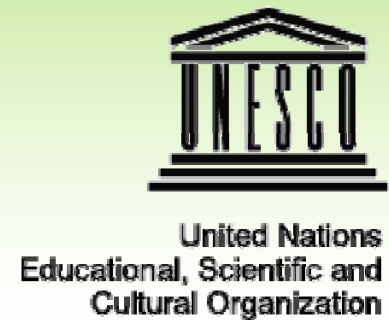




ADB Water Week
13 March 2013
Where is the progress in IWRM
application?



Integrated Flood Risk Management in a Seamless Manner

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Kuniyoshi Takeuchi

**International Centre for Water Hazard and Risk
Management under the auspices of UNESCO (ICHARM)
Public Works Research Institute (PWRI)
Tsukuba, Japan**



Evolution of IWRM

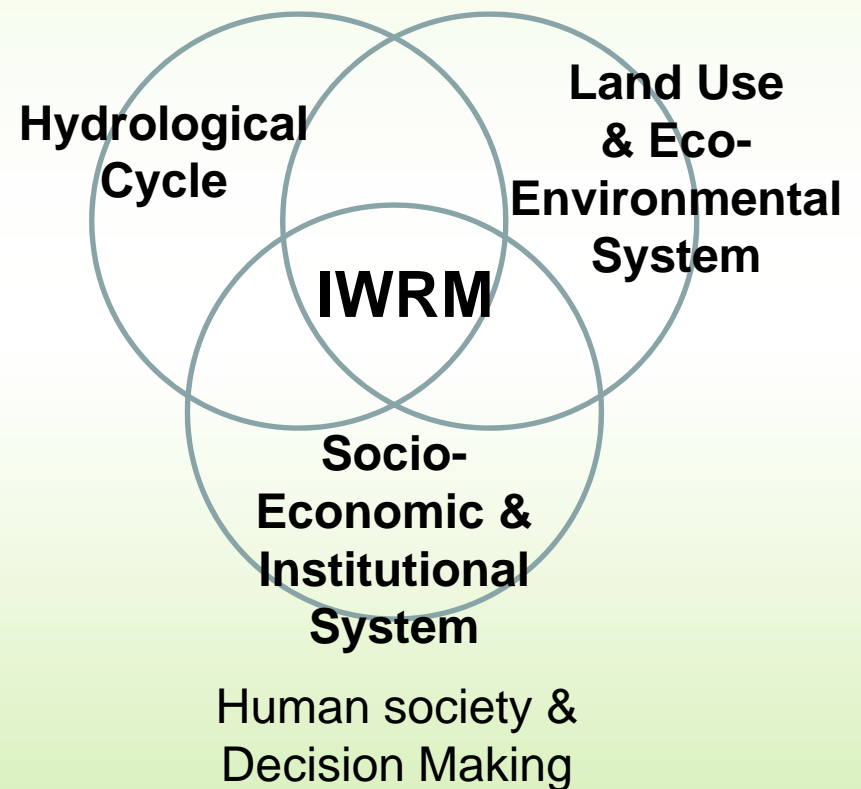
- Many historical WRDs, TVA (1930s) etc.
- Mal del Plata Action Plan (1977) use & efficiency, natural hazards, environmental & pollution control, planning & management, public information, education, cooperation
 - the first internationally coordinated approach to IWRM
- Dublin Conference and Agenda 21 (1992)
 - Finite, vulnerable & essential to be managed in an integrated manner, participatory approach, women's role, economic good
- GWP Technical Advisory Committee (2000)
- Bonn Conf (2001) & Johannesburg WSSD (2002)

⇔ From Principle to Implementation



Integrated Water Resources Management

- IWRM is a process which promotes the co-ordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. (GWP TAC, 2000)



Integrated Flood Risk Management

- IFRM \supset IFM \supset IWRM
- **IFRM** is a process which promotes the co-ordinated development and management of floodplain to reduce flood risk while maximizing the benefit of floodplain in an equitable manner within ecological and societal sustainability by the best mix of structural and nonstructural means to control floods, mitigate flood damages or adapt society for the nature.
- **Integrated with:** environmental management, forestry, roads, transportation, underground develop, sewerage, city/land use planning/regulation, capacity development, awareness raising, community preparedness, ...



Needs of IFRM in a seamless manner

- Seamless in what?
 - Temporal and spatial hydrological scales
 - Developed and developing worlds
 - In availability of capacity, data & other resources.
 - Water-land-climate-environmental and human societal boundaries
 - Disciplinary boundaries
 - Socio-economic sectorial boundaries
 - Institutional & administrative boundaries
 - Trans-boundaries

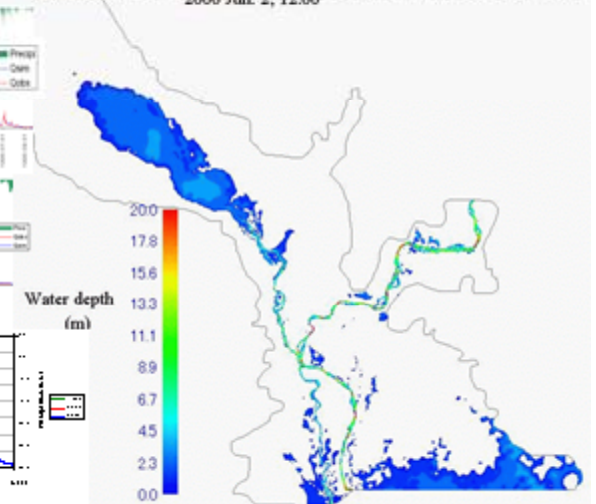
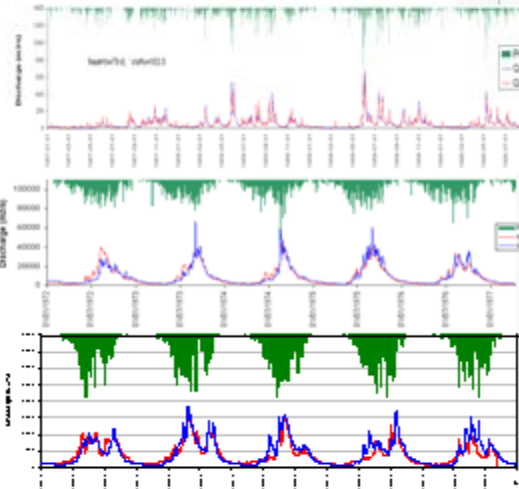
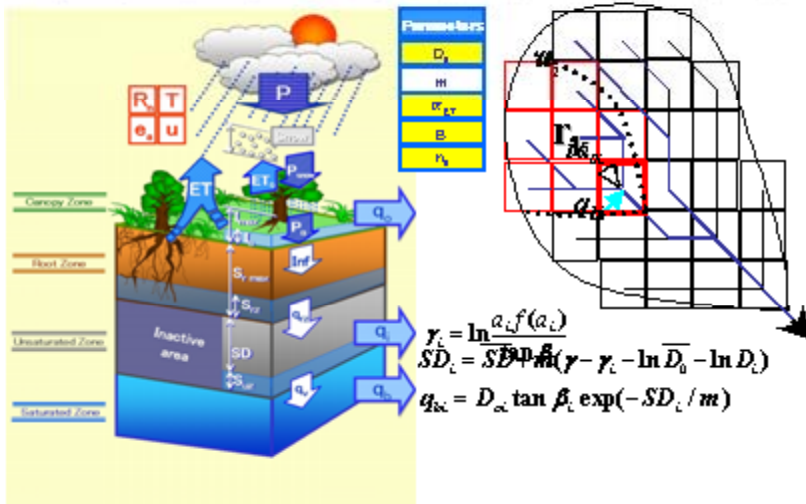
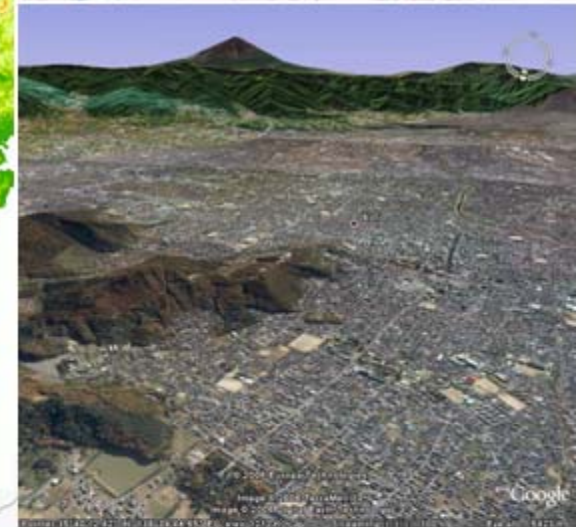
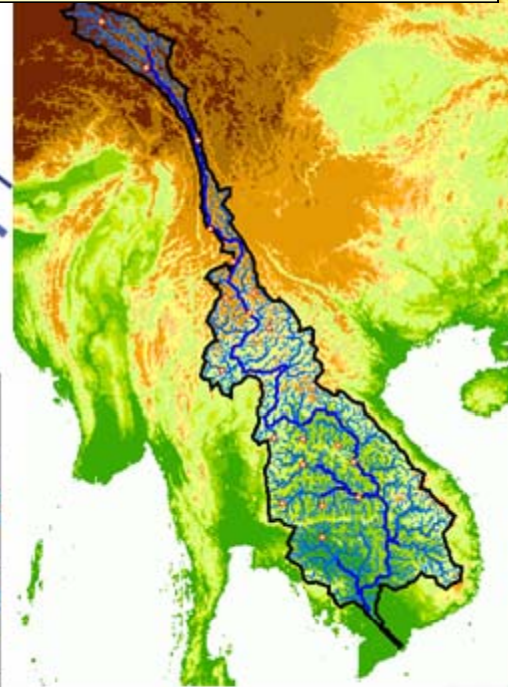
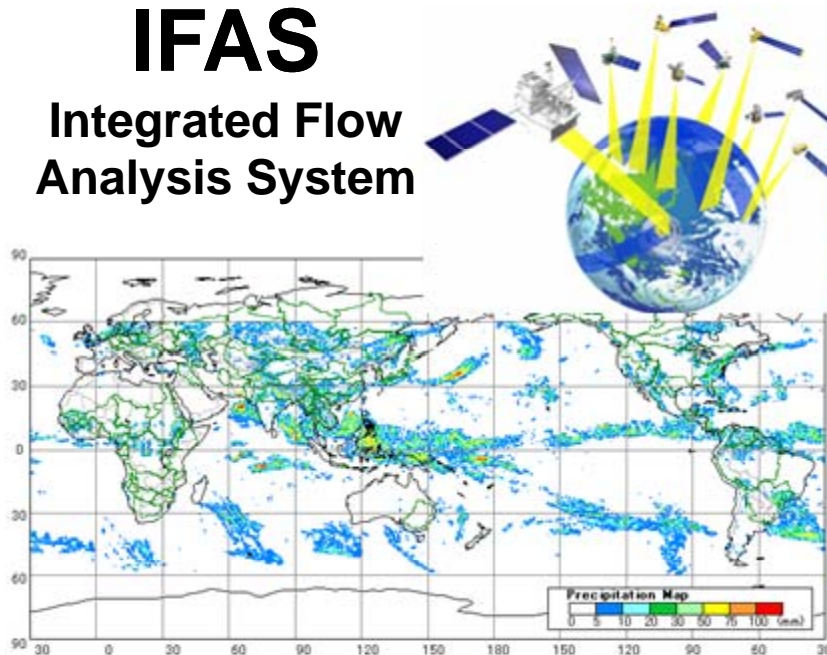
Key is a hydro-environmental simulation model.



