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Feasibility Study on Himawari-8 Event-driven Rapid Scan

The Advanced Himawari Imager (AHI) on board Himawari-8 can produce target-area images every 2.5 minutes based on rapid-scan observation. Such observation is essentially focused on tropical cyclones in the RSMC Tokyo Typhoon Center's area of responsibility and on volcanic eruptions in that of the Tokyo Volcanic Ash Advisory Center (VAAC Tokyo). A goal of the Jakarta Declaration adopted at the Joint RA-II/RA-V Workshop on WIGOS for Disaster Risk Reduction in October 2015 is the development of a protocol for NMHSs of countries in the region on requests for event-driven rapid-scan imagery. Accordingly, JMA and the Australian Bureau of Meteorology (AuBoM) conducted a joint feasibility study on the development of a protocol for Himawari-8 rapid-scan observation. The target area designated by AuBoM was successfully observed, and the data obtained were collected by AuBoM on a real-time basis.

Action/recommendation proposed: none

Feasibility Study on Himawari-8 Event-driven Rapid Scan

1 INTRODUCTION

The Advanced Himawari Imager (AHI) on board Himawari-8 can perform various types of scanning during full-disk observation, which is conducted every 10 minutes (Figure 1). During the 10-minute timeline of such observation, the AHI scans target areas four times (every 2.5 minutes; 1,000 x 1,000 km at the sub-satellite point). The scan area can be changed each time for observation of target phenomena such as typhoons and active volcanoes.

Himawari-8 rapid-scan target area observation essentially focuses on tropical cyclones in the area of responsibility of the Regional Specialized Meteorological Centre (RSMC) Tokyo Typhoon Center and on volcanic eruptions in that of the Tokyo Volcanic Ash Advisory Center (VAAC Tokyo). For typhoons in the Western North Pacific (WNP) area, the Japan Meteorological Agency (JMA) operates tracking observation with a constantly shifting target area.

A goal of the Jakarta Declaration adopted at the Joint RA-II/RA-V Workshop on WIGOS for Disaster Risk Reduction in October 2015 is the development of a protocol for NMHSs in project countries on requests for event-driven rapid-scan imagery. Accordingly, JMA and the Australian Bureau of Meteorology (AuBoM) conducted a joint feasibility study on the development of a protocol for Himawari-8 rapid-scan observation.

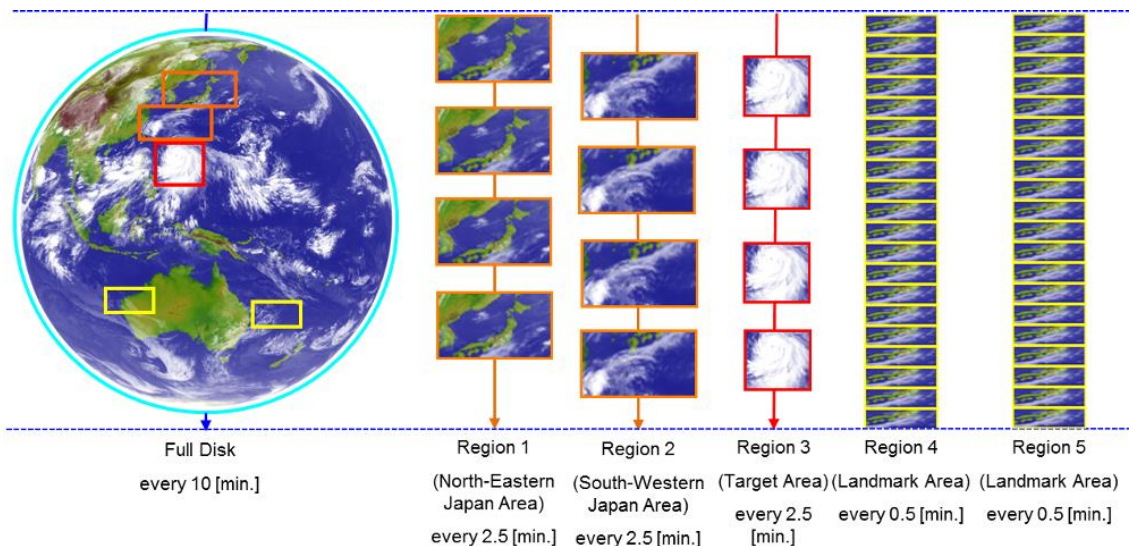


Figure 1 AHI observation areas and frequencies on a timeline of 10 minutes

2 METHOD

In typhoon tracking, a reservation file specifying the duration of the observation and the coordinates of the area of each scan is required for the target area. For typhoon observation in the WNP, JMA creates such files and runs target area scanning with coordinates determined in reference to typhoon position analysis and hourly forecasts from the RSMC Tokyo Typhoon Center. The coordinates are shifted every 10 minutes based on interpolation, and the reservation file is updated in line with typhoon track forecast updates.

In the feasibility study, AuBoM created and uploaded reservation files to a dedicated server supervised by JMA. The target observation area was then determined from the coordinates provided in the files. In the event of a schedule conflict (e.g., if a typhoon in the WNP and a cyclone in the Southern Hemisphere occur together and two reservation files are simultaneously present), JMA's schedule coordinate system will adopt reservation files for typhoons before those for cyclones, as typhoon observation is given higher priority.

3 RESULTS

The feasibility study was conducted by JMA and AuBoM in February and March 2016. The six days of test observation for the target area went as per AuBoM's expectations.