

**Tokyo Metropolitan University**  
Department of Civil and Environmental Engineering

# Numerical Modeling of Saline Intrusion in the Red River Delta, Vietnam

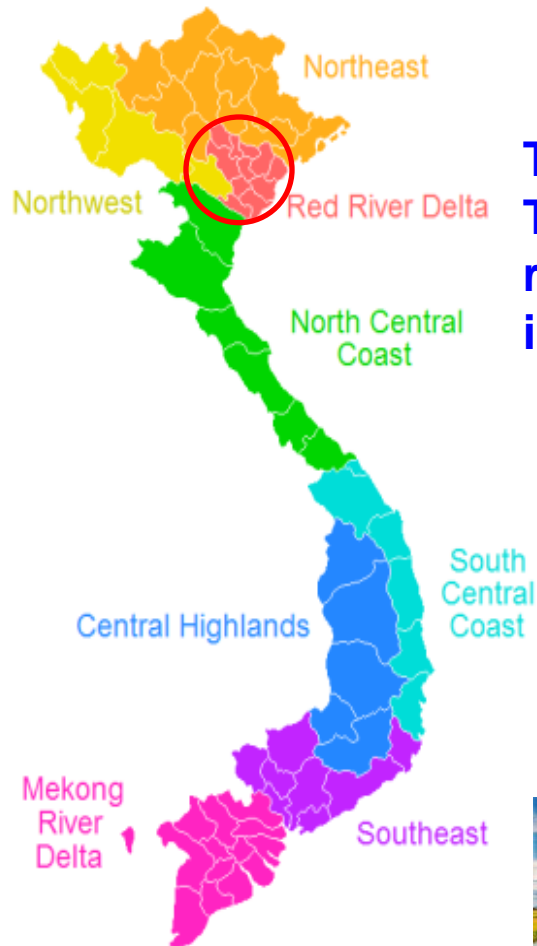
A perspective of climate change and sea level rise

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# Red Rive Delta



**The RRD has rich cultural traditions. The delta plays an important strategic role in the socio-economic development in the Northern provincial area**

- ✚ The total area: 16,444 km<sup>2</sup>
- ✚ The population: almost 17 million
- ✚ The RRD consists of 9 provinces including several big cities such as Hanoi, Hai Phong, Hai Duong, Bac Ninh, and Thai Binh



# Problems

The major disasters:

*Flood*

*Storm*

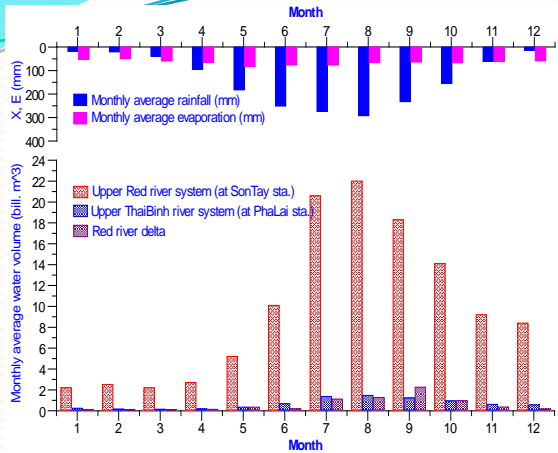
*Inundation*

*Erosion/Sedimentation*

*Salinity intrusion*



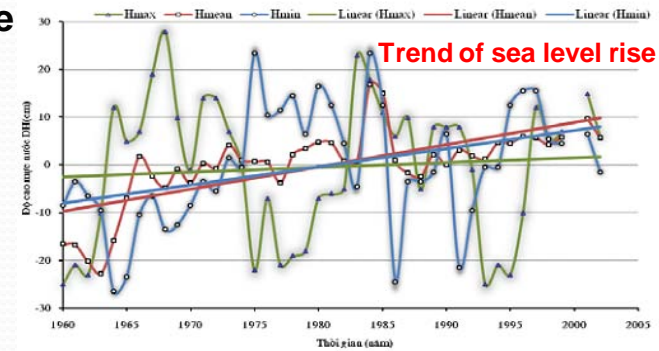
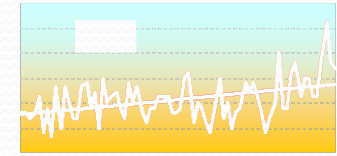
# Salt intrusion in multi connected estuaries in the RRD



Monthly rainfall, evaporation and discharge

## Present problems

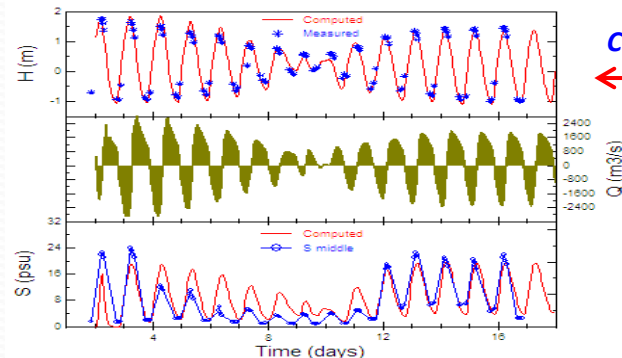
- Increase of water demand
- Decrease of freshwater supply
- Climate change and sea level rise
- Saltwater pollution



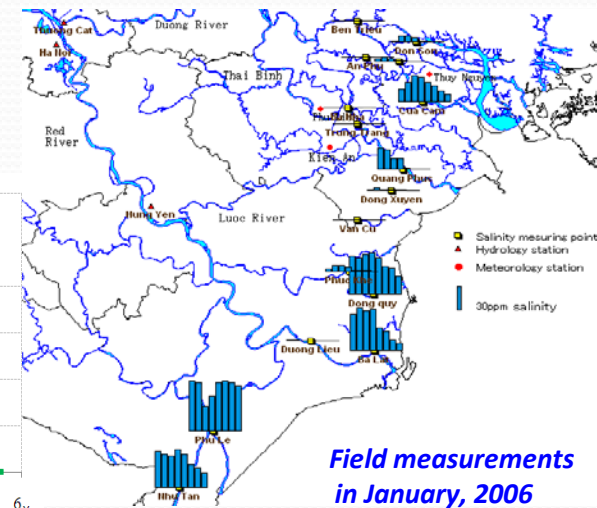
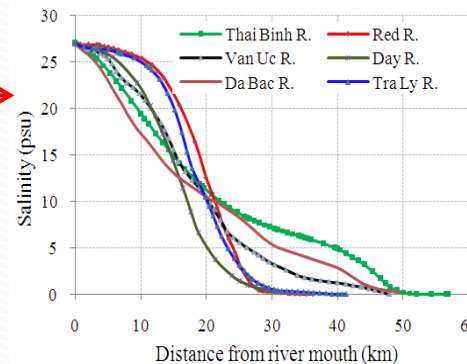
Trend of sea level rise

## Objectives

- Investigate saltwater distribution
- Evaluate the influence of discharge, tide, and geometry on salinity intrusion
- Develop a method to predict the spatial salinity distribution
- Manage water resources adapts to climate change and sea level rise



Computed results



Field measurements in January, 2006

**Thank you  
for your kind attention!**

