



AOMSUC-15 FYSUC-2025

FIFTEENTH ASIA-OCEANIA METEOROLOGICAL SATELLITE USERS' CONFERENCE
THE JOINT 2025 FENGYUN SATELLITE USER CONFERENCE



Fengyun Quantitative Precipitation Estimates (QPE) Product for Rainfall Classification using Artificial Intelligent in INDONESIA Region

+Cases Study of FengYun Satellites Application on Extreme Condition in INDONESIA

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▶ **Outline of Presentation**

- I. Introduction**
 - II. Data and Method**
 - III. Result and Analysis**
 - IV. Potential Future Applications of Fengyun Satellites in INDONESIA**
 - V. Case Study of Extreme Event in Indonesia that Captured by Fengyun Satellite**
 - VI. Conclusion**
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Introduction of Cases Study



Indonesia,officially the Republic of Indonesia is a country in **Southeast Asia** and **Oceania** between the **Indian and Pacific** oceans.

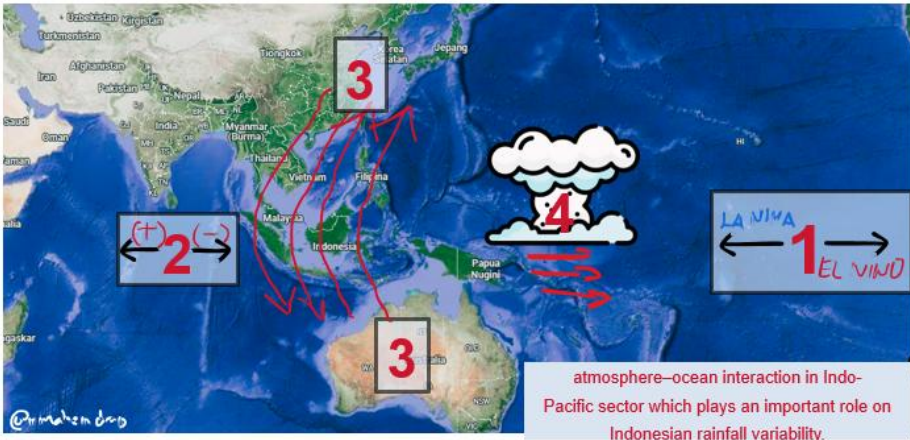


Weather forecasting in Indonesia is **not easy**. Because Atmospheric and climate phenomena in Indonesia are very complex.

Geographically, Indonesia is also flanked by two of the largest oceans in the world, namely the **Pacific Ocean** and the **Indian Ocean**. The phenomenon of interaction between the sea and the atmosphere in both oceans also makes the weather in Indonesia even more difficult to predict.

INDONESIA WEATHER CHARACTERISTIC

- 1 ENSO
- 2 IOD
- 3 MONSOON
- 4 MJO





Goal of Research Project

The goal of this AI Modelling is to show How the FengYun satellite can automatically tell the weather condition and prediction in the area whether Cloudy, Slight Rain, Moderate Rain, or Heavy Rain.

This made for people in general, so **they can easily understand the weather condition without needing any special knowledge about satellite interpretation**

Data and Method



FENGYUN Satellite Data Service

  **National Satellite Meteorological Center
(National Center for Space Weather)**

[Home](#) [Satellite](#) [Search](#) [Image](#) [Data](#) [Quality](#) [Document](#) [Tools](#)

Product ^ satellite (FY3G) or product (SST) 🔍

[Home](#) / [Data Collection](#)

 Text mode

 Image mode

Filter: Satellite:  Clear All

Series

☐ GEO (66)

Satellite

☒ FY-4B (66)

Category

☐ L1 Data (10)

☐ Image (12)

☐ Atmosphere (24)

Total: File 20,792,210 / 280.82TB , 66 Datasets

qpe



☐	Thumbnail	Product	Type	Satellite	Instr.	Area	Peri...	Res.	Start	Last
☐		AGRI Quantitative Precipitation Estimation (Full Disk)     134,433 files / 116.52GB	QPE	FY4B	AGRI	DISK	HHmm	4000M	2022-06-01	2025-07-29

Showing 1 to 1 of 1 rows

AI Rainfall Classification of QPE Product

Teachable Machine

Upload

Slight Rain

30 Image Samples

Webcam **Upload**

Moderate Rain

30 Image Samples

Webcam **Upload**

Heavy Rain

30 Image Samples

Webcam **Upload**

Training

Model Trained

Advanced

Epochs: 50

Batch Size: 16

Learning Rate: 0.001

Reset Defaults

Under the hood

Preview **Export Model**

Input ☒ ON **File**

Choose images from your files, or drag & drop here

Import images from Google Drive

UTC : 2025

Precipitation Estimate (mm)

