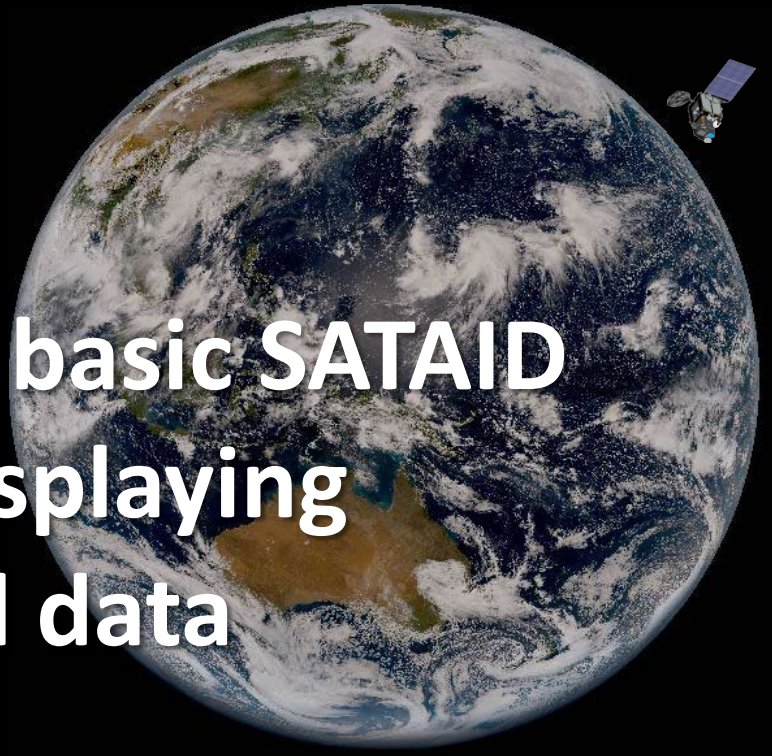
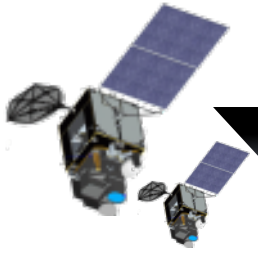


Hands-on training on basic SATAID functions and displaying RGBs/ASWind data

Taro HANDA
Meteorological Satellite Center / Japan Meteorological Agency

3rd March 2023



2014 Himawari-8
2016 Himawari-9

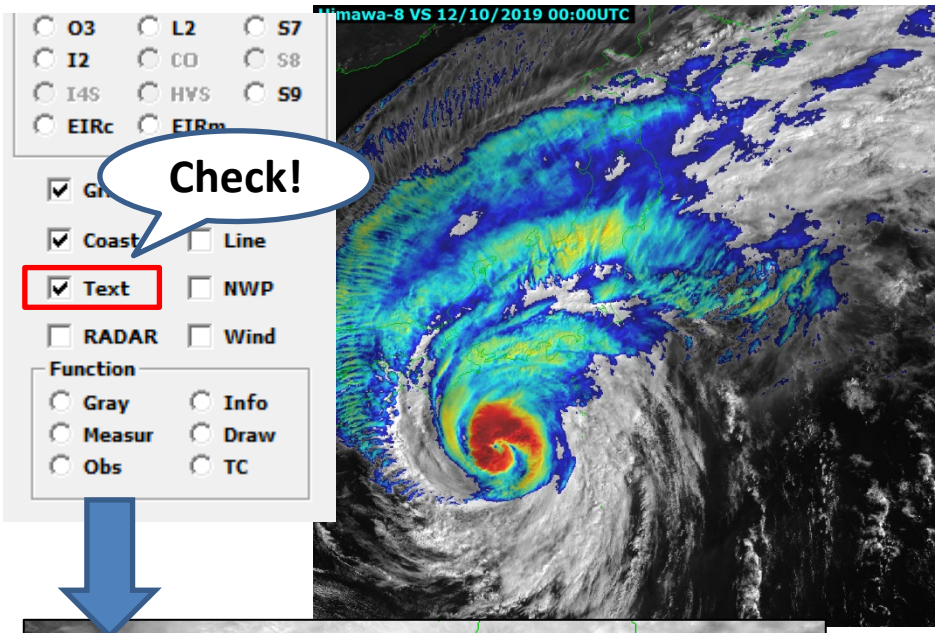
Hands-on training on basic SATAID functions and displaying RGBs / ASWind data

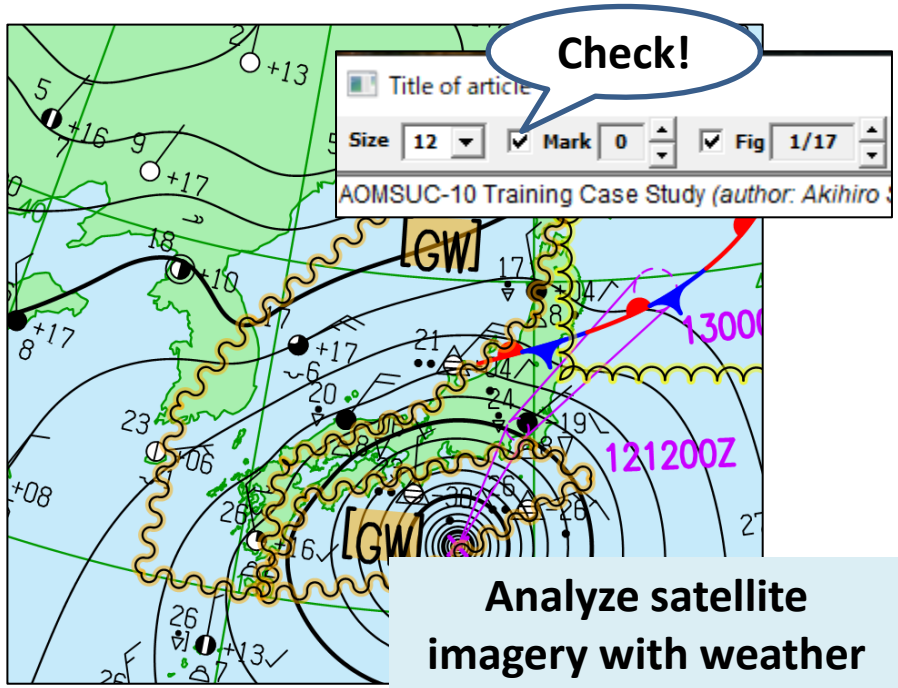
It’s time to practice using main SATAID functions in order to get used to its basic operations!
Then let’s take a look at these case studies by SATAID modules.

1. Typhoon Hagibis (T1919) approaching Japan
   - 12 October, 2019 00:00 UTC – 18:30 UTC

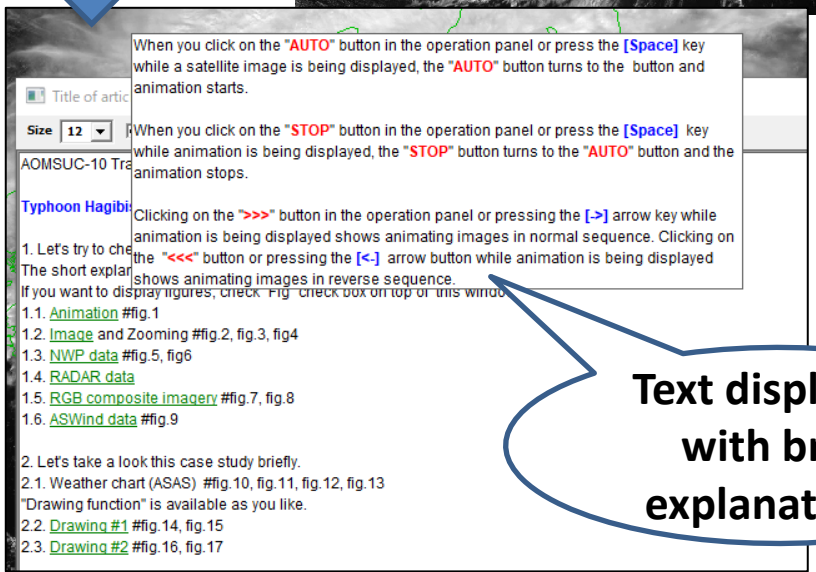
2. Flood in Papua New Guinea
   - 22 September, 2019 00:00 UTC– 23 September, 2019 18:30 UTC

Overview of SATAID case study modules



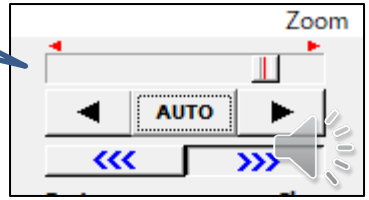


Analyze satellite imagery with weather chart, observation data and so on.

