SATREPS MCCOE ACTIVITIES TO SUPPORT CINDY/DYNAMO 2011 CAMPAIGN OVER INDONESIA MARITIME CONTINENT

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Agency for the Assessment and Application of Technology (BPPT)

and

Shuichi Mori
Japan Agency for Marine-Earth Science and Technology (JAMSTEC)


BPPT
OUTLINES:
• SATREPS MCCOE
• RESEARCH FACILITIES
• PROPOSED CAMPAIGN: HARIMAU IOP 2011

Science and Technology Research Partnership for Sustainable Development (SATREPS)

Climate Variability Study and Societal Application through Indonesia-Japan Maritime Continent Center of Excellence (MCCOE) – Radar-Buoy Network Optimization for Rainfall Prediction

BPPT LAPAN BMKG JICA JST RISH JAMSTEC

Kick-off Workshop (March 9, 2010; Bali)

Climate Variability Study and Societal Application through Indonesia-Japan "Maritime Continent COE"
- Radar-Buoy Network Optimization for Rainfall Prediction

A Scientific & Technology Research Partnership for Sustainable Development (**SATREPS-MCCOE**)

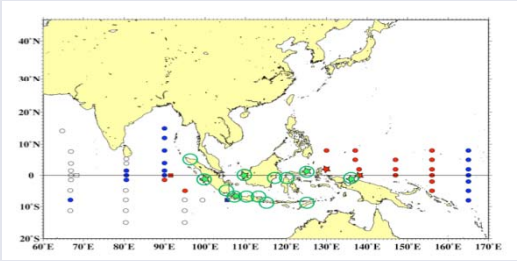
Obs. Center Facility

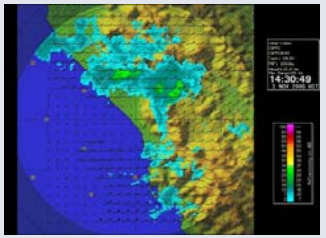
Radar NW operations

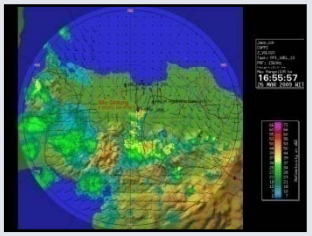
Buoy NW maintenance

Contribution to GEO

Data Center Facility



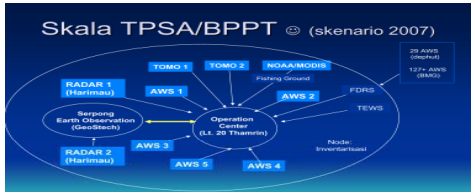




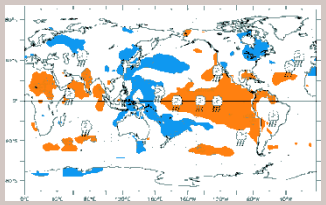
Data application (domestic/international, scientific/social)

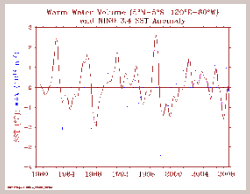
"Maritime Continent COE"

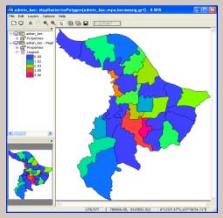
Data network (NEONET)

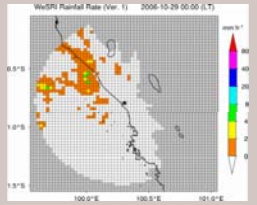


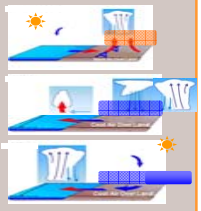
Research Center Facility



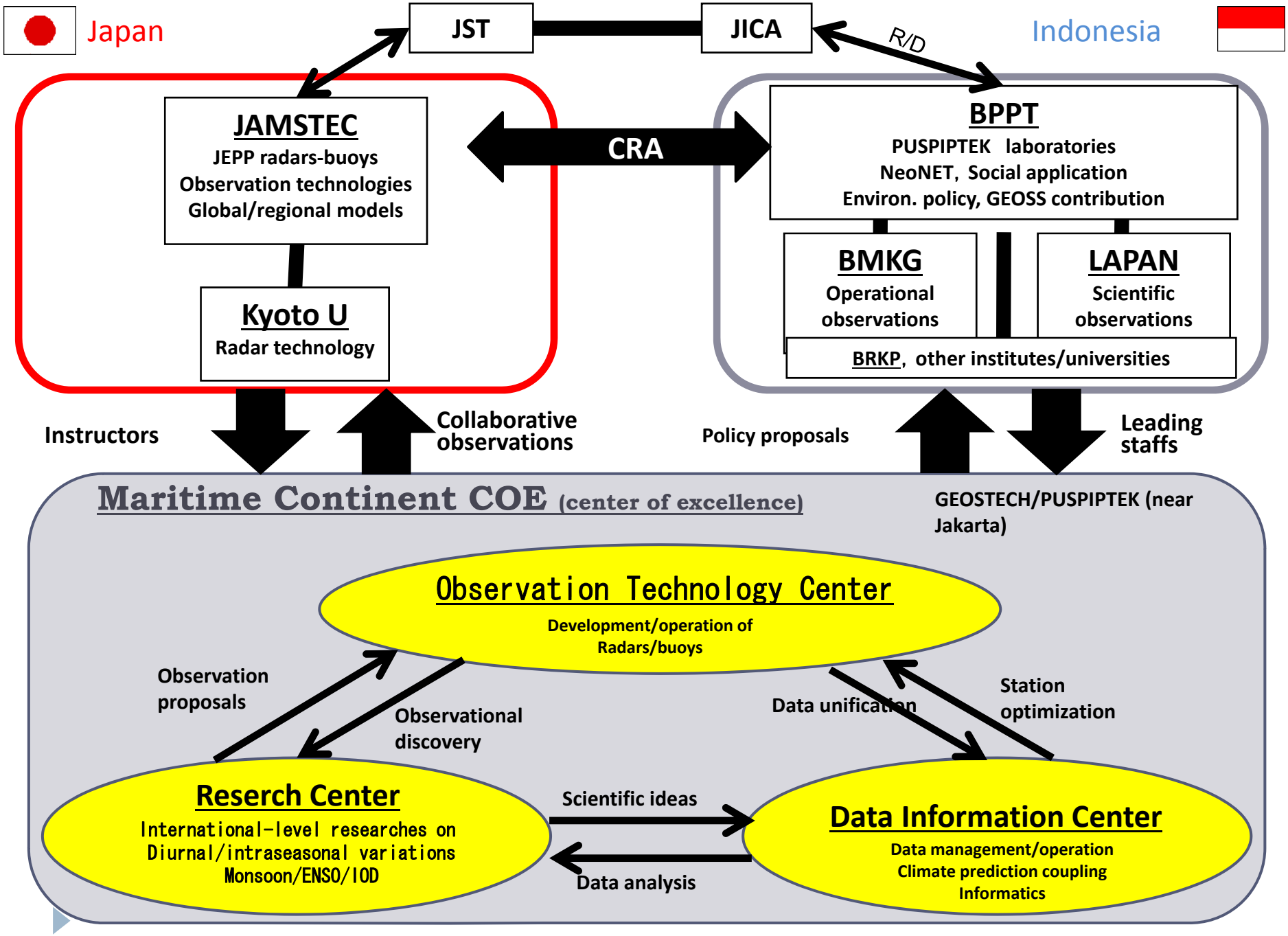








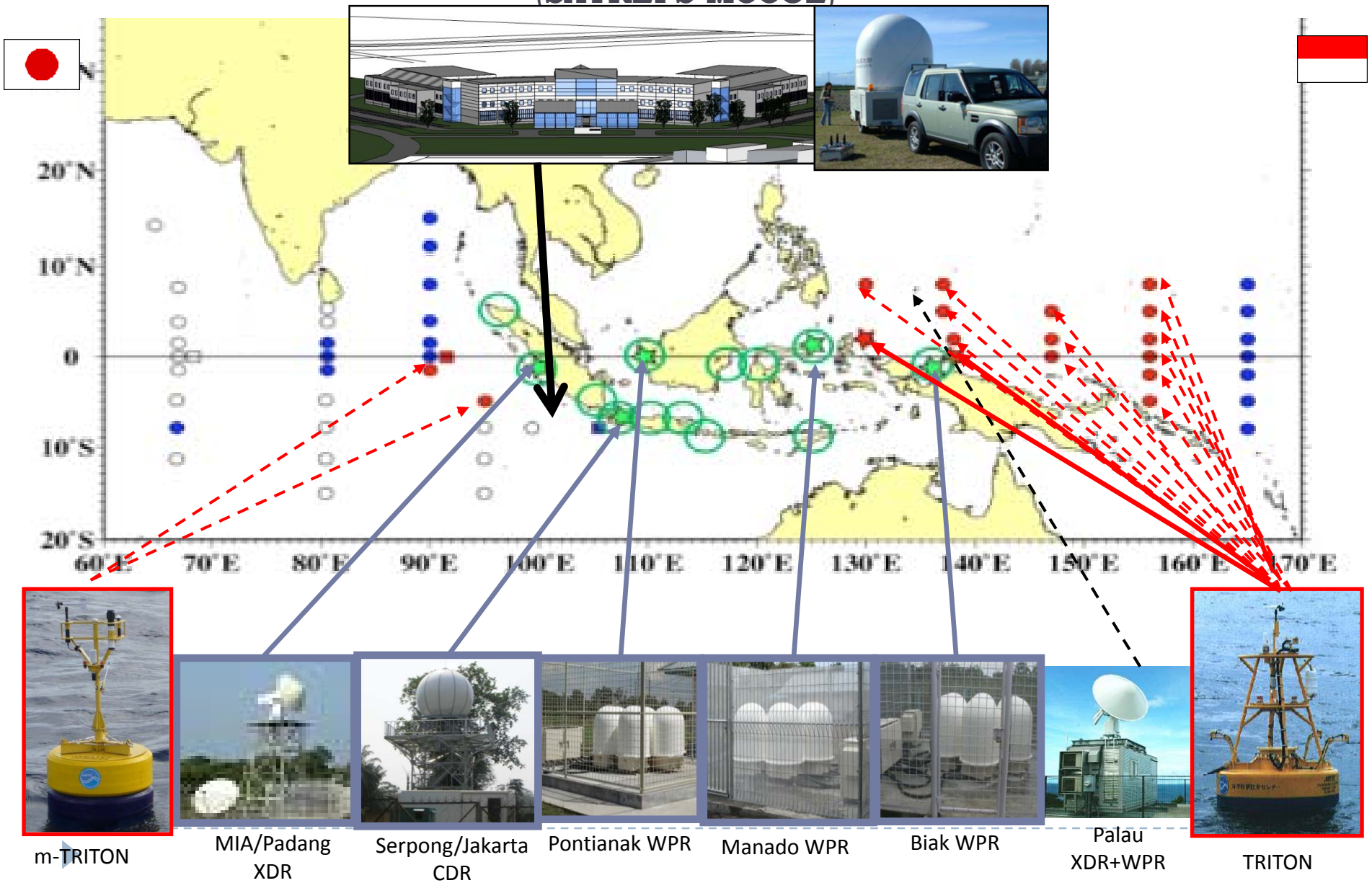
Contribution to international scientific community / domestic policy


