

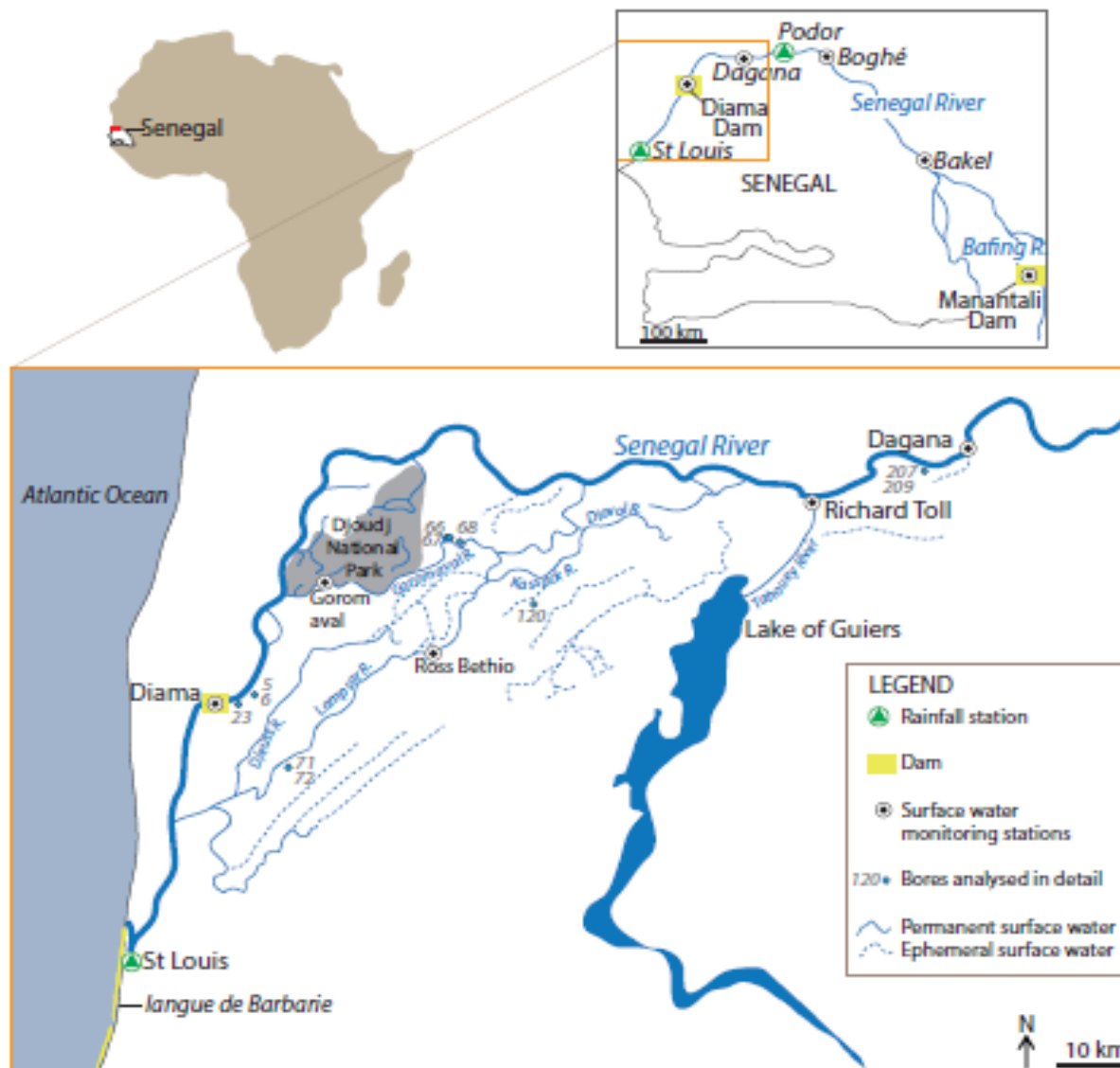
UNIVERSITE CHEIKH ANTA DIOP DE DAKAR
FACULTE DES SCIENCES ET TECHNIQUES
DEPARTEMENT DE GEOLOGIE