Advanced Technology for Early Warning & Hazard Mapping

IFAS

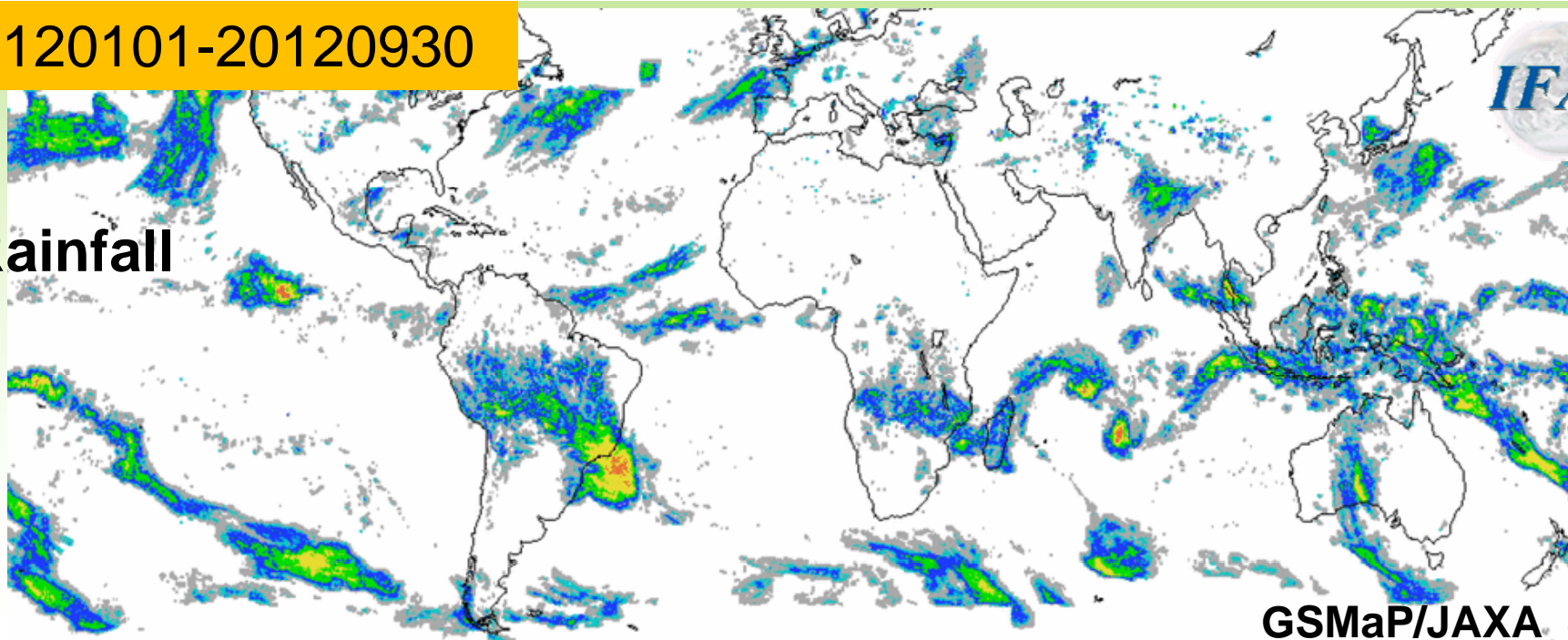
Integrated Flow
Analysis System



20120101-20120930

IFAS

Rainfall

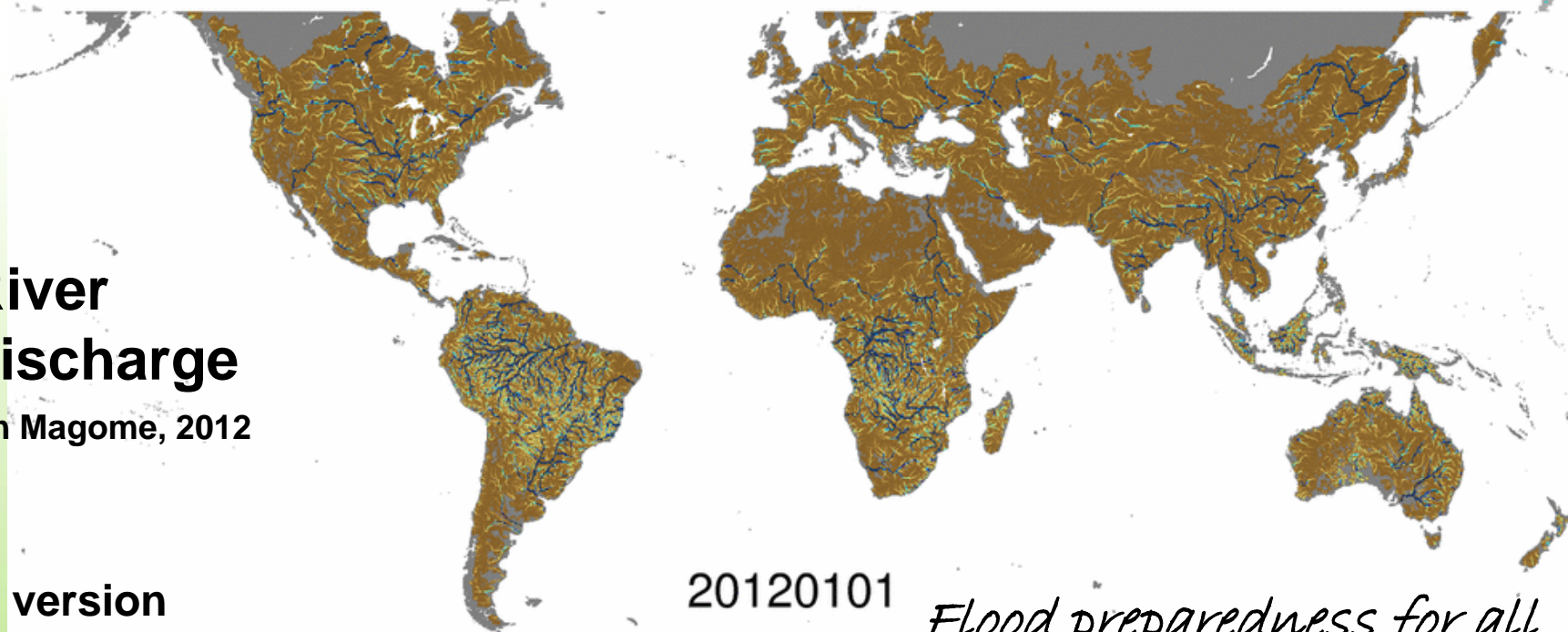


GSMaP/JAXA

River
