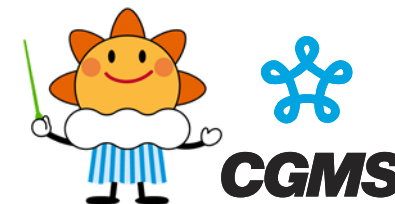


JMA report on the status of current and future satellite systems

Presented to CGMS-43 Plenary session, agenda item E.1

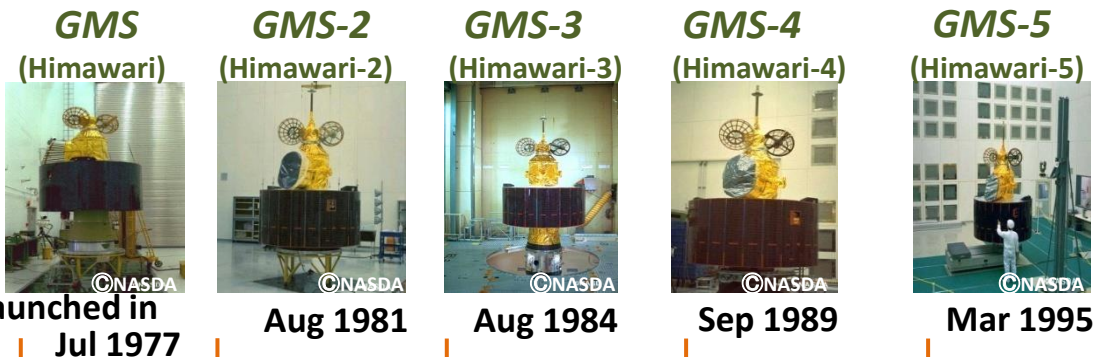
Japan Meteorological Agency

**Coordination Group for
Meteorological Satellites**



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

GMS (Geostational Meteorological Satellite)

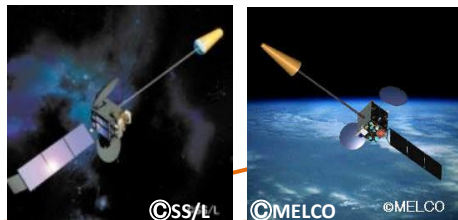


(GOES-9)

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) MTSAT-2 (Himawari-7)

