



# **Risk Assessment of two drinking water sources in the Mekong Delta for salinity, selected nutrients, heavy metals and microbial pollution**

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- Main objectives
- (Drinking) water sources in the Mekong Delta
- Focussing on surface water and groundwater – results of household interviews
- Surface water quality
  - Objective
  - Study sites
  - Primarily results
- Groundwater quality
  - Objective
  - Study sites
  - Primarily results
- What need to be done / required data
- Discussion

- Presenting risks of drinking water sources and domestic water sources on digital Arc-GIS based maps
  - Should be understandable for policy makers
- Assess the sources of pollution and behavior of pollutants in the study sites
- Provide insight in use of drinking water sources / domestic water sources for 2011 in the study sites

## (Drinking) water sources

💧 Surface water



💧 Groundwater



💧 Rainwater



💧 Piped water

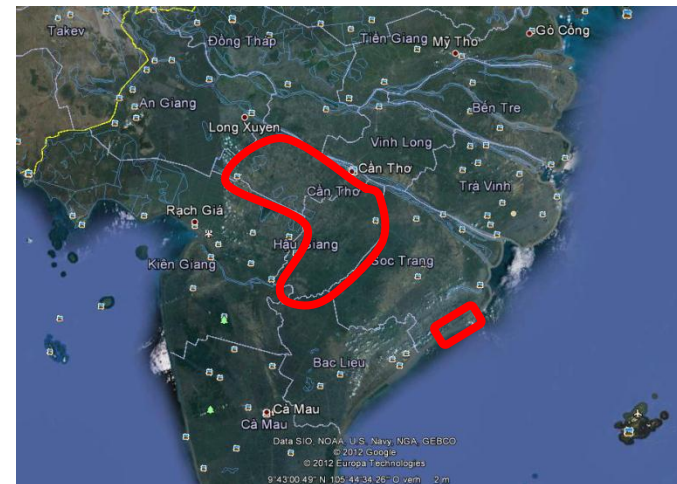


💧 Bottled water



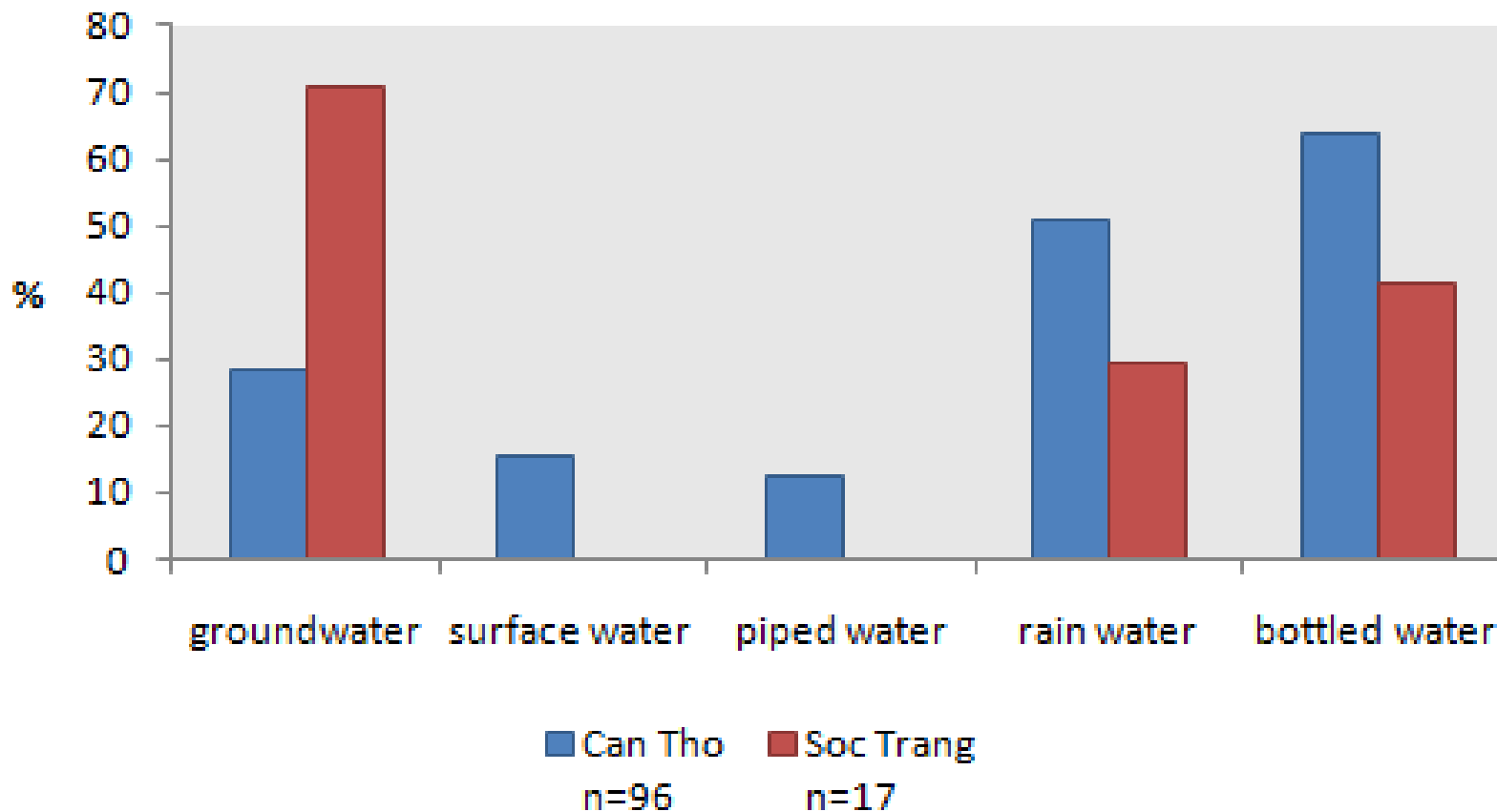
- Main focus on surface water and groundwater quality
  - Expected high loads of microbial contamination in surface water (*Isobe et al*, 2002)
  - Salinity problems in both surface- and groundwater quality (*kotera et al.*, 2008)
  - Heavy metal pollution (arsenic) in groundwater is known for the delta (*Buschmann et al.*, 2008; *Hoang et al.*, 2010)
  - Intensive agricultural activities —→ nutrient pollution to both surface- and groundwater (*Bhumbla*, nd)
- What I will not do
  - Assessment of rainwater, piped water and bottled water

- Reason:
  - Insight in use of drinking water sources/domestic use
  - Insight sources of pollution
- In total around 200 interviews are planned randomly in the study sites

