

Capacity Building in Radar Techniques in the Southeast Asia

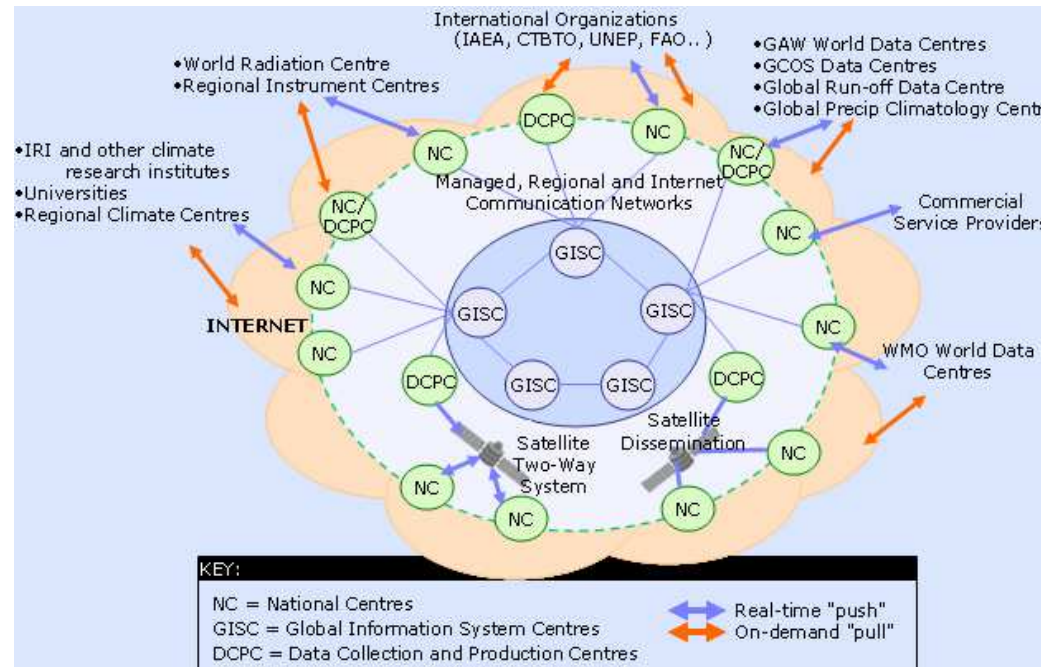
Hiroaki MINEMATSU

Planning Division, Administration Department
Japan Meteorological Agency (JMA)

JMA Workshop on WMO Information System Implementation
(Tokyo, Japan, 6-8 December 2016)

Why radar?

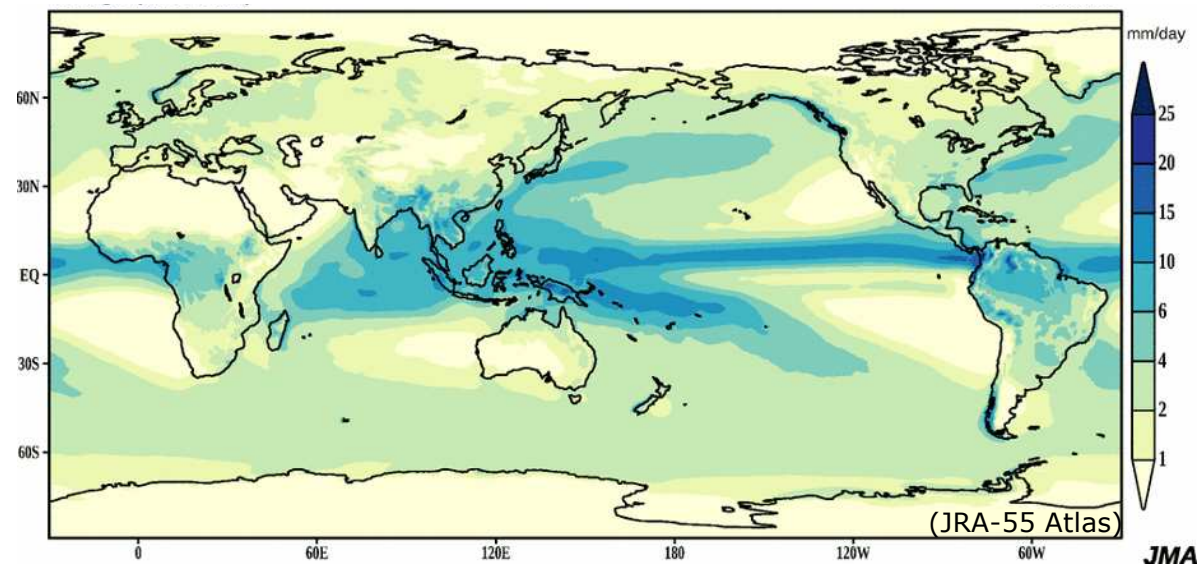
- Now that transport system (WIS, AMDCN) is ready, we have to deliver better items (= good quality observation data).
- Today, various observations are available.
- Our goal is to deliver better meteorological services to various users by the advanced communication network.



Why radar?