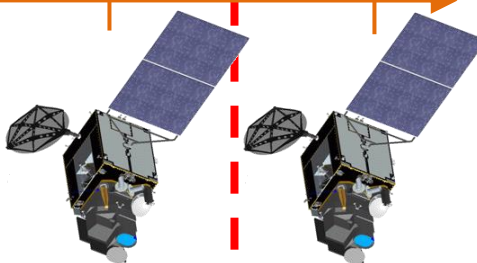


Launched in Feb 2005 Feb 2006

Himawari-8 Himawari-9

Himawari

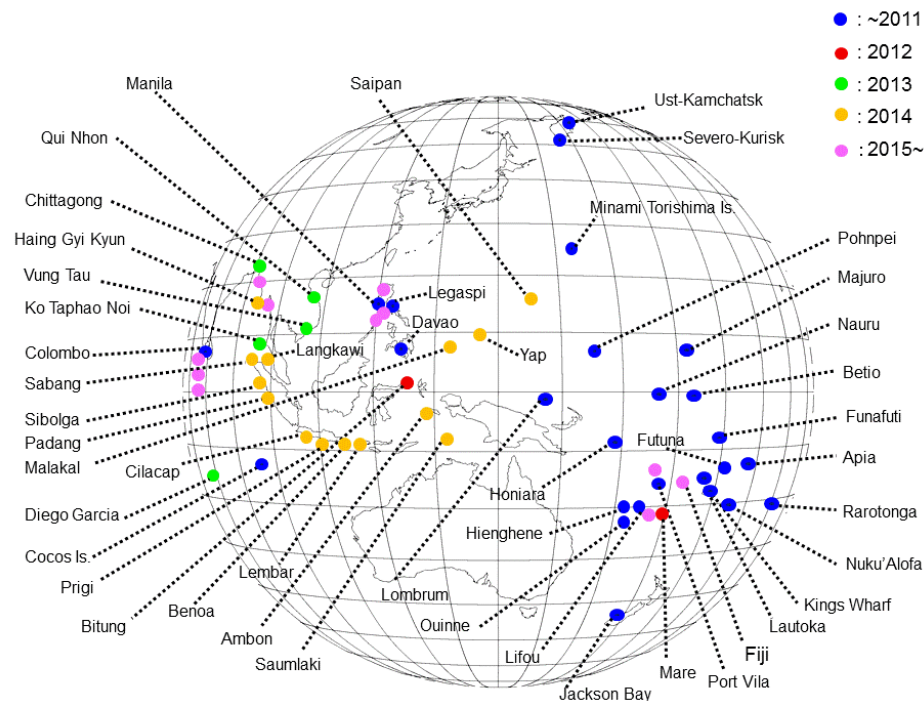
Oct 2014 2016



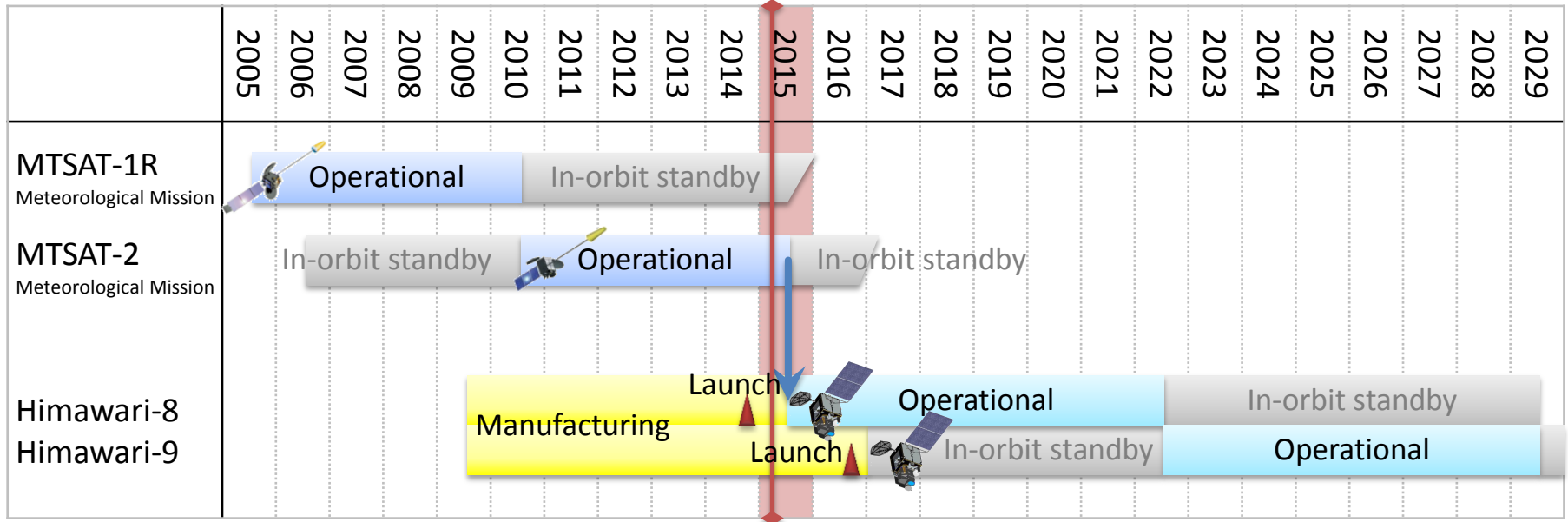
| Satellite | Observation period |
|------------|--------------------|
| GMS | 1978 – 1981 |
| GMS-2 | 1981 – 1984 |
| GMS-3 | 1984 – 1989 |
| GMS-4 | 1989 – 1995 |
| GMS-5 | 1995 – 2003 |
| GOES-9 | 2003 – 2005 |
| MTSAT-1R | 2005 – 2010 |
| MTSAT-2 | 2010 – 2015 |
| Himawari-8 | 2015 – 2022 |
| Himawari-9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

CURRENT GEO SATELLITES

- **MTSAT-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 **MTSAT-DCS** has rapidly increased. In addition, the **high-frequent collection** (6-minute intervals) is implemented.