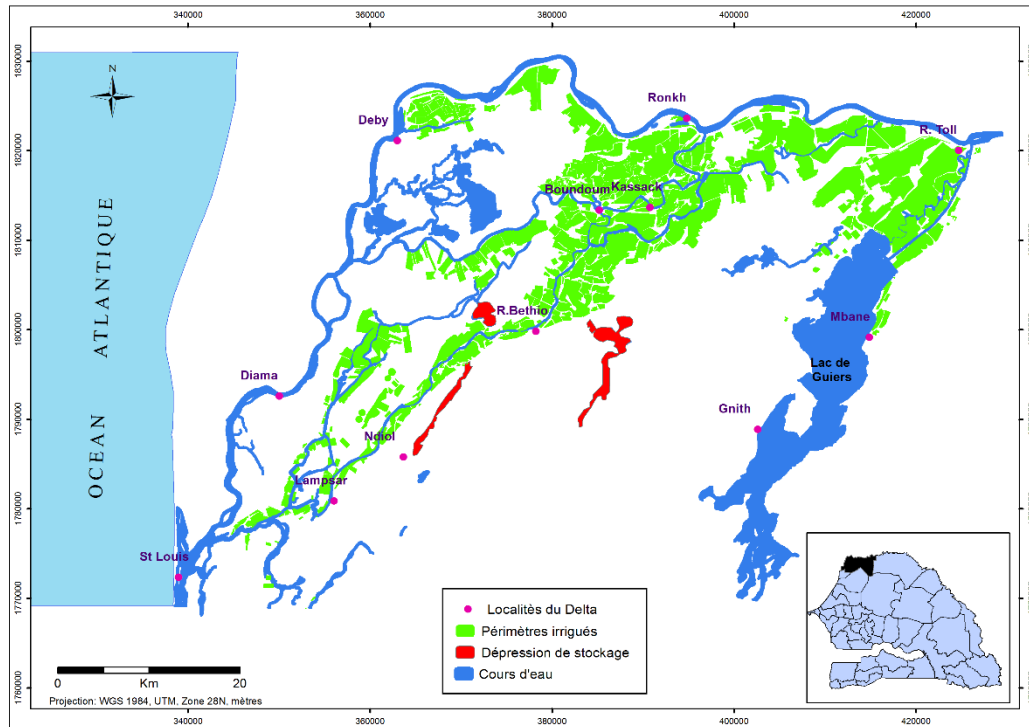
Rapid evolution of water resources in the Senegal River delta and its impacts in the soil salinisation

Dr Fatou Diop NGOM, Dr Abdou Aziz GNING, Dr Sarah TWEED,
Dr Raymond MALOU

STUDY AREA



SOCIO-ECONOMICAL CONTEXT



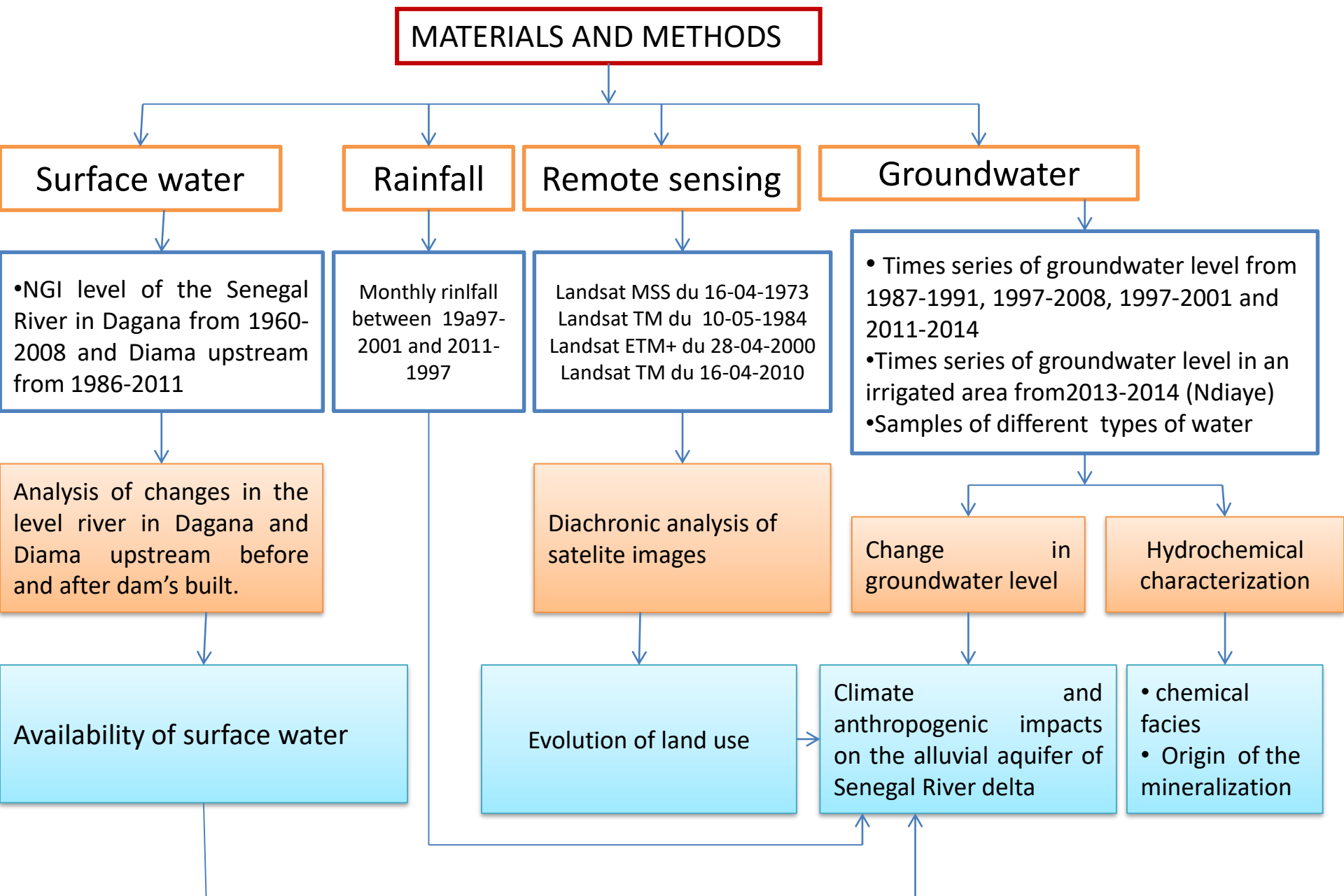
- Water is really available
- 150 000 ha exploitable land
- 70 000 ha developed land
- Many agricultural intensification programs such as PNAR and GOANA
- Output is around 500 000 tons a year



