The Bureau of Meteorology

Australian VLab Centre of Excellence Regional Focus Group meeting 27th November 2025

Bodo Zeschke,
Bureau of Meteorology Training Centre
Australian VLab Centre of Excellence

Australian VLab Centres of Excellence Regional Focus Group meeting,

02UTC 27th November 2025

Contents

- **A summary of the 15th Asia Oceania Meteorological Satellite User Conference (AOMSUC-15):** presented by Bodo Zeschke, Bureau of Meteorology Training Centre.

- **Some follow up actions to AOMSUC-15, including a short Regional Case Study:** presented by Bodo Zeschke, Bureau of Meteorology Training Centre.

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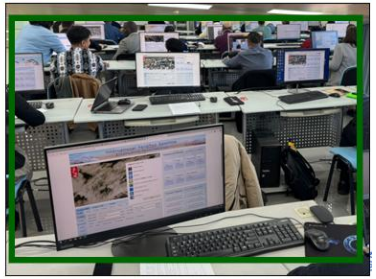
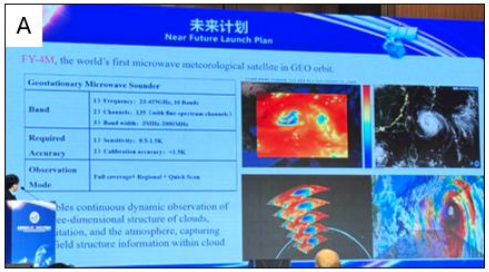
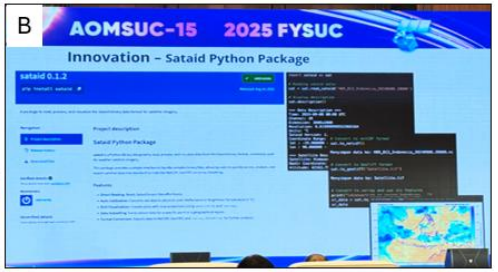
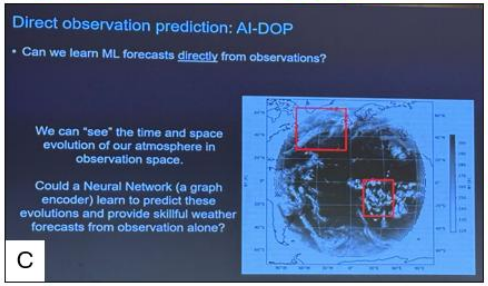
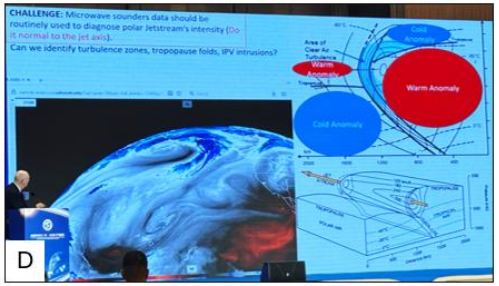
AOMSUC-15 Training Event, Conference, Joint RA-II / RA-V Coordination Meeting





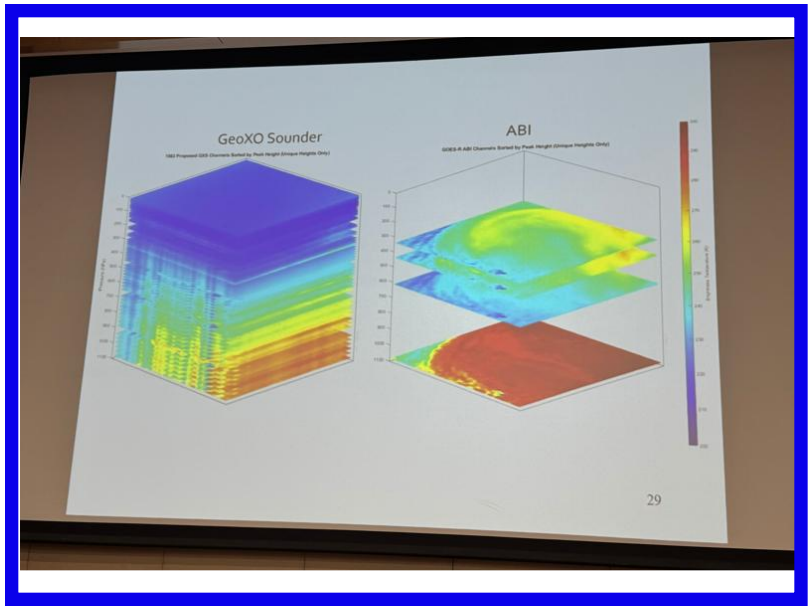






AOMSUC-15 Training Event, Conference, Joint RA-II / RA-V Coordination Meeting

The AOMSUC-15 Training Event, 26th October



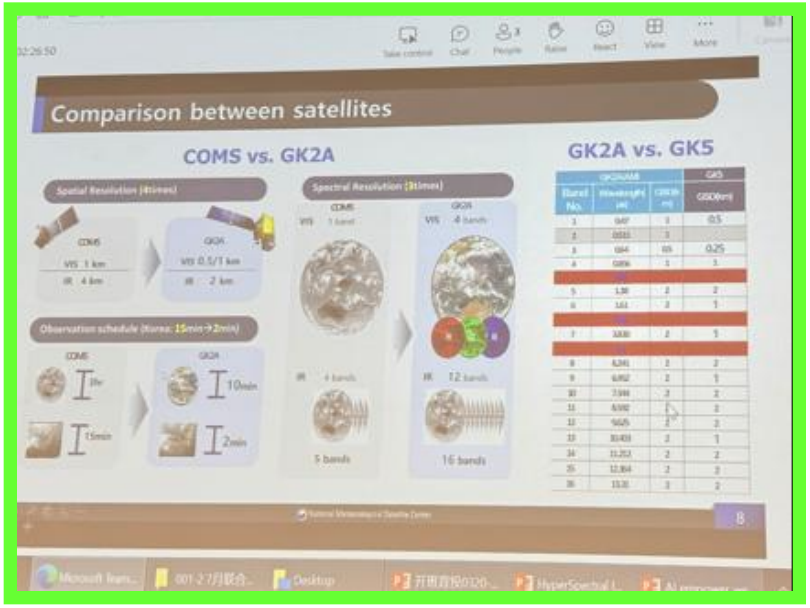
The AOMSUC-15 Training Event, Day 1, 26th October (part 1)

The morning sessions of the first day were conducted in the Multi-Function Classroom on the China Meteorological Administration (CMA) International Cooperation and Training Centre (CMATC ICTC).

Dr Allen Huang of SSEC University of Wisconsin Madison delivered the first keynote presentation on the topic of Hyperspectral Infrared Soundings. Here you can see the capability of the future GEO-XO infrared sounder in comparison to existing GOES ABI channels in interrogating the atmosphere.

REFERENCE

The AOMSUC-15 Training Event, 26th October

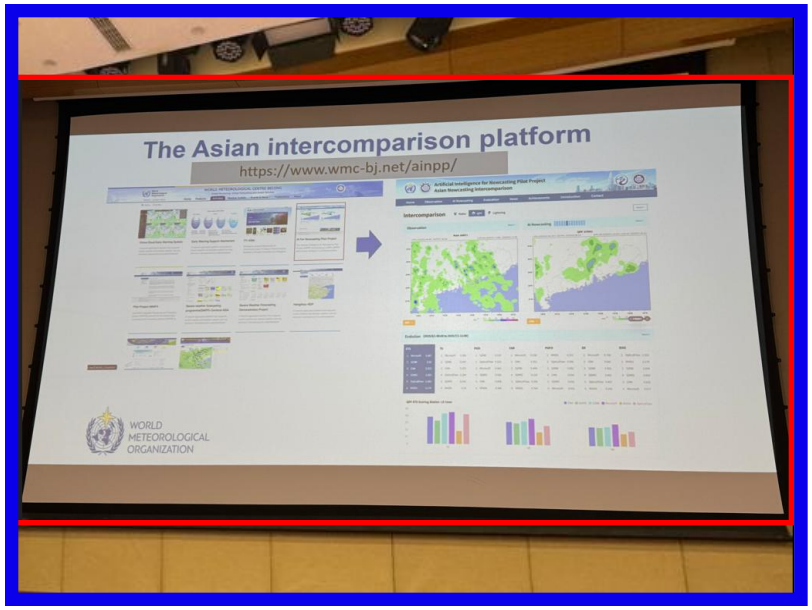


The AOMSUC-15 Training Event, Day 1, 26th October (part 2)

The second keynote presentation was presented Dr Byung-il Lee of KMA, introducing the Korean GEO-KOMPSAT-2A satellite and its meteorological products. Dr Byung-il Lee also shared information about the future GK-5 satellite.

REFERENCE

The AOMSUC-15 Training Event, 26th October

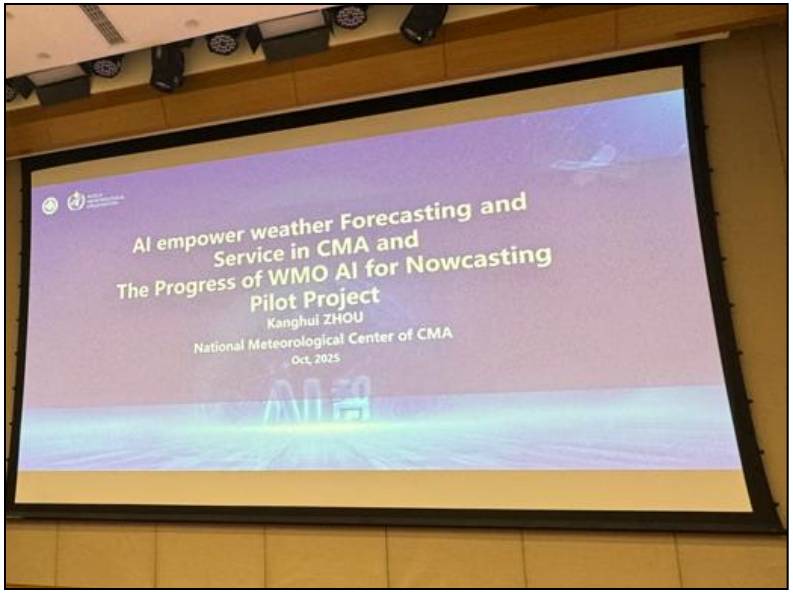


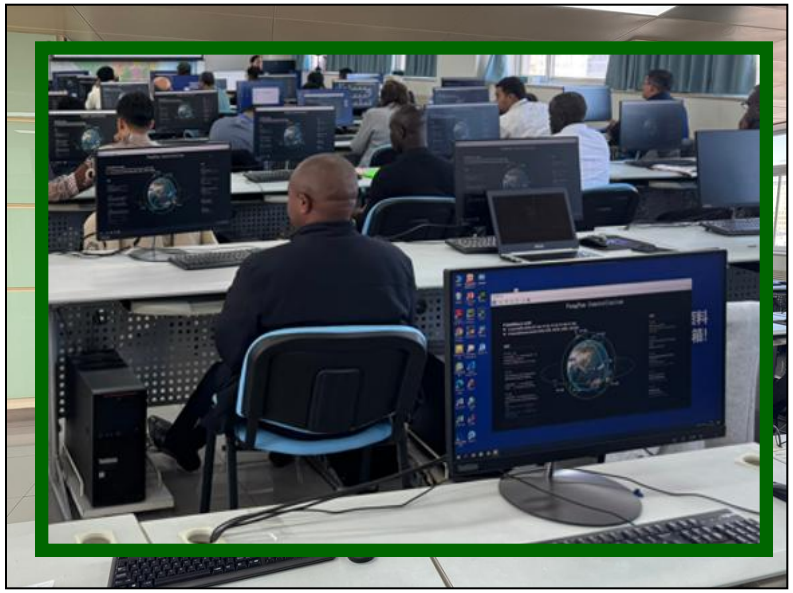
The AOMSUC-15 Training Event, Day 1, 26th October (part 3)

Dr Zhou Kanghui of CMA NMC then presented "AI based weather forecasting in CMA and the progress of WMO AI for Nowcasting Pilot Project". Dr Kanghui introduced "The Tech Engine: how AI empowers EW4All", and how this can be applied to countries with a low observation network. The AI for Nowcasting Pilot project was presented with a list of AI-based nowcasting products for developing countries within the Asia, Latin America and Africa regions.

REFERENCE

The AOMSUC-15 Training Event, 26th October





The AOMSUC-15 Training Event Day, 1, 26th October (part 4)

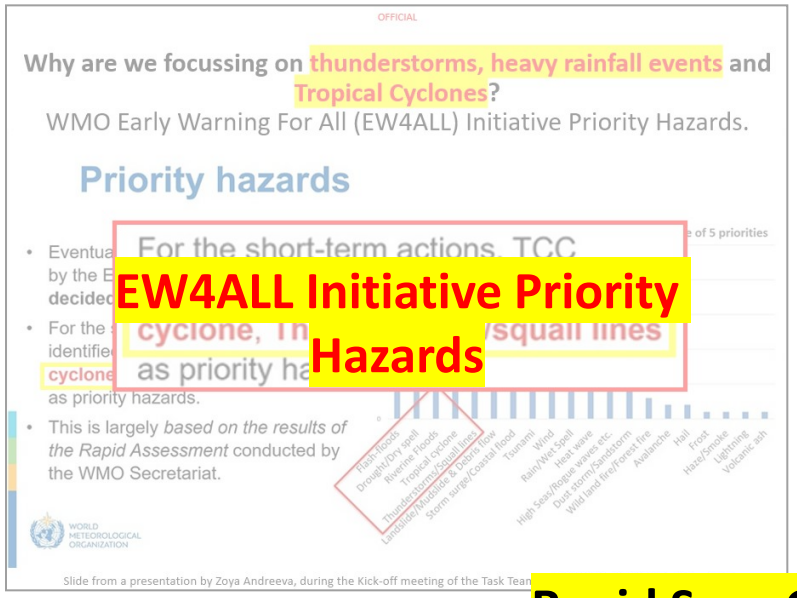
The afternoon hands-on sessions were conducted in the Computer Laboratory Room 903, well equipped with enough laptop computers for every one of the attendees.

Dr Zhang Yan of CMA NSMC presented "Application of SWAP system and Fengyun Earth". Dr Zhang Yan was successful in showing all attendees how to download the FY data, and there was also time to explore the Fengyun data viewers.

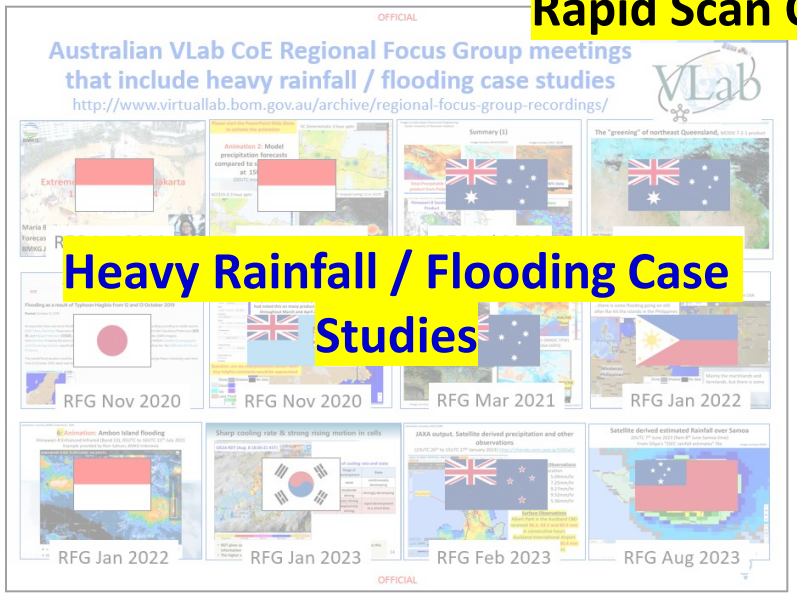
Japan Meteorological Agency (JMA) colleagues Omori-san, Harada-san, Maruyama-san, and Fukuhara-san contributed with "Practical Training on the Utilisation of Himawari-9 Imagery using SATAID". The first part of this session included an introduction to the JMA resource "Utilisation of Meteorological Satellite Data in Cloud Analysis". This was followed by an introduction to SATAID. Attendees were readily able to load SATAID onto their computer, through the shared screen capability in the CMA Lab computer set up. Many attendees took the opportunity to experiment with the SATAID functionality.

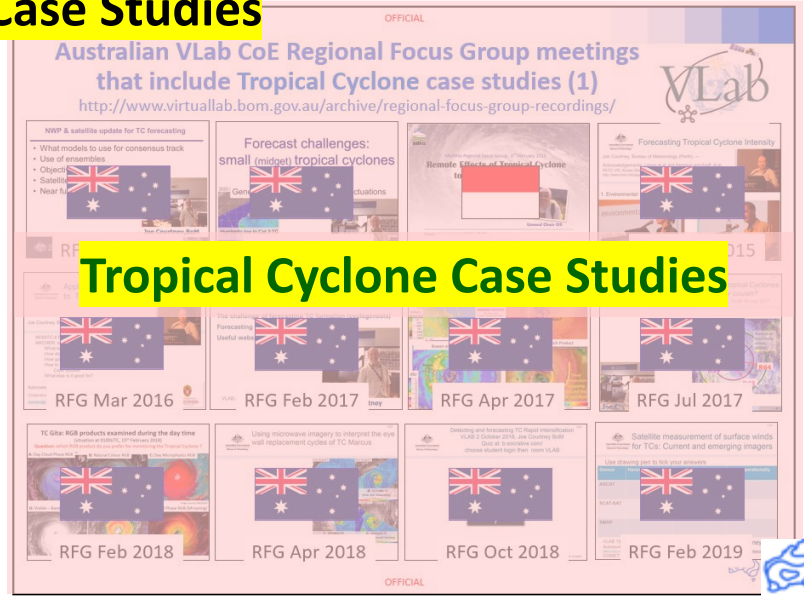
REFERENCE

My Training Event Activity, 26th October



Rapid Scan Case Studies



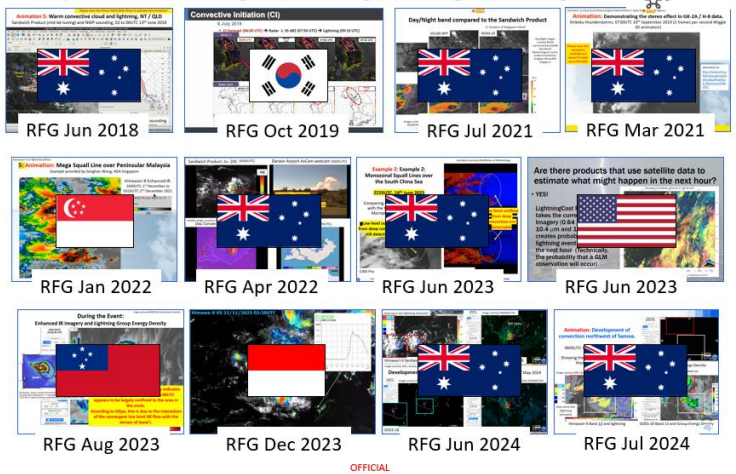


Learner engagement during my AOMSUC-15 Training Event activity

OFFICIAL

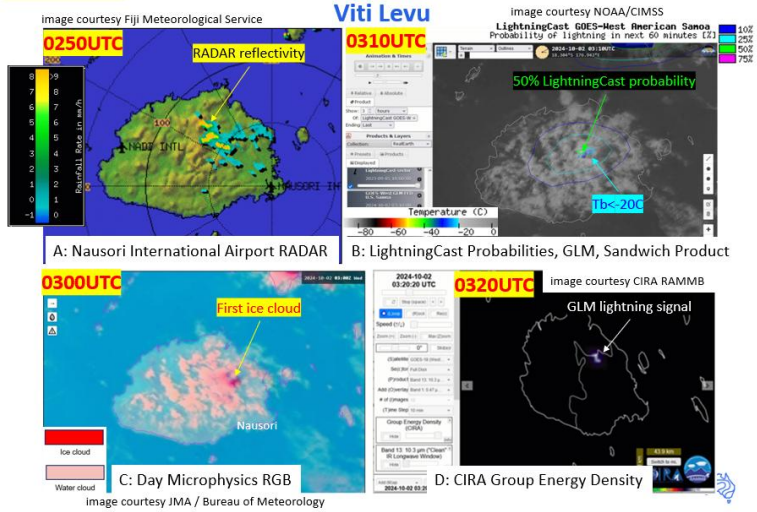
Australian VLab CoE Regional Focus Group meetings that included thunderstorm case studies

http://www.virtuallab.bom.gov.au/archive/regional-focus-group-recordings/



OFFICIAL

Summary: Thunderstorm development and lightning detection over Viti Levu



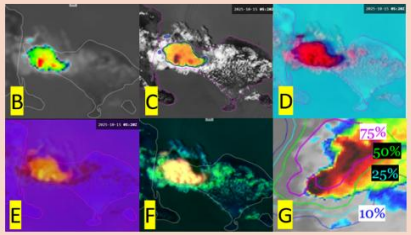
OFFICIAL

Socrative Question 1

What satellite data or data products do you use to monitor and anticipate thunderstorm formation and development?

Select all that apply.

A. Visible imagery
B. Enhanced infrared imagery
C. Sandwich Product
D. Day Microphysics RGB
E. Day Convection RGB
F. Cloud Phase RGB
G. LightningCast
H. Other
I. Not relevant to my job

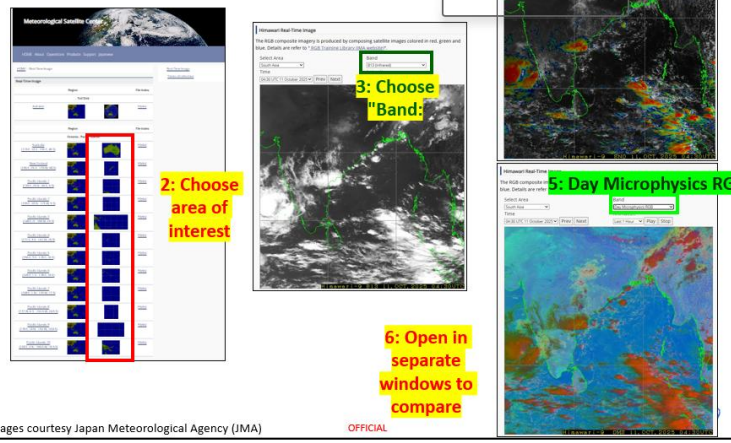


OFFICIAL

Exercise 3

1: Open the JMA AHI Real-Time image website

https://www.data.jma.go.jp/mscweb/data/himawari/



OFFICIAL

Learner engagement during my AOMSUC-15 Training Event activity

Australian VLab CoE Regional Focus Group meetings that included thunderstorm case studies

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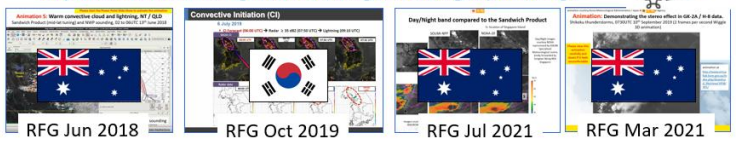
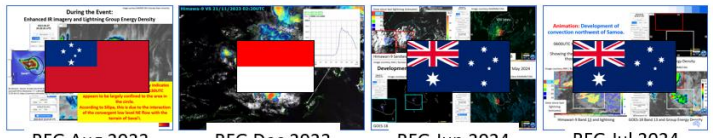


Australian VLab CoE Case Studies that relate to this Hazard



Summary: Thunderstorm development and lightning detection over Viti Levu

image courtesy Fiji Meteorological Service

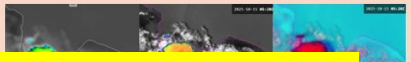
Demonstration of data used in a single case study

image courtesy JMA / Bureau of Meteorology

Socrative Question 1

What satellite data or data products do you use to monitor and anticipate thunderstorm formation and development?

Select all that apply.



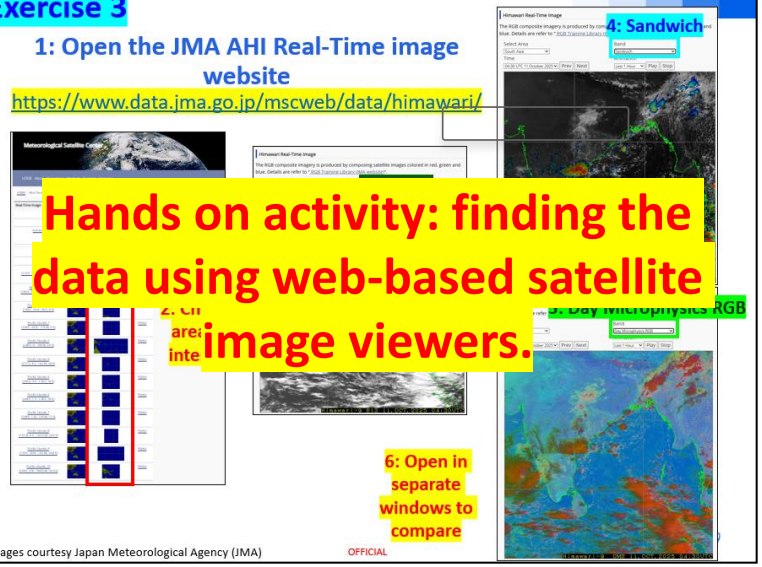
Socrative question regarding satellite data use in monitoring this Hazard

D. Day Microphysics
E. Day Convection RGB
F. Cloud Phase RGB
G. LightningCast
H. Other
I. Not relevant to my job

Exercise 3

1: Open the JMA AHI Real-Time image website

https://www.data.jma.go.jp/mscweb/data/himawari/



Hands on activity: finding the data using web-based satellite image viewers.

images courtesy Japan Meteorological Agency (JMA)

The AOMSUC-15 Training Event, Day 1, 26th October (part 5)

The last session of the first day rounded off the hands-on activities with case studies taken from the Australian VLab Centre of Excellence Regional Focus Group archive and as presented by me.