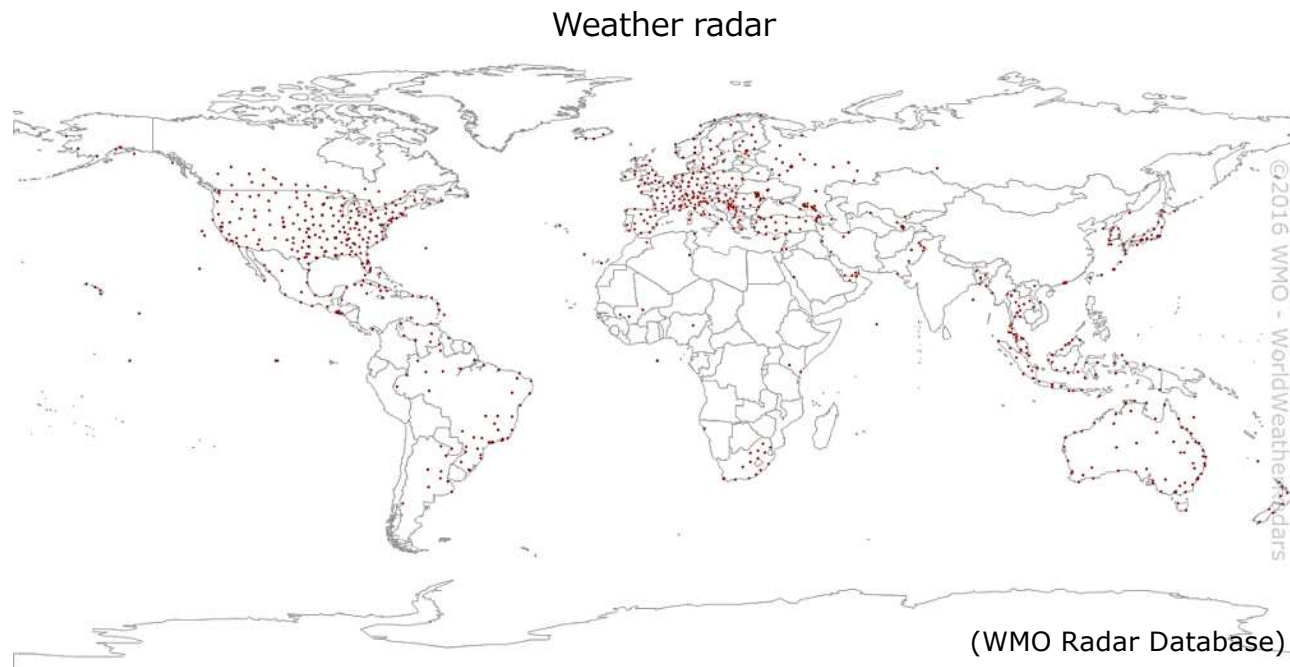
- The Southeast Asia countries share the unique meteorological nature characterized by frequent high-impact phenomena.
 - Tropical cyclones and severe convective weather
- The Disaster Risk Reduction (DRR, protecting lives and property) in this densely populated region is highly needed for the NMHSs.

Average annual precipitation during 1981-2010 (JRA-55 Atlas)



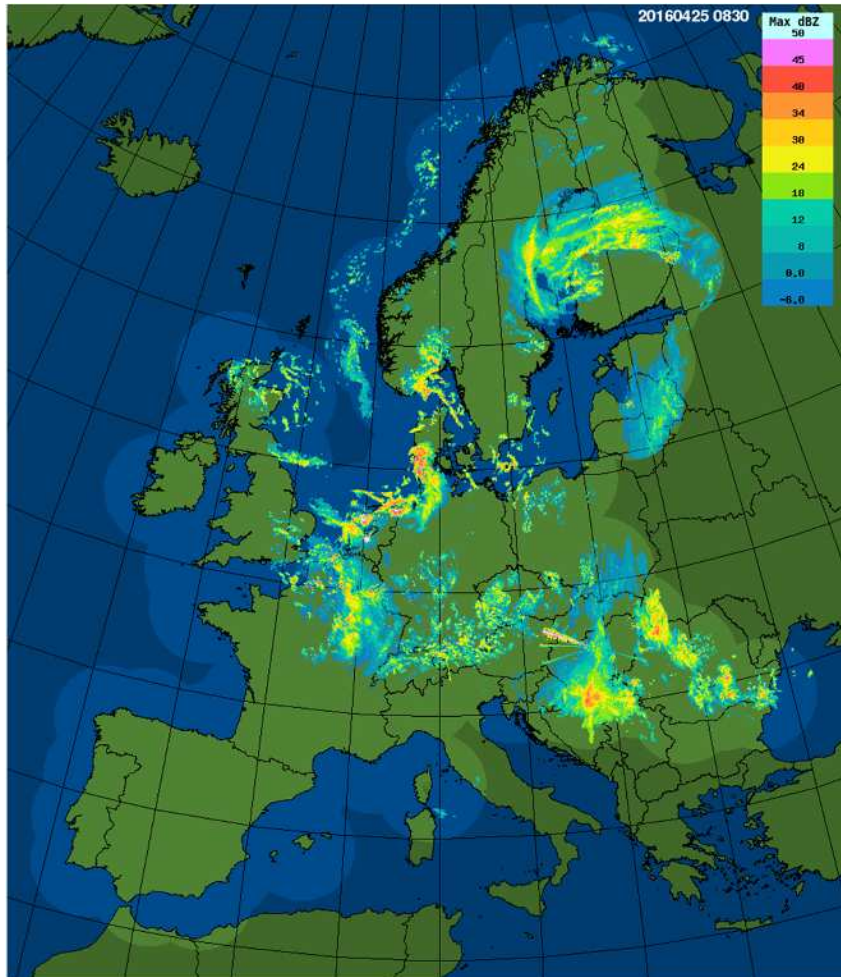
Why radar?

- Under the severe circumstances, the radar coverage is improving in Southeast Asia as well as other regions.
- To fulfill the DRR, the function of existing tools should be maximized because of limited resources.
- The international radar data sharing and composite is challenging but worth trying.