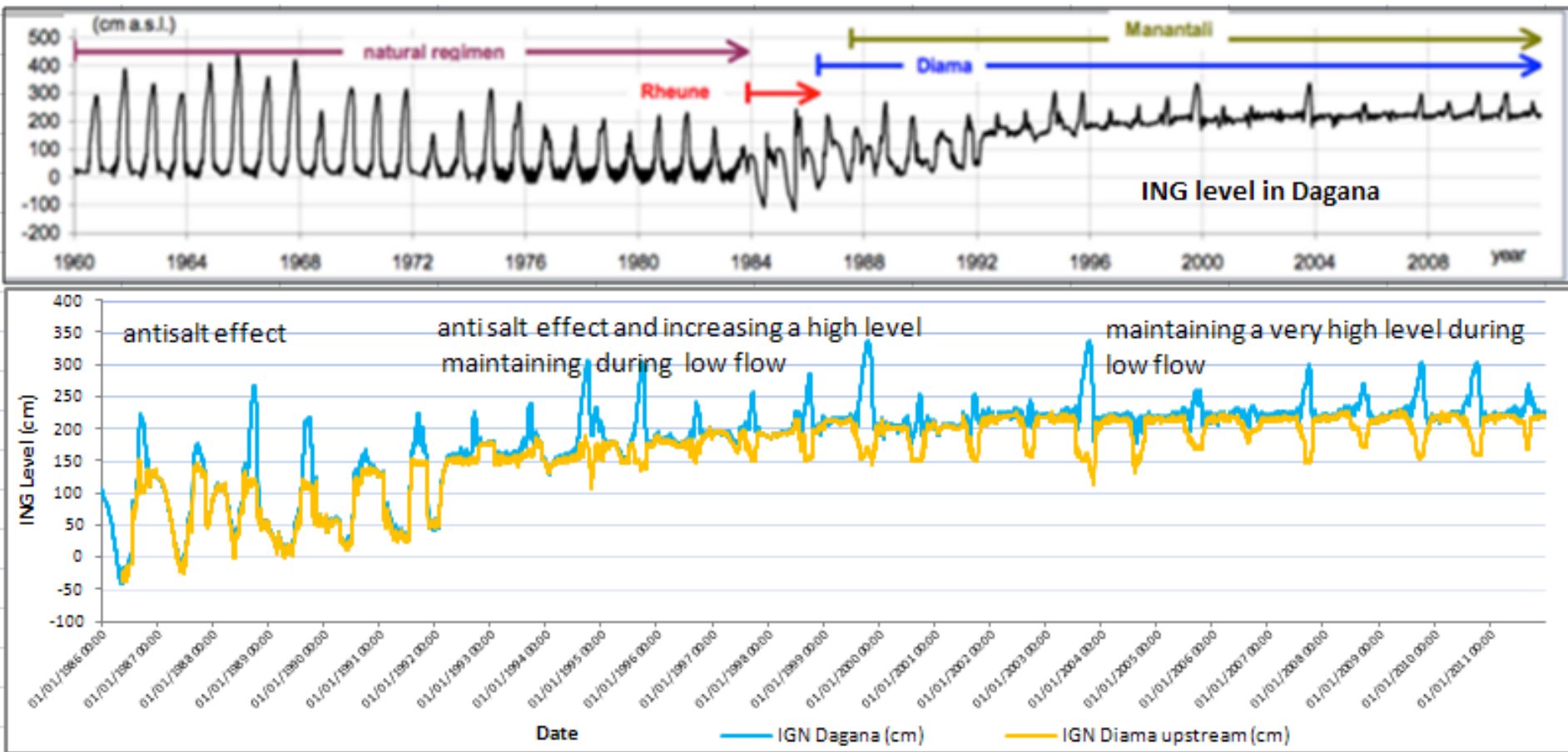
PROBLEM: LAND DEGRADATION BY SALINISATION



Land degraded after a few years of cultivation by development of salt efflorescence. This constitute a threat to the environmental and agriculture value of the region, e.g. 15000 hectares of land abandoned because of the salty soil.