Short Thunderstorm, Heavy Rainfall and Flooding, and Rapid Scan image cases studies were presented, compatible with critical meteorological hazards from the WMO EW4ALL Initiative Priority Hazards Gap Analysis.

Interaction with attendees included Socrative cloud-based learner response system survey questions regarding satellite data use by the attendees.

There were also easy to follow exercises that permitted familiarisation and exploration of CMA, JMA, USA and European web-based satellite data viewers.

REFERENCE

Training Event Day 2 and Bullet Train to Qingdao, 27th October

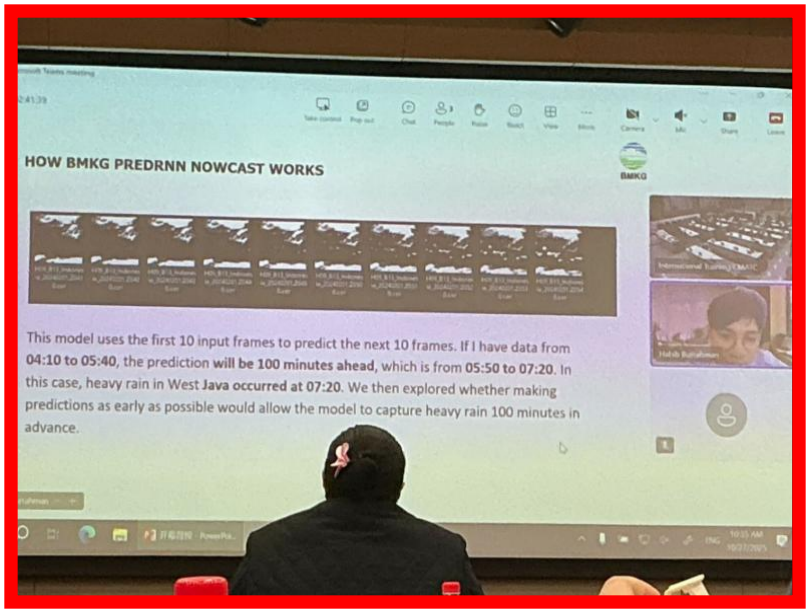
The AOMSUC-15 Training Event, Day 2, 27th October (1)

Day 2 of the Training Event was conducted in the Multi-Function Classroom on the China Meteorological Administration (CMA) International Cooperation and Training Centre (CMATC ICTC).

Mr Xutao Li of CMA presented "AI Based Methods and Applications with Fengyun Satellite Data". The theme of this presentation summarised the use of AI with Fengyun-4 geostationary satellite data for short term (0-6 hours) and high spatial resolution (street level) to support emergency response, agriculture, smart cities/transport, and aeronautics. Topics included severe convection nowcasting, cloud detection and radiometric calibration.

REFERENCE

Training Event Day 2 and Bullet Train to Qingdao, 27th October



The AOMSUC-15 Training Event, Day 2, 27th October (2)

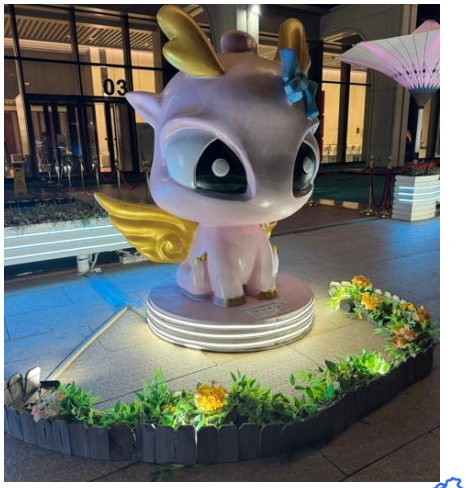
Habib Burrahman of BMKG Indonesia presented "Autoregressive Nowcasting using VIL". This included the BMKG PREDRNN deep learning-based nowcasting model. This uses the first 10 input frames to predict the next 10 frames, i.e., 100 minutes into the future for storm development.

A group of AOMSUC-15 Training Event attendees then took the High-Speed G207 train from Beijing to Qingdao. Some of the scenery along the way is shown on the slide. I noted quite a few wind turbines along the way. The digital display inside our carriage indicated that the train attained a top speed of 307km/hr.

REFERENCE

Qingdao International Conference Centre.

With Dragon mascots
Zhao Zhao and Mumu



Group Photo, Conference Centre, Qingdao.

A big international turnout…

The AOMSUC-15 Conference sessions

http://www.nsmc.org.cn/conference/fysuc/2025/en/aomsuc15_2025fysuc.html

FENGYUN Satellite User Conference (FYSUC)

Home | Agenda | Gallery | About NSMC

AOMSUC-15 and 2025 FYSUC

(28-30 October 2025, Qingdao, Shandong Province)

DAY 1 | Sessions Overview | Session 1 | Session 2 | Session 3 | Session 4 | Session 5 | Session 6 | Session 7 | Session 8

October 28, 2025 **Qingdao International Conference Center Shanghe Hall (2nd floor)**

Time(UTC+8)	Content	Speaker	Moderator
9:00-10:30	Opening Ceremony		
10:10-10:30	Group Photo, Tea Break		
Plenary Session			
10:30-12:30	Agency Report: CMA	TANG Shihao	Allen Huang
	Agency Report: EUMETSAT	Bojan Bojkov	
	Agency Report: IMD	Rm Kumar Giri	
	Agency Report: KMA	Changbeom CHO	
	Agency Report: JMA	Hiroshi ONO	
	Agency Report: NOAA/NESDIS	David Michael Ford	
	Agency Report: ROSHYDROMET	Konstantin LITOVCHENKO	
	Agency Report: WMO	Natalia Andreevna Donoho	
12:30-14:00	Lunch		

Hosted by

Organized by

The AOMSUC-15 Conference sessions

http://www.nsmc.org.cn/conference/fysuc/2025/en/aomsuc15_2025fysuc.html

Conference Presentations 28th October	
Opening Ceremony, Agency Reports, Various Presentations	
Conference Presentations 29th October	
Session 1: Weather and Climate Applications	Session 2: Ecological Environment and Agricultural Presentations
Session 3: Weather, Climate and Space Weather Applications	Session 4: Quantitative Applications of Satellite Remote Sensing
Conference Presentations 30th October	
Session 5: Fengyun Satellite Industrial Applications	Session 6: Artificial Intelligence and New Technology Applications
Section 7: Data Sharing and Application Tools	Session 8: Disaster presentation and Mitigation and Emergency

The AOMSUC-15 Conference, 28-30th October 2025 (1)

The Conference was held at the very modern and functional Qingdao International Conference Centre.

As can be seen from the group photo, there were many attendees to the Conference. From the Australasia-Pacific region but also from the America's, from Europe, from western Asia and the Middle East and from Africa.

The first day of the Conference was held in one location, Shanghe Hall.

During the second and third days of the Conference there were parallel sessions.

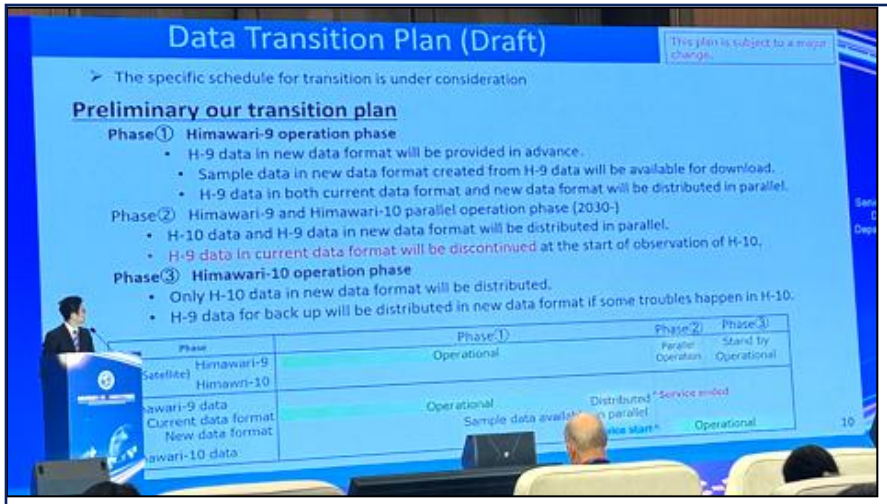
I attended the sessions highlighted in pink. On the 30th I moved between parallel sessions to listen to all those presentations of particular interest.

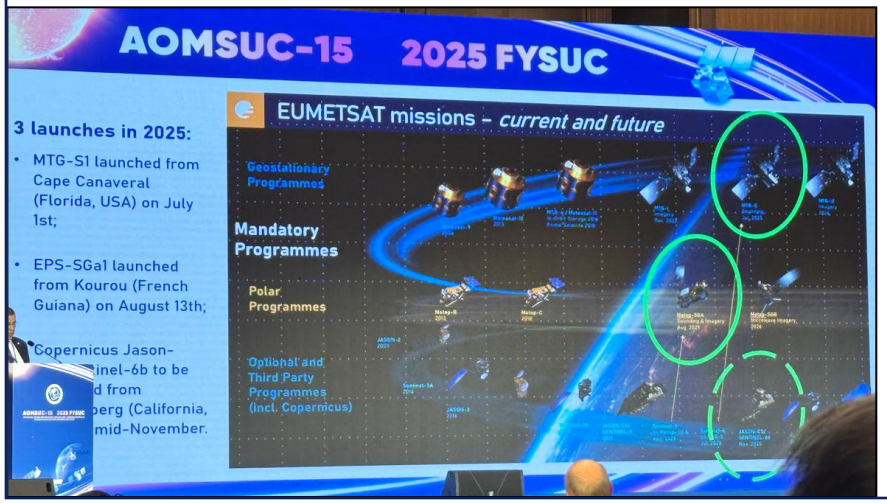
The following slides show a summary of some of the presentations, grouped into:

- New and future satellites
- AI in Satellite Meteorology
- WMO, EW4All, SDRG and VLab related presentations
- Other Conference presentations of interest

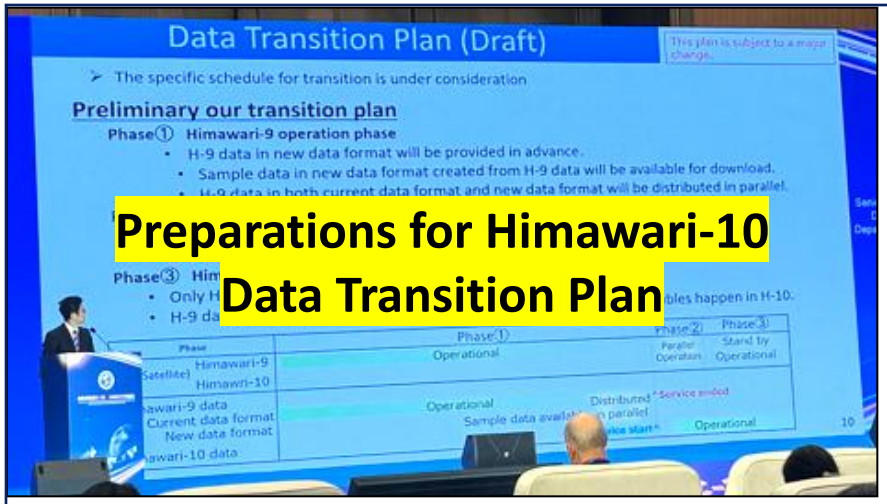
REFERENCE

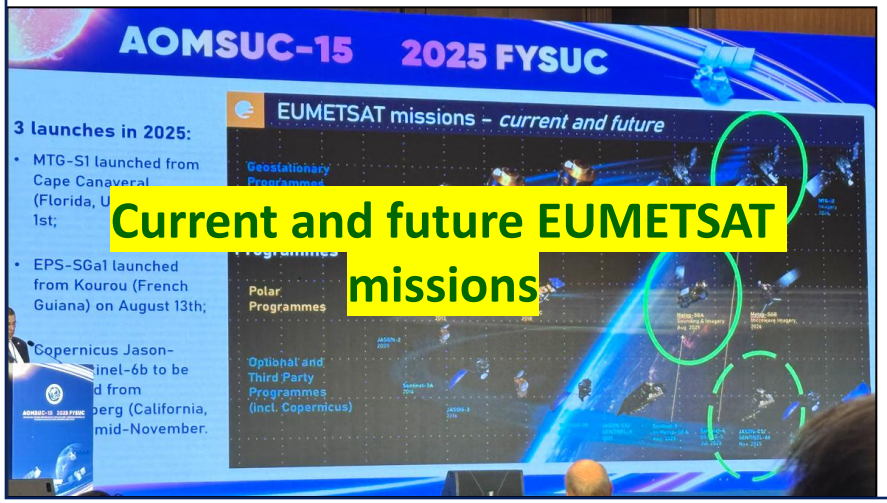
AOMSUC-15 Conference Presentations: new and future satellites





AOMSUC-15 Conference Presentations: new and future satellites





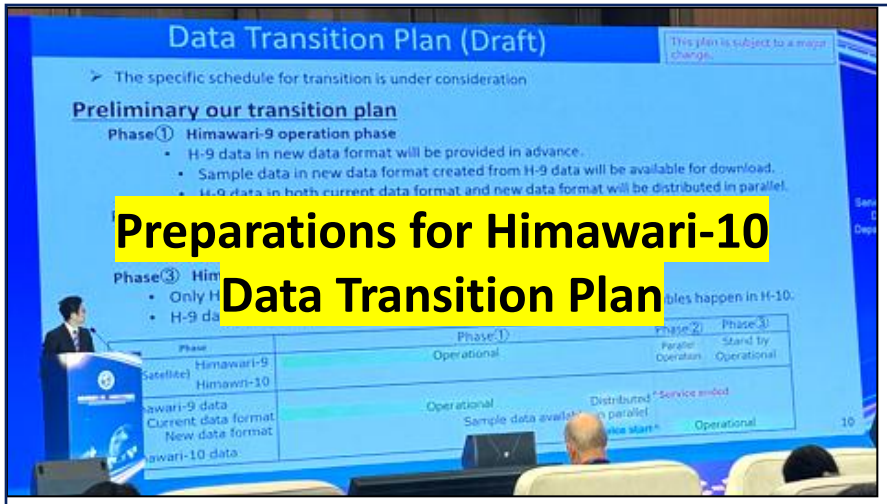
Conference presentations on new and future satellites (1)

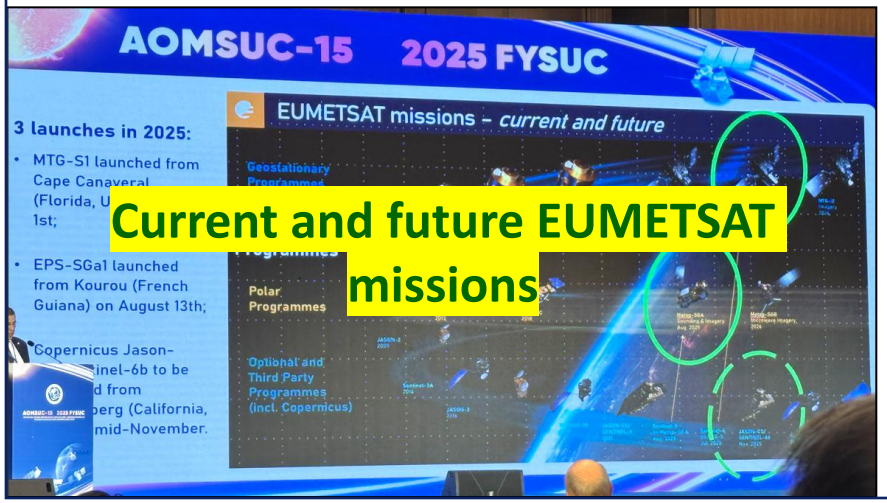
Here is a brief summary of some presentations advertising new and future meteorological satellites.

- JMA gave the latest update on Himawari-10, the successor satellite to Himawari-9, expected to be deployed by 2030. This included the data transition plan in preparation for Himawari-10. Himawari-10 will be the primary satellite, with Himawari-9 as backup. The satellite data for both satellites will be in a new format.
- The EUMETSAT colleague summarised current and future EUMETSAT missions and also showed the first image of Metop-SGA1. The Metop-SGA1 satellite hosts a total of six atmospheric sounding and imaging instrument missions. Metop-SGA1 also carries the European Union's Copernicus Sentinel-5 mission. For more information, see https://www.eumetsat.int/successful-launch-metop-sga1-take-weather-forecasting-new-heights
- A CMA colleague presented a summary of existing and new Chinese Fengyun satellite missions

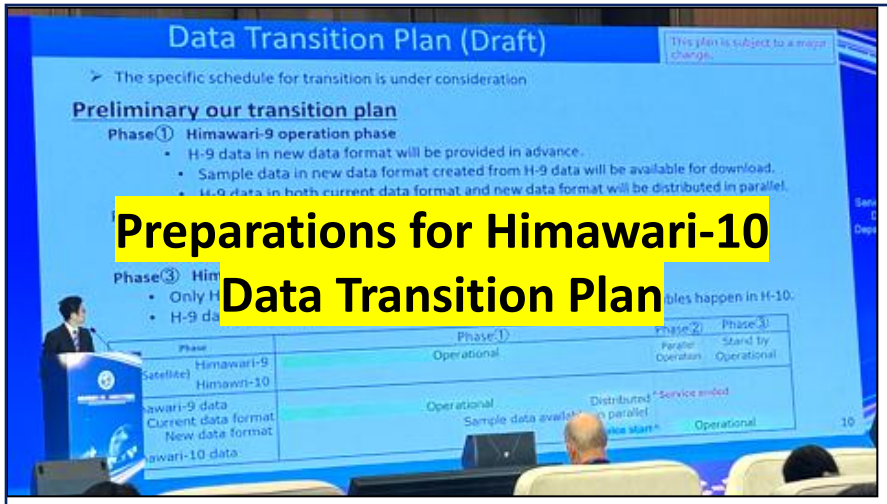
REFERENCE

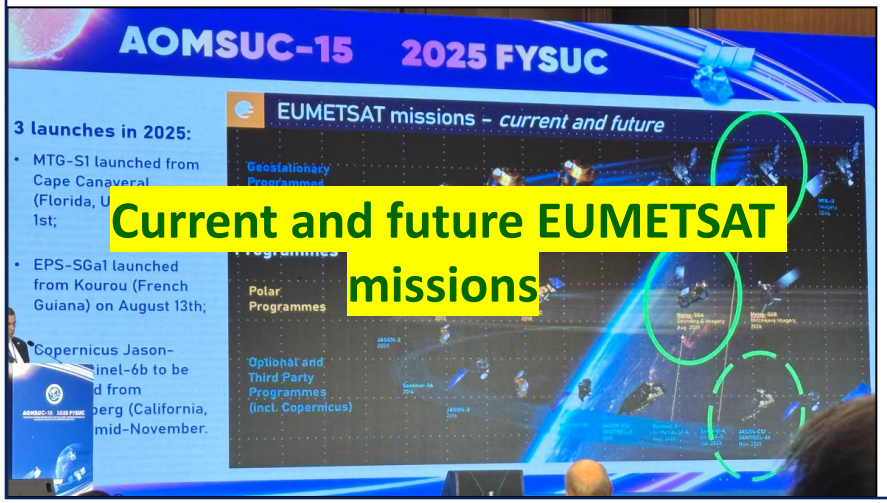
AOMSUC-15 Conference Presentations: new and future satellites



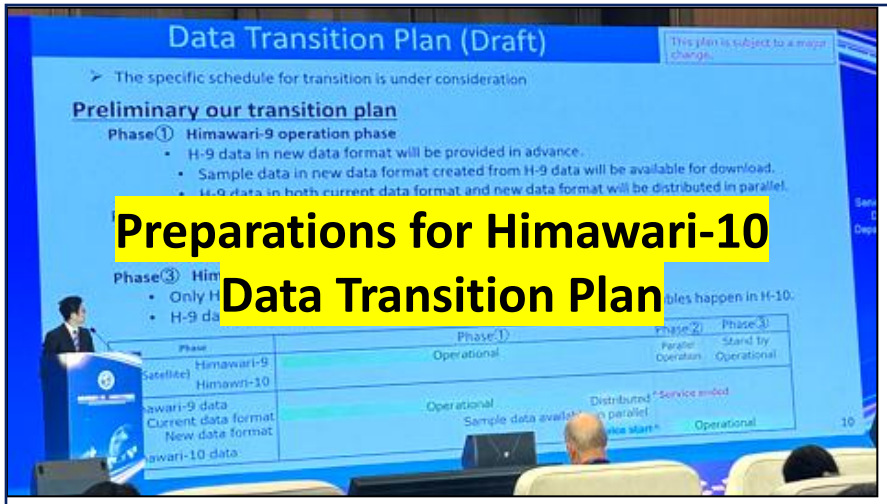


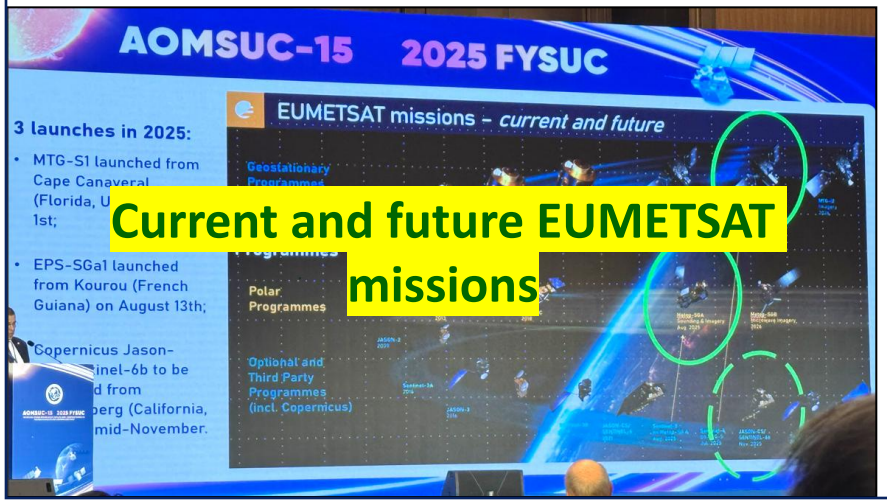
AOMSUC-15 Conference Presentations: new and future satellites





AOMSUC-15 Conference Presentations: new and future satellites



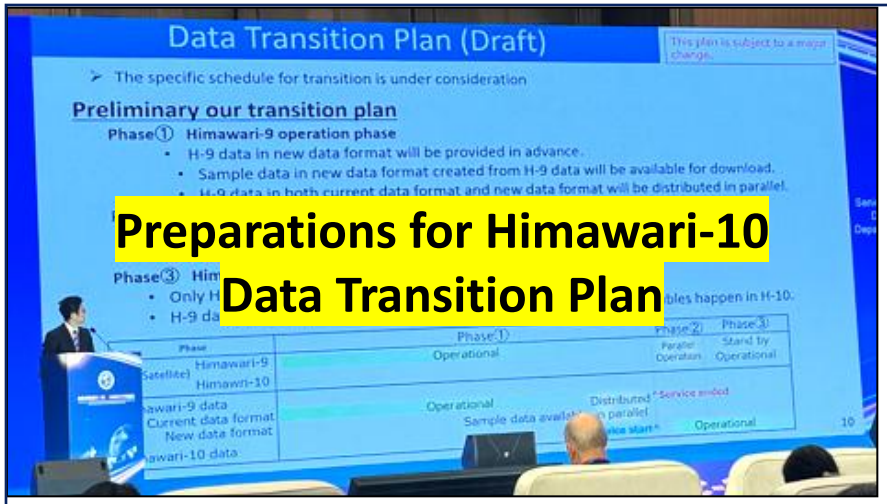


Conference presentations on new and future satellites (2)

- A CMA colleague presented a summary of existing and new Chinese Fengyun satellite missions. In particular:
  - The Fengyun-3H polar orbiting satellite launched on the 27th September 2025 has a greenhouse gas absorption spectrophotometer onboard.
  - The geostationary Fengyun-4C will have a full disk lightning sensor onboard, planned to be launched later this year.
  - The geostationary Fengyun-4M will have a microwave sensor onboard, planned to be launched in 2026.