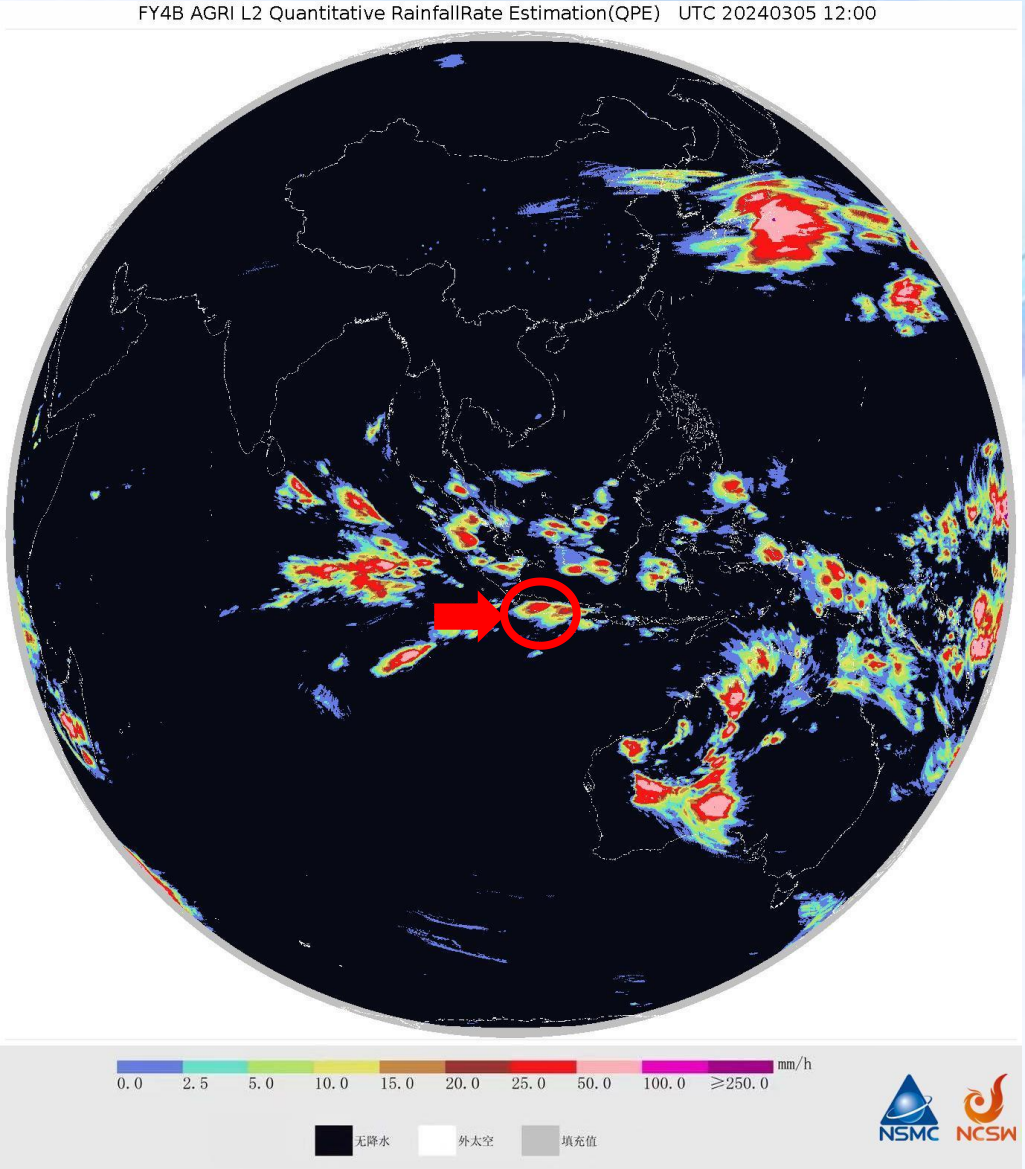
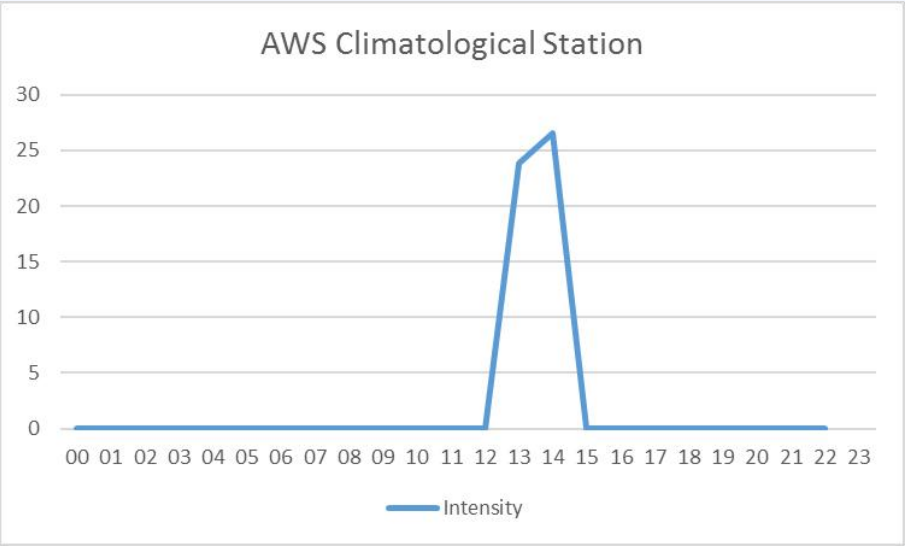
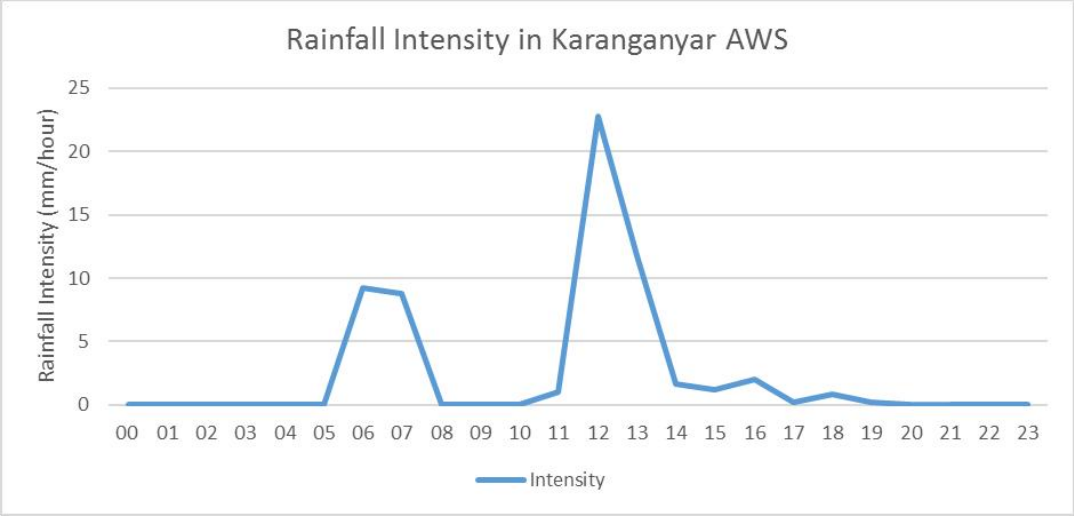
0 1 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50