discharge

Jun Magome, 2012

β version



20120101

Flood preparedness for all

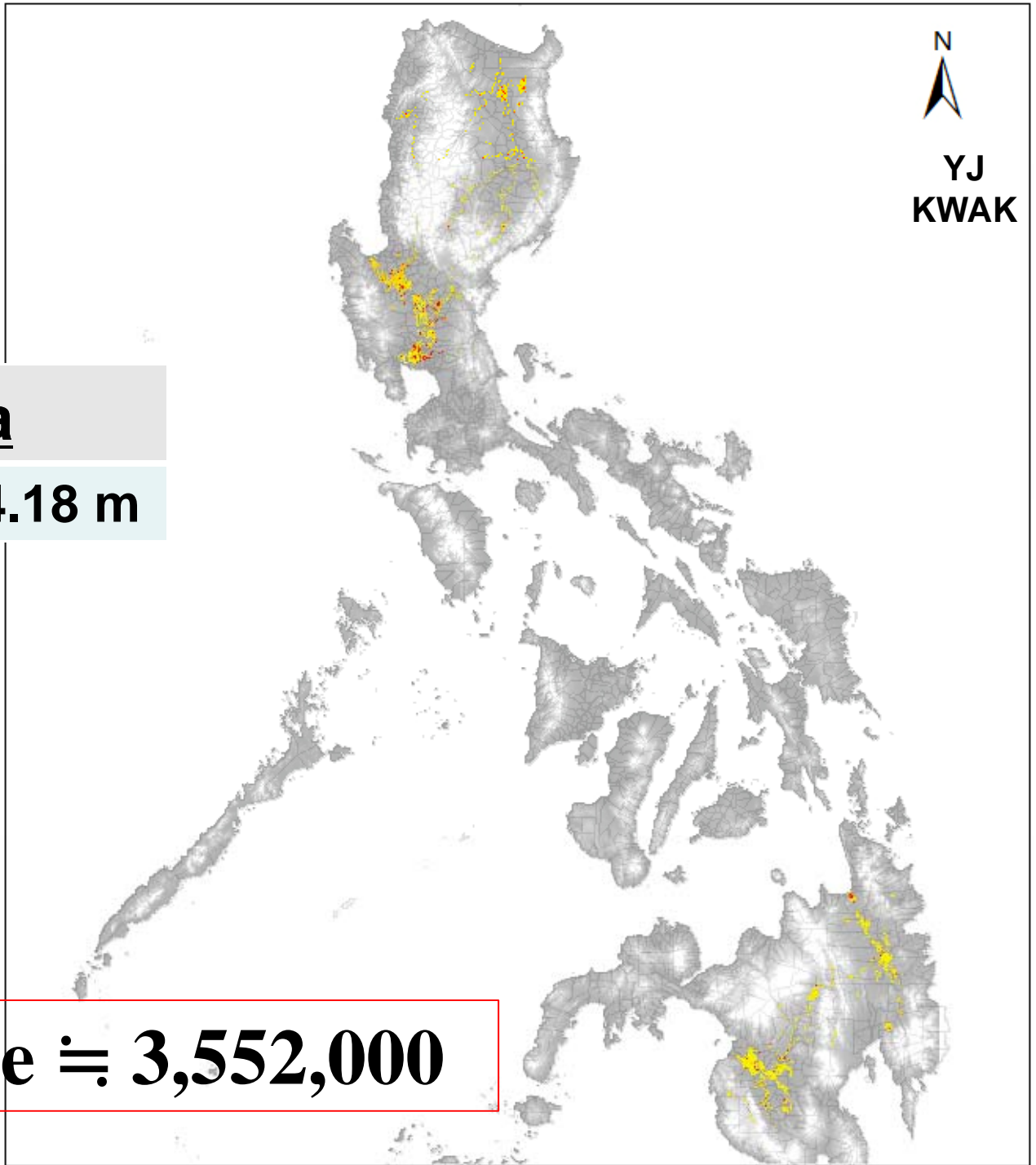
RM

Philippines

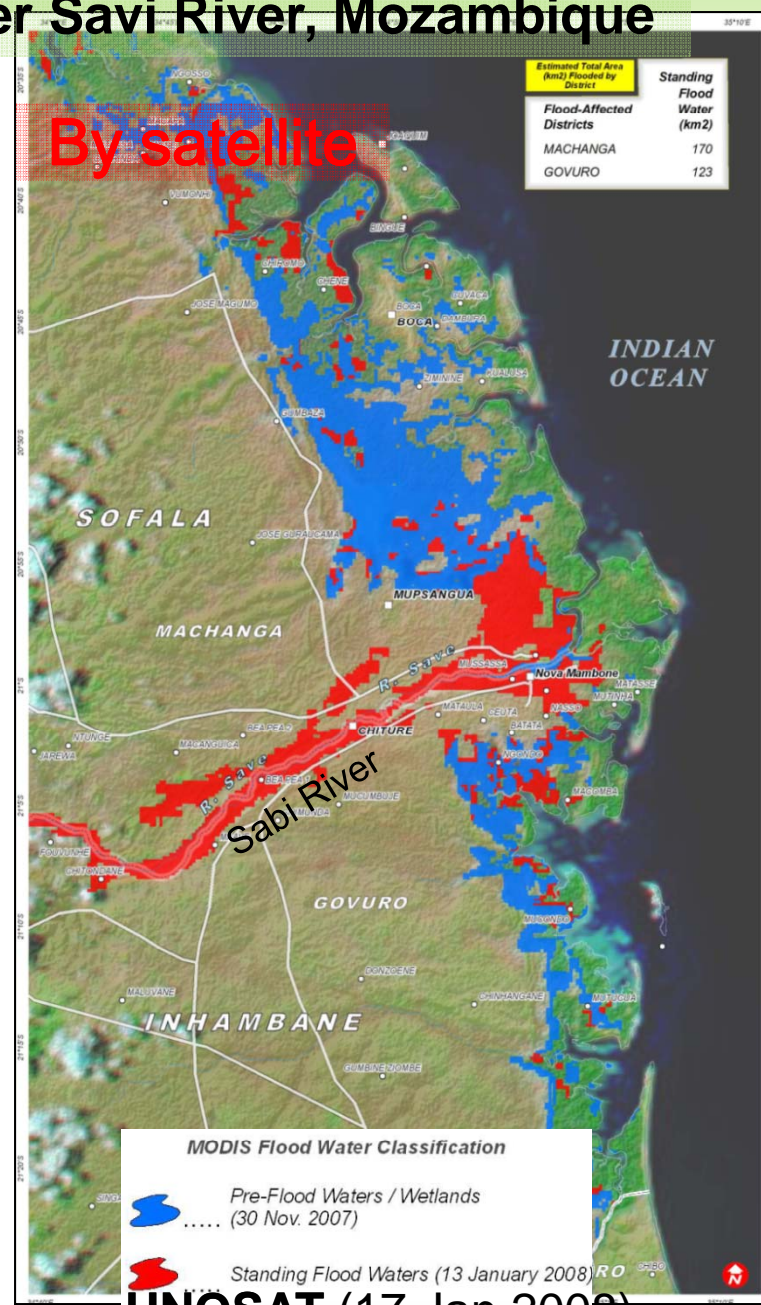
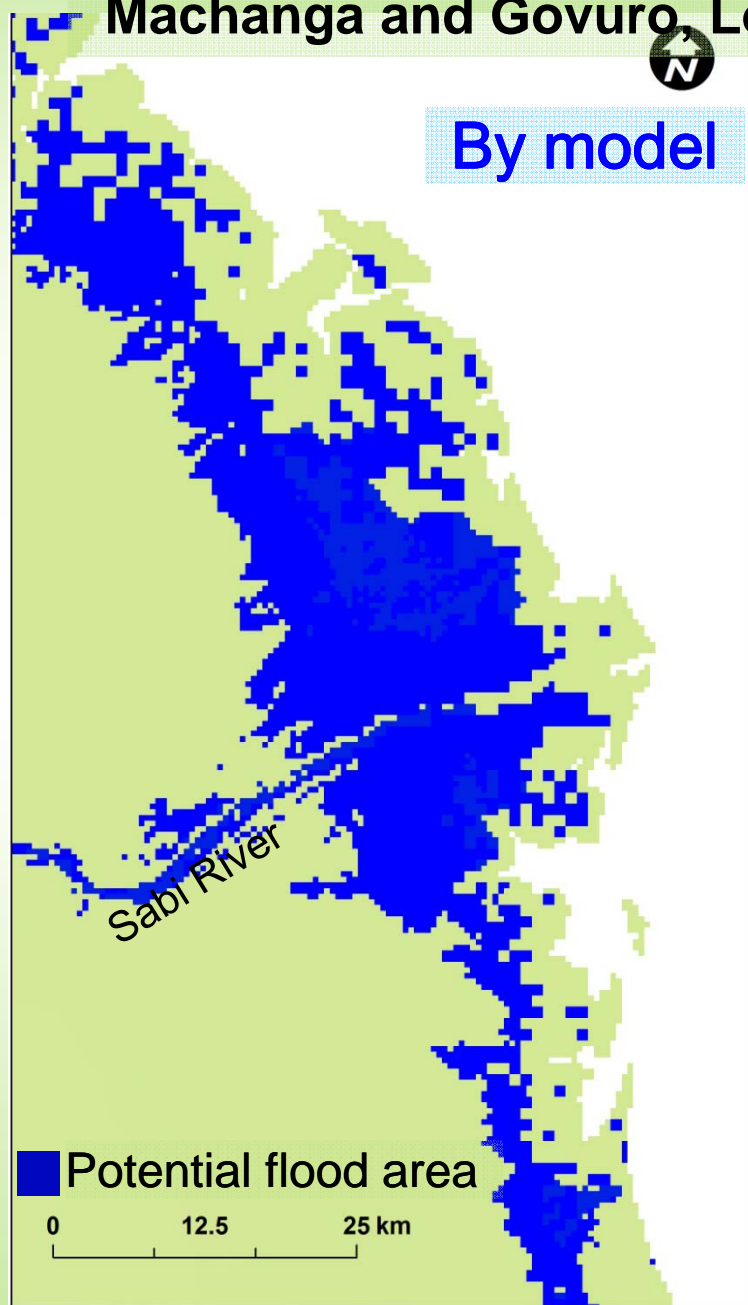
Hazard: FID area