FUTURE GEO SATELLITES



- **Himawari-8** was successfully launched on 7 October 2014.
- Currently, **Himawari-8** is in the in-orbit commissioning phase.
- JMA plans to start its operation in **July 2015** as a replacement for **MTSAT-2**.
- **Himawari-8** will observe the East Asia and Western Pacific regions for a period of 15 years with **Himawari-9**.

Dawn of a "New Era"



MTSAT-2 VIS 02, APR, 2015 16:00UTC

Himawari-8 02, APR, 2015 16:00UTC

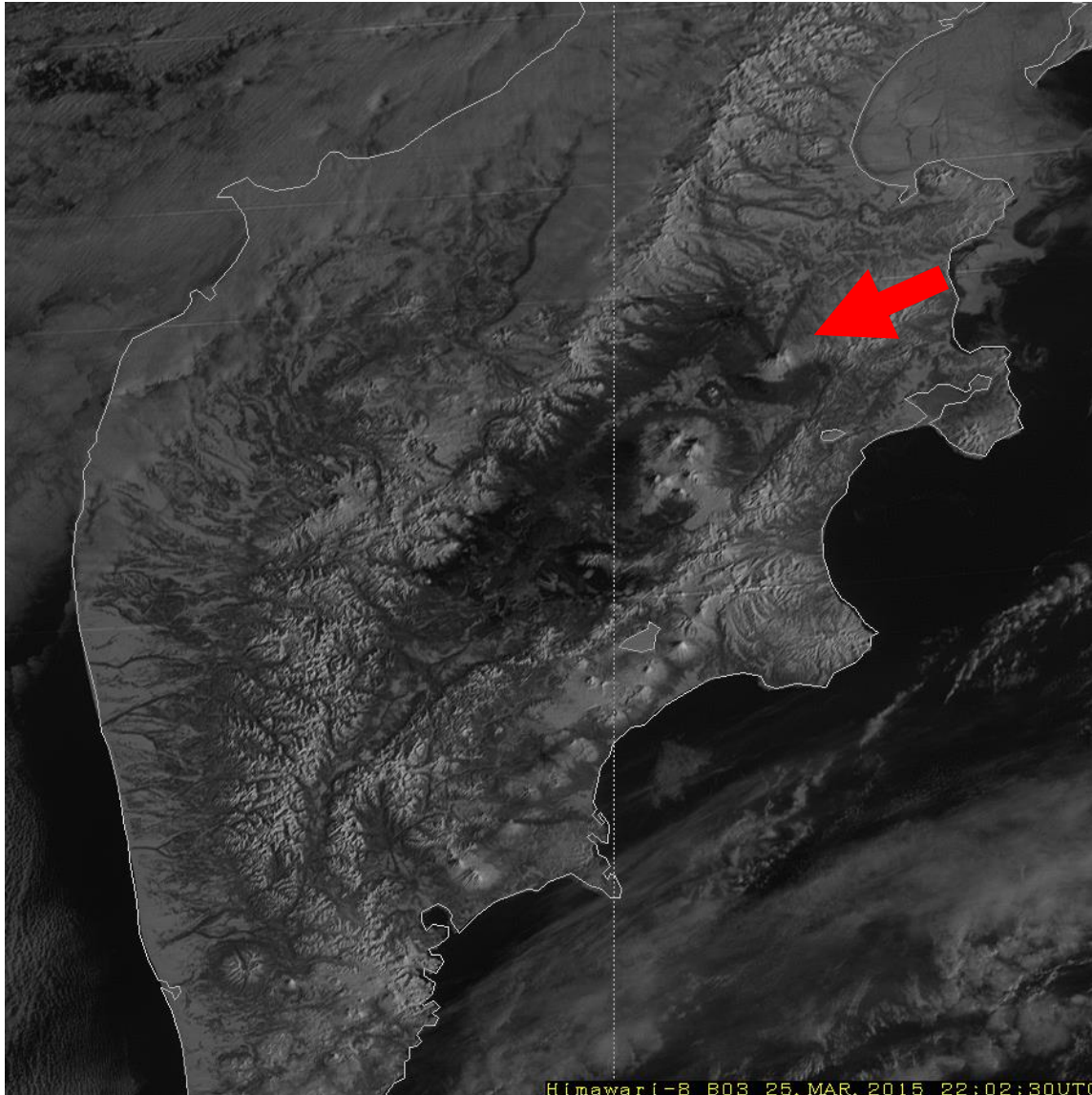
MTSAT-2

Himawari-8

Every 60 minutes in Monochrome

Every 10 minutes in Full-Color

Captured the Moment of Volcano Eruption



Target Area Observation

Mt. Shiveluch in Kamchatka

Band-03 (0.64 μm , visible)

Every 2.5 minutes

Data distribution/dissemination methods

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

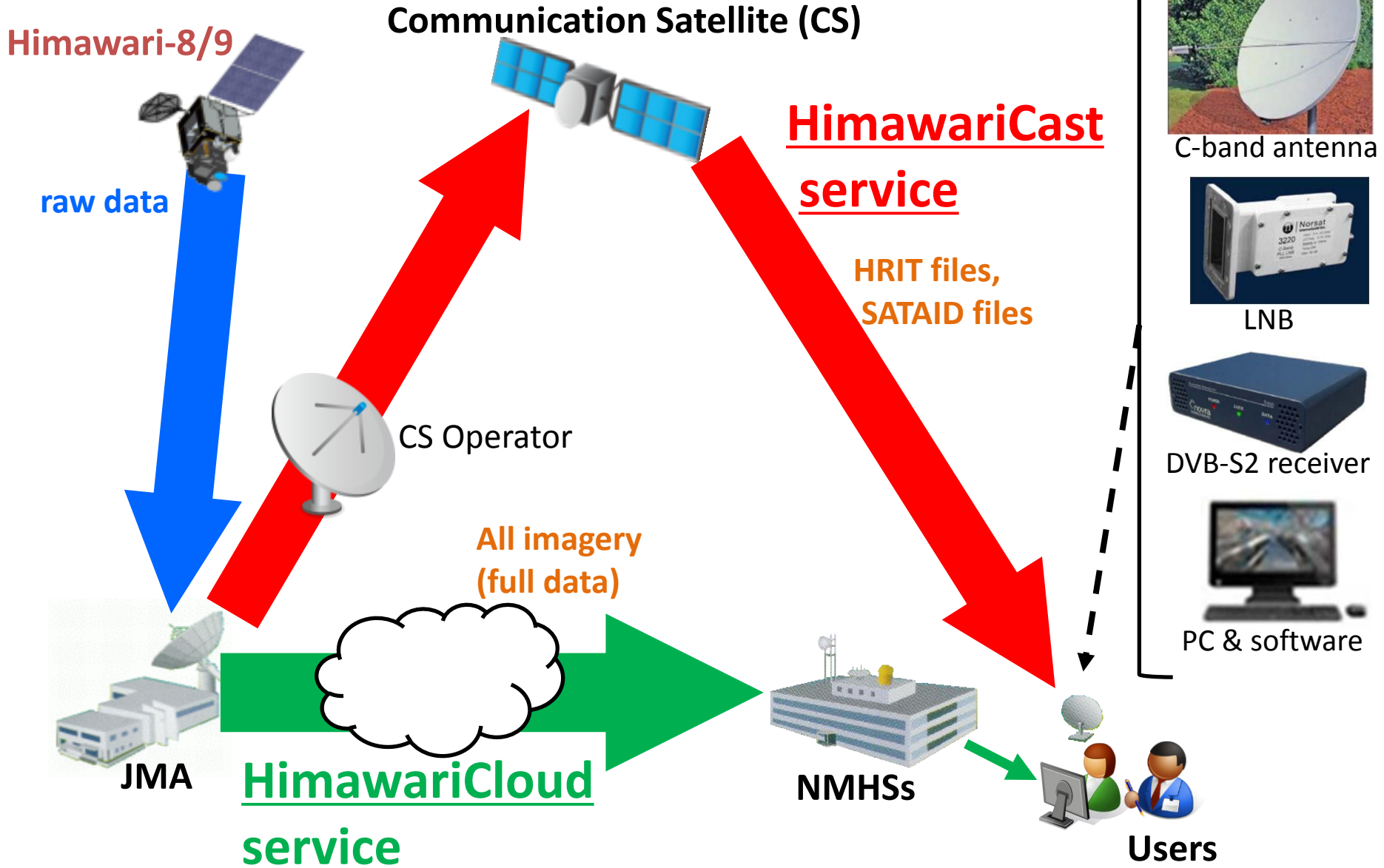
HimawariCast via Communication Satellite

