

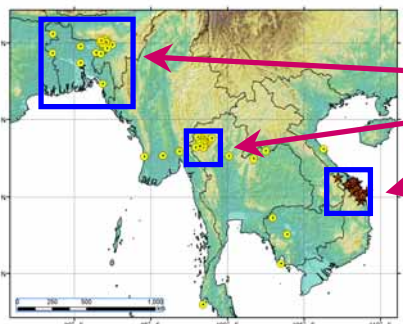
Japan EOS Promotion Program (JEPP) Theme 2-2 by Prof. Matsumoto, U-Tokyo

Development of rainfall observation system in Southeast Asia

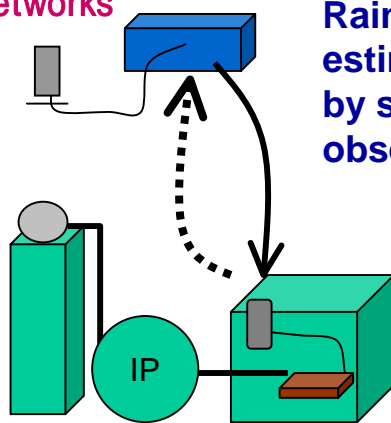
Objective: Develop rainfall observation system in order to understand water cycle and its variability by climatic changes in tropical Asian monsoon region over Indochina

(1) Research on rainfall distribution
Rainfall observation by automatic rain gauges and development of real-time data transmission system

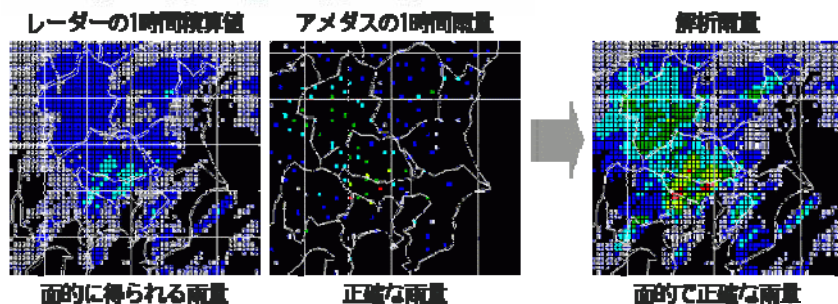
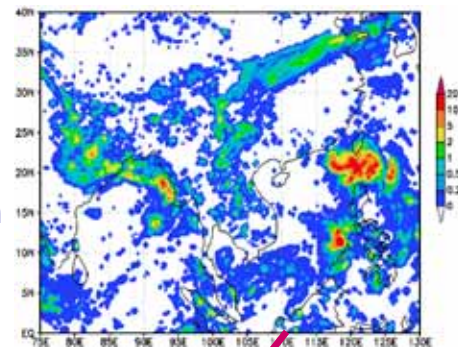
(2) Research on flood prediction
Rainfall estimation using radar and satellite observation and its application to flood prediction



Automatic rain gauge Networks
 India, Bangladesh 36
 Thailand 18
 Vietnam 33



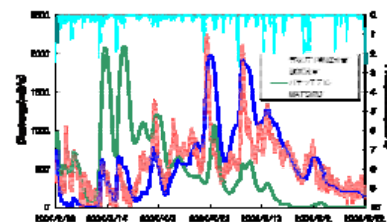
Rainfall estimation by satellite observation



Radar data + Raingauge data Composite rainfall data

Similar to Radar-AMeDAS system in Japan

Flood prediction



Topographic Setting of Danang area



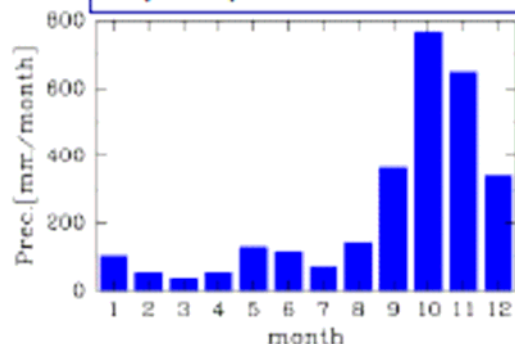
- Just the South of Hai Van Pass (雲海峽), “climatic divide” of Viet Nam

Source : Google Earth

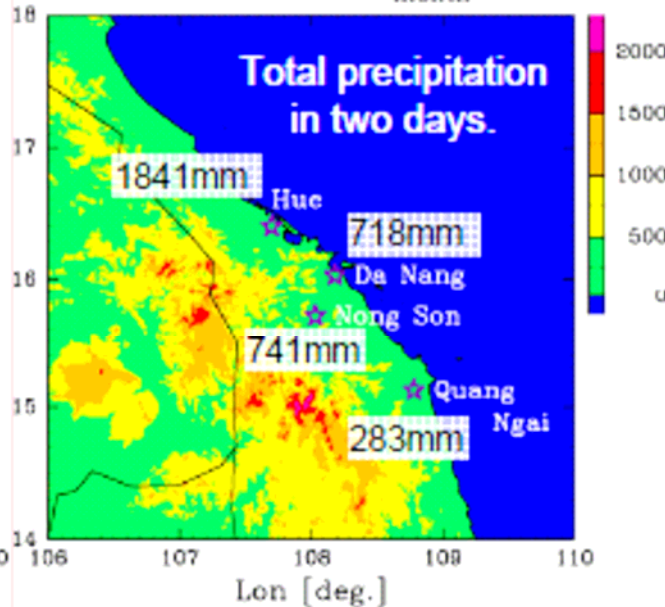
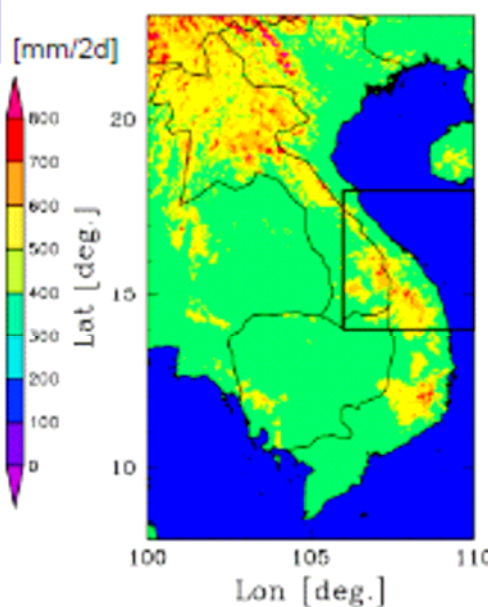
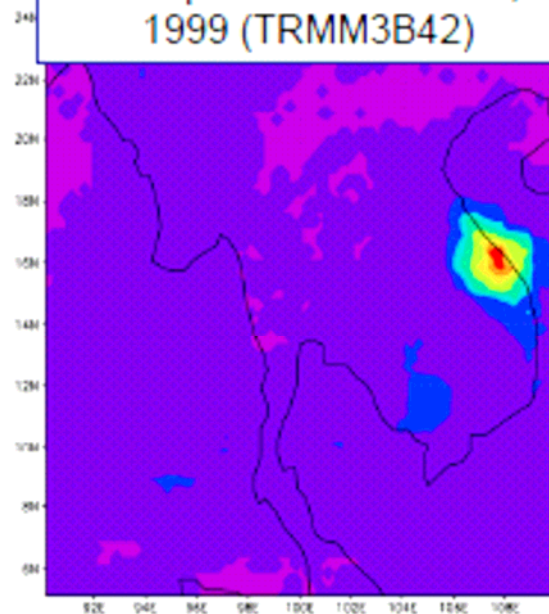
A heavy rainfall event in central Vietnam in November 2-3, 1999

