The Sixth Asia/Oceania Meteorological Satellite Users' Conference
9 – 13 November 2015, Tokyo/Japan

Cambodia's expectations of new-generation satellites for hazard monitoring
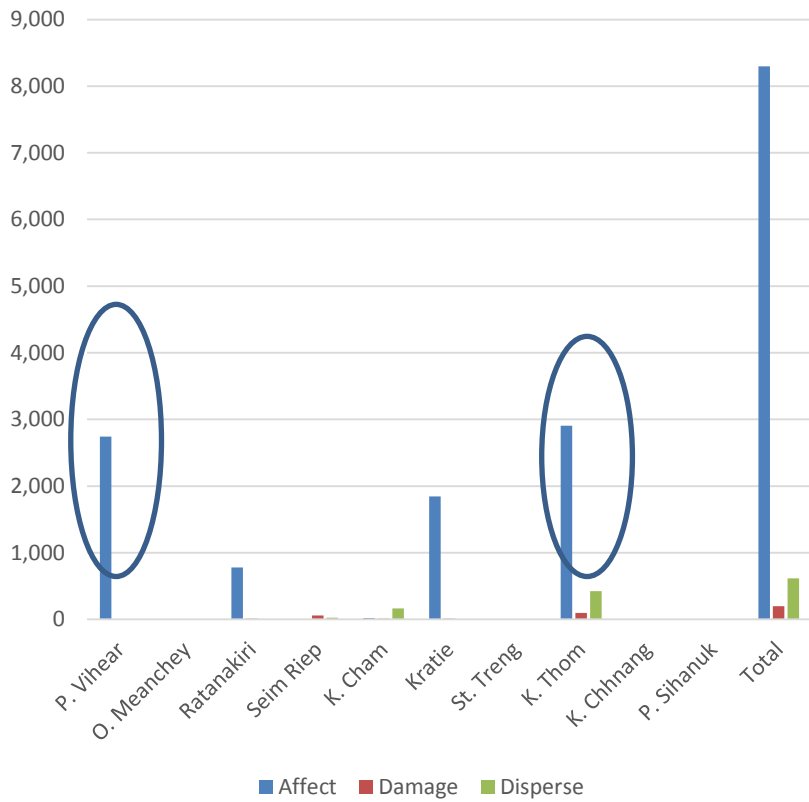
SO IM MONICHOTH

Department of Meteorology, Cambodia

Cambodia's top three hazards
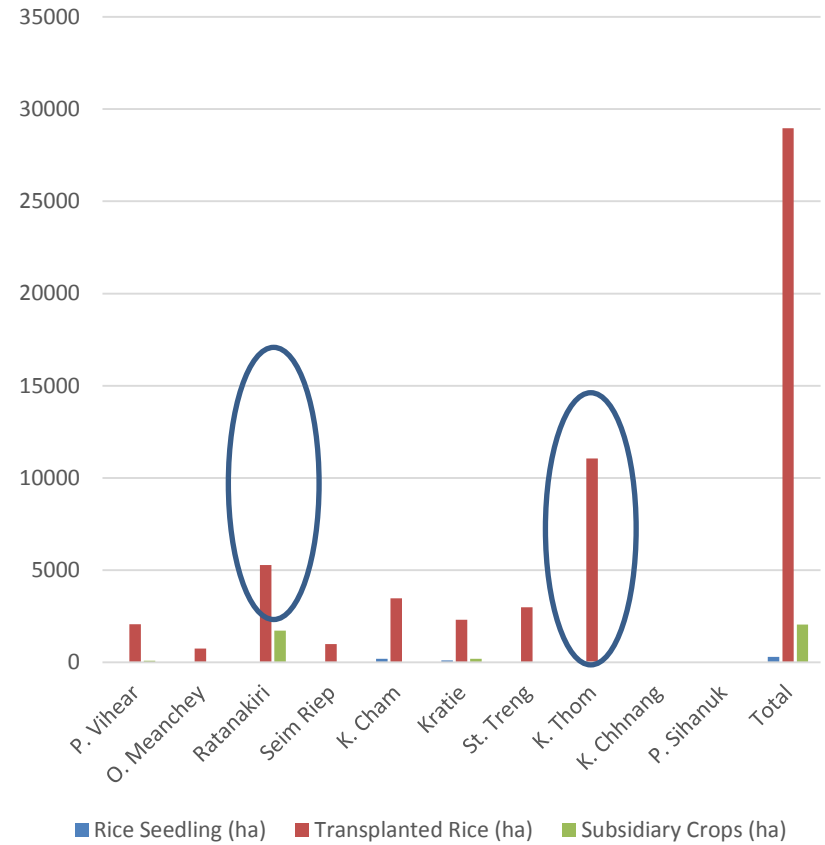## that can be monitored by satellite

- Hazard 1: Tropical cyclones, Typhoon, Severe thunderstorms, Monsoon activity
  - Seasonal Flooded
    - The weakening typhoon struck northeastern Cambodia as one of the most severe storms ever the country, with the worst damage in Kampong Thom Province in central Cambodia. Death tolls reached 43 people.[53] Also more than 66,000 families were forced from their homes by floodwaters.
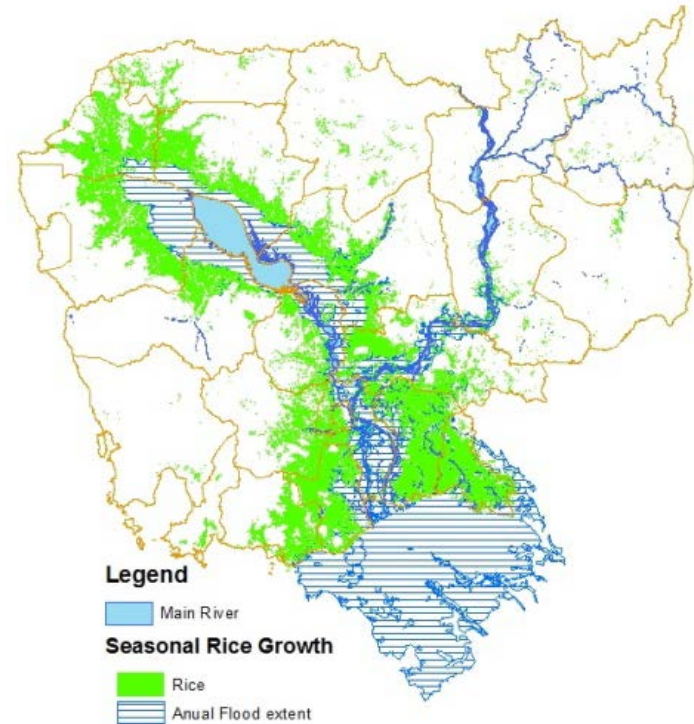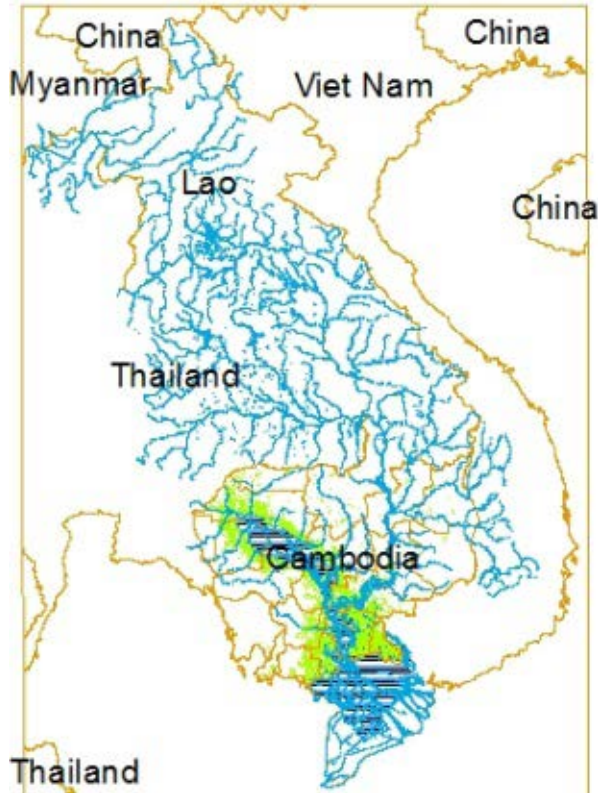 - Flashes Flooded

