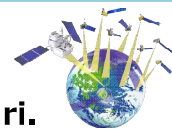


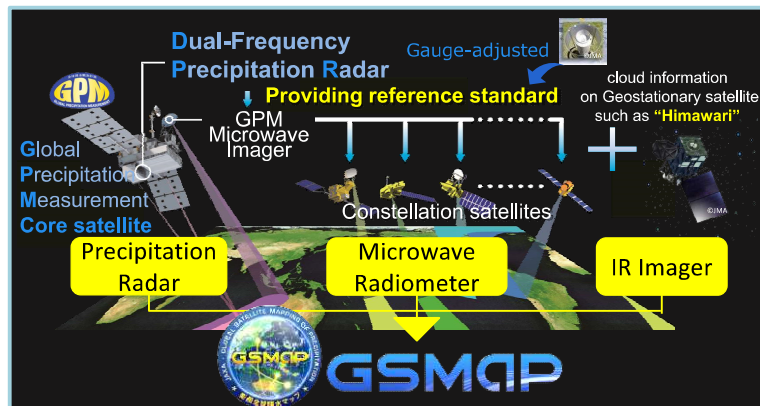
M. YAMAJI, T. KUBOTA, and R. OKI  
Japan Aerospace Exploration Agency (JAXA)

## SUMMARY

- “GSMaP” is the multi-satellite precipitation product provided by JAXA.
- GSMaP can be more useful with the synergistic effect with JMA products, such as high-spatiotemporal resolution cloud information given by Himawari.
- JAXA is going to collaborate with JMA to develop the integrated applicational services.



## Overview

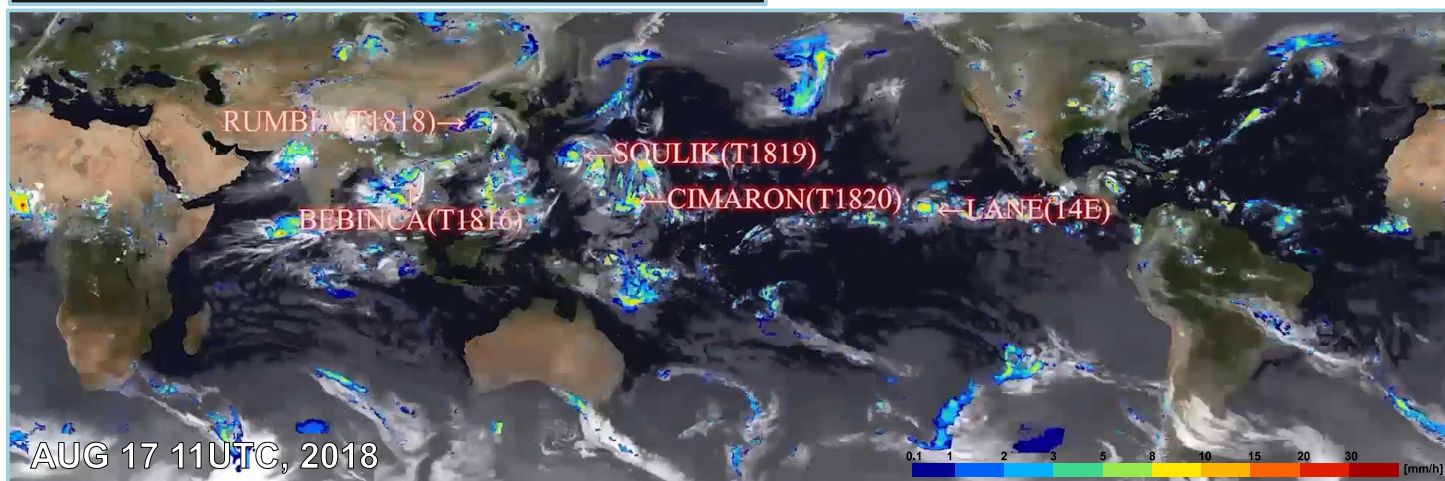


- **GSMaP** is the multi-satellite precipitation product under the Global Precipitation Measurement (GPM) Mission.
- JAXA developed the better latency version of GSMaP, which led to wider utilization including operational activities especially in Asian regions.

Please visit our GSMaP Website!