- Precipitation on Nov. 2 and 3, 1999 in Hue (16.4N, 107.7E) is more than 800 mm/day.
 - the maximum precipitation event since 1951.
- Heavy rainfall concentrates in central Vietnam east of the Annam range.

Climatological monthly precipitation at Hue

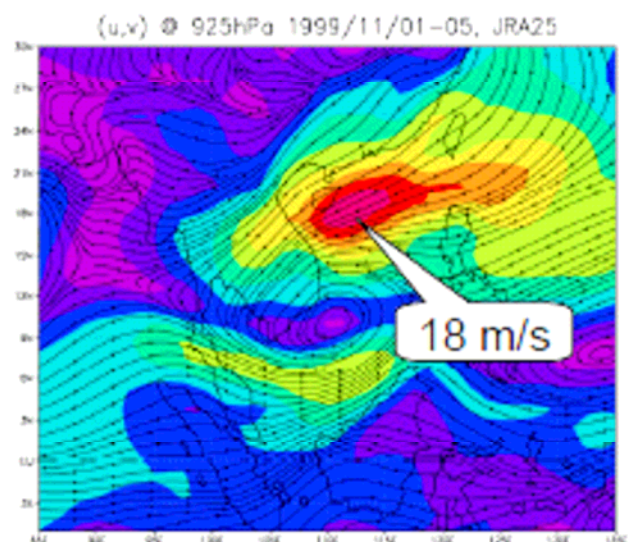


Precipitation in Nov. 2-3, 1999 (TRMM3B42)



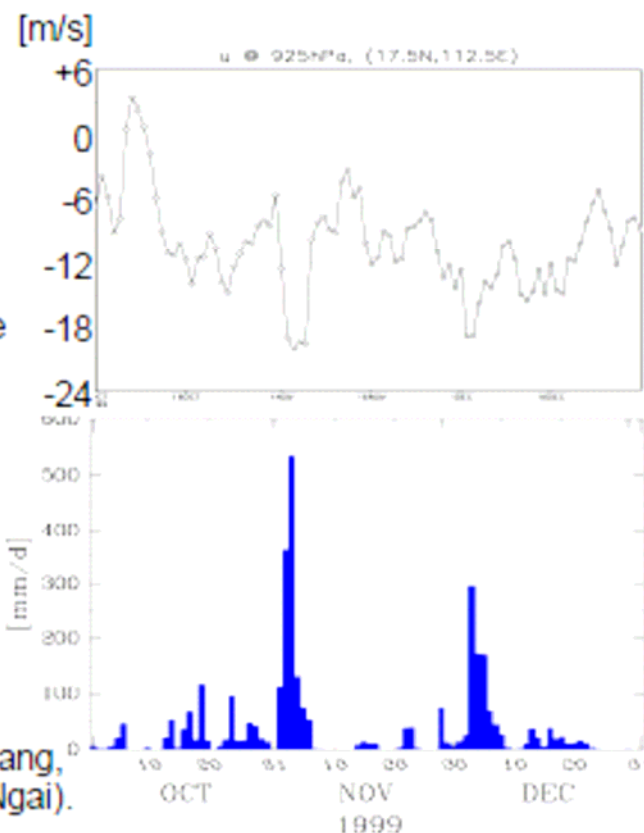
Circulation field and possible causal mechanisms:

- Prior to the heavy rainfall, monsoonal northeasterly over the South China Sea strengthened.
- How? (Causal mechanism)
 - Some cold-surge-like features were observed.
 - westward-moving disturbances (TD, Rossby waves, etc.)?
 - Upper-level trough?
- Attempt to reproduce with MM5.

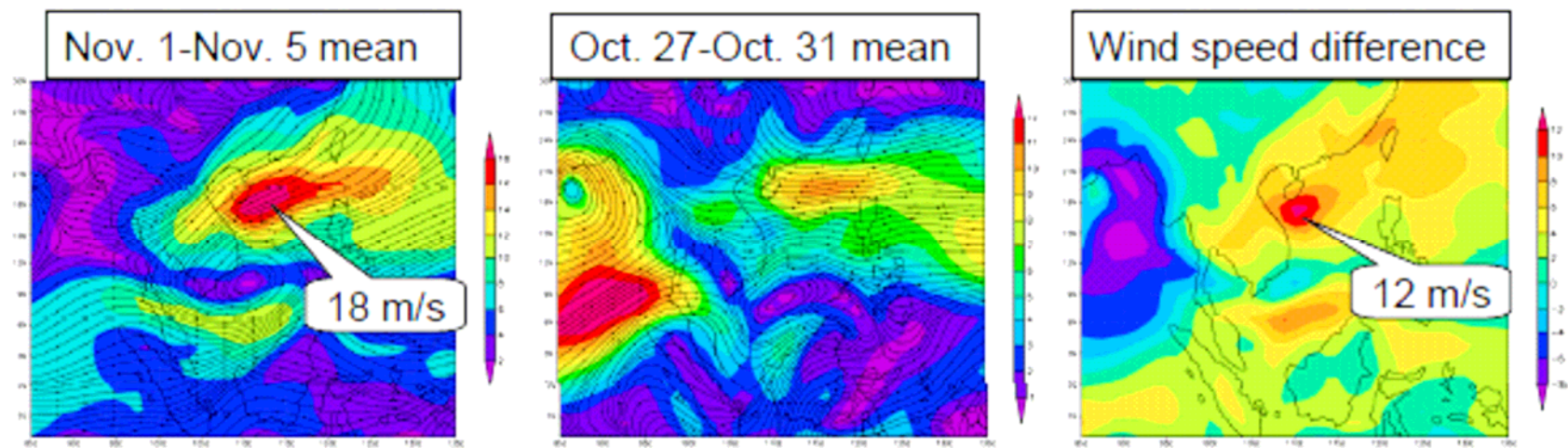


Zonal wind at 925hPa averaged from Nov. 1 to Nov. 5. (JRA25)