Typhoon Ketsana, 2009

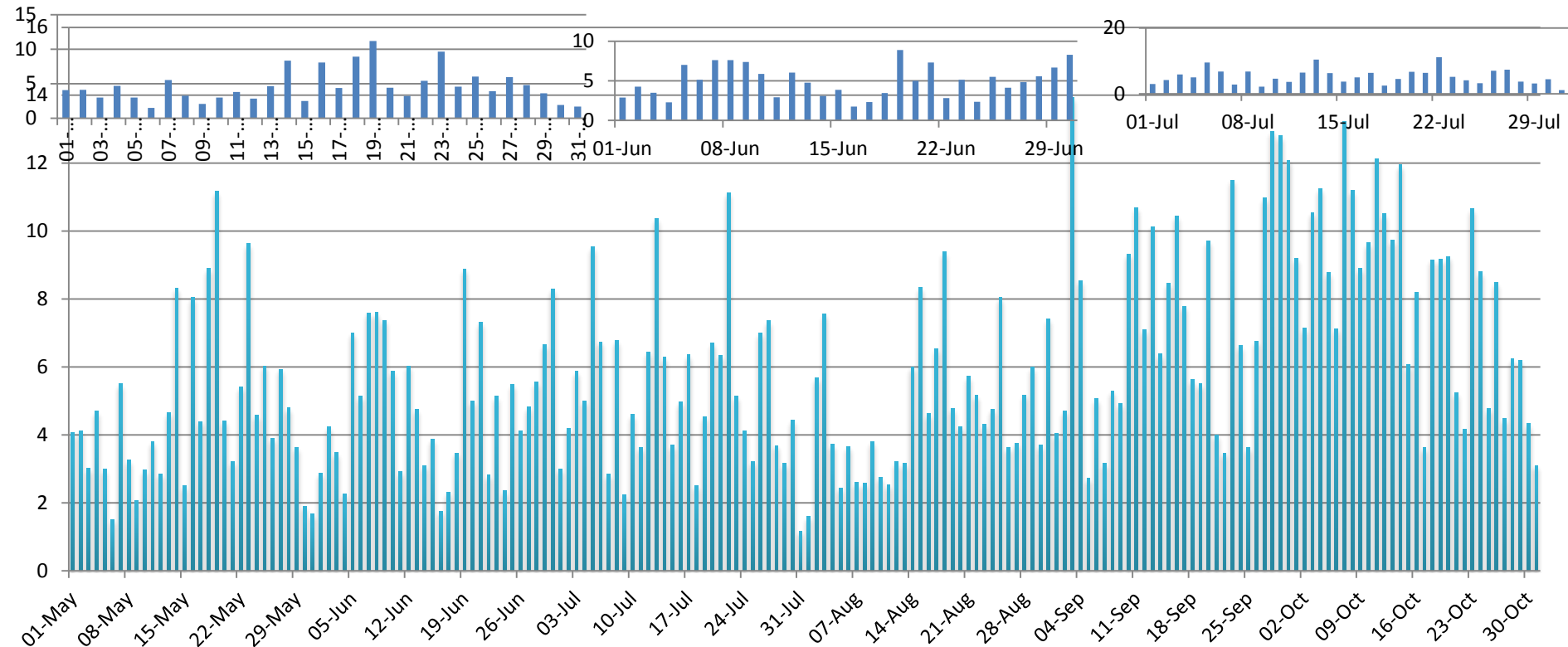Hourse effected by flooded September 2009, Katsana

Affect   Damage   Disperse

Agricultureal Sector

Rice Seedling (ha)   Transplanted Rice (ha)   Subsidiary Crops (ha)