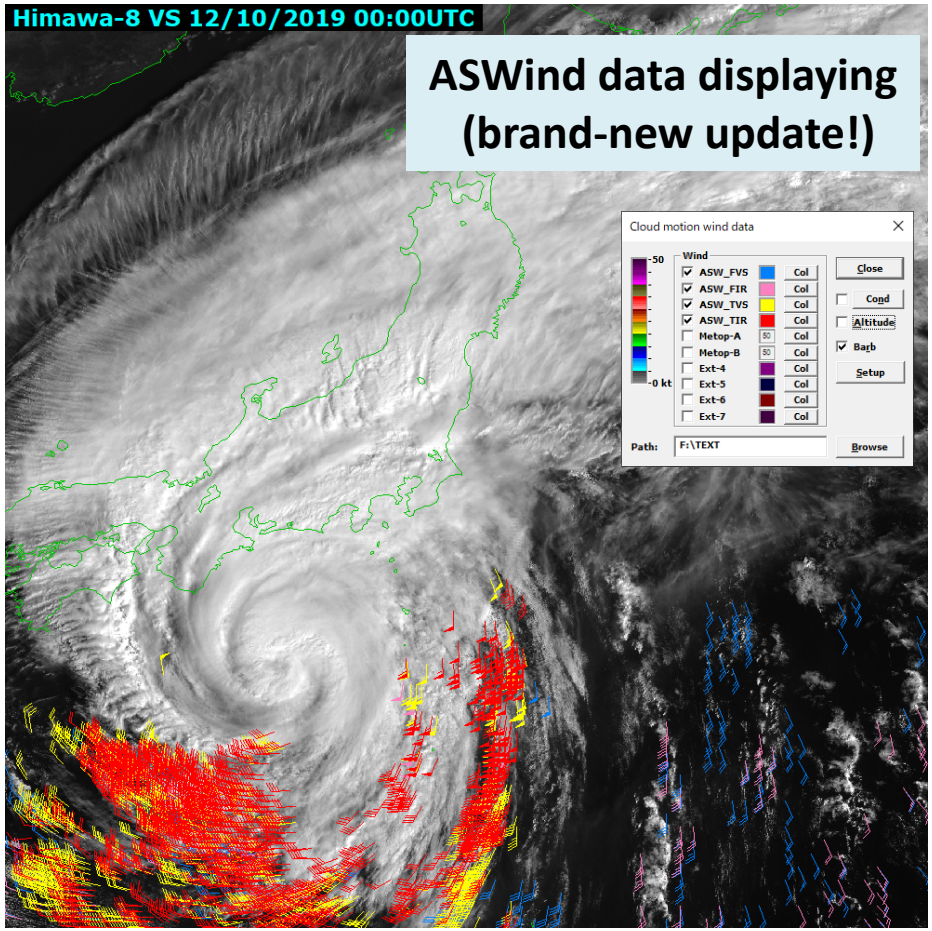


Text displaying with brief explanations.

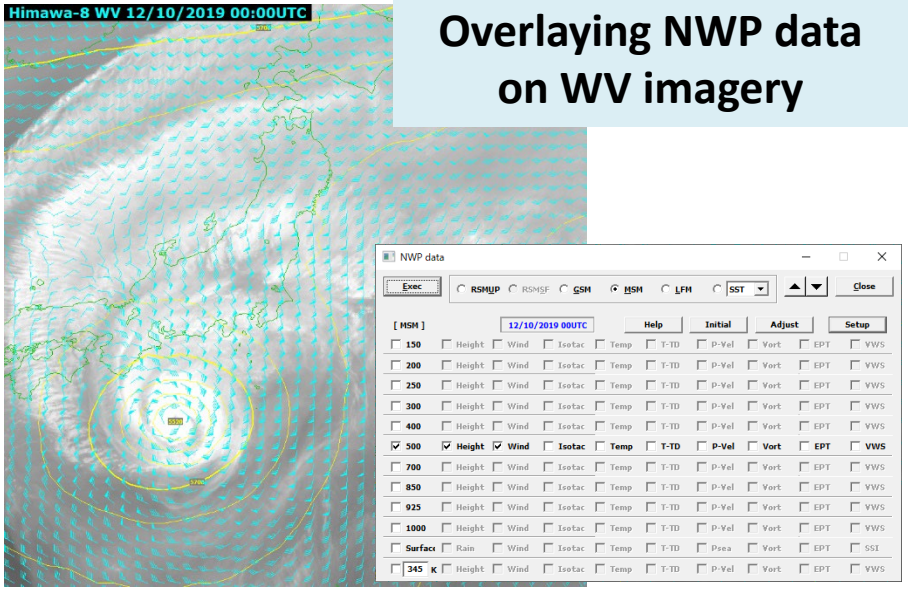
Animation makes easy to analyze satellite imagery.



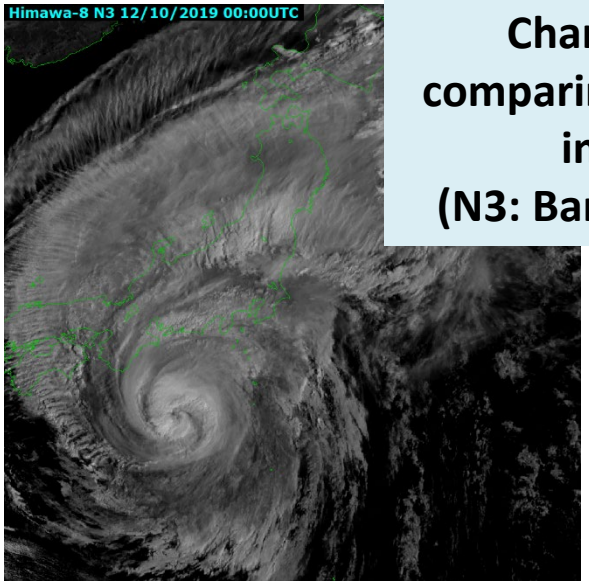
Overview of Case 1
Typhoon Hagibis (T1919) approaching Japan



ASWind data displaying (brand-new update!)