Color & Quantitative Precipitation Estimate

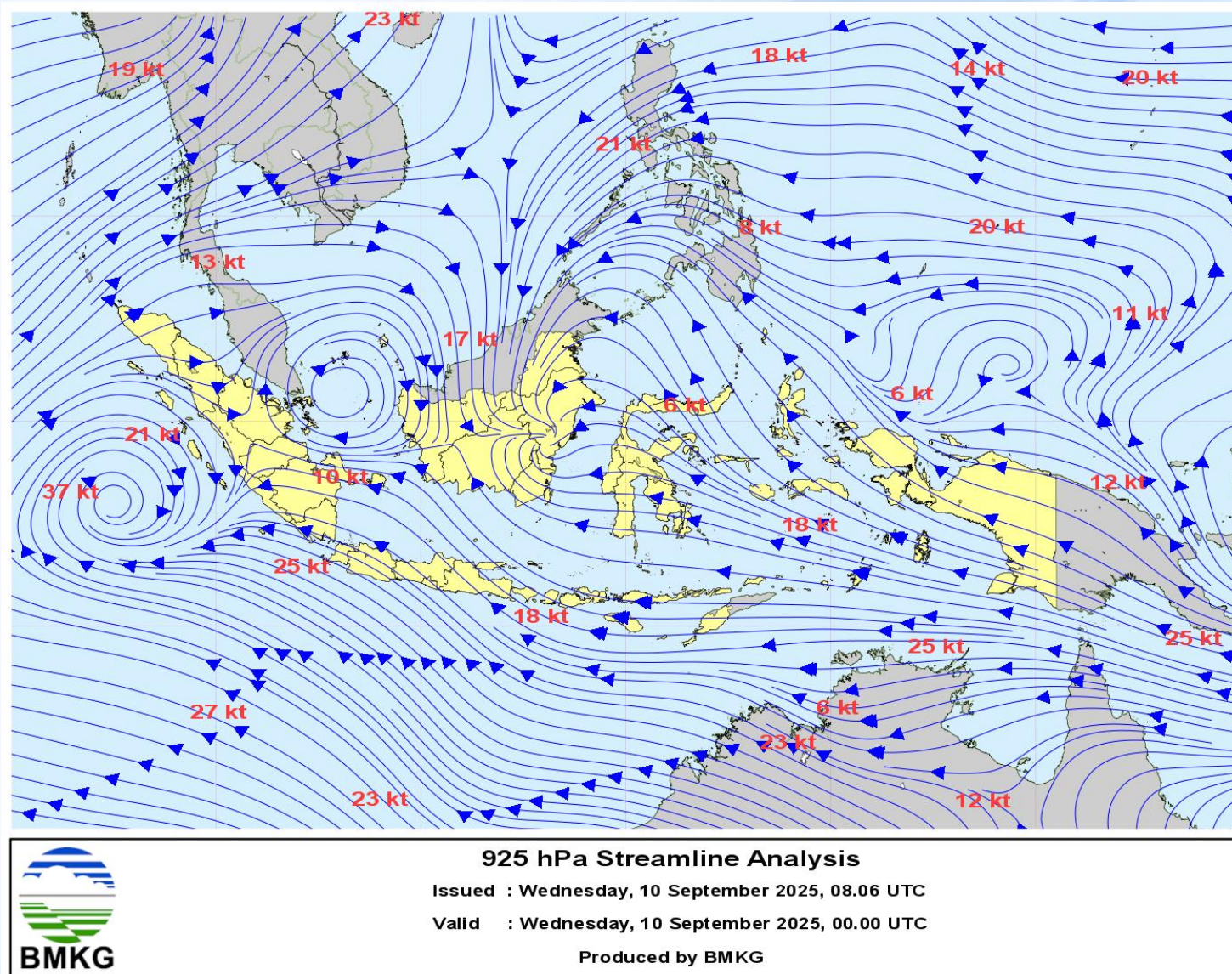
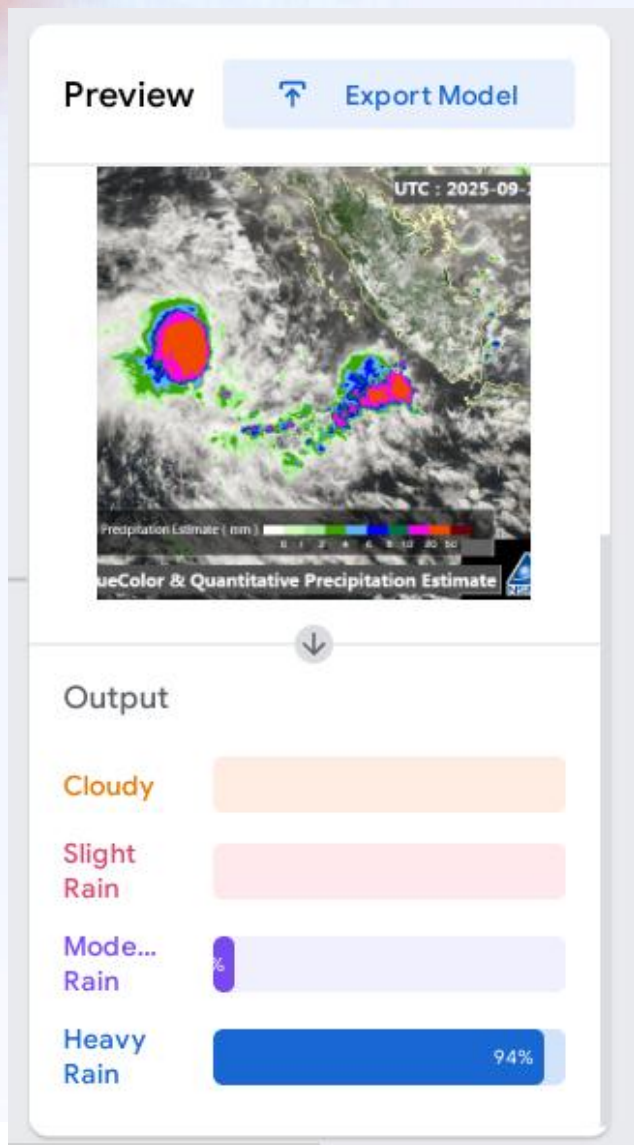
Output