$0 \text{ m} < H_{\max_50 \text{ year}} < 4.18 \text{ m}$

Affected People \approx 3,552,000

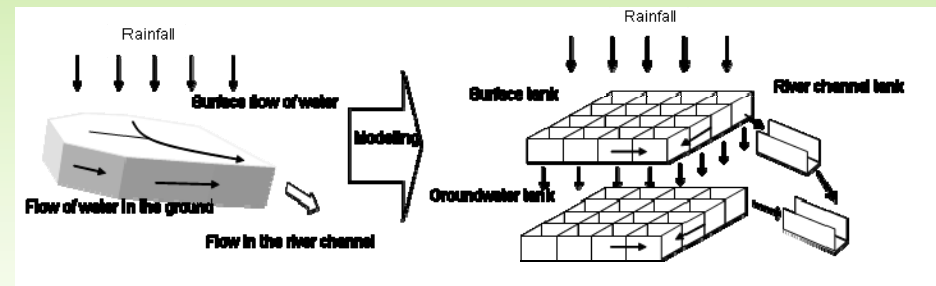


Map of Flood Waters over the Affected Districts of Machanga and Govuro, Lower Savi River, Mozambique

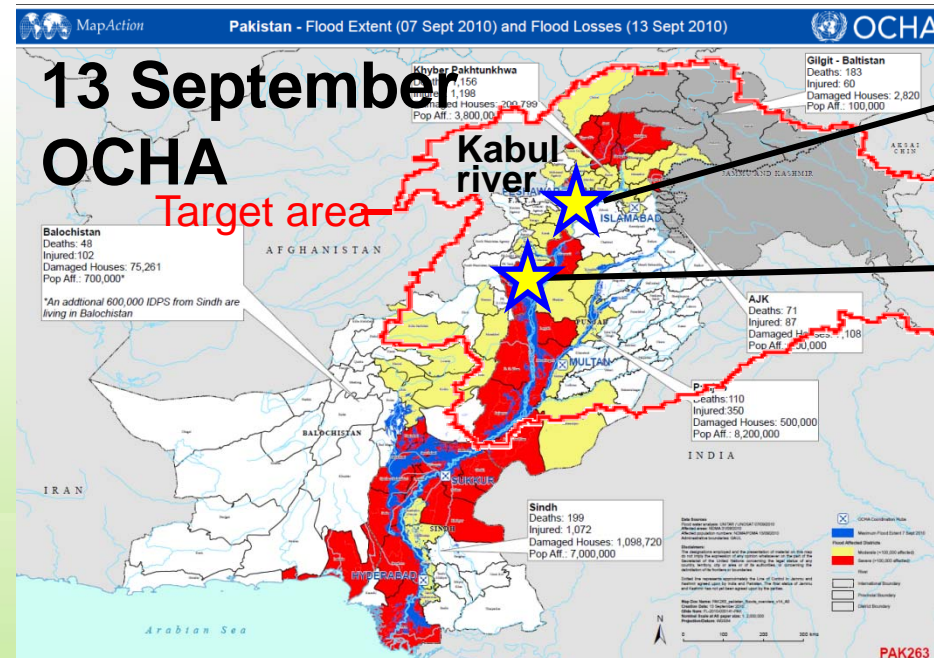
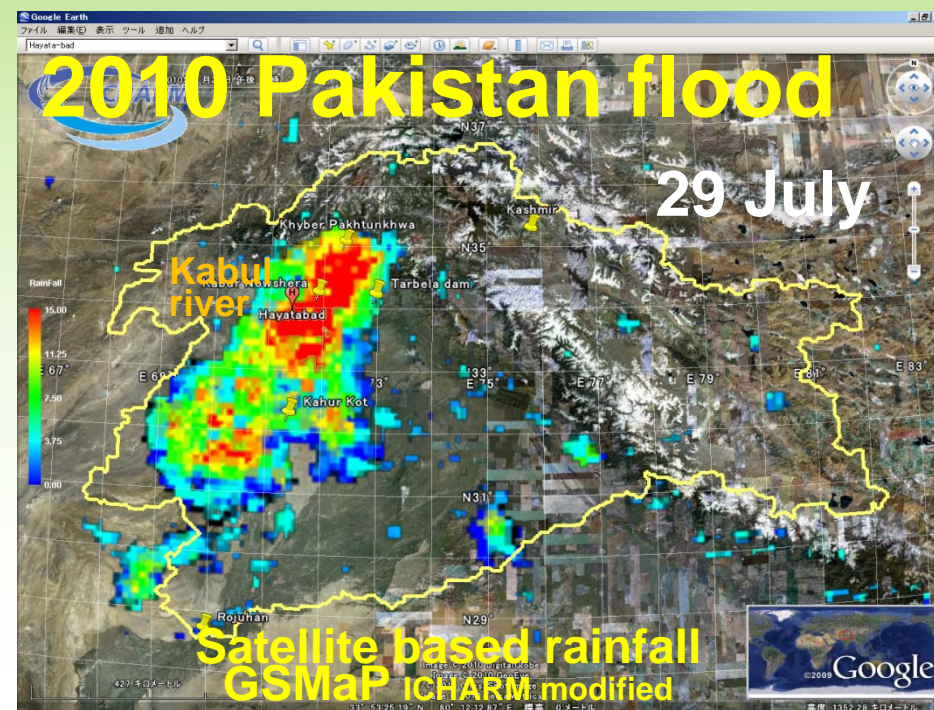
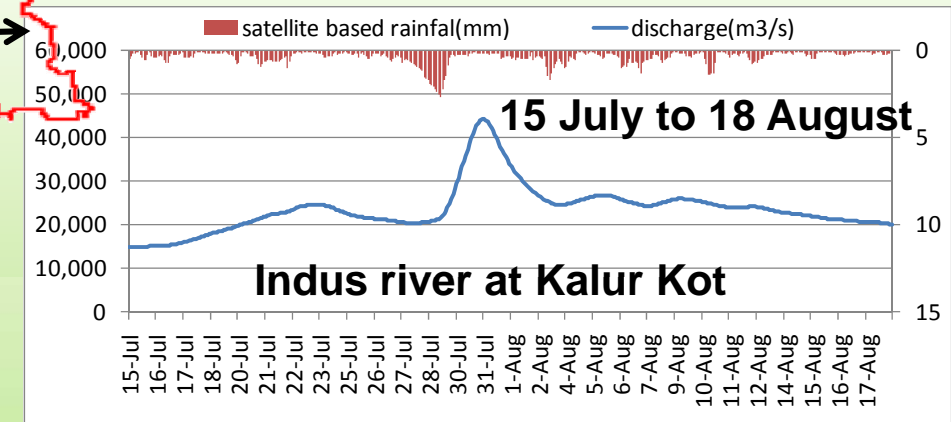
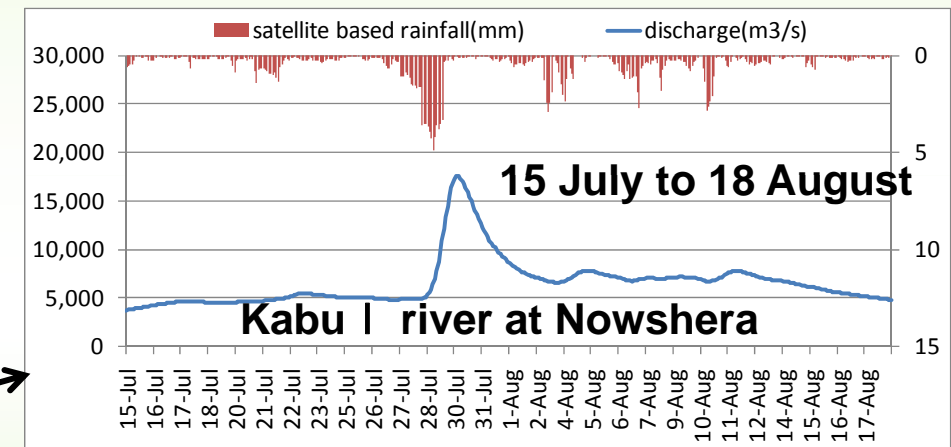