Advanced project in Europe

Example of composite (Max reflectivity)



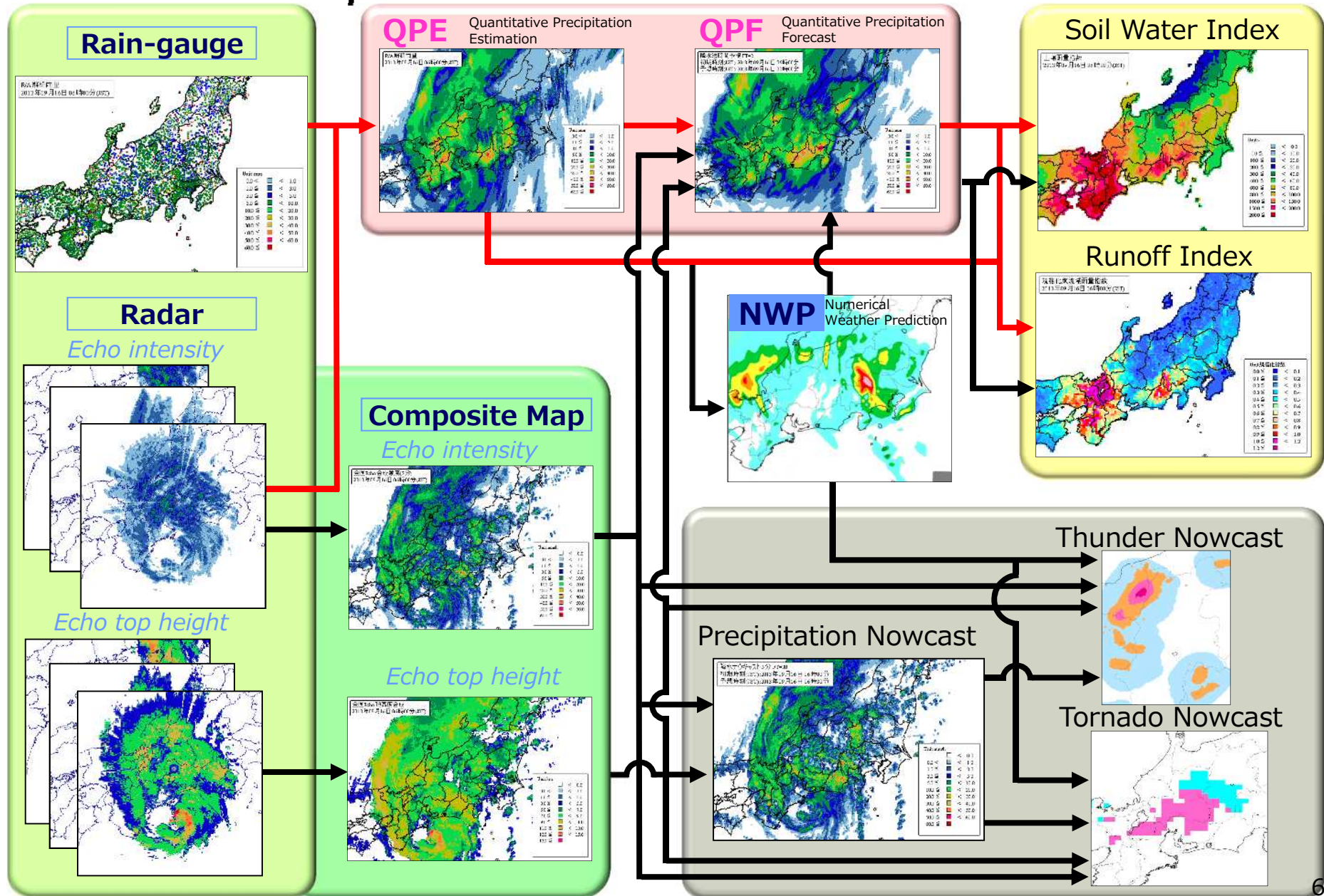
- The best practice of international radar data sharing and composite is OPERA in Europe (RA-VI).
- SE Asia (RA-II/V) is willing to go towards similar project.

The objectives of OPERA are:

to provide a European platform wherein expertise on operationally-oriented weather radar issues is exchanged.

to develop, generate and distribute high-quality pan-European weather radar composite products on an operational basis 5

Various products derived from radars



Recent challenges in SE Asia

WMO (WIGOS)

- Capacity Building in Radar Techniques in the Southeast Asia (2013-2016)
 - The subproject of "RA II WIGOS Project for Observing Systems Integration for Supporting Disaster Risk Reduction"
- Joint RA-II/RA-V Workshop on WIGOS for Disaster Risk Reduction (Jakarta, Oct. 2015)

