



**DELIVERY OF  
FLOOD HAZARD MAPPING  
TO LOCAL COMMUNITY:  
WHEN AND HOW**

**Case study: Thua Thien Hue Province, Vietnam**

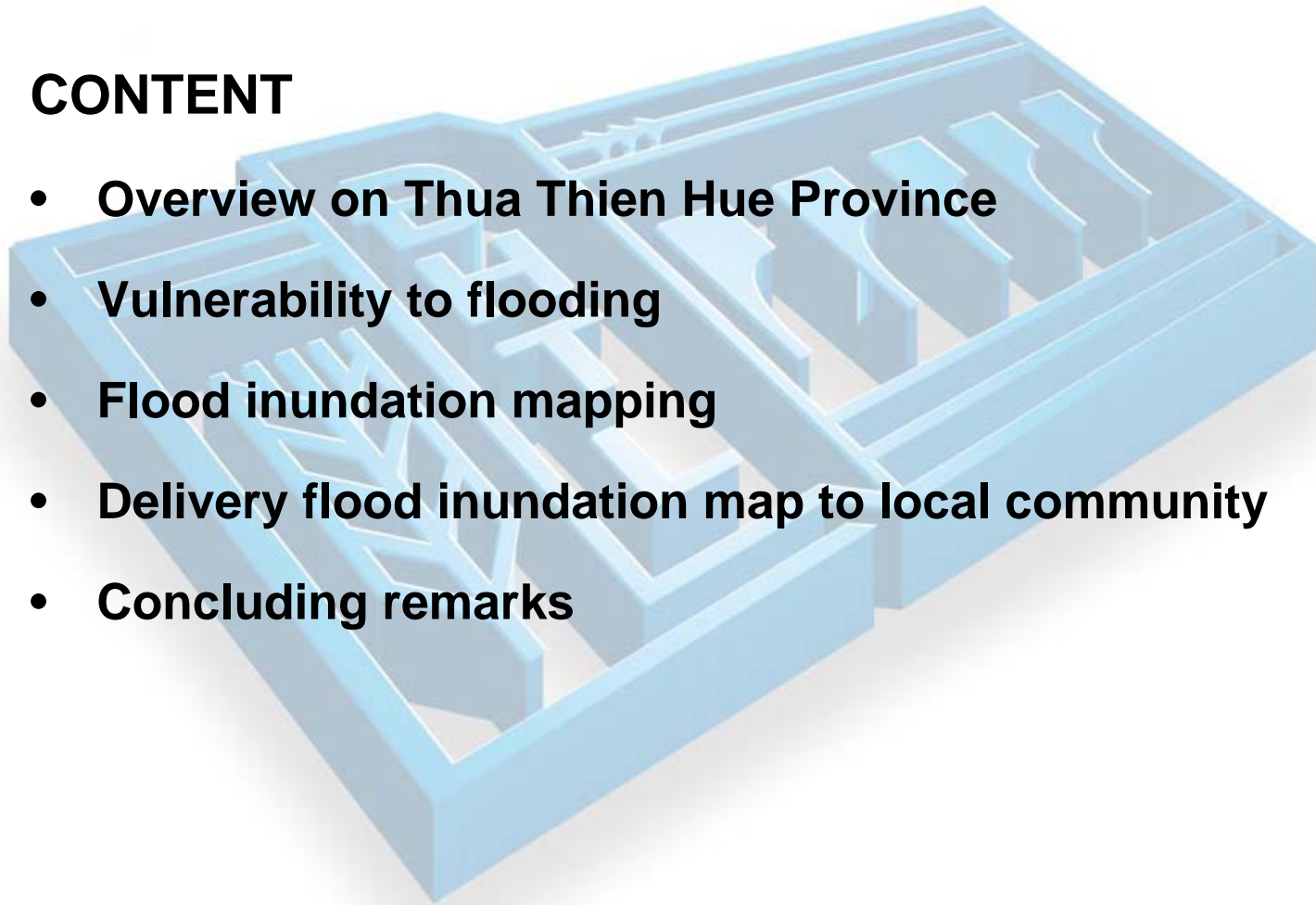
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## **CONTENT**

