Influence of groundwater-surface interactions on groundwater salinity in the Senegal River Delta

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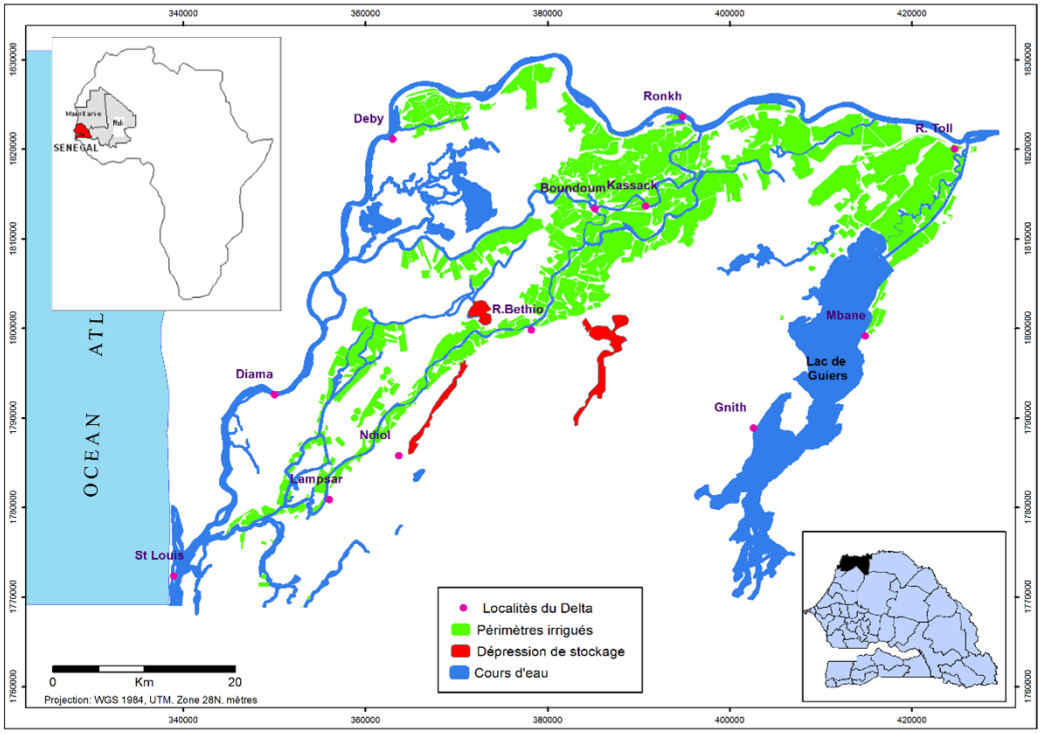
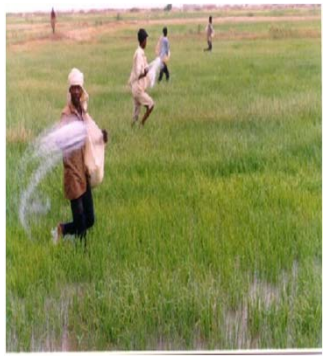
Study area and problematic



- Large amount of available water thanks to the River
- 150 000 ha of exploitable land for agriculture

⇒ Big potential for the development of agriculture



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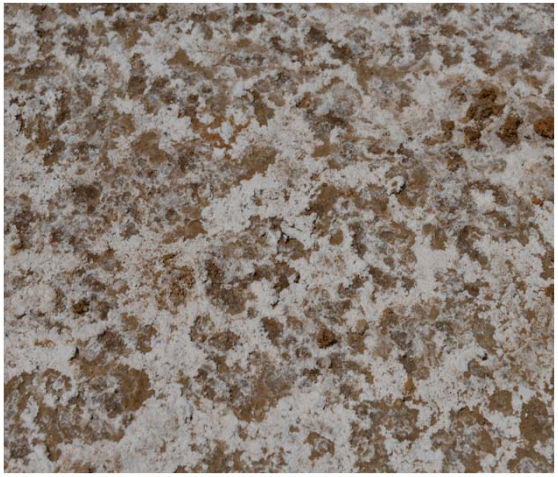
Study area and problematic