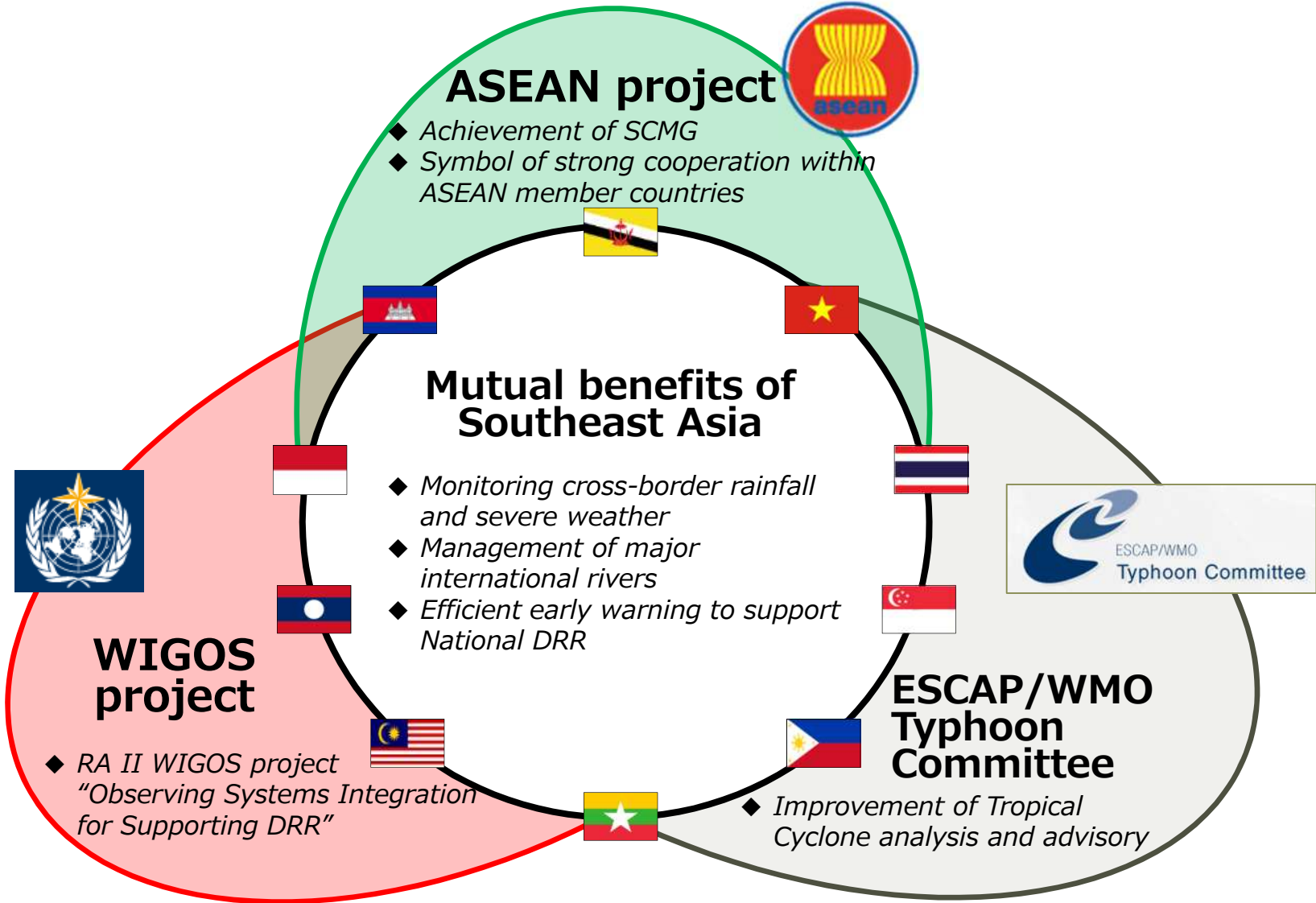
ASEAN

- Regional Training Workshop (Bangkok, Feb.–Mar. 2014)

ESCAP/WMO Typhoon Committee

- Development of regional radar network (2011-)
 - TMD has developed the techniques with JMA as a leading attempt of the project.
 - Experimental test of radar data sharing among TMD, MMD and JMA began in November 2016.

Synergies of radar projects in SE Asia



Regional WIGOS Project (2013-2016)

Capacity Building in Radar Techniques in the Southeast Asia

Type: Cross-regional Implementation Project (RAs II and V)

Key Regional Players: ASEAN-SCMG: Thailand, Malaysia

Completed

- ASEAN Regional Training Workshop on Weather Radar Maintenance, QPE and Forecast (Bangkok, 2014) with 20 participants from 7 ASEAN members.
- National reports of many ASEAN members on usage of weather radar to the 35th and consecutive ASEAN/SCMG annual meetings.
- TMD-JMA technical meetings on radar issues started in 2011 and followed by every year as activities of the WMO/ESCAP Typhoon Committee.
- Experimental international radar data exchange among TMD, MMD and JMA has started in 2016 as an activity of the WMO/ESCAP Typhoon Committee.
- MMD-JMA technical meetings on radar issues started in 2014.
- BMKG-JMA technical meetings on remote-sensing technology started in 2015.

On-going

- Continuous activities for capacity building on QA/QC techniques of weather radar in Southeast Asia through technical meetings.
- Experimental radar data exchange for radar composite map in Southeast Asia subsequent to the technical meetings on radar issues.
- Thailand proposed to hold Regional Training Workshop on Weather Radar Quality and Standardization at ASEAN/SCMG (Myanmar, Aug 2016).
- To be approved as RA II/V Joint WIGOS Project as proposed as Jakarta Declaration.
- Consider further involvement of other Members in the Regions.
- Consider the establishment of Coordination Group for effective management of the project.

9

ASEAN Radar Workshop (2014)



- Proposed jointly by Malaysia and Thailand
- Led by Japanese experts from JMA, radar manufacture and University

(Bangkok, Feb - Mar 2014)

- The good first step toward ASEAN radar composite !