Nowcasts by IFAS

Seishi Navesaka



IFAS modeling schematics



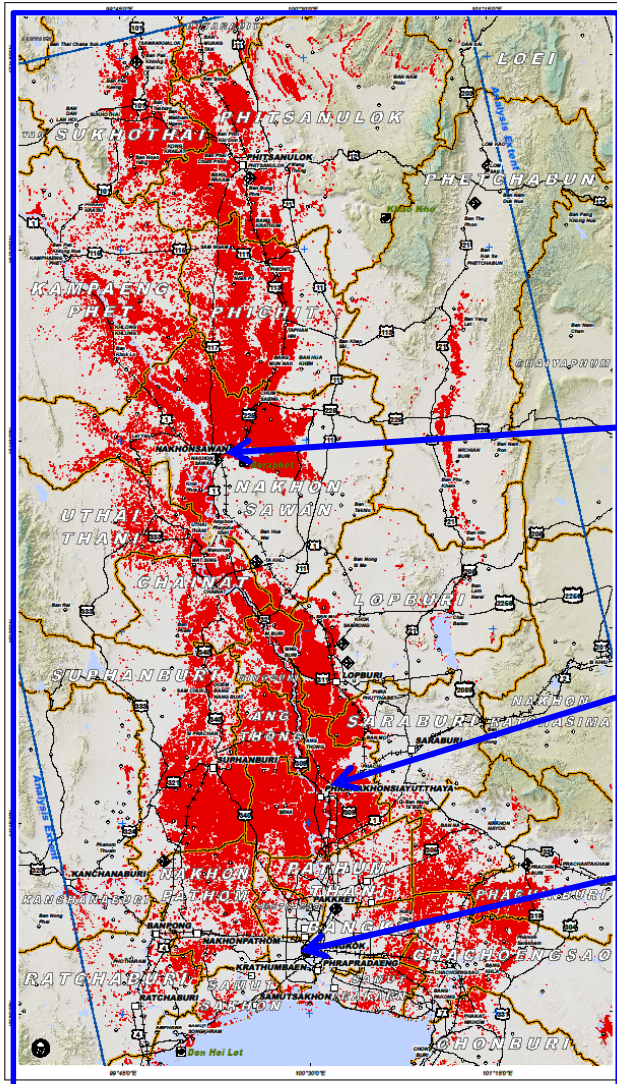
001 / 152

Tropical Cyclone & Flooding

Production Date: 13/10/2011

Version 4.0

Glide Number: FL-2011-000135-THA

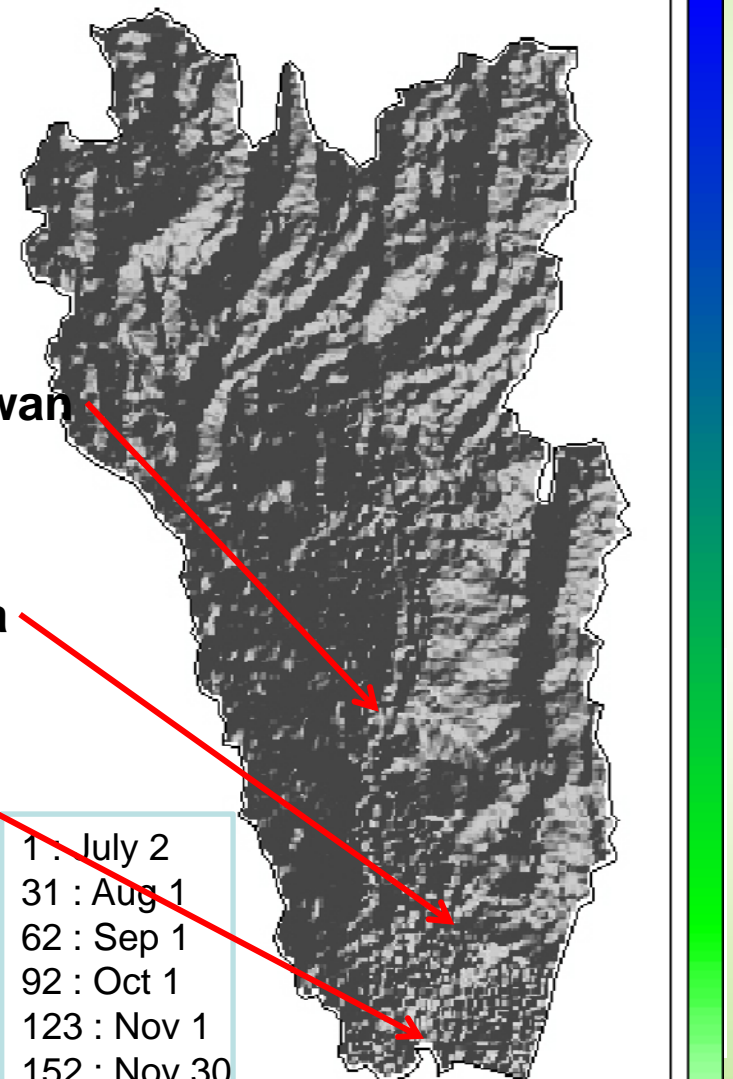


Nakhon Sawan

Ayutthaya

Bangkok

Simulation on
Oct 18, 2011 by ICHARM 5m



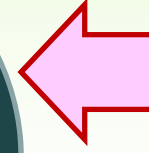
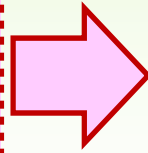
Sayama's RRI model
by satellites & NWF