The development of agriculture is threatened by soil salinization due to:

- High evapotranspiration rates
- The presence of a very shallow salty aquifer

Study area and problematic

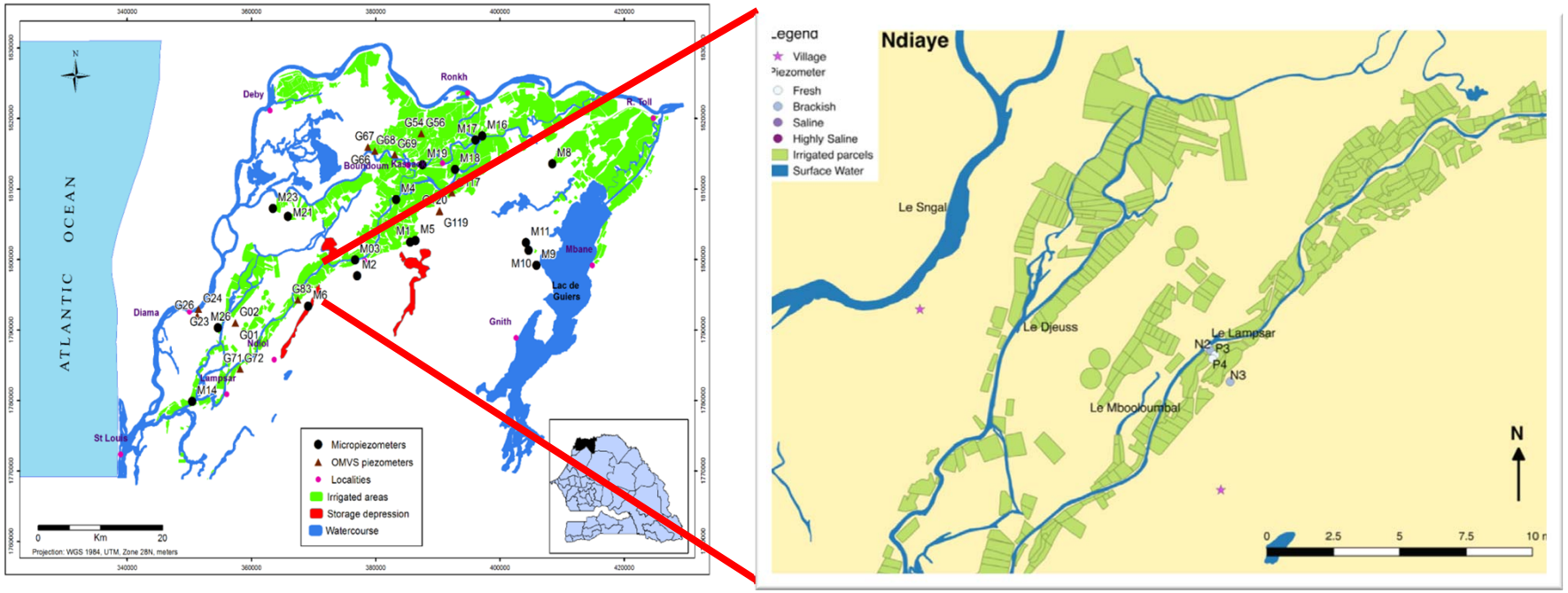
Management of the river with two dams (~ 1980):

- Large amounts of fresh water available throughout the year and increase of irrigation
- No more seawater intrusion in the river
- Increase of river levels and expected increase of lateral recharge to the groundwater

$\Rightarrow$ Do we observe a freshening of groundwater ?

$\Rightarrow$ What is the extend of this freshening ?