Typhoon Committee project (2011-)

Cooperation between Thailand and Japan

Development of regional radar network (since 2011)

- **2011 JMA >> TMD**

Expert mission visited Thailand
(TMD Headquarters, Suvarnabhumi and Rayong radar stations, 7-9 Sep)

- **2012 JMA << TMD**

Attachment Training for TMD experts on radar composite techniques
(Tokyo, Japan, 19-22 Nov)

- **2013 JMA << TMD**

Technical Meeting on radar composite map for TMD and JMA experts
(Tokyo, Japan, 25-28 Nov)

- **2014 JMA << TMD**

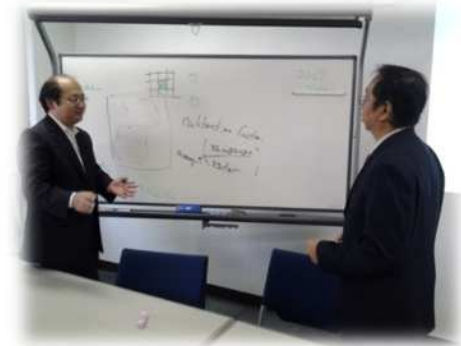
Technical Meeting on radar composite map for TMD and JMA experts
(Tokyo, Japan, 25-28 Nov)

- **2015 JMA >> TMD**

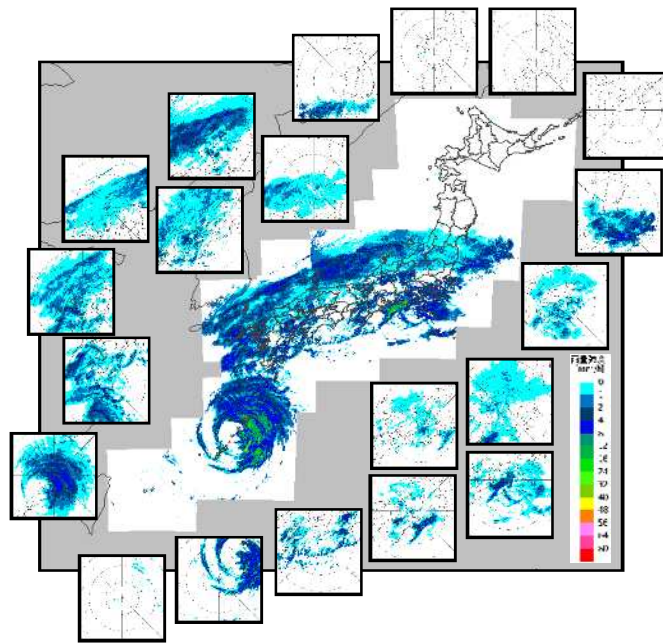
Technical Meeting on radar composite map for TMD and JMA experts
(Bangkok, 30 Nov-4 Dec)

- **2016 JMA << TMD**

Technical Meeting on radar composite map for TMD and JMA experts
(Tokyo, 29 Nov-2 Dec)

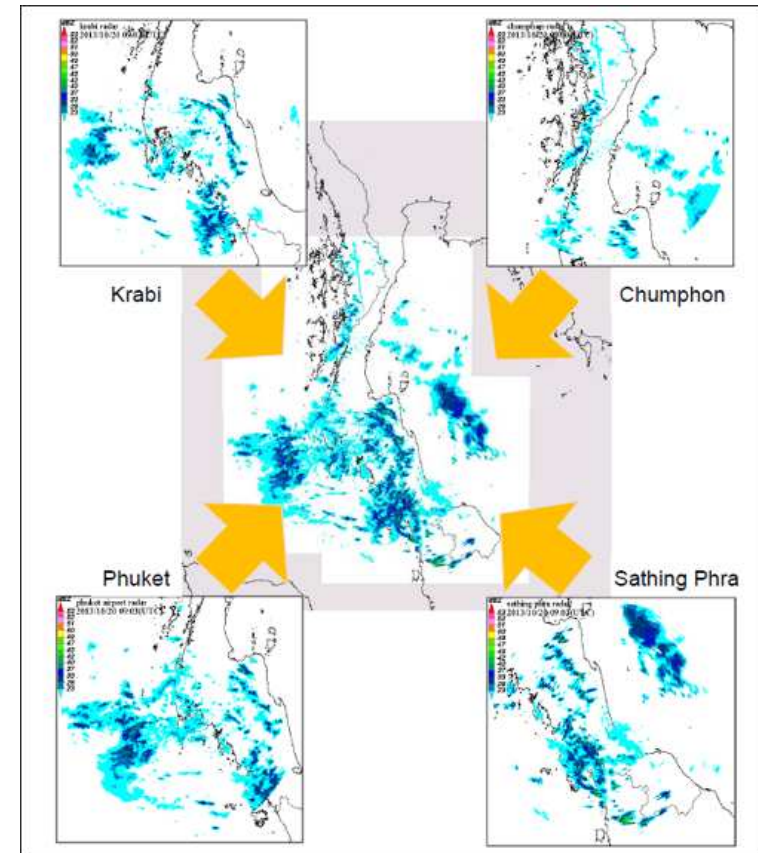


Typhoon Committee project (2011-) Cooperation between Thailand and Japan



Composite map in Japan

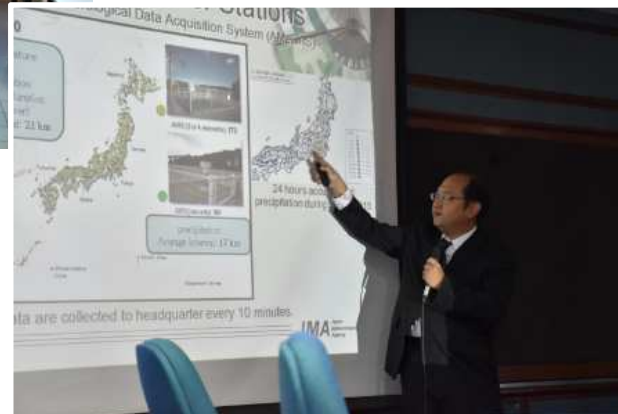
- The technical cooperation between TMD and JMA started in 2011.
- TMD successfully implemented the nationwide radar composite map in 2015.
- TMD, MMD and JMA began experimental radar data sharing in 2016.