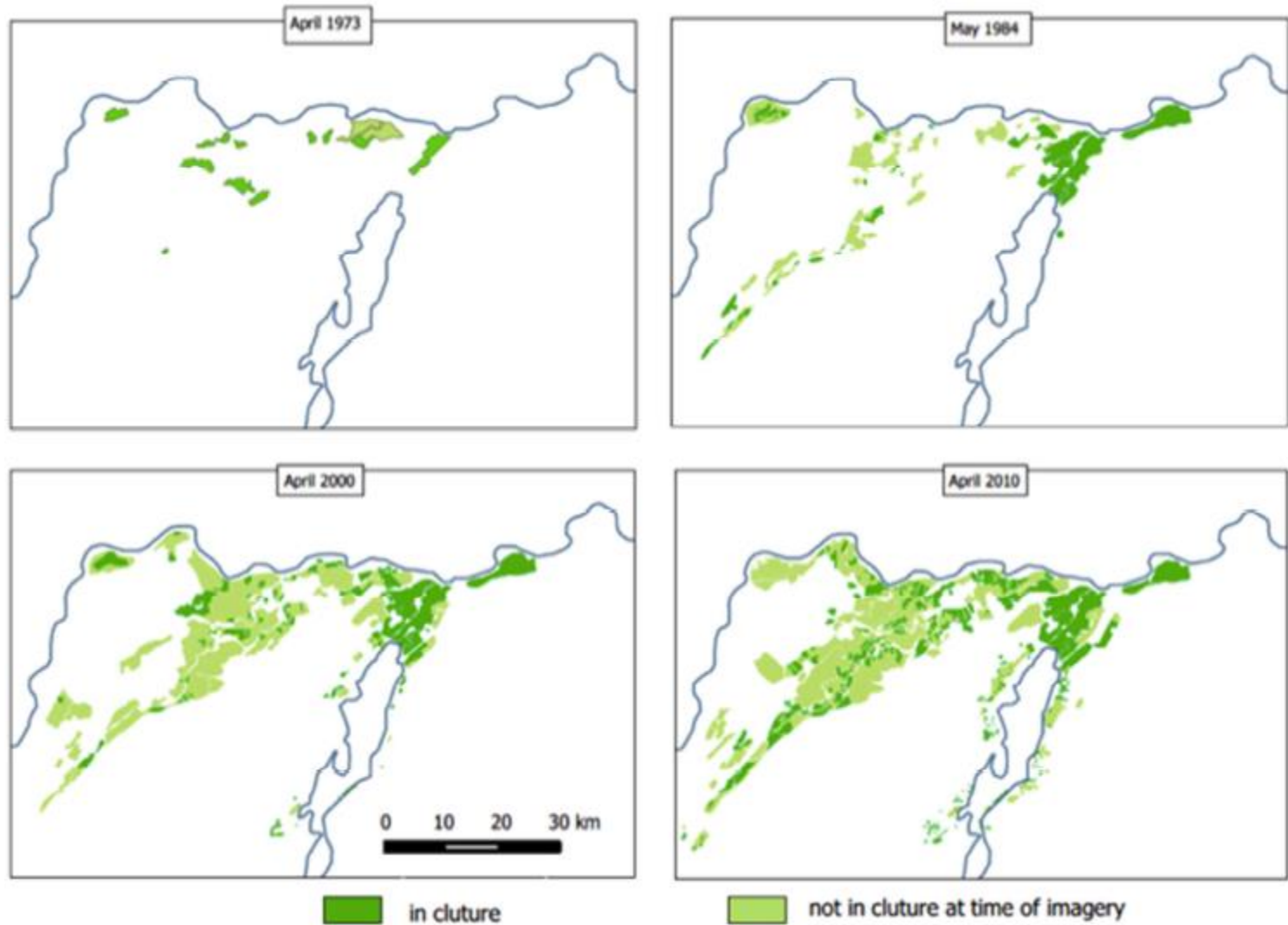


RESULTS AND DISCUSSION

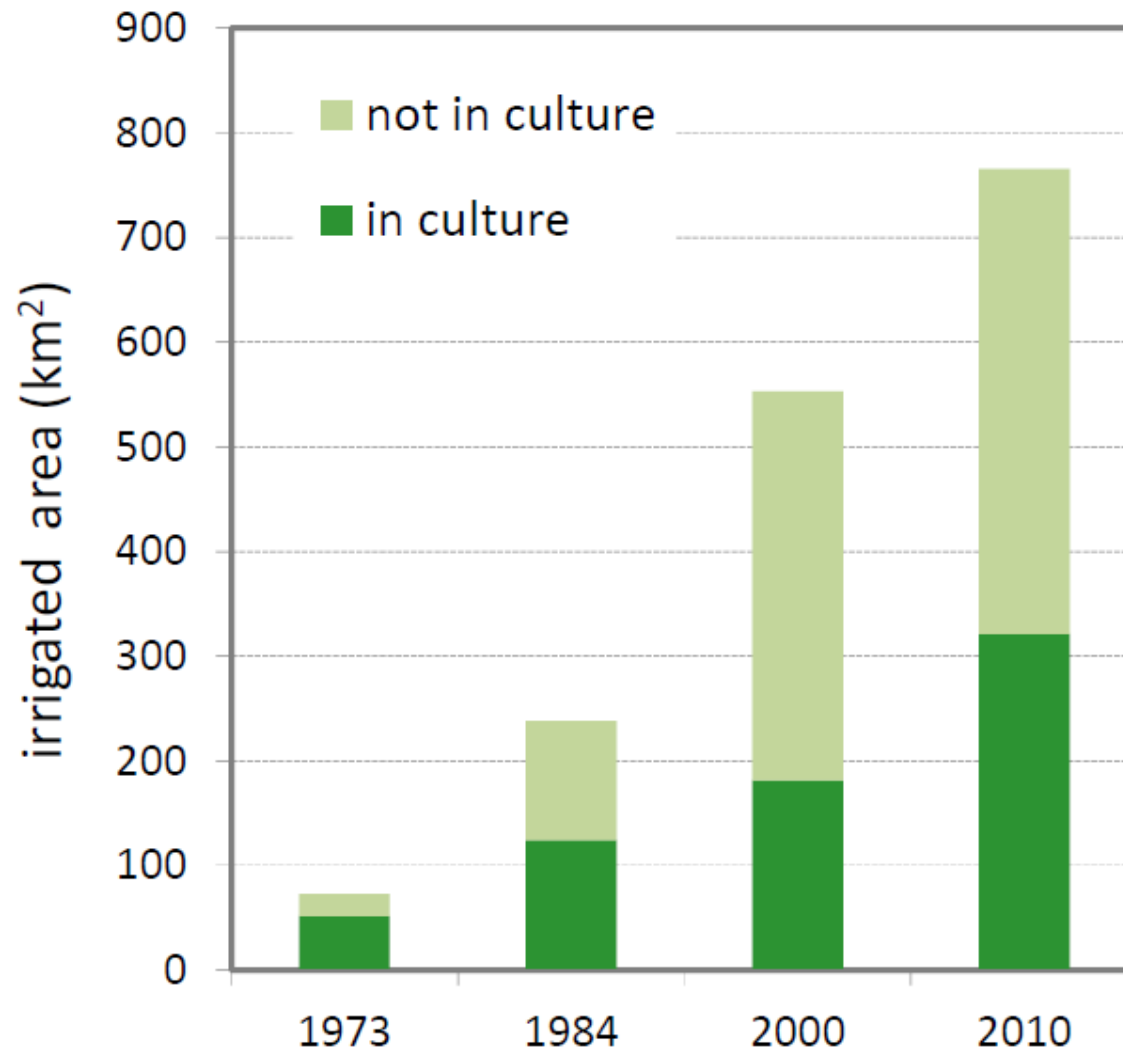


Evolution of surface water in the Senegal River Delta

Land use : evolution of irrigated area