- Service for Everyone
- 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
- No Pass Code for Receiving

HimawariCloud via Internet Cloud

- Service for NMHSs with high-speed Internet access
- Full Specification (temporal and spatial) of Imagery
- All 16 bands (3 VIS and 13 IR)

Data distribution/dissemination methods

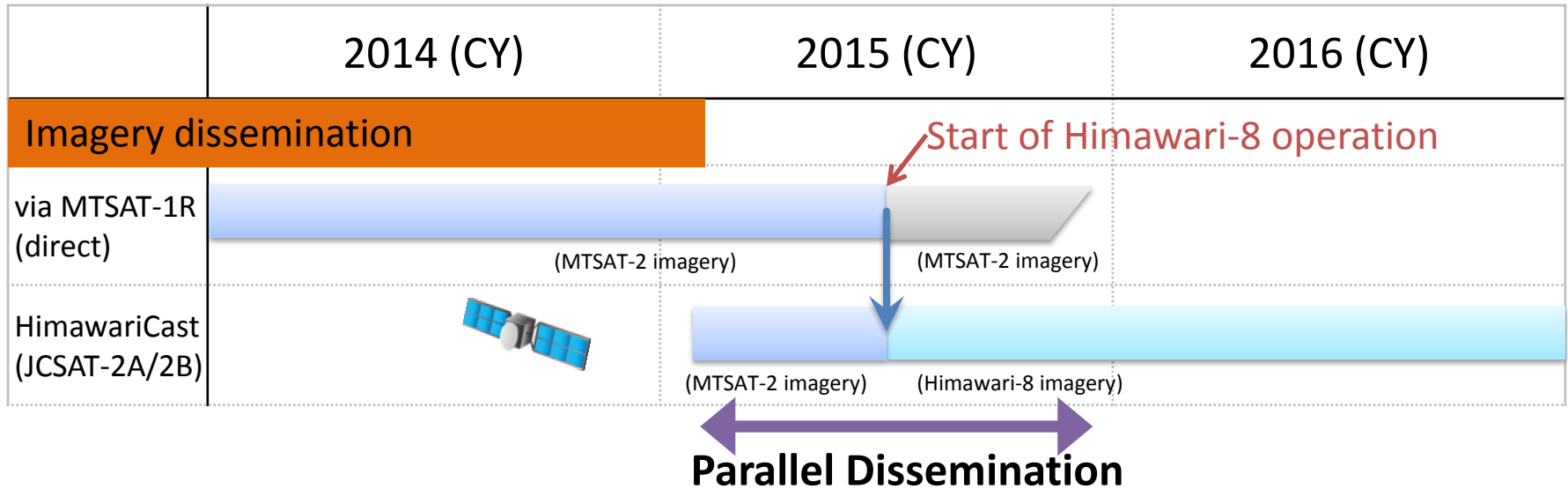


HimawariCast service

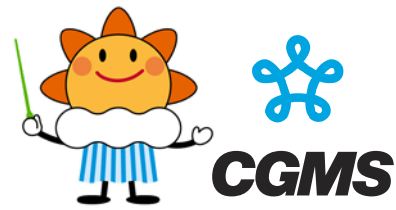
- **HimawariCast service** started disseminating **MTSAT-2 imagery** in **January 2015**.
- **Himawari-8 imagery** will be disseminated after **Himawari-8** becomes operational in **July 2015**.
- As far as JMA knows, **23 NMHSs** plan to receive **HimawariCast** data.