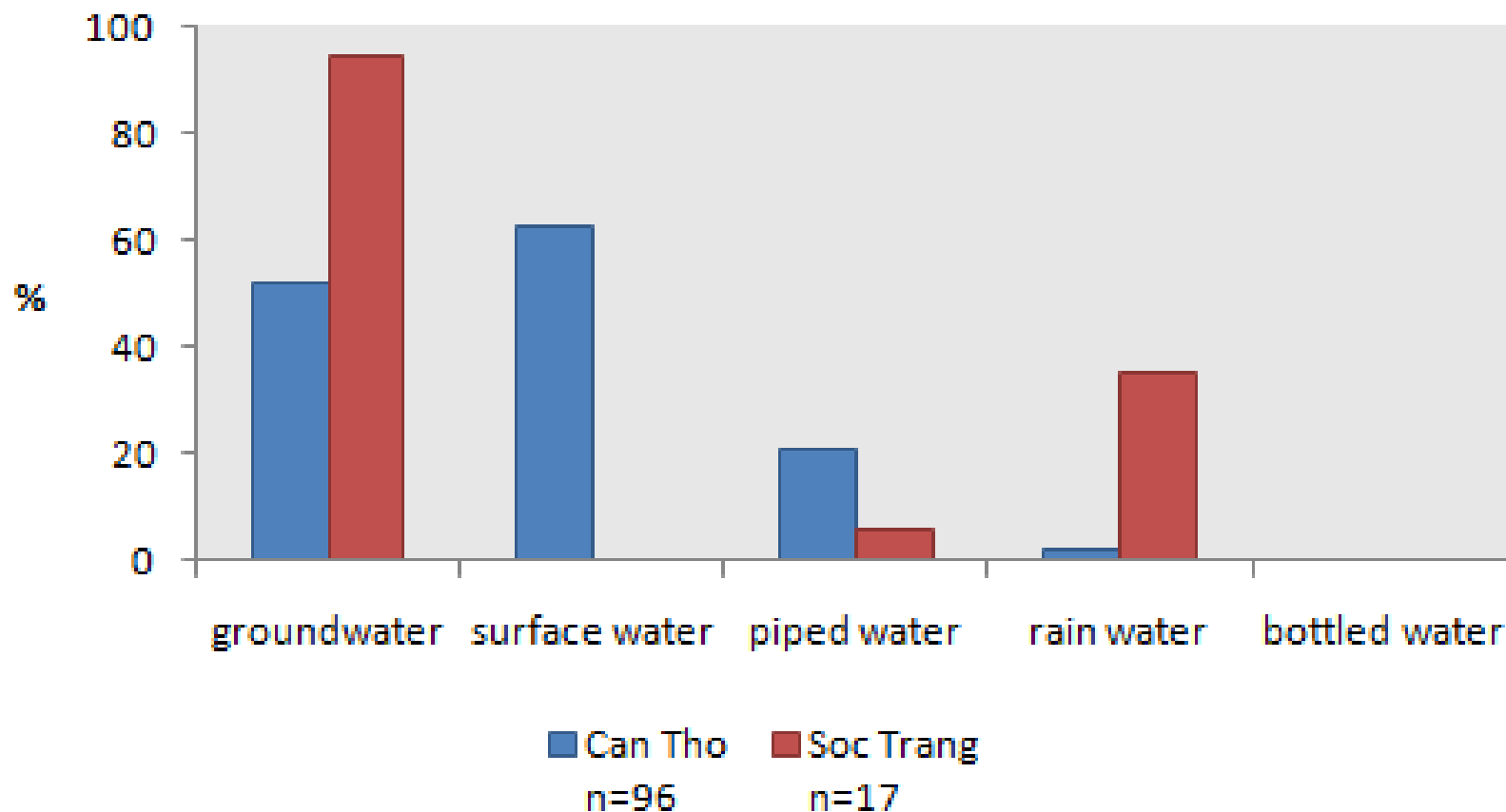


## Primarily results of household interviews (1)

### Drinking water use



### Domestic water use





- Objective: to generate GIS-based risk maps of surface water quality in the selected study areas. Based on correlation land-use/soil type and surface water quality