Japan
JST
JICA
R/D
Indonesia
JAMSTEC
JEPP radars-buoys
Observation technologies
Global/regional models
CRA
BPPT
PUSPIPTEK laboratories
NeoNET, Social application
Environ. policy, GEOSS contribution
Kyoto U
Radar technology
BMKG
Operational observations
LAPAN
Scientific observations
BRKP, other institutes/universities
Instructors
Collaborative observations
Policy proposals
Leading staffs
Maritime Continent COE (center of excellence)
GEOSTECH/PUSPIPTEK (near Jakarta)
Observation Technology Center
Development/operation of Radars/buoys
Observation proposals
Observational discovery
Data unification
Station optimization
Reserch Center
International-level researches on
Diurnal/intraseasonal variations
Monsoon/ENSO/IOD
Scientific ideas
Data analysis
Data Information Center
Data management/operation
Climate prediction coupling
Informatics

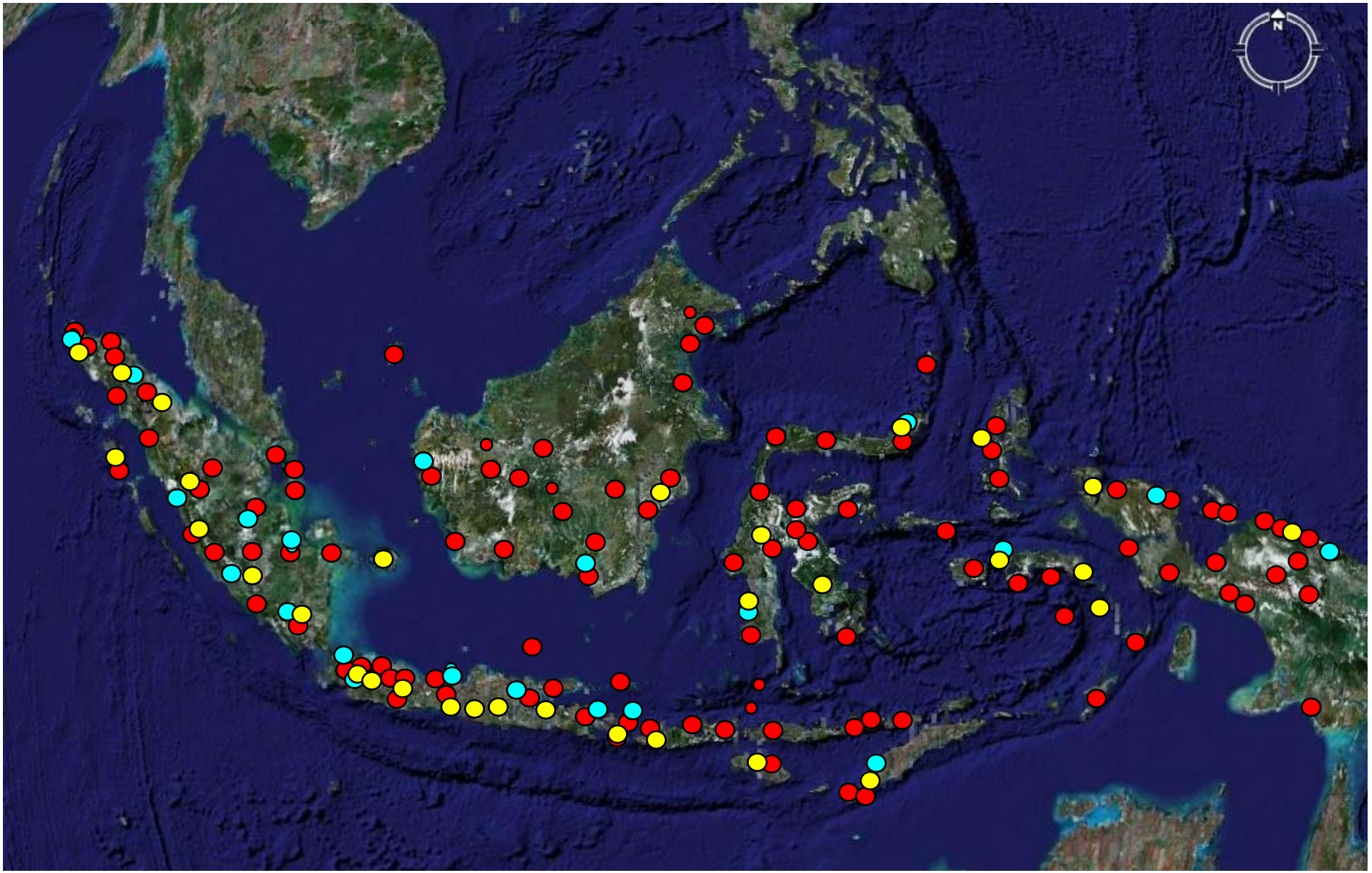
Climate Variability Study and Societal Application through Indonesia-Japan "Maritime Continent COE" Radar-Buoy Network Optimization for Rainfall Prediction

A Scientific & Technology Research Partnership for Sustainable Development

(SATREPS-MCCOE)

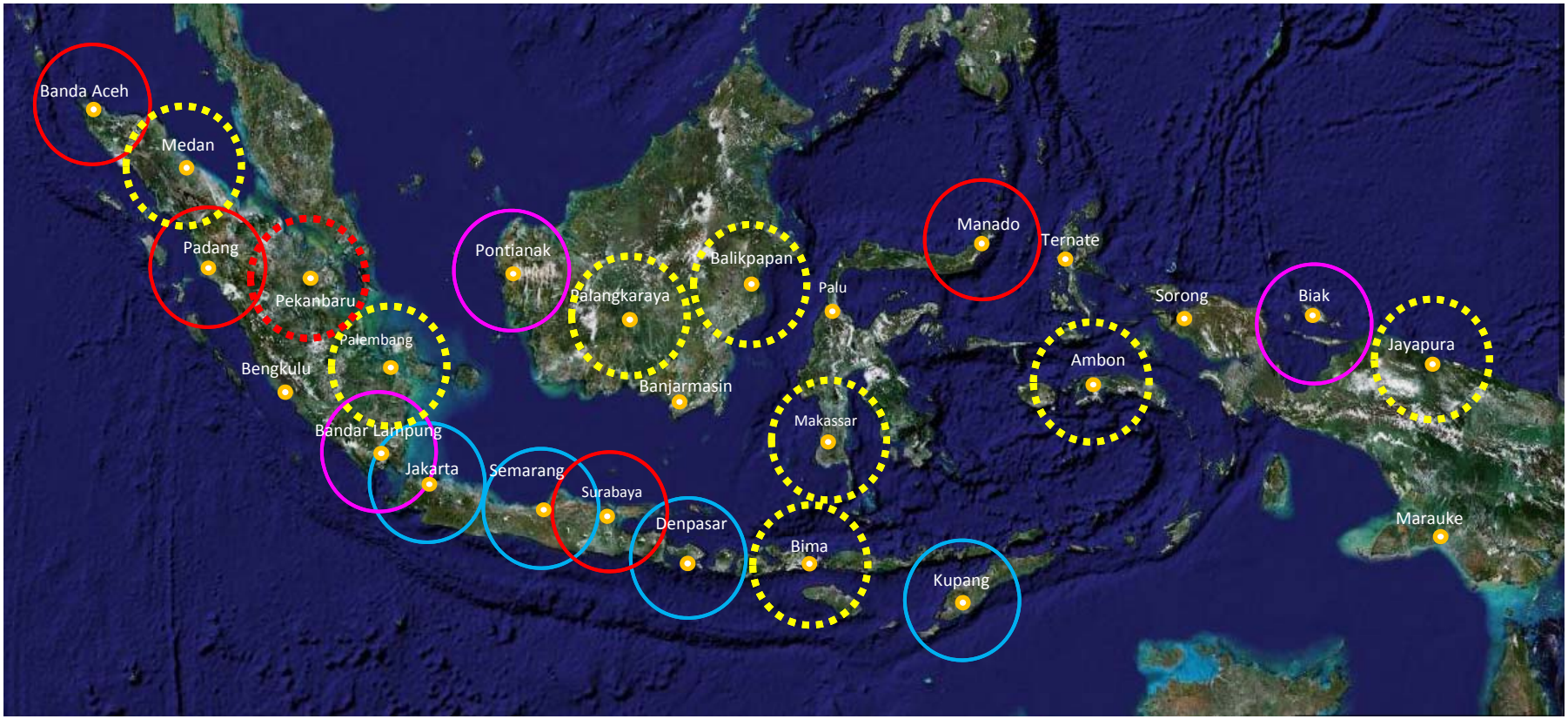


BMKG STATION NETWORK



Stasiun Meteorologi (120) Stasiun Geofisika (31) Stasiun Klimatologi (21)

