CGMS-54-JMA-WP-09-p
4 June 2026

Prepared by: Japan Meteorological Agency
Agenda Item 3
Discussed at Plenary

Subject	**JMA UPDATES SINCE CGMS-53 AND REPORT ON THE MEDIUM TO LONG-TERM FUTURE PLANS ON EARTH OBSERVATION**
In response to CGMS action/recommendation	
HLPP reference	
Executive Summary	The Japan Meteorological Agency (JMA) operates two geostationary meteorological satellites, Himawari-8 and -9, equipped with the Advanced Himawari Imager (AHI). JMA conducted the operational satellite switchover from Himawari-8 (in operation since July 2015) to Himawari-9 in December 2022 for scheduled operation until FY 2030. JMA contracted manufacturing of the follow-on satellite Himawari-10 in March 2023, with initiation of operation scheduled for FY 2030. Himawari-10 is scheduled to carry a visible/infrared imager as well as an infrared sounder and a high energy electron sensor, and high and very high energy proton sensor. JMA is considering Himawari-10 imager and sounder data formats and a plan for transition from Himawari-9 to Himawari-10.
Action/Recommendation proposed	None

1 INTRODUCTION

This paper reports on the status of JMA's current and future satellite systems.

2 CURRENT SATELLITE SYSTEMS

Table 2.1 JMA's current GEO satellites

Sector	Satellite	Location	Launch date DD/MM/YYYY	Data Access	Payload and status
East Asia and Western Pacific	Himawari-8	140.7°E	07/10/2014	HimawariCast HimawariCloud	16-channel AHI, DCS, SEDA; in-orbit standby
	Himawari-9	140.7°E	02/11/2016	HimawariCast HimawariCloud	16-channel AHI, DCS, SEDA; operational

3 STATUS OF CURRENT GEO SATELLITE SYSTEMS

The Japan Meteorological Agency (JMA) operates two geostationary meteorological satellites, Himawari-8 and -9, equipped with Advanced Himawari Imager (AHI) units. JMA has established a satellite observation system with redundancy based on twin satellite operation, which is expected to contribute to disaster risk reduction in Asia and the western Pacific until FY 2030. Himawari-8 had chiefly been used for observation during the early part of this period, with Himawari-9 in a back-up role. Their operation was switched in December 2022 to place Himawari-9 in the main observation role with Himawari-8 as back-up. The switch had been conducted almost seamlessly, with no data format or data dissemination system changes other than filenames for Himawari Standard Data (HSD) and NetCDF file. JMA also provided parallel distribution of experimental Himawari-9 products and observation data for several months as an alternative approach before the switchover for user readiness (non-operational purposes).

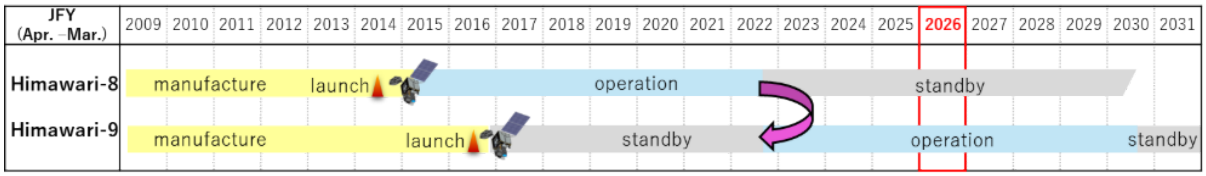

Figure 1: Himawari-8 and -9 timeline

3.1 Status of spacecraft

3.1.1 Himawari-8

Due to a Himawari-9 anomaly on 12 October 2025, Himawari-8 engaged in back-up observation from this date until 26 November. The following webpage provides information on irregular events, processing events and data outages of the satellite:

Himawari-8 Event Log, MSC/JMA
https://www.data.jma.go.jp/mscweb/en/oper/event_H8.html

In the event of a critical Himawari-9 malfunction, Himawari-8 will begin back-up observation.

3.1.2 Himawari-9

Due to a Himawari-9 anomaly on 12 October 2025, the satellite stopped providing data on this date and resumed observation on 26 November. It has operated stably since the recovery, and no issues have been identified in related observation data. The following webpage provides information of irregular events, processing events and data outages of the satellite:

Himawari-9 Event Log, MSC/JMA
https://www.data.jma.go.jp/mscweb/en/oper/event_H9.html

3.1.3 Impact on spacecraft due to space weather

Space weather related spacecraft anomalies (Items in bold are required)

During the reporting period, no anomalies were confirmed in relation to space weather-related events.