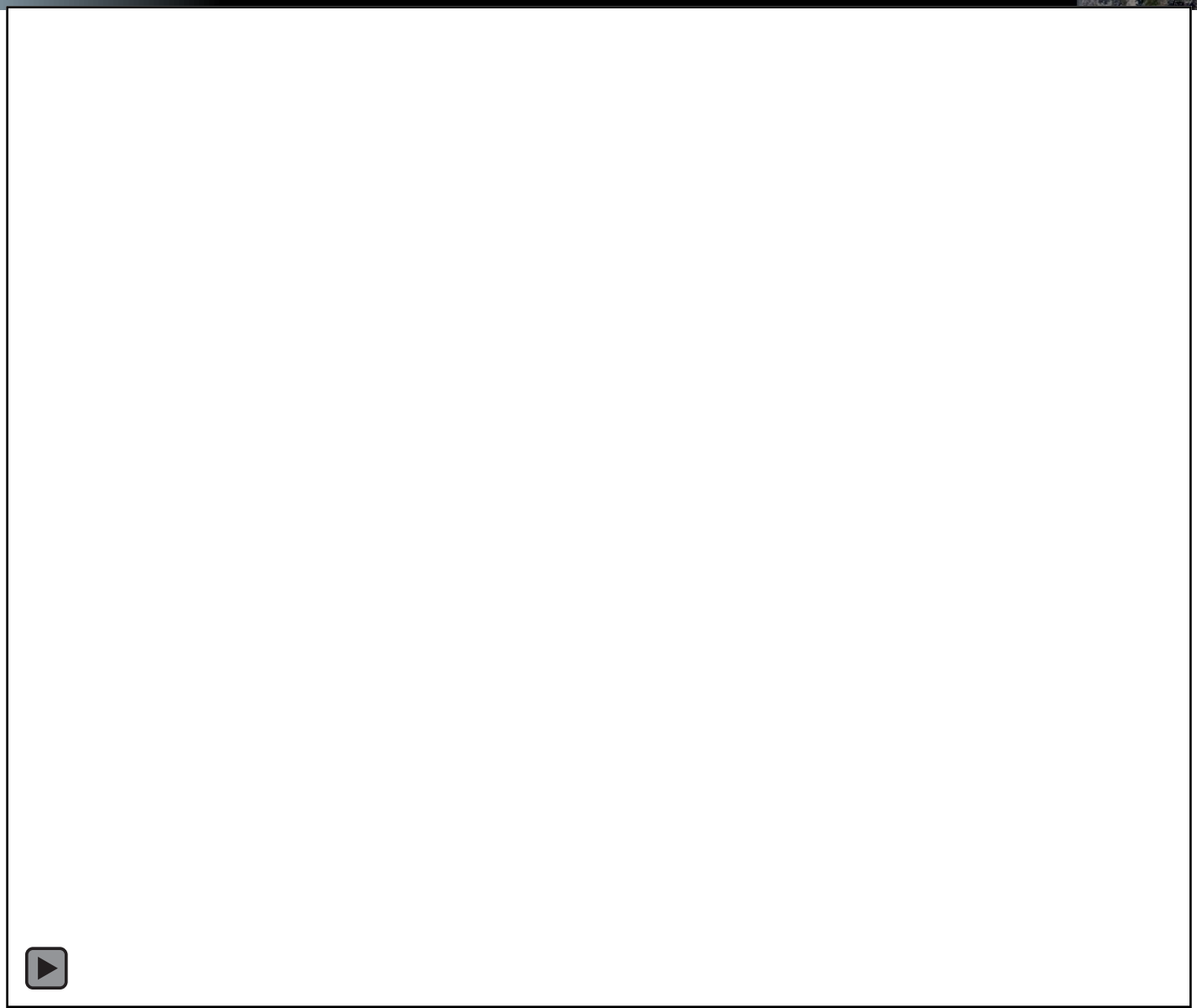
Overlaying NWP data on WV imagery



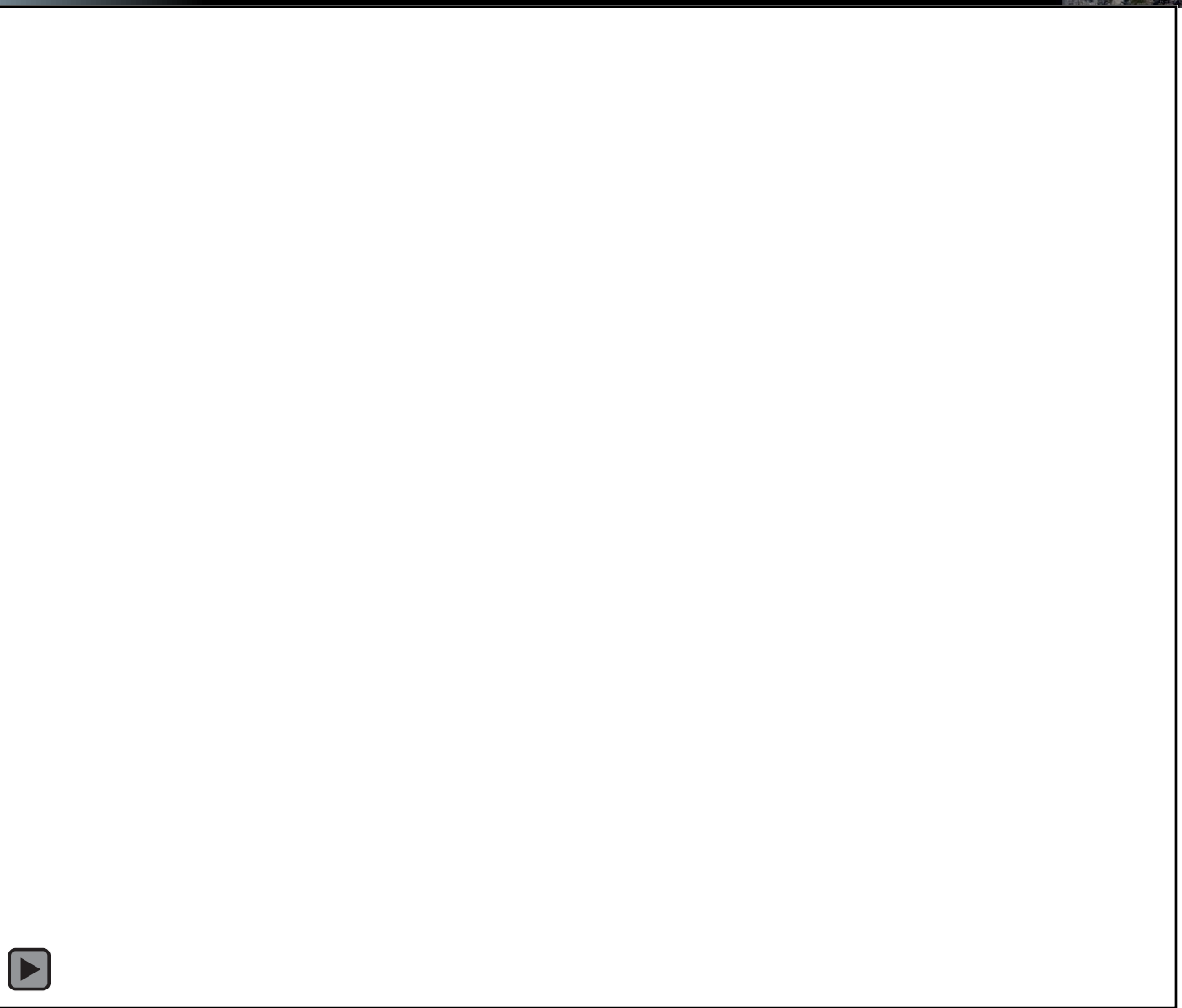
Changing and comparing multi band imagery (N3: Band 6, 2.3 µm)

Let's have a familiarity with the SATAID basic operations!

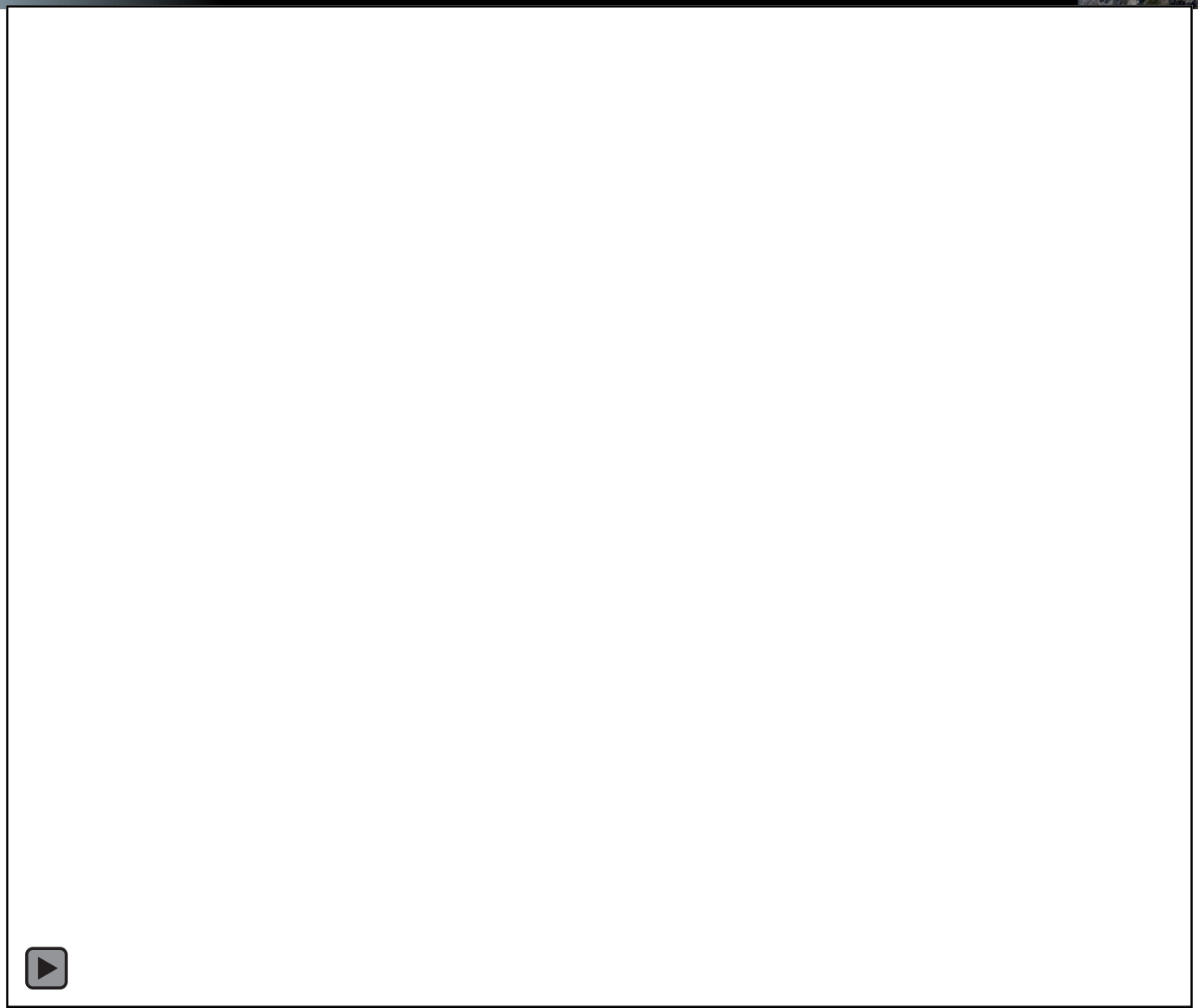
Overview of Case 1
Typhoon Hagibis (T1919) approaching Japan