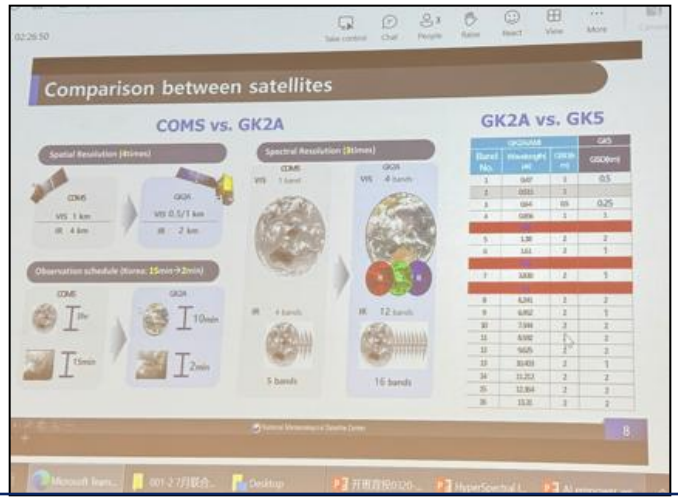
REFERENCE

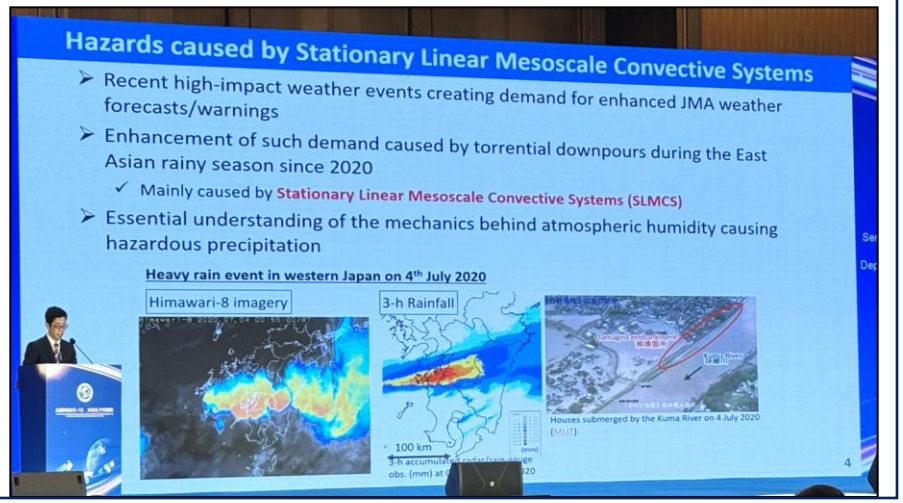
AOMSUC-15 Conference Presentations: new and future satellites



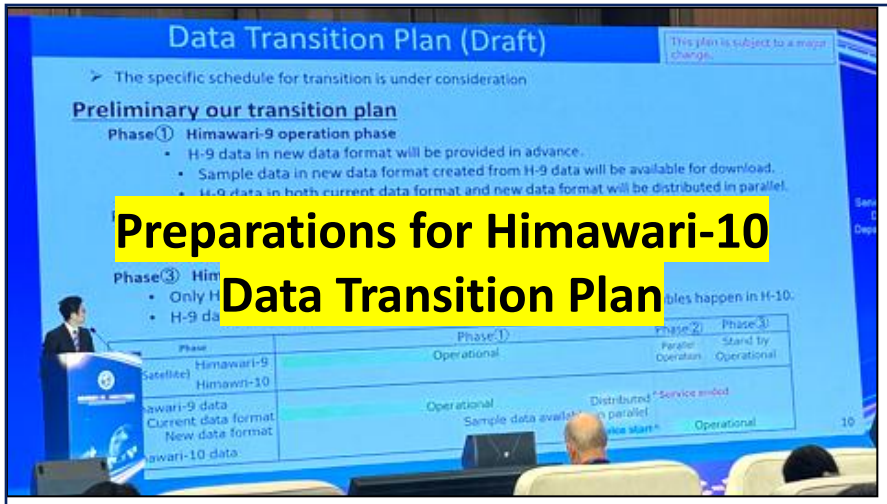
Preparations for Himawari-10 Data Transition Plan

FengYun-4M, to be launched in 2026. With microwave sensor onboard





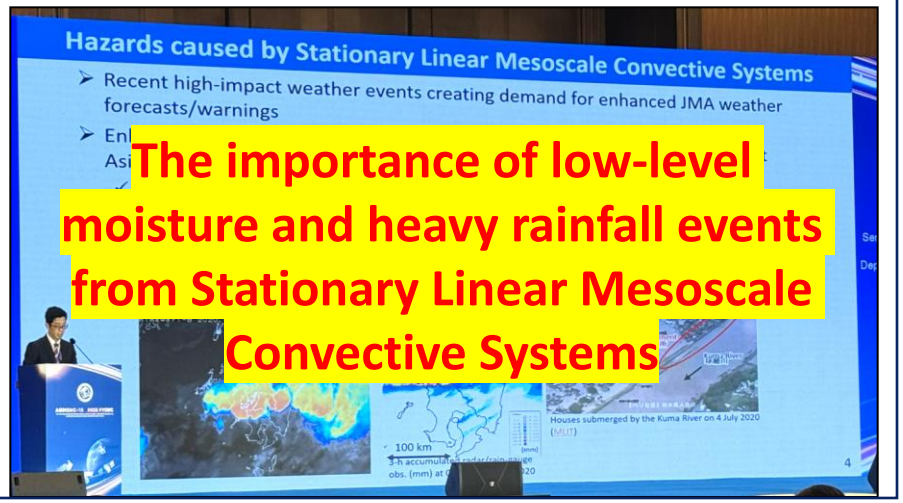
AOMSUC-15 Conference Presentations: new and future satellites



Preparations for Himawari-10 Data Transition Plan

FengYun-4M, to be launched in 2026. With microwave sensor onboard

Like Himawari-10, GK5 will also carry the 5.1-micron band



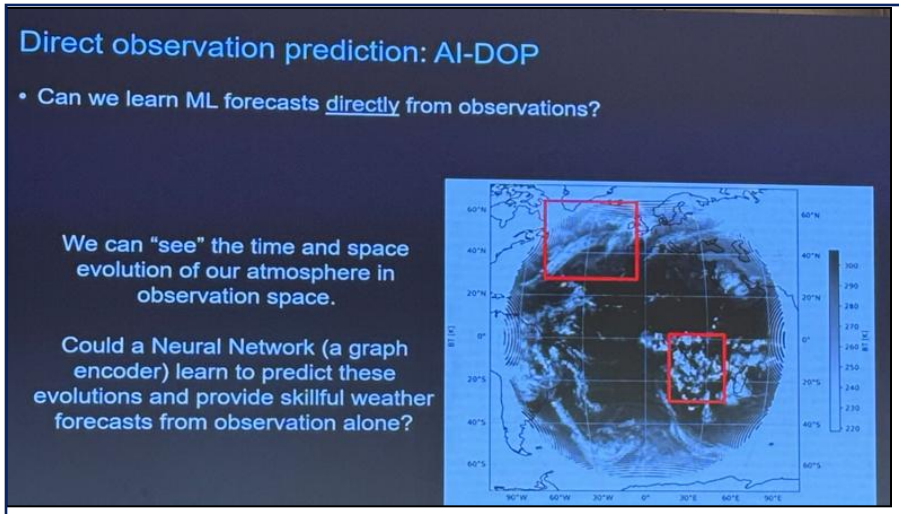
The importance of low-level moisture and heavy rainfall events from Stationary Linear Mesoscale Convective Systems

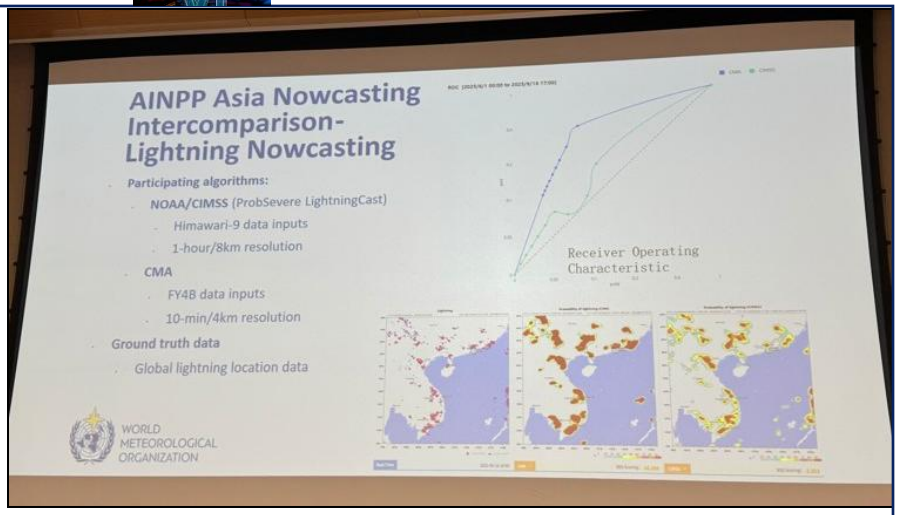
Conference presentations on new and future satellites (3)

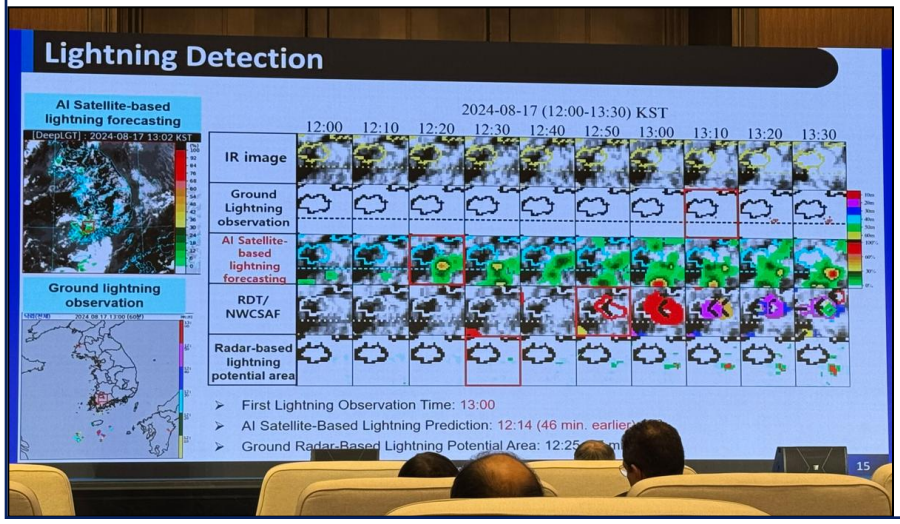
- During the Training Event our KMA colleague introduced the future GEO-KOMPSAT 5, to be launched in 2031. Both Himawari-10 and GK-5 will have the 5.1-micron band, highlighting the importance of monitoring low level moisture boundaries during this time of climate change.
- Our JMA colleague mentioned that Stationary Linear Mesoscale Convective Systems were becoming more frequent over the east Asian region. Hence, the importance of detecting and monitoring low level moisture and moisture boundaries in anticipating the development of these high impact events.

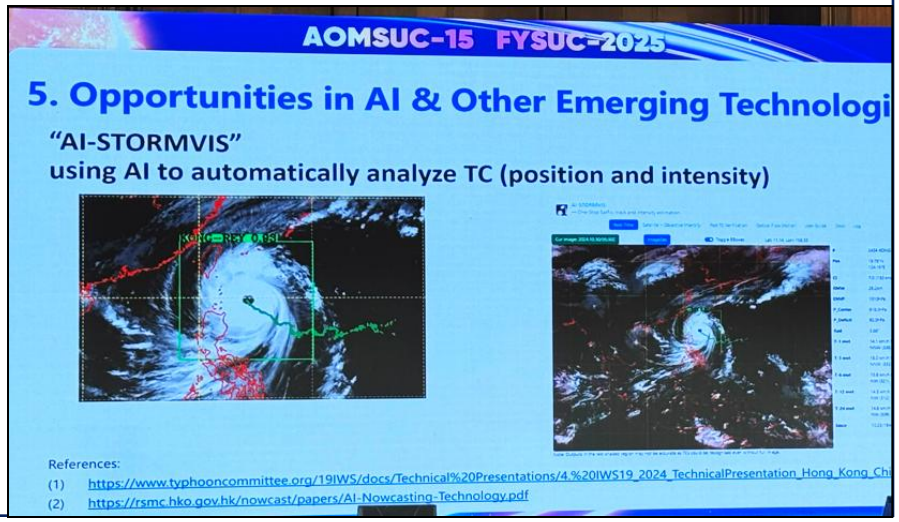
REFERENCE

AOMSUC-15 Conference Presentations: AI in Satellite Meteorology

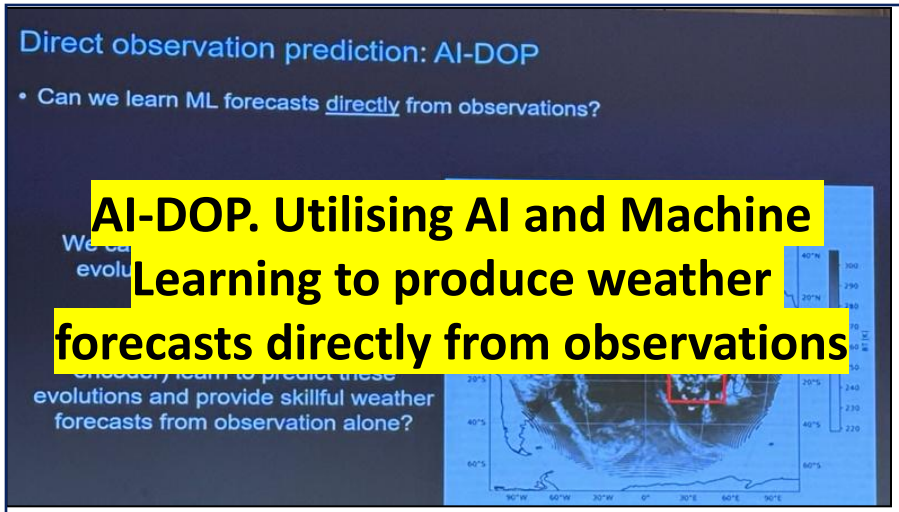




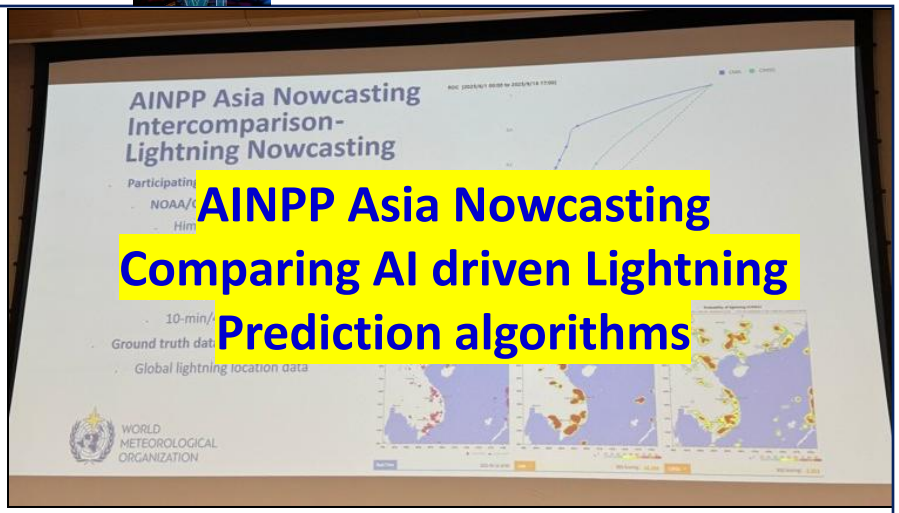




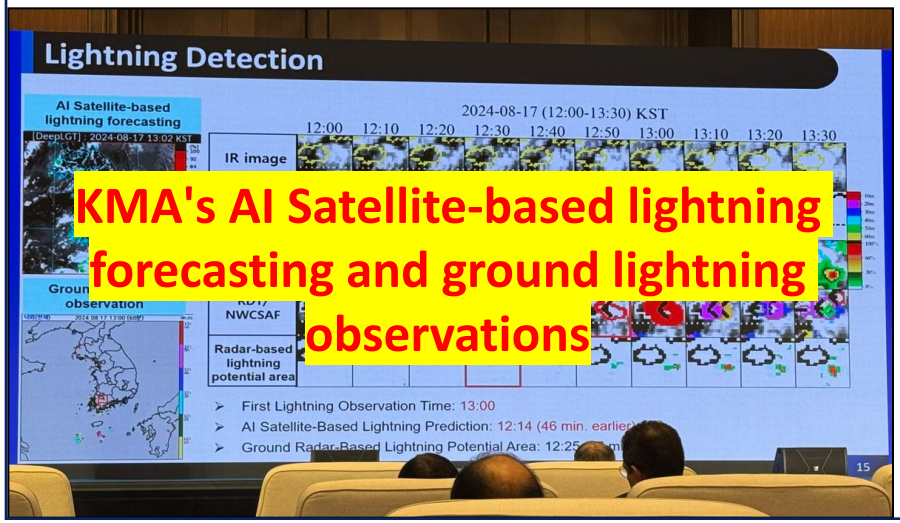
AOMSUC-15 Conference Presentations: AI in Satellite Meteorology



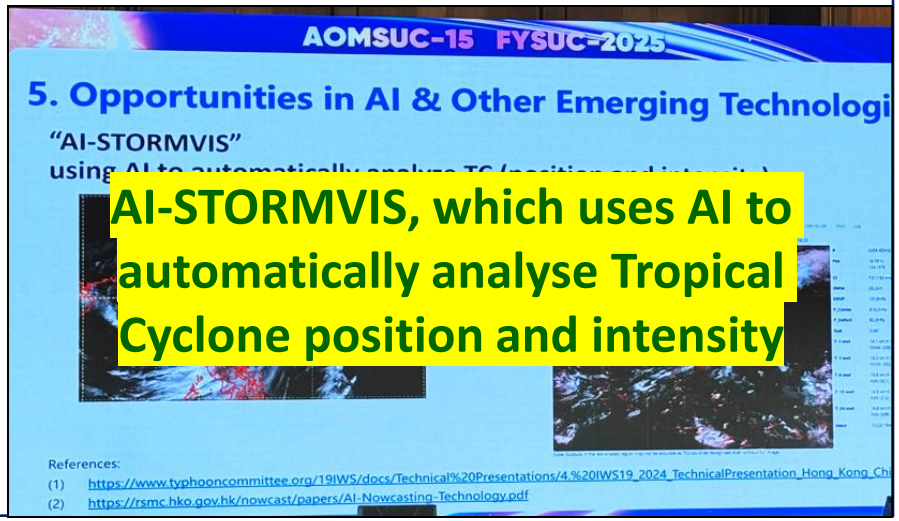
AI-DOP. Utilising AI and Machine Learning to produce weather forecasts directly from observations



AINPP Asia Nowcasting Comparing AI driven Lightning Prediction algorithms



KMA's AI Satellite-based lightning forecasting and ground lightning observations



AI-STORMVIS, which uses AI to automatically analyse Tropical Cyclone position and intensity

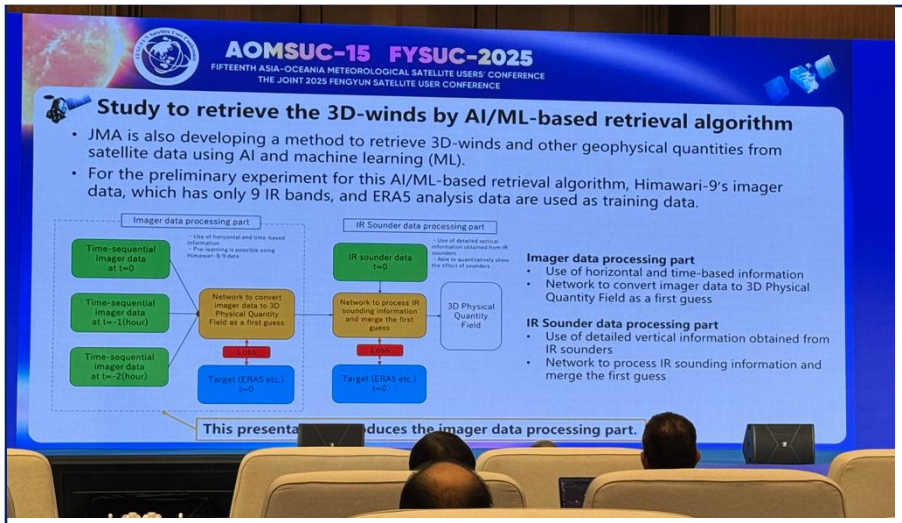
Conference presentations on AI in Satellite Meteorology (1)

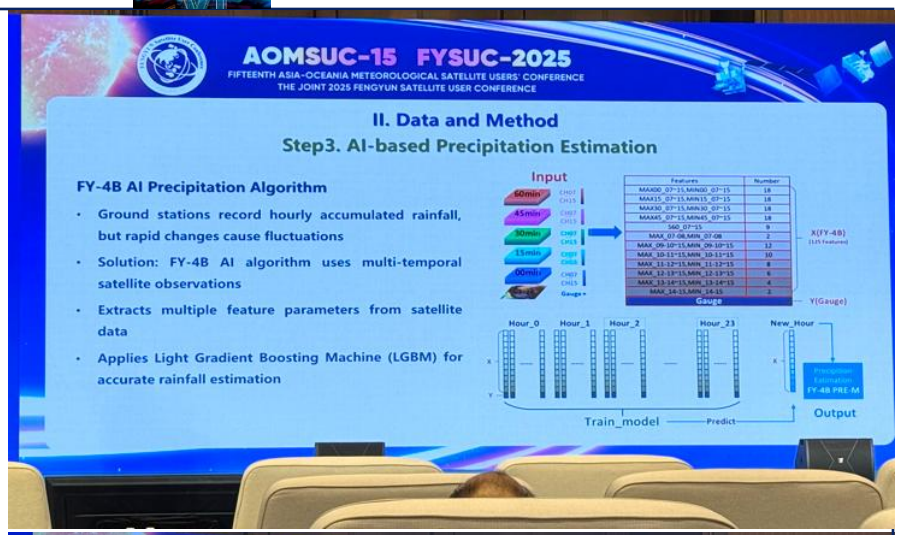
Here is a brief summary of some presentations advertising the application of Artificial Intelligence (AI) in satellite meteorology.

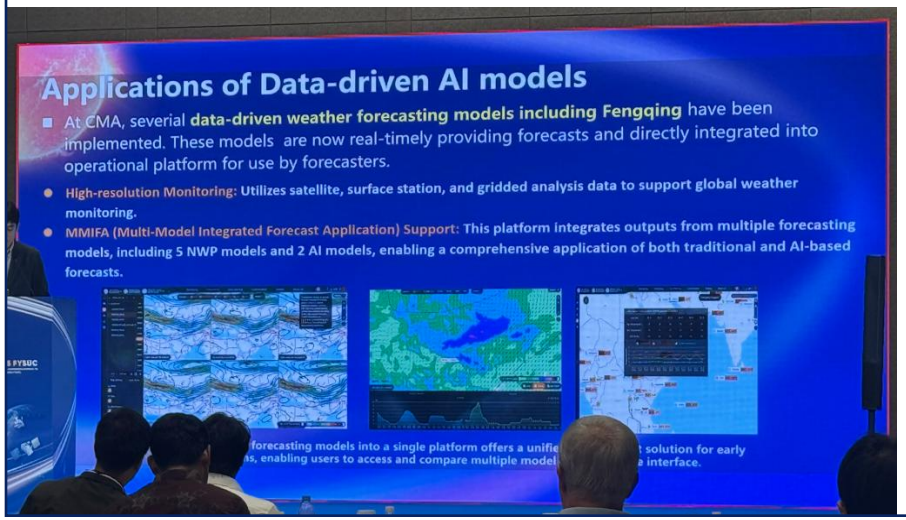
- ECMWF's Artificial Intelligence-Direct Observation Prediction (AI-DOP), as a multi strand approach to Machine Learning/AI and NWP. Weather forecasts are produced directly from observations. End-to-End Data Driven Machine Learning. 12 hour data, 12 hour forecasts.
- The WMO AI for nowcasting Pilot project (AINPP), specifically the Asian Intercomparison Platform. An example of interest included the nowcasting comparison between CMA's Lightning Detection Algorithm and ProbSevere LightningCast.
- Comparison between KMA's AI Satellite-based lightning forecasting and ground lightning observations as presented by our Korean colleague.
- Our Hong Kong colleague introduced AI-STORMVIS, which uses AI to automatically analyse Tropical Cyclone position and intensity.