## Landuse:

Fruit trees



Rice fields



Shrimps



Industrial zone



Aquaculture



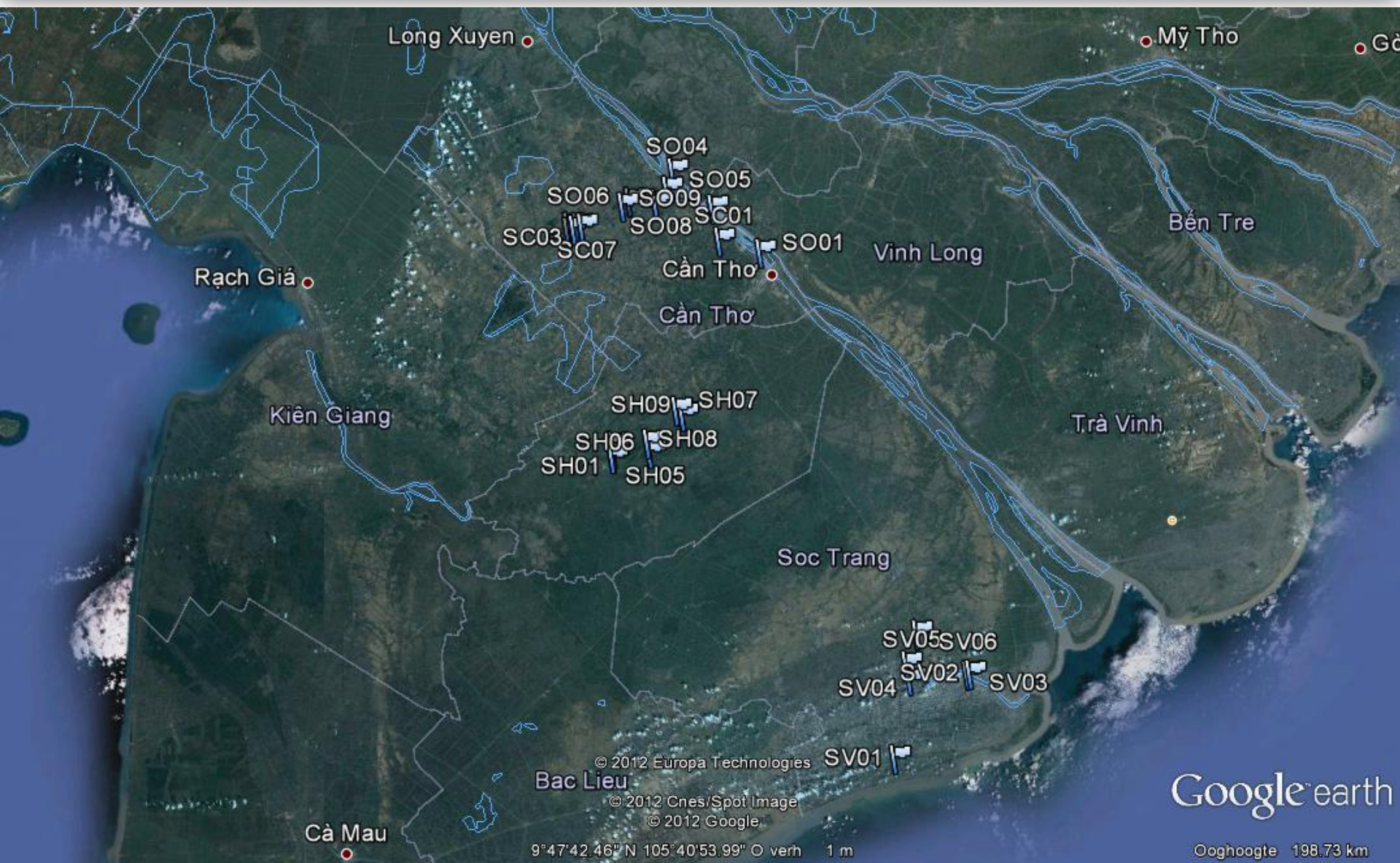