Cloudy

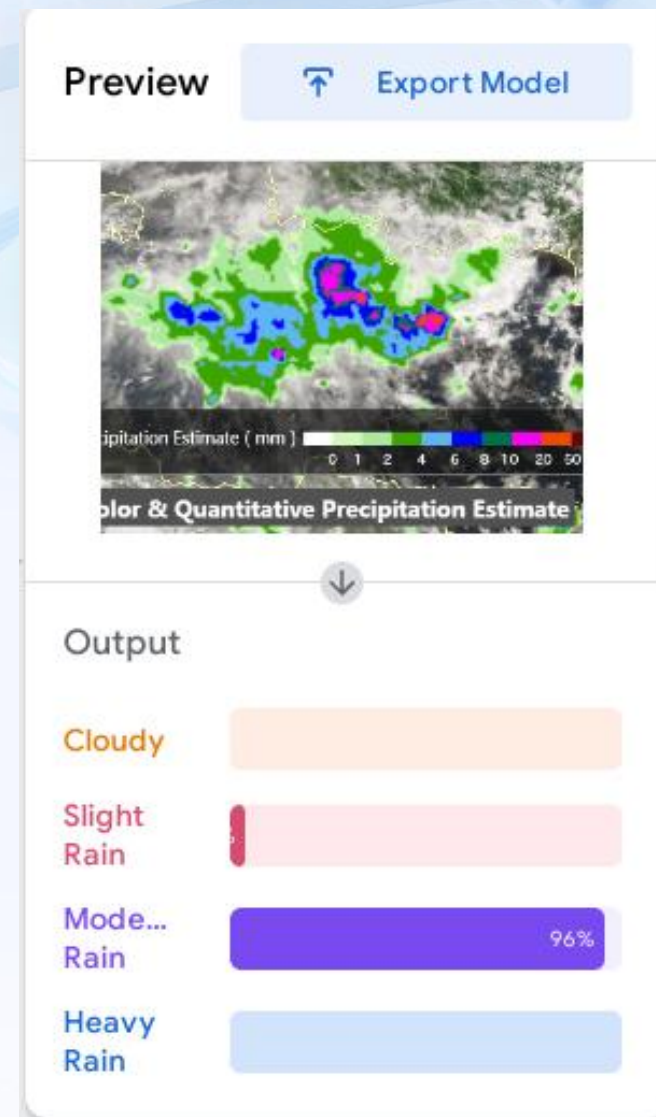
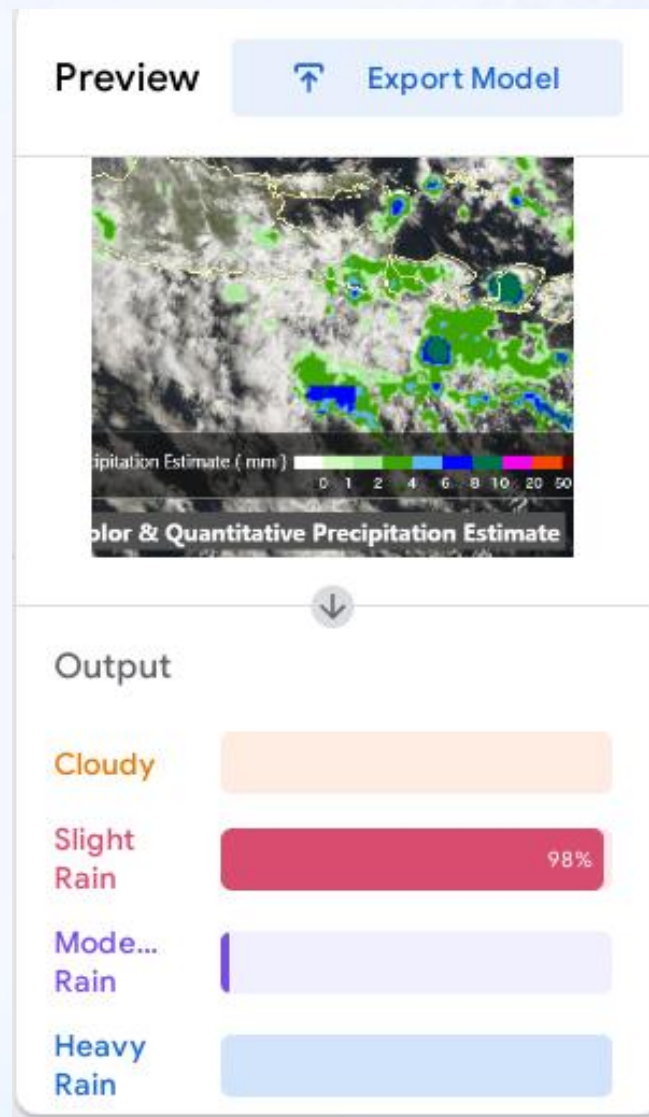
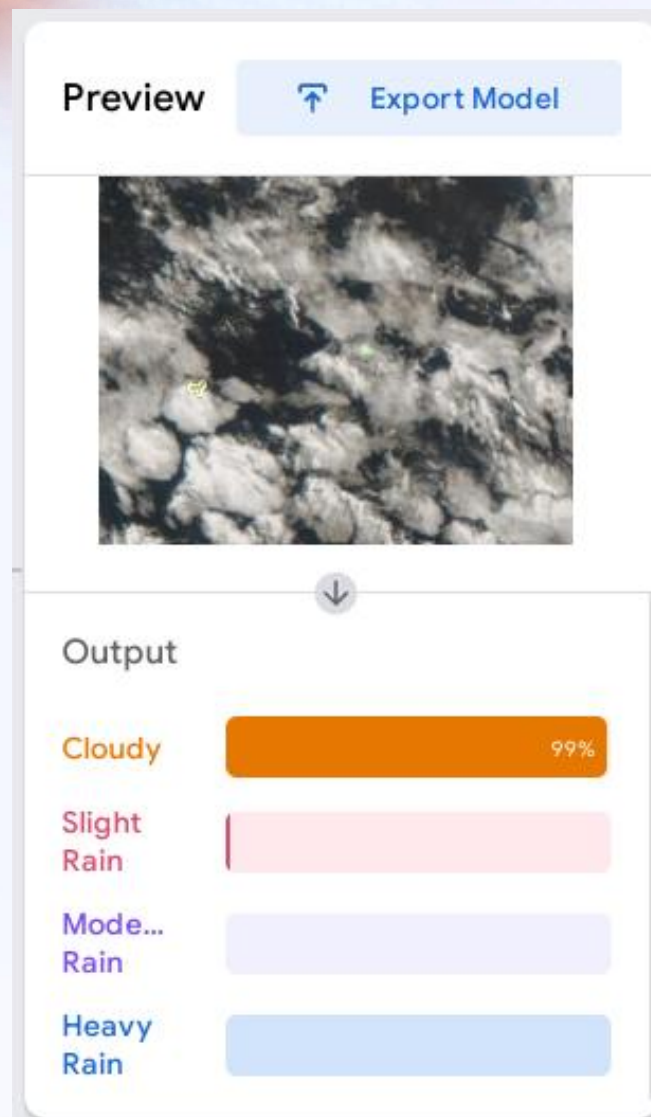
Result and Analysis