Geography and Season Flooded Area

Legend
Main River
Seasonal Rice Growth
Rice
Anual Flood extent

Raining Season May-Oct

**Average Long-term Daily (1985-2011)
Rainfall in mm**

Annual Rainfall Pattern

Average Annual Rainfall
1,500<=,
2,000<=
3,000 mm<=
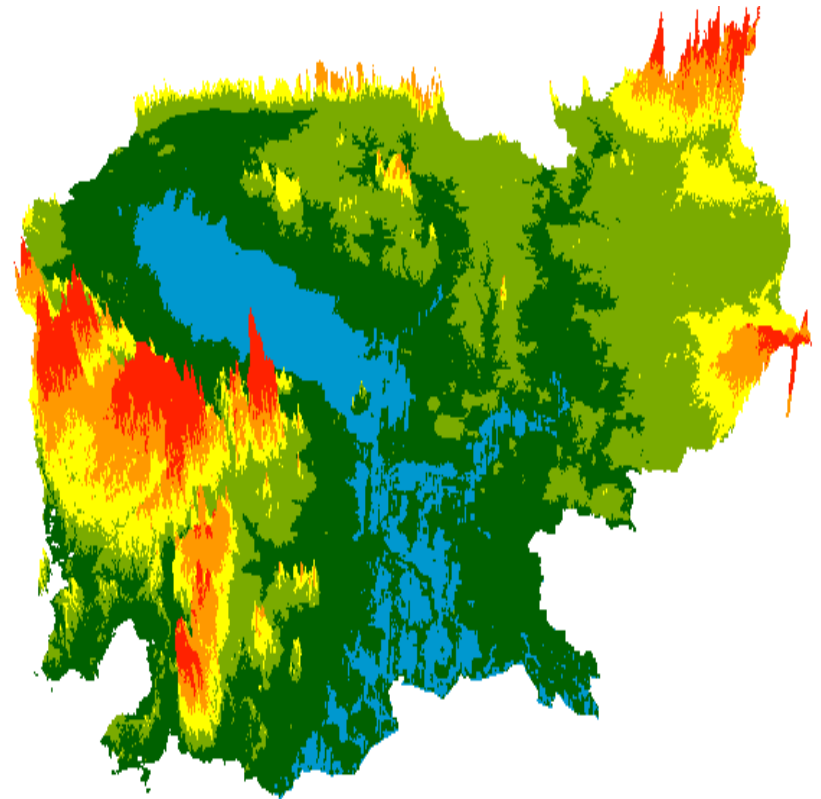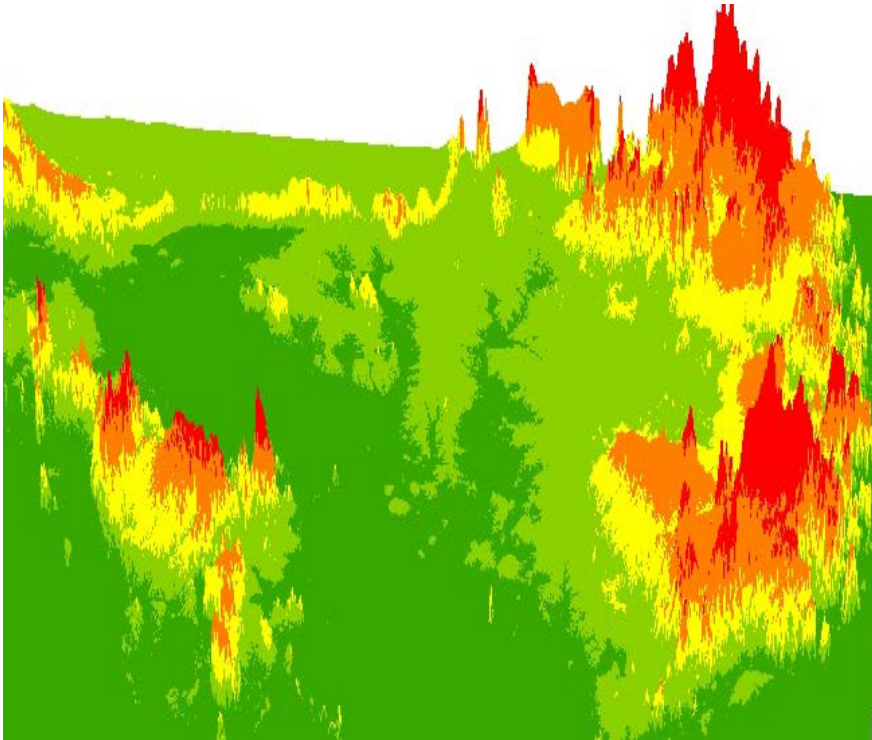
- **Central, Mountain and Coastal land area**

Annual Normal and Extreme Flood Area the Last three Years
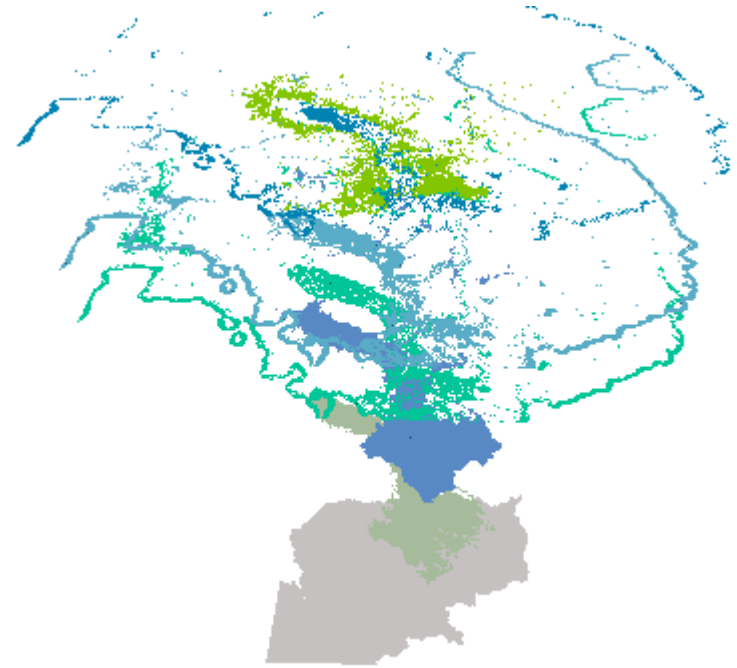
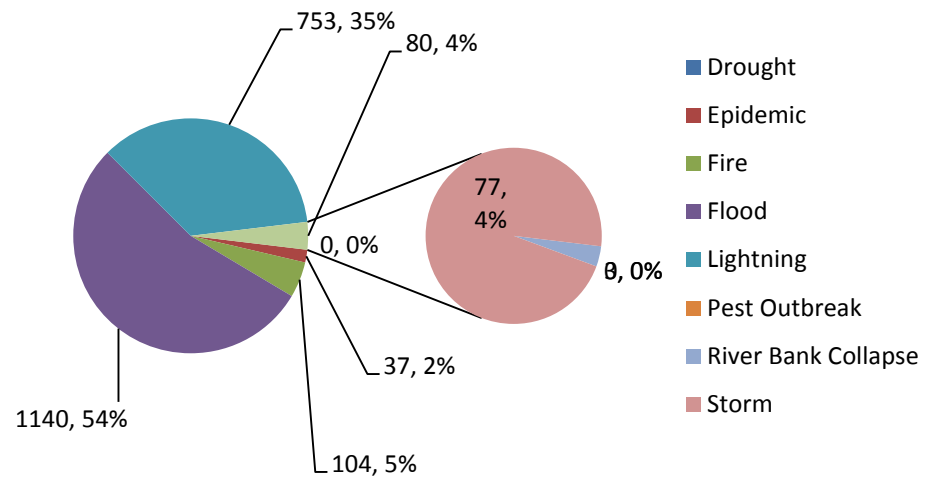# Cambodia Disaster loss and Damages