BMKG WEATHER RADAR NETWORK



TA 2006 – 4 LOKASI

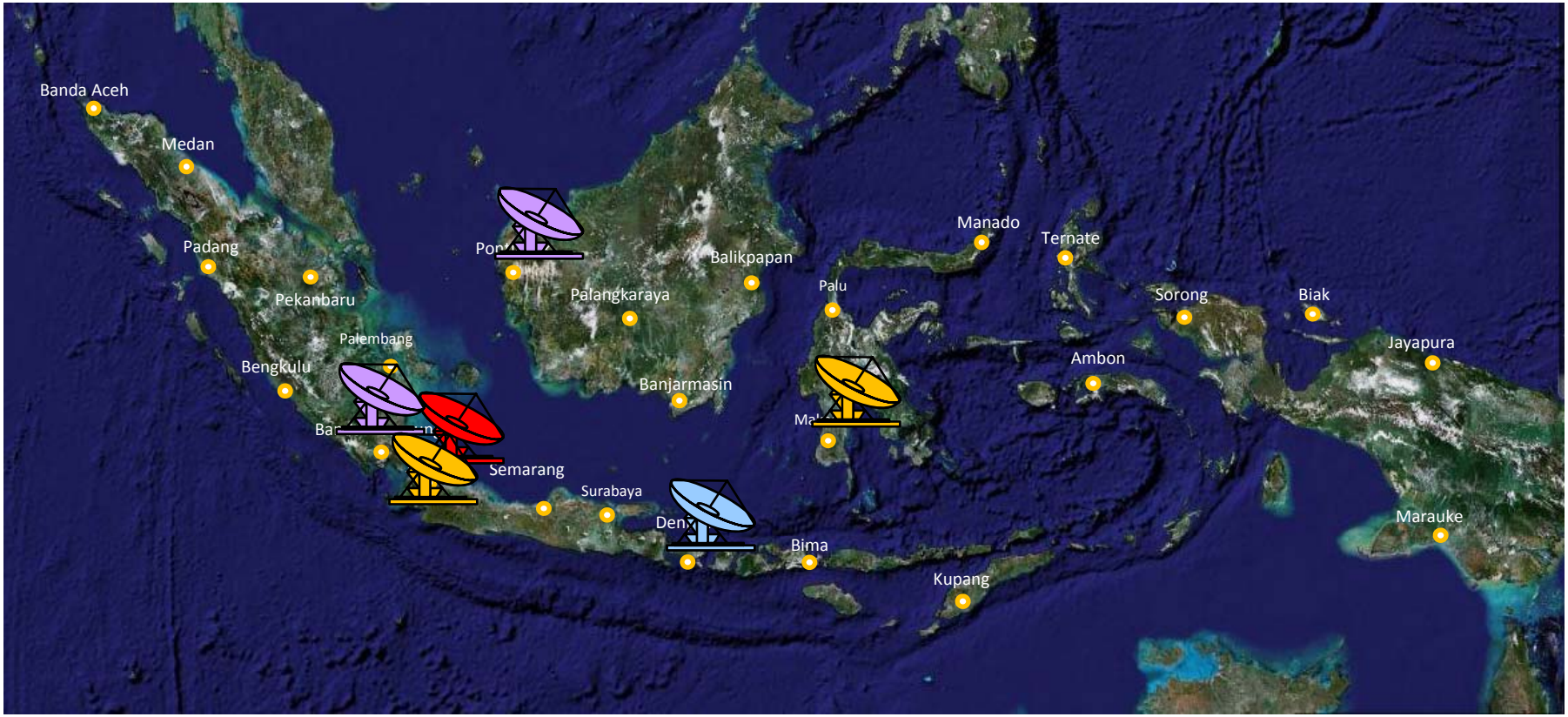
TA 2007 – 3 LOKASI

TA 2008 – 4 LOKASI

TA 2009 – 8 LOKASI

TA 2010 – 1 LOKASI

BMKG GROUND SATELLITE RECEIVER NETWORK



TA 2006 – 1 Lokasi

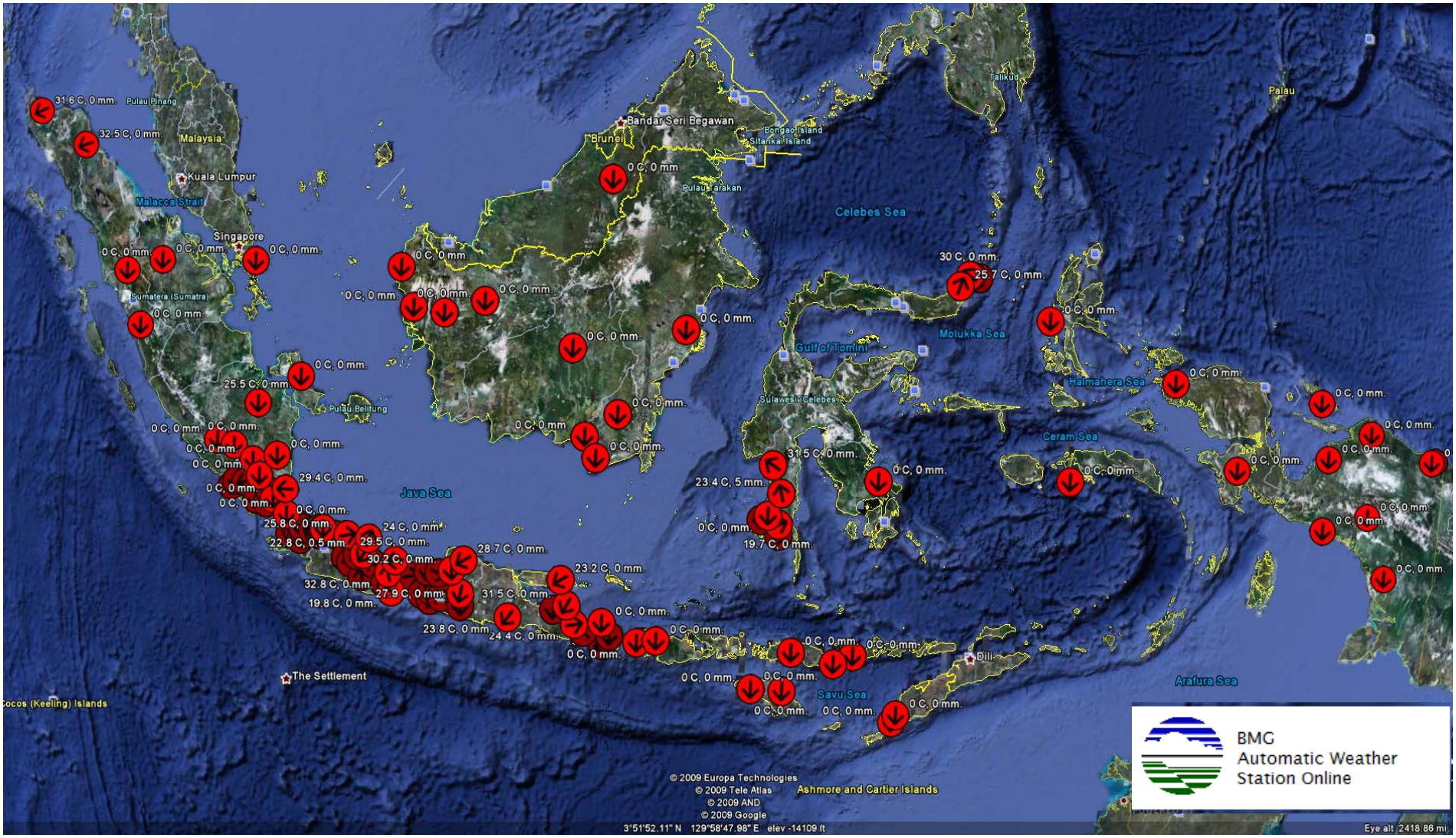
TA 2007 – 2 Lokasi

TA 2008 – 1 Lokasi

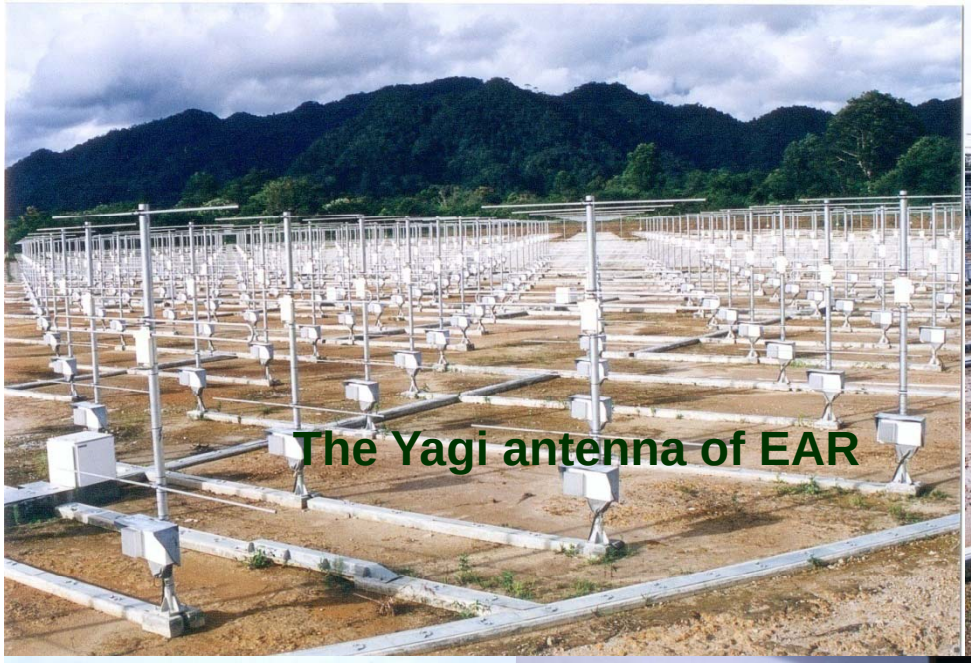
TA 2009 – 2 Lokasi

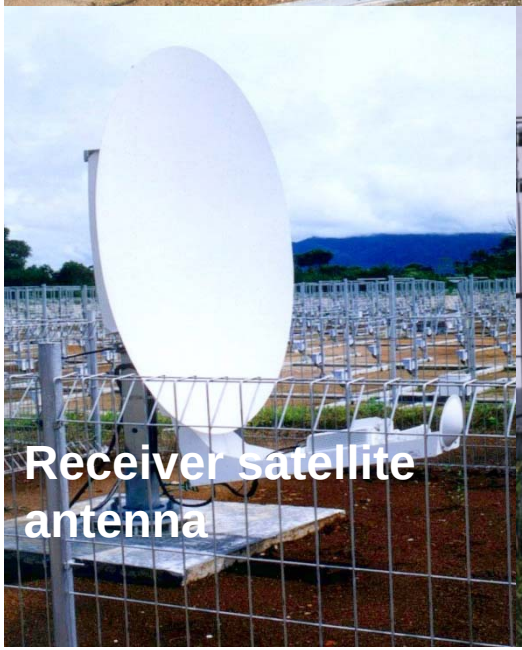
BMKG AUTOMATIC WEATHER STATION NETWORK

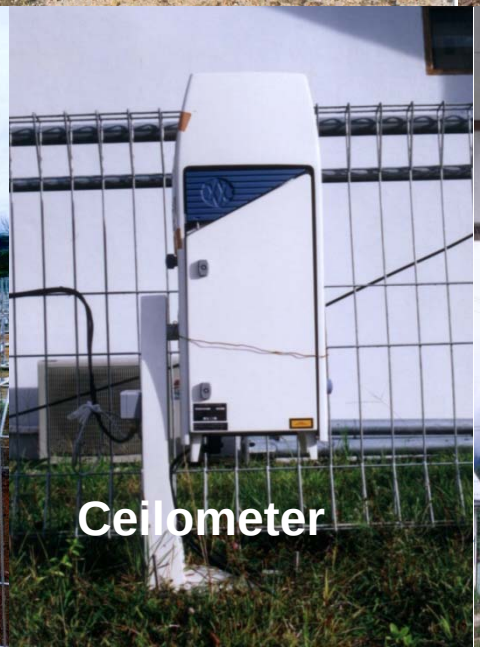
(126 AWS)

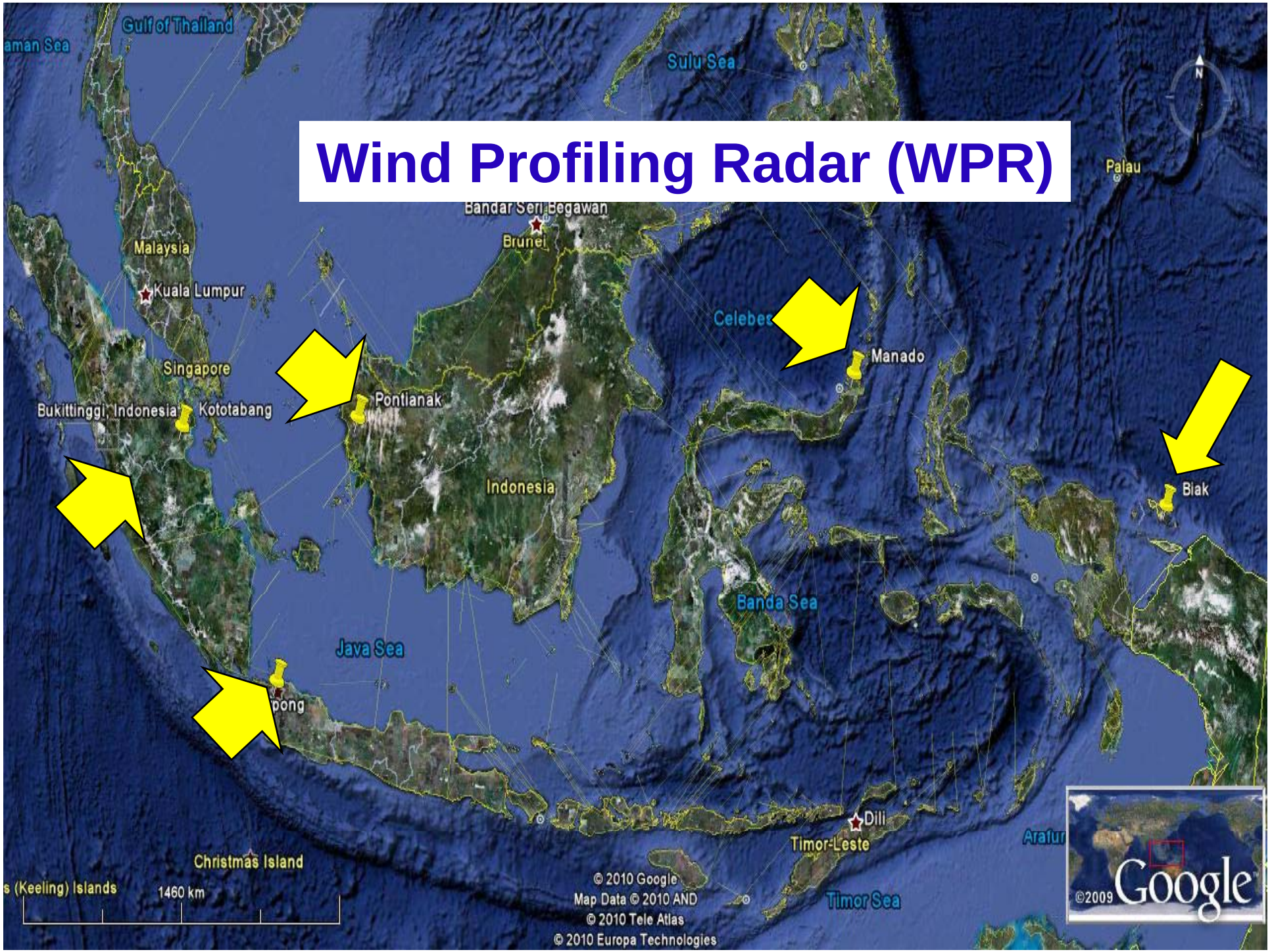