Result and Analysis for Cyclonic Condition around Indonesia



Result of AI Classification for Another Rain Category



Potential Future Applications of Fengyun Satellites in INDONESIA

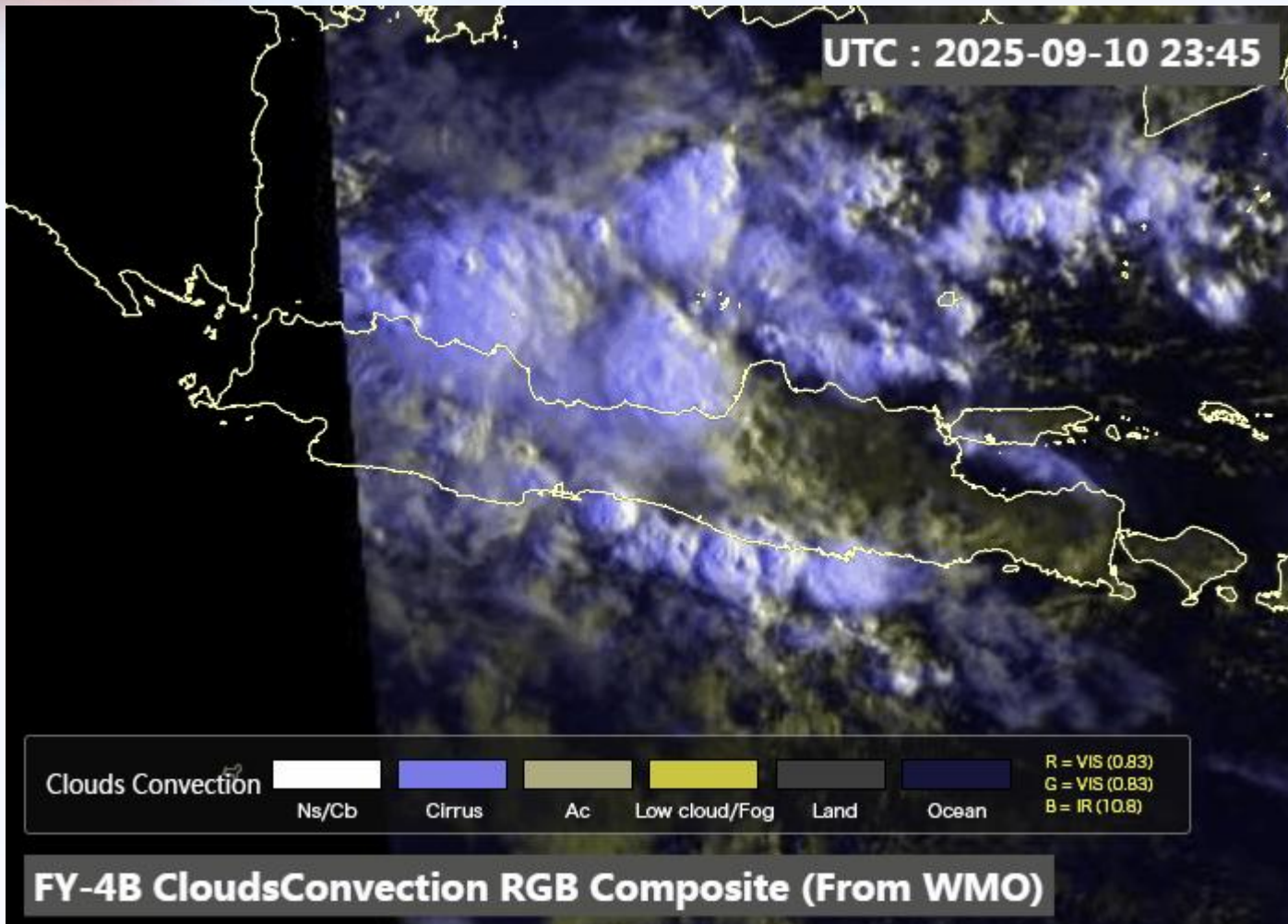


- Help Forecaster to make Nowcasting Prediction of **Severe Rainfall**
- Monitoring of **Tropical Depression** in INDONESIA
- Monitoring of **Volcanic Ash Distribution** in INDONESIA
- Prediction of **Cumulonimbus Cloud** for Aviation Safety
- **GIRRS Product** for Vertical Structure of Atmosphere

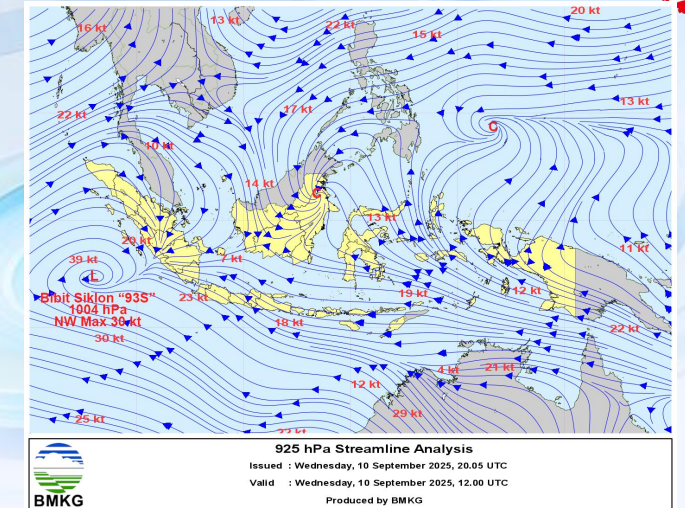
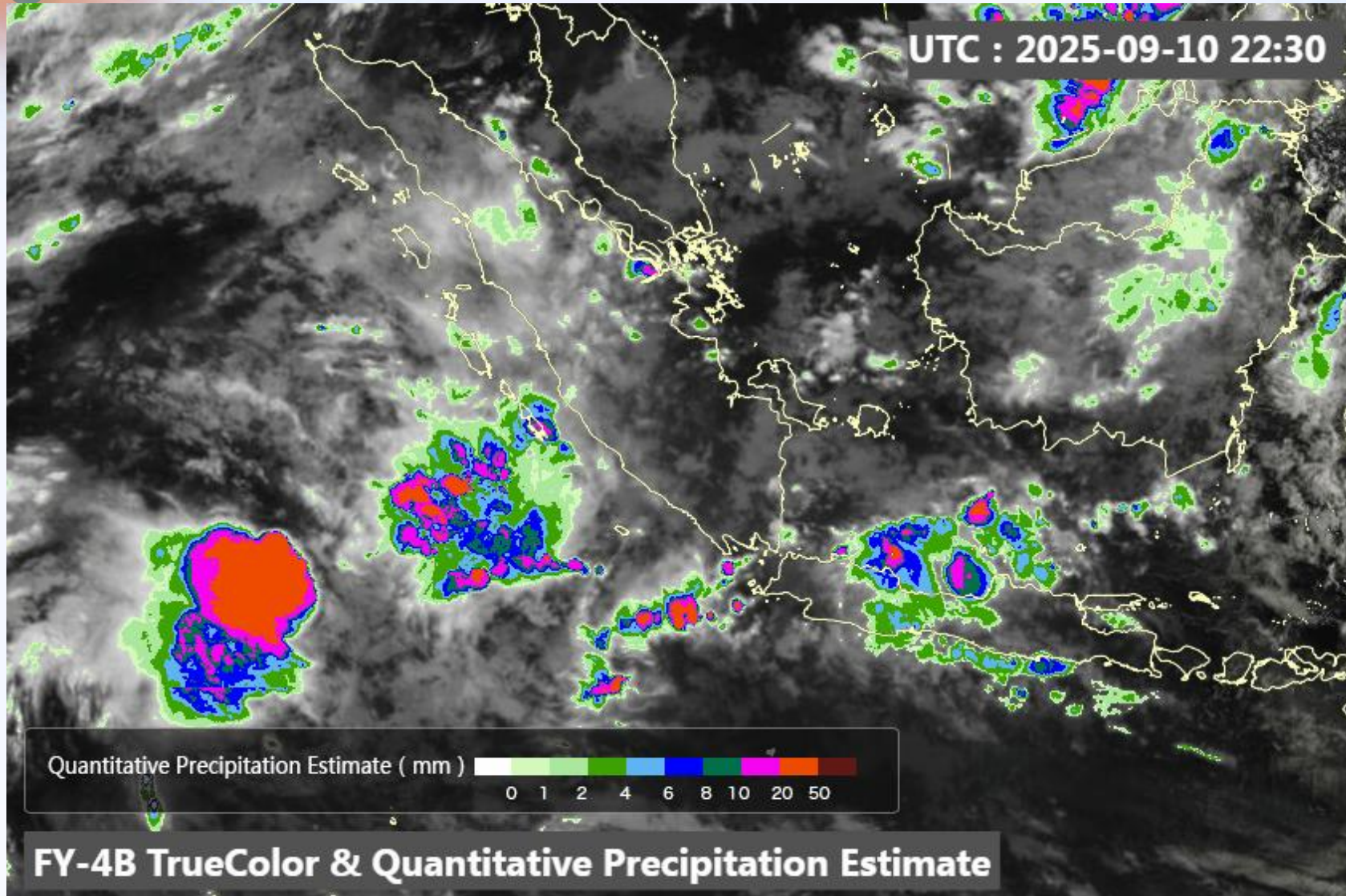
The background features a blue and white abstract design with concentric circles and a play button icon in the top left corner.