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

HimawariCast service



■ Direct dissemination of **MTSAT-2 imagery** via MTSAT-1R will be continued until around **November 2015** for **users' transitions**.



HimawariCast service

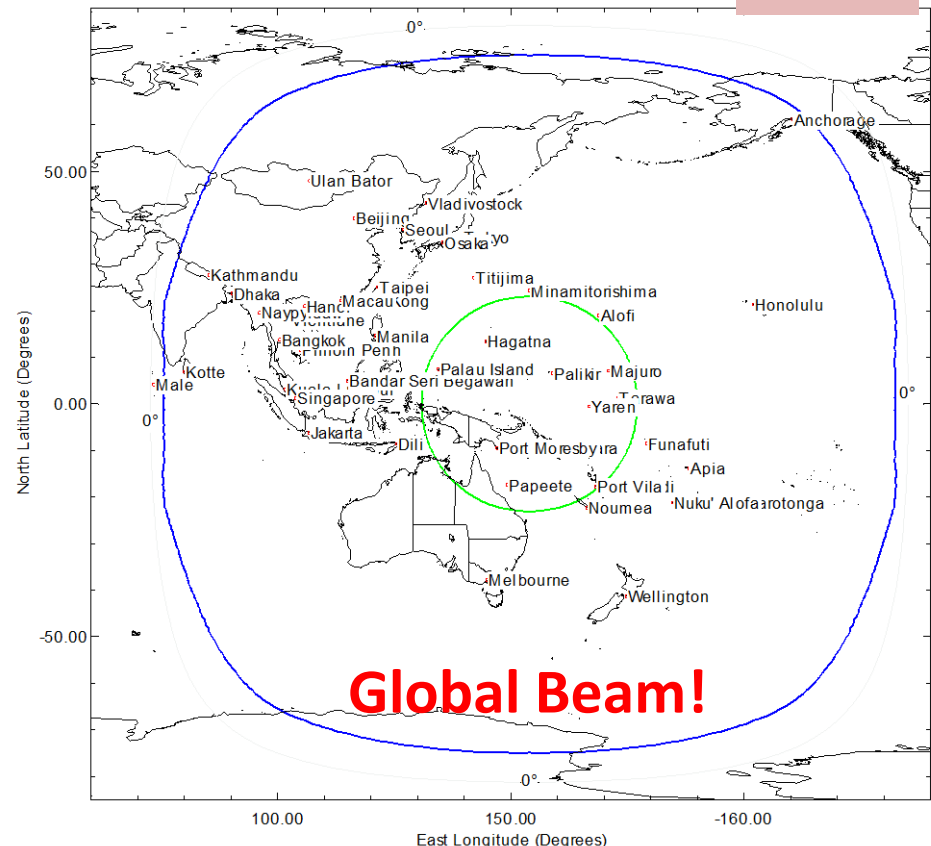
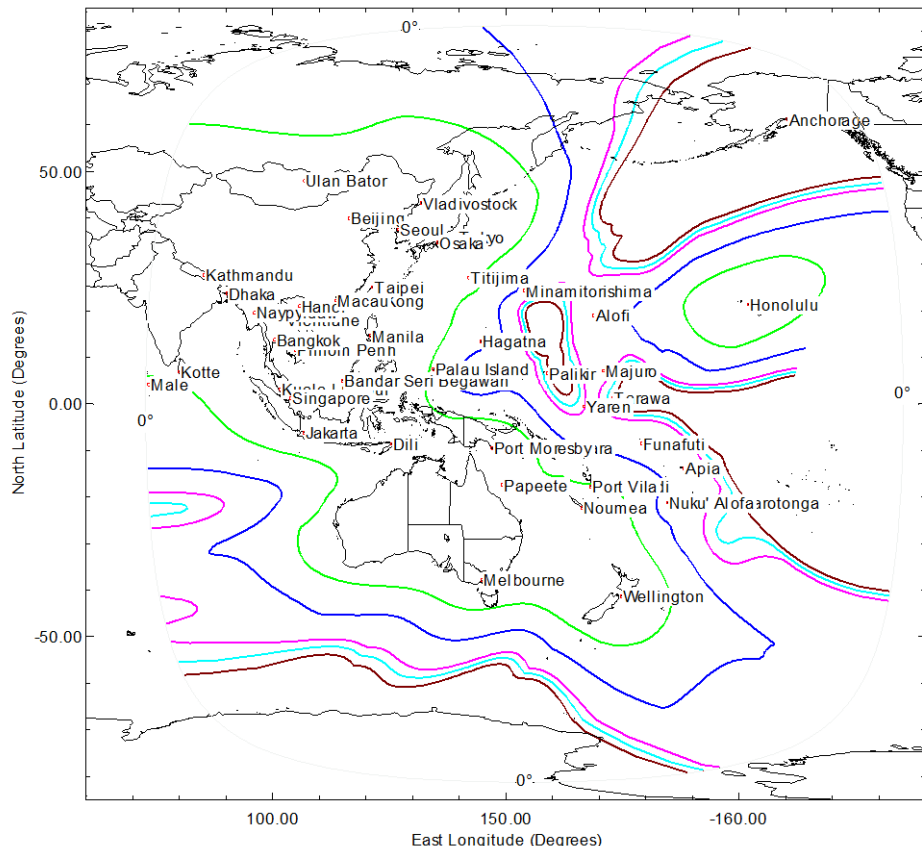
Communication satellite: **JCSAT-2A** (154 degrees East)
 followed by **JCSAT-2B** in Q4 of 2015