- **Overview on Thua Thien Hue Province**
- **Vulnerability to flooding**
- **Flood inundation mapping**
- **Delivery flood inundation map to local community**
- **Concluding remarks**



## OVERVIEW on

### Thua Thien Hue Province

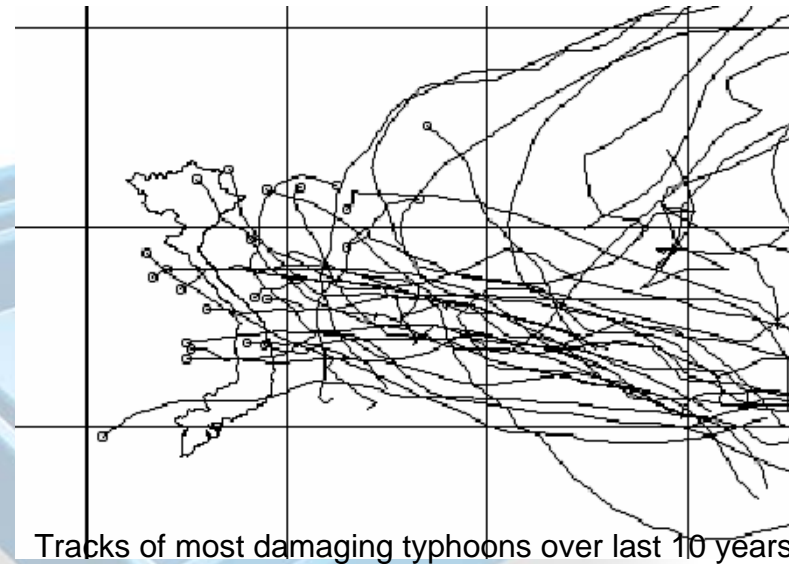
- Located in the northern central Vietnam
- Area: 5000 km<sup>2</sup>
- Characterized by beautiful Huong river system and vast lagoon Tam Giang Cau Hai with an area of 22,000ha
- Population: 1,066,162
- Fantastic historical and cultural complex of Hue City and Huong river
- Low economic growth
- Vulnerable area to storm, flood and sea level rise.



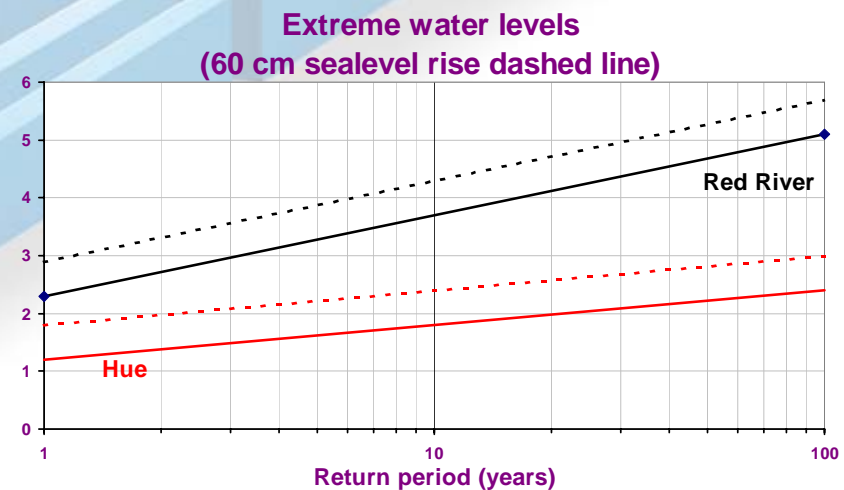


## Vulnerability to flooding

- Severe storms occur every year causing damaging floods
- All types of flooding: flash flood, river flood, sea flood
- Threat of sea level rise increasing frequency of flood occurrence