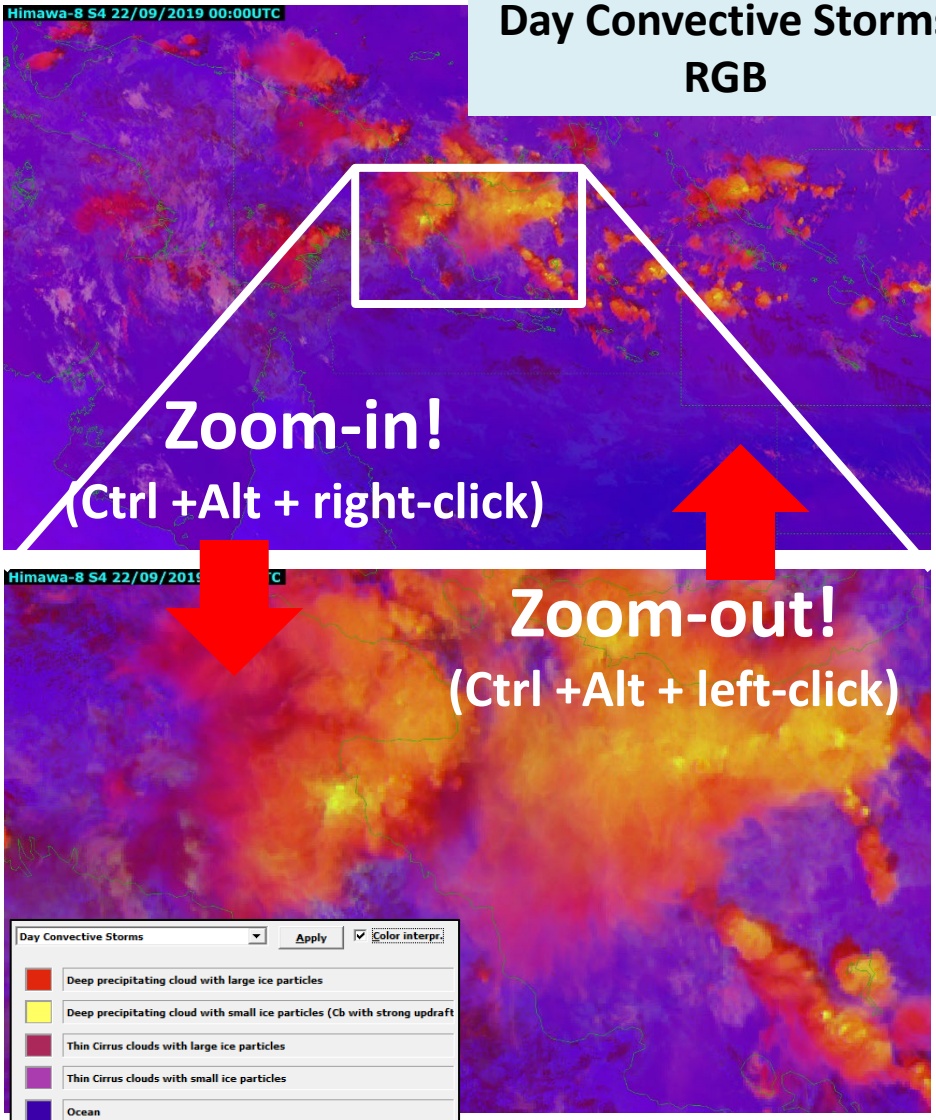
Overview of Case 1
Typhoon Hagibis (T1919) approaching Japan



Overview of Case 1
Typhoon Hagibis (T1919) approaching Japan

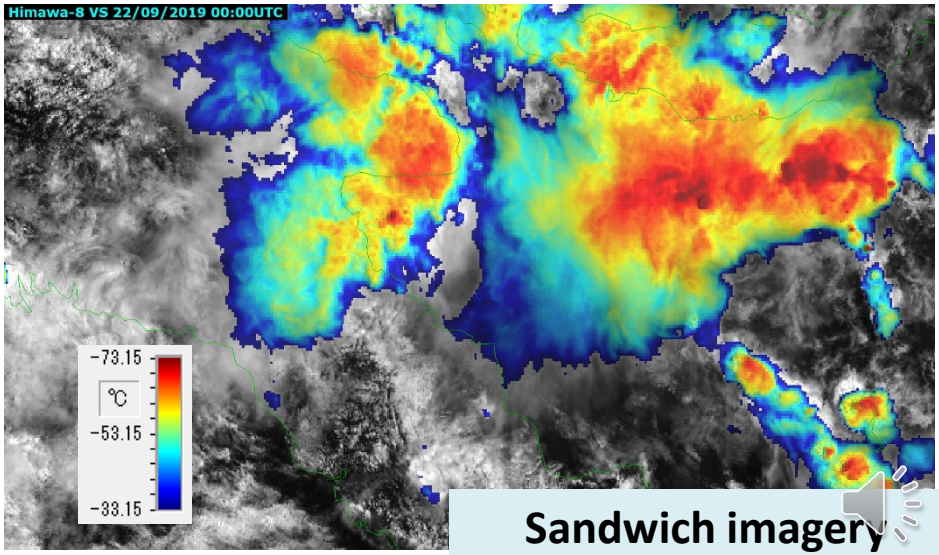


Overview of Case 2
Flood in Papua New Guinea



Day Convective Storms RGB

Focus on Cb clouds which brought heavy rain and flood.



Sandwich imagery

Overview of Case 2
Flood in Papua New Guinea



Summary



- JMA is developing SATAID that can display satellite imageries to analyze phenomenon such as typhoon.
- SATAID can display many types of data by simple operations such as RGB composites and so on.
- We challenged hands-on practical training of RGB case studies by using SATAID in this presentation.



Thank you
for your participation!