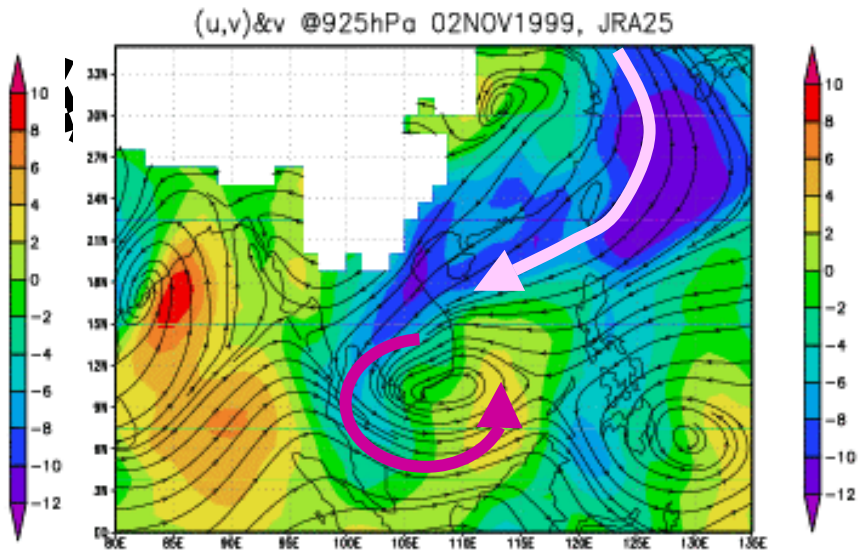
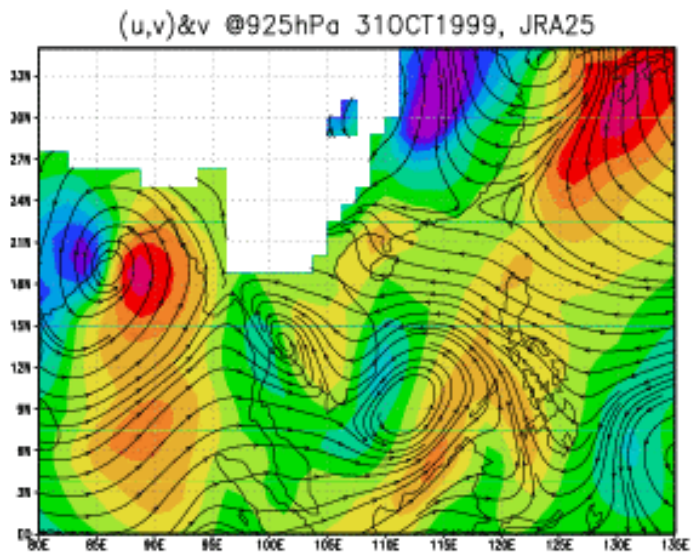
u(925hPa) over the northern SCS



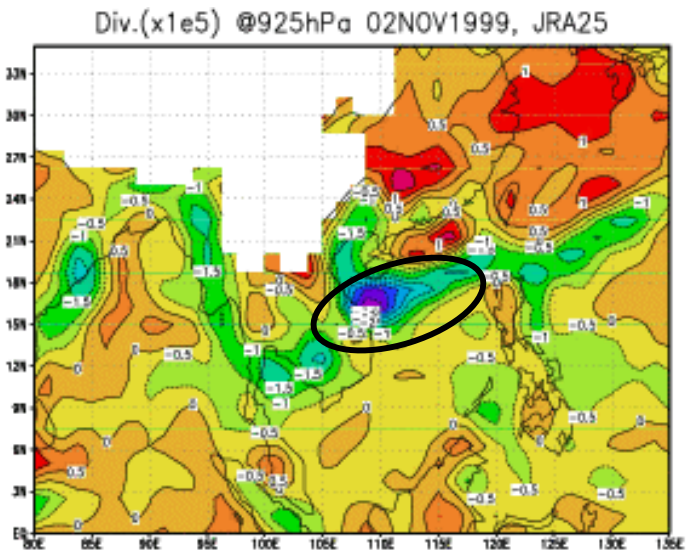
Daily precipitation averaged over four stations (Hue, Da Nang, Nong Son, Quang Ngai).



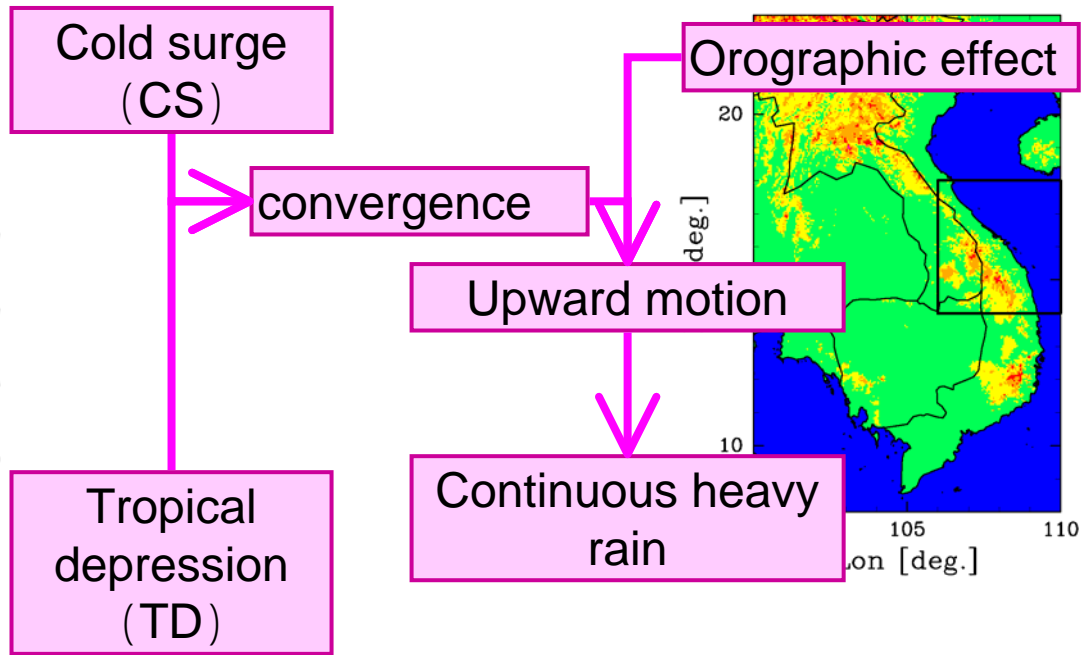
Stream line and wind speed at 925hPa. (JRA25)



