

## **Protocol for Himawari-8/9 event-driven rapid scanning**

This document outlines the draft protocol for Himawari-8/9 request-based rapid scanning.

JMA will take requests from RA II and RA V NMHSs in collaboration with AuBoM. Although Japan's national interests will take priority in rapid-scan observation, JMA will respond to requests from NMHSs in these regions as far as possible. The main targets for the protocol are tropical cyclones and volcanic eruptions, although other events are also eligible.

JMA, AuBoM and other NMHSs in the relevant regions will coordinate and discuss details toward the protocol's activation.

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### 1 INTRODUCTION

The Asia-Oceania region is prone to meteorological and other natural disasters such as tropical cyclones and volcanic eruptions. Most tropical cyclones are observed from space, and satellite data play important roles both in determining their position/intensity and in forecasting their development. The region also sees significant volcanic activity, being part of the Pacific Ring of Fire, and satellite data are useful in determining the height and distribution of volcanic ash clouds.

Attendees at the Joint RA II/RA V Workshop on WIGOS for Disaster Risk Reduction (12 – 14 October 2015, Jakarta, Indonesia) recognized the advantages of 2.5-min scans for monitoring severe meteorological events such as tropical cyclones and identifying/tracking volcanic ash clouds. The RA II WIGOS Project to Develop Support for NMHSs in Satellite Data, Products and Training incorporates activities (i) to develop a protocol for NMHSs of the countries in the region to request event-driven rapid scan imagery; and (ii) to assist NMHSs to utilize rapid scan data in support of DRR in response to their requests.

Only JMA's Himawari-8/9 satellites are currently capable of providing rapid-scan imagery for its Target area observation, which covers 1,000 x 1,000 km, every 2.5 minutes with focus on tropical cyclones and active volcanoes within the areas of responsibility covered by the RSMC Tokyo Typhoon Center and the Tokyo Volcanic Ash Advisory Center (VAAC Tokyo), respectively. KMA and CMA plan to operate geostationary imagers with similar capabilities over the region.

### 2 DRAFT PROTOCOL FOR REQUEST-BASED HIMAWARI-8/9 RAPID SCANNING

This draft protocol describes the mechanisms to be considered by JMA to support the handling of requests from WMO RA II and RA V Members for event-driven rapid scanning in certain areas of interest. The term *rapid scanning* refers to image repetition cycles of significantly less than 10 minutes, and of 2.5 minutes for Himawari-8/9. This capability is currently provided only by JMA, but may be adopted by other operators in the region in the future.

The following is an overview of the draft protocol, which includes consideration of current WMO regional center responsibilities and is based on the close working relationship between the Australian Bureau of Meteorology (AuBoM) and JMA. It also reflects the results of a successful 2016 AuBoM/JMA feasibility study on event-driven Himawari-8 rapid scanning.

The feasibility study indicated that it would be advantageous for RA V Member requests to be managed by AuBoM as a broker in order to reduce the number of requests that JMA may potentially be faced with in the case of an extreme event.

National security and other national priorities or interests of the satellite operator in the operation of the geostationary imager may take priority over requests from RA II and RA V Members. The satellite operator will consider requests from Members on a best-effort basis in consideration of feasibility within the operational limitations of the satellite and its ground segment.

JMA places the highest priority on observation of tropical cyclones for the RSMC Tokyo Typhoon Center, volcanic ash clouds for VAAC Tokyo and other events of national interest. The default target area is determined for monitoring of the areas at high-risk of volcanic eruptions in VAAC Tokyo's area of responsibility (e.g., the Kamchatka Peninsula). When a tropical cyclone forms in RSMC Tokyo's area of responsibility, the target area will be changed for related observation. If no such phenomena are present, other natural disasters may be considered for Target area observation.

In the event that AuBoM receives multiple simultaneous requests from NMHSs in RA V, it will in principle give higher priority to observation of tropical cyclones and volcanic eruptions. In the event of multiple requests relating to high-priority events, AuBoM will assign priority based on its own judgment. The highest priority request will be informed to JMA by AuBoM.

Priority for other requests will be decided on a case-by-case basis by JMA.

RA II and V member countries will be required to email observation requests to JMA and AuBoM, respectively, based on their own analysis/forecasts, including information on the center position of the window and the start/end times of Target area observation. In response, the satellite operator will determine priority, reconfigure the relevant satellite systems and establish related operating processes before commencing Target area observation. The maximum duration of requests should not exceed 48 hours, and any extension will require a further request in line with this protocol.

The full Himawari-8/9 data set (including Target area observation data) is provided via the HimawariCloud service. Related imagery is also provided on the Himawari Real-time Image web page at <http://www.data.jma.go.jp/mscweb/data/himawari>. No meteorological products derived from Target area observation data are provided.

NMHSs whose requests are accepted should provide AuBoM or JMA with feedback on Target area observation results rather than 10-minute Full disk observation results.

### **3 TECHNICAL IMPLEMENTATION**

- JMA, AuBoM and individual NMHSs to determine authorized contact points
- JMA to establish an email request form

- AuBoM to inform JMA of center position and start/end times of Target area observation based on the specified format
- AuBoM to coordinate with RA V Members
- RA II Members to inform JMA of those information in the same format

#### **4 SCHEDULE**

JMA reported on the recent status of draft protocol development at the WMO IPET-SUP-3 meeting.

The Agency will provide a development update at the 5th RA II WIGOS Project Coordination Group Meeting to be held in October 2017 after AOMSUC-8. Based on current expectations, the protocol will be activated after the meeting.