Urban



## Soil type: alluvial, acid-sulphate and saline soils

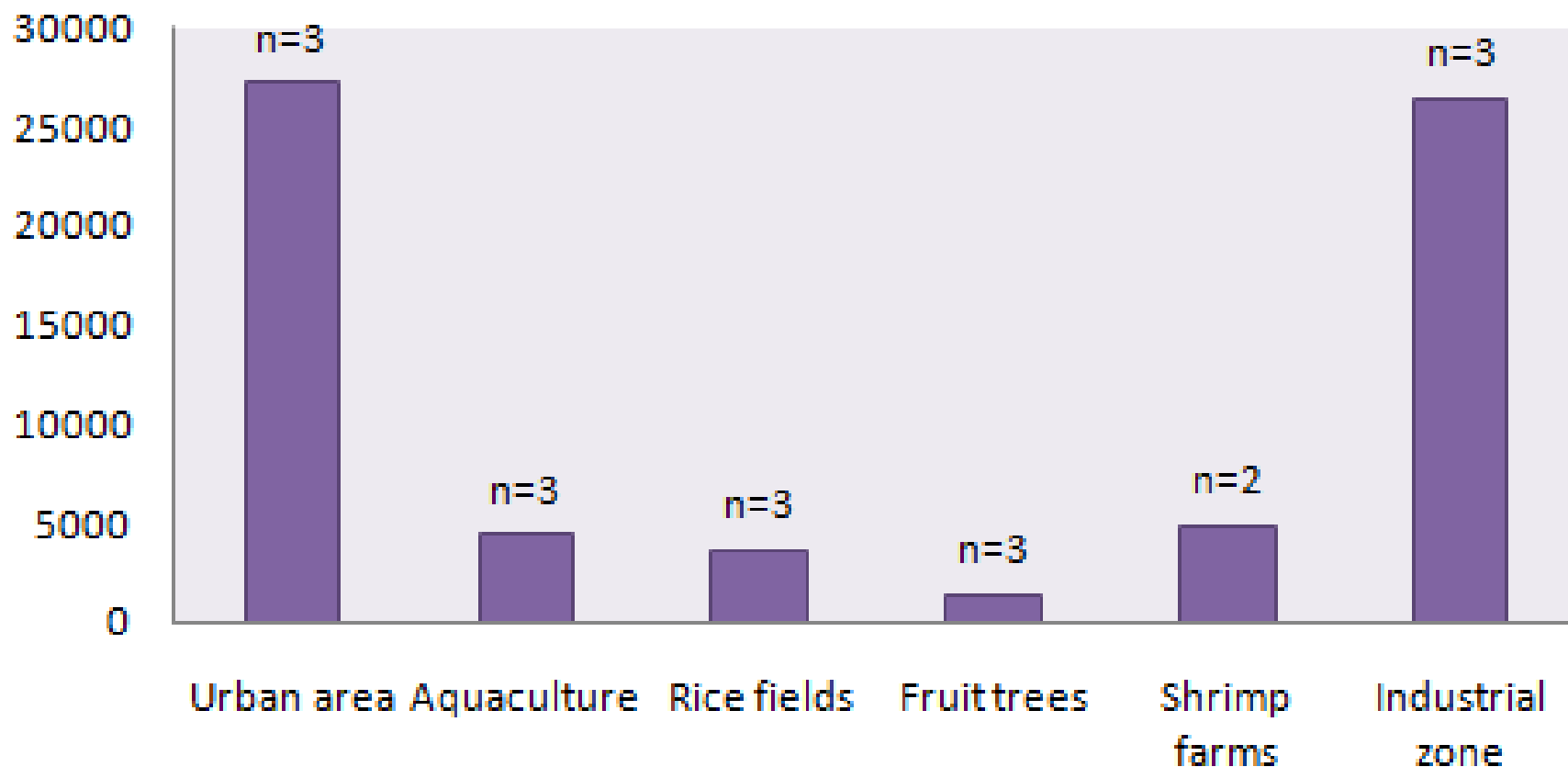


# Surface water quality