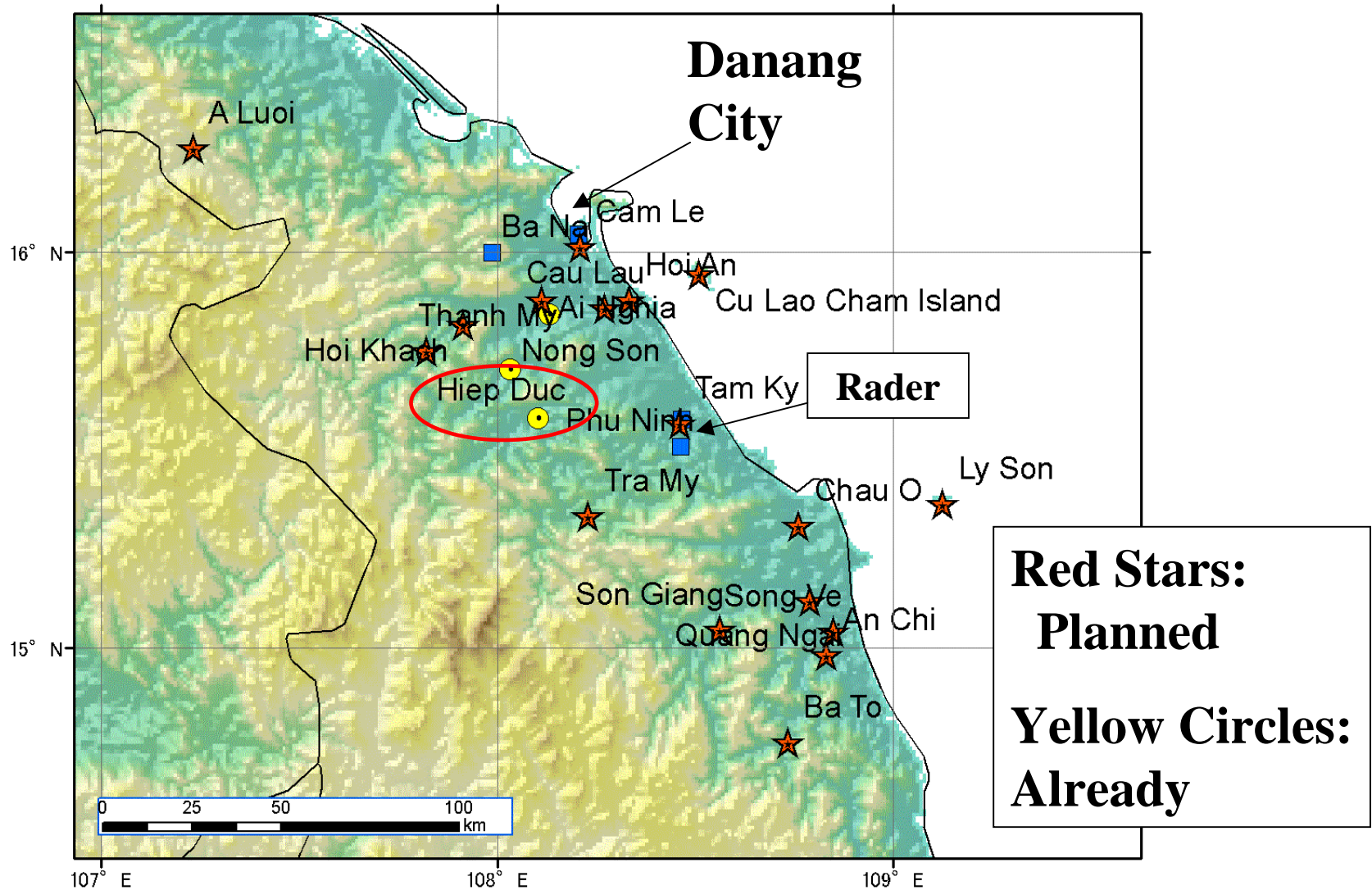
925hPa Stream line & v



925hPa divergence

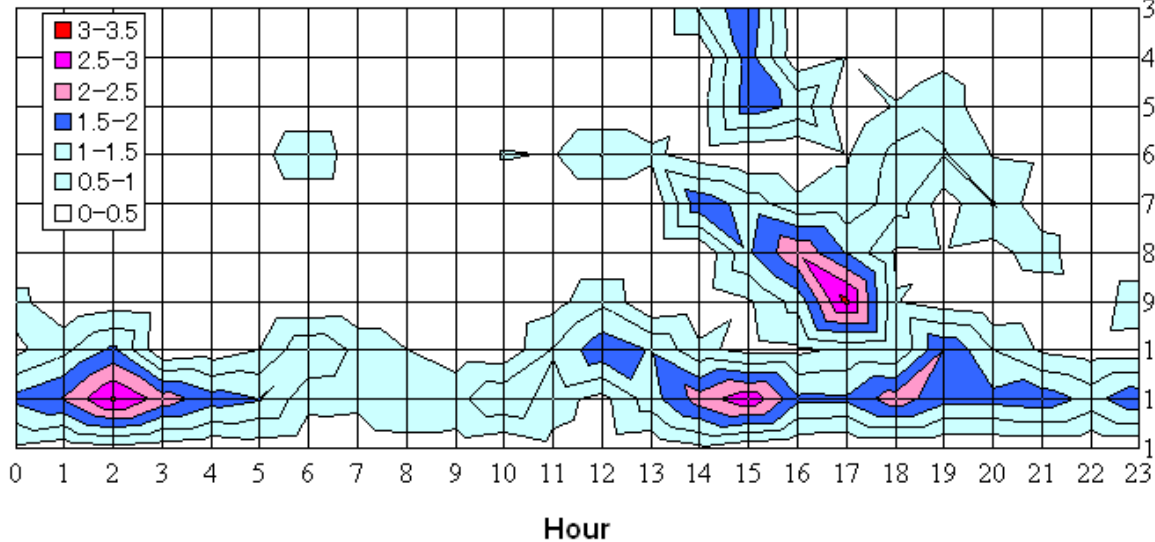


DaNang District Rainfall Measurement Mission

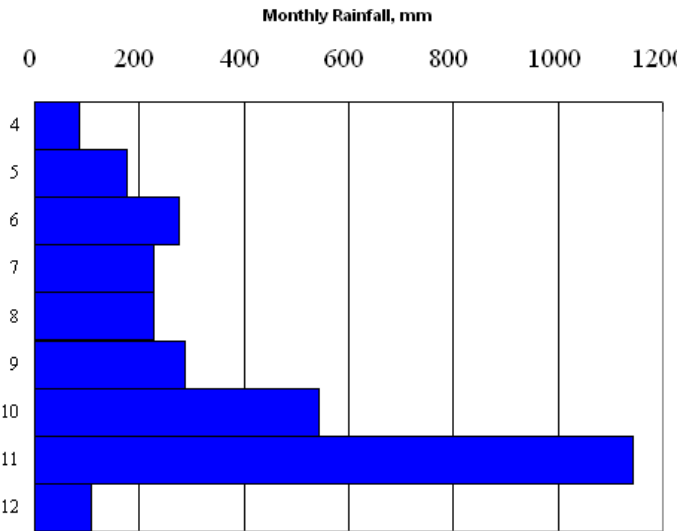