LAPAN KOTATABANG OBSERVATORY STATION








Wind Profiling Radar (WPR)
Gulf of Thailand
Sulu Sea
Palau
Malaysia
Kuala Lumpur
Bandar Seri Begawan
Brunei
Celebes
Manado
Singapore
Bukittinggi, Indonesia
Kototabang
Pontianak
Indonesia
Biak
Banda Sea
Java Sea
Dili
Timor-Leste
Christmas Island
1460 km
© 2010 Google
Map Data © 2010 AND
© 2010 Tele Atlas
© 2010 Europa Technologies
Timor Sea
©2009 Google

Japan EOS Promotion Program (JEPP) + Indonesian Research/Technology Grant

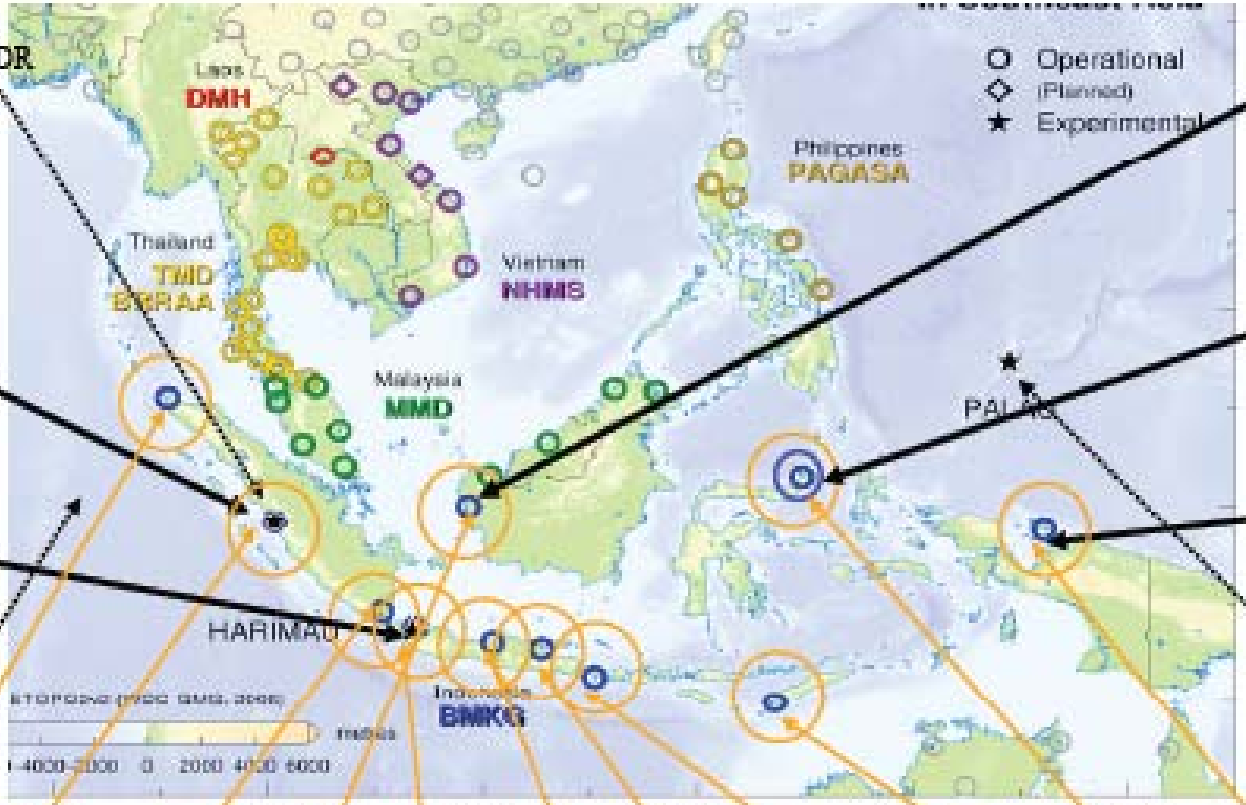
Hydrometeorological Array for ISV-Monsoon Automonitoring (HARIMAU)