(NCDM, CamDi)
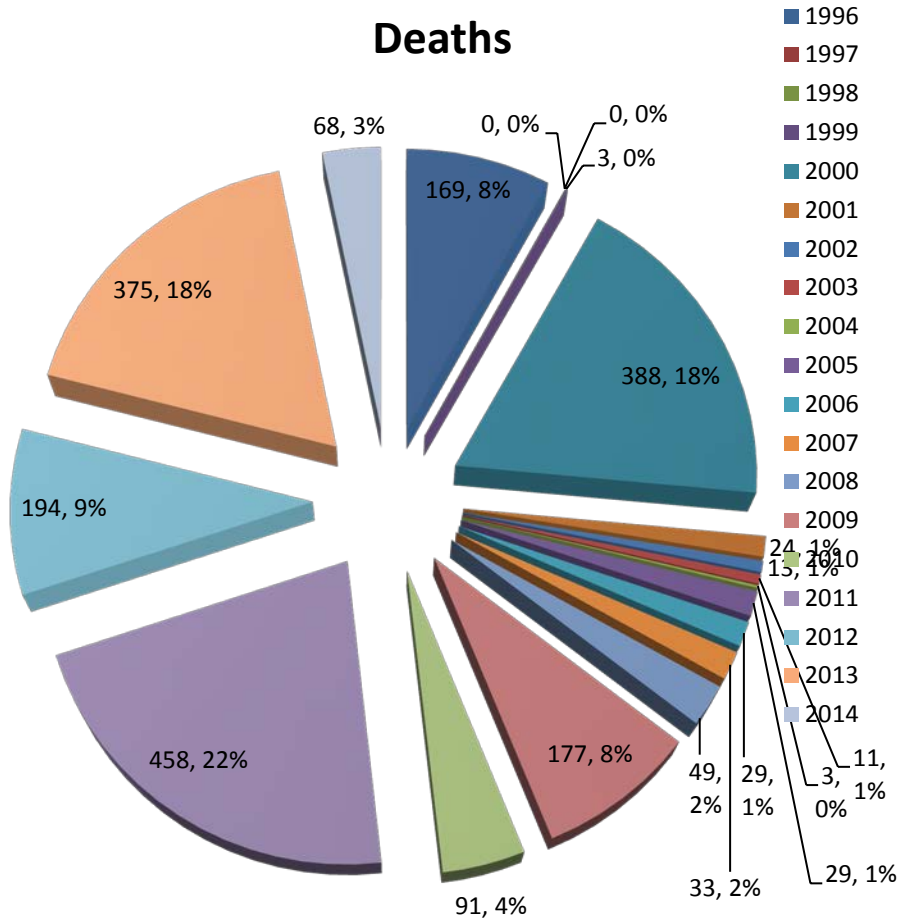
Lake size effect to the rainfall amount (UT, JAXA, SAFE, MOWRAM , May 2014)
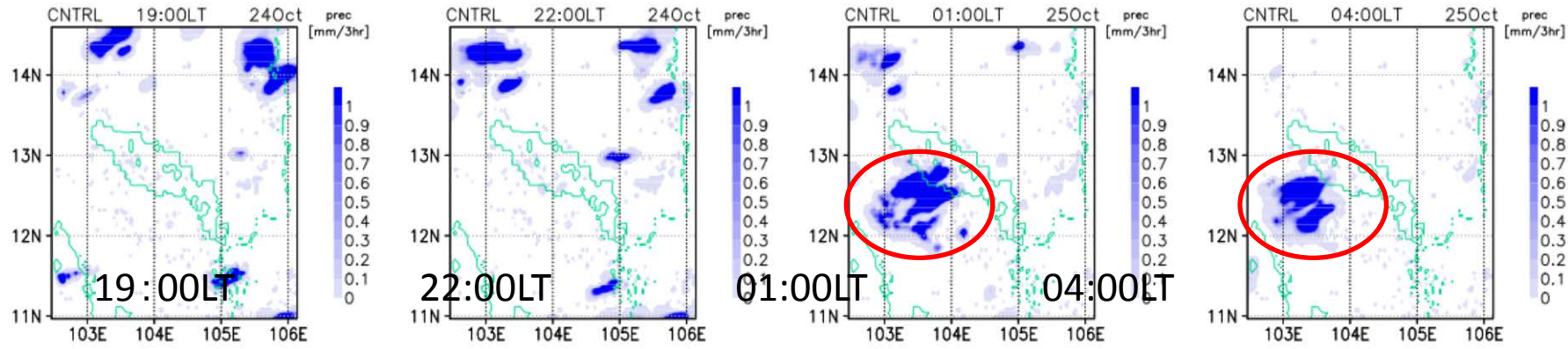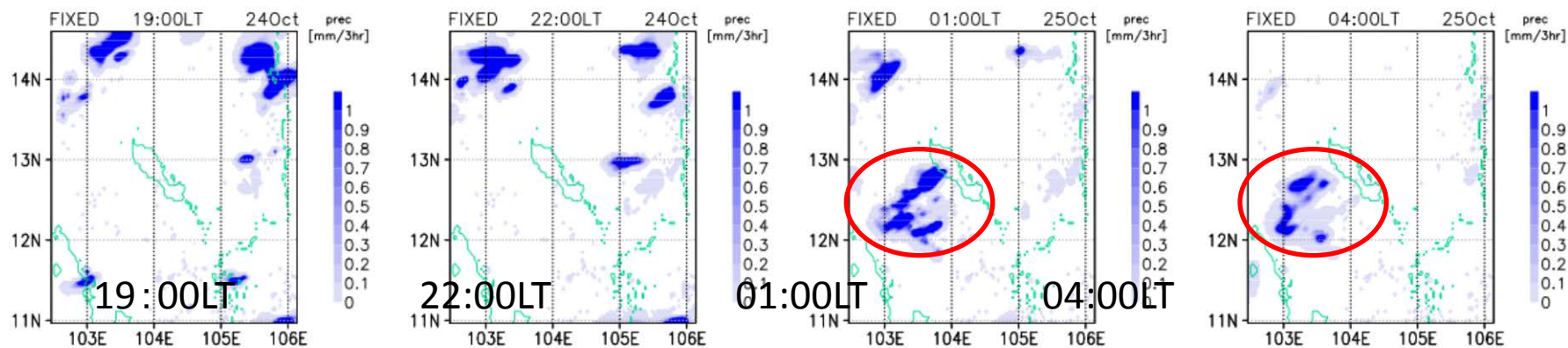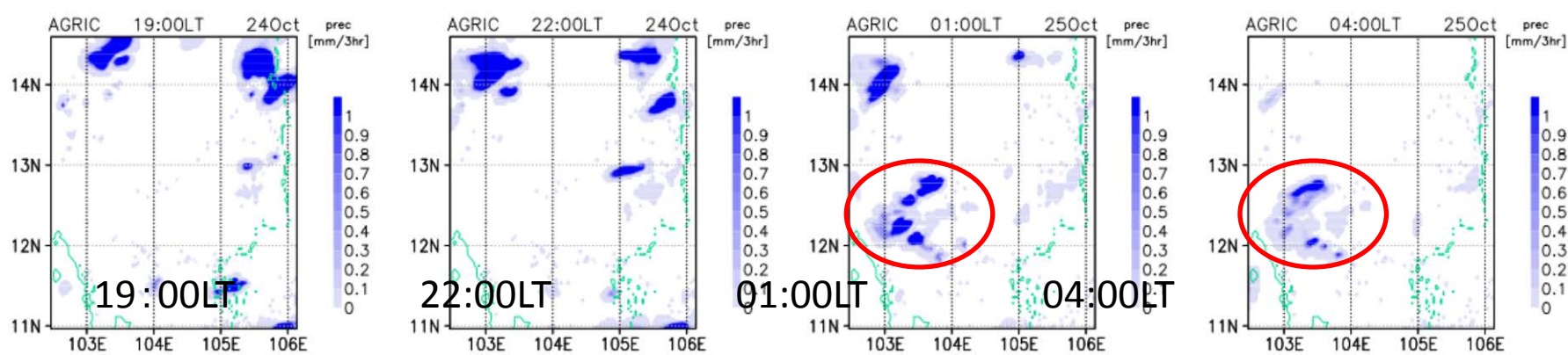
General Weather situation over lower Mekong Basin, 29 September 2009