measurement locations



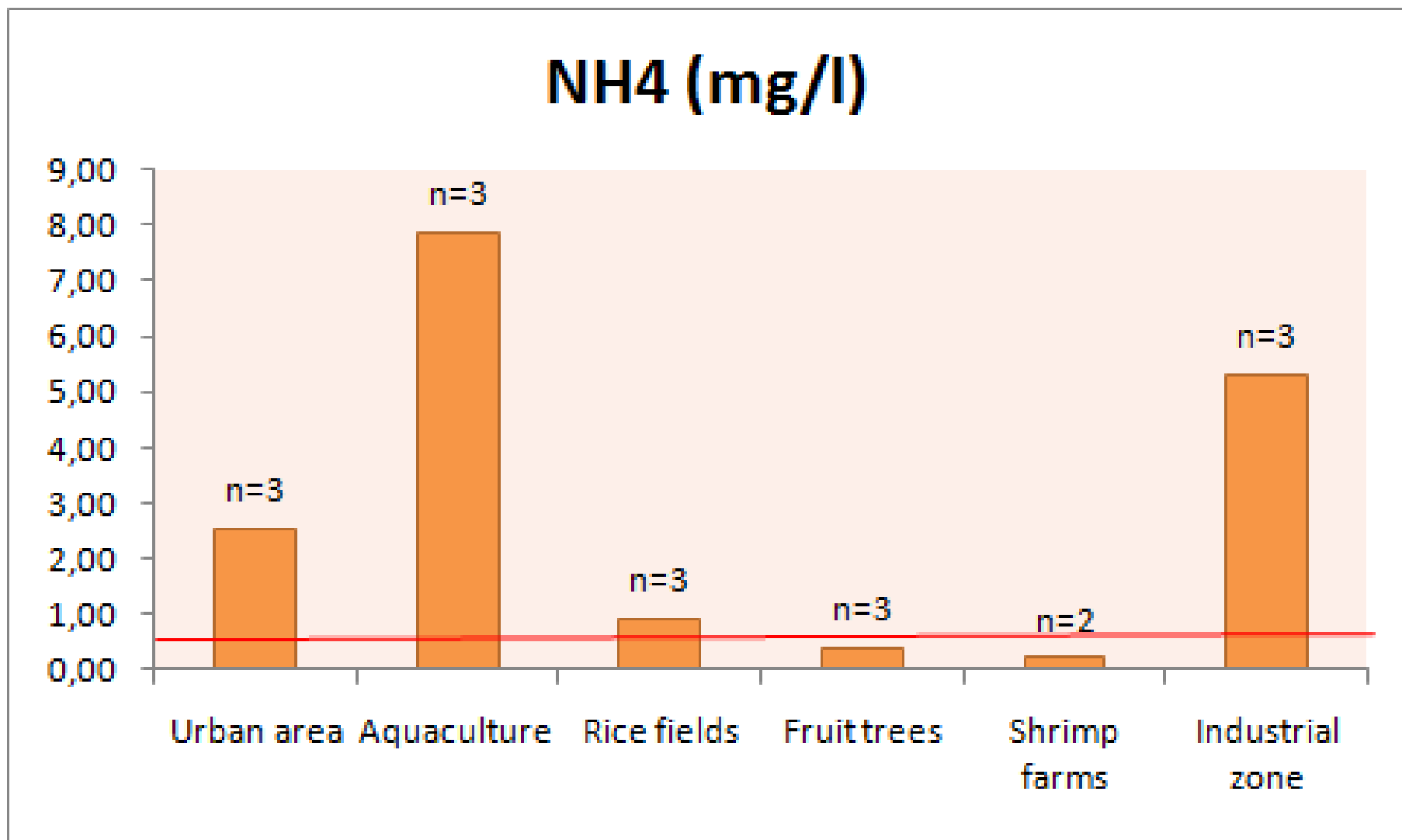
## Primarily results surface water(1) Average concentrations