- **Diurnal and seasonal rainfall variations by automatic rain gauge at Hiep Duc, central Vietnam in 2004**

Hiep Duc Station, 2004, mm/h

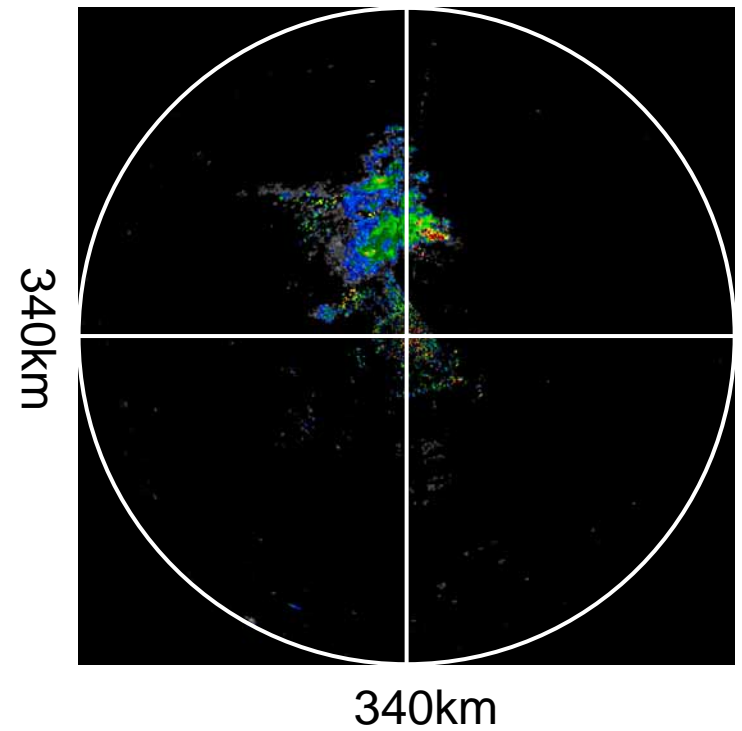
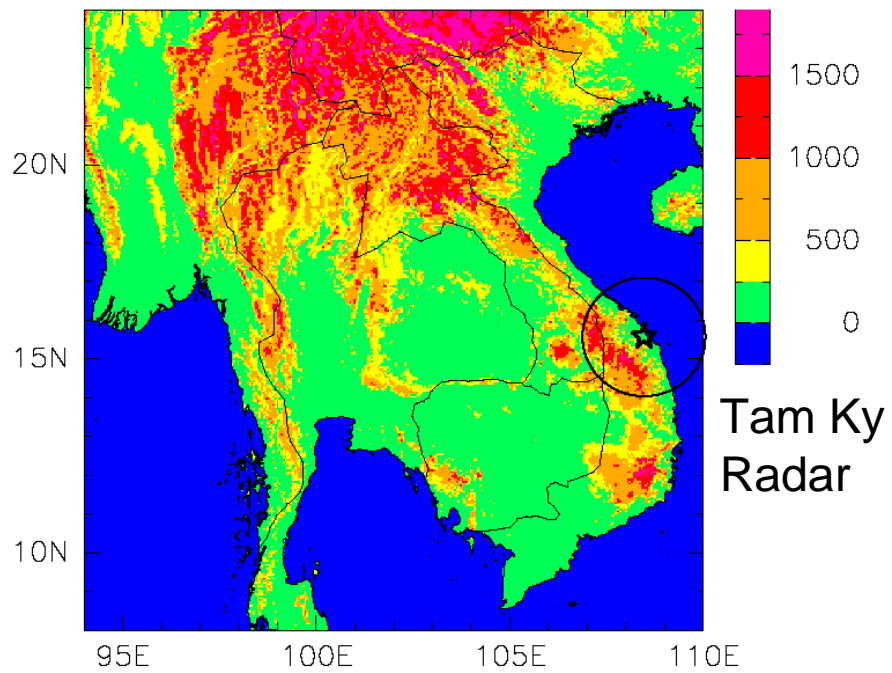