Historical flood occurred in Thua Thien-Hue in 1999



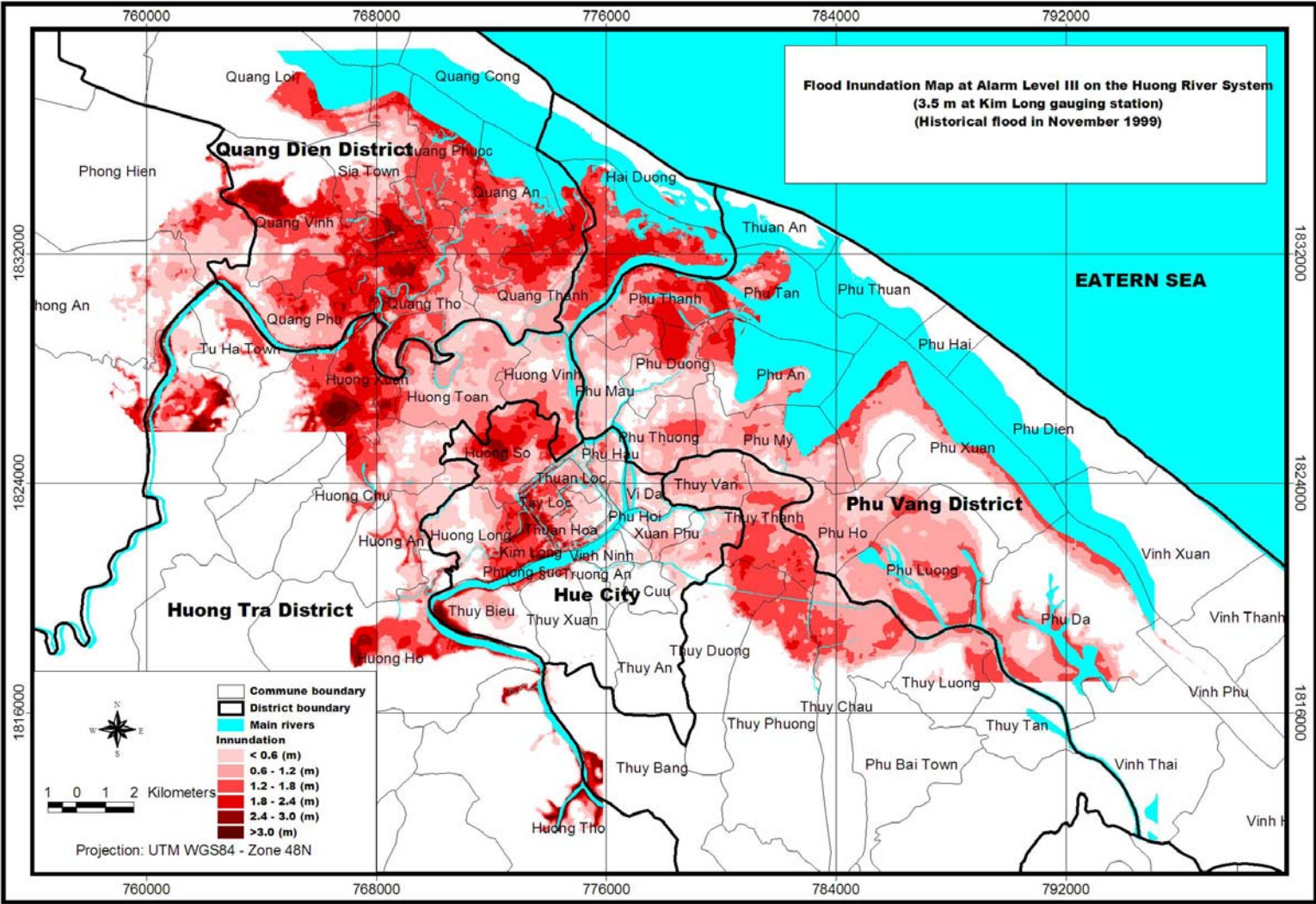
Note: ..... 60cm sea level rise

Estimated occurrence of extreme water level at present and at 60cm-sea-level-rise (adapted from Tom G., et. al., 1996)

## Development of flood inundation map

- Step 1: Develop a digital elevation model (DEM) from the collected GIS data. The digital elevation model of Thua Thien Hue province with resolution (grid) of 50x50m is developed from the digital topographical map of 1:10,000 scale.
- Step 2: Compute water level using hydrological/hydraulic models (TANK, HEC RAS, VRSAP)
- Step 3: Develop water surface models WSMs
- Step 4: Flood inundation maps are developed by using spatial analysis tools in GIS: at any point flood depth is calculated to be  $\Delta H(x,y) = WSM(x,y) - DEM(x,y)$  ; boundary of flood inundation areas are lines connecting points which has  $\Delta H(x,y) = 0$ ; and then Map Query tool is used to separate inundation areas into different layers and then combine them in one thematic map.