Appendices

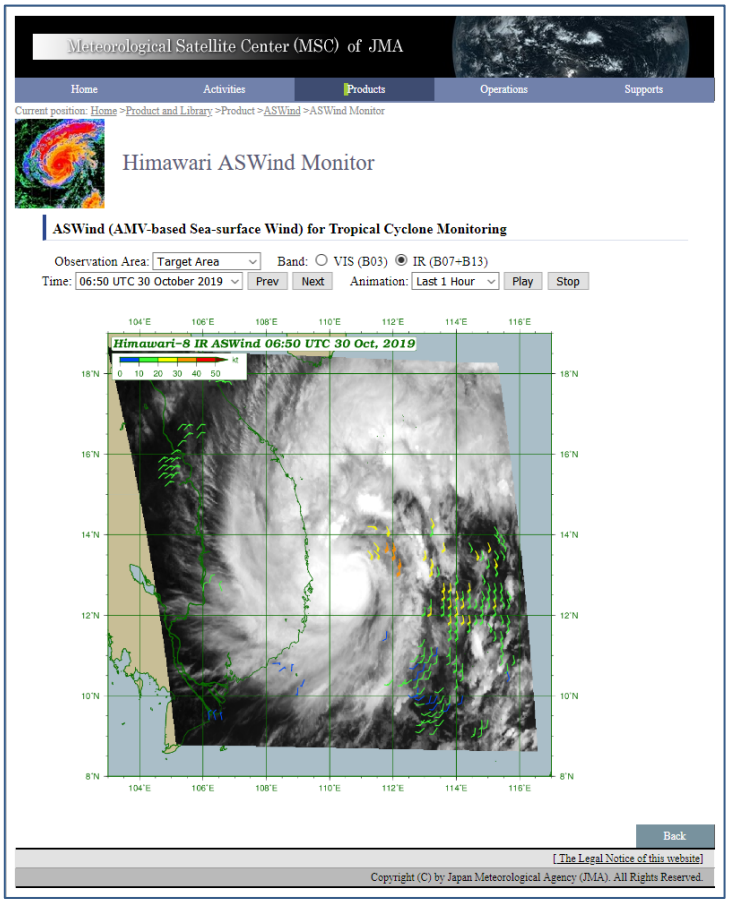


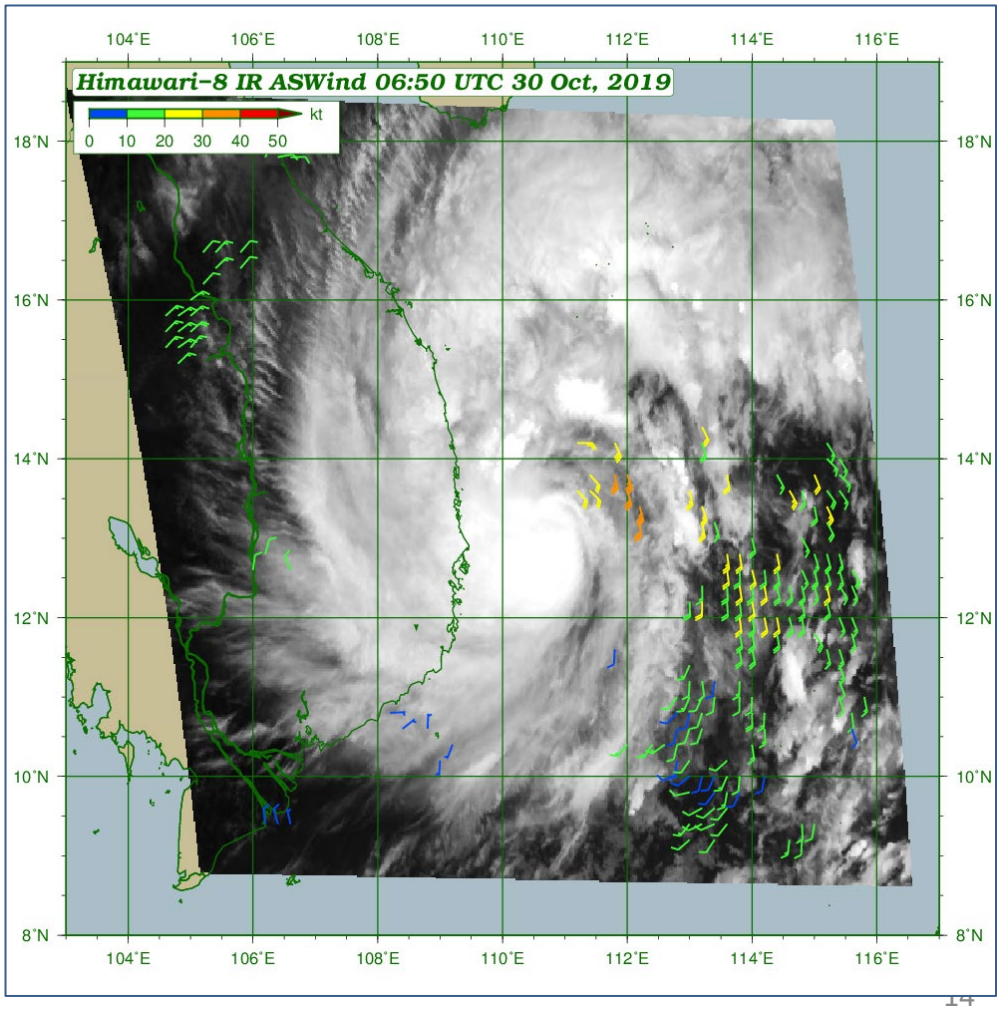
Himawari satellite imagery & products on websites

Himawari ASWind Monitor

ASWind (AMV-based Sea-surface Wind) for Tropical Cyclone Monitoring

https://www.data.jma.go.jp/mscweb/en/product/aswind.php





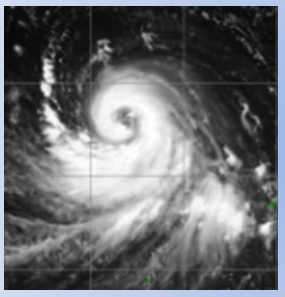
Imagery products for Asia-Oceania Region

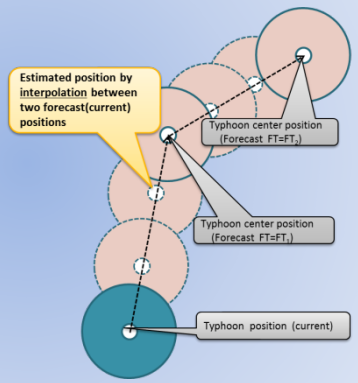
Anyone can get these products by Real-time JPEG imagery service through MSC website for Asia-Oceania region via the Internet.
http://www.data.jma.go.jp/mscweb/data/himawari/index.html

Providing imagery on MSC website
- Easy access to Himawari imagery
- **Processed into sectored images in JPEG format for**
  - Australia
  - Central Asia
  - Pacific Islands
  - Southeast Asia

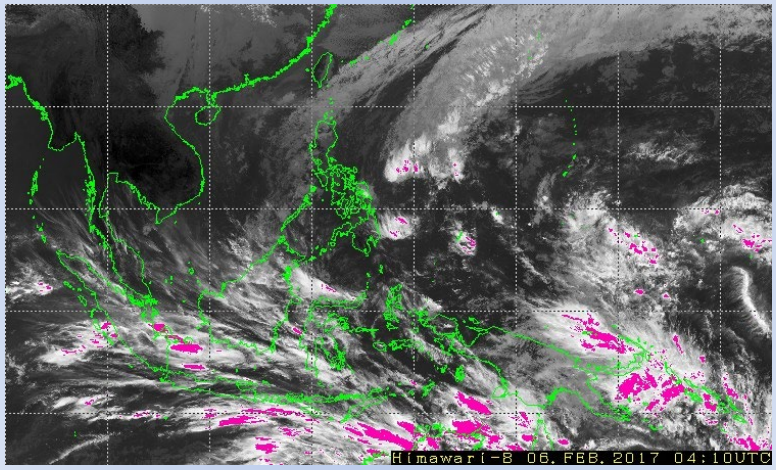
and more....
on real-time basis with animation in the last 23 hours