Method : two scales of work to study the superficial aquifer



Regional scale :

- Groundwater level surveys
- Hydrogeochemical surveys

local scale :

- Geophysical surveys
- Hydrogeochemical surveys

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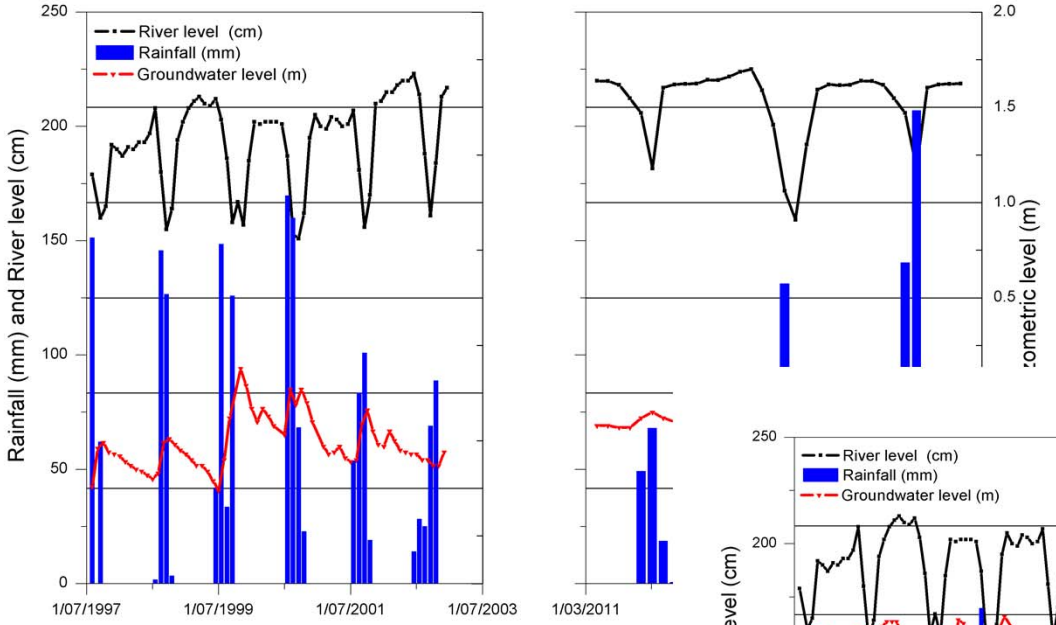
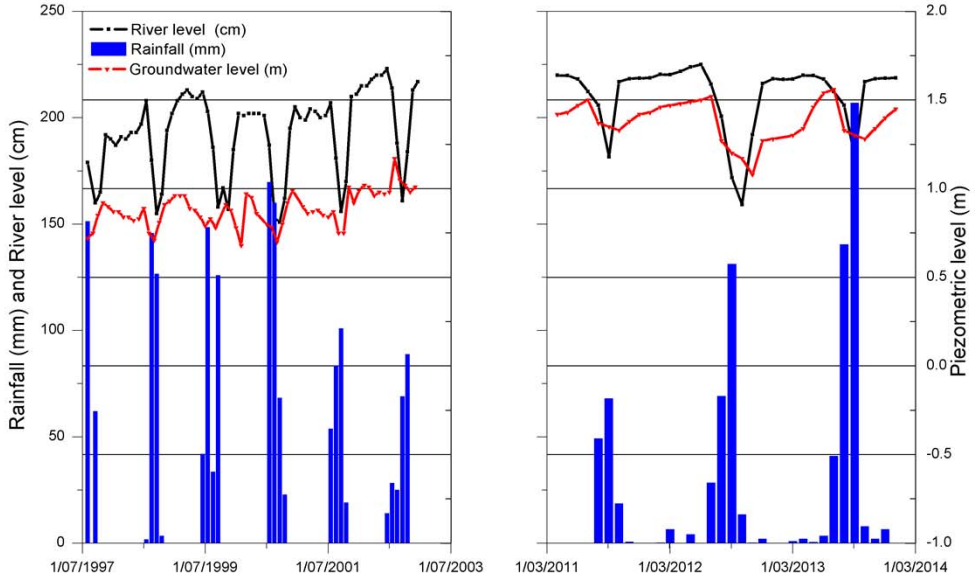
Regional scale : Groundwater level surveys