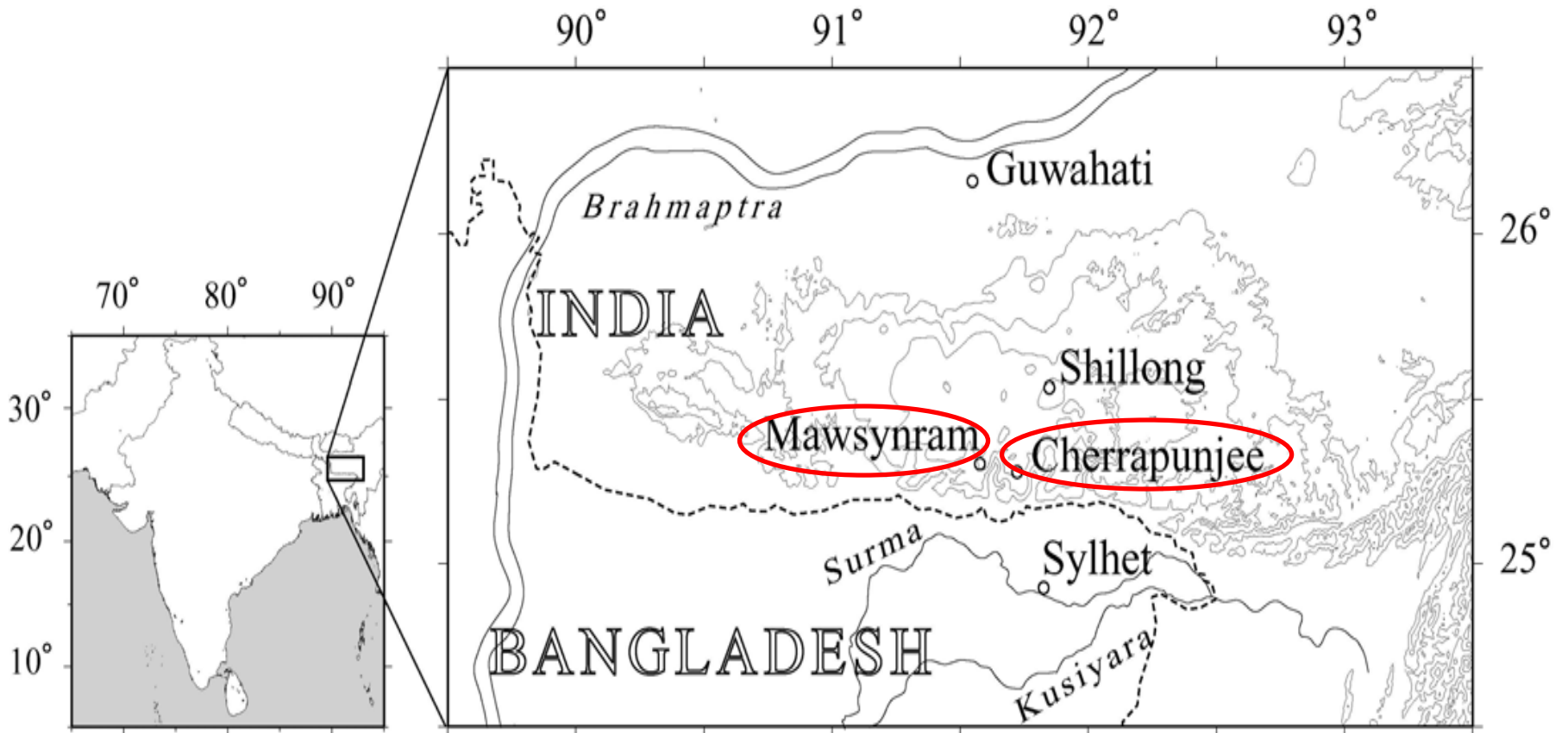
2004 HiepDuc



Hiep Duc, 2004 : Month-Hour Diagram

Tam Ky Radar





THE WETTEST PLACE ON PLANET EARTH CHERRAPUNJEE

A LAND OF BREATHTAKING BEAUTY & EXOTIC PEOPLE

CHERRAPUNJEE IS LOCALLY KNOWN AS 'SOHRA'.

THIS SIGN, COURTESY

CHERRAPUNJEE HOLIDAY RESORT

PHONES: 03637-264218, 264219, 264220

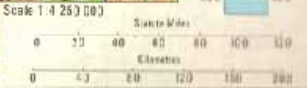
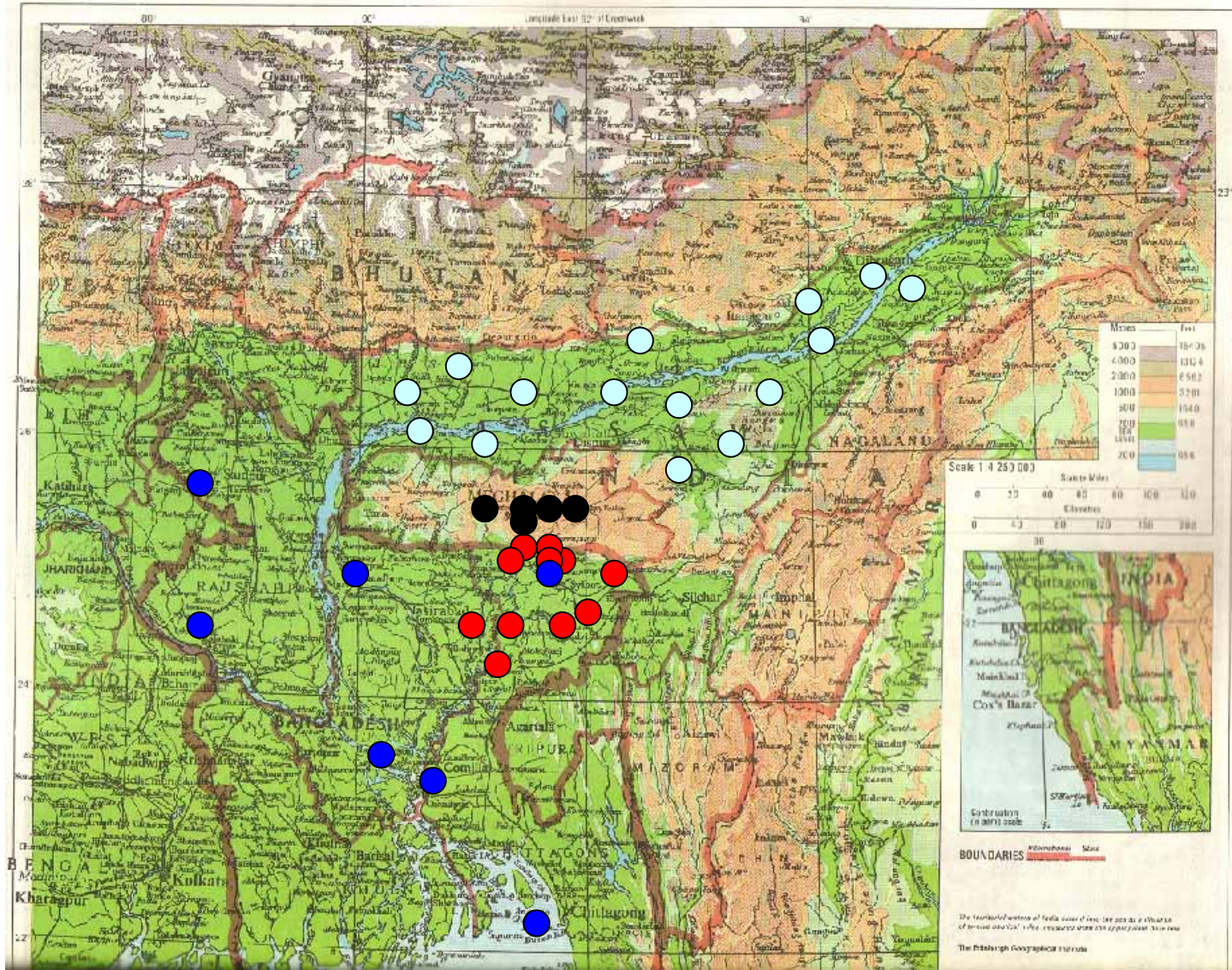
E-MAIL: CHERRAPUNJEE@HOTMAIL.COM, CHERRAPUNJEE@YAHOO.CO.IN

WEBSITE: WWW.CHERRAPUNJEE.COM

AVERAGE ANNUAL RAINFALL (1973-2002) 12063.3MM.