Promoting local ownership of flood forecasts

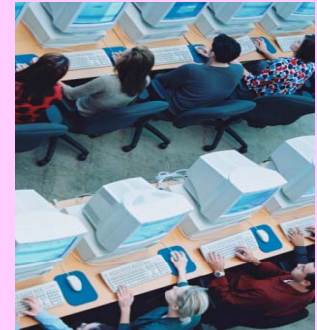
ICHARM's Challenge: *Localism*

System

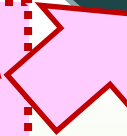
IFAS



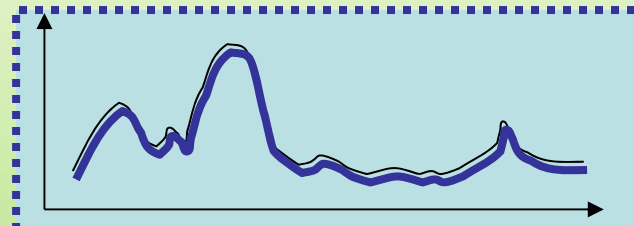
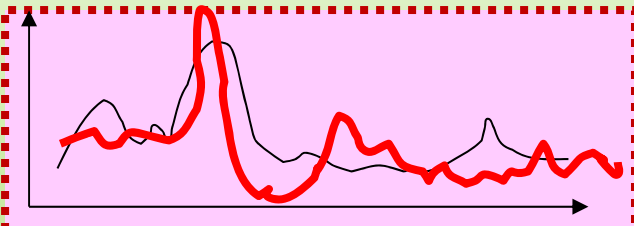
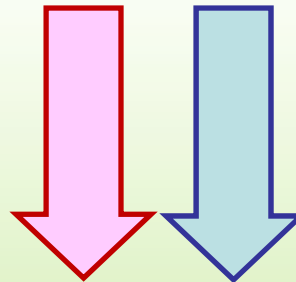
Training

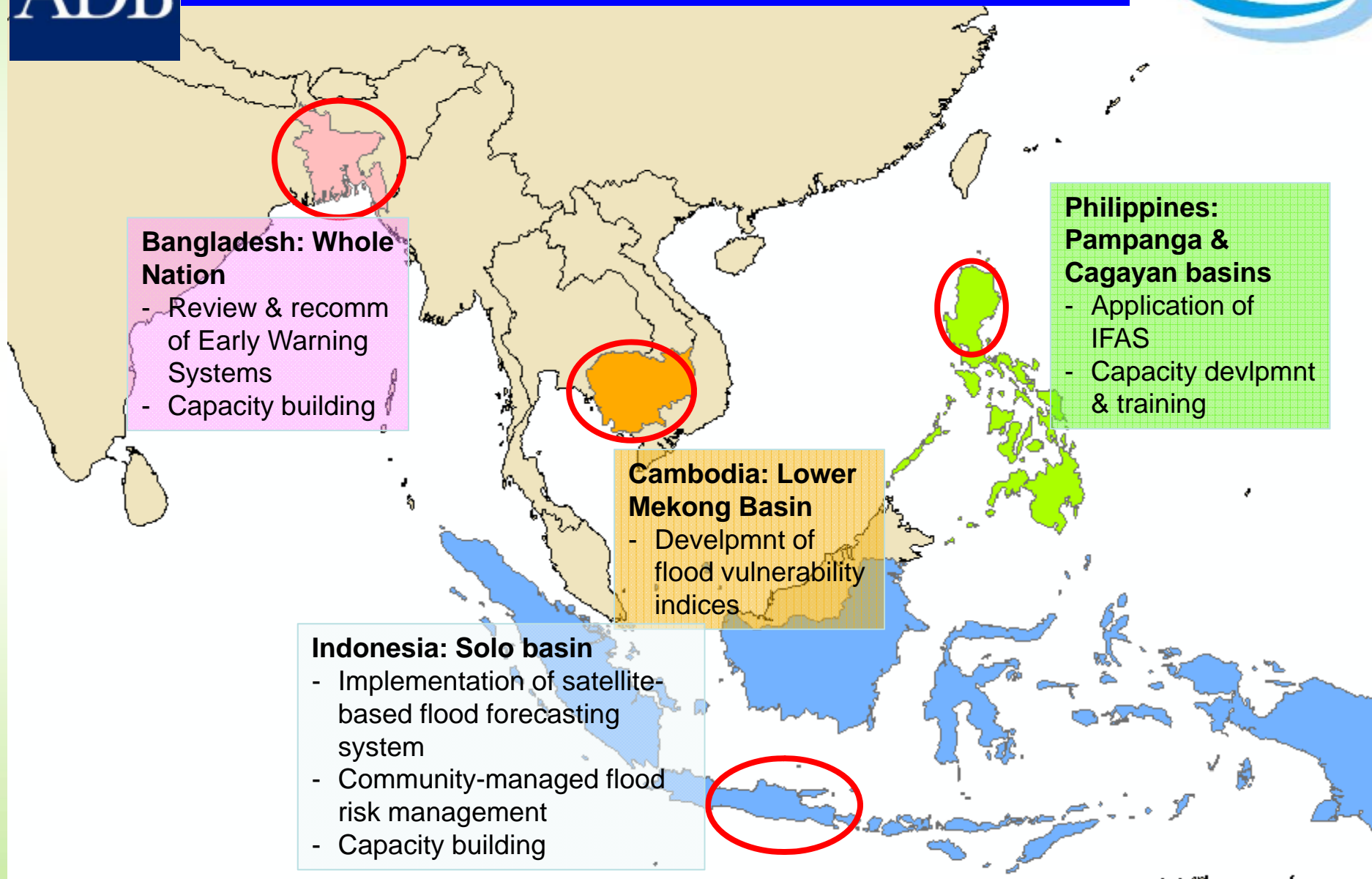


Global Data



Local Data





Installation of IFAS

Indonesia Component

Real-time Flood Alert System



Data collection by
SMS (hourly)

Automatic
access



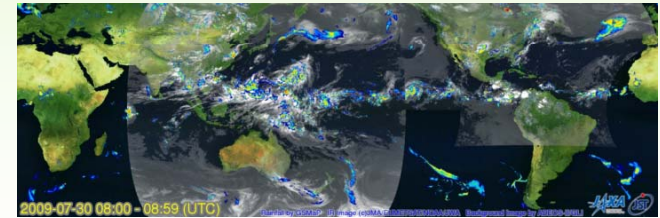
Data pick up



Output

Satellite based
rainfall

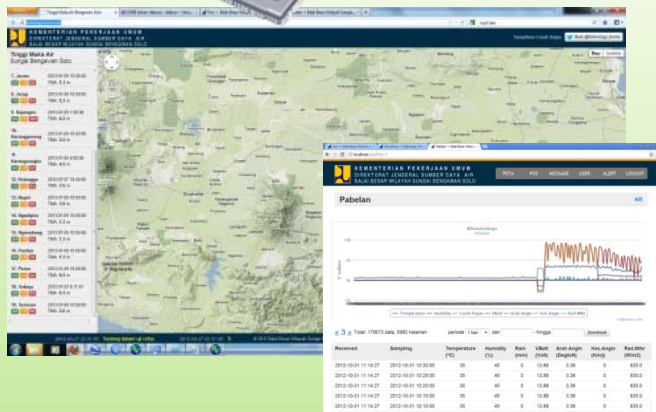
Near Real time Flood Alert System



Courtesy of JAXA



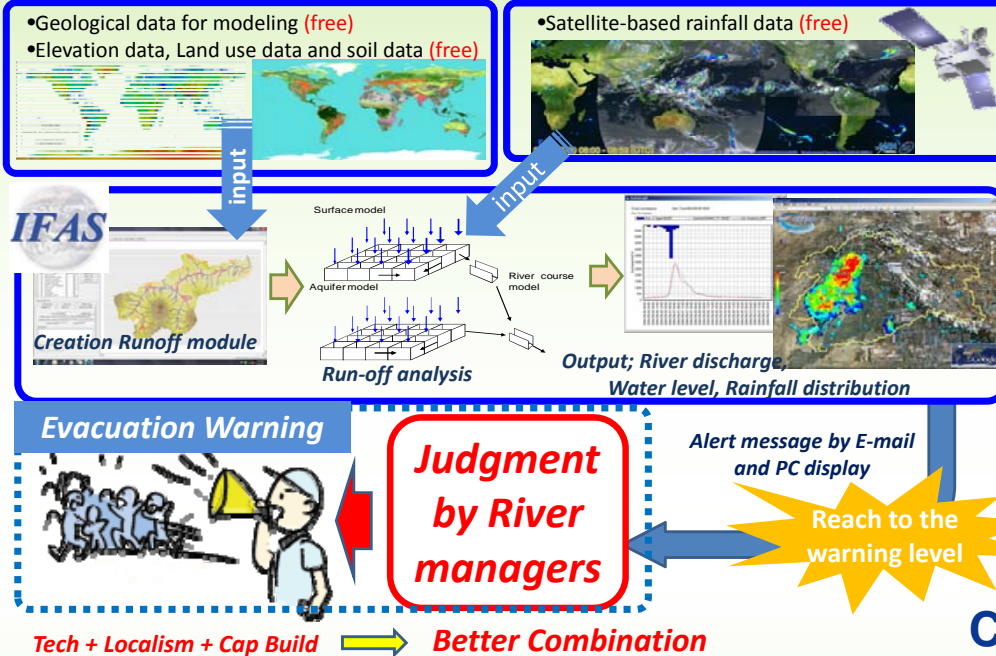
Automatic
access



Automatic Alert e-mail

IFAS installation in Solo river basin in Indonesia

Integrated Flood Analysis System (IFAS)