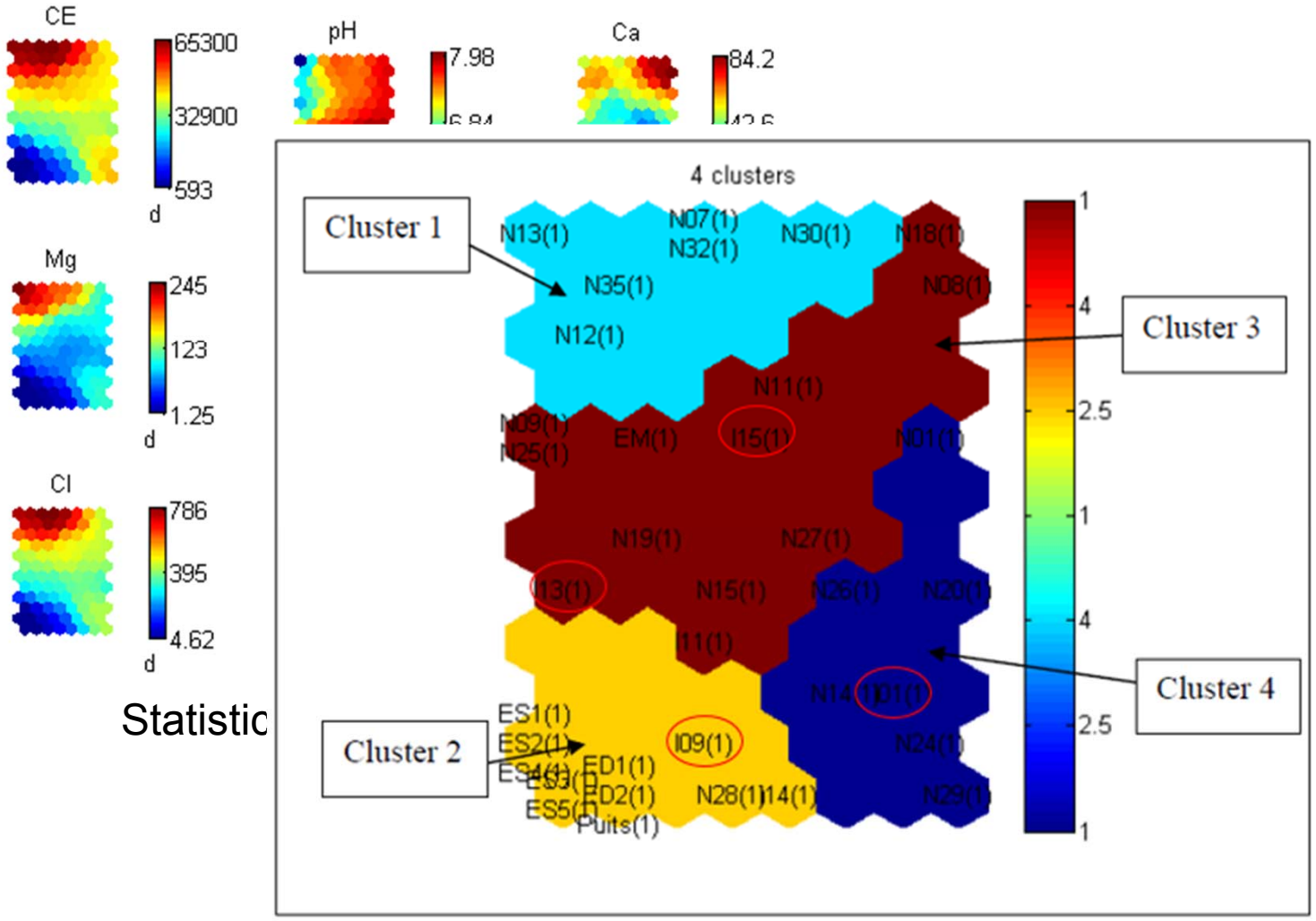


Away from river



Close to river

Regional scale : Hydrogeochemistry



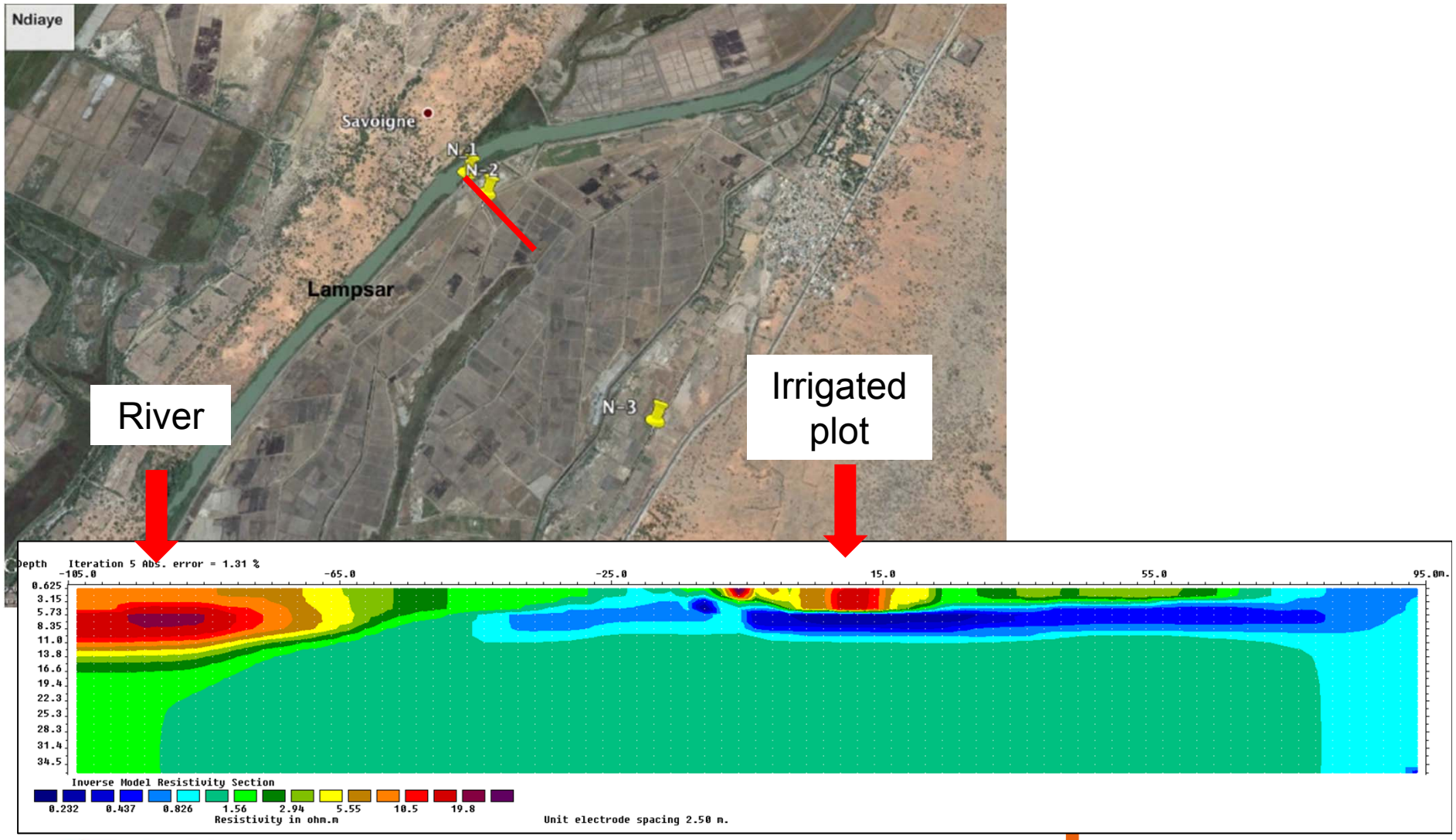
Statistic

Regional scale : conclusion

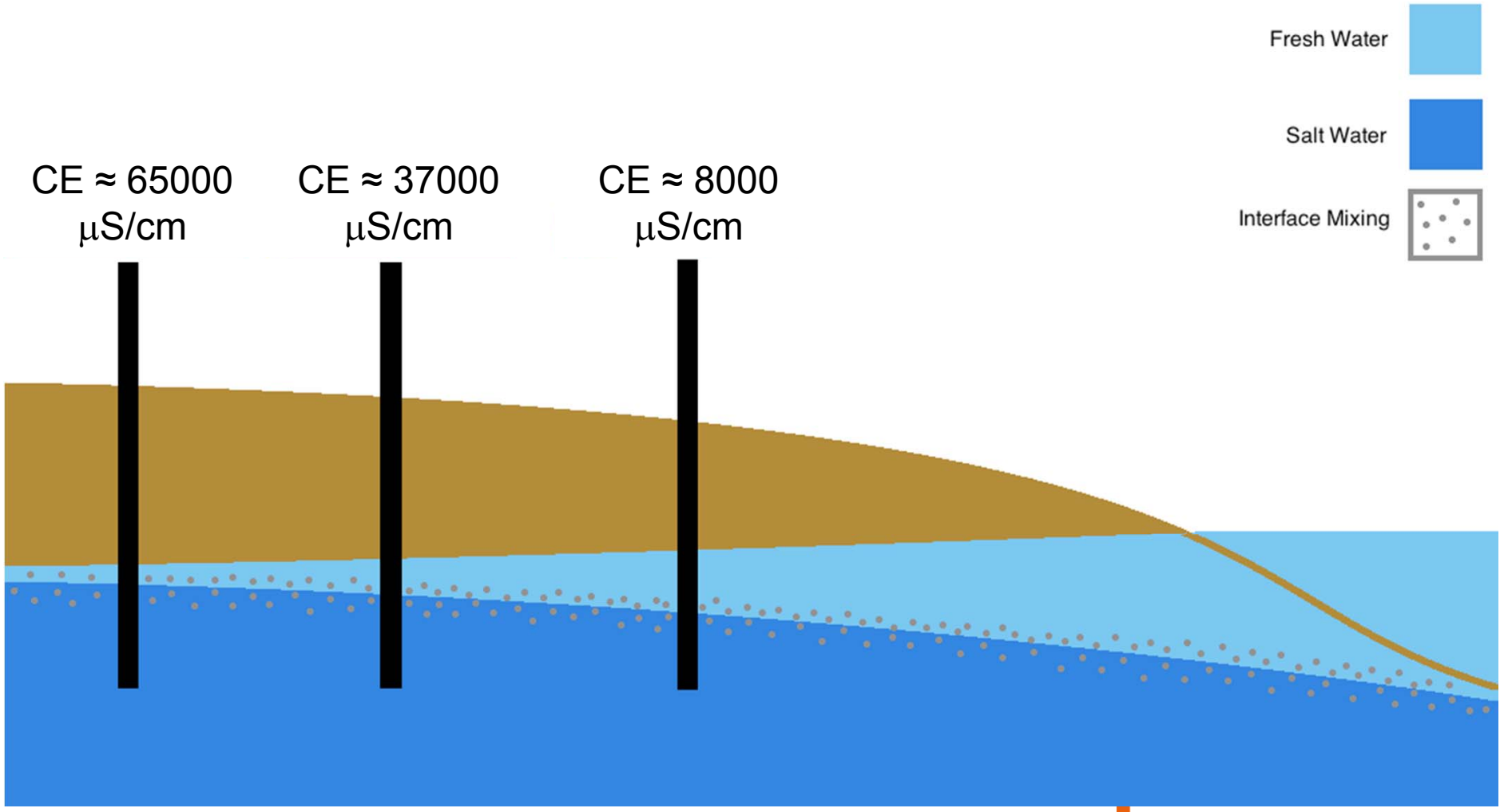
Groups	Away from River	Close to River
Outside irrigated plots	Groundwater levels influenced only by rainfall High mineralisation	Groundwater levels influenced by River levels Low to middle mineralisation
In irrigated plots	Groundwater levels influenced only by rainfall and irrigation Middle to high mineralisation	Groundwater levels influenced by river levels and irrigation Low to middle mineralisation

(Gning et al 2017, Journal of Hydrology : Regional studies)