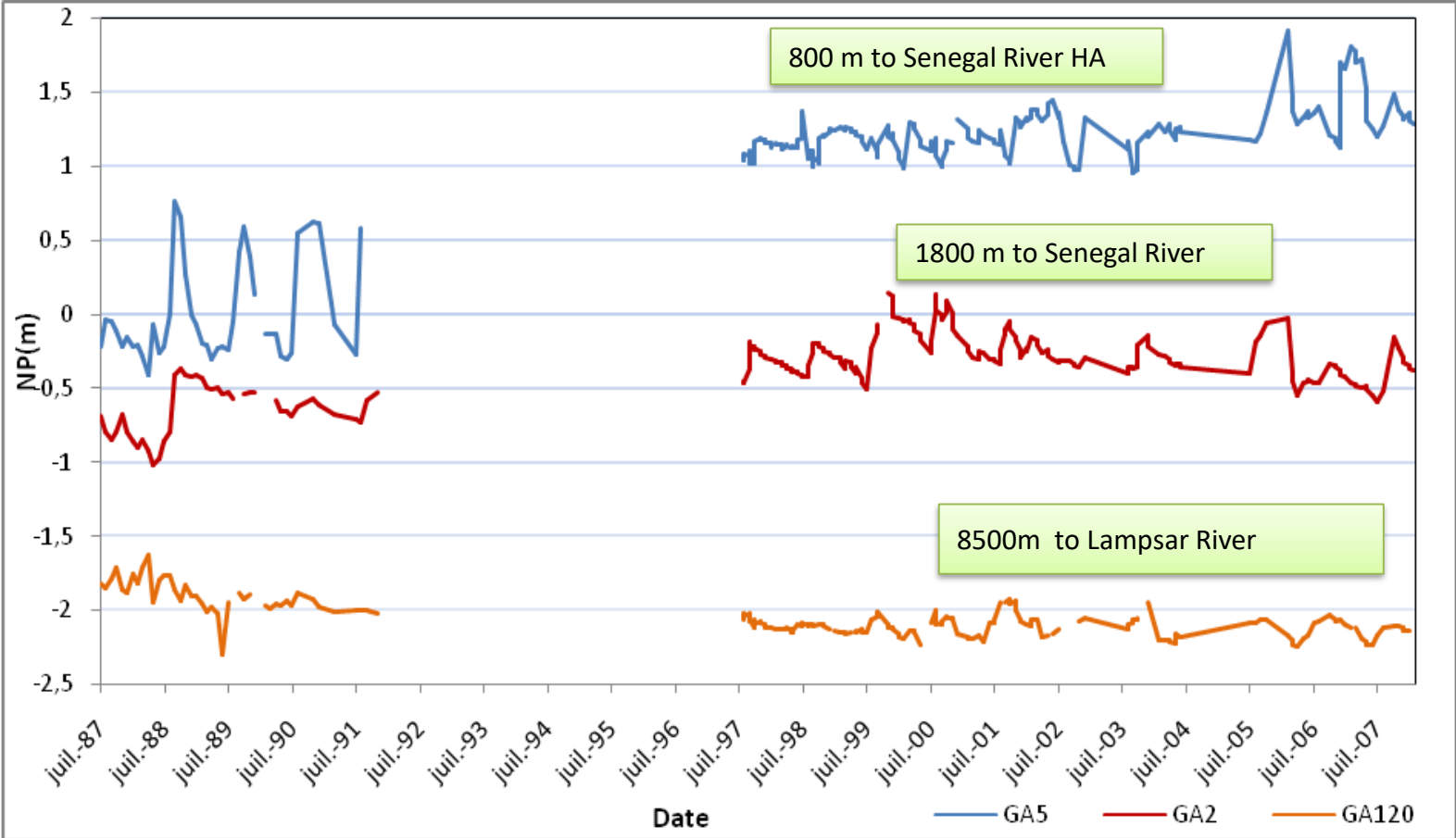


Land use : evolution of irrigated area



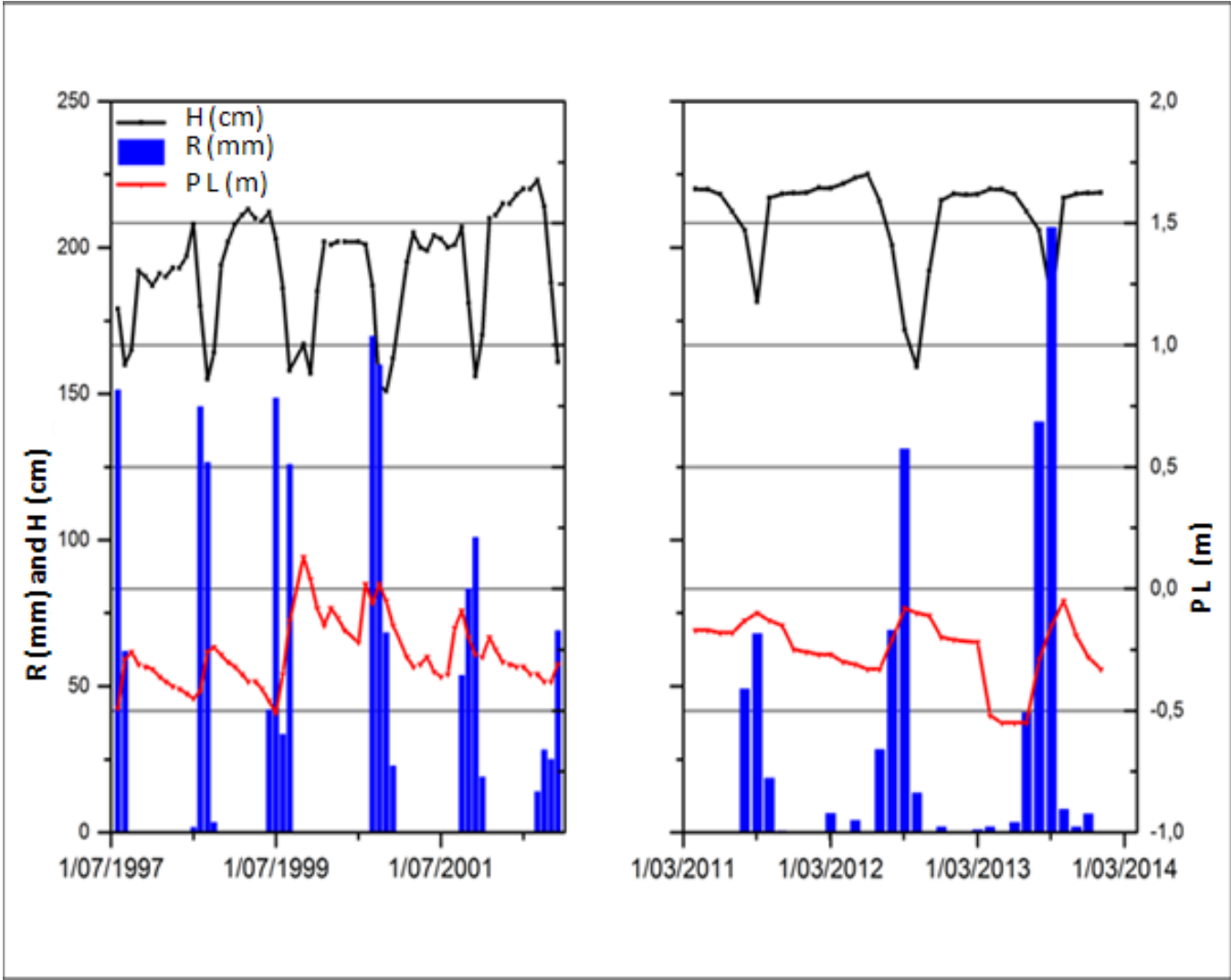
RESULTS AND DISCUSION

Dynamic of the shallow aquifer in the Senegal river delta



RESULTS AND DISCUSION Dynamic of the shallow aquifer in the Senegal river delta

GROUP 1 : the piezometers are located far from the Rivers and out of irrigated land