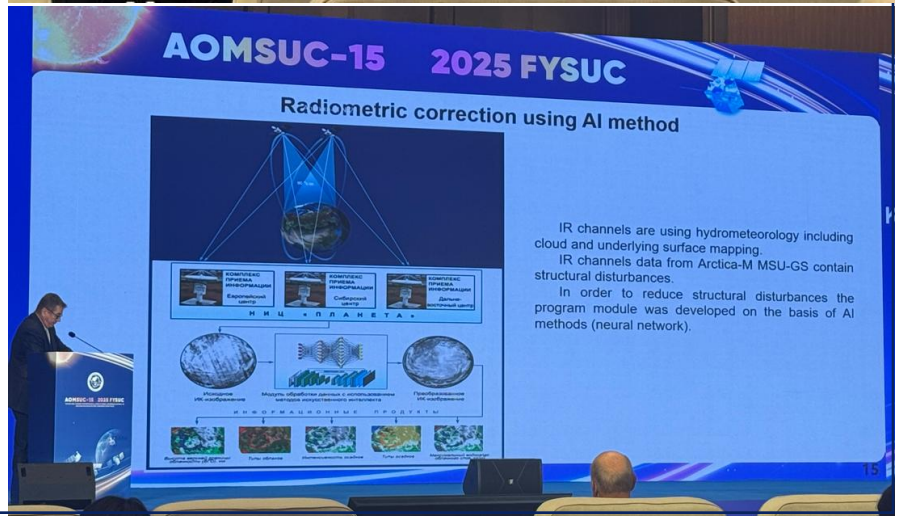
REFERENCE

AOMSUC-15 Conference Presentations: AI in Satellite Meteorology

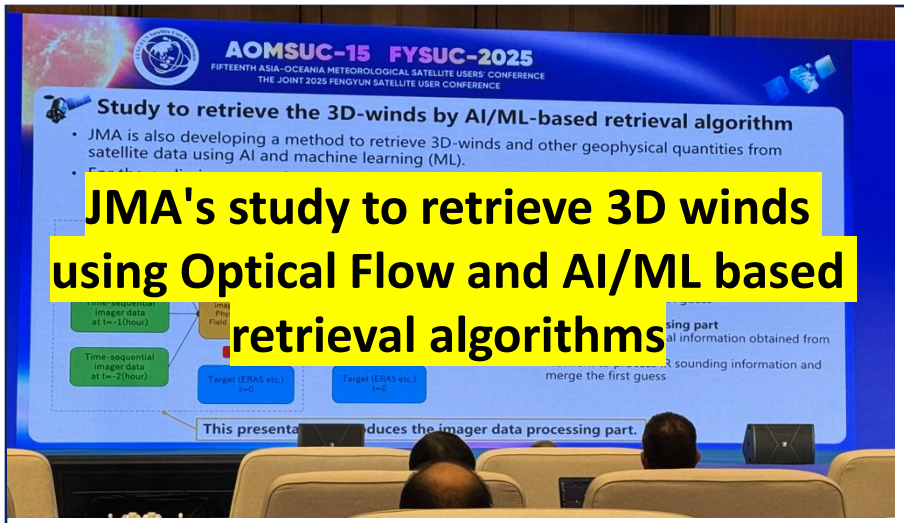


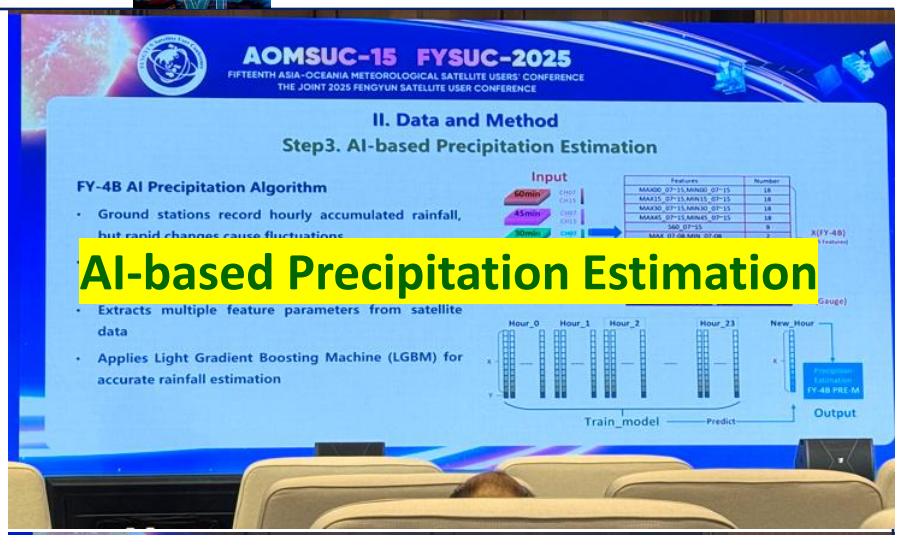


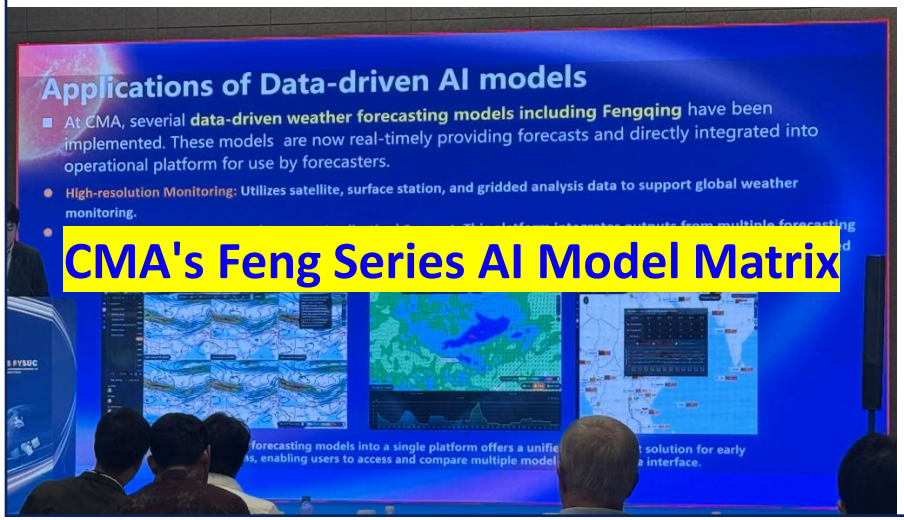


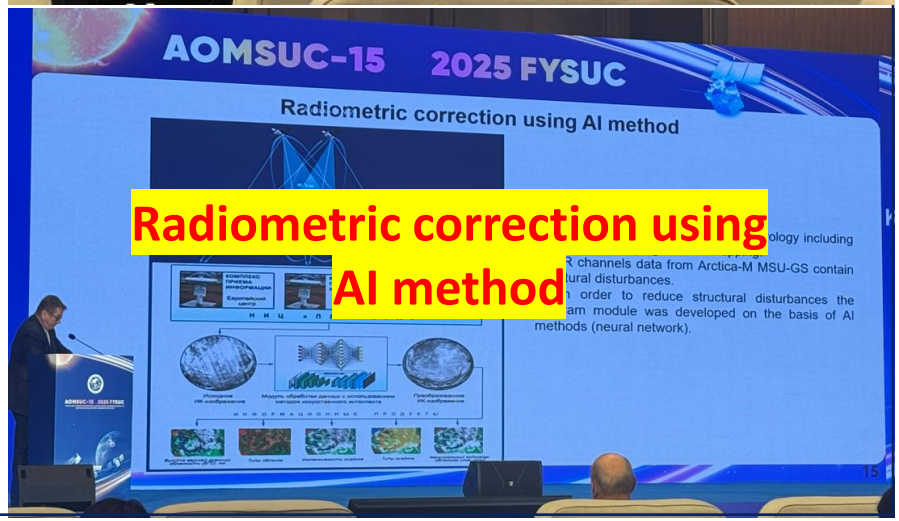


AOMSUC-15 Conference Presentations: AI in Satellite Meteorology







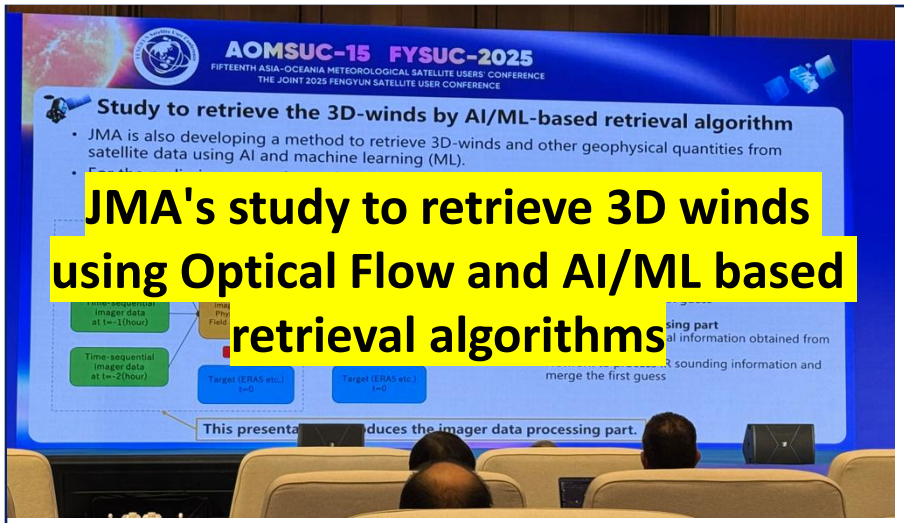


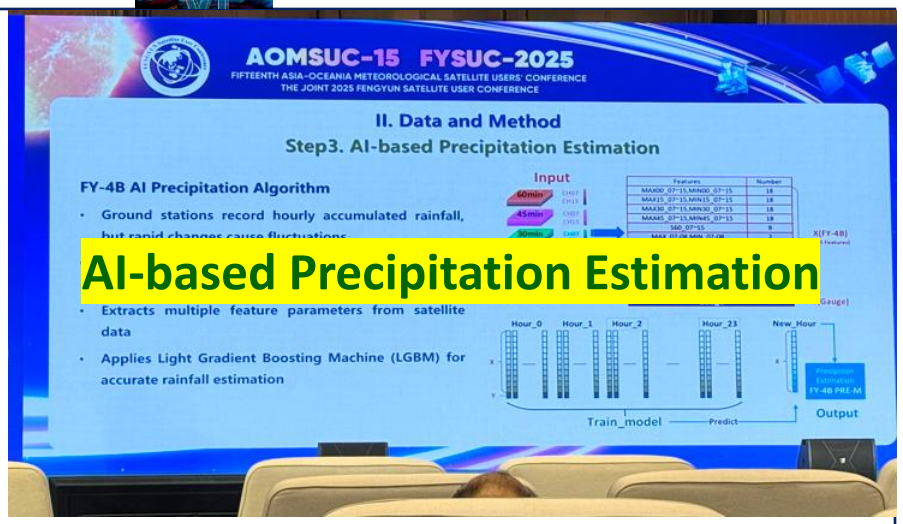
Conference presentations on AI in Satellite Meteorology (2)

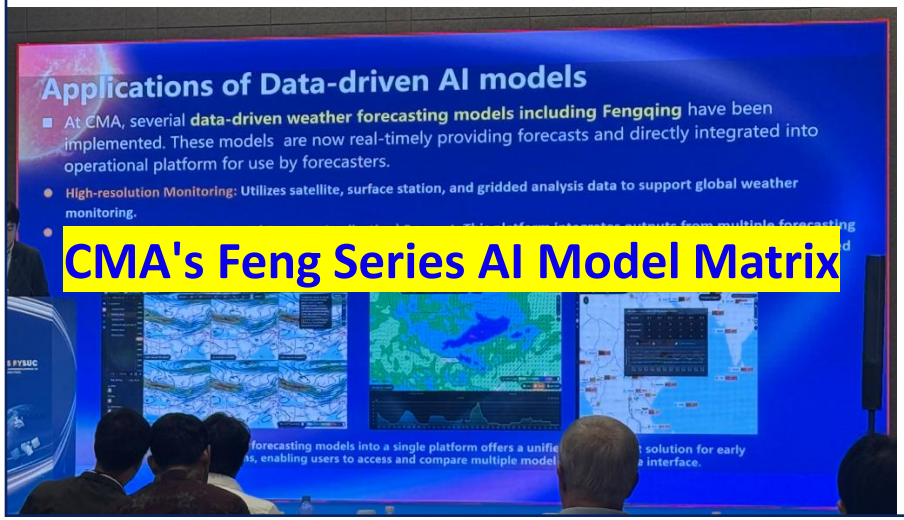
- JMA's study to retrieve 3D winds using Optical Flow and AI/ML based retrieval algorithms. AI/ML wind speed estimations appear to be much better than those generated by the Optical Flow method.
- AI-based Precipitation Estimate as presented by our Thai colleague. Thai colleagues are also looking at AI – multisensor fusion (satellite, RADAR and surface observations).
- CMA's Feng Series AI Model Matrix, including:
  - Fengqing; a Global AI Weather Model with forecasts out to 15 days. Fengqing is Open Code – GITHUB. Open sourced. Can download this. Requires 20Gb of memory.
  - Fenglei; A physical AI model for nowcasting precipitation, including extreme precipitation.
- Our Russian colleague presented information about Radiometric correction using AI methods. Addressing unstable temperature of radiant cooler (of AGRI / FY-4A)

REFERENCE

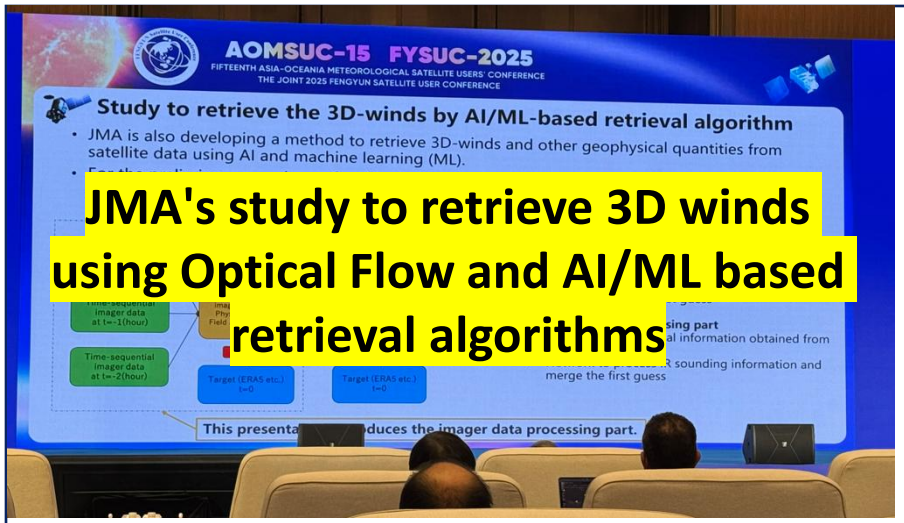
AOMSUC-15 Conference Presentations: AI in Satellite Meteorology

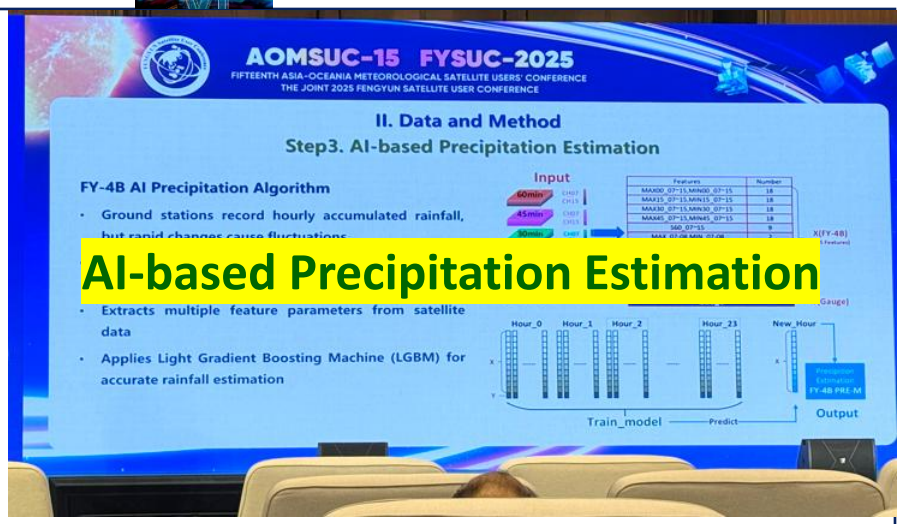


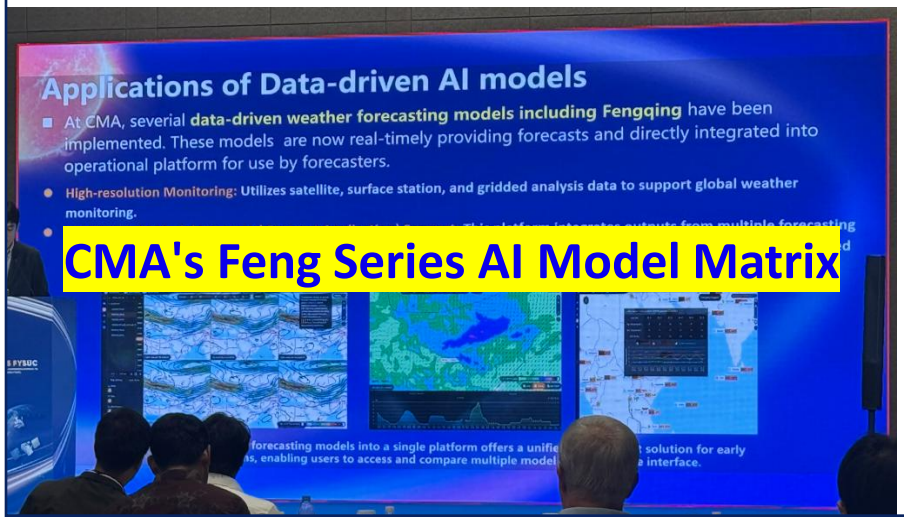




AOMSUC-15 Conference Presentations: AI in Satellite Meteorology





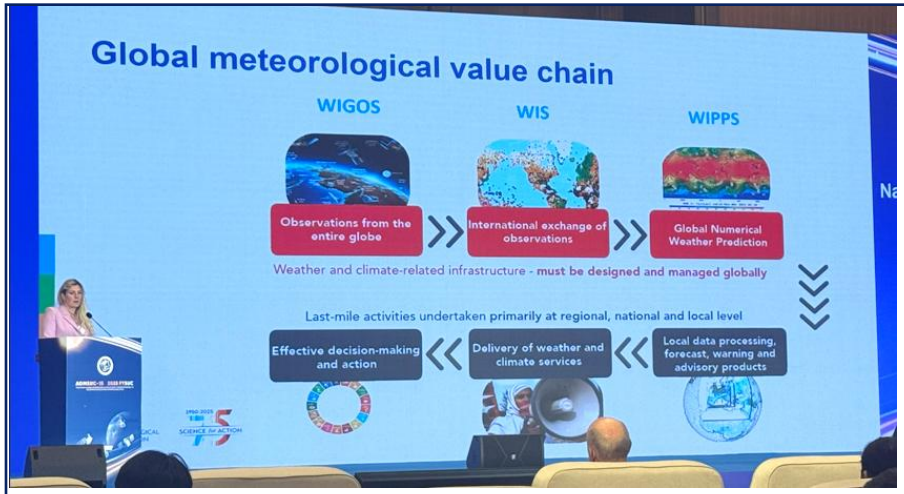


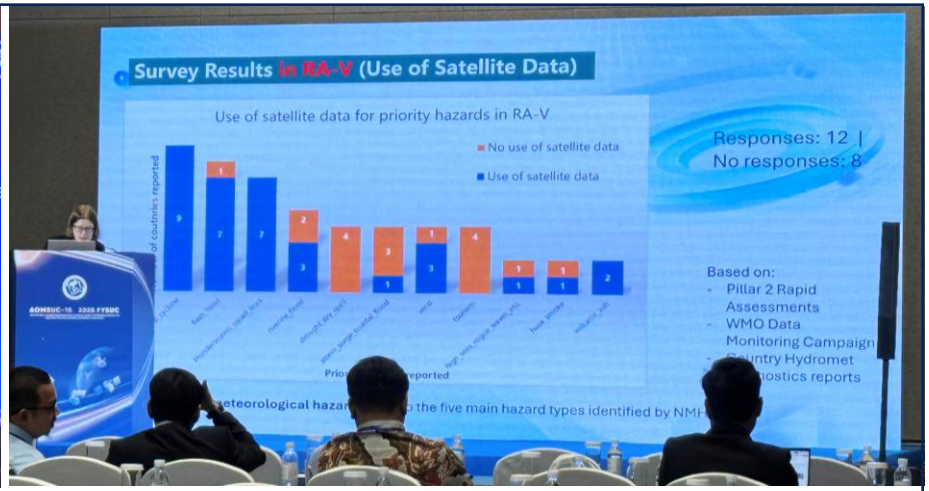
Conference presentations on AI in Satellite Meteorology (3)

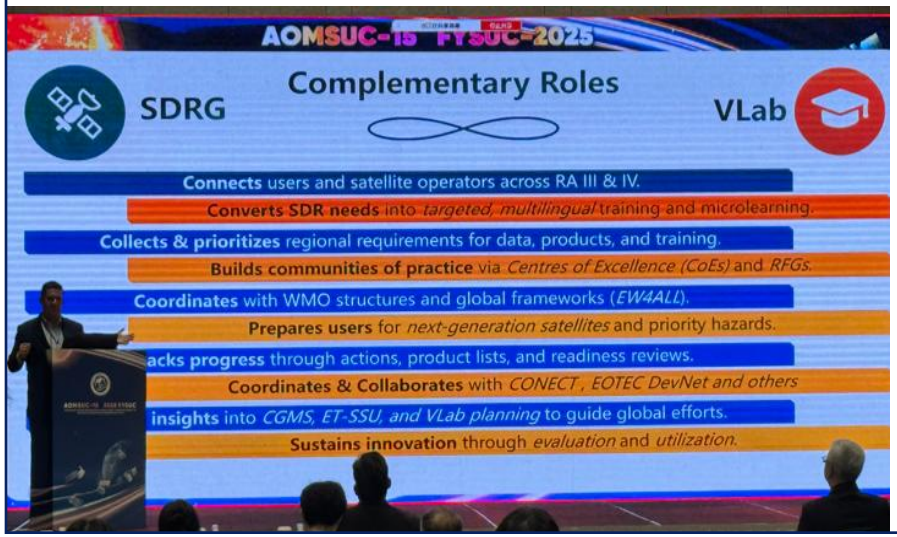
- Finally, a presentation about AI empowering Nigerian women in agriculture. This involves AI-GEAR to overcome the disconnect between Fengyun data and grassroots needs in Nigeria. The associated toolkit is activated by AI-GEAR, providing field-ready satellite intelligence for women farmers. Male farmers are also trained in the use of AI-GEAR.