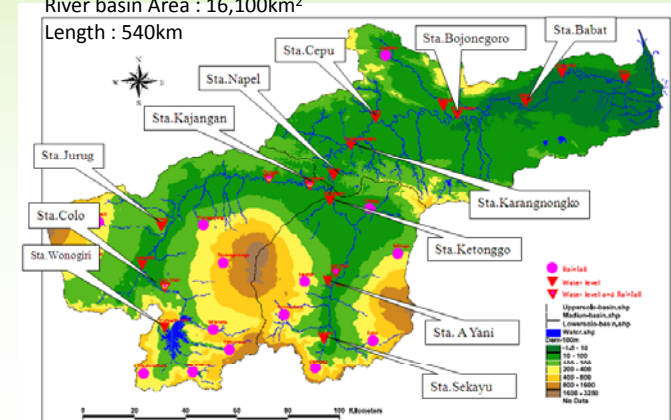


Solo River

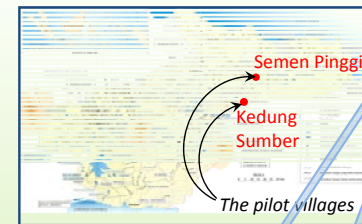
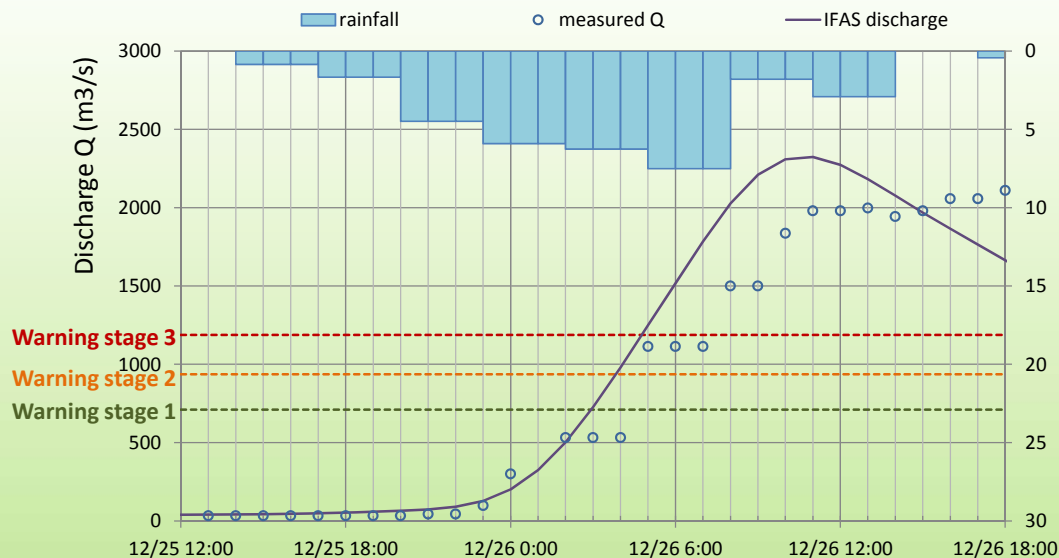
Target Area: Solo River

River basin Area : 16,100km²

Length : 540km



Community based flood management

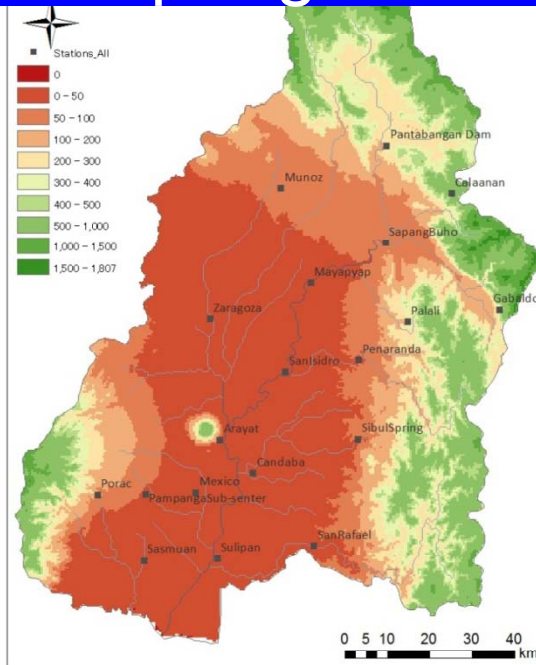


Demonstration activities:

- (1) facilitation for community hazard and risk assessment and mapping,
- (2) facilitation for preparing risk maps, FRM action plans and the manual for early warning system and evacuation plan
- (3) support community in technical aspects for carrying out emergency drills and exercises



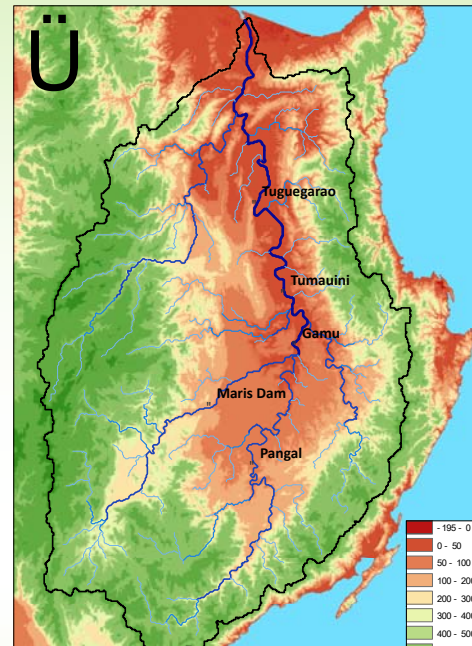
IFAS installation and identifying flood causes in Pampanga and Cagayan river basins in the Philippines



Pampanga River
10,454km²
18 rainfall stations
11 water level stations



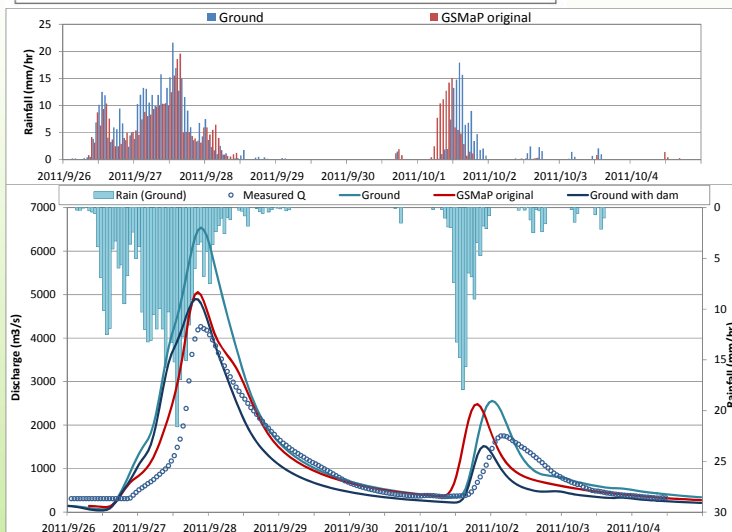
Mayapay station



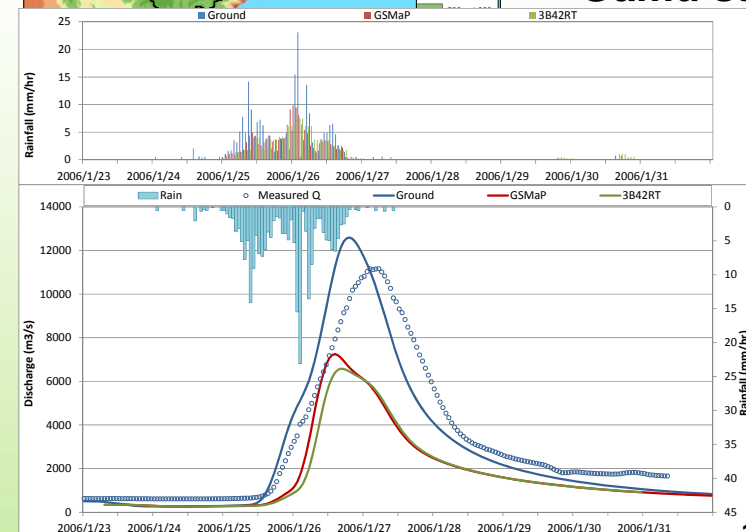
Cagayan River
27,280km²
5 rainfall stations
5 water level stations