Composite map in Thailand

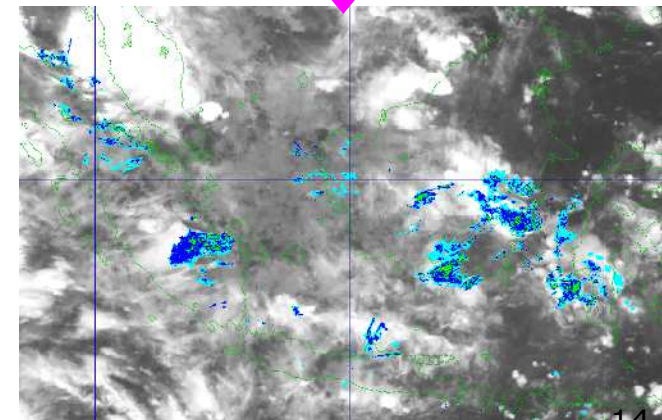
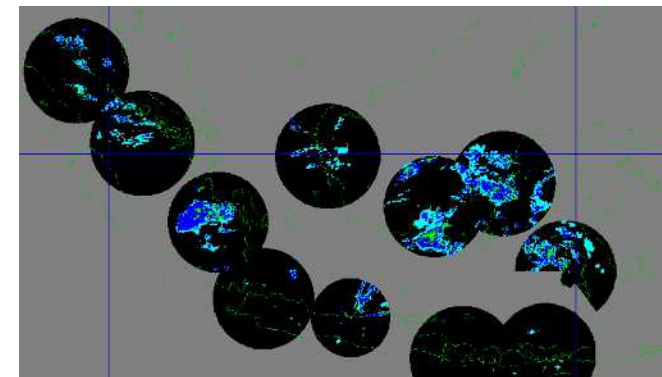
Cooperation between Malaysia and Japan

- MMD and JMA started technical cooperation for radar on bilateral basis.
- Weather Radar Workshop was held in 2015.
(Petaling Jaya, 2-6 November 2015)
- Another workshop is planned in 2016.
(Tokyo, 19-23 December 2016)



Cooperation between Indonesia and Japan

- BMKG and JMA started discussion on remote sensing technology including radar on bilateral basis.



Joint RA II/RA V Workshop on WIGOS (Jakarta, Indonesia, 12-14 October 2015)



Joint RA II/RA V Workshop on WIGOS

(Jakarta, Indonesia, 12-14 October 2015)

Jakarta Declaration

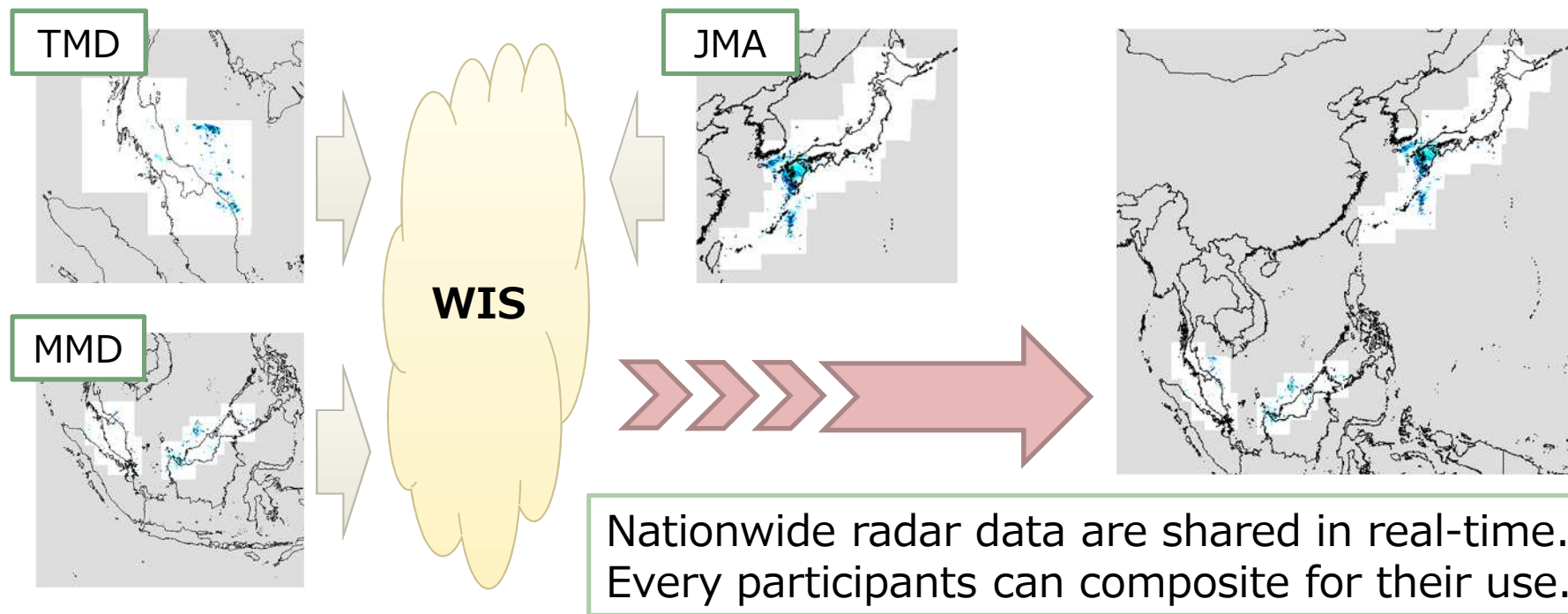
Participants in the Joint RA-II/RA-V Workshop on WIGOS for Disaster Risk Reduction propose

