current MTSAT-2 (Himawari-7) imagery in PNG format on its website. In order to facilitate rapid downloading of essential imagery for meteorological services, the Agency also formulates various types of cut-out imagery in Joint Photographic Experts Group (JPEG) format on its website. JMA plans to continue this service even after Himawari-8 becomes its main operational satellite.

_____