

## JMA report on the status of current and future satellite systems

Presented to CGMS-44 Plenary session, agenda item D.1

### Japan Meteorological Agency

## Overview – Planning of JMA satellite systems (Himawari-series)

### GMS (Geostational Meteorological Satellite)

**GMS**  
(Himawari)



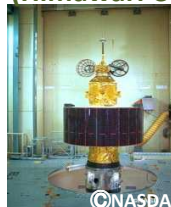
Launched in  
Jul 1977

**GMS-2**  
(Himawari-2)



Aug 1981

**GMS-3**  
(Himawari-3)



Aug 1984

**GMS-4**  
(Himawari-4)



Sep 1989

**GMS-5**  
(Himawari-5)



Mar 1995

### (GOES-9)

Back-up operation of  
GMS-5 with GOES-9 by  
NOAA/NESDIS  
from May 22, 2003  
to June 28, 2005

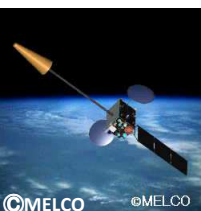
### MTSAT (Multi-functional Transport SATellite )

**MTSAT-1R**  
(Himawari-6)



Launched in  
Feb 2005

**MTSAT-2**  
(Himawari-7)

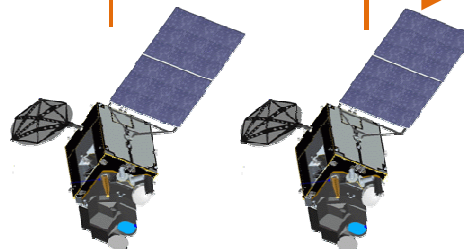


Feb 2006

### Himawari-8 Himawari-9 Himawari

Oct 2014

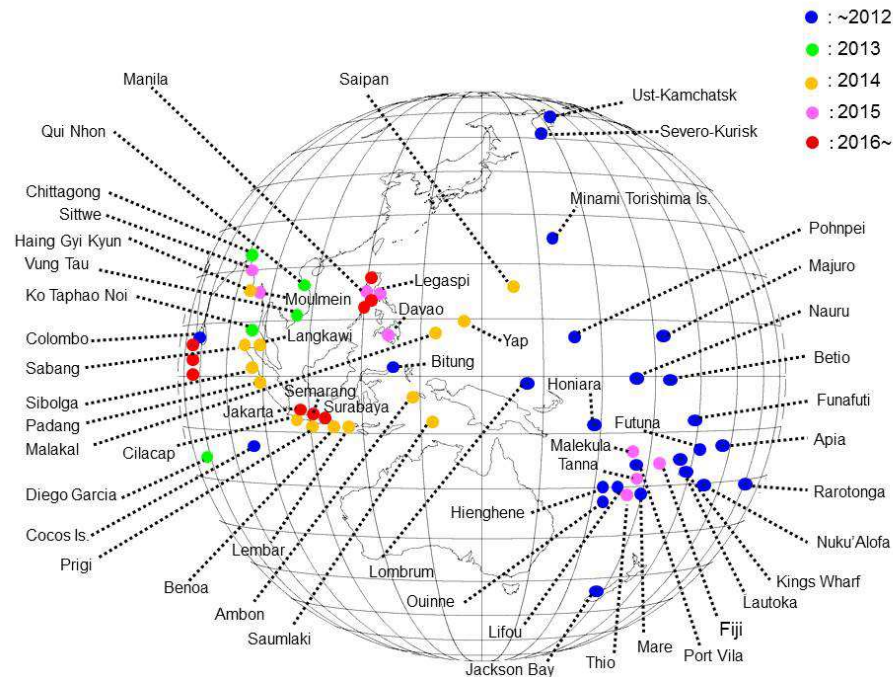
2016



Satellite	Observation period
GMS	1978 – 1981
GMS-2	1981 – 1984
GMS-3	1984 – 1989
GMS-4	1989 – 1995
GMS-5	1995 – 2003
GOES-9	2003 – 2005
MTSAT-1R	2005 – 2010
MTSAT-2	2010 – 2015
Himawari-8	2015 – 2022
Himawari-9	2022 – 2029

## CURRENT GEO SATELLITES

- **Himawari-DCS** (Data Collection System) plays a very important role in disaster prevention services in the Asia and Pacific regions.
- In recent years, the number of tidal/tsunami stations using **Himawari-DCS** has rapidly increased. In addition, the high-frequency collection (6-minute intervals) is implemented.