Gamu station



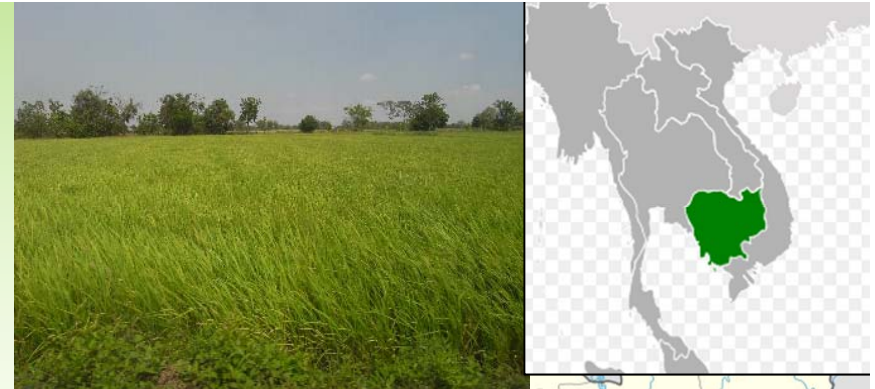
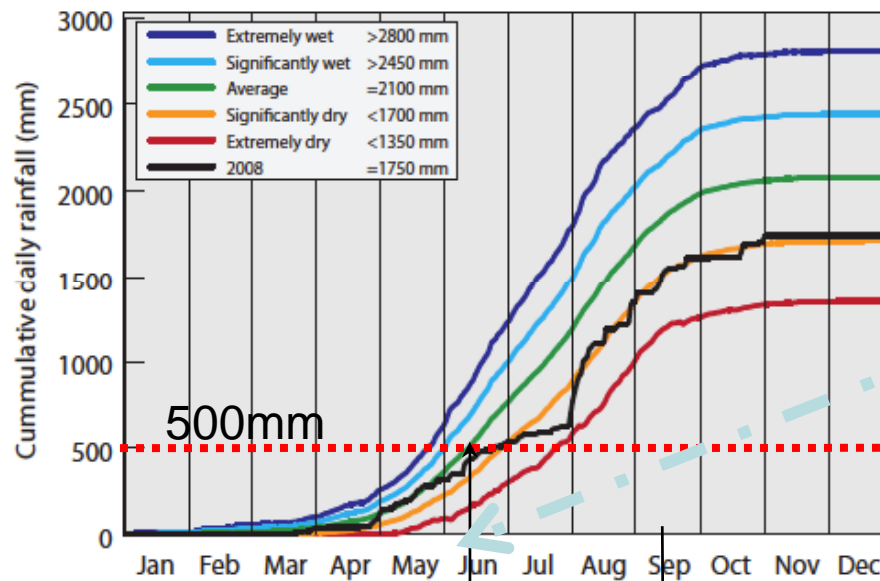
IFAS results at Mayapay station



IFAS results at Gamu station

Dates of Rice Planting and Harvesting

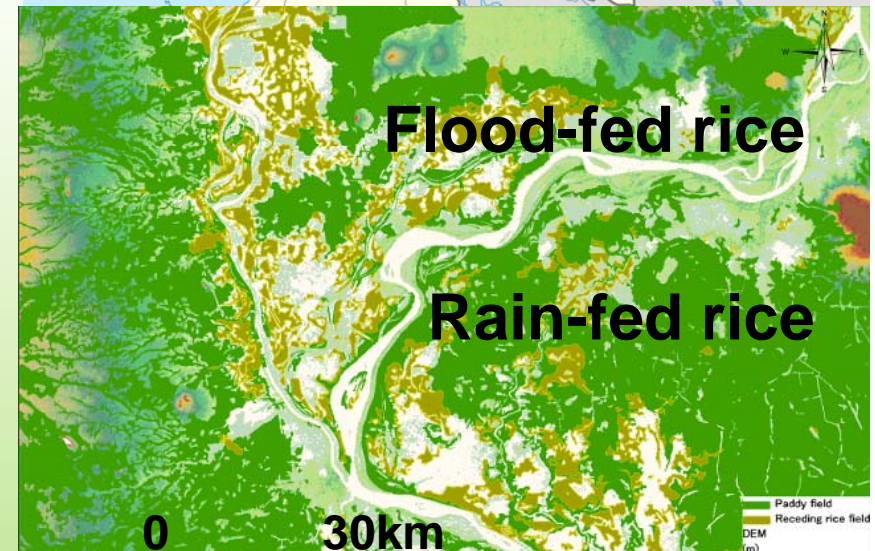
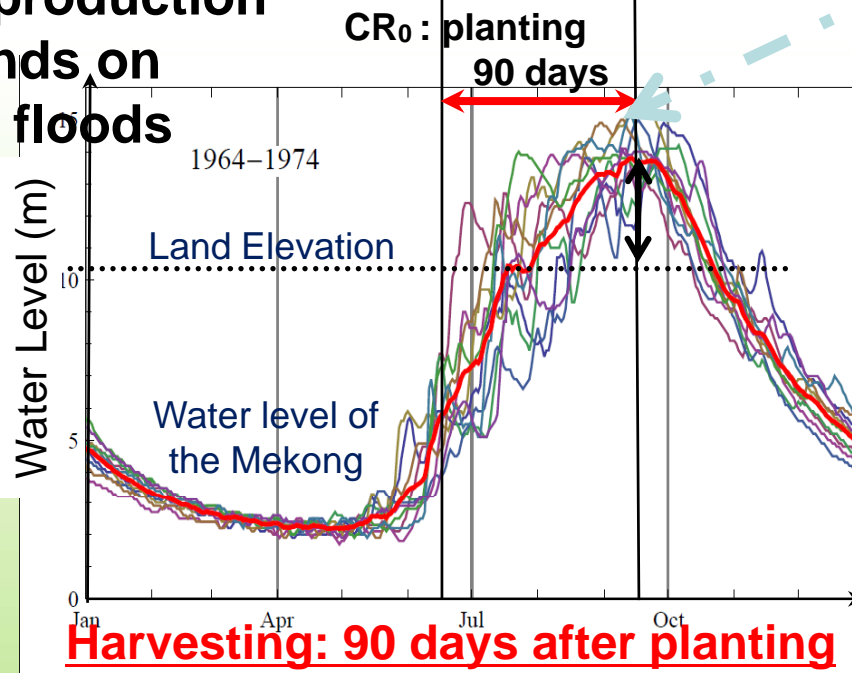
Planting: when total rain reached to 500mm



**Mekong River Basin
Kamponchum District**



**Rice production
depends on
when floods
come**



Flood Vulnerability Assessment in Lower Mekong River Basin

Results

Average year

Relative Difference between
Extreme 2000 - Normal 2006 floods

FVI-AF Agricultural Damages (Kandal Province)

FVI-EF Agricultural Damages (Kandal Province)

Agricultural damages

FVI-AvFI

FVI-ExFI

Legend

FVI-AF
Agricultural Damages

- Low
- Medium
- High
- Very High
- Province boundary
- Commune boundary

0 5 10 20 30 40
Kilometers

Legend

FVI-EF
Agricultural Damages

- 0 - 0.5
- 0.5 - 1
- > 1
- Province boundary
- Commune boundary

0 5 10 20 30 40
Kilometers

FVIs for Agricultural Damages: Kandal Province

居安思危 Be aware of risk while we are safe
思則有備 Awareness leads us preparedness
有備無患 Preparedness leaves us no regret

「春秋」左氏伝

Source : Zuo Qiuming "Zuoshi Commentary"
in Confucius ed. "Spring and Autumn", 480BC

Let us ally for water-
related DRR