This picture was flooded by Ketsana in September 31th 2009

09092914GMT

EEI–lab. Kochi Univ. / MTSAT–1R IR1 JMA / background NASA
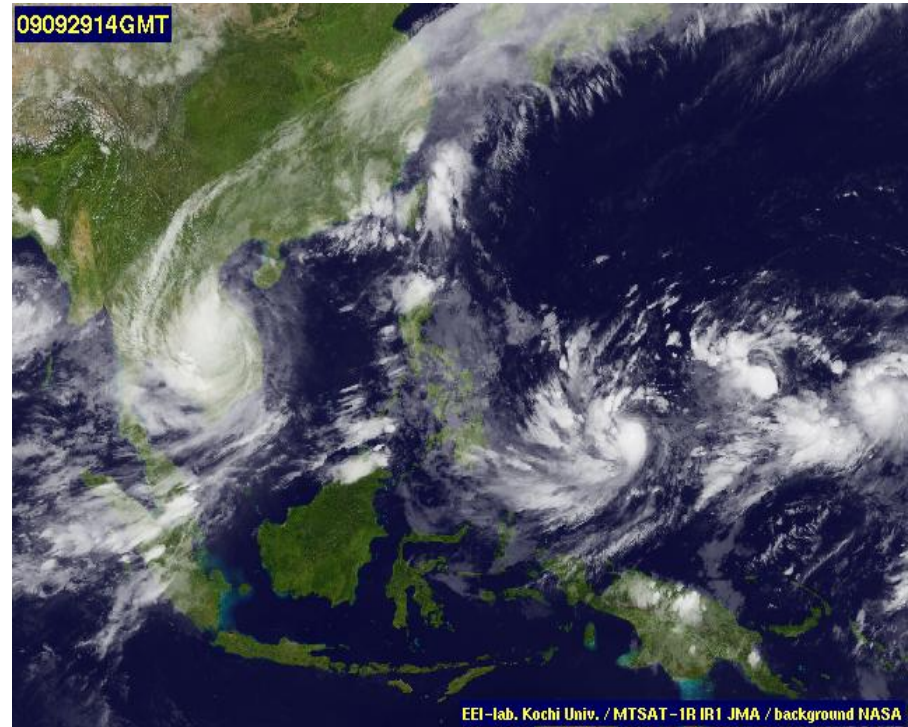
The tropical strom Ketsana hit the central part of the Vietnam's Costal. Its influence covers over North and Northeast part of Cambodia. It caused heavy rainfall and extreme wind. This will be affected on the plateau area and some parts of Central, North and Northwest of Cambodia.
It is expected that the effect of TS Ketsana will cause flash flood in some parts of above areas.

Cambodia's top three hazards
that can be monitored by satellite

- Hazard 2: torrential rain (Flashes flood)
  - A flash flood caused by extremely heavy rain in North and Northeast Part Cambodia in 2009
- In September 14, 2011 was heavy rain at the beginning of the week have causes the flash floods in Siem Reap Province coupled with badly affected many of communities at the moment 34 families from 10 communities are very seriously affected by the flooding

Accumulate of MAP for 24 hour on 30 September 2009 (FFG-MRCS)
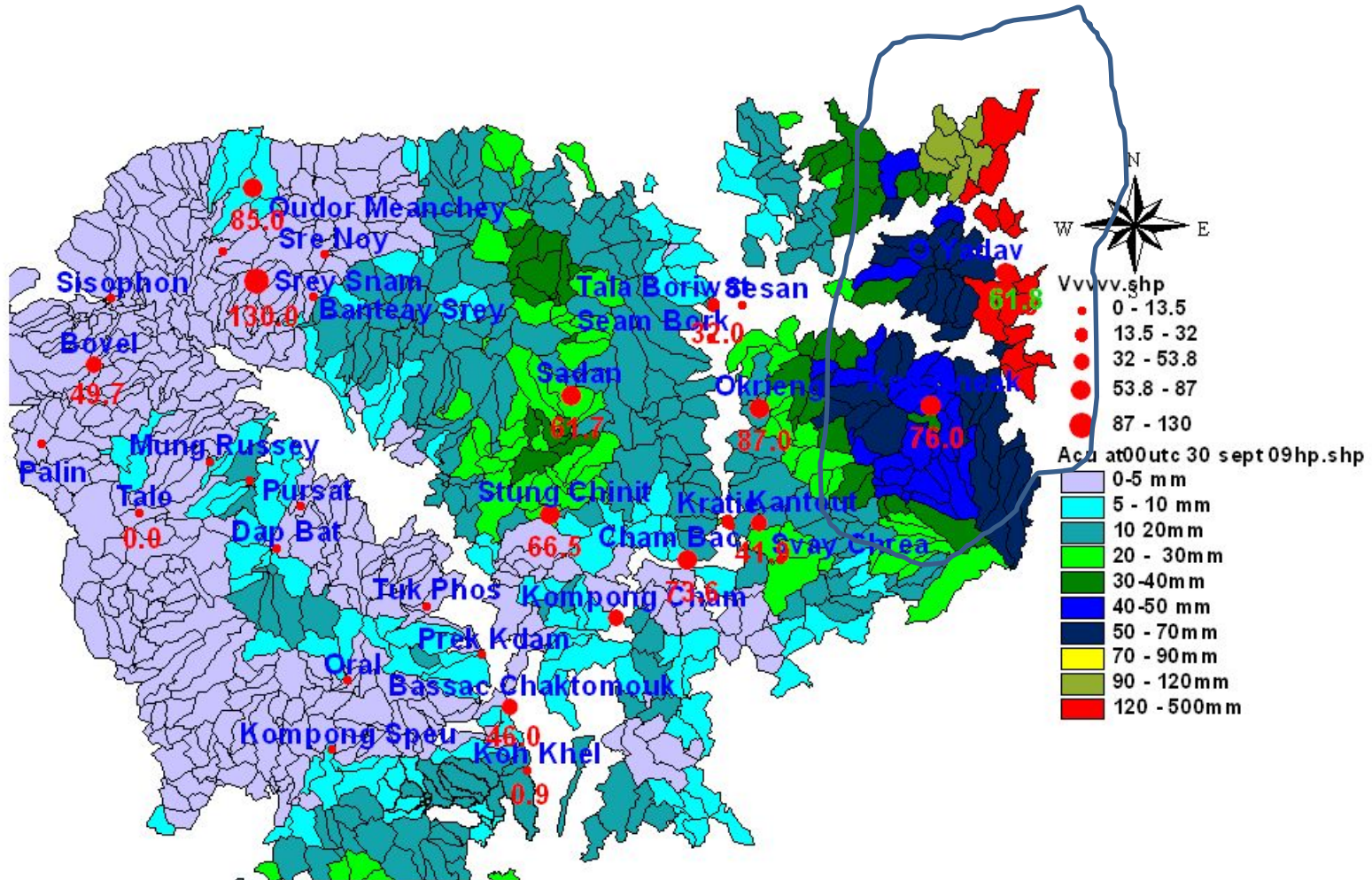
Hydro condition