Kototabang EAR_BLR_XDR
KU + LAPAN

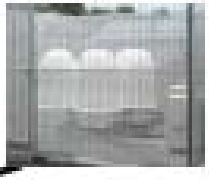
MIA XDR

Serpong CDR

Mirai CDR
JAMSTEC



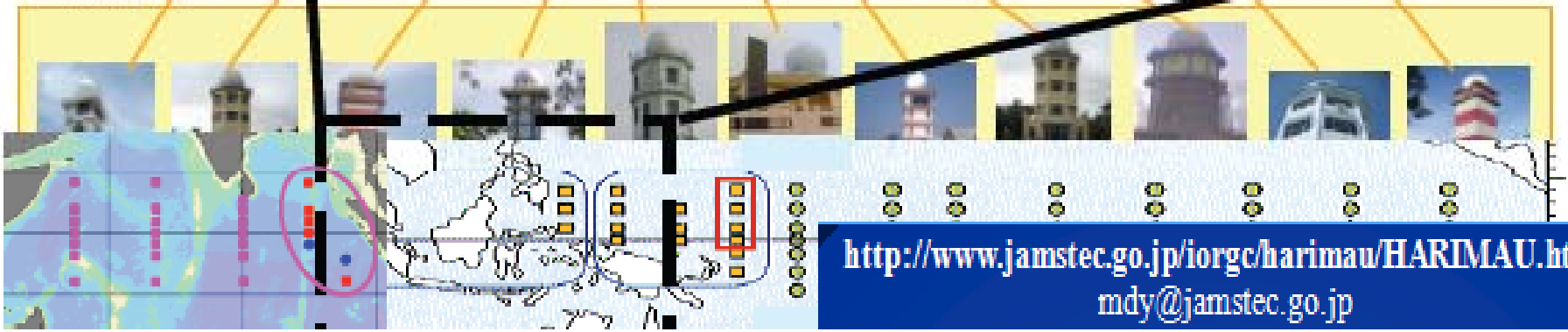
Pontianak WPR



Manado WPR

Biak WPR

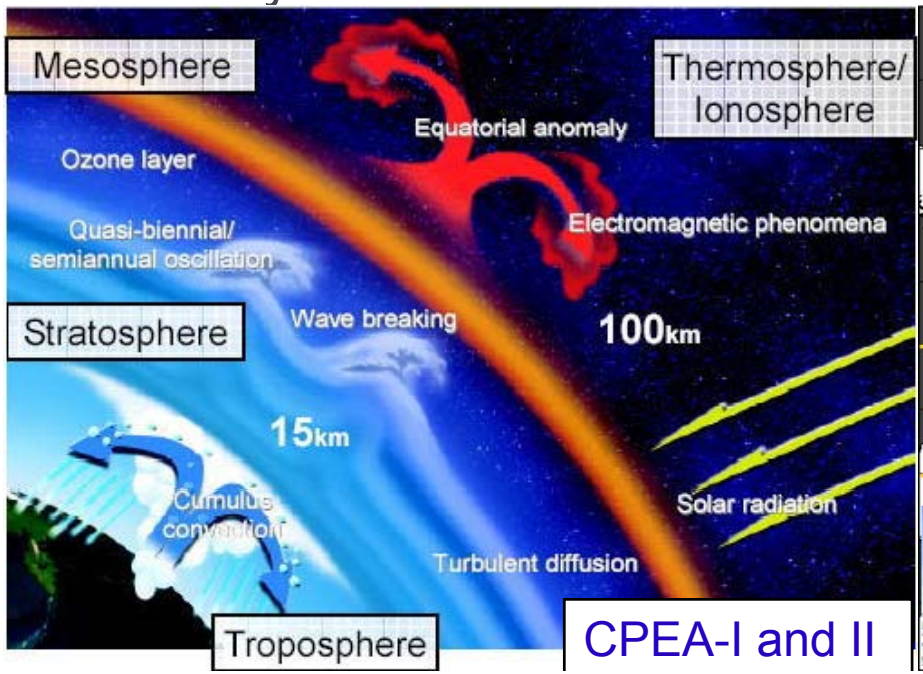
Palau XDR+WPR
JAMSTEC



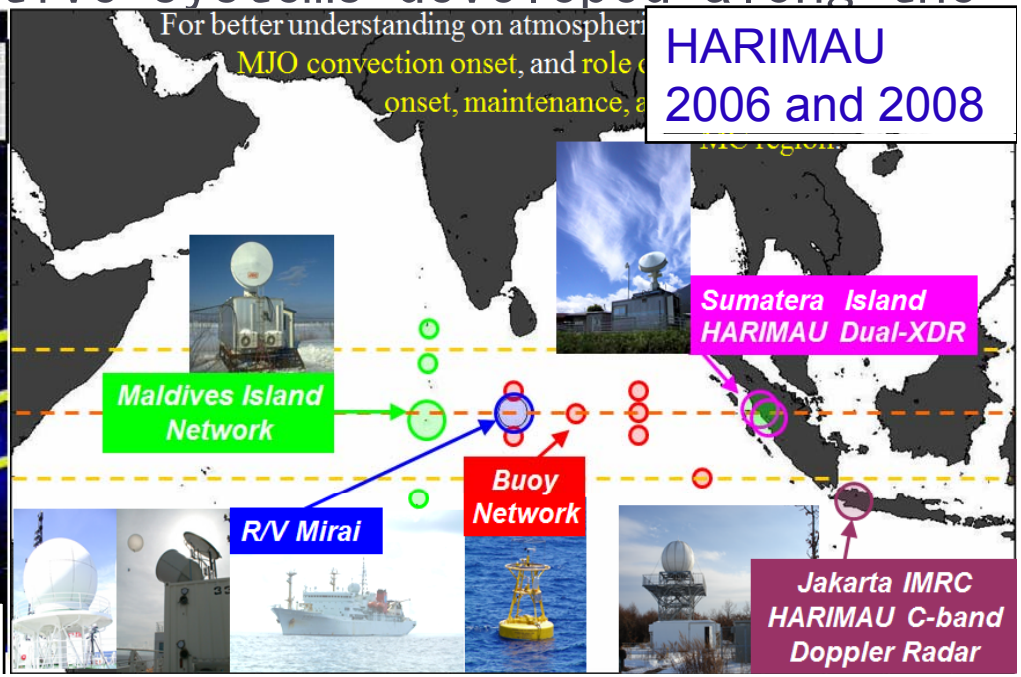
http://www.jamstec.go.jp/iorgc/harimau/HARIMAU.html
mdy@jamstec.go.jp

HARIMAU-II 2011 IOP: Background

- Series of campaign observation
  - CPEA-I (2004), CPEA-II (2005) lead by Kyoto Univ. and LAPAN:
    Study on coupling processes in the equatorial atmosphere using EAR, BLR, XRR, etc. in the mountainous region over Sumatera Island.
  - HARIMAU2006, HARIMAU2008 led by JAMSTEC and BPPT:
    Study on mesoscale convective systems developed along the