### E-coli (bacteria/100 ml)



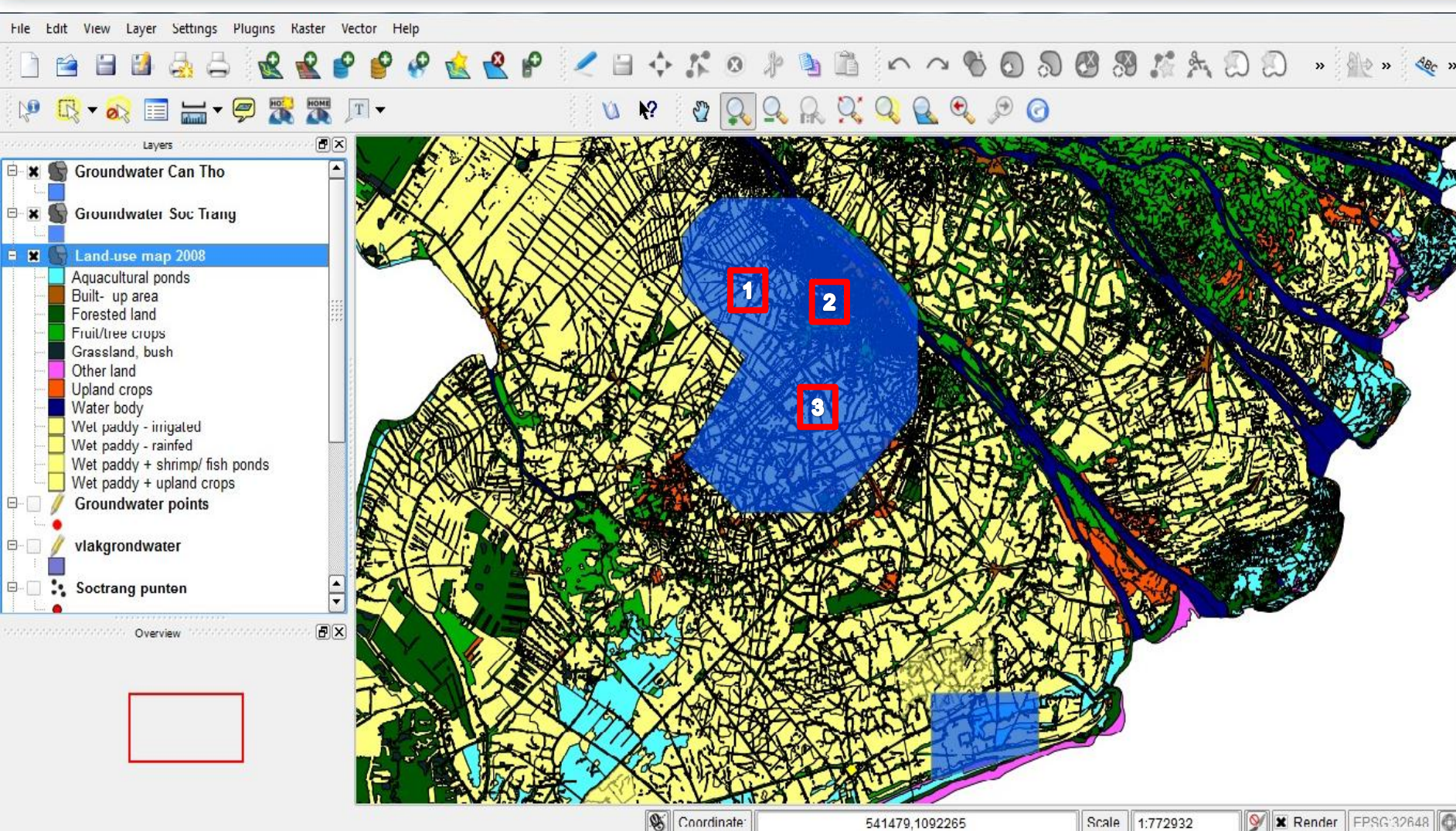
## Primarily results surface water (2)