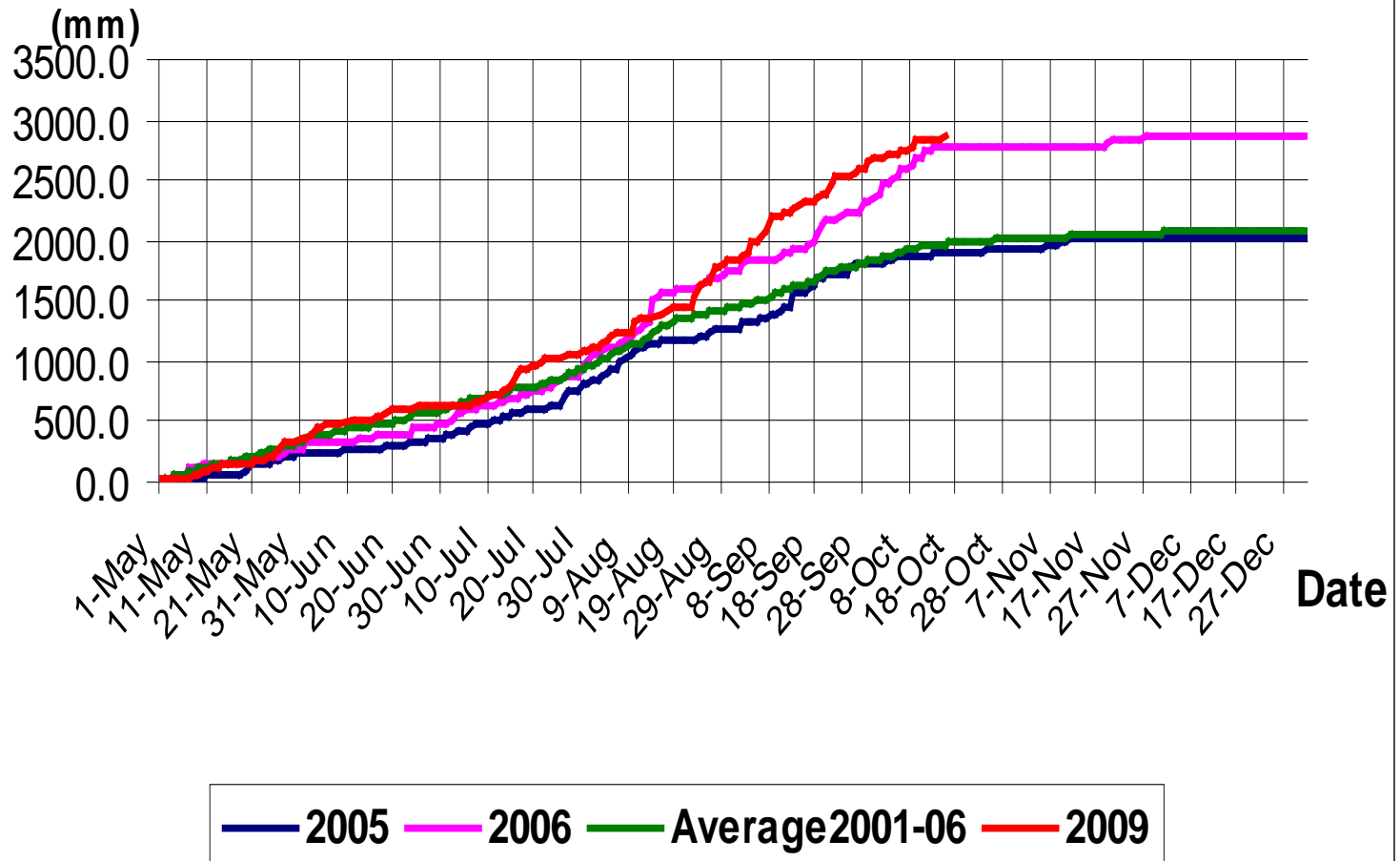## Rainfall condition in river Srepork catchment