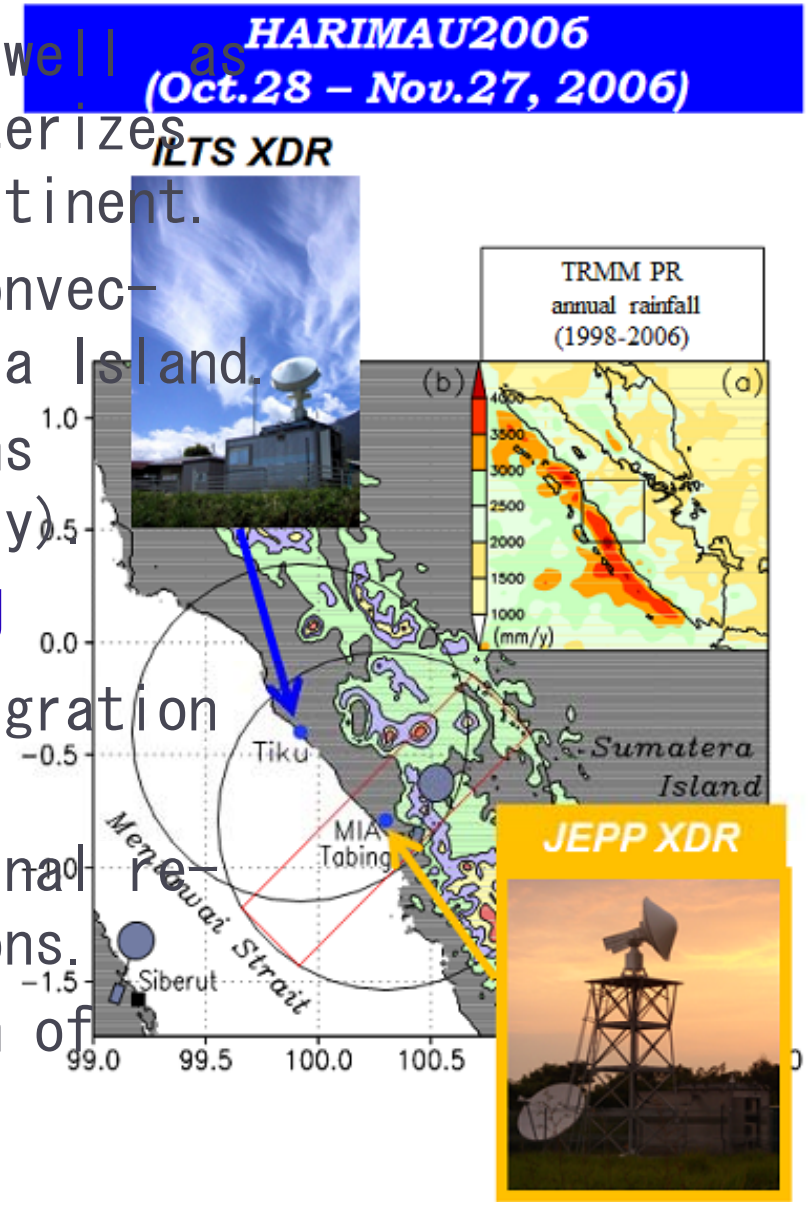


CPEA-I and II

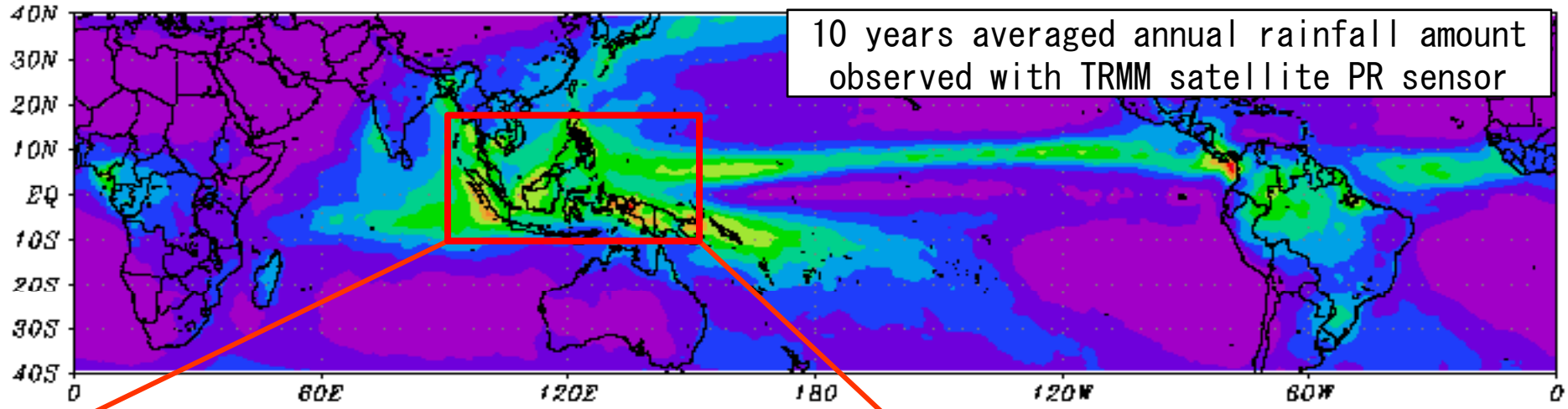


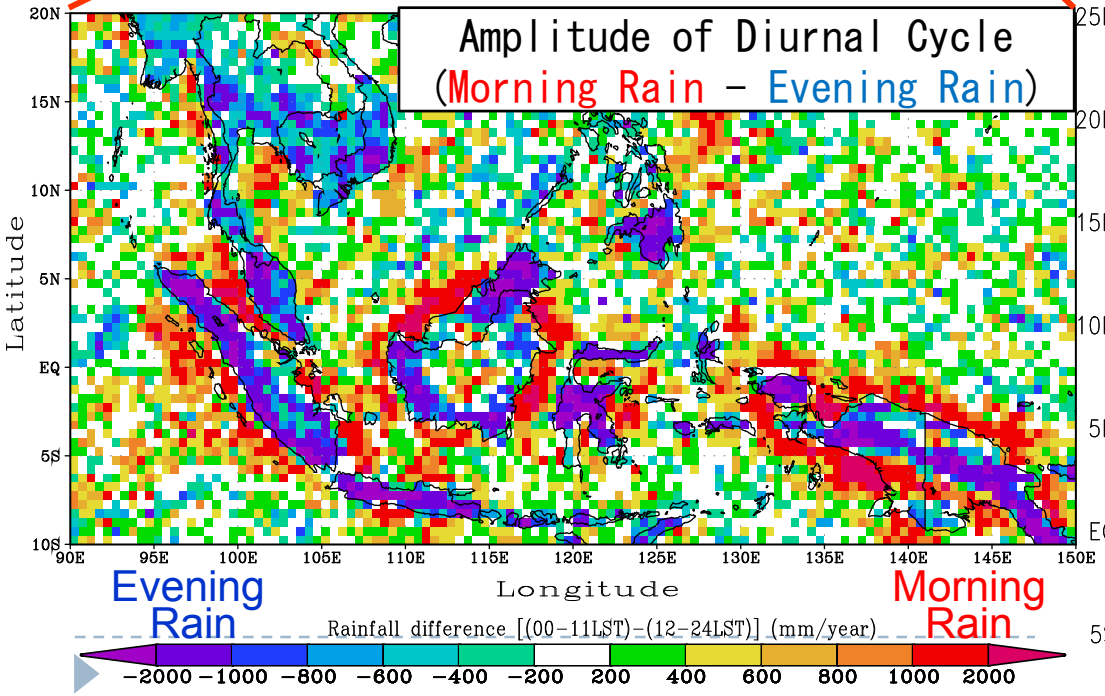
HARIMAU-II 2011 IOP: Background

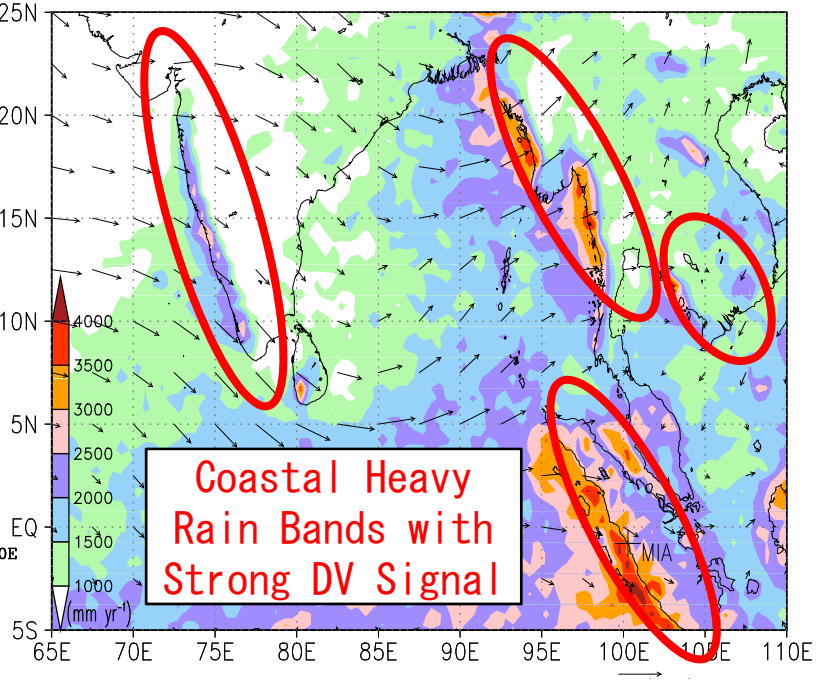
- What we learned from CPEA and HARIMAU
  - Importance of diurnal cycles as well as ISVs including MJO which characterizes regional climate in Maritime Continent.
  - Diurnal land-sea migration of convections along coastline of Sumatera Island.
  - Modulation of diurnal convections affected by ISVs (AM radio theory).
- Aims and Scope of post HARIMAU
  - Mechanism of diurnal land-sea migration of coastal convections.
  - Cloud physical process of nocturnal re-development of coastal convections.
  - Dynamics of upscale organization of Coastal Heavy Rainband (CHeR).