REFERENCE

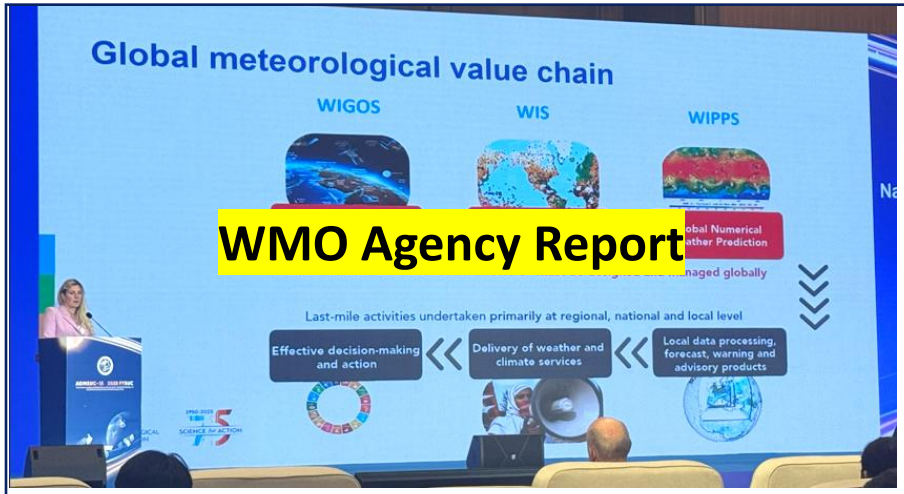
WMO, EW4All, SDRG and VLab related presentations



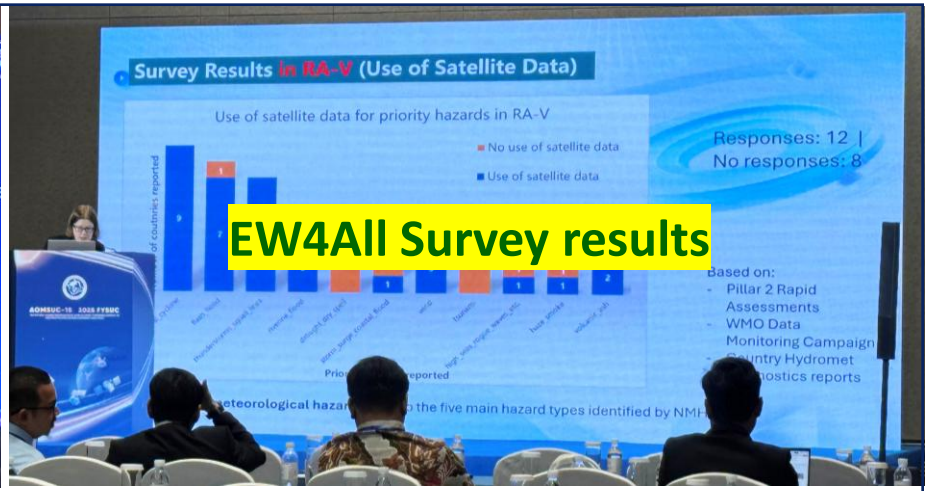




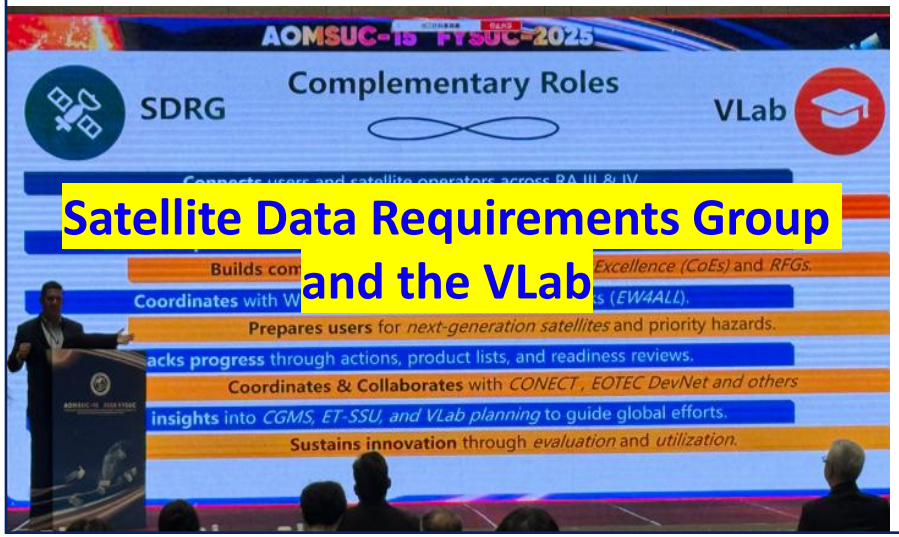
WMO, EW4All, SDRG and VLab related presentations



WMO Agency Report



EW4All Survey results



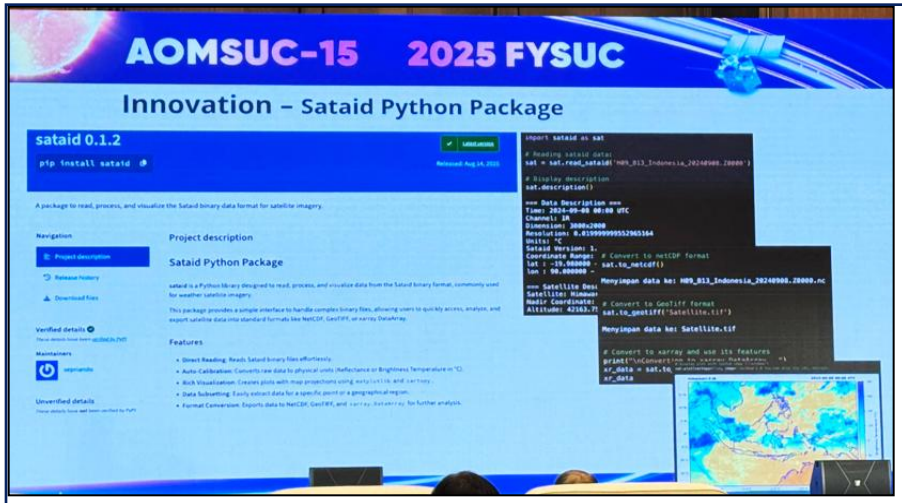
Satellite Data Requirements Group and the VLab

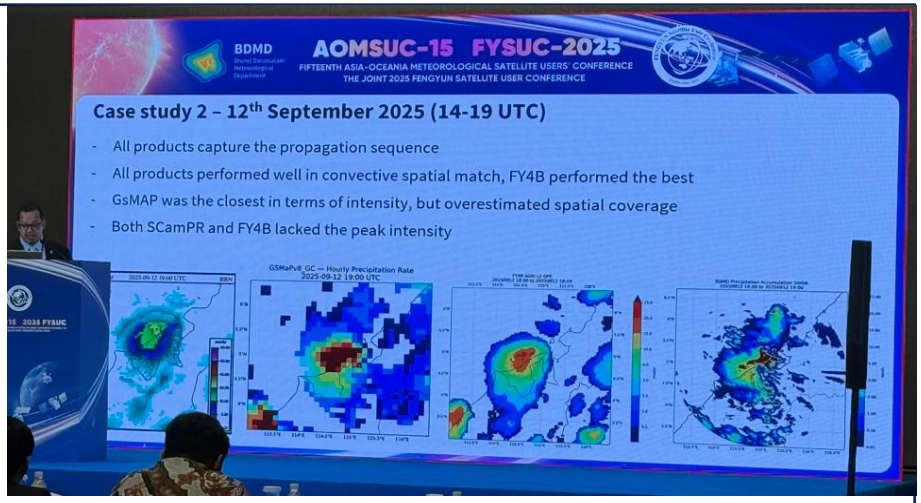
WMO, EW4All, SDRG and VLab related Conference presentations

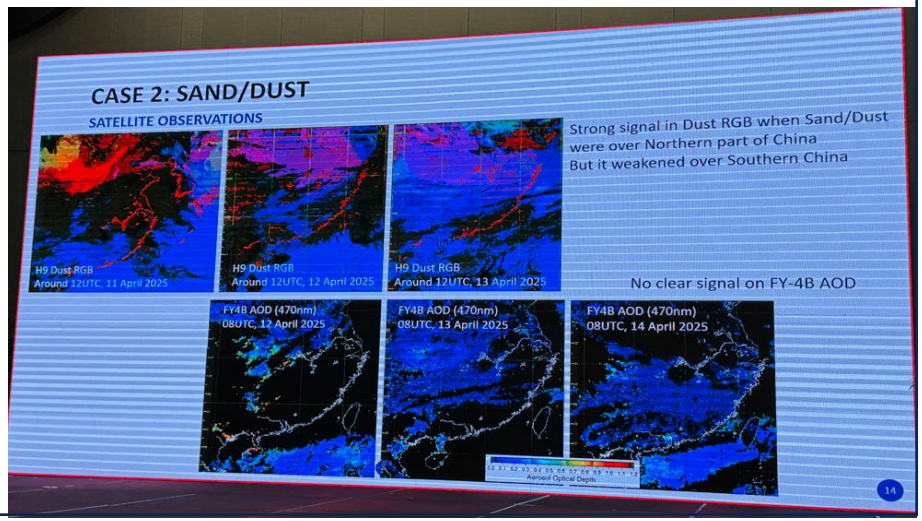
- WMO Agency Report was presented by the Head of the WMO Space Programme, Natalia Donohoe. The WMO EW4ALL initiative was also presented. This included, by 2027; AI integration, free and open exchange of data, data sharing infrastructure with transition from NETCDF to WIS. Satellite meteorology experts located in local forecasting offices.
- Roll out status of EW4All in the Asia Pacific region was presented by the Scientific Officer of the WMO Space Programme Section Zoya Andreeva. This included presentation of the WMO EW4ALL Satellite Products Dashboard at https://community.wmo.int/ew4all-satellite-products .
- Presentation by our Costa Rica colleague about SDRG: Satellite Data Requirements Group for WMO RA III and IV (the Americas). This Coordination Group on Satellite Data Requirements links users of meteorological satellites to the satellite providers. The complementary roles of SDRG and the VLab were also covered.
- My summary of the past year's activities Australian VLab Centre of Excellence.

REFERENCE

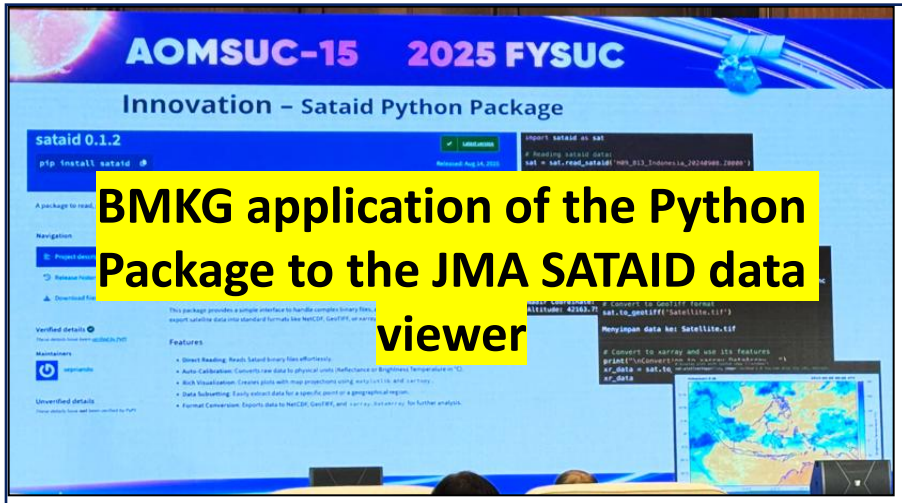
Other Conference Presentations of interest

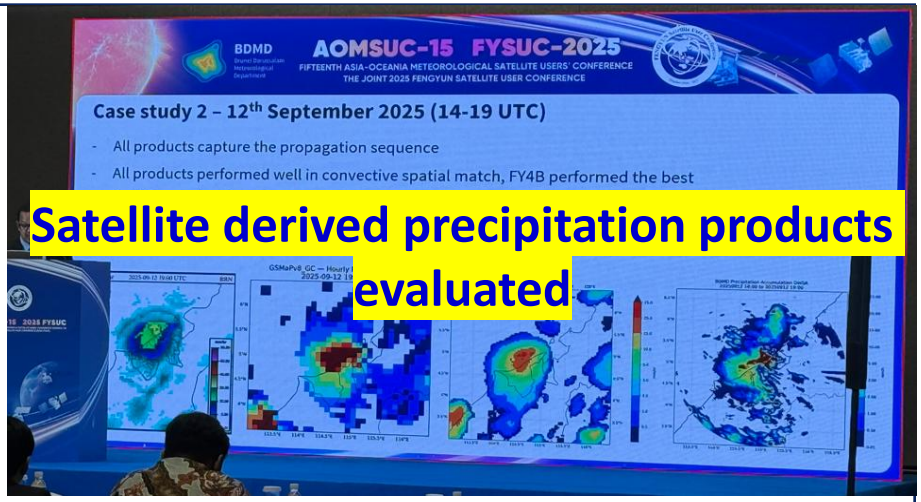


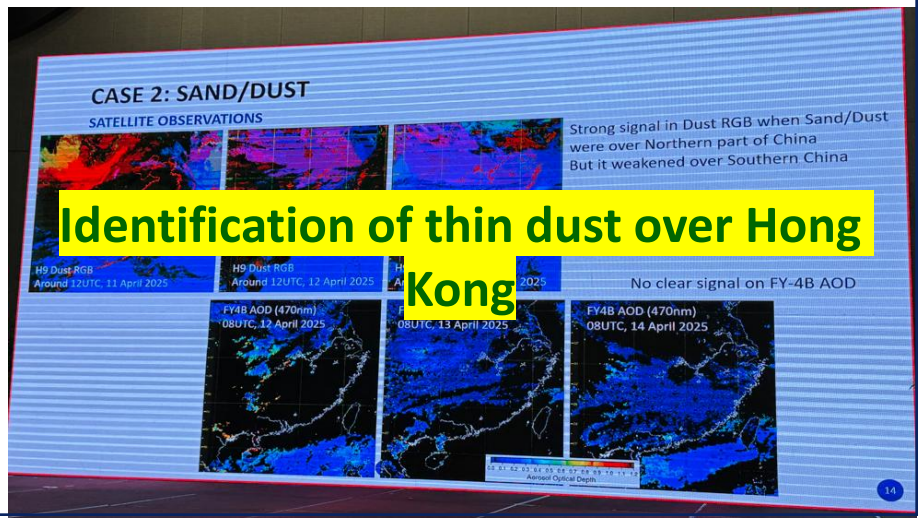




Other Conference Presentations of interest







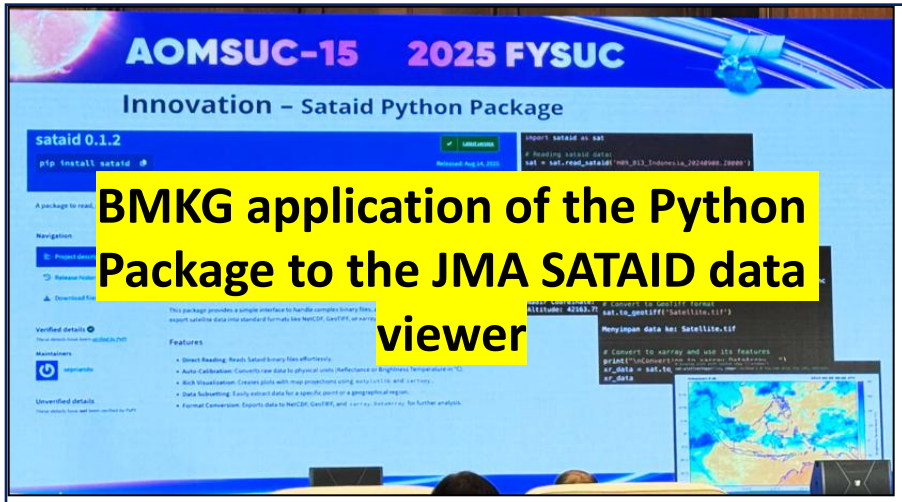
Other Conference presentations of interest (1)

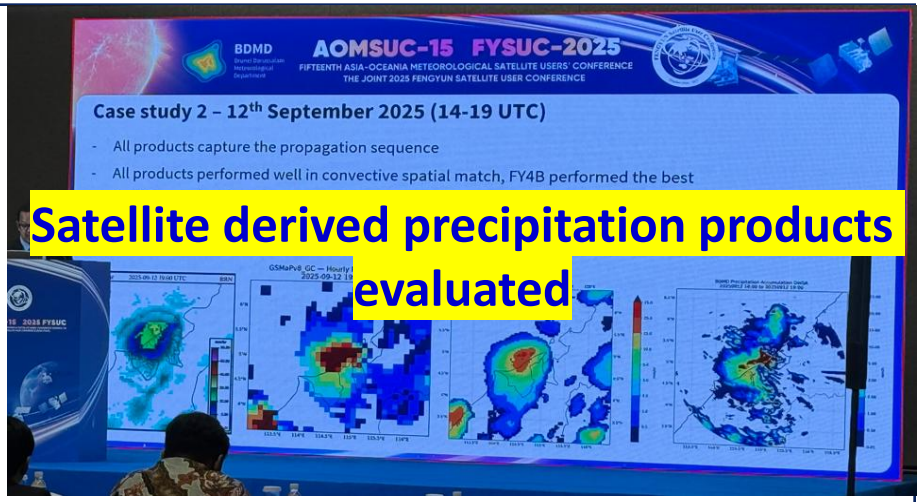
Here is a brief summary of other presentations of interest.

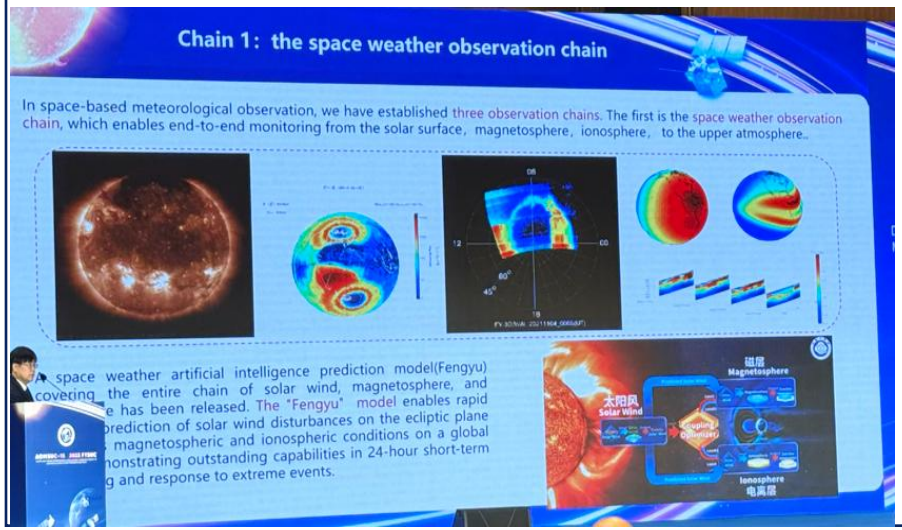
- BMKG Indonesia have developed Python script for JMA's SATAID application. This is open source. They can share this from December.
- Presentation by our Brunei colleague, summarising the results of heavy rainfall event case studies as monitored using different satellite derived products (FY4B, GSMaP, SCamPR) over Brunei and adjacent regions.
- The Early Warning System for Tonga was presented by our Tongan colleague. I was interested to hear that there is a website that now has the Tonga RADAR reflectivity data available in near real time.
- Issues with detection of thin dust over Hong Kong (also Saudi Arabia) as presented by our Hong Kong and Saudi Arabian colleagues.

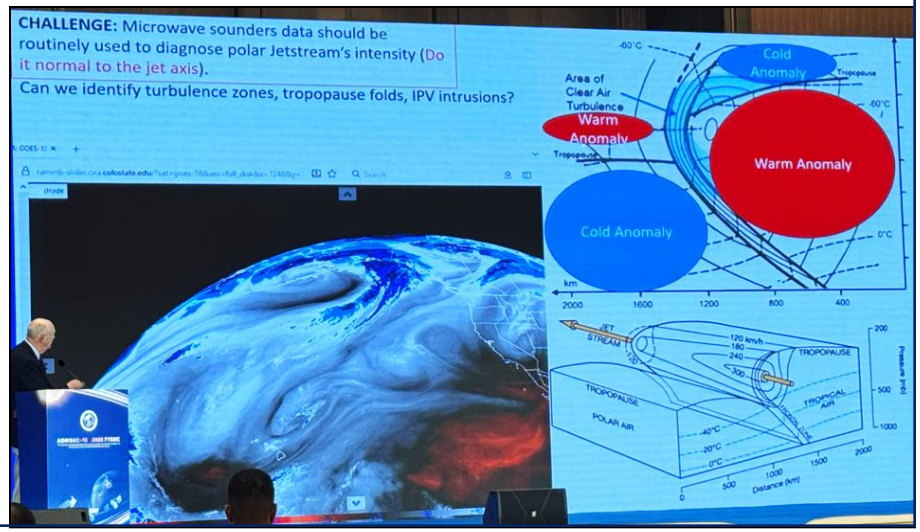
REFERENCE

Other Conference Presentations of interest

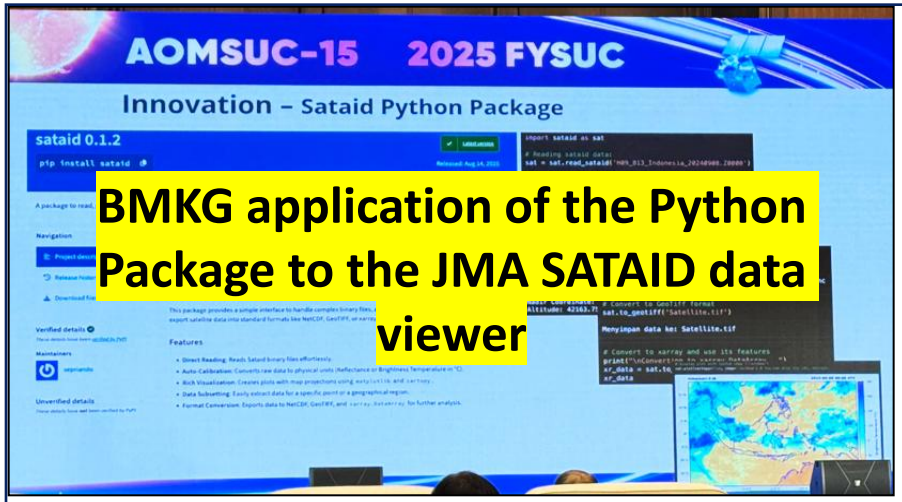


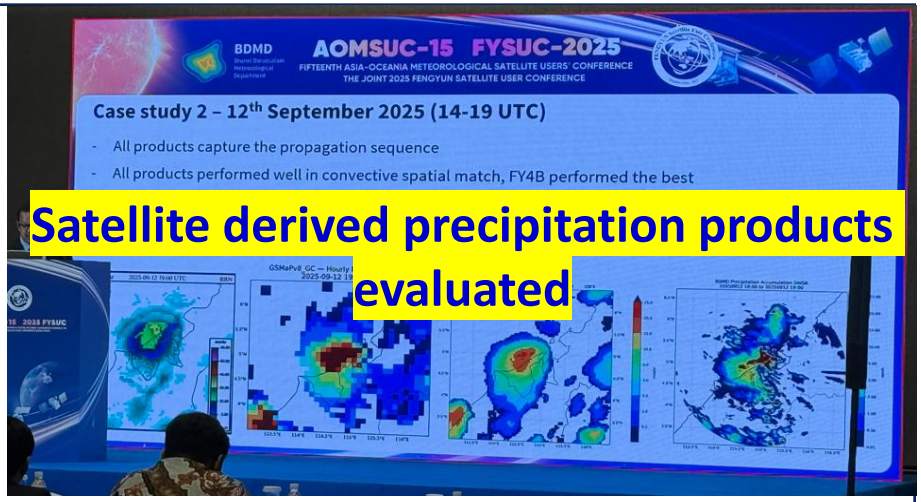


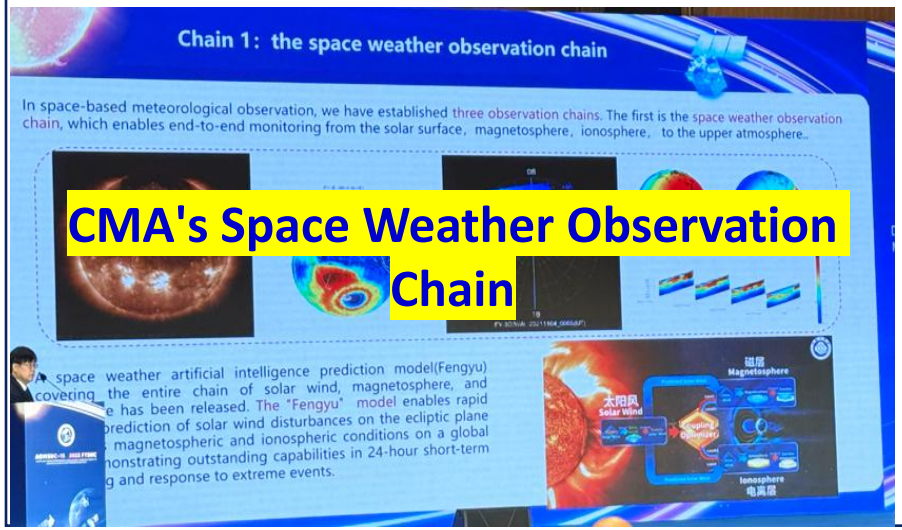


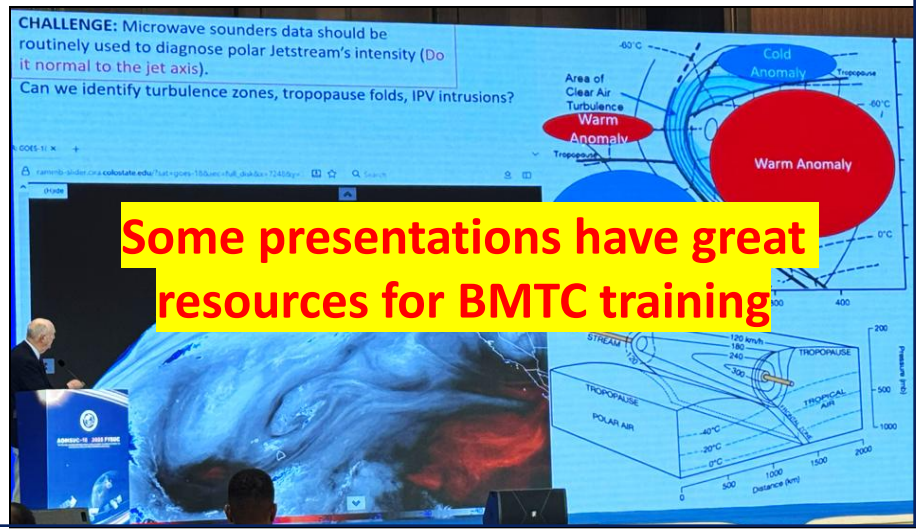


Other Conference Presentations of interest







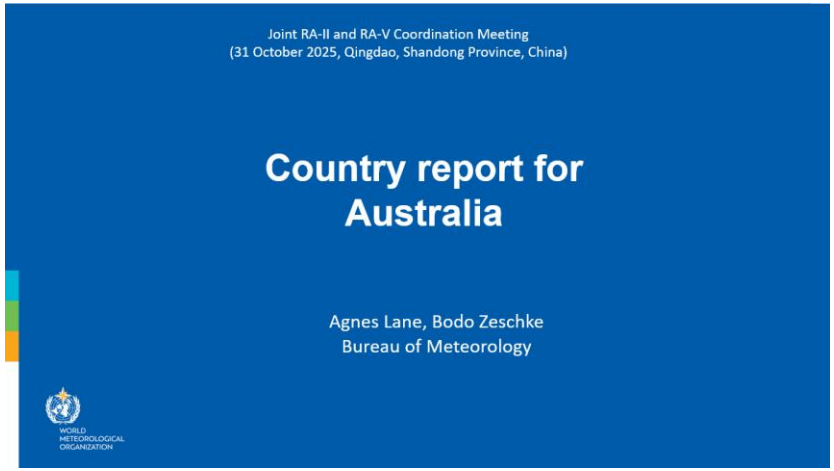


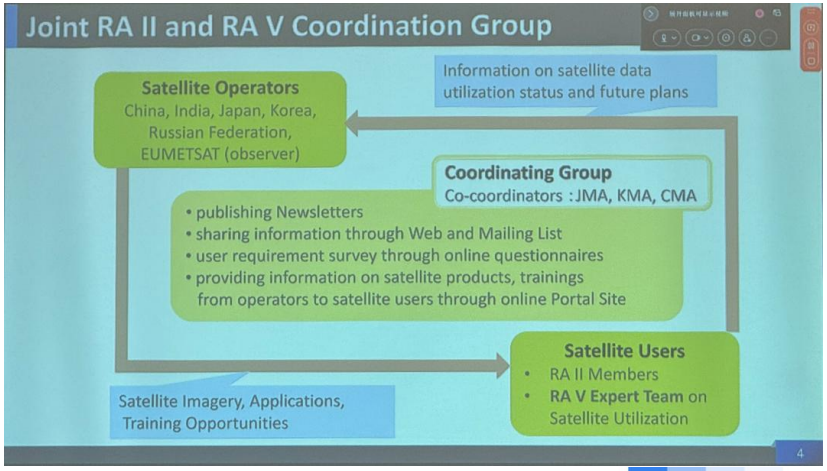
Other Conference presentations of interest (2)

- A Chinese colleague presented CMA's Space Weather Observation Chain
- Some presentations have great resources for BMTC training. This includes Jim Purdom's presentation "Challenges and Opportunities of Meteorological Satellites"

REFERENCE

Joint RA-II / RA-V Coordination Meeting, 31st October





The Bureau of Meteorology

AOMSUC-15 FYSUC-2025
FIFTEENTH ASIA-OCEANIA METEOROLOGICAL SATELLITE USERS' CONFERENCE
THE JOINT 2025 FENGYUN SATELLITE USER CONFERENCE

VLab

The VLab activities of the Australian, Indonesian and Korean VLab Centres of Excellence

Mr Bodo Zeschke
Teacher, Australian Bureau of Meteorology Training Centre
Point of Contact, Australian VLab Centre of Excellence

Joint RA-II / RA-V Coordination Meeting topics of discussion

Updates on working structure and Operating Plans of RA II and RA V

Results of the Gap Analysis in support of EW4ALL

CMA NSMC Services Supporting the Region

Country Reports

RA II WIGOS Coordination Group activities (CMA, JMA, KMA)

RAIDEG

SDR-Group-RA-III-IV

WMO-CGMS Virtual Laboratory (VLab) updates

Updates from VLab Centres of Excellence

Joint RA-II / RA-V Coordination Meeting topics of discussion

- The key topics presented at the Joint RA-II / RA-V Coordination Meeting were also briefly summarised.
- In particular, the following requires clarification:
  - RAIDEG: The RA I Dissemination Expert Group (RAIDEG), established by EUMETSAT and the World Meteorological Organization, aims to improve access to satellite data. In so doing, it makes recommendations for the list of satellite data products disseminated via EUMETCast-Africa.
  - SDRG: Satellite Data Requirements Group for WMO RA III and IV (the Americas) The Coordination Group on Satellite Data Requirements links users of meteorological satellites in the Americas (WMO Region III and IV) to the satellite providers.