Case Study of Extreme Event in Indonesia that Captured by FengYun Satellite

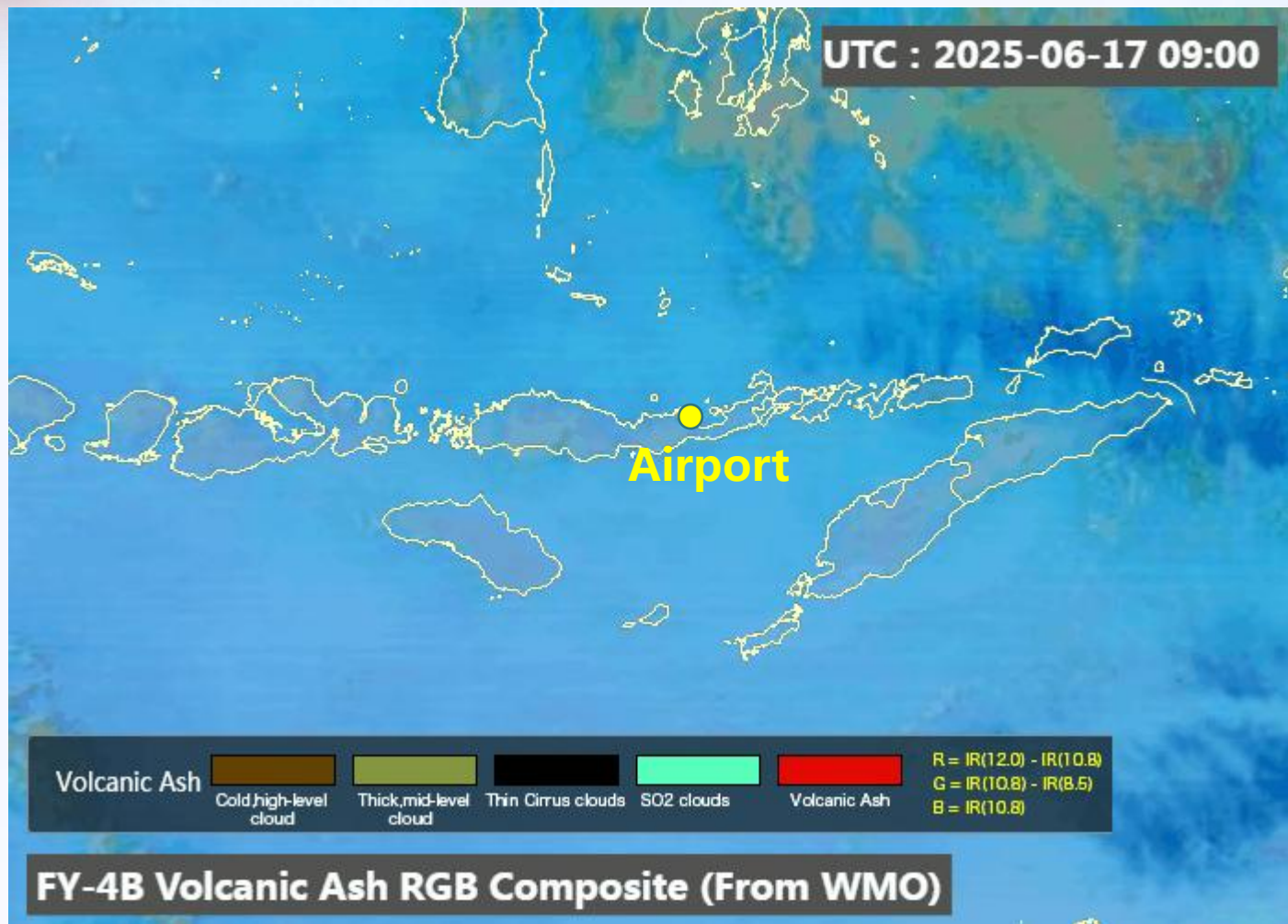
Nowcasting Prediction of Severe Rainfall