Global Rainfall Distribution and Diurnal Variation

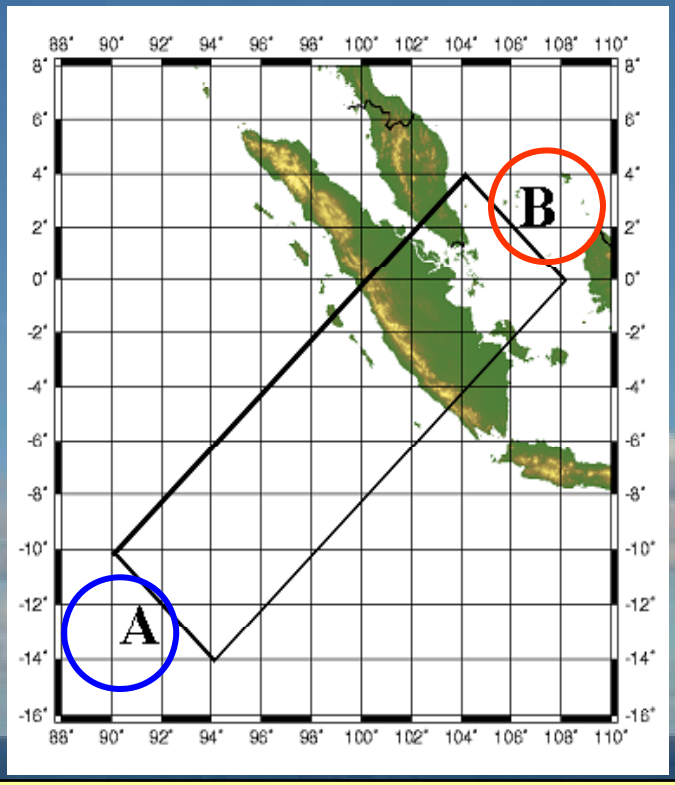


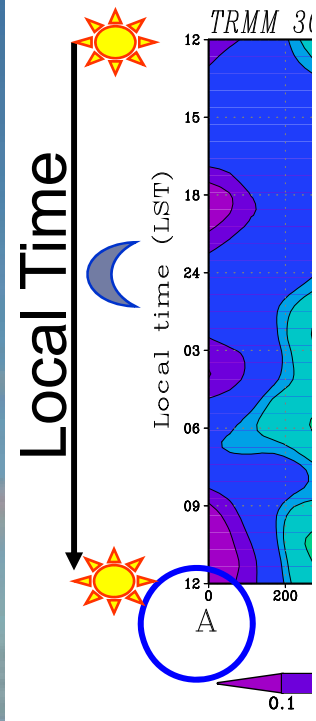


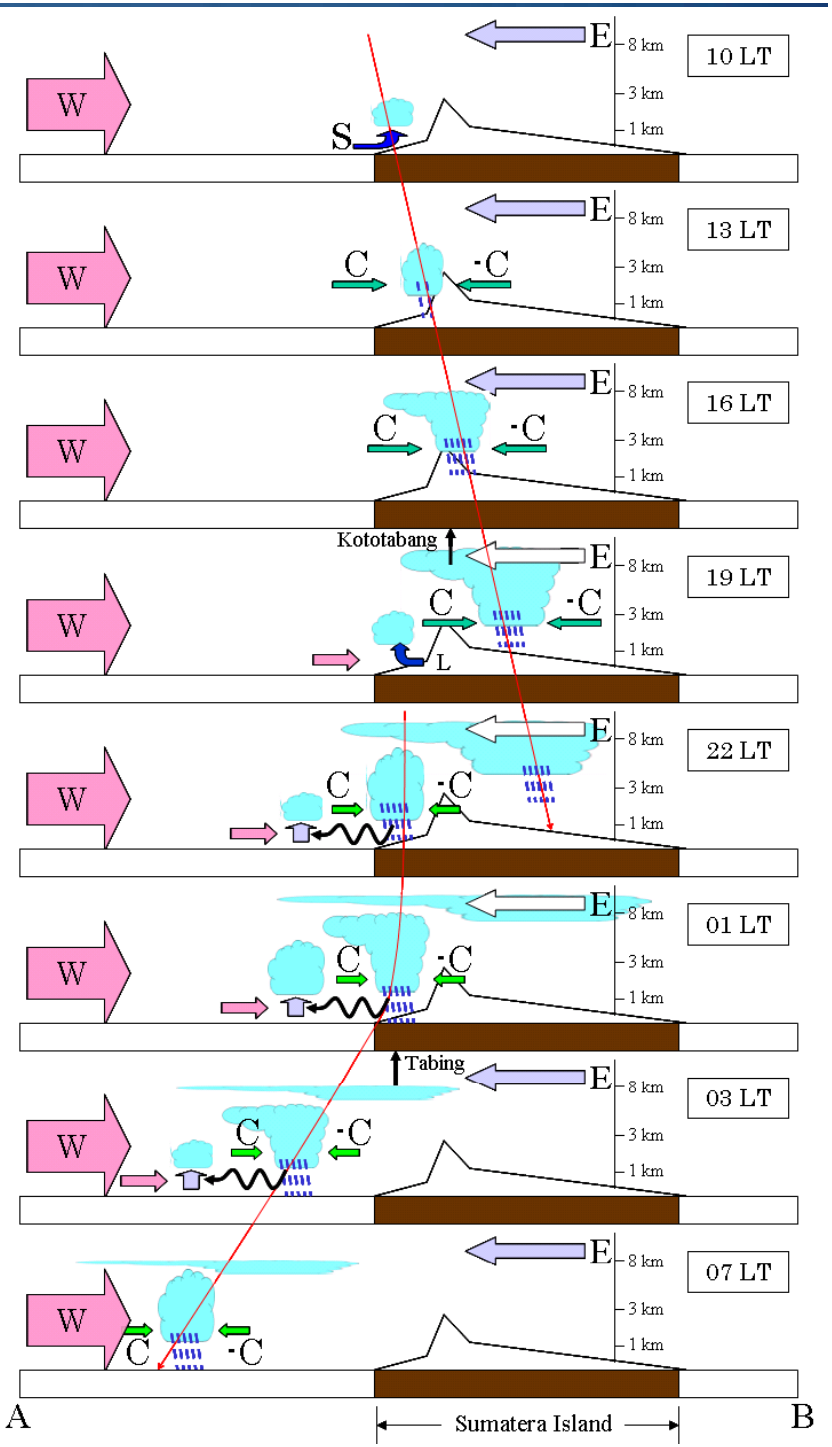


Annual rainfall and 850hPa Winds

Diurnal Land-Sea Rainfall F
Sumatra Island of Indonesia C



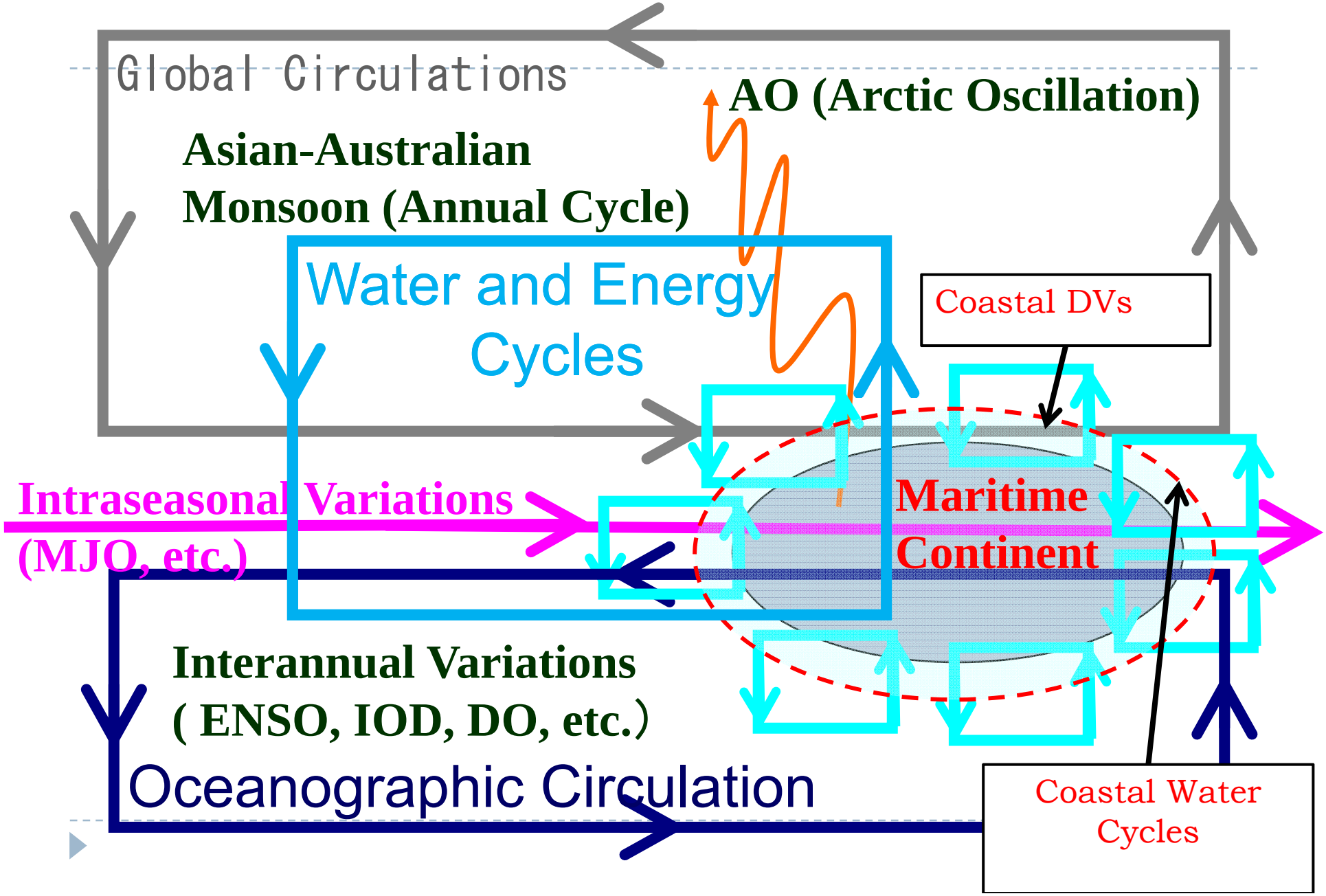




Rainfall peaks migrate
toward the inland region in
the nighttime,
toward the offshore region in
the daytime!