REFERENCE

The Night Lights of Qingdao

image courtesy B.Zeschke, BMTC

A big thanks to our hosts, the China Meteorological Administration

- Whilst showing the beautiful nightlights of the Qingdao skyline, I gave thanks to our AOMSUC-15 CMA hosts. Including Ms Jingmian Deng of CMATC and CMATC colleagues. Also, Ms Li Ruolin and colleagues at CMA. For helping to make the AOMSUC-15 Training Event and Conference such a productive and memorable experience.

REFERENCE

Australian VLab Centres of Excellence Regional Focus Group meeting,

02UTC 27th November 2025

Contents

- **A summary of the 15th Asia Oceania Meteorological Satellite User Conference (AOMSUC-15):** presented by Bodo Zeschke, Bureau of Meteorology Training Centre.

- **Some follow up actions to AOMSUC-15, including a short Regional Case Study:** presented by Bodo Zeschke, Bureau of Meteorology Training Centre.

The importance of "follow up actions" to AOMSUC

This will ensure that the "Spirit of AOMSUC-15" lives on, long after all the attendees have returned to their home countries.

1. Training Event Worksheet forwarded to colleagues.
2. Socrative instructions and summary forwarded to some colleagues.
3. Information about the comparison of Lightning Detection Algorithms as per the Asian Intercomparison Platform https://www.wmc-bj.net/ainpp/ of the WMO AI for nowcasting Pilot project forwarded to colleagues.
4. Regional Focus Group meeting resource regarding the detection of thin dust forwarded to Hong Kong and Saudi Arabia colleagues.
5. Regional Focus Group meeting resource regarding JAXA GSMaP forwarded to a colleague.
6. In collaboration with the Tonga colleague, developing a local case study using the Tonga RADAR.

The importance of "follow up actions" to AOMSUC

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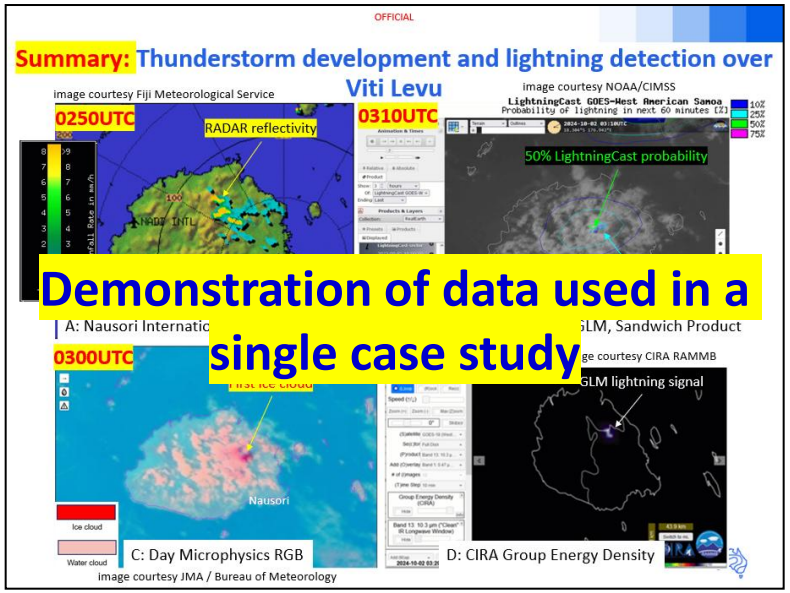
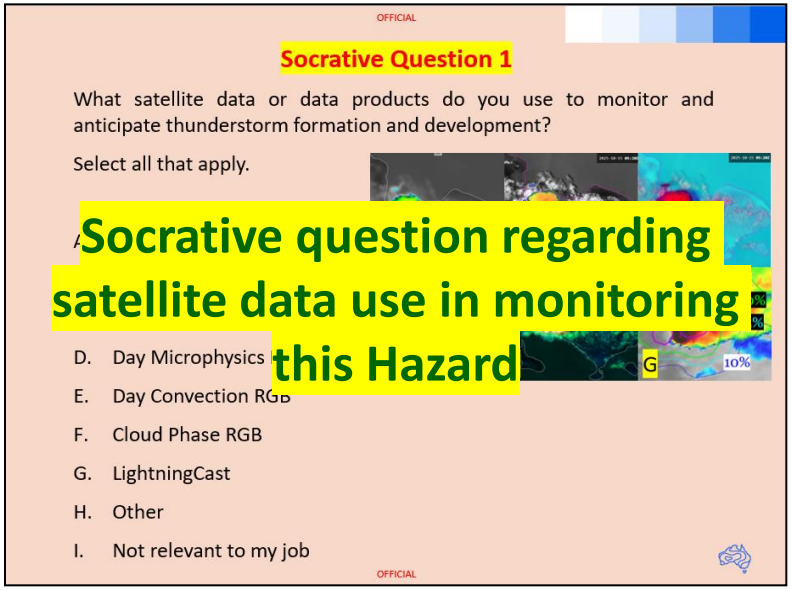
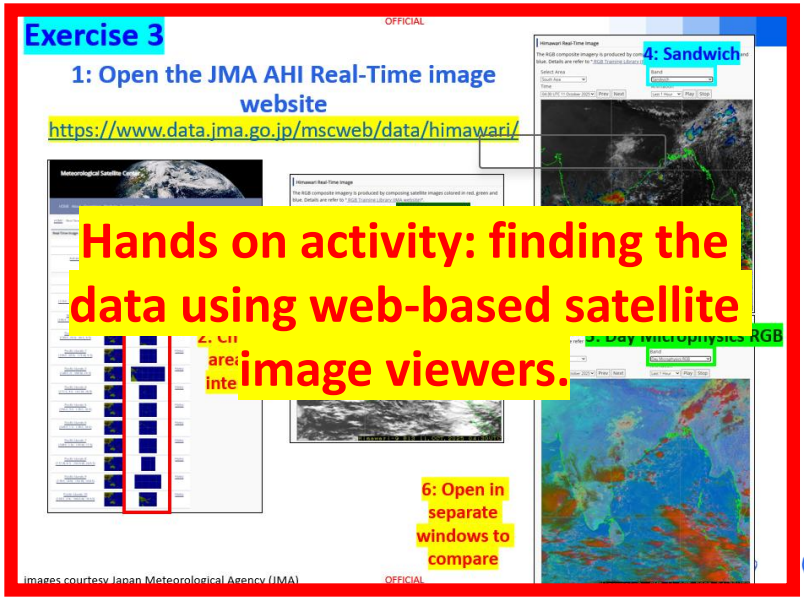
6. In collaboration with the Tonga colleague, developing a local case study using the Tonga RADAR.

Follow on from AOMSUC-15: Resources Disseminated







Example: Exploring Fengyun images

1: Open the CMA SWAP website

http://rsapp.nsmc.org.cn/geofy/

2: Menu

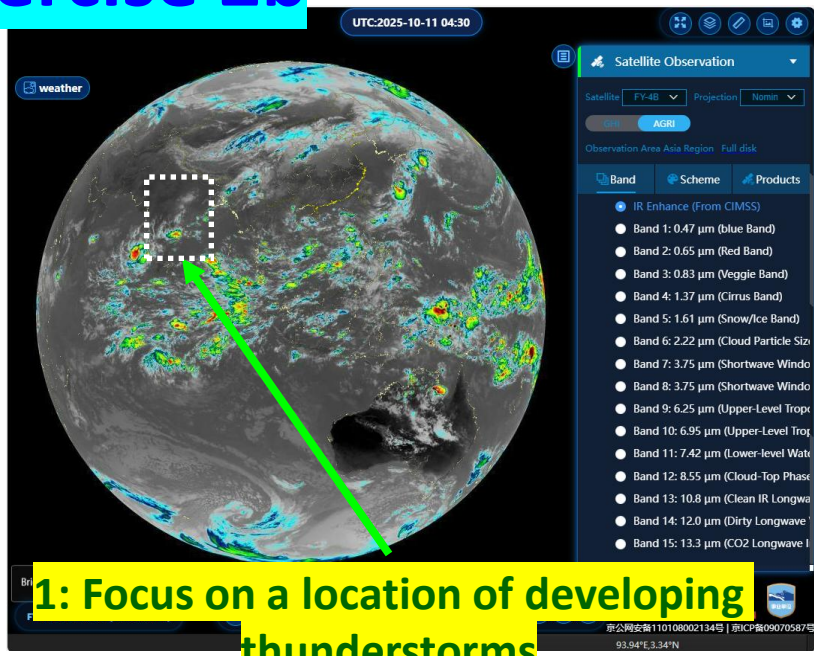
IR Enhance (From CIMSS)

4: Scheme

Day Microphysics RGB Composite

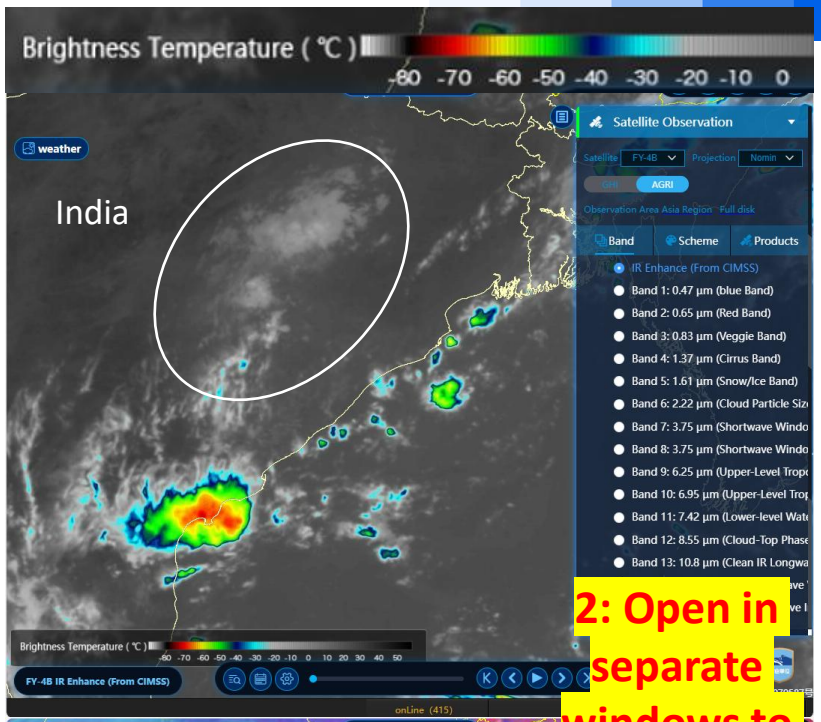
images courtesy China Meteorological Administration (CMA)

Exercise 2b

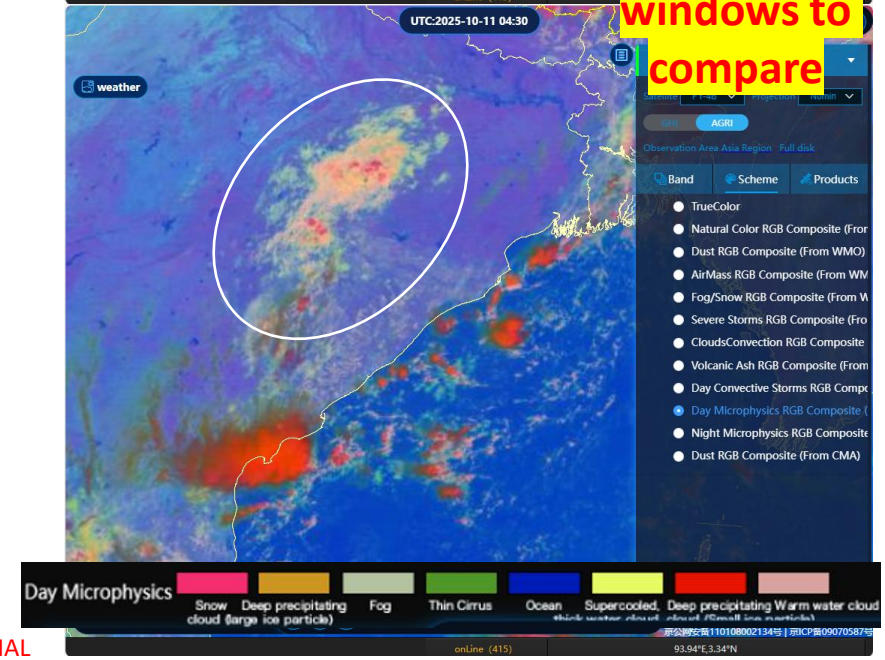


1: Focus on a location of developing thunderstorms

Maybe over your own country

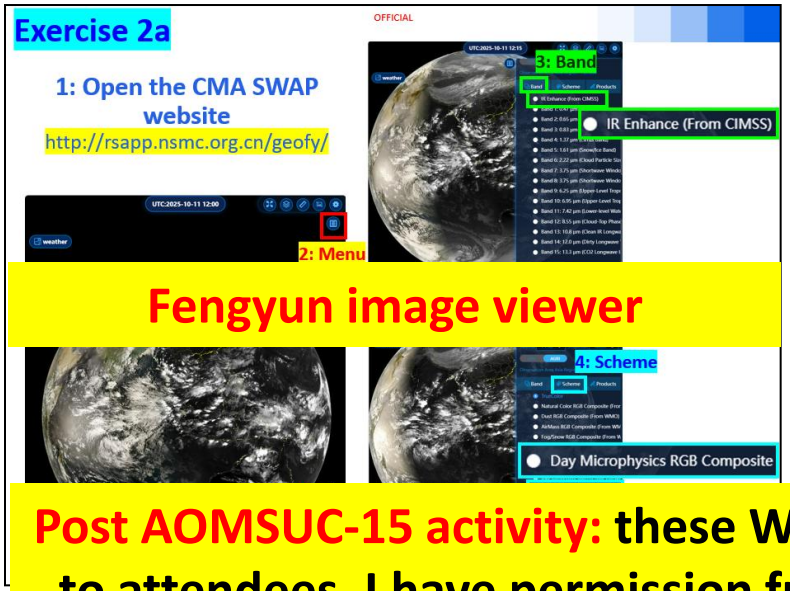


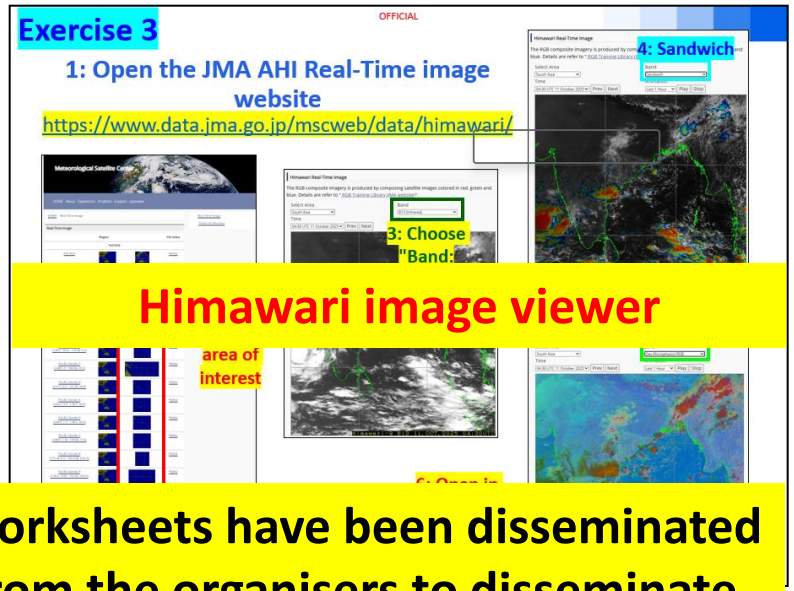
2: Open in separate windows to compare



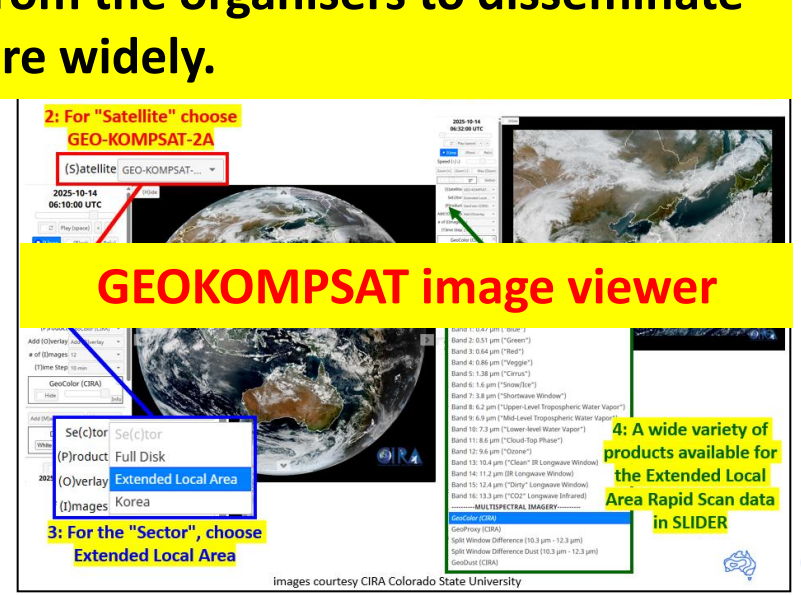
images courtesy China Meteorological Administration (CMA)

Hands on activity: using web-based satellite image viewers.





Post AOMSUC-15 activity: these Worksheets have been disseminated to attendees. I have permission from the organisers to disseminate these more widely.



Training Event Worksheet forwarded to colleagues.

- I have forwarded the easy-to-follow Training Event Worksheet that I used during my AOMSUC-15 Training Event session to colleagues who attended the Training Event.
- In the previous slides, the format of my Training Event is summarised, including:
  - The advertising of Australian VLab CoE resources relevant to the hazard under discussion, a single demonstration case study, interaction with the audience using Socrative and the hands-on activity.
  - Instructions for exploring the CMA SWAP website to obtain satellite data relevant to the investigation of thunderstorm development.
  - Showing the other Satellite Data Viewers that are showcased within the Worksheet.

REFERENCE

The importance of "follow up actions" to AOMSUC

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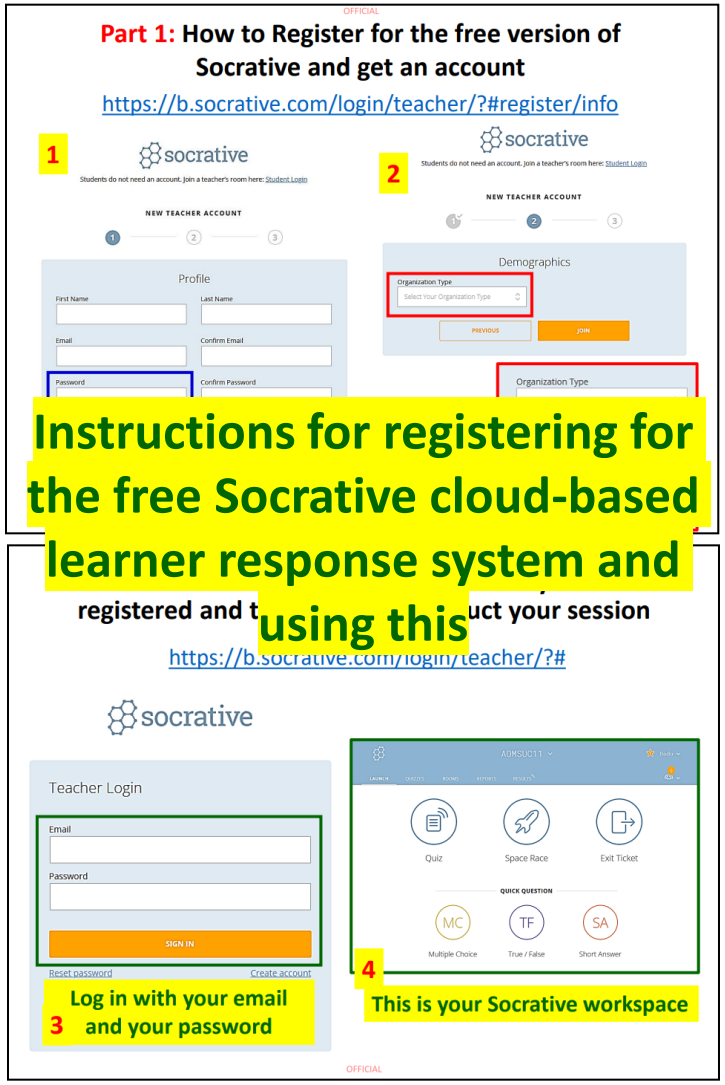
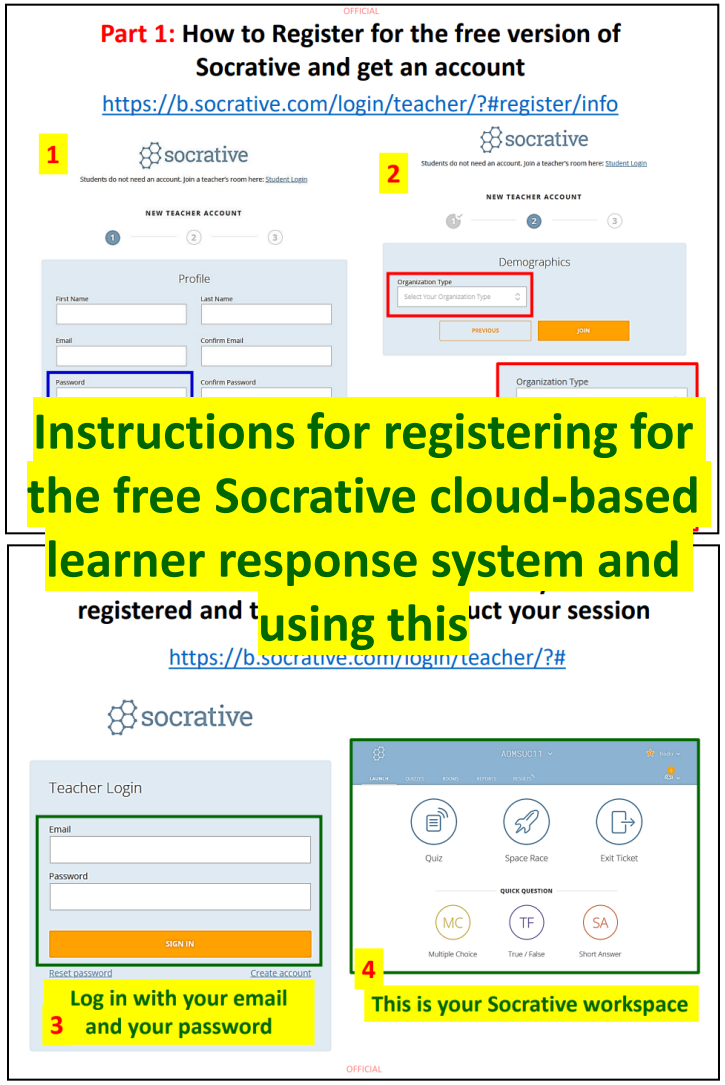
Socrative instructions and summary