### Average concentrations

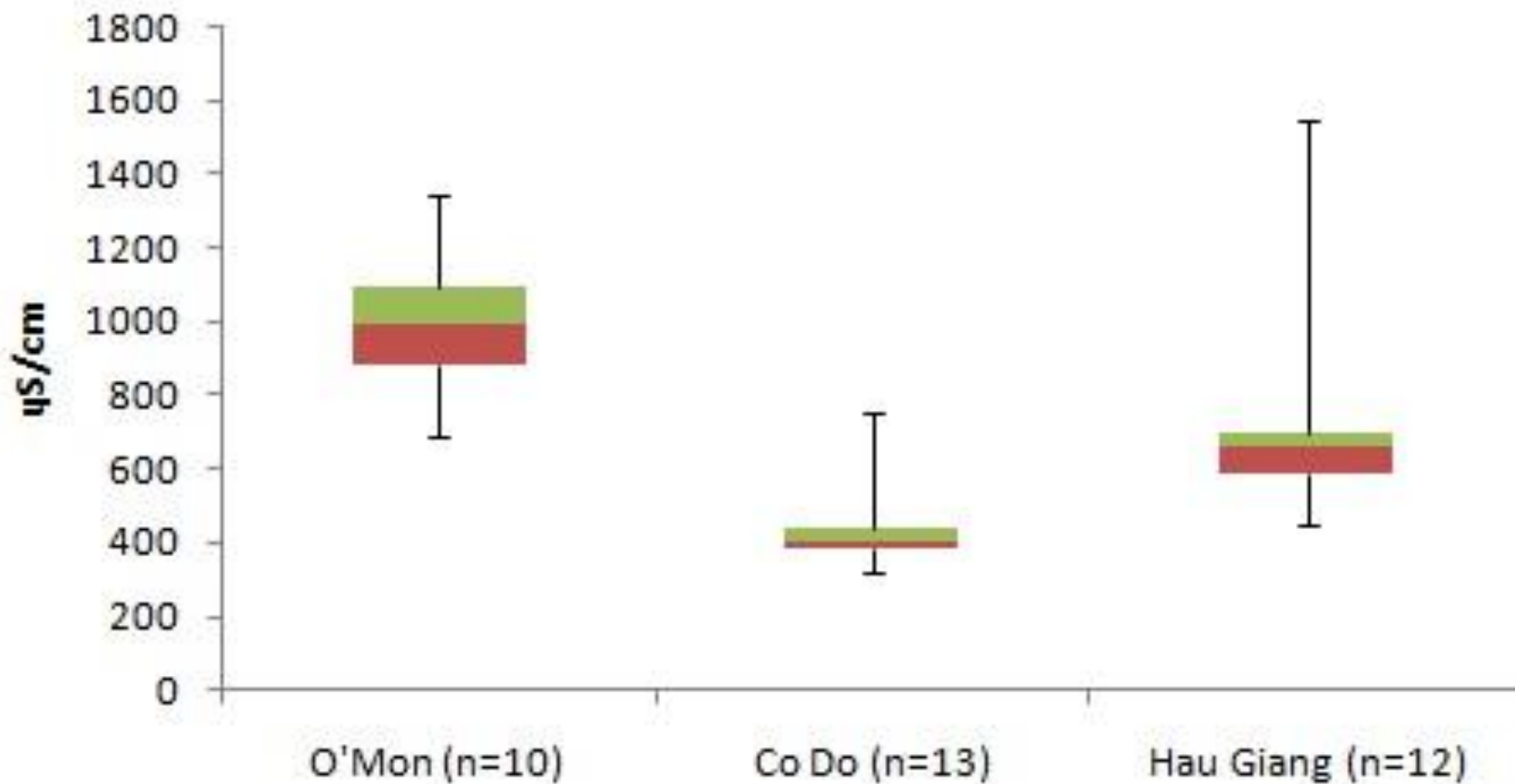


- Objective: generate GIS-based maps of groundwater quality by using interpolation techniques for two areas in the Mekong Delta
- Use groundwater wells at households





## EC groundwater ( $\pm 6\text{km}^2$ per study area)





- Activities until end of field campaign
  - Continue with surface water sampling campaigns until August/September
  - Start with collecting groundwater samples
  - Continue with interviews
  
- Required data
  - Recent digital soil map
  - Recent digital land-use map of at least selected study sites
  - Recent digital satellite image

Thank you for your attention. Questions?