# Development of flood inundation map



**Flood inundation map at alarm level III on the Huong River system**

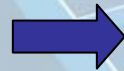


# Delivery of flood inundation map to local community

HOW MUCH is this map USEFUL?

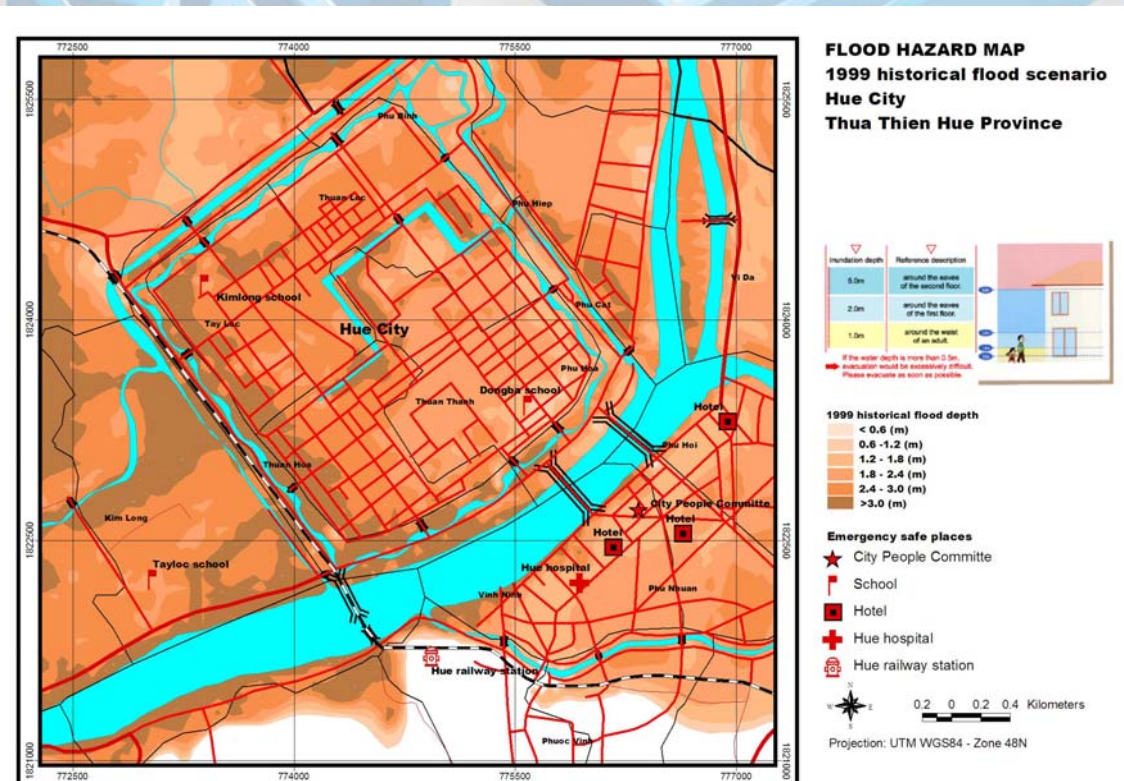
Answer is : Yes! for the scientiest and planner

No! for the local community



WHEN and HOW to deliver this map to them

Sample of flood hazard map



## Concluding Remarks

- Flood inundation map for Thua Thien Hue so far is just modelling simulation results and thus, not yet practical and useful
  - ➔ Further development is required!
- As structural measure to prevent flood in Huong River system is not applicable, local community has always to be prepared during flooding season
  - ➔ Clear flood hazard map is of great importance!





*Thank you*