Target area observation

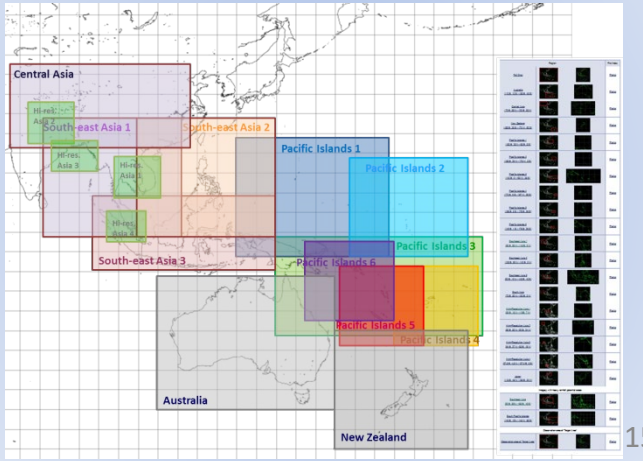




Imagery with heavy rainfall potential areas

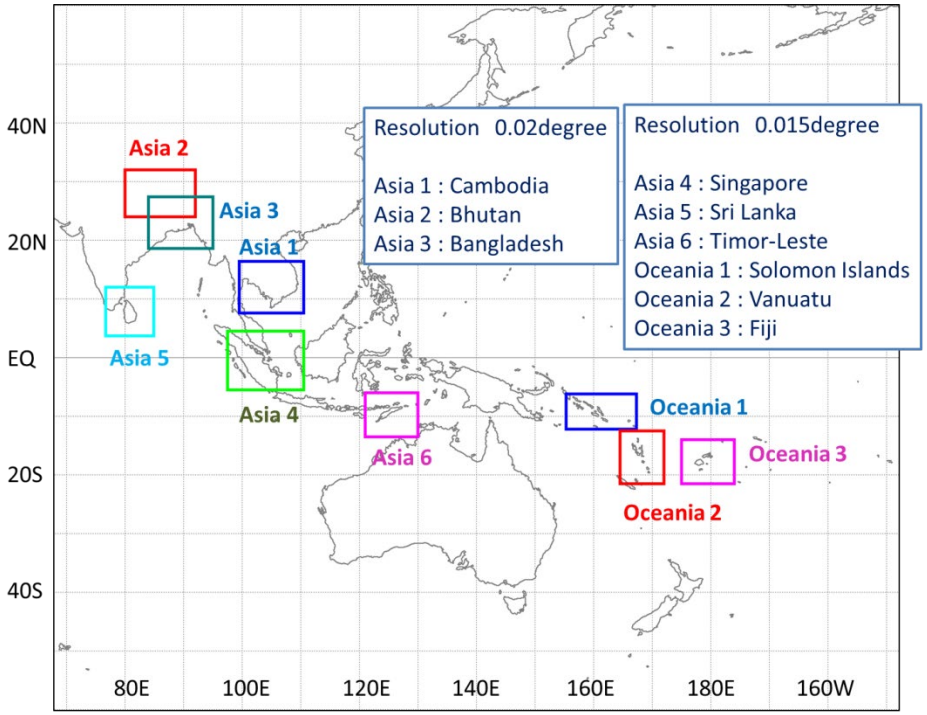


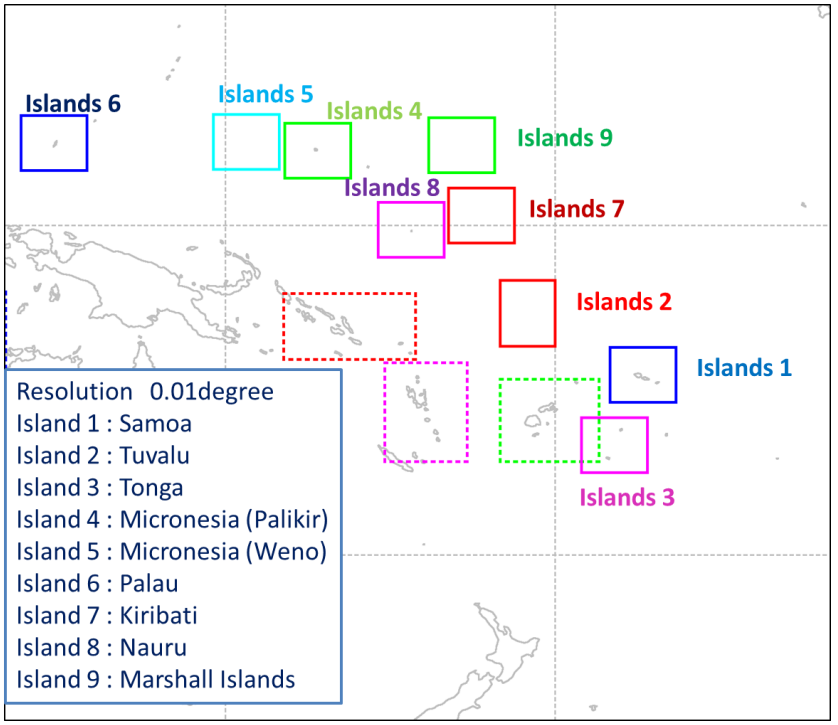
Real-time JPEG Imagery Service through JMA/MSC Website for Asia-Oceania Region



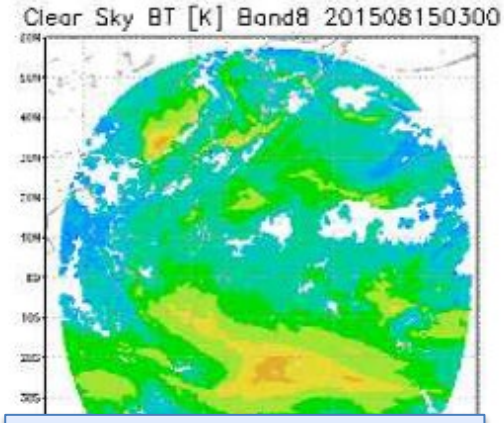
Real-time JPEG Imagery Service on JMA/MSC Website for Oceania Region

JMA/MSC provide high resolution imagery with tiny file size via the Internet to be able to get even under an unstable Internet environment.

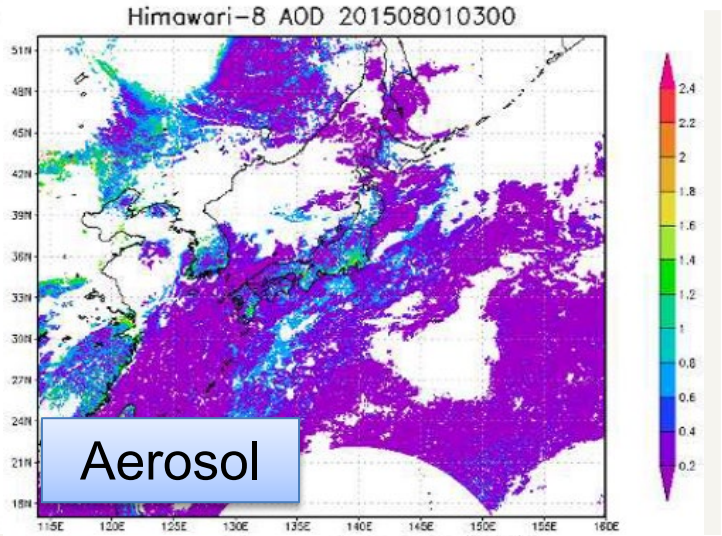




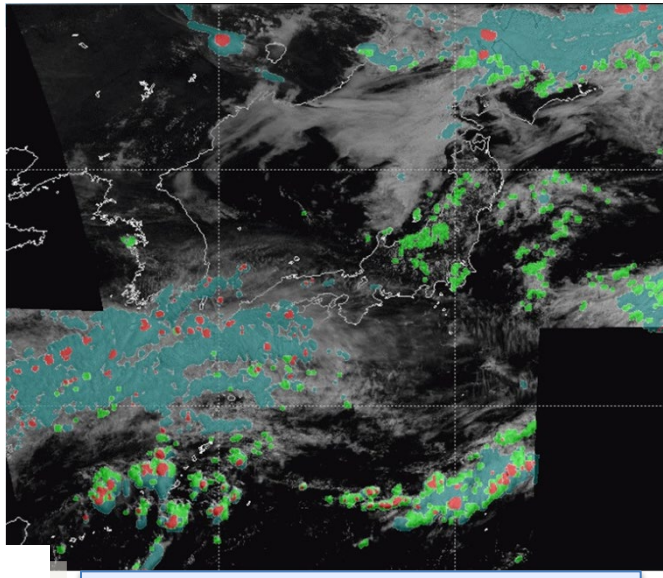
Satellite Products



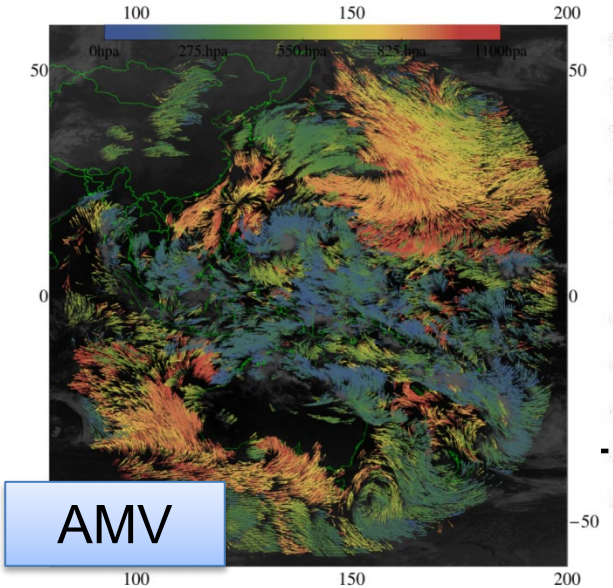
CSR
(Clear Sky Radiance)