JCSAT-2A



JCSAT-2B

Tentative



Antenna Size: 1.8 mΦ 2.4 mΦ 3.8 mΦ 4.5 mΦ 5.0 mΦ

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.
- 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"> • Himawari Standard Data (HSD) • PNG | <ul style="list-style-type: none"> - HSD: 16 bands (full resolution) - PNG: True-color composite (1 km) |
| Target area (2.5-minute intervals) | <ul style="list-style-type: none"> • HSD • NetCDF • PNG | <ul style="list-style-type: none"> - HSD: 16 bands (full resolution) - NetCDF: 16 bands (latitude/longitude grid) - PNG: True-color composite (1 km) |

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

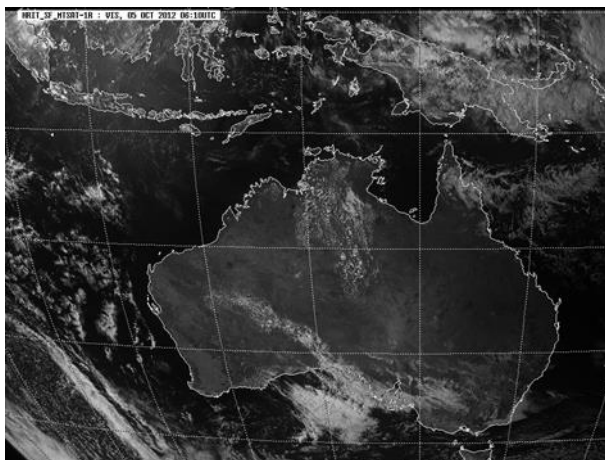
| Observation area | Himawari Standard Data (Himawari Standard Format) | HRIT/LRIT Data (HRIT/LRIT File Format) | NetCDF Data (NetCDF Format) | Color Image Data (PNG 24-bit Format) |
|------------------|---|--|-----------------------------|--------------------------------------|
| Full disk | | Sample data | — | |
| Japan area | Sample data | — | Sample data | Sample data |
| Target area | | | | |