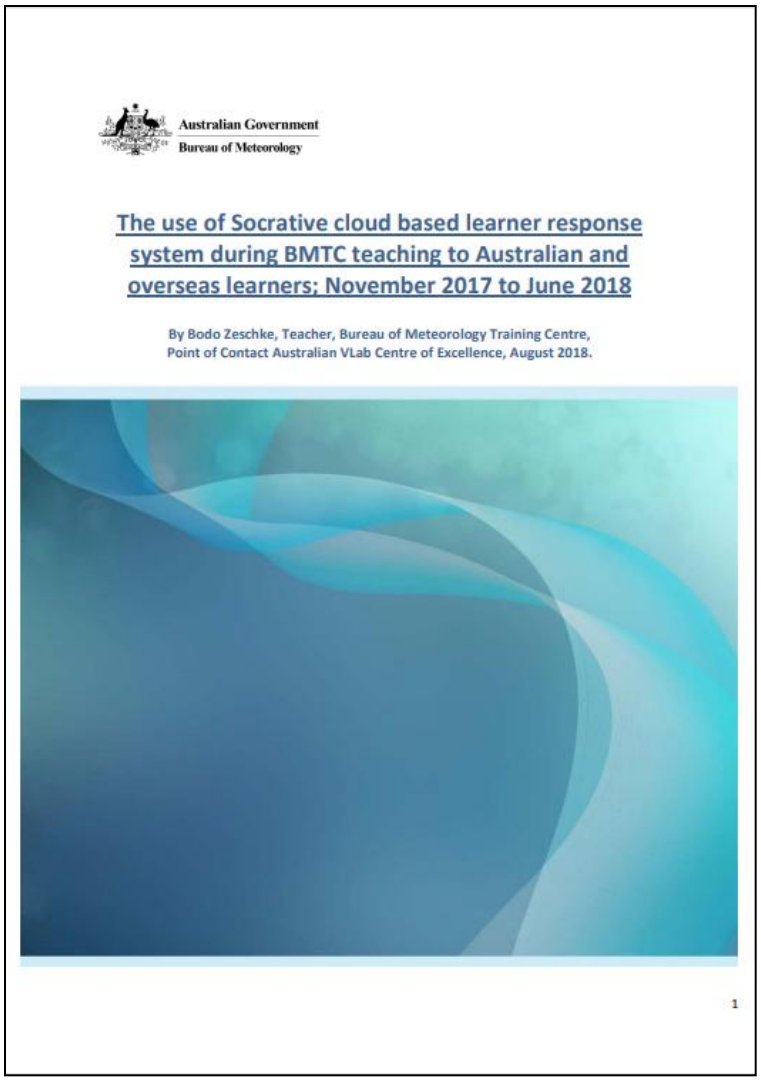


…recommended by experts at CALMET 2017…

Enhancing interaction during teaching at BMTC since 2017

Socrative instructions and summary





Socrative instructions and summary

- Here is a summary of the Socrative cloud-based learner response system resources that I have disseminated to some colleagues.
- This includes a brief history of my use of Socrative. Also, a paper that I have written summarising the use of Socrative within my BMTC teaching.

REFERENCE

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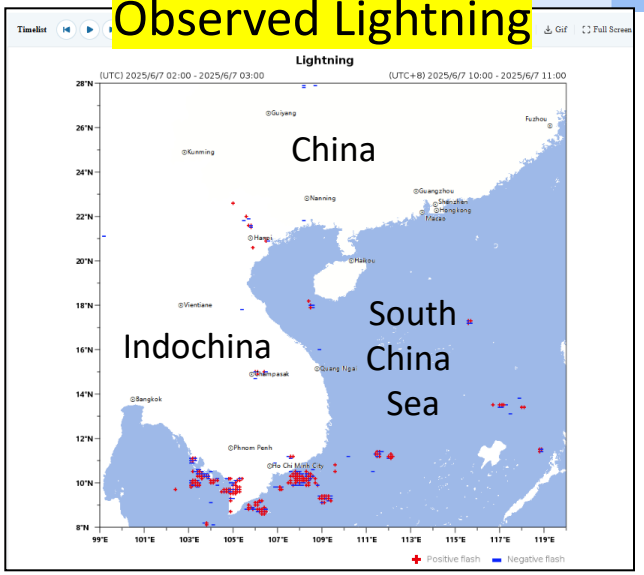
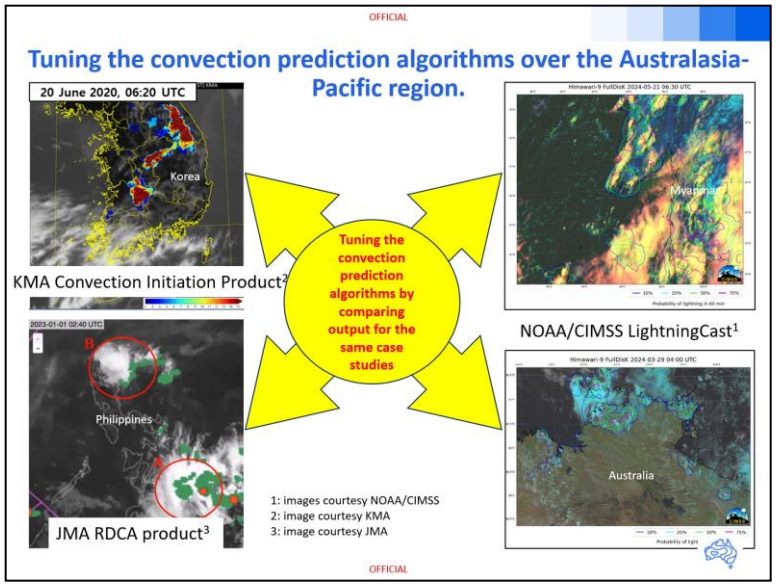
The Asian Nowcasting Intercomparison Platform of the WMO AI for nowcasting Pilot project (AINPP)

https://www.wmc-bj.net/ainpp/

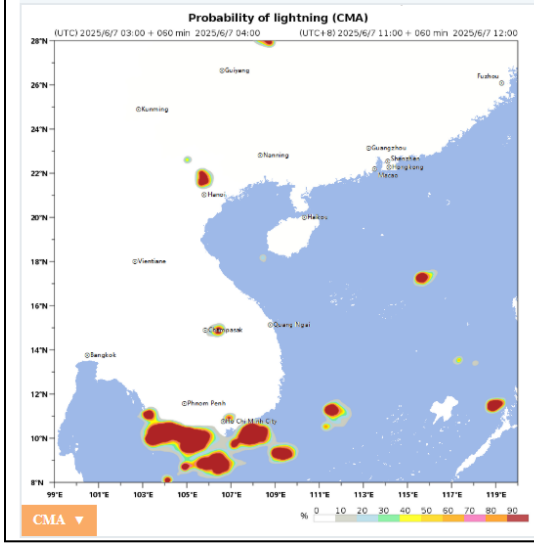
Observed Lightning





CMA's Lightning Detection Algorithm

ProbSevere LightningCast



The Asian Nowcasting Intercomparison Platform of the WMO AI for nowcasting Pilot project (AINPP)

- As there are now a number of convection prediction algorithms used by JMA, KMA and CMA over the Australasia Pacific region, therefore, during the 122nd Australian VLab Centre of Excellence Regional Focus Group meeting of November 2024 we discussed the possibility of analysing particular convective events using a number of these algorithms. This to stimulate further improvements of these algorithms.
- The AINPP web link was shown, and an archived result of a thunderstorm case study over the China / Indochina / South China Sea region was presented.
- The case study compared the performance of CMA's Lightning Detection Algorithm and the NOAA/CIMSS ProbSevere LightningCast Algorithm.
- It should be noted that ProbSevere LightningCast has been tuned over the America's using the GOES geostationary satellite data. Therefore, this AI algorithm is not yet so familiar with the indicators of convective development over the southeast Asian region.

REFERENCE

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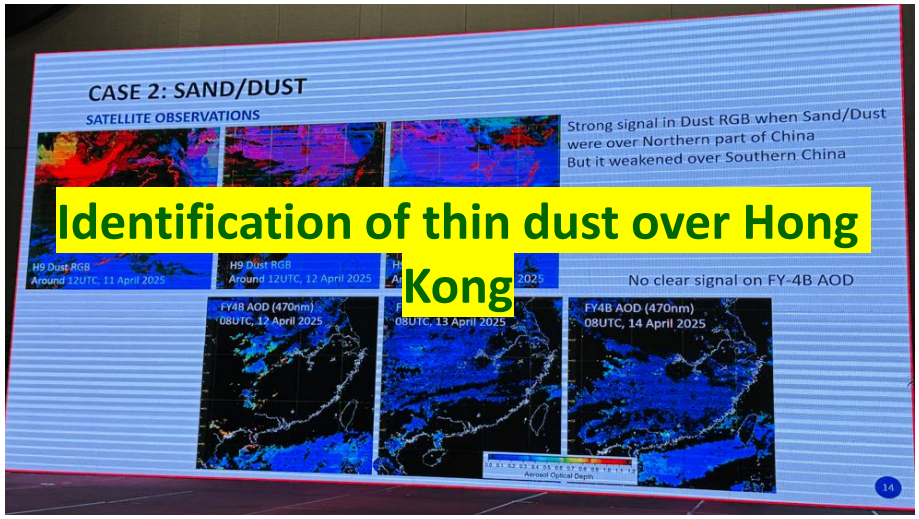
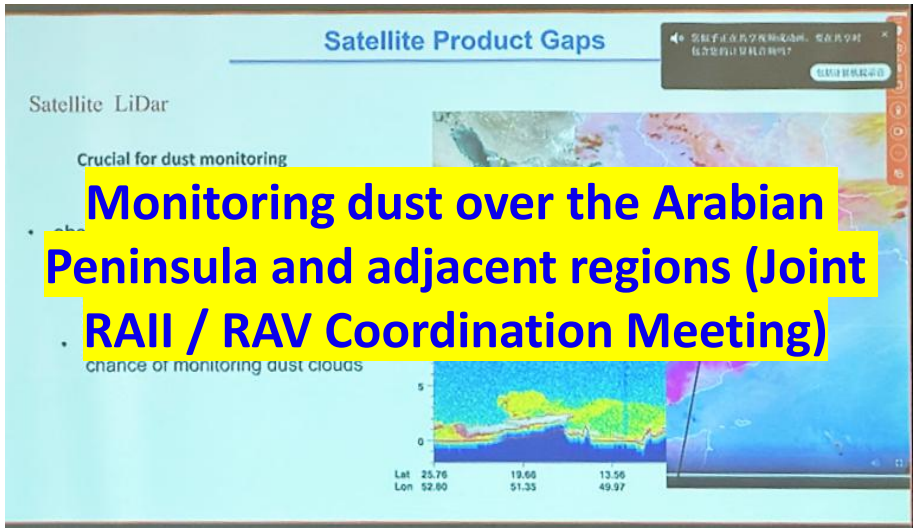
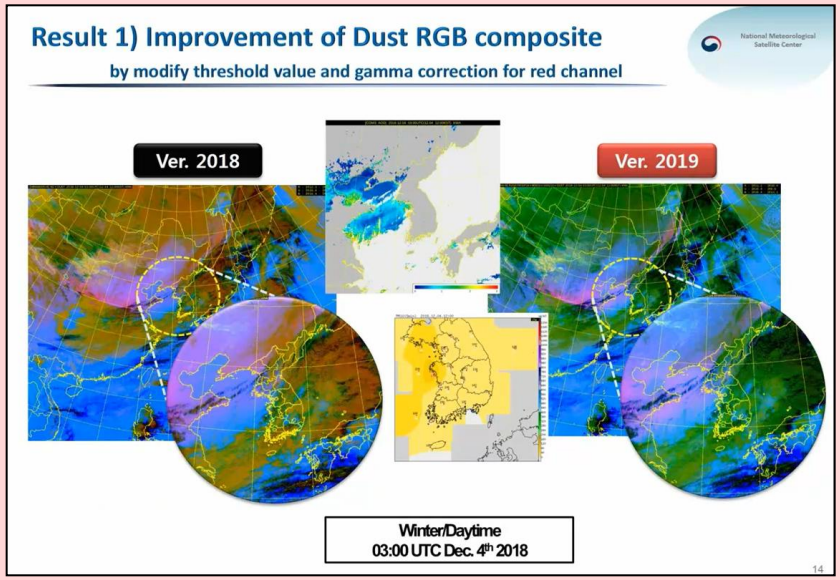


Identification of thin dust over Hong Kong



Monitoring dust over the Arabian Peninsula and adjacent regions (Joint RAII / RAV Coordination Meeting)



30th April 2019 Regional Focus Group meeting (68)

Introducing KMA's modified Dust RGB composite for improved detection of weak dust events

(facilitator Dr Hyesook Park KMA)

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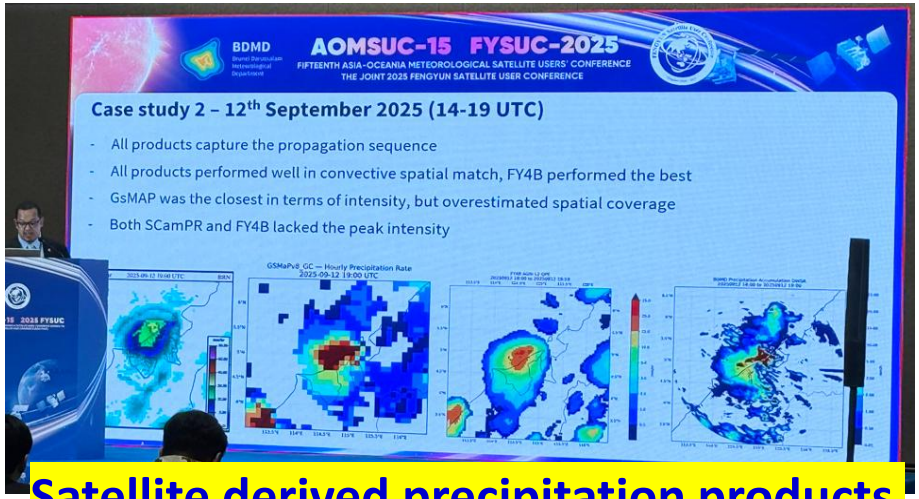
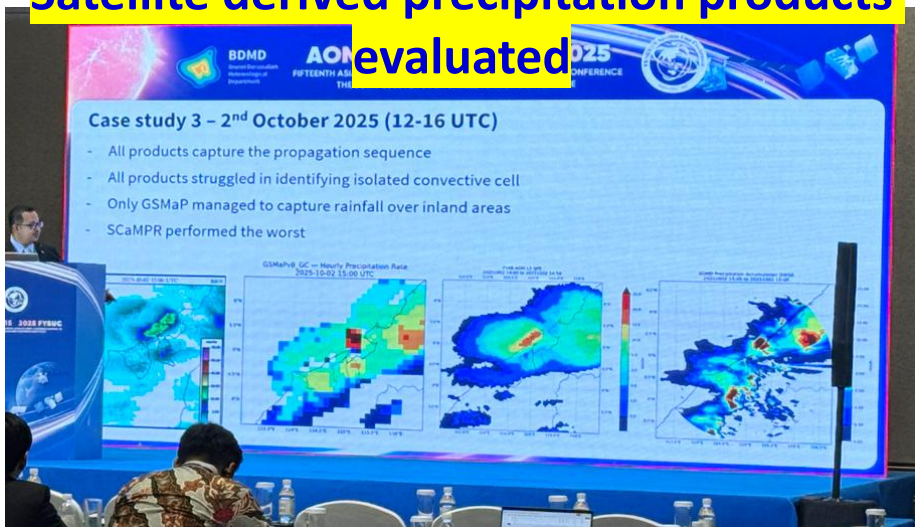
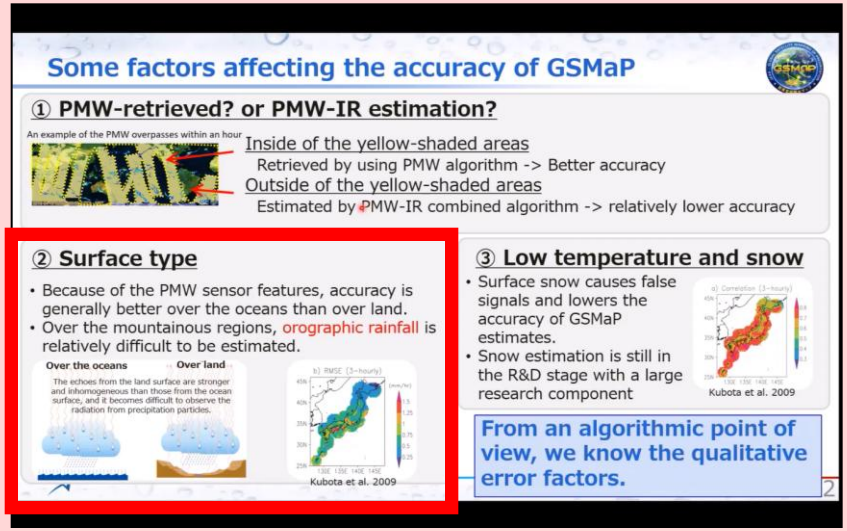


Satellite derived precipitation products evaluated





29th February 2024 Regional Focus Group meeting (117)

Utilisation of the Global Satellite Mapping of Precipitation (GSMaP) dataset.

Presented by Nao Yoshida, Earth Observation Research Center, JAXA

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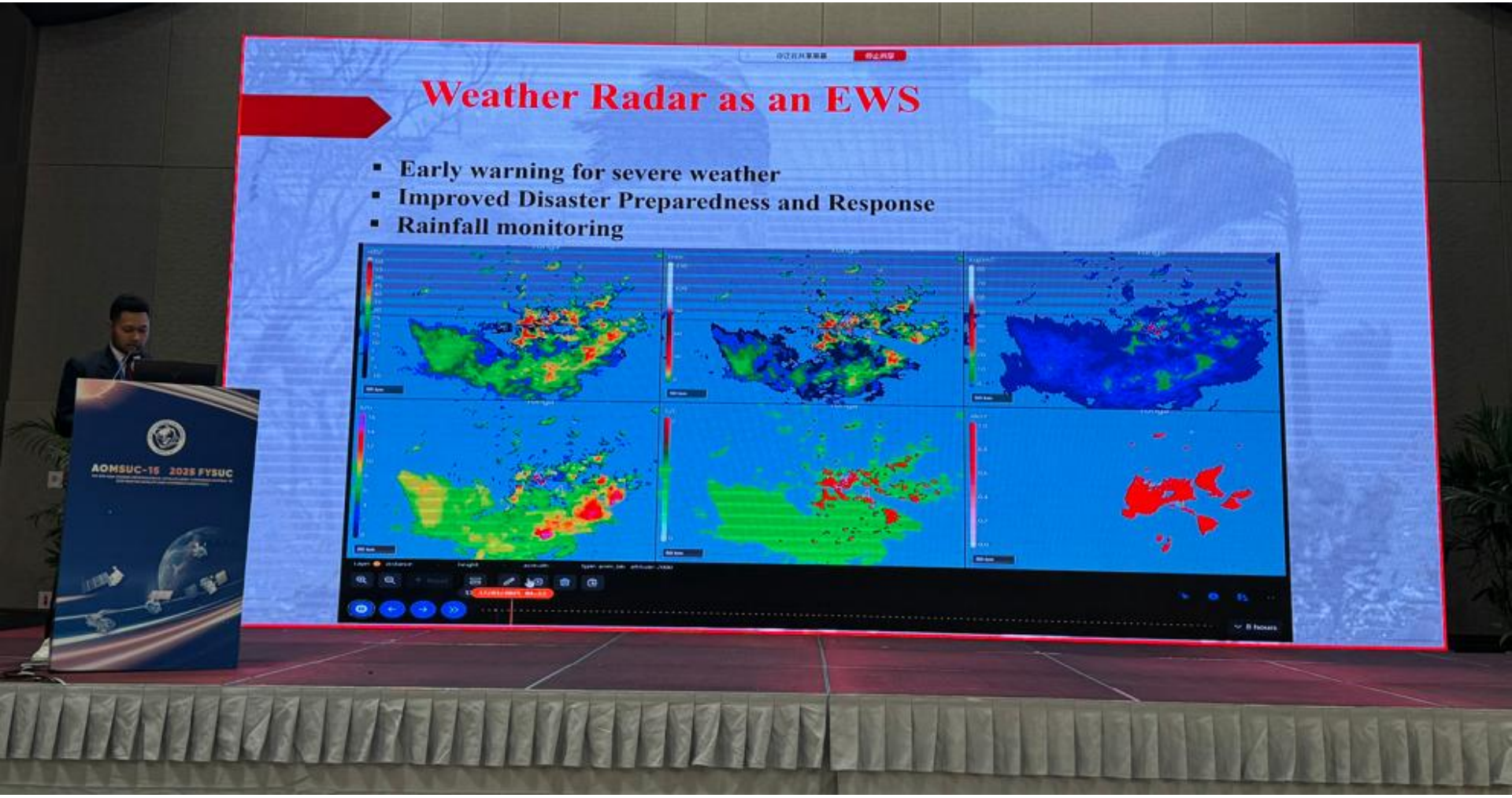
Follow on from AOMSUC-15: Developing Case Studies

"Importance of Early Warning Systems for Tonga". AOMSUC-15 Conference presentation by Inoke Lelenga, Tonga Meteorological Service



Thunderstorm development and lightning detection over Tonga (1)

- From the conference presentation by our Tongan colleague, I became aware of the near real time Tonga RADAR reflectivity data as can be accessed on the Tonga Meteorological Service link at https://www.rainradar.to/simple . This presented a great opportunity to develop a case study comparing the RADAR output with the satellite output.
- In the below case study, the RADAR reflectivity has been compared to the GOES-18 Sandwich Product, but also with the output from NOAA / CIMSS ProbSevere LightningCast and the GOES-18 Geostationary Lightning Mapper (GLM). As can be seen, LightningCast performed very well in anticipating the formation of lightning to the east of Tongatapu.
- Examination of the RADAR reflectivity signals for the showers, closer to Tongatapu and the reflectivity signals corresponding to the developing thunderstorms as shown within the red ellipses, is also instructive.