- A "Joint RA-II/RA-V WIGOS Radar Data Project" aiming at
 - (i) improvement of data quality of existing radars,
 - (ii) development and expansion of national radar networks,
 - (iii) near real time international exchange of radar data,
 - and
 - (iv) development of «sub-regional» radar data centre(s);

Achieved radar data sharing in SE Asia

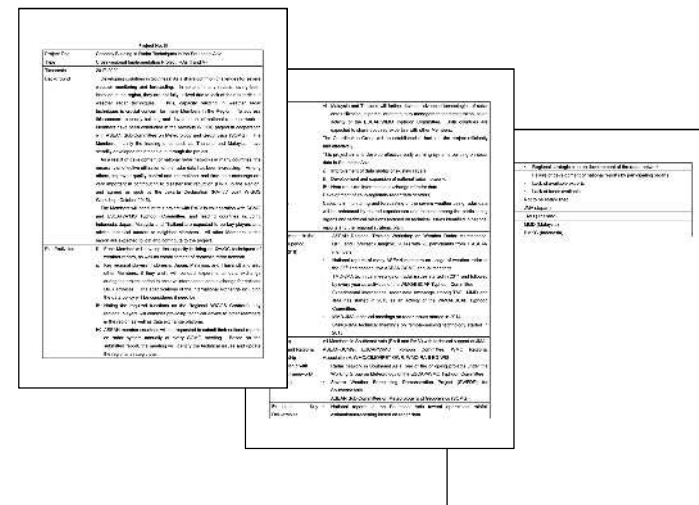
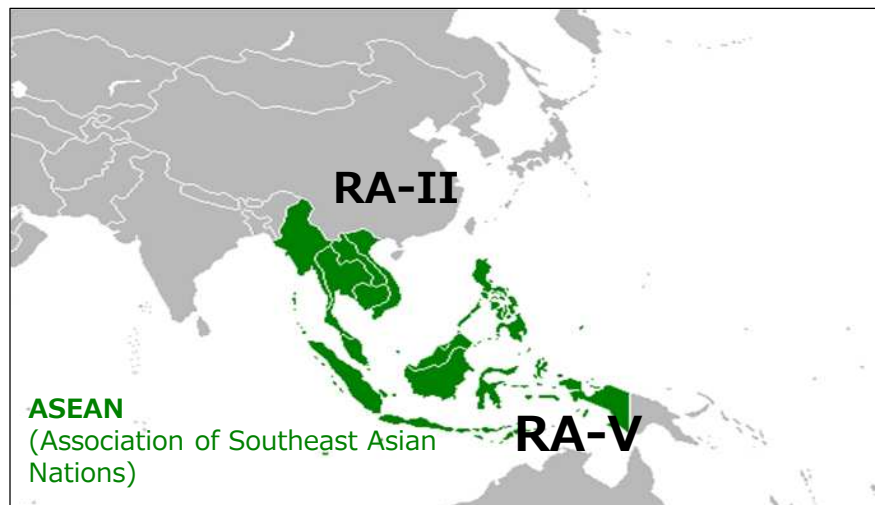
Experimental sharing among MMD, TMD and JMA

- MMD, TMD and JMA began the experimental radar data sharing this November.
- The sharing is expected to be a pioneer of a deliverable of the WIGOS project.
 - Started as a Typhoon Committee project