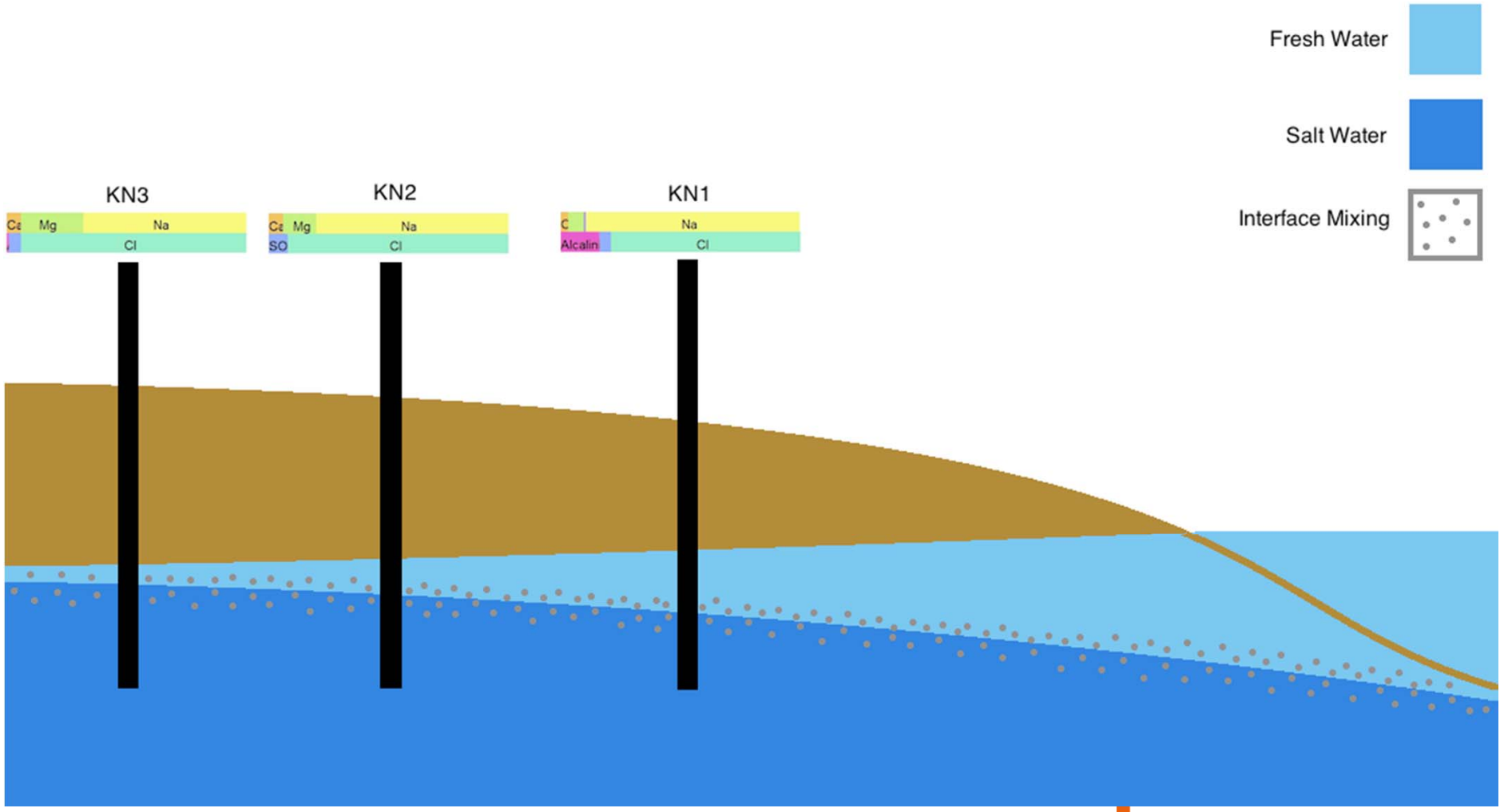
Local scale : Geophysical survey



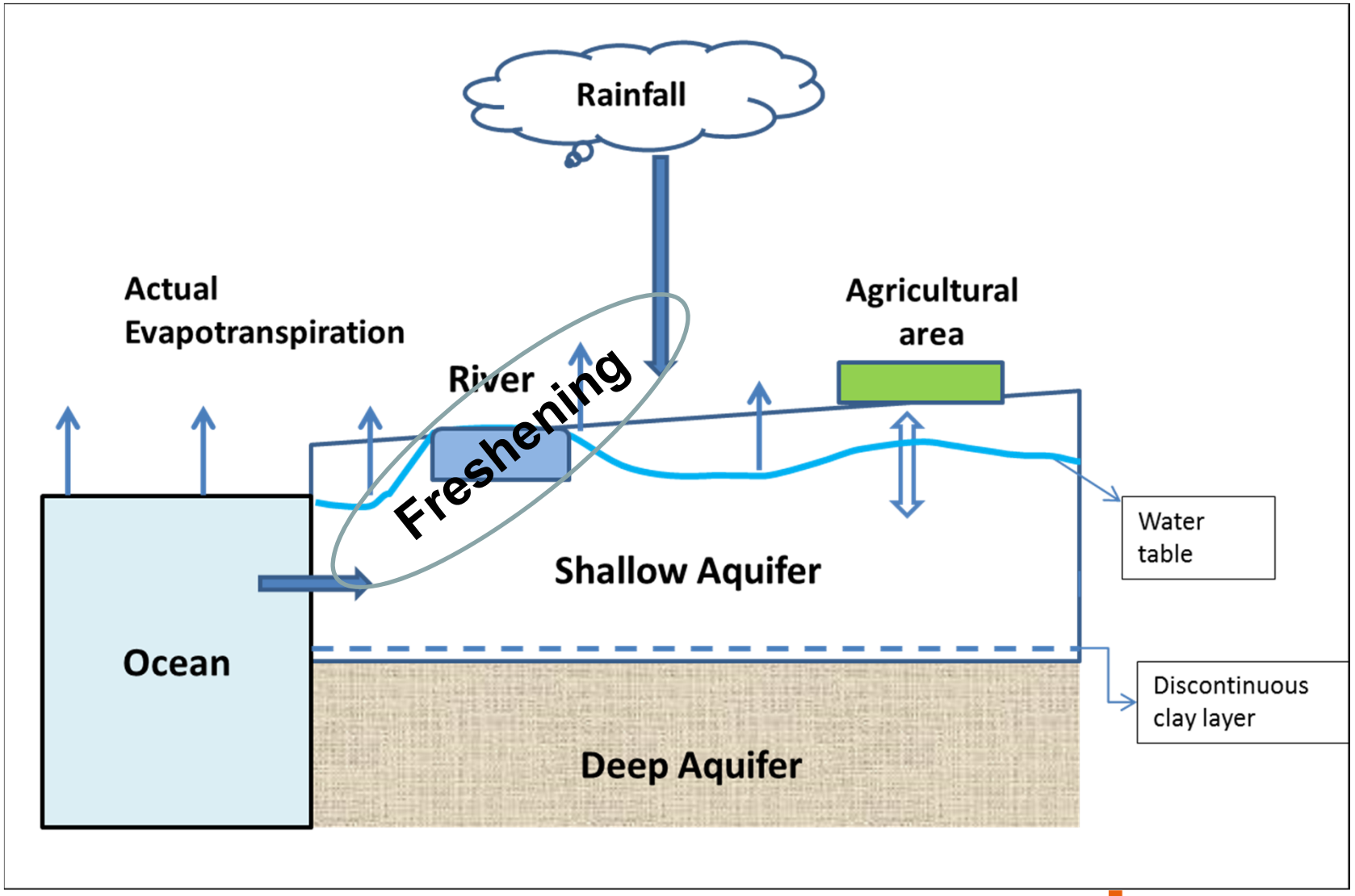
Local scale : Hydrochemistry



Local scale : Hydrochemistry



General conclusions



Acknowledgment :

Any questions?

Groundwater Quality 2019

The next IAHS conference on Groundwater Quality (**GQ 2019**) will be held in Liège (Belgium) on 9-12 September 2019 !

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More information : **aimontefiore.org/GQ2019**

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