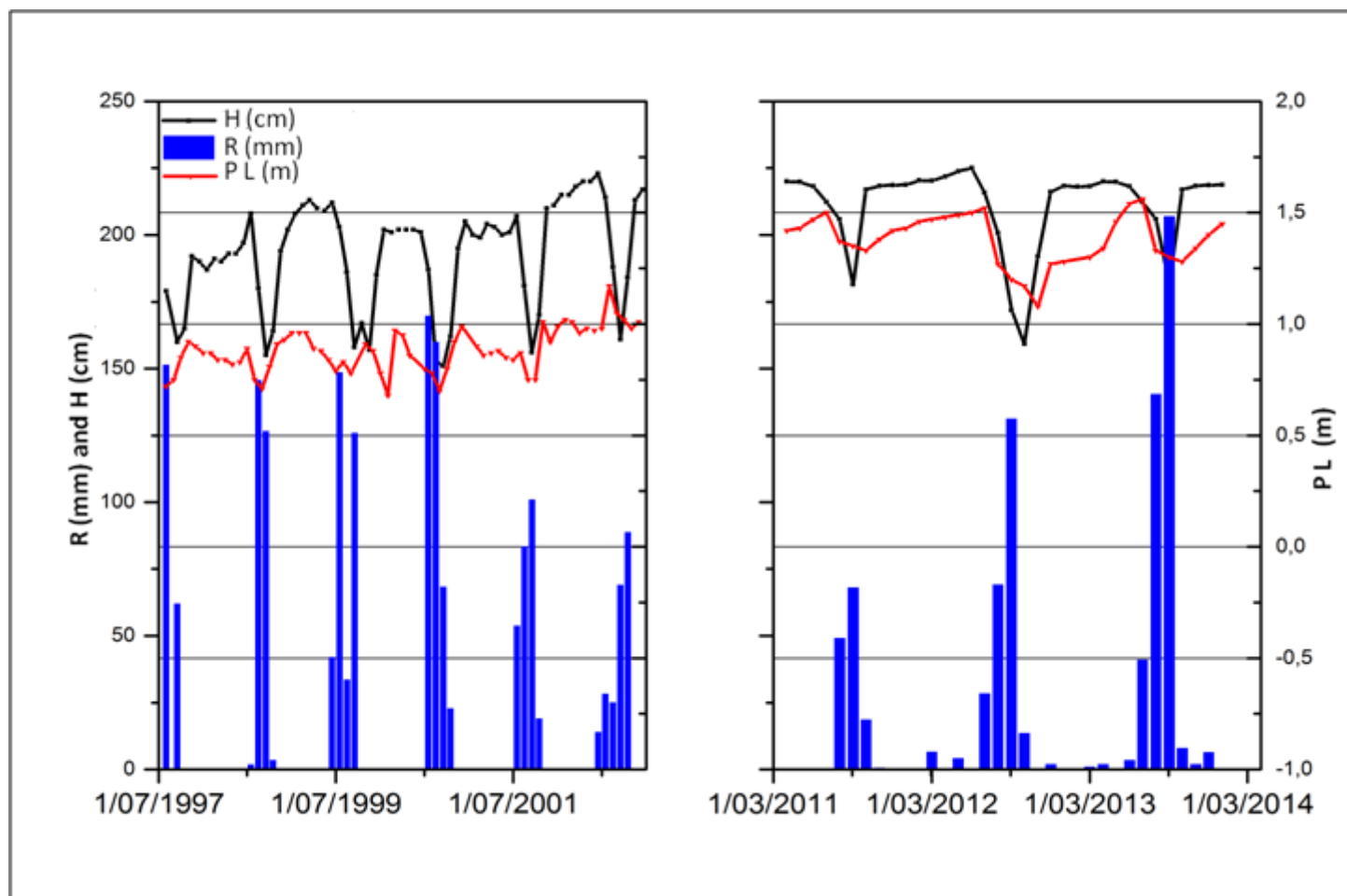


R = Rain ; H = River level; PL = piezmoetric level

RESULTS AND DISCUSSION

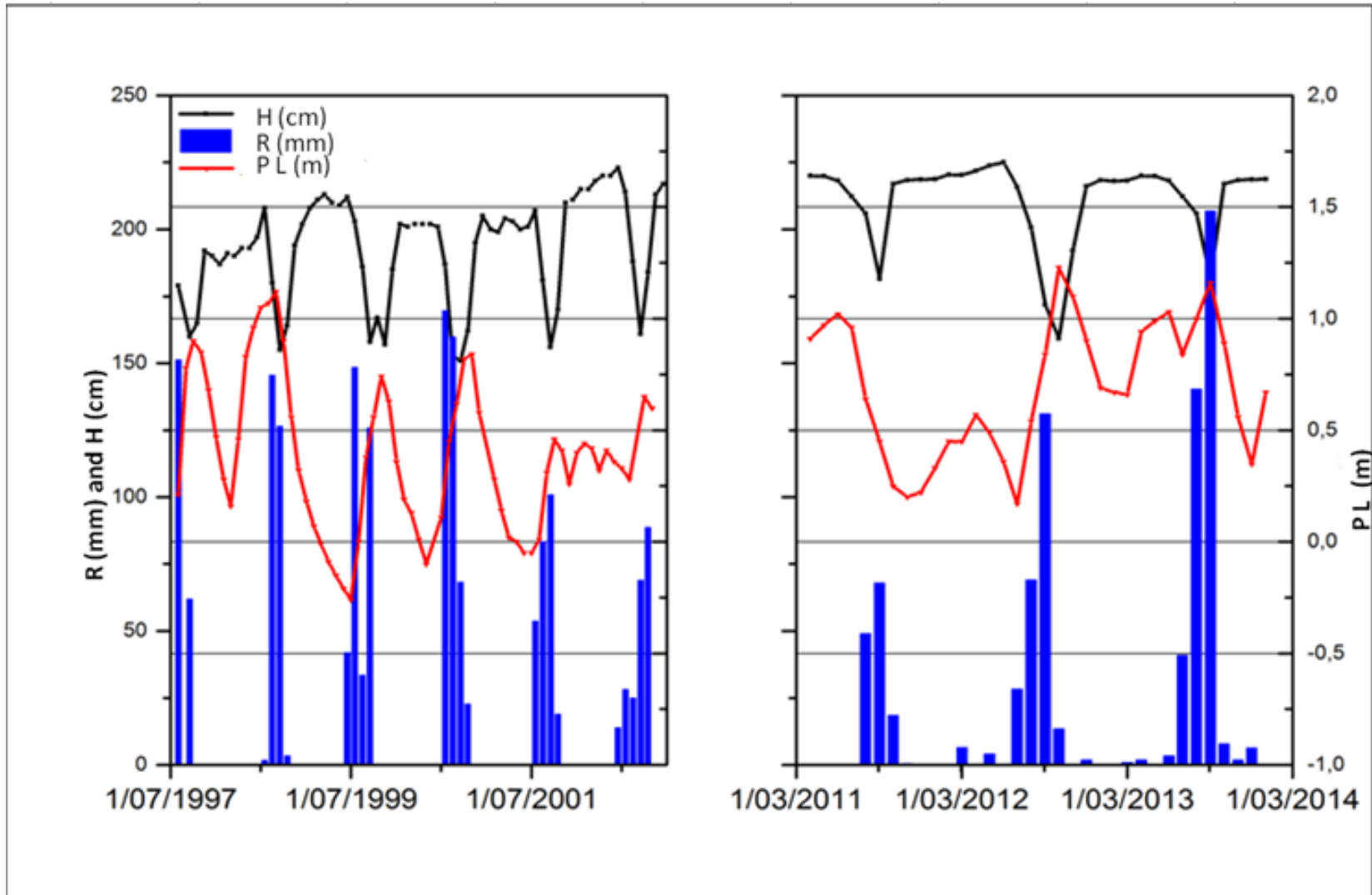
Dynamic of the shallow aquifer in the Senegal river delta

GROUP 2 : Piezometers are located near the River and out irrigated area