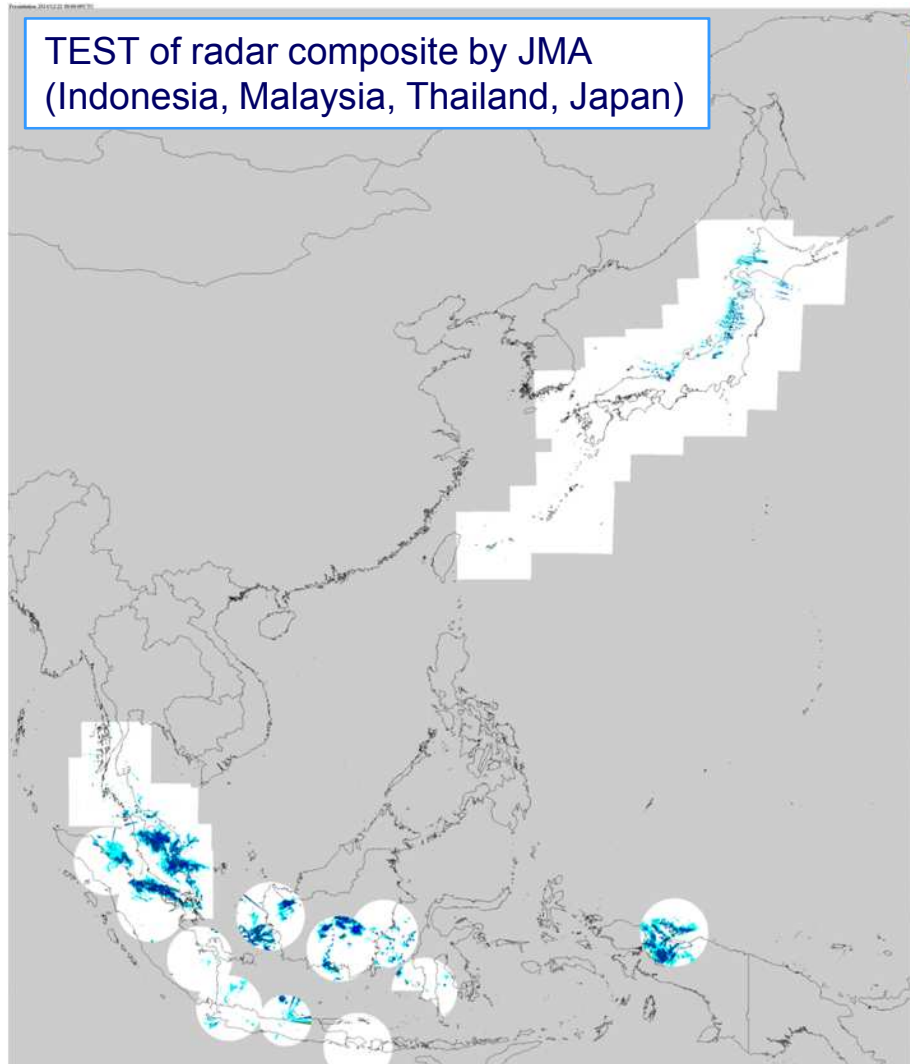


Future challenge of the radar project

- Planning the next regional WIGOS projects is ongoing.
 - Jakarta Declaration will be approved as the WIGOS project officially.
(RA-II meeting in UAE, February 2017)
- >> The activities will be boosted further.

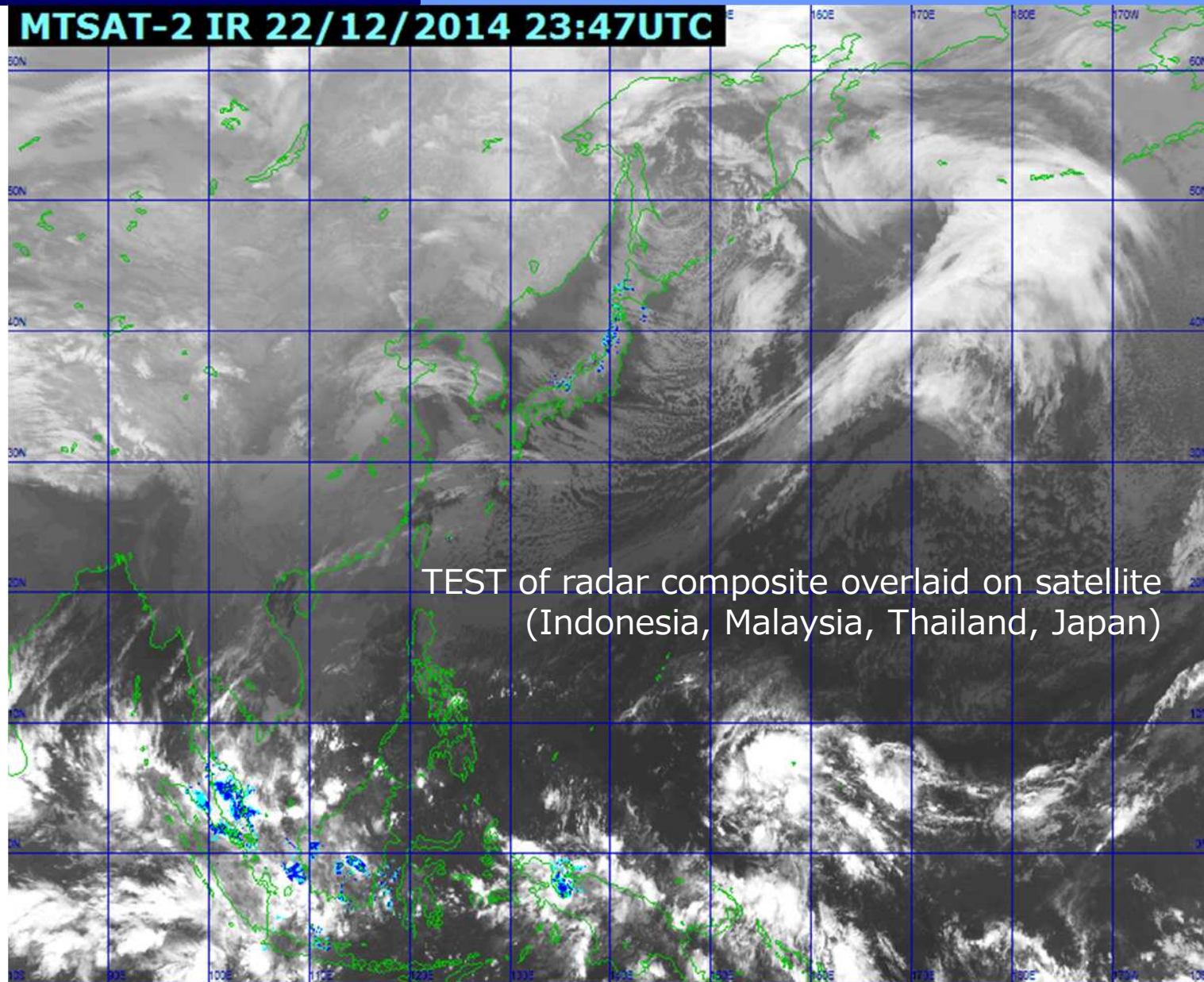


Future challenge of the radar project



- The coverage of the radar data is expected to expand in SE Asia.
- Stable communication network and radar operation, and radar data processing techniques are keys of the project.

Future challenge of the radar project



Benefits through the radar project

- Capacity in monitoring and forecasting of the severe weather using radar data will be enhanced.
 - Monitoring cross-border rainfall and severe weather
 - Management of major international rivers
 - Efficient early warning to support National DRR
- >> Technical challenges will be shown in the following sessions.

Thank you for listening.