

# Utilizing information from space-borne sensors for climate risk management

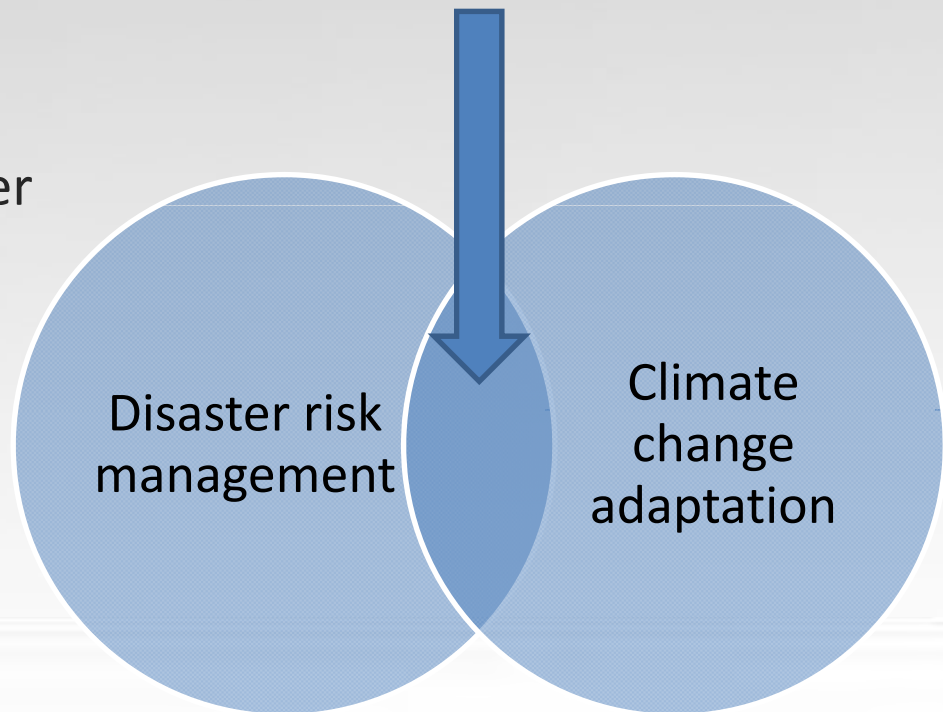
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Asian Disaster Preparedness Center

United Nations/Indonesia  
**International Conference on  
Integrated Space Technology  
Applications to Climate Change**