Tropical Depression of 93S



Volcanic Ash Distribution of LEWOT0BI Eruption



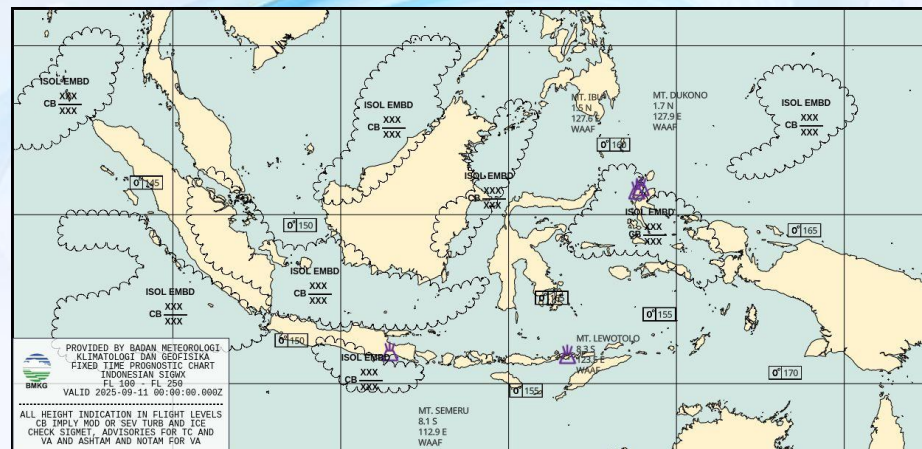
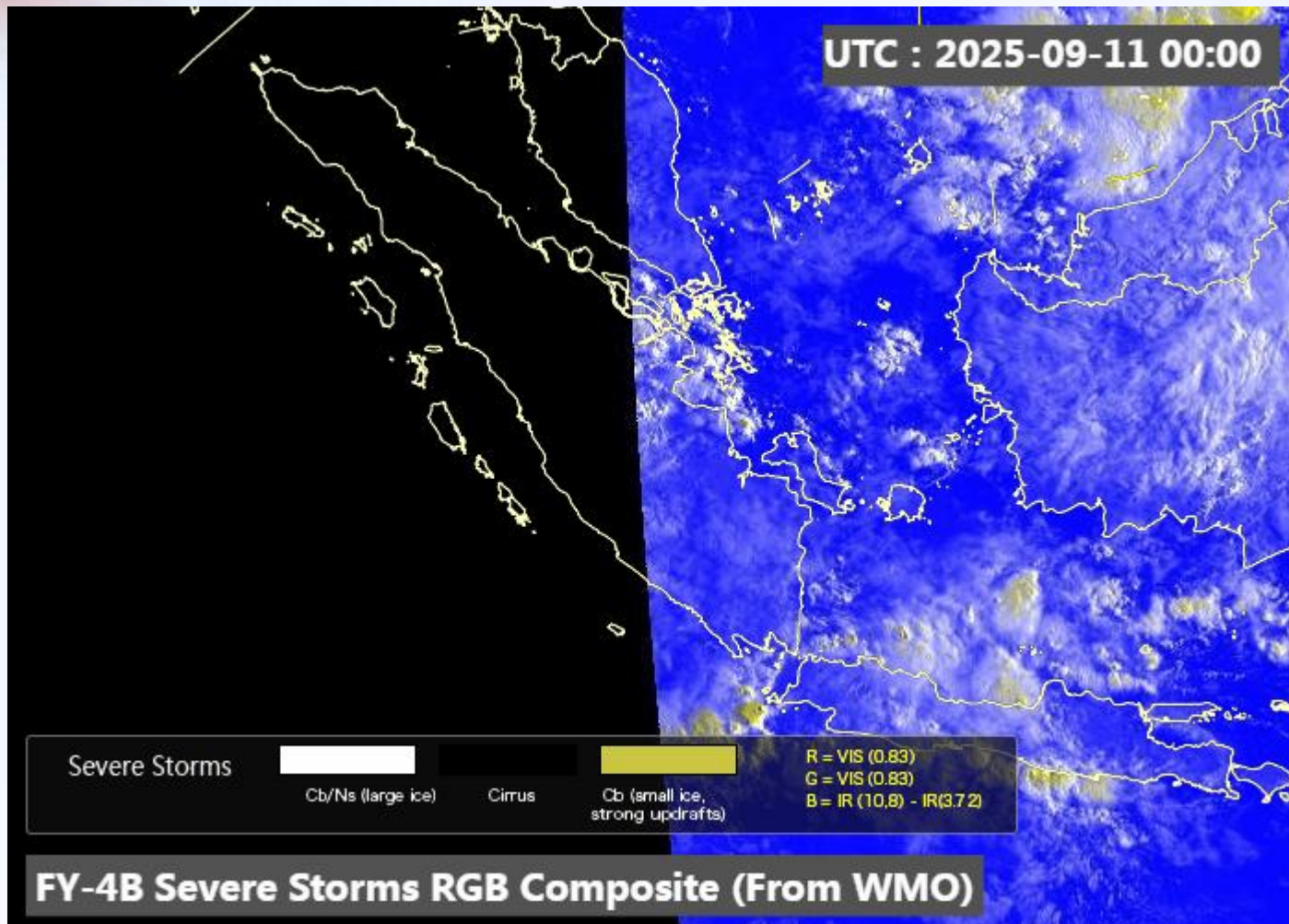
Flight routes affected by volcanic ash at Fransiskus Xaverius Seda Airport have been temporarily closed.

Public Relations of the Directorate General of Public Works Monday, July 7, 2025



Mauere (7/7/2025) - Fransiskus Xaverius Seda Airport in Mauere is temporarily closed in accordance with NOTAM Aerodrome Closed Number C0894 NOTAMN starting July 7, 2025 at 09:00 WITA until July 8, 2025 at 06:00 WITA.