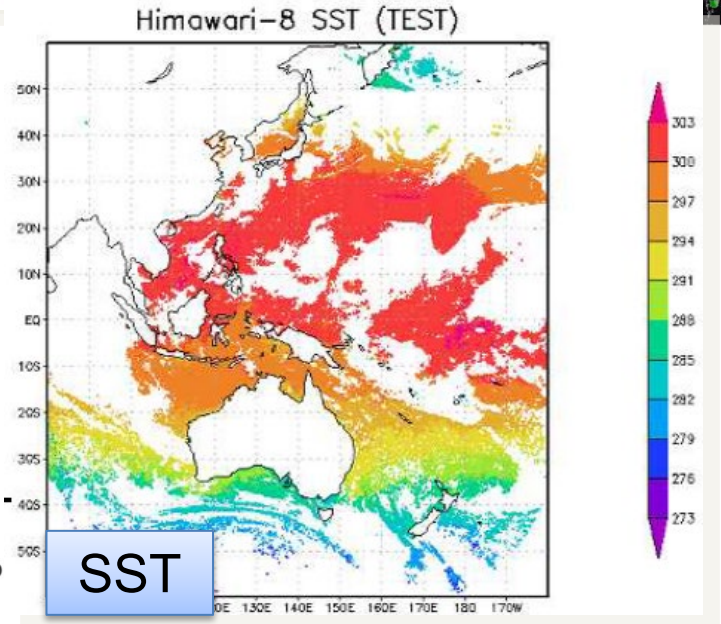
Aerosol



RDCA
(Rapidly Developing
Cloud Area)



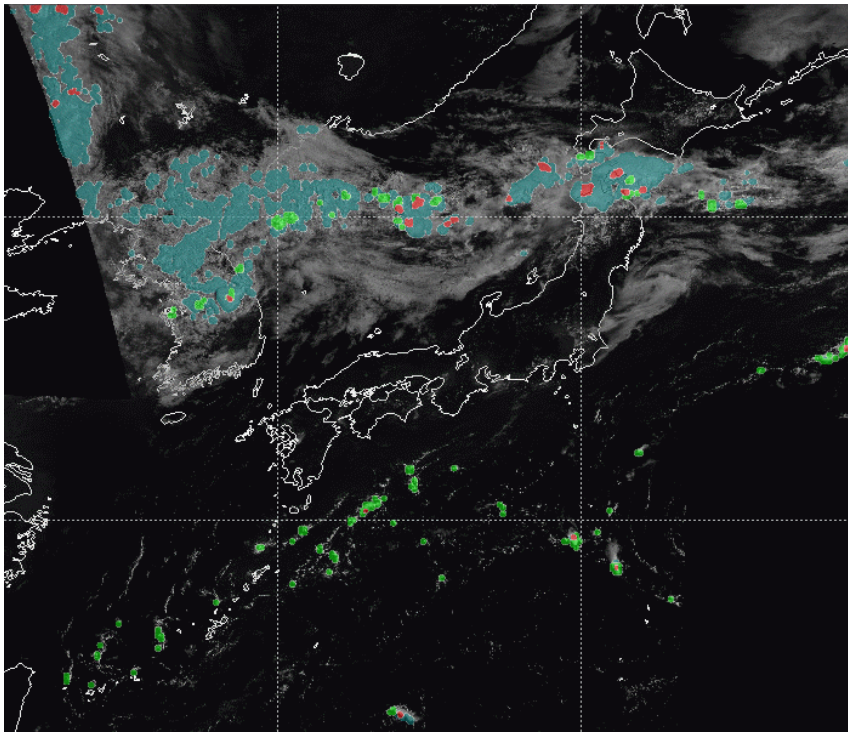
AMV



SST

Rapidly Developing Cumulus Area(RDCA)

- RDCA product detects **rapidly developing cumulus** with thunder and **area of disturbance to occur in near future**.



Rapidly Developing Cumulus Area (RDCA)

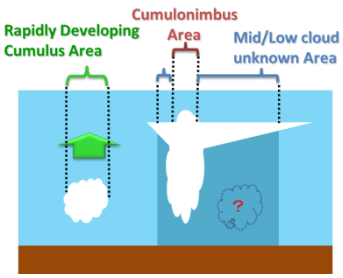
- ✓ Developing cumulus
- ✓ Current/Future disturbance is expected

Cumulonimbus Area

- ✓ A round top, except for anvil cirrus
- ✓ Strong upward flow is expected

Mid/Low Cloud Unknown Area

- ✓ Anvil cirrus
- ✓ Anvil cirrus hides clouds below



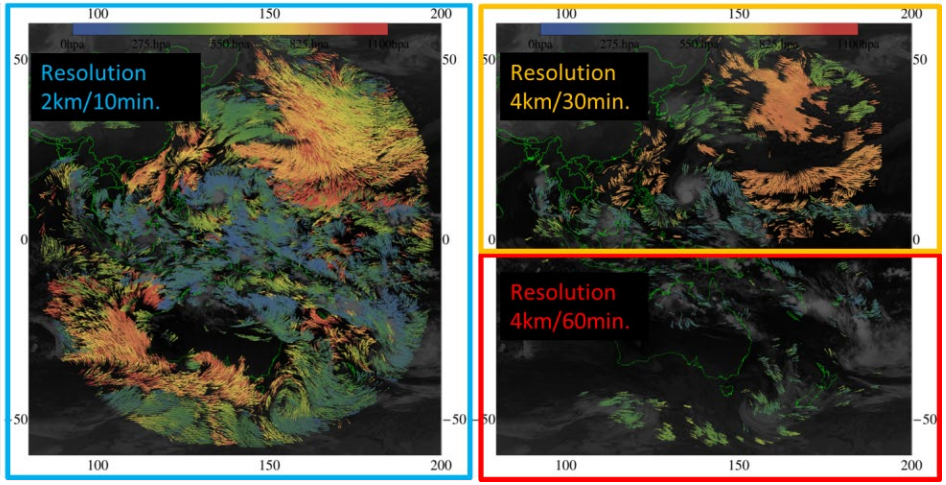
This product is provided to aviation users.

Atmospheric Motion Vectors (AMVs)

AMV is a satellite-derived product that is to estimate the altitude and motion vector of clouds from satellite imagery. It is already used for typhoon analysis , and be used as initial value by numerical forecast.

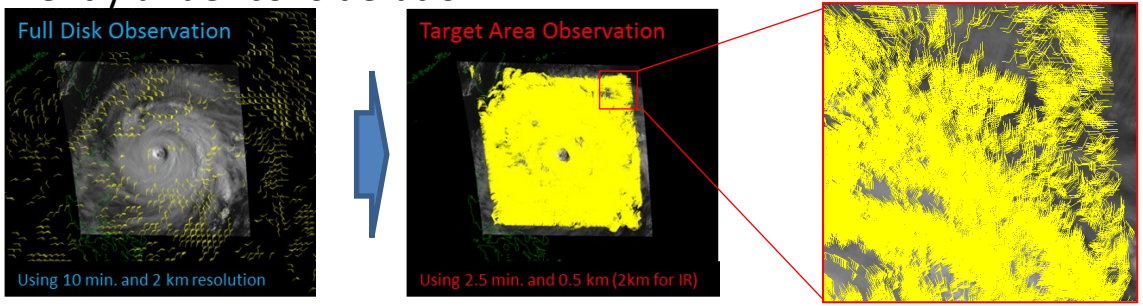
Himawari-8 AMVs derived from Himawari-8 imagery with new algorithm

MTSAT-2 AMVs derived from MTSAT-2 imagery and heritage algorithm



- In the past, AMV was calculated from the difference of images at 30-minute intervals in northern hemisphere using MTSAT-2.
- In southern hemisphere, calculated by images at 60-minute intervals.
- Now, AMV is calculated by using Himawari-8 full disk observation at 10-minute intervals.
- As not only temporal but also spatial resolution is higher than MTSAT-2, detection numbers of AMVs is increasing.

Calculation of AMVs using target area observation is currently under consideration.