2 - 4 September 2013

Jakarta, Indonesia



## Climate Variable

- temperature
- precipitation
- humidity

## Change to Climate Variable

## Impact

- hazards
- environment
- people
- elements at risk

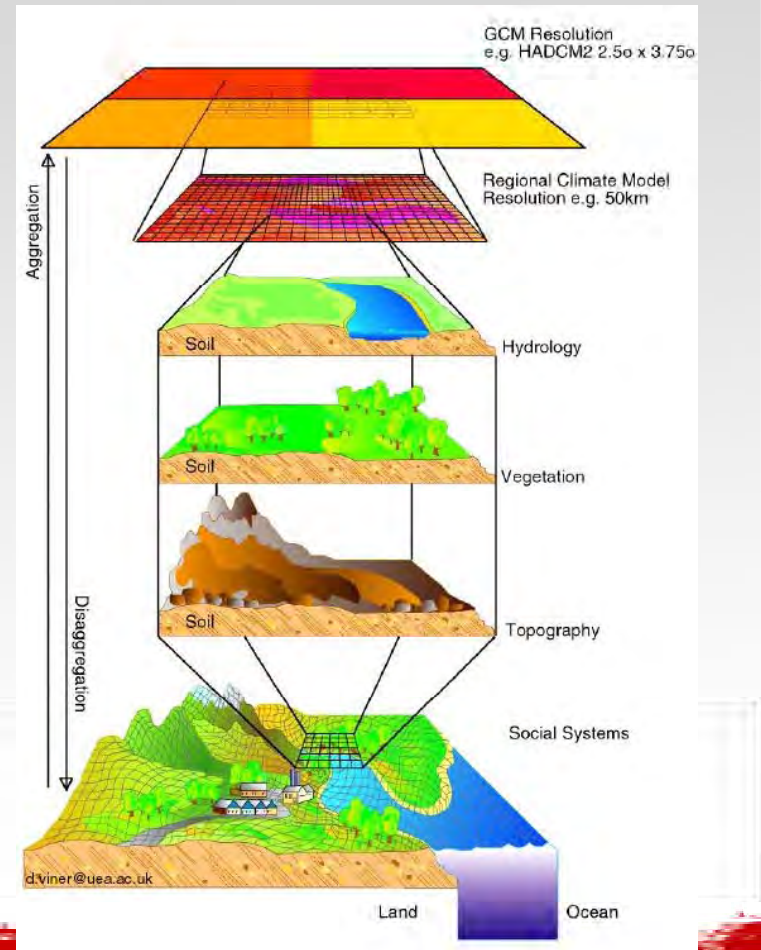
## Risk

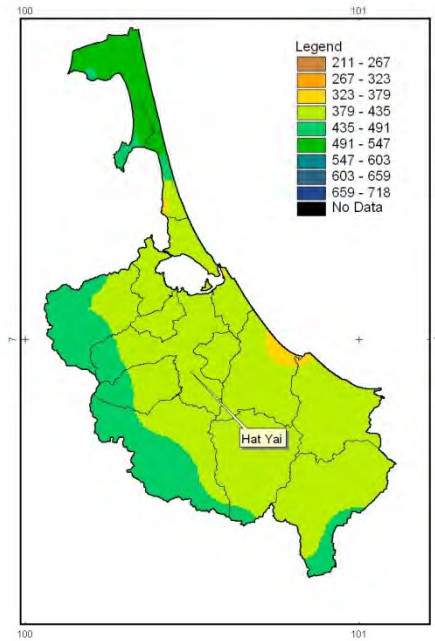
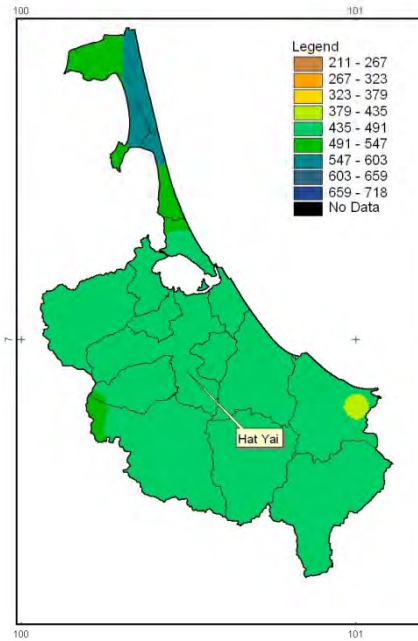
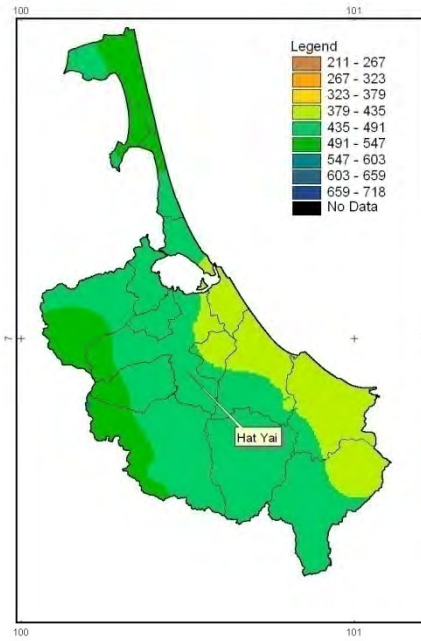
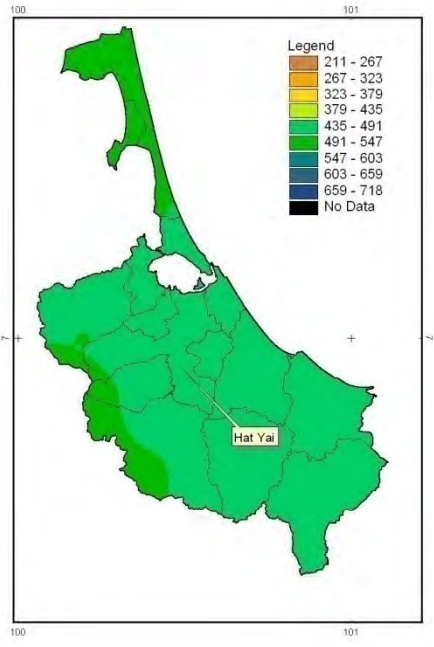
## INITIATIVES