## Data distribution/dissemination methods

# Two Ways of Himawari-8/9 Imagery Dissemination/Distribution

## **HimawariCast** via Communication Satellite

- JMA's Baseline for Imagery Dissemination
- 14 bands (1 Vis. And 13 IR) every 10 minutes for Full Disk
- Coarse Spatial Resolution as of MTSAT HRIT compatible
- Meteorological data and products in SATAID format
- No Pass Code for Receiving

## **HimawariCloud** via Internet Cloud

- Full Specification (temporal and spatial) of Imagery
- Himawari Standard Format
- HRIT files(same as the ones disseminated via HimawariCast)

# Data distribution/dissemination methods

Himawari-8/9

Communication Satellite (CS)

raw data

HimawariCast  
service

HRIT files,  
SATAID files

CS Operator

All imagery  
(full data)

JMA

HimawariCloud  
service

NMHSs

Users



C-band antenna



LNB



DVB-S2 receiver



PC & software

## HimawariCast service

- **HimawariCast service** started disseminating **Himawari-8 imagery** in **July 2015**.
- Communication satellite: **JCSAT-2A** (154 degrees East)  
followed by **JCSAT-2B** in July 2016

Parallel dissemination by JCSAT-2A and JCSAT-2B will start at 03:00 UTC on 6th July and dissemination of JCSAT-2A will stop at 03:00 UTC on 20th July 2016.

Data type	Format	Notes
Himawari imagery (full disk)	<b>HRIT files</b> <b>LRIT files</b> <ul style="list-style-type: none"> <li>• Compatible with the MTSAT HRIT/LRIT services</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Interval: 10 minutes</b></li> <li>- <b>HRIT: 14 bands (VIS: 1 km, IR: 4 km)</b></li> <li>- <b>LRIT: 4 bands (VIS, IR1, IR3, IR4: 5 km)</b></li> </ul>
<ul style="list-style-type: none"> <li>• NWP products</li> <li>• In-situ observations</li> <li>• ASCAT ocean surface wind</li> </ul>	SATAID format	<ul style="list-style-type: none"> <li>- Superimposed onto satellite imagery by SATAID software</li> </ul>

## HimawariCloud service

- **HimawariCloud service** started distributing Himawari-8 in-orbit-test imagery in **April 2015**.
- Full-disk imagery is available **within 8 minutes** on the **HimawariCloud** server.
- In November 2015, HRIT data distribution started (same as the ones disseminated via HimawariCast).
- Upon receiving application forms, JMA is providing **HimawariCloud** accounts for NMHSs in the East Asia and Western Pacific regions.

Observation type	Format	Notes
Full disk (10-minute intervals)	<ul style="list-style-type: none"> <li>• Himawari Standard Data (HSD)</li> <li>• PNG</li> </ul>	<ul style="list-style-type: none"> <li>- HSD: 16 bands (full resolution)</li> <li>- PNG: True-color composite (1 km)</li> <li>- HRIT files (HSD)</li> </ul>
Target area (2.5-minute intervals)	<ul style="list-style-type: none"> <li>• HSD</li> <li>• NetCDF</li> <li>• PNG</li> </ul>	<ul style="list-style-type: none"> <li>- HSD: 16 bands (full resolution)</li> <li>- NetCDF: 16 bands (latitude/longitude grid)</li> <li>- PNG: True-color composite (1 km)</li> </ul>

## Support for User Readiness: **Webpage**

### Contents:

- Overview of satellite observation
- Overview of data dissemination
- Imager (AHI) specifications
- [Sample data](#)
  - Himawari Standard Data (HSD)
  - HRIT/LRIT files
  - NetCDF
  - PNG
- [Sample source code](#) to read HSD and convert into other formats

Meteorological Satellite Center (MSC) of JMA

Home Activities Products Operations Supports

Current position: [Home](#) > [Himawari-8/9](#) > [Sample Data](#)

Sample Data

Introduction Spacecraft Imager (AHI) **Sample Data** AHI Proxy Data (For researchers)

HimawariCast HimawariCloud (For NMHSs)

**Sample data created from AHI Observation data and AHI Proxy data**

This page provides sample data created from AHI Observation data and [AHI Proxy data](#). Table 1 shows names and formats of Himawari-8 and -9 data processed by JMA.