Table 2.2 Source: Recommendations for Contents of Anomaly Database for Correlation with Space Weather Phenomena, P. O'Brien, J.E. Mazur, T. Guild, November 2011, AEROSPACE Report No.TOR-2011(3903)-5.

1. Date and Universal Time of the anomaly	**2. Fully specified location of the anomaly** (spacecraft location)	**3. Velocity or orbital elements at time of the anomaly**	4. Eclipse state of the vehicle (full, penumbra, partial, none)	5. Vector to Sun in spacecraft coordinates	6. Velocity vector of spacecraft in spacecraft coordinates	7. Initial guess at type of anomaly (See taxonomy below)	8. Estimated confidence of that guess	9. Anomaly category (e.g., affected system or kind of disruption)	10. Vehicle identity	11. Notes (e.g. unusual operational states or recent changes to operations (recent commands, attitude scheme, etc.)

Taxonomy of Satellite Anomalies Caused by In Situ Charged Particle Environment (to be used for column 7):

1. Electrostatic discharge (charging)
    - 1.1 Surface charging
        - 1.1.1 Plasma sheet (subauroral)
        - 1.1.2 Auroral
    - 1.2 Internal charging
        - 1.2.1 Subsurface charging (e.g., beneath blanket)
        - 1.2.2 Deep charging (e.g., inside a box)
2. Single-Event Effects
    - 2.1 Protons
        - 2.1.1 Solar proton event
        - 2.1.2 Geomagnetically trapped protons
    - 2.2 Heavy ions
        - 2.2.1 Galactic Cosmic Rays
        - 2.2.2 Solar energetic particles
        - 2.2.3 Geomagnetically trapped heavy ions
3. Total Dose
    - 3.1 Long-term dose accumulation (multiple causes combined)
    - 3.2 Short-term (days or less) dose accumulation
        - 3.2.1 Solar protons
        - 3.2.2 Geomagnetically trapped protons
        - 3.2.3 Geomagnetically trapped electrons

3.2 Ground segment matters

The availability of the Himawari-8 and -9 ground systems was normal during the reporting period.

3.3 Data transmission

JMA mainly distributes Himawari-8 and -9 data in two ways. One is the HimawariCast, by which primary sets of imagery are disseminated as operational meteorological services via a commercial communication satellite. The other is the HimawariCloud, by which full sets of imagery are delivered to National Meteorological and Hydrological Services (NMHSs) via a private Internet cloud service. JMA upgraded both systems in FY 2024. See CGMS-54-JMA-WP-07 for more information on Himawari-8 and -9 data provision.

3.4 Projects, services

3.4.1 Data Collection System

Himawari-8 and -9 currently support the Data Collection Service. Monthly reports on Himawari-8 and -9's IDCS are available at
Monthly Operation Report, MSC/JMA
https://www.data.jma.go.jp/mscweb/en/oper/opr_report.html.

See the CGMS-54-JMA-WP-02 for more information on Himawari-DCS.

3.4.2 Space Environment Data Acquisition

Himawari-8 and -9 have instruments to sense proton and electron flux for satellite housekeeping known as SEDA (Space Environment Data Acquisition). SEDA text data acquired from the satellites are provided to the National Institute of Information and Communications Technology (NICT) to support near-real-time space environment monitoring and forecasting. For more information, see the NICT Space Weather Information Center Web page at https://himawari-seda.nict.go.jp/.

3.4.3 HimawariRequest Service

In January 2018, JMA launched a new international service "HimawariRequest", in collaboration with the Australian Bureau of Meteorology. The service allows NMHS users in Himawari-8 and -9 coverage area to request Target Area observation covering a 1,000 km x 1,000 km area every 2.5 minutes.

As of 1 May 2026, JMA had taken 22 registrations from NMHSs in RA II and RA V, and opened the service to the nineteen whose preparations for request submission were complete. There have been 374 international requests since the commencement of the service, among which 342 have been accepted. Table 2.3 shows numbers of international requests and accepted requests received so far.

Table 2.3: HimawariRequest status

	International requests	Accepted requests
2018	10	8
2019	47	36
2020	39	38
2021	45	41
2022	32	30
2023	51	48
2024	46	43
2025	71	67
2026 (as of 1 May)	33	31

JMA provides information on past, current and planned observation schedules for target-area observation, including that conducted under the HimawariRequest service, at:

- Past: https://www.data.jma.go.jp/mscweb/data/himawari/obs_info_tg_en.html,
- Current: https://www.data.jma.go.jp/mscweb/data/himawari/sat_tga.php,
- Planned: https://www.data.jma.go.jp/sat_info/data/Request/RequestStatus.html.

See CGMS-54-JMA-WP-08 for more information on the status of JMA HimawariRequest service.