Modeling regional climate change  
Early warning systems

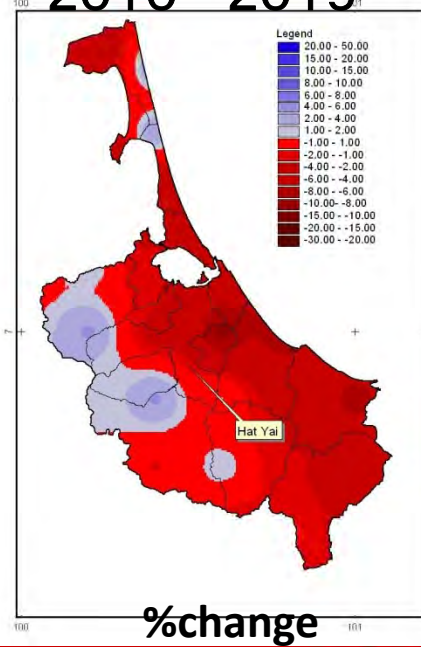
# Dynamic downscaling of future climate projections for Thailand

- Hat Yai & Chiang Rai
- Input to flood management, agriculture, tourism planning
- Use-defined temporal resolution
- Felt need: DEM to generate impact scenarios



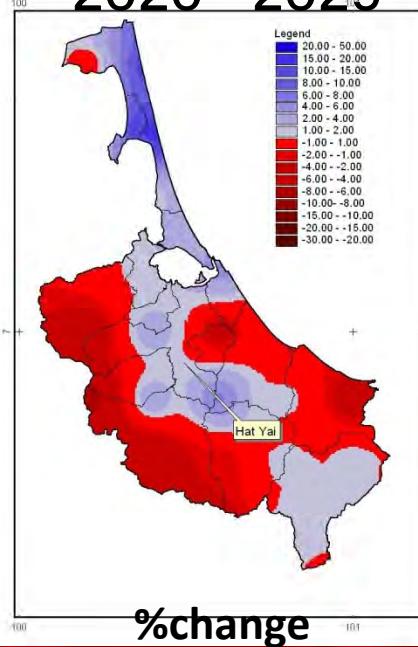


2010-2019



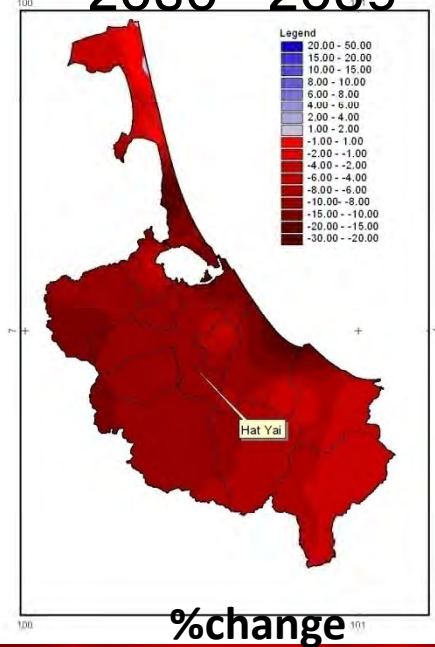
%change

2020-2029



%change

2030-2039



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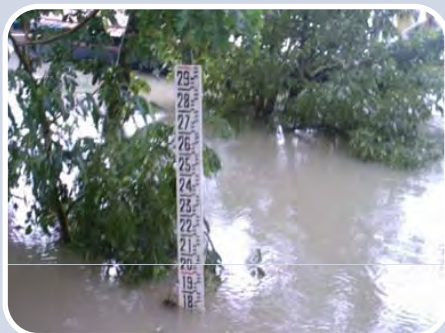
2000-2009  
MJJ Rainfall in  
Hat Yai, Thailand