JAN, FEB, NOV & DEC. RECEIVE NOMINAL OR NO RAINFALL

NORTH EASTERN INDIA, BHUTAN AND BANGLADESH



BOUNDARIES ————— State

The boundaries between all fields shown here are not as a guarantee of accuracy. They are derived from the appropriate best available data.

The Pittsburgh Geographical Institute

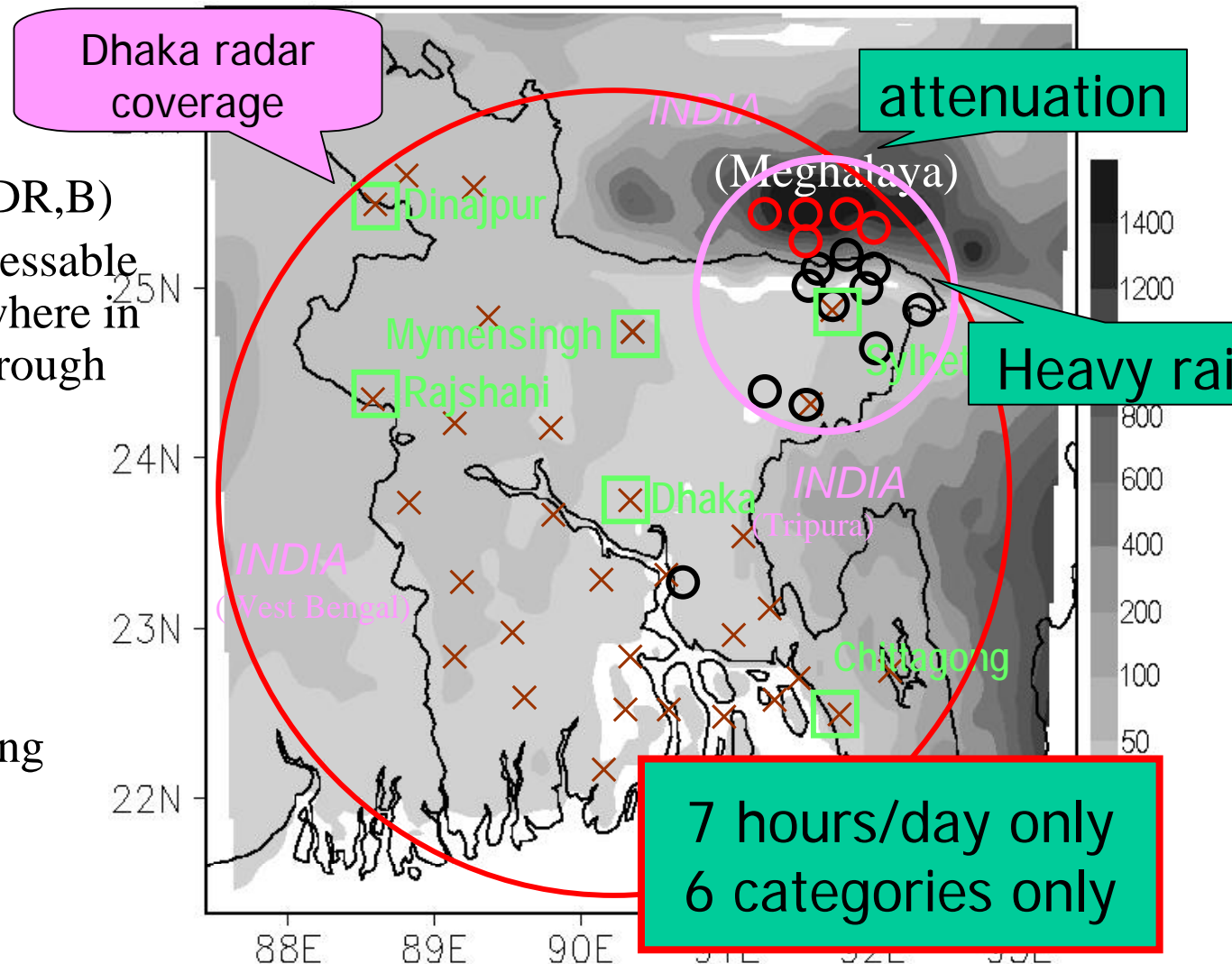
Locations of radar and raingauges

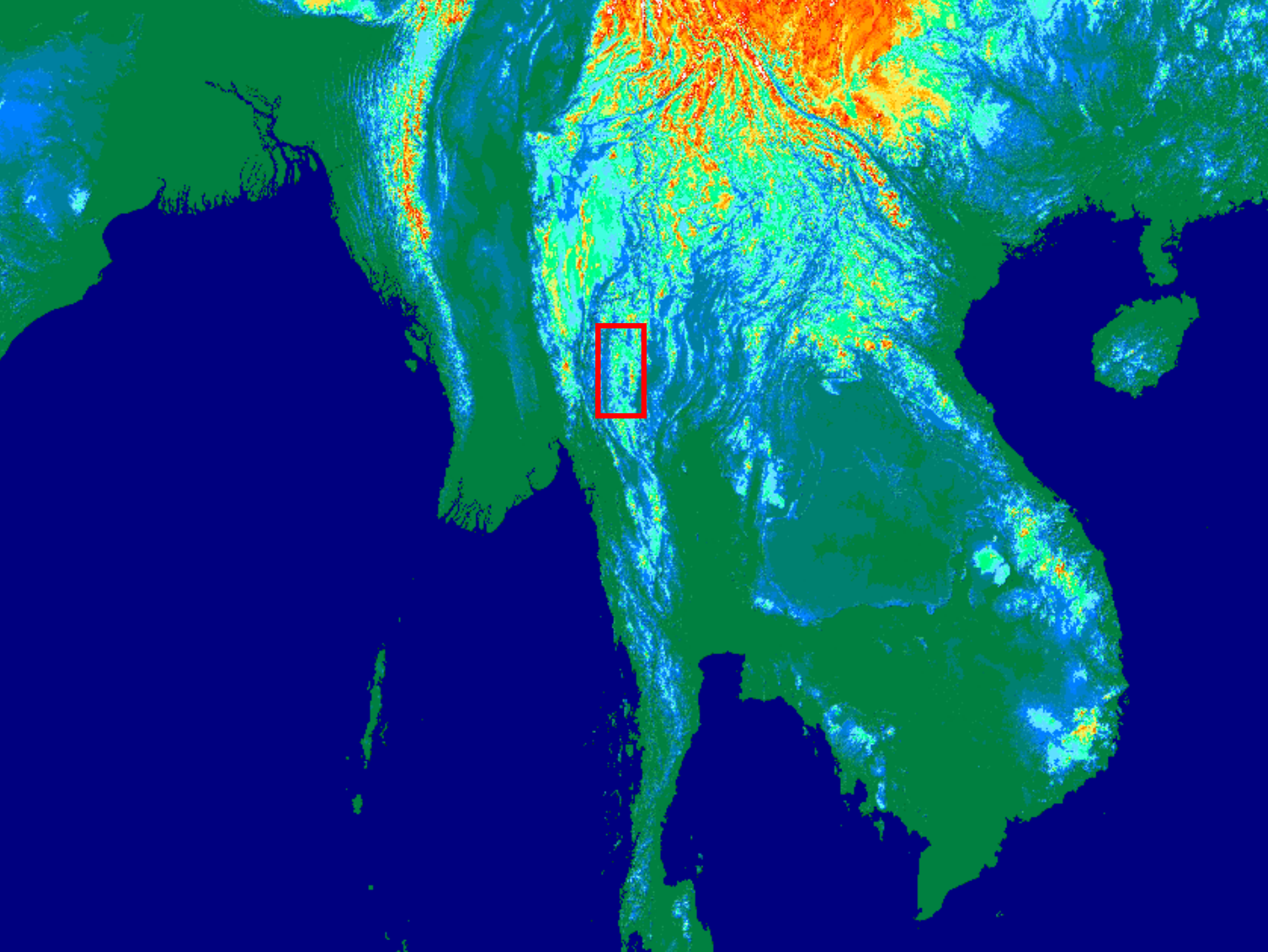
- AWS

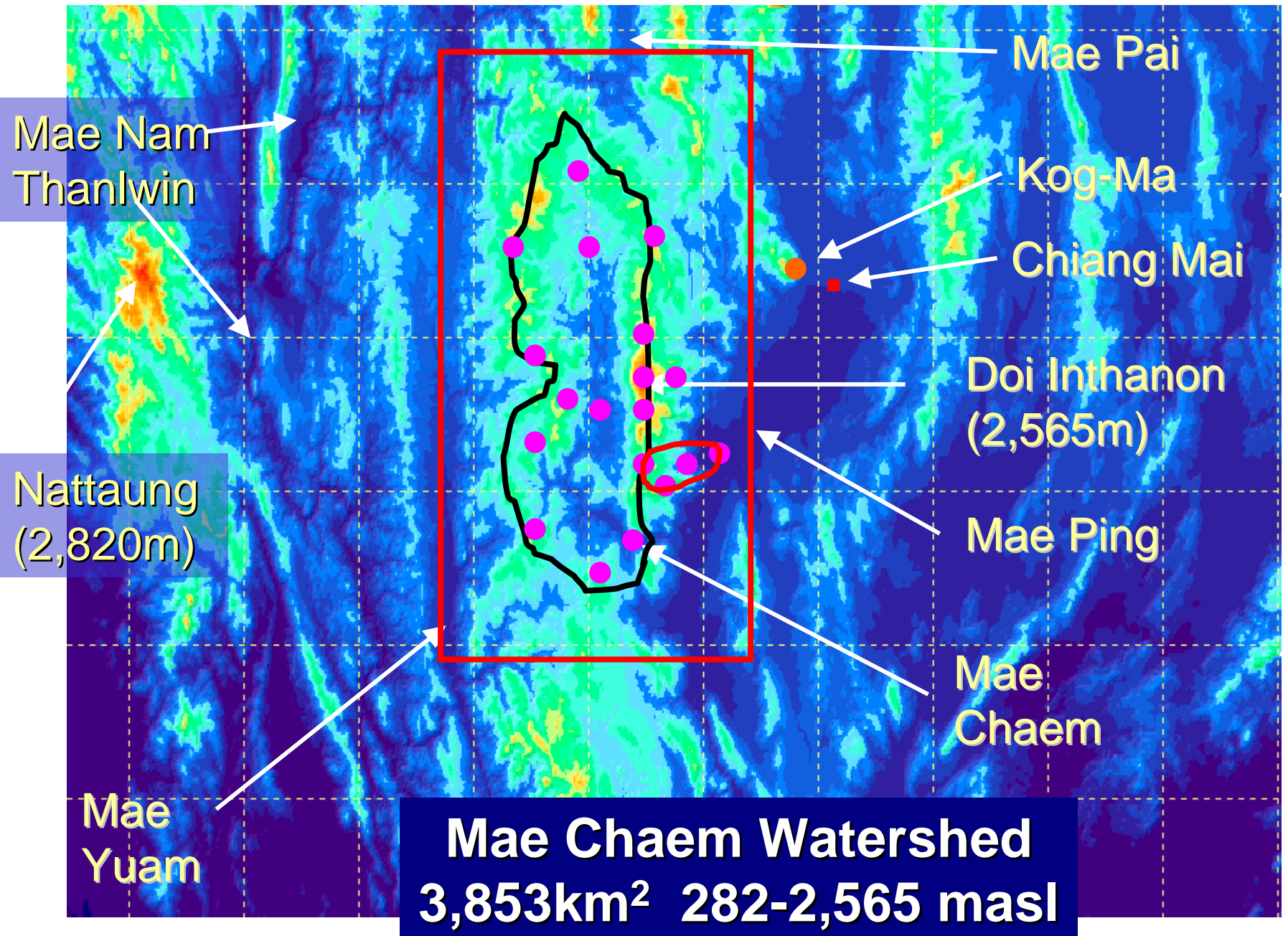
- Dhaka(ICDDR,B)
- Data are accessible from everywhere in the world through the network.

- Raingauges

- 6-gauges :
- 11-gauges :
- 5-gauges :
- 0.5mm tipping buckets







Rainfall-elevation