<https://sharaku.eorc.jaxa.jp/GSMaP/index.htm>

(Free to use and no need to set up any computers)



## GSMaP Family

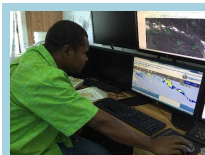
- GSMaP consists of some types for each purpose.
- We recently improved the “GSMaP\_Gauge\_NRT”

Type of GSMaP	only satellite	gauge adjusted	Spatial resolution	Time Interval	Data Latency	latency
GSMaP Real Time <small>*1 limited in Himawari/Meteosat domain</small>	○ NOW	○ under developing	0.1 deg. lat/lon	30 min.	quasi-realtime (a few mins.)	↑
GSMaP Near Real Time	○ NRT	○ <sup>*1</sup> Gauge_NRT	0.1 deg. lat/lon	1 hour	4 hour	↑
GSMaP Standard	○ STD	○ <sup>*2</sup> Gauge	0.1 deg. lat/lon	1 hour	3-day	↓

\*1 : Adjusting by using 30-day latest GSMaP\_Gauge

\*2 : NOAA/CPC Daily Gauge-Based Analysis (Chen et al., 2008) is used to adjust GSMaP hourly rainfall over land.

## Synergistics Utilization with JMA Product



- Forecaster who utilizes both Himawari and GSMaP.
- GSMaP can be more useful with the synergistic effect with Himawari product.

As the first step, the evaluation activities for providing error information of GSMaP are now ongoing under the collaboration with JMA.

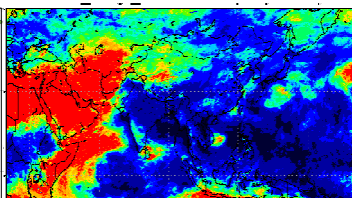
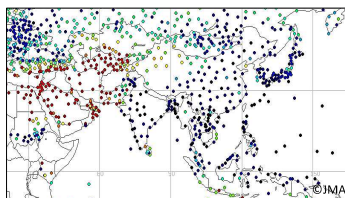
## Monthly comparison with CLIMAT

Large-scale comparison of monthly precipitation between CLIMAT and GSMaP

July 2018

CLIMAT

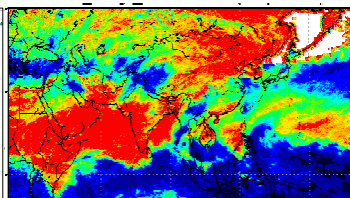
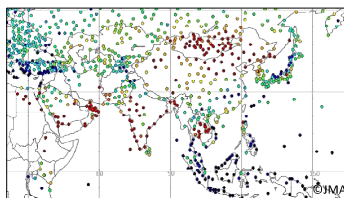
GSMaP Gauge NRT



January 2019

CLIMAT

GSMaP Gauge NRT



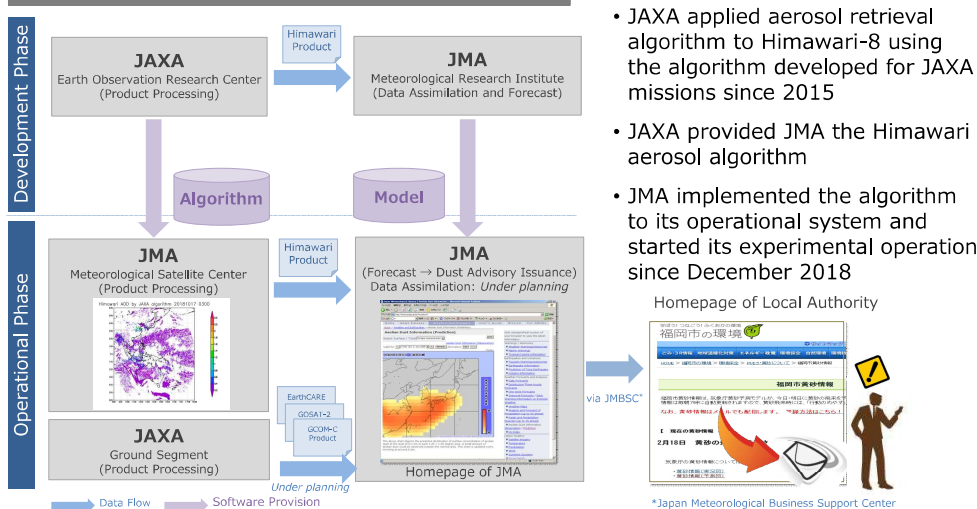


M. Kikuchi, M. Yoshida, H. Murakami, M. Kachi, and R. Oki (Japan Aerospace Exploration Agency)  
T. Kitajima and A. Ogi (JMA)