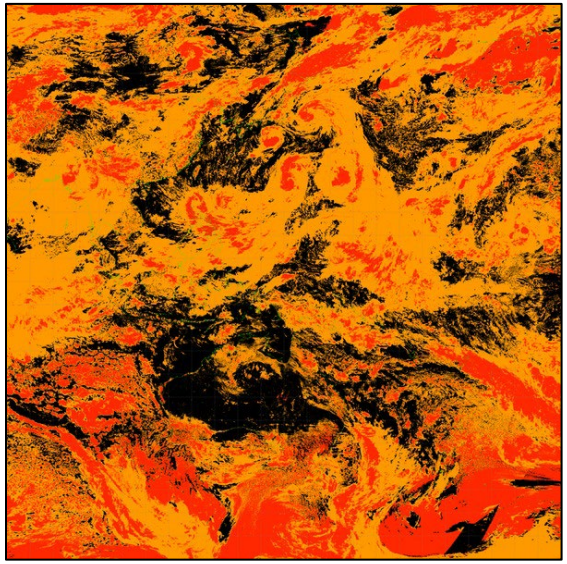


- Improvement to temporal and spatial resolution.
- Detection of low er layer.
- Particularly, the data of the lower layer may be used for estimating the area of windstorm or strong wind.

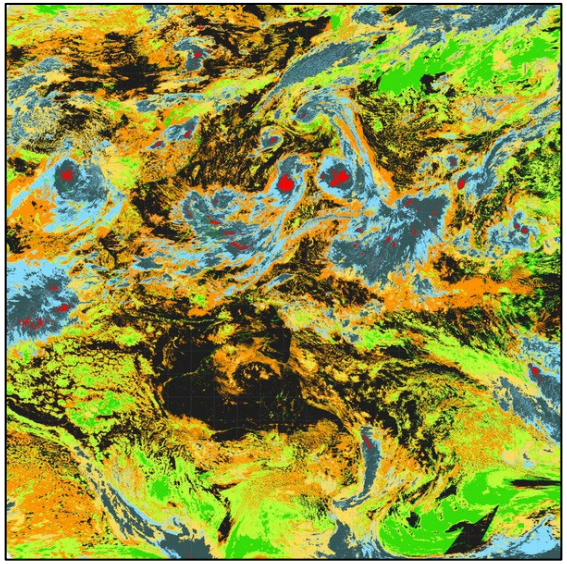
High-resolution Cloud Analysis Information (HCAI)

- Cloud mask, type and top height
  (0.02 degree latitude/longitude grids)
- Currently, MSC provides selected area data to Hong Kong, Indonesia, Kiribati, Malaysia, Mongolia, Myanmar, Singapore, Tonga and Viet Nam via the Internet.

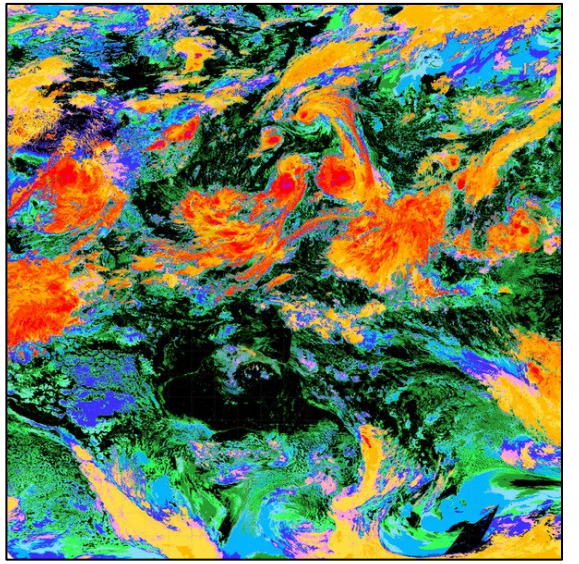
Cloud Mask



Cloud Type



Cloud Top Height

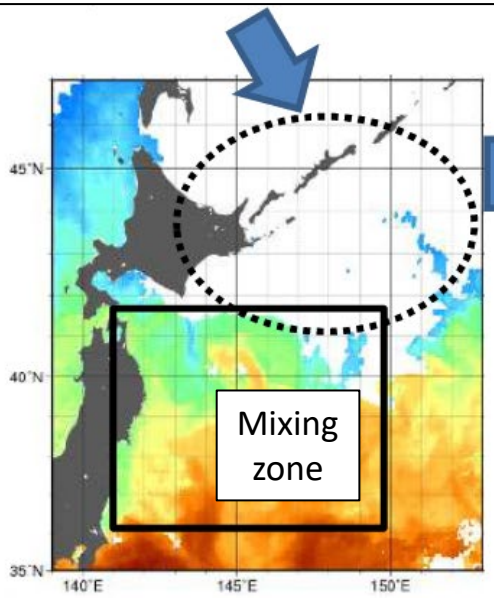


Sea surface temperature

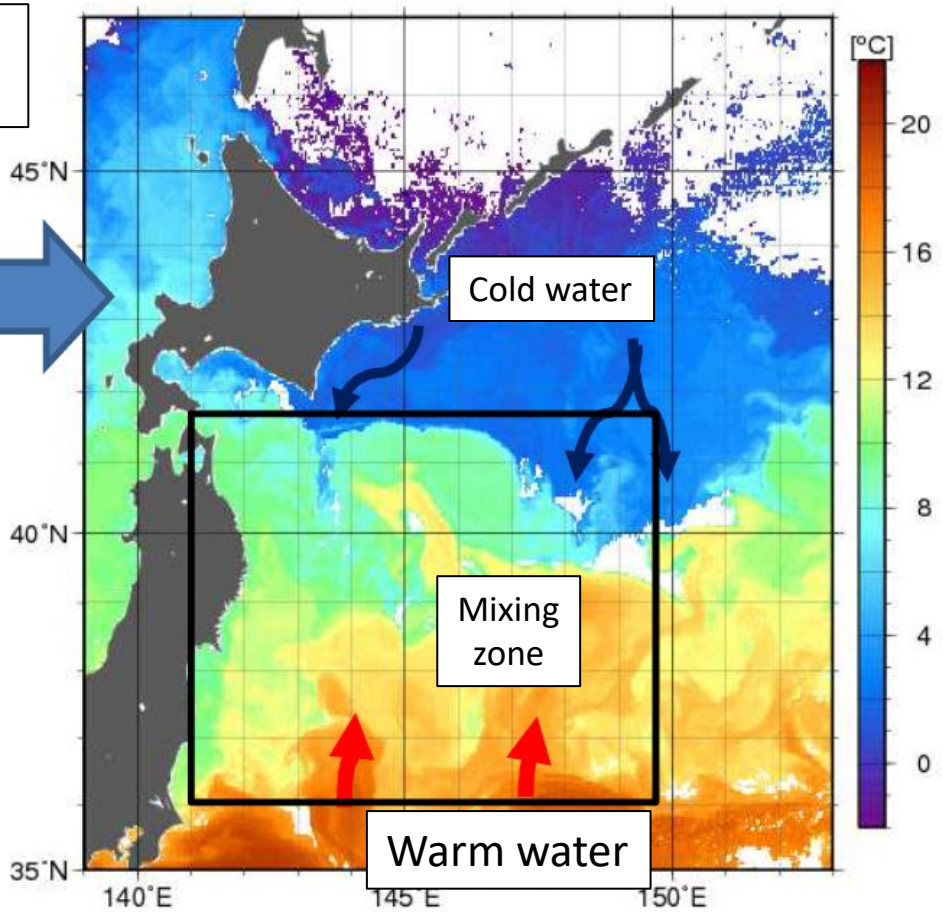
- Use of multi-spectral bands leads to distinguish the cold sea surface and the cloud
- High frequency observation provides more cloud free data

Himawari-7(MTSAT-2)

Can't distinguish the cold sea surface and the cloud



Himawari-8





SATAID



What is SATAID?

- Originally developed by JMA's MSC (Meteorological Satellite Center) as an application software to display satellite imagery and NWP data for training purposes
- Provided to NMHSs as a JMA's contribution to WMO-CGMS Virtual Laboratory for Training in Satellite Meteorology (VL)
- Today, used also as an operational tool for daily weather analysis including tropical cyclone monitoring at JMA's HQ and local offices
- Freely available to NMHSs and easy to install
- Equipped with lots of functions

Introduction to SATAID

For more information on SATAID, please see Introduction Guide for SATAID.



https://www.wis-jma.go.jp/cms/sataid/file/QuickGuide_to_SATAID.pdf