(Mori et a

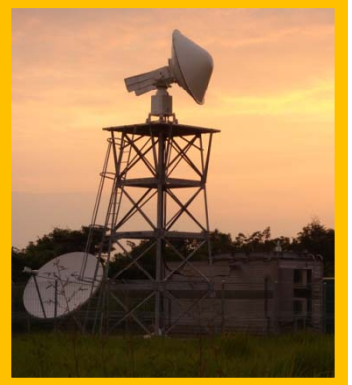
Diurnal Convections maintain the MC Climate

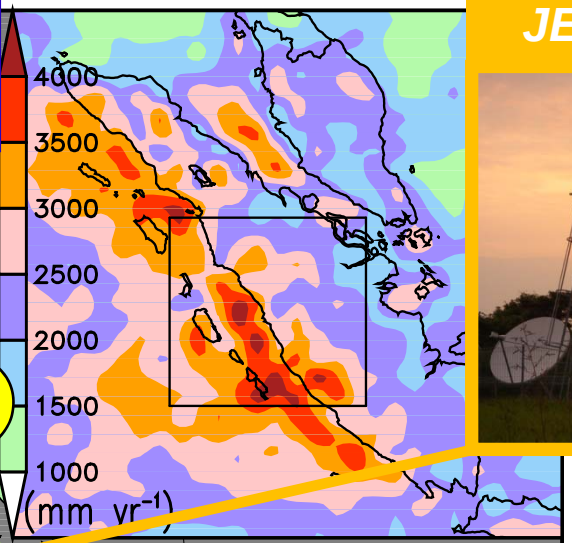


Proposed Layout of HARIMU2011 Campaign (Nov.2011)

UAV Flight Sounding

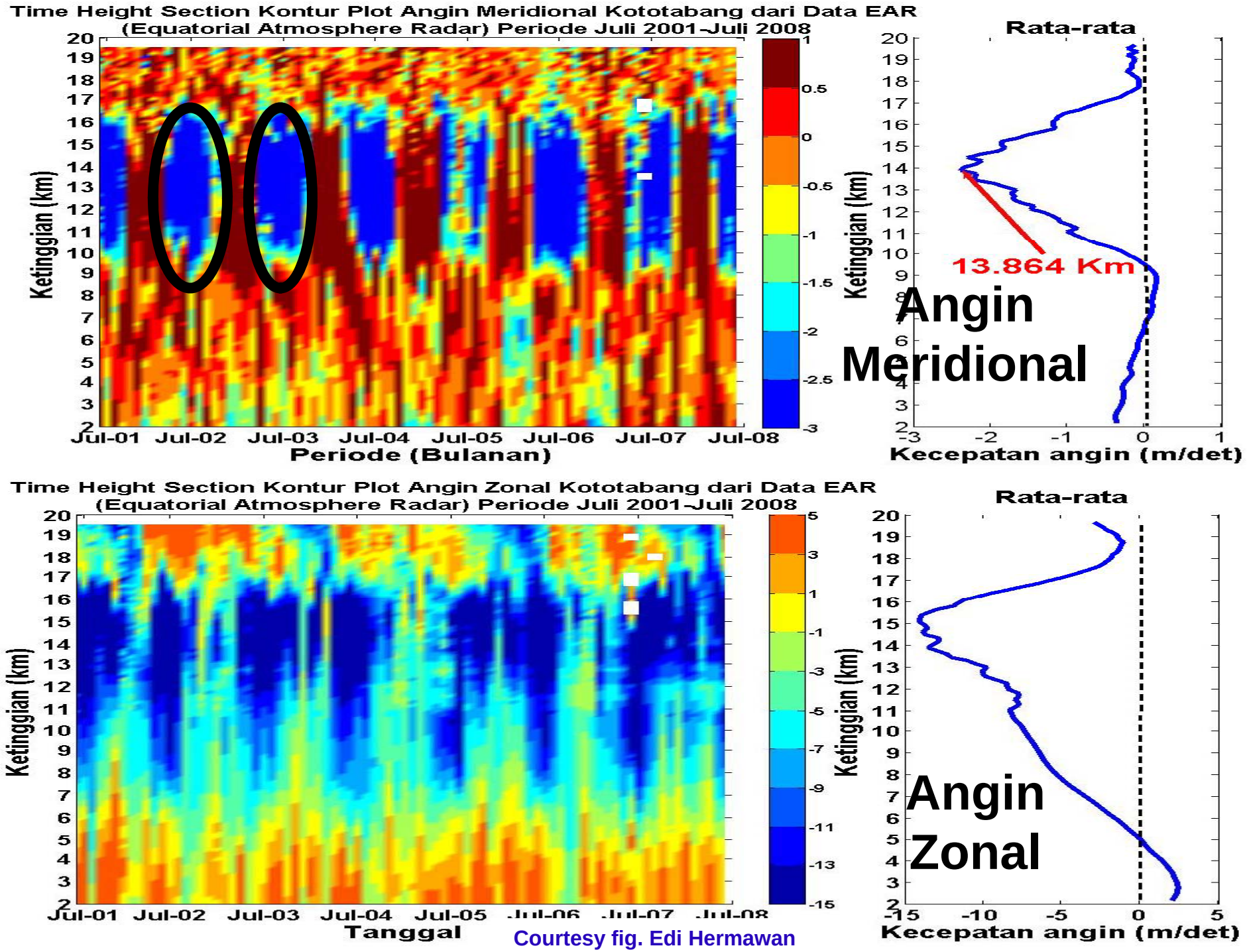
JEPP XDR

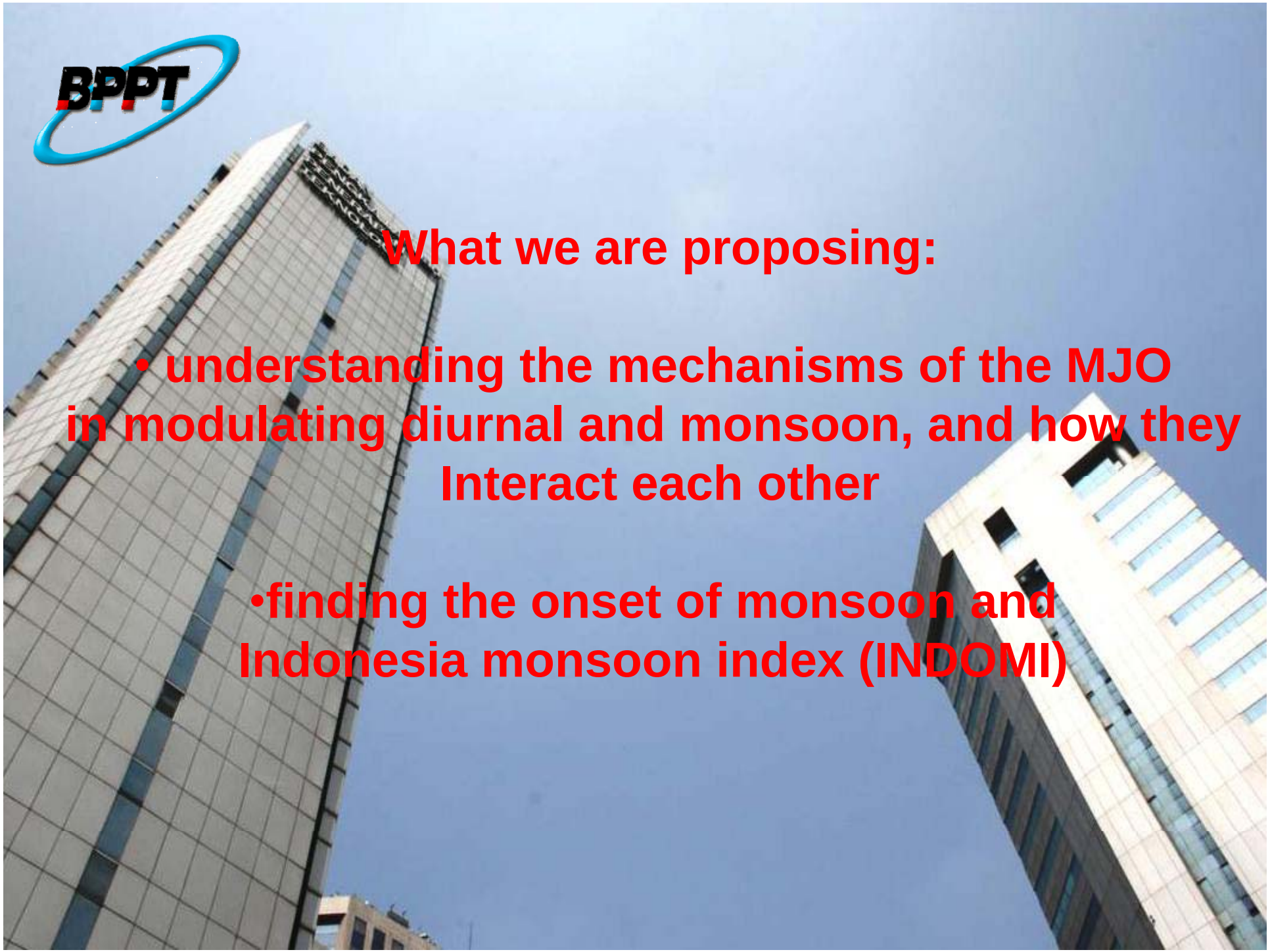




X-band dual-pol. Radar

Sounding with HYVIS


Time Height Section Kontur Plot Angin Meridional Kototabang dari Data EAR
(Equatorial Atmosphere Radar) Periode Juli 2001-Juli 2008
Ketinggian (km)
Periode (Bulanan)
Jul-01 Jul-02 Jul-03 Jul-04 Jul-05 Jul-06 Jul-07 Jul-08
Rata-rata
13.864 Km
Angin Meridional
Kecepatan angin (m/det)
Time Height Section Kontur Plot Angin Zonal Kototabang dari Data EAR
(Equatorial Atmosphere Radar) Periode Juli 2001-Juli 2008
Ketinggian (km)
Tanggal
Rata-rata
Angin Zonal
Kecepatan angin (m/det)
Courtesy fig. Edi Hermawan


What we are proposing:
• understanding the mechanisms of the MJO in modulating diurnal and monsoon, and how they Interact each other
•finding the onset of monsoon and Indonesia monsoon index (INDOMI)