Accumulative Rainfall at Dak Nong

Legend: 2005, 2006, Average2001-06, 2009

Rainfall condition in the river Sesan Catchment

Accumulative Rainfall at Ayunpa

Legend: 2001, 2003, Average2001-06, 2009

Accumulative Rainfall at Don Ha

Legend: 2004, 2005, Average2001-06, 2009
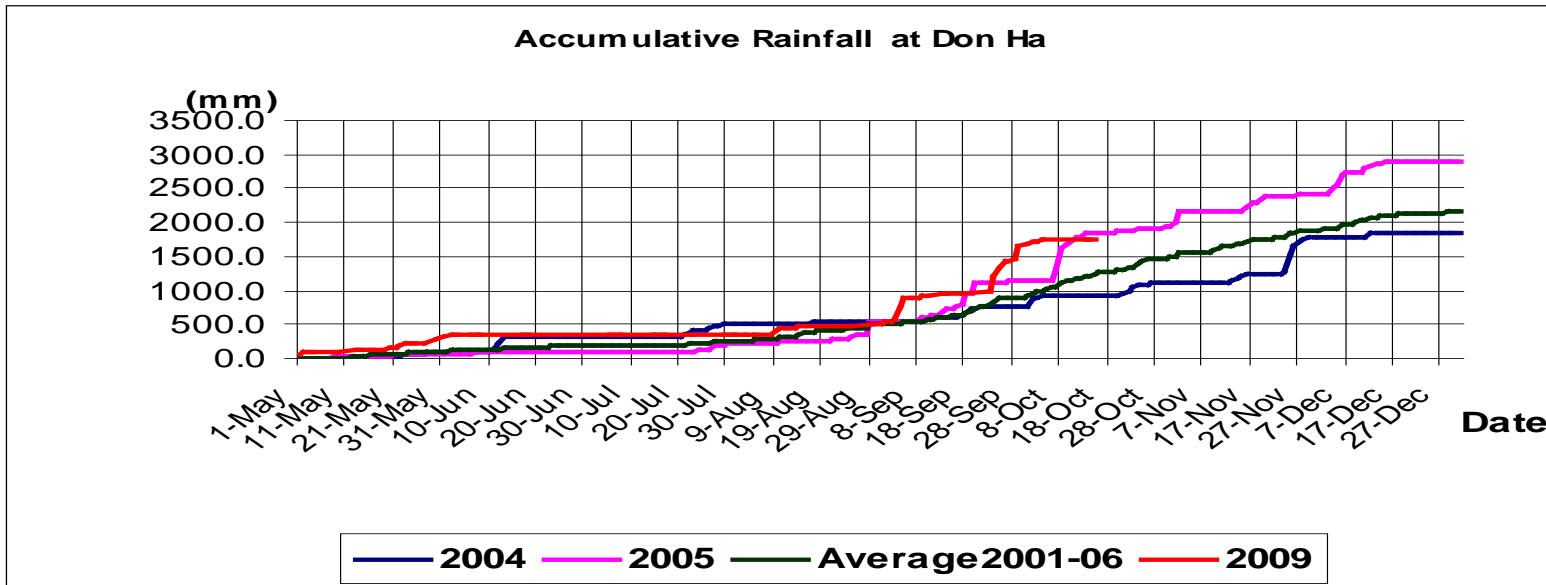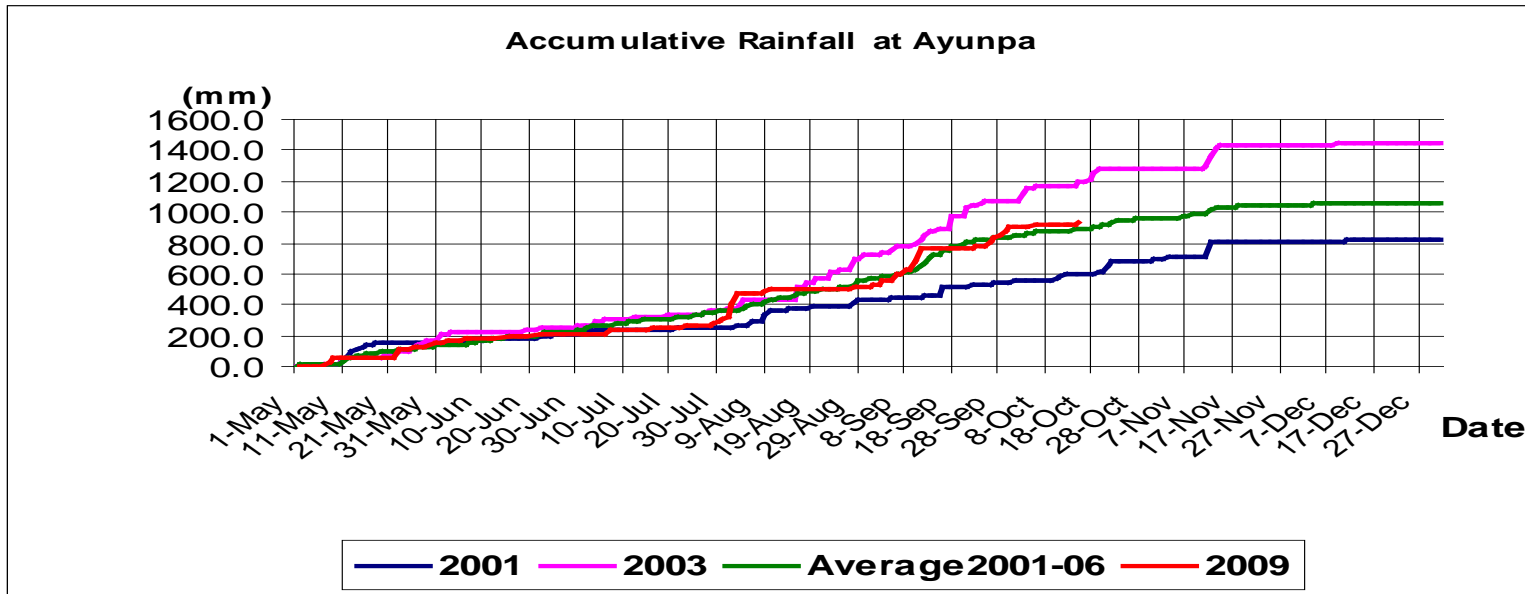
Hydrological condition in Cambodia

Hourly Water Level

2009, 2 October 2100h

2009, September 29.09 00h

W.L(m)

Legend: ◆ Veonsai   ■ Lumphat   ▲ Siempang   × Battombang   ✳ Sisophon   • kg.Thom
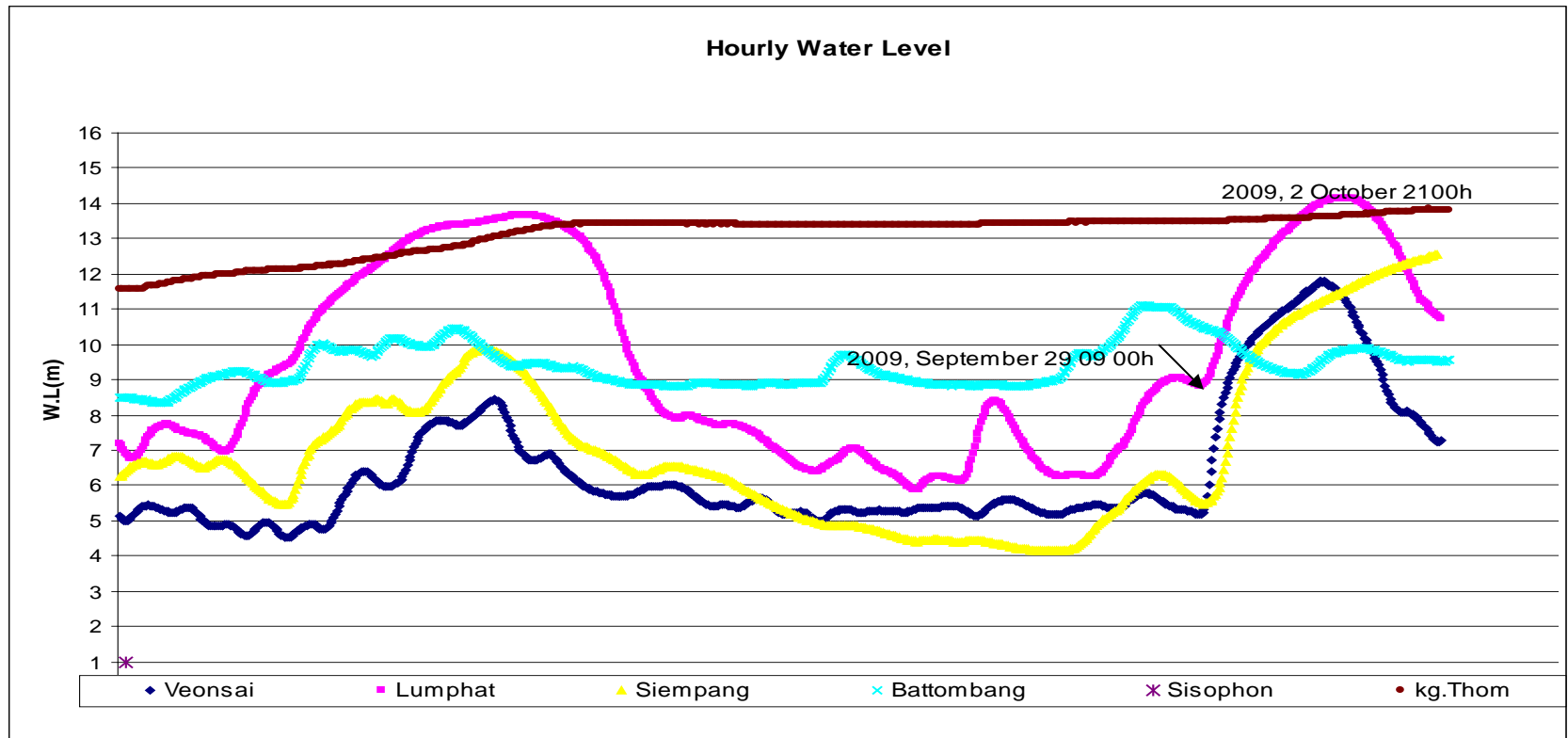
- The water level - in Voen sai (Sesan), Lumphat (Srepok), Siem pang (Sekong) - is increasing on 29 September 2009 at 9:00 AM local time.