adpc

Safer communities and sustainable development through disaster risk reduction



# Flood Forecasting & Early Warning Systems



## Hydrological observation

- ground observation
- satellite observation



## Flood monitoring

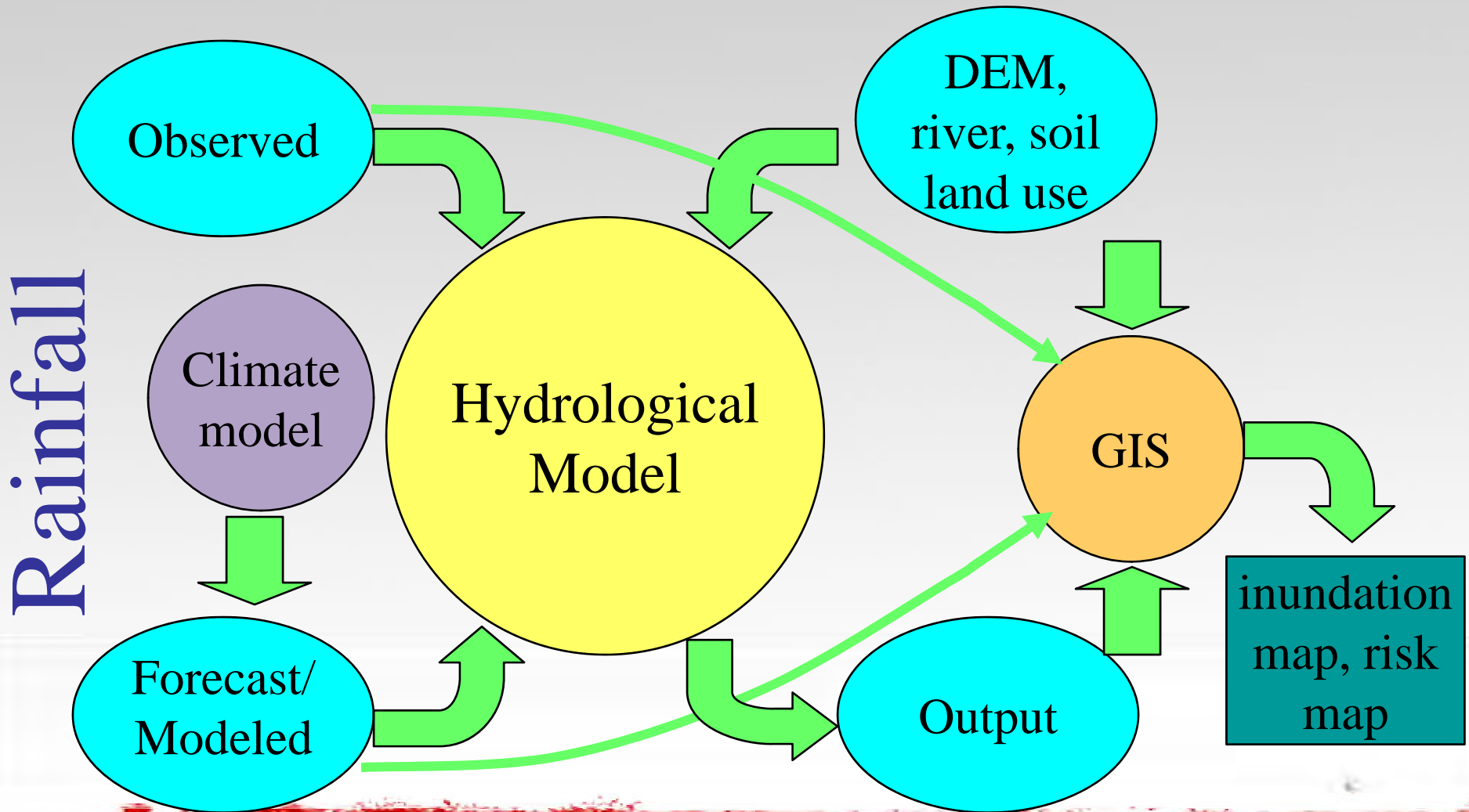
- monitoring system
- flood model



## Flood early warning

- local risk assessments
- SOPs, exercise
- downscaling, CC impacts assessment

# Flood Modelling System



# Flood Forecasting and Warning System for Semarang, Indonesia

Initial conditions and corresponding project activities:

- Bringin river – no measuring stations for rainfall, river level, stream flow; no river model; no DEM; no flood risk map → installed “automated” gauges, data collection, model development and calibration
- Satellite data for tidal forecast, no coastal inundation model → model development
- Flash flood at slope, riverine flood at the flood plain, tidal inundation at the sea → EWS development
- General understanding that climate change will increase precipitation → ???

# Utility of space technology

- Digital elevation model, digital terrain model
- Images for change detection
- Generation of hazard map, land use map
- Telemetry, SMS for telemetry, GPS for positioning of measuring stations
- Possibility: gridded precipitation values that combine gauge and satellite measurement (e.g. Global Precipitation Climatology Project)