Prediction of Cumulonimbus Cloud for Aviation Safety



SIGWX Chart for Aviation

GIIRS Product for Vertical Structure of Atmosphere

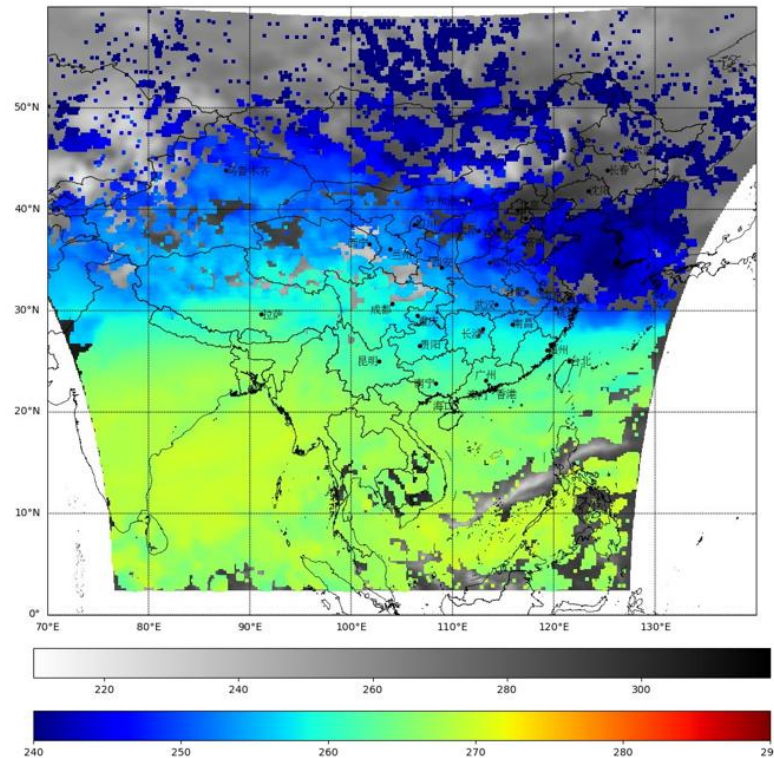


FY4B-GIIRS-N_REGC_1050E_L2-AVP-MULT_GLL_20240312050328_20240312062945_012KM_V0001_ATProf_500

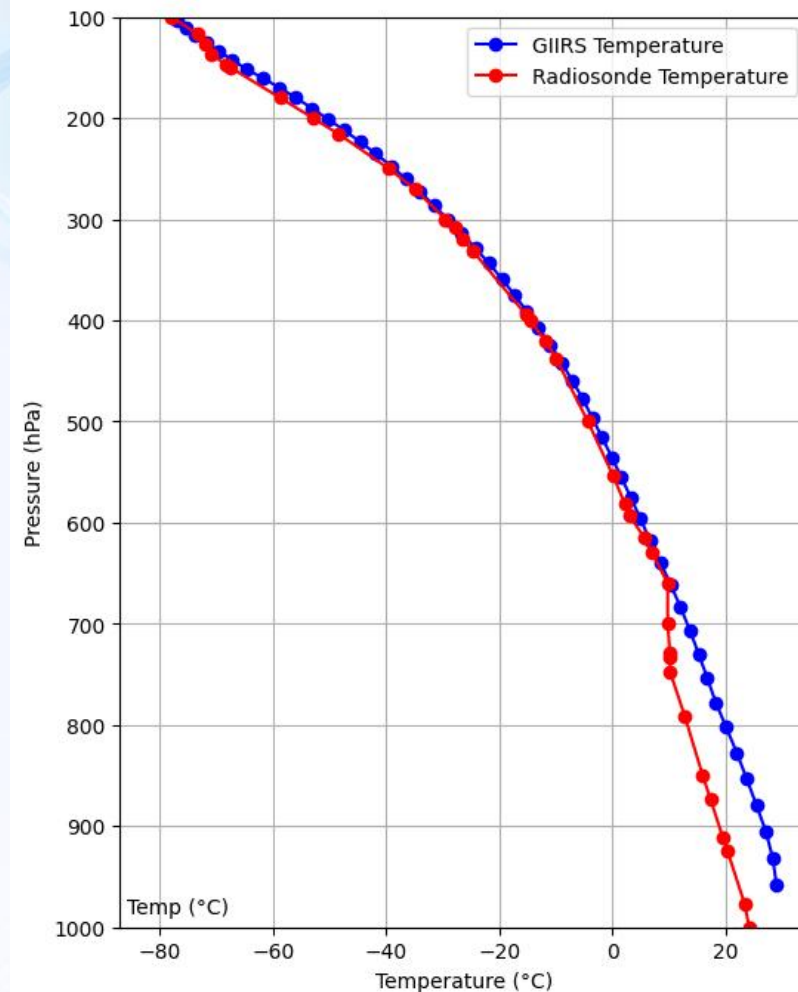
GIIRS cover area of Indonesia Region



1. Aceh Upper Air Observation (5.510 N, 95.410 E)
2. Medan Upper Air Observation (3.560 N, 98.680 E)
3. Natuna Upper Air Observation (3.560 N, 98.680 E)
4. Tarakan Upper Air Observation (3.330 N, 117.560 E)



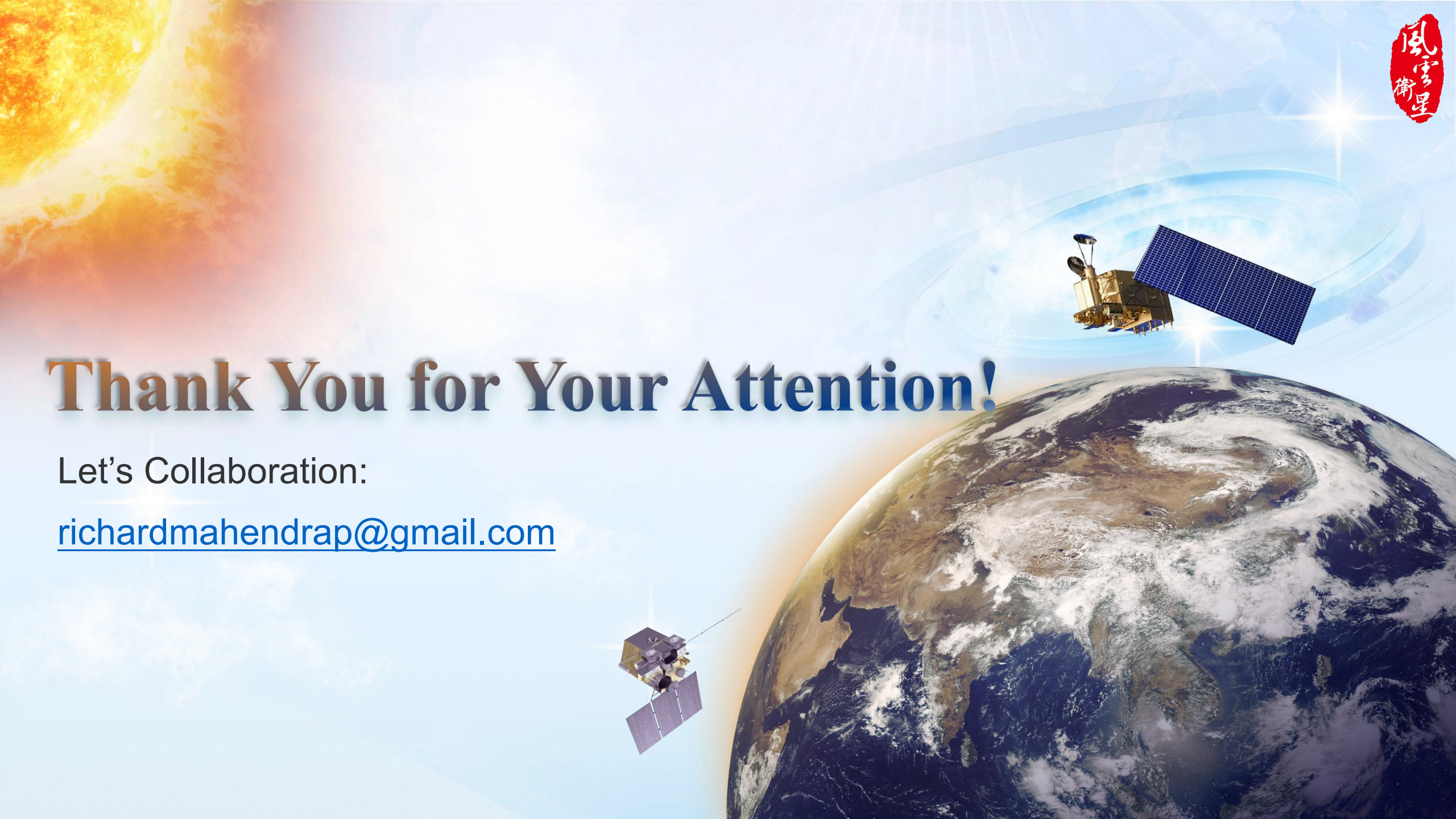
Atmospheric Temperature Profile Overlay
FY 4B GIIRS vs Radiosonde
lat=3.95 N, lon=108.38 E



Conclusion



- FengYun satellites provide valuable data for severe event in Indonesia such as monitoring rainfall, cyclones, volcanic ash, and aviation weather.
- AI-based products of QPE from FengYun Satellite have a good result for Classification of Rainfall Intensity.
- Utilization of FengYun Satellite for Case studies in Indonesia such as severe rainfall, tropical depression, volcanic ash, cumulonimbus clouds and also structure vertical of atmosphere demonstrate their practical impact.
- Strengthening the use of Fengyun satellites will improve disaster preparedness, aviation safety, and national resilience.



Thank You for Your Attention!

Let's Collaboration:

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