

Real-time distribution of Himawari 8 observational data

*Yoshiaki Nagaya¹, Ken T. Murata¹, Atsushi Higuchi², Koichi Toyoshima², Rie Honda³, Kotaro Bessho⁴, Katsuhiro Mouri⁵, Kentaro Ukawa⁶, Kazuya Muranaga⁶, Yutaka Suzuki⁶, Jun'ichi Murayama⁶

1.National Institute of Information and Communications Technology, 2.Center for Environmental Remote Sensing (CEReS), Chiba University, Japan, 3.Department of Information Science, Kochi University, 4.Meteorological Satellite Center, Japan Meteorological Agency, 5.Nagoya City Science Museum, 6.Systems Engineering Consultants Co.,LTD.

On July 7, 2015, the next-generation meteorological satellite "Himawari 8" of Japan Meteorological Agency (JMA) started formal operation. Corresponding to a request from the Japan Meteorological Agency, Science Cloud project of National Institute of Information and Communications Technology (NICT) cooperates in preservation and distribution of observational data of Himawari 8, and Science Cloud unveiled the Himawari 8 Real-time Web on the same day.

Himawari 8 observes a full-disk in every 10 minutes, and a Japanese region and a target region in every 2.5 minutes. A sensor in Himawari 8 has 16 observation bands between visible light to infrared rays, and spatial resolution of 500m (band 3) at under the satellite's orbit. The data size after converted into physical values turns into about 50 times in Himawari 7, and about 400GB per day with large improvement in time and spatial resolution of the Himawari 8 sensor.

Moreover, those data is transferred from the satellite in every 10 minutes. It takes about 10 minutes after the observation to be put on the storage of JMA and converted into physical values. The data is acquired by Science Cloud in an instant mostly through SINET by National Institute of Informatics and JGN by NICT. After adjusting a color tone to improve appearance, the website has distributed observational data by HTML.

This website is developed for accesses of not only PCs but also smart phones and tablets. In addition, control by finger touch is also activated for user experience and practical use at school education. In addition, time, data, place, and zoom ratio of display are acquired in the format of URL, and a characteristic observational data is sharable through a social network etc. is also implemented.

In order to respond to many requests for a night observation, infrared rays are added as the observation result of 24 hours, although only visible light is available on July 7, 2015.

International use of observational data should be in target because Himawari 8 covers East Asia and Oceania. Therefore, the website also supports the display by eight languages with cooperation of overseas researchers.

Close to 30,000 per day users visited to the website when this website opening to the public and it has settled down on about 2,000 accesses / day after one month. However, when a typhoon approached and landed at Japan, the number of accesses reached to 5,000 /day. In addition, in the eruption of Mt. Aso on September 14, 2015, the number of accesses increased. From these things, when a certain weather event occurs, it is assumed that usage in which users check actual data by this website is created.

According to users by countries, there is much use from the People's Republic of China and the Republic of China. Since this increase is coincide with the release in Chinese, it is assumed that not only specialists but general users are interested in this service. Moreover, the program code which collects images automatically from this website was registered into the open source program share site "GitHub", and, as a result, access from the United States of America and Russian Federation increased rapidly on February 4, 2016.

The users of Himawari 8 observational data are not only specialists or researchers, but general

users all over the world across the border have interest. It is assumed that the Himawari 8 Real-time Web has an important result in which science data restricted to use of only researchers and specialists until now is made familiar for general users.

As this background, it is assumed that the time and spatial resolution of observational data which is advanced by Himawari 8 are overlapped to the ordinary personnel life. It is concluded that this is a good feasible study for expanding use of science data like education sector as a result of advancement of observation technology and development of information and communications technology.

Keywords: Big data, Real-time processing, Satellite, Himawari