REFERENCE

Thunderstorm development and lightning detection over Tonga (2)

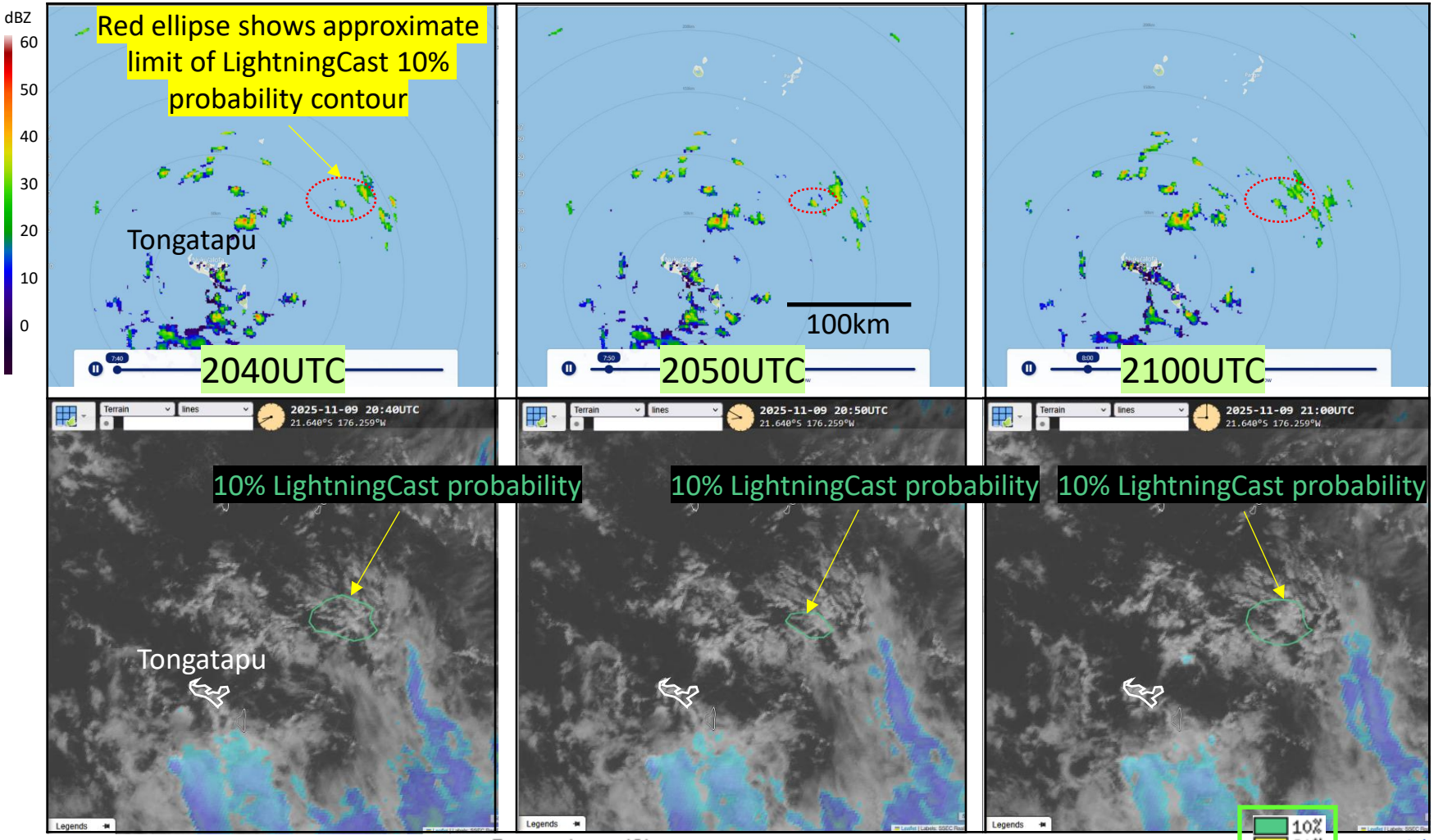
- This is a useful case study to assist the training of regional operational forecasters. This case study will be developed further in future, in collaboration with Tonga Meteorological Service staff.
- Finally, it will be interesting to see how the RADAR data integrates with satellite data and other meteorological data when used as an overlay within a multilayer display. It is important to consider two factors here when developing future case studies:
  - Differences in the receipt of the RADAR data and the satellite data from time of scanning / overpass.
  - The effect of the parallax error, resulting in displacement between the stormtop locations as shown in the satellite data in relation to the RADAR signature. Some calculations have been performed for GOES-18 data over Tonga in the last two slides.

REFERENCE

Thunderstorm development and lightning detection over Tonga

Tonga RADAR reflectivity (top) and GOES-18 Sandwich Product and LightningCast Probabilities (bottom) 2040-2100UTC, 9 November 2025

images courtesy Tonga Meteorological Service

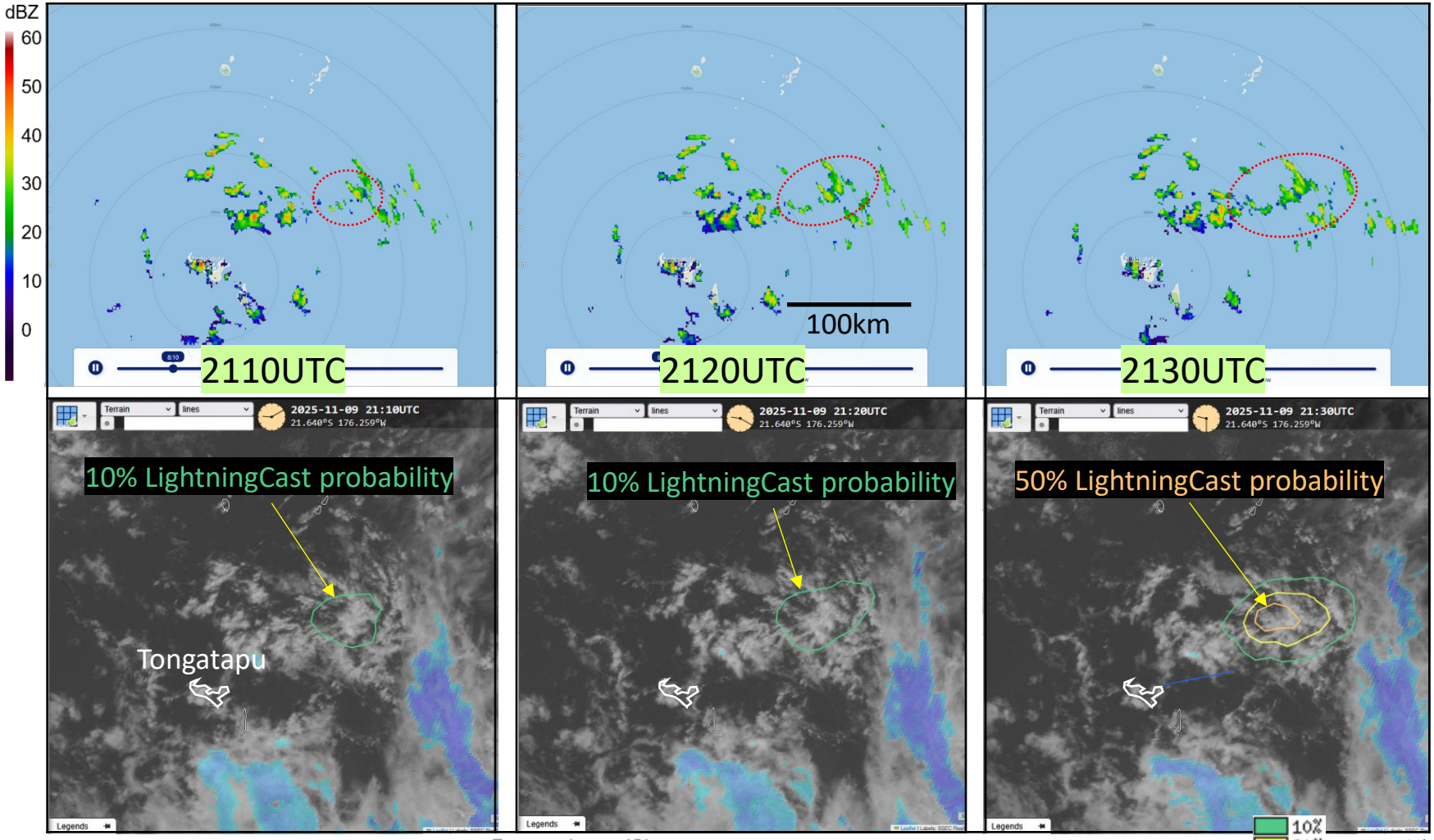


images courtesy NOAA/CIMSS

Thunderstorm development and lightning detection over Tonga

Tonga RADAR reflectivity (top) and GOES-18 Sandwich Product and LightningCast Probabilities (bottom) 2110-2130UTC, 9 November 2025

images courtesy Tonga Meteorological Service



images courtesy NOAA/CIMSS

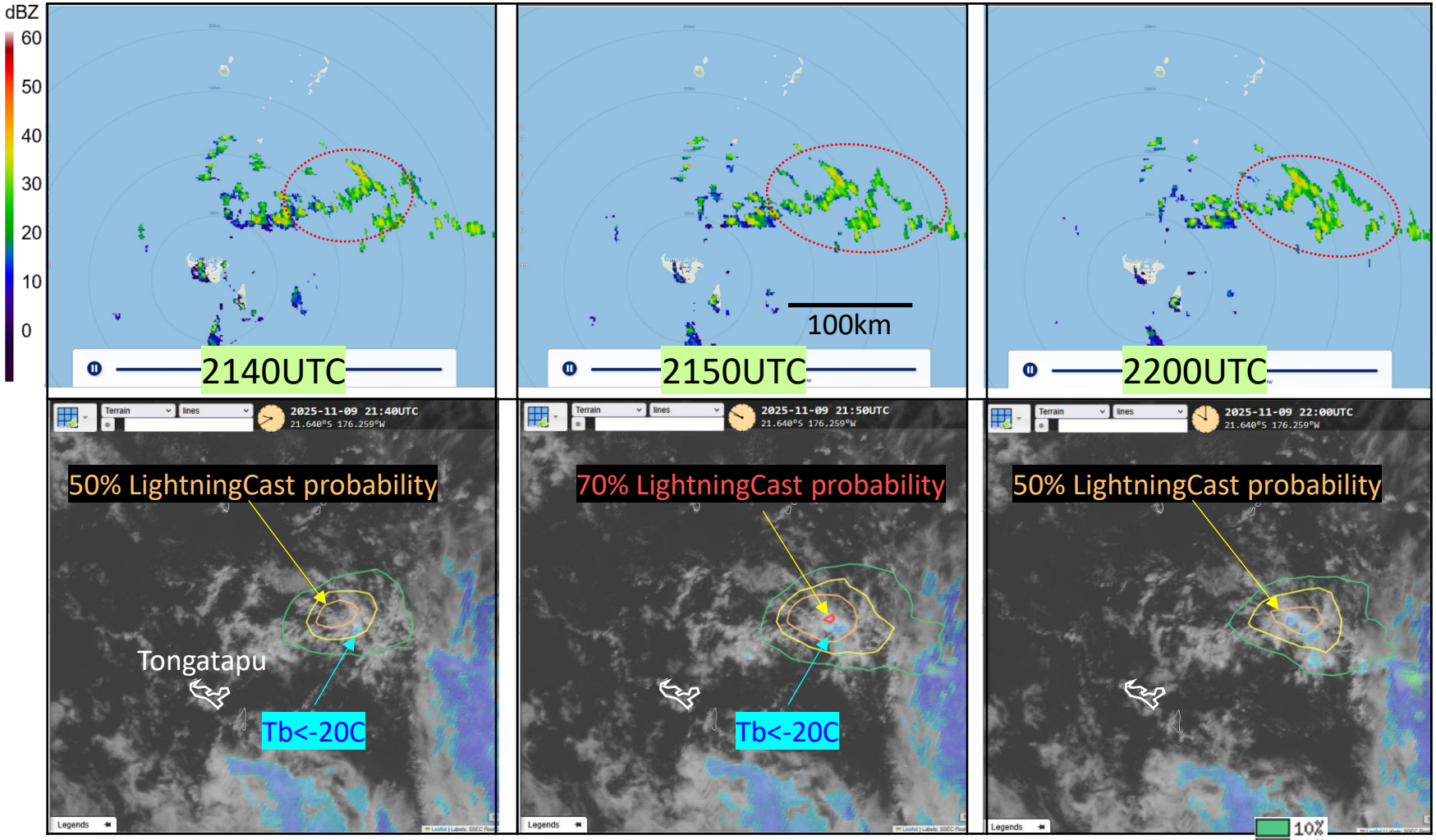
Temperature (C)
-80 -60 -40 -20 0

LightningCast GOES-West American Samoa
Probability of lightning in next 60 minutes [%]
10%
30%
50%
70%
90%

Thunderstorm development and lightning detection over Tonga

Tonga RADAR reflectivity (top) and GOES-18 Sandwich Product and LightningCast Probabilities (bottom) 2140-2200UTC, 9 November 2025

images courtesy Tonga Meteorological Service

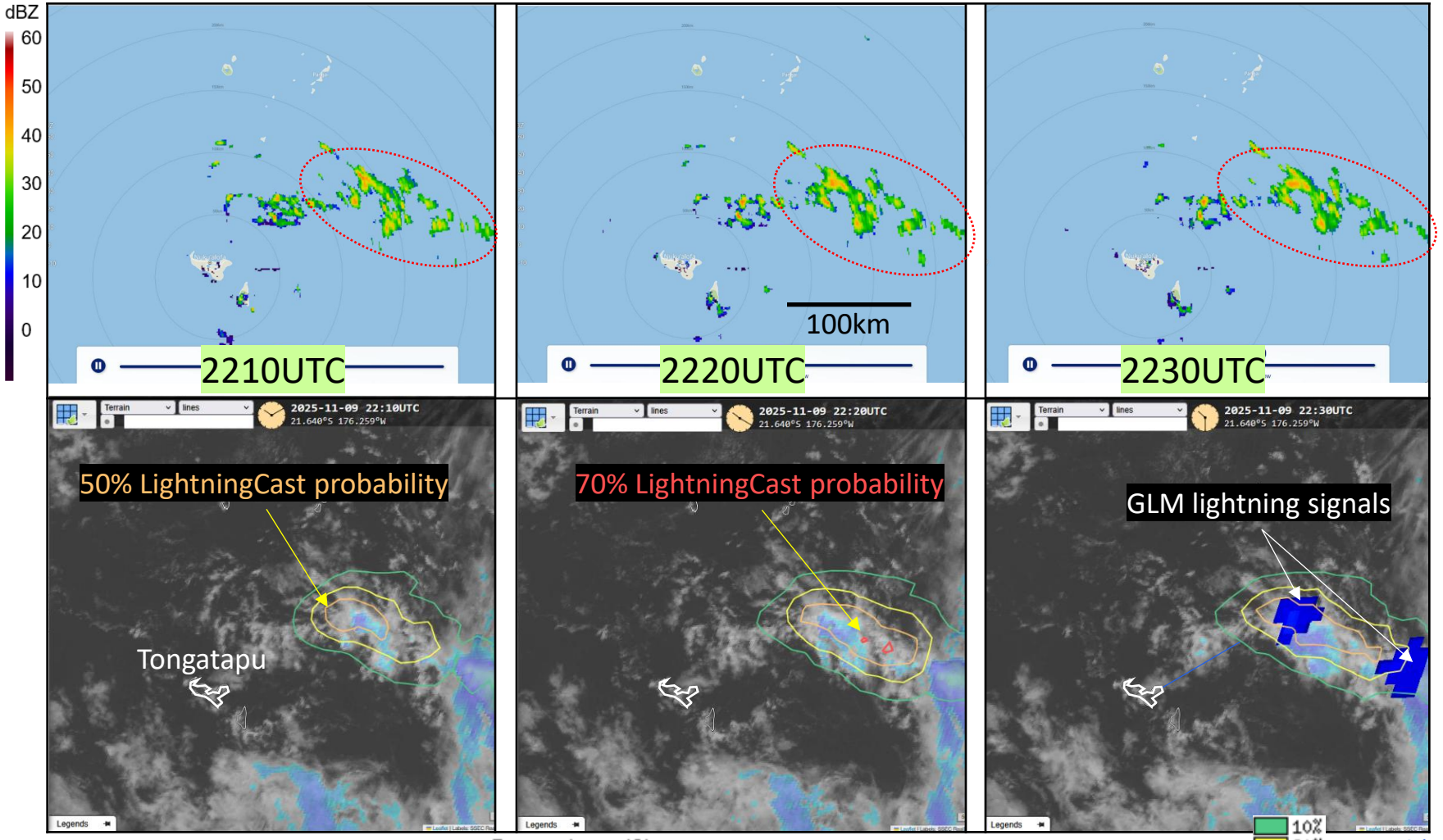


images courtesy NOAA/CIMSS

Thunderstorm development and lightning detection over Tonga

Tonga RADAR reflectivity (top) and GOES-18 Sandwich Product and LightningCast Probabilities (bottom) 2210-2230UTC, 9 November 2025

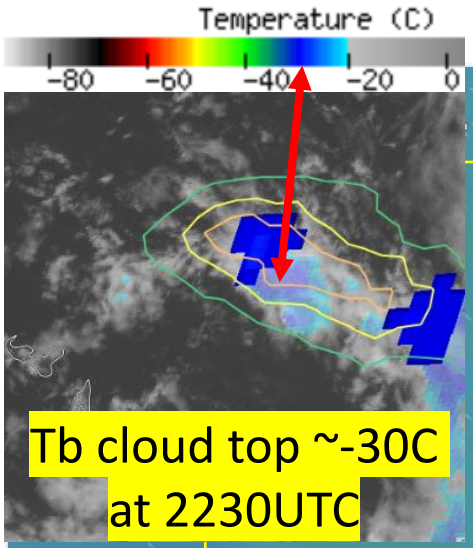
images courtesy Tonga Meteorological Service



images courtesy NOAA/CIMSS

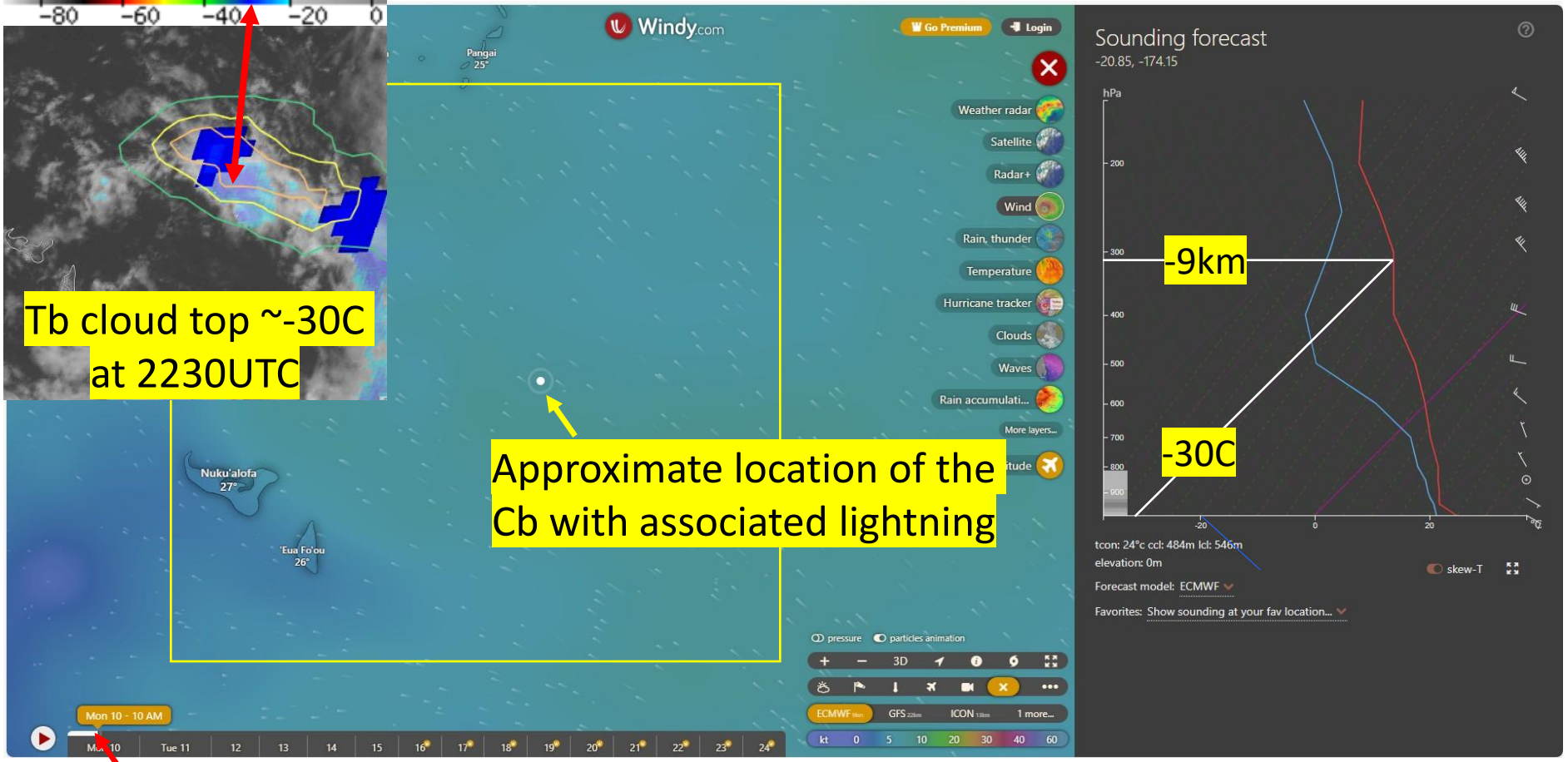
Appendix 1: Determination of storm top height at the time of the lightning, using ECMWF model data.

image courtesy NOAA/CIMSS



Tb cloud top ~-30C at 2230UTC

image courtesy Windy.com



NWP Forecast time 23UTC, 9th November 2025

Appendix 2: Evaluating the Parallax Error for the Storm

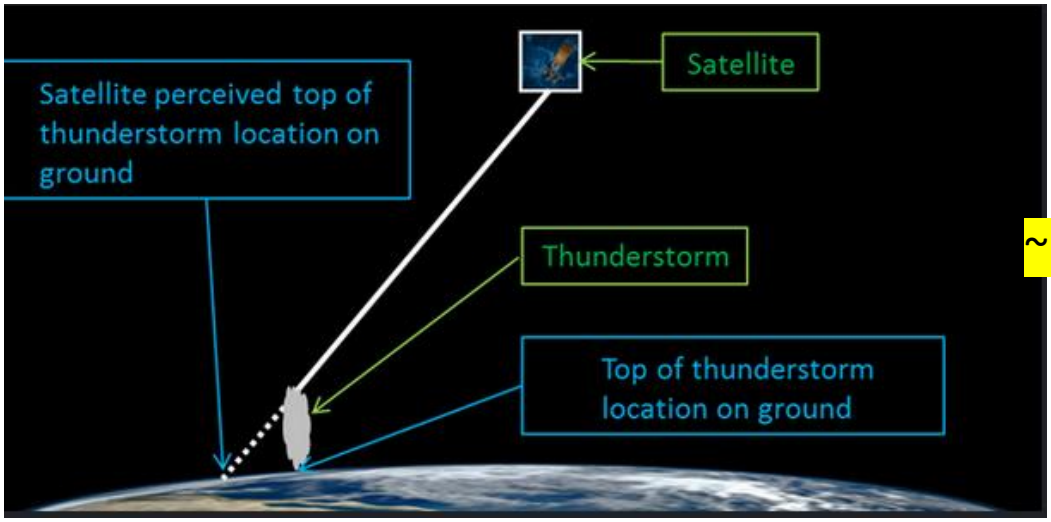
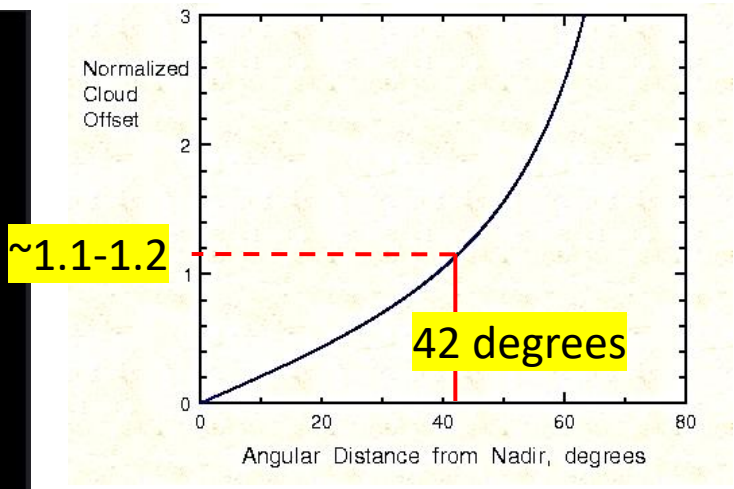


image modified from Satellite Liaison Blog submission by B.Line



from http://www-das.uwyo.edu/~geerts/cwx/notes/chap02/parallax.html

Tonga storm location	20.85° S, 174.15° W
GOES-18 sub-satellite	0, 137W
Distance from sub-satellite point	~42 degrees
Normalise cloud offset	~ 1.1-1.2
Storm top height	~9km (Tbb ~-30C)
Offset	~11 km away from (to southwest) of sub-satellite point

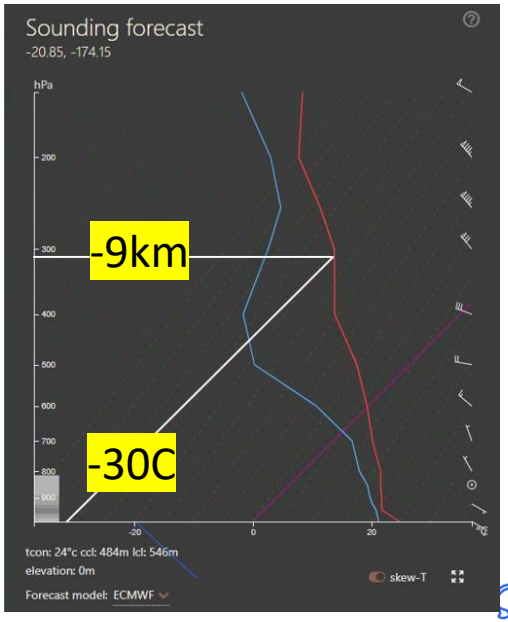


image from Windy

Australian VLab Centre of Excellence Regional Focus Group meeting, 02UTC 27th November 2025

Topics included

- **A summary of the 15th Asia Oceania Meteorological Satellite User Conference (AOMSUC-15):** presented by Bodo Zeschke, Bureau of Meteorology Training Centre.

- **Some follow up actions to AOMSUC-15, including a short Regional Case Study:** presented by Bodo Zeschke, Bureau of Meteorology Training Centre.

…. the time of the next Regional Focus Group meeting will be announced in future…

The Bureau of Meteorology

Thank You ☺

Bodo Zeschke,
Bureau of Meteorology Training Centre
Australian VLab Centre of Excellence