See <http://www.data.jma.go.jp/mscweb/en/himawari89/>

Support for User Readiness: **Special Observations**

Special Observations by the backup satellite, **MTSAT-1R**

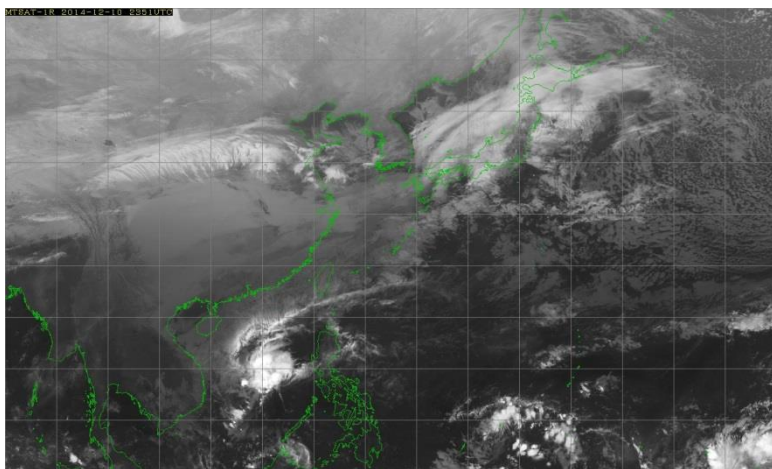
as part of preparations for Himawari-8 high-frequency observation



Period: January – March 2014

Interval: **10 minutes**

Area: around Australia



Period: October 2014

Interval: **10 minutes**

Area: East Asia



S

JMA plans to distribute Himawari-8 AMV and CSR via JDDS (the JMA Data Dissemination System) from May to July 2015 so that NWP users can evaluate the products in advance.

and CSR

and in

parallel for smooth user transition.

Parallel Dissemination via JMA FTP server

After Himawari-8 begins operation, MTSAT-2 AMV and CSR will continue to be provided via JDDS to support NWP users in transitioning smoothly from MTSAT-2 to Himawari-8.

MTSAT AMVs
for backup

Operational MTSAT AMVs

Operational Himawari-8 AMVs

Operational AMVs via GTS

Himawari-8 AMV and CSR products will be distributed via GTS when Himawari-8 becomes operational. The distribution of MTSAT-2 AMV and CSR via GTS will be terminated at the same time.

Support for User Readiness: **User Training**

■ The Australian **Bureau of Meteorology** runs the **National Himawari-8 Training Campaign** as a **VLab** activity. JMA appreciates the Bureau's efforts and contributes to the campaign by providing test data.

The screenshot shows the website for the National Himawari-8 Training Campaign. The header includes the Australian Government Bureau of Meteorology logo and the Melbourne VLab Centre Of Excellence logo. The main navigation menu includes Home, Satellite Products, Events, Training, News, Archive, Links, and Contact Us. The page title is "National Himawari-8 Training Campaign". The main content area features a grid of training resources and outcomes, organized into Phase 1 and Phase 2. Phase 1 includes Familiarisation Resources (rapid scan) and Learning Outcomes. Phase 2 includes Training and Assessment (rapid scan) and Tutorial Sessions and Feedback. A central yellow box highlights "Instructions and Timeline (please read this first)".

| | | |
|--|--|---|
| Phase 1: Familiarisation Resources (rapid scan) | Learning Outcomes | Phase 1: Familiarisation Resources (RGB products) |
| Phase 2: Training and Assessment (rapid scan) (to be posted soon) | Instructions and Timeline (please read this first) | Phase 2: Training and Assessment (RGB products) (to be posted soon) |
| Phase 2: Training and Assessment (detailed case studies) (to be posted soon) | Objectives | Tutorial Sessions and Feedback |

■ In conjunction with **AOMSUC-6** to be held in November 2015 in Tokyo, JMA plans to hold a **two-day training course** for NMHSs.