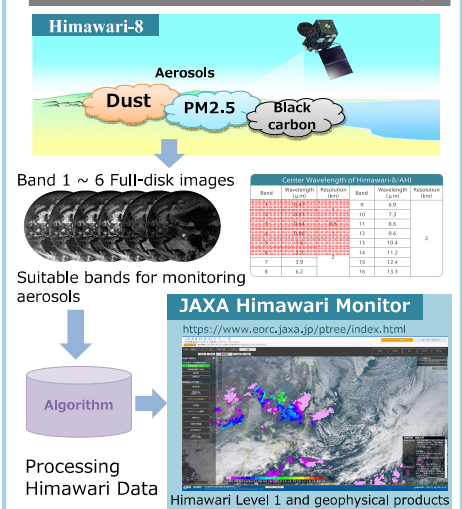
## SUMMARY

- JMA's Himawari-8 was launched in October 2014, taking the lead in the so-called "next generation geostationary satellite" series.
- JAXA has been developing algorithms to estimate atmospheric particles (aerosols) for its polar-orbiting satellite missions.
- JAXA applied the algorithm to Himawari-8 data and JMA implemented the algorithm to its operational system, starting its experimental operational processing on 19 December 2018

## JMA-JAXA Collaboration Framework

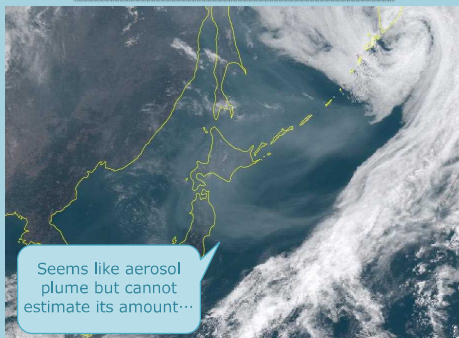


## Satellite Air Quality Monitoring

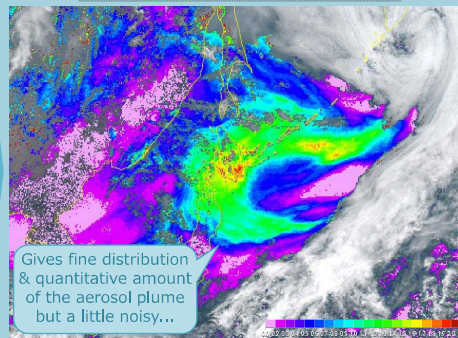


## Aerosol Product

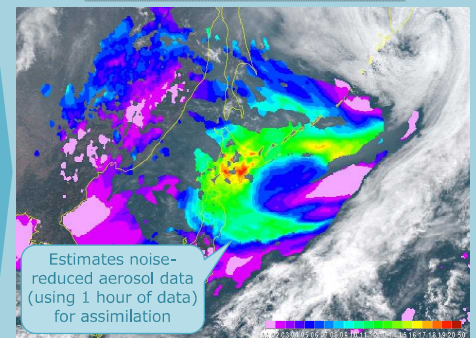
### RGB from L1 (10 min)



### L2 Product (10 min)



### L3 Product (Hourly)



Wildfire Aerosol Case : Originated from Lake Baikal Area in Russia

02 : 00 UTC,  
19 May 2016

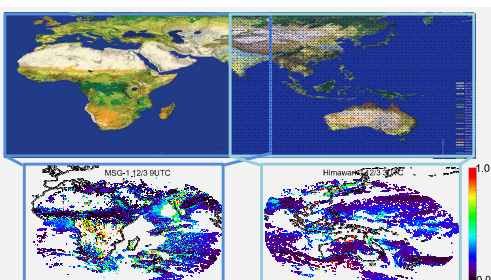
- Aerosol Products are in approx. 5km resolution, with data latency within 1-2 hours\*
- L2 Product offers aerosol data every 10 minutes and L3 Product is an hourly product with strict quality control

\* latency estimated based on JAXA Himawari Monitor

< Reference >

Yoshida, M., M. Kikuchi, T. M. Nagao, H. Murakami, T. Nomaki, and A. Higurashi, 2018: Common retrieval of aerosol properties for imaging satellite sensors, *J. Meteor. Soc. Japan*, doi:10.2151/jmsj.2018-039  
Kikuchi, M., H. Murakami, K. Suzuki, T. M. Nagao, and A. Higurashi, 2018: Improved Hourly Estimates of Aerosol Optical Thickness using Spatiotemporal Variability Derived from Himawari-8 Geostationary Satellite, *IEEE Transactions on Geoscience and Remote Sensing*, 10.1109/TGRS.2018.2800060

## Proposals for JMA's RSMC for Nowcasting



- Demonstrated the feasibility of applying the Himawari aerosol algorithm to Meteosat Second Generation (MSG)
- Himawari-Meteosat combination can support air quality monitoring for most of Asia
- Your comments and suggestions are welcome

## Evaluation