Flash Flood Guidance Report for Cambodia, 30 Sep 2009

Hydrological Condition

ASM - 06 hr   2009-09-30 00:00 UTC   CAMBODIA

fraction
- 1.00
- 0.95
- 0.90
- 0.85
- 0.65
- 0.30
- 0.01
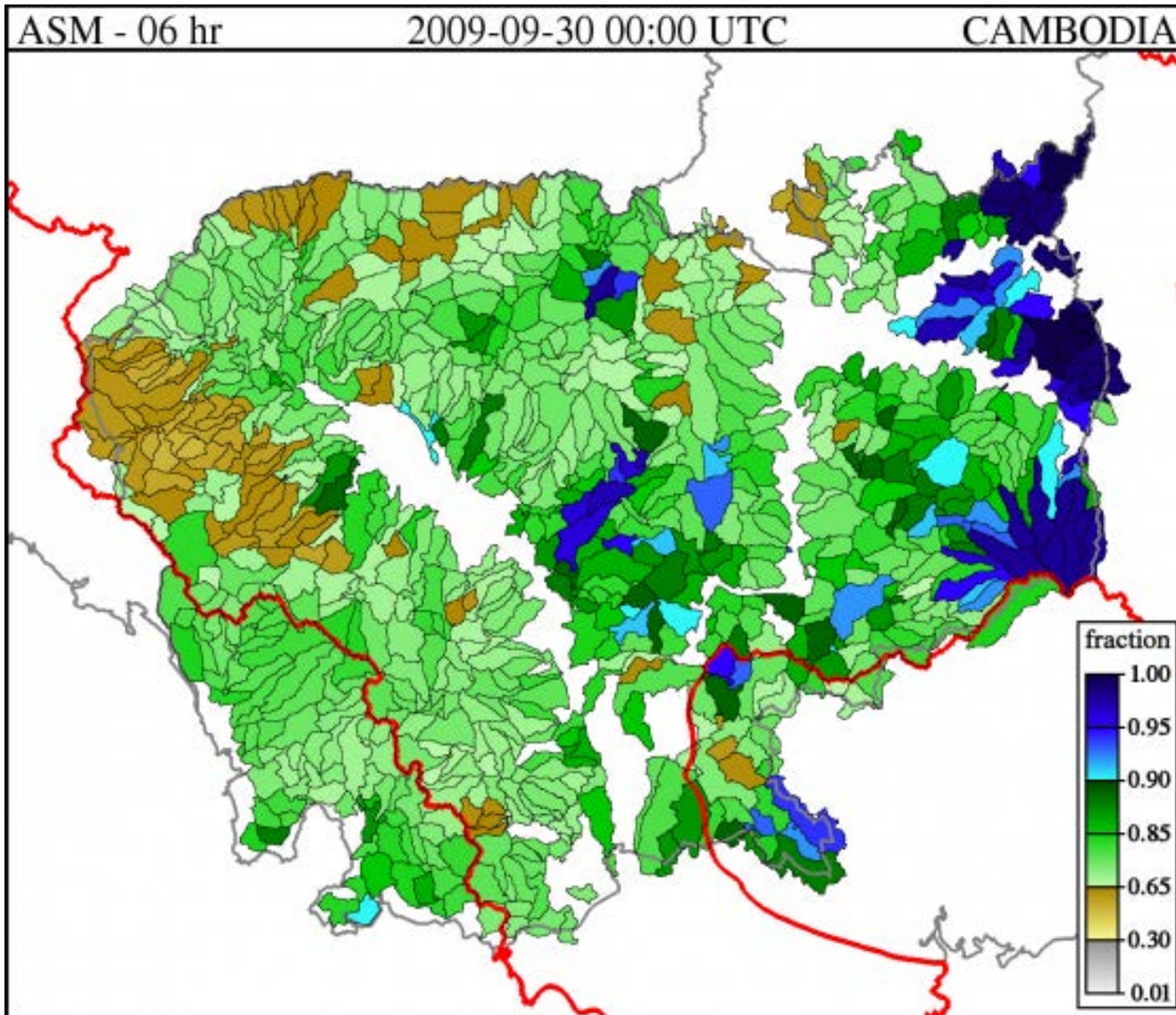
On 30 Sep 2009 at 0UTC discharge along the Mekong River and tributaries increased sharply. The heavy rainfall in Cambodia and upper part caused of the soil moisture condition are saturated in Ratanakiri, Mondulkiri, Preah Vihear, Kg.Thom and some area around the Tonlesap lake. So, the area mention above will be faced the flash flood.

flashfloods in Cambodia
September, 2011

Cambodia's expectations of new series of satellites for hazard monitoring

Major hazard	Features of new generation GEO met. satellite
Hazard 1: tropical cyclones, Typhoon, Severe thunderstorms, Monsoon activity	**Multi-spectral bands:** New signals derived from multi-spectral-band observations will support issuance of more effective warnings.
Hazard 2: Torrential rain (flashes flood)	**Rapid scanning:** Data from rapid scanning observation will enable early detection *for monitoring smaller-scale meteorological phenomena* **Multi-spectral bands:** New quantitative products will be derived from multi-spectral band observation data.

Cambodia's requirements to get desired benefits from the new generation of satellites

Major hazard	Features of new generation GEO met. satellite
Hazard 1: tropical cyclones	**Training in imagery analysis:** Training would support the retrieval of new signals from multi-spectral band observation.
Hazard 2: torrential rain	**Product algorithms:** The provision of product algorithms maybe would support the creation of the rain or storm track for analysis . **Easy-to-understand product:** We would be interested in using a product made with multi-spectral band data that indicates new signals prior to extremely heavy rain.

Thank you for your attention