4 FOLLOW-ON SATELLITE HIMAWARI-10

In FY 2018, JMA began consideration of the Himawari-8 and -9 follow-on program. The Implementation Plan of the Basic Plans on Space Policy devised by the Strategic Headquarters for National Space Policy under the Japanese government's Cabinet Office states that Japan will continue manufacturing Himawari-10, with operational commencement provisionally scheduled for around FY 2030. Against this background, JMA completed a contract for Himawari-10 in March 2022 and began related manufacture.

JMA plans the operation of a seamless geostationary earth orbit satellite system in consideration of the CGMS baseline and the WMO Vision for WIGOS in 2040, including the deployment of hyperspectral infrared sounders across the full geo-ring.

In addition to visible/infrared imager operation, infrared sounder usage is planned for Himawari-10 mission to help improve JMA services in extreme weather monitoring, nowcasting and numerical weather prediction. Regarding Himawari-10 imager, JMA is currently considering the L1 data format for Himawari-10 data provision to users. The various formats used for Himawari-8/9 AHI data provision will be changed and unified, and Himawari-10 imager data will be provided in the generic NetCDF format for ease of use.

The format transition for Himawari-10 data involves three planned phases. In Phase 1, sample data will be provided and disseminated from Himawari-9 in Himawari-10 NetCDF format. In Phase 2, when Himawari-10 operation begins, provision of Himawari-9 data in Himawari-8/9 format will be terminated, and Himawari9/10 data will be provided in parallel in Himawari-10 NetCDF format. In Phase 3, provision of all data related to Himawari-9 will be discontinued, and only Himawari-10 data in Himawari-10 NetCDF format will be provided. In the event of Himawari-10 anomalies, Himawari-9 data will be distributed in Himawari-10 NetCDF format as backup.

Regarding Himawari-10 sounder, the GHMS observes the earth's atmosphere using a step-and-stare approach, with a single file as the smallest unit of data for each stare. Due to the sheer volume of raw GHMS observation data produced, JMA plans to provide NMHSs with reduced GHMS Principal Component Analysis (PCA) data to facilitate user handling.

The Radiation Monitor for Space weather (RMS) developed by the National Institute of Information and Communications Technology (NICT), which was funded by the Ministry of Internal Affairs and Communications (MIC) will also be mounted on the satellite as hosted payload.

The Himawari series of satellites have been used widely in East Asia and the Western Pacific, representing an indispensable part of this international infrastructure.

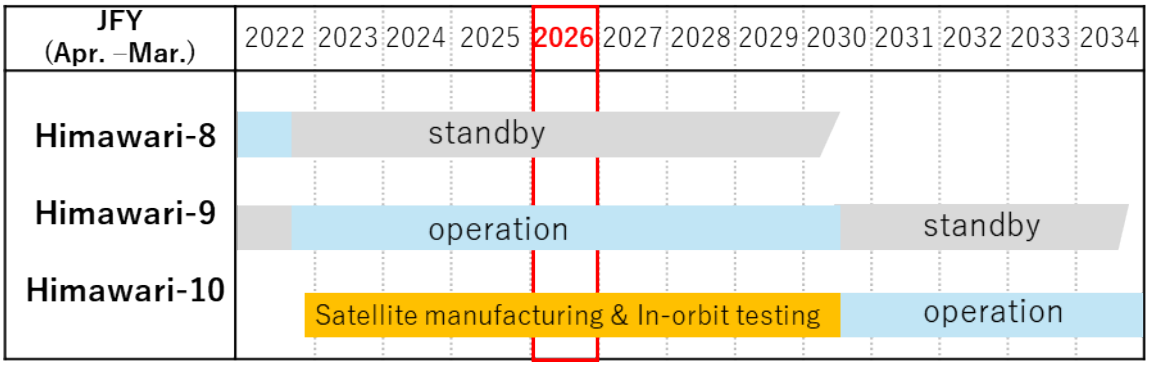

Figure 2: Himawari-8/9 and Himawari-10 timeline

5 CONCLUSIONS

Himawari-8 and -9 are operating normally with no significant anomalies, and JMA now operates the related HimawariRequest service to help mitigate disaster conditions in the Asia-Pacific region. A seamless switch from Himawari-8 to -9 was conducted in December 2022, with parallel provision of Himawari-9 data prior to the switch for user readiness. The agency contracted manufacturing of the follow-on satellite Himawari-10 in March 2023, with initiation of operation scheduled for FY 2030. Himawari-10 is

scheduled to carry a visible/infrared imager as well as an infrared sounder and a high energy electron sensor, and high and very high energy proton sensor.