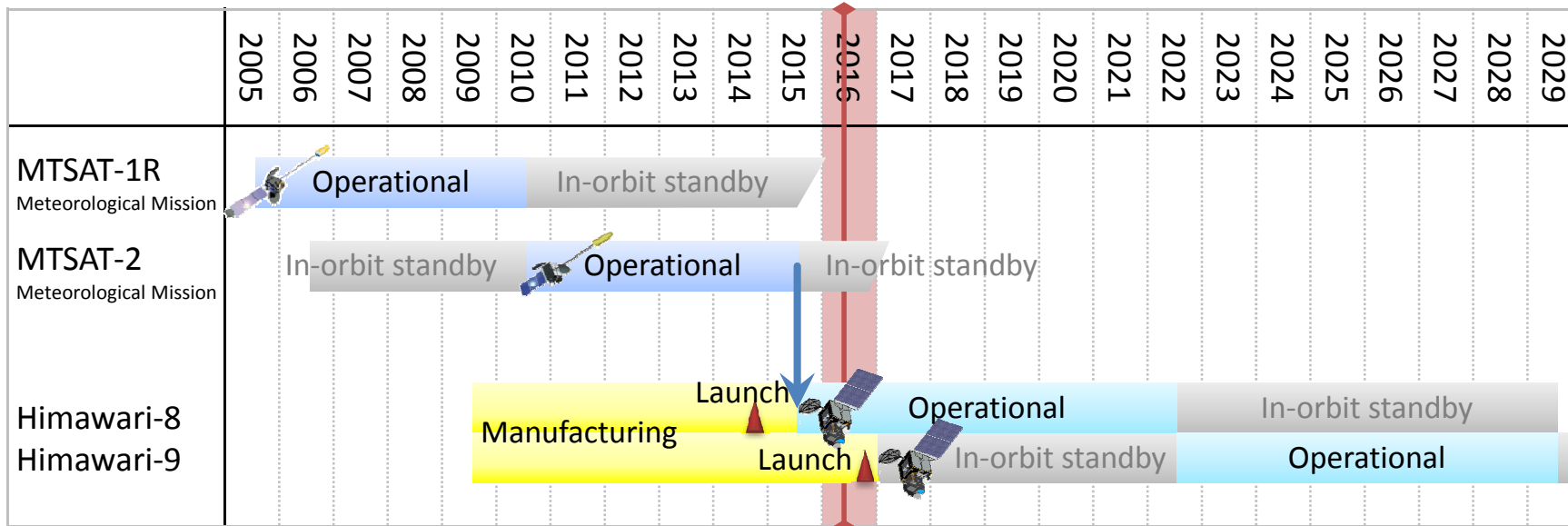
**Table 1. Names/formats of Himawari-8 and -9 observation data processed by JMA**

Observation area	Himawari Standard Data (Himawari Standard Format)	HRIT/LRIT Data (HRIT/LRIT File Format)	NetCDF Data (NetCDF Format)	Color Image Data (PNG 24-bit Format)
Full disk		<a href="#">Sample data</a>	–	
Japan area	<a href="#">Sample data</a>	–	<a href="#">Sample data</a>	<a href="#">Sample data</a>
Target area				

See <http://www.jma-net.go.jp/msc/en/support/index.html>



## FUTURE GEO SATELLITES



- JMA has started **Himawari-8** operation in **July 2015** as a replacement for **MTSAT-2**.
- JMA plans to launch Himawari-9 in 2016 as a backup and successor satellite.
- **Himawari-8** observes the **East Asia and Western Pacific regions** for a period of **15 years** with **Himawari-9**.