Monsoon Synoptic Overview of YOTC Period - AMY

http://www.wcrp-amy.org/

Jun Matsumoto (Tokyo Metropolitan U., JAMSTEC/RIGC) YOTC IPM at Honolulu, Hi USA, July 13, 2009
Fujikawa et al. (2008): JMA

Fig. 1 The definitions of each SAMOIs

Each box is based on the EOF analysis for OLR.

SAMOI-A = (-1) x (OLR[W] + OLR[E])
SAMOI-N = (-1) x (OLR[S] – OLR[N])
SAMOI-W = (-1) x (OLR[E] – OLR[W])

WYI : Zonal wind shear index (Webster and Yang, 1992)
MTI : Meridional Thickness Index (Kawamura, 1998)
Summer Monsoon in 2008 (Fujikawa et al., 2008)

The total activity of Asian Summer Monsoon was near normal (SAMOI-A was -0.2). However, anti-cyclonic circulation was dominant from the Bay of Bengal to the Philippines in the lower troposphere. As a result, convection was suppressed around the Philippines, while remarkably enhanced in the tropical western Indian Ocean.

Fig. 6 JJA mean anomalies in 2008

Left: SST anomalies (color shade) and 925 hPa stream function anomalies (contour)
Right: OLR anomalies (color shade) and 200 hPa stream function anomalies (contour)
‘A’ and ‘C’ indicate the center of anti-cyclonic and cyclonic circulation anomalies, respectively.
Overview of Asian Summer monsoon in 2008
(by Dr. Yoshiyuki Kajikawa, IPRC, Univ. Hawaii)

Both (seasonal JJA mean) ISM and WNPM in 2008 was weaker than normal!!

Increasing Rainfall over N-India with strengthened Somali Jet ...

Weakening of subtropical High

ISM index (JJAS)

WNPM index (JJAS)

Dipole pattern of convection anomalies
1. Indian summer monsoon

ISM index = $U_{850}(40E-80E,5N-15N) - U_{850}(70E-90E,20N-30N)$

ISM onset in 2008 was clear with onset vortex over the Arabian Sea and the timing was quite similar to climatology, although the ISM was relatively weaker in June and July.
2. Western North Pacific monsoon

WNPM Index = $U_{850}(100E-130E,5N-15N)$ - $U_{850}(110E-140E,20N-30N)$

RAMMASUN (TY200802) induced the WNPM onset and HALONG (TY200804) over the SCS.

ISO in MJO time scale was overall weak in 2008.
East-West Dipole pattern of convection anomalies over the (South) Indian Ocean with easterly wind anomalies.

SST anomalies over EIO and WIO is not clear in Sep. and Oct.

[Q] Why the (SST) IOD mode was not developed through boreal autumn in 2008?
Monsoon Asia Hydro-Atmospheric Research and prediction Initiative (MAHASRI) Asian Monsoon Years (AMY 2007-2012)
Late Spring - Early Summer
EAMEX Field Experiment

Tsing-Chang Chen and EAMEX science team

Iowa State University, Ames, IA, U.S.A
Rainstorm 1: Hanoi, Vietnam

Landslide in Hai Phong

Source: Vietnam News Agency
Rainstorm 2: Okinawa, Japan

Torrential rains in Southern Okinawa region at midnight

-- Okinawa Times 6/4

Collapse of street

Okinawa, Japan
Rainstorm 3: Kaohsiung, Taiwan

“Rainstorm caused floods and Agriculture damage in Southern Taiwan” – The Liberty Time 6/6
“Rainstorms which brought the heaviest downpour since records began have swamped Hong Kong, causing landslides which claimed two Lives”
– BBC news 6/7
“At least 71 people are now known to have died, and 640,000 displaced, after floods and landslides triggered by days of heavy rain in southern China.”
– BBC news 6/12
R1 (5/18~5/22)
R2 (5/30~6/4)
R3 (6/2~6/5)
R4 (6/4~6/8)  
R5 (6/11~6/15)  

Passing through northern Taiwan only
SoWMEX/TiMREX

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Large-scale Sounding Network for TIMREX

SoWMEX/TiMREX Sounding Network

Pingdong
Heavy rain S, flood central Taiwan
Time series for 46750 from 06/12 to 06/26

Heavy rain south, southerly flow

Pingdong
IOP-1

Front across Taiwan, orographic rain

19-22 May 2008
IOP-2
Afternoon showers near Taichung and southern Taiwan
28-29 May 2008
IOP-3

Front Approaching, Rainfall over Northern Taiwan

30 May 2008
IOP-4

Heavy Rainfall South, Floods in Central Taiwan

2-3 June 2008
IOP-5,6
Heavy Rainfall Southern Taiwan; Weak Depression along Meiyu Front

4-6 June
Torrential Rains over Hainan Island in October 2008
-- The Interaction of Asian Winter Monsoon with Tropical Synoptic-scale Disturbances --

伍 培明 Wu Peiming
Research Institute for Global Change, JAMSTEC, Japan
with Y Fukutomi, B Wu, M D Yamanaka and J Matsumoto

Contents:

1. Hainan Island and its Climate, the heavy rainfall in October 2008;

2. Occurrence and westward propagation of tropical synoptic-scale disturbances from the western Pacific;

3. Mid-latitude synoptic-scale atmospheric conditions;

4. The roles of tropical synoptic-scale disturbances and Asian winter monsoon in the heavy rains.
Torrential Rains over Hainan Island in October 2008
- the worst flooding event in the island in 42 years -
2. Occurrence and propagation of tropical synoptic-scale disturbances:

TRMM Rainfall, 850-hPa winds:
GMS satellite IR images from MTSAT-1R:

QuikSCAT Sea surface winds:
Heavy rains at Hanoi on 30 Oct. – 1st Nov. 2008
By Dr. Nguyen Thi Tan Thanh, VNHMS
Rainfall amount
72h (from 00z 30/10 - 00z 02/11/08)
Rainfall amount 72h
(from 7h 30/10-7h 02/11/2008)
a) Observation
b) GEM
c) GFS
d) GSM
Forecasting Time 7h 30/10/2008
Fig. 1. Time-latitude sections showing the meridional winds from QuikSCAT sea surface winds along 108 E from October 2008 to April 2009 (By Dr. Wu Pei-Ming).
Suggested period of interest

- May-June, 2008: Monsoon onset phase, many torrential rain events in East Asia.

- October, 2008: Vietnam, Hai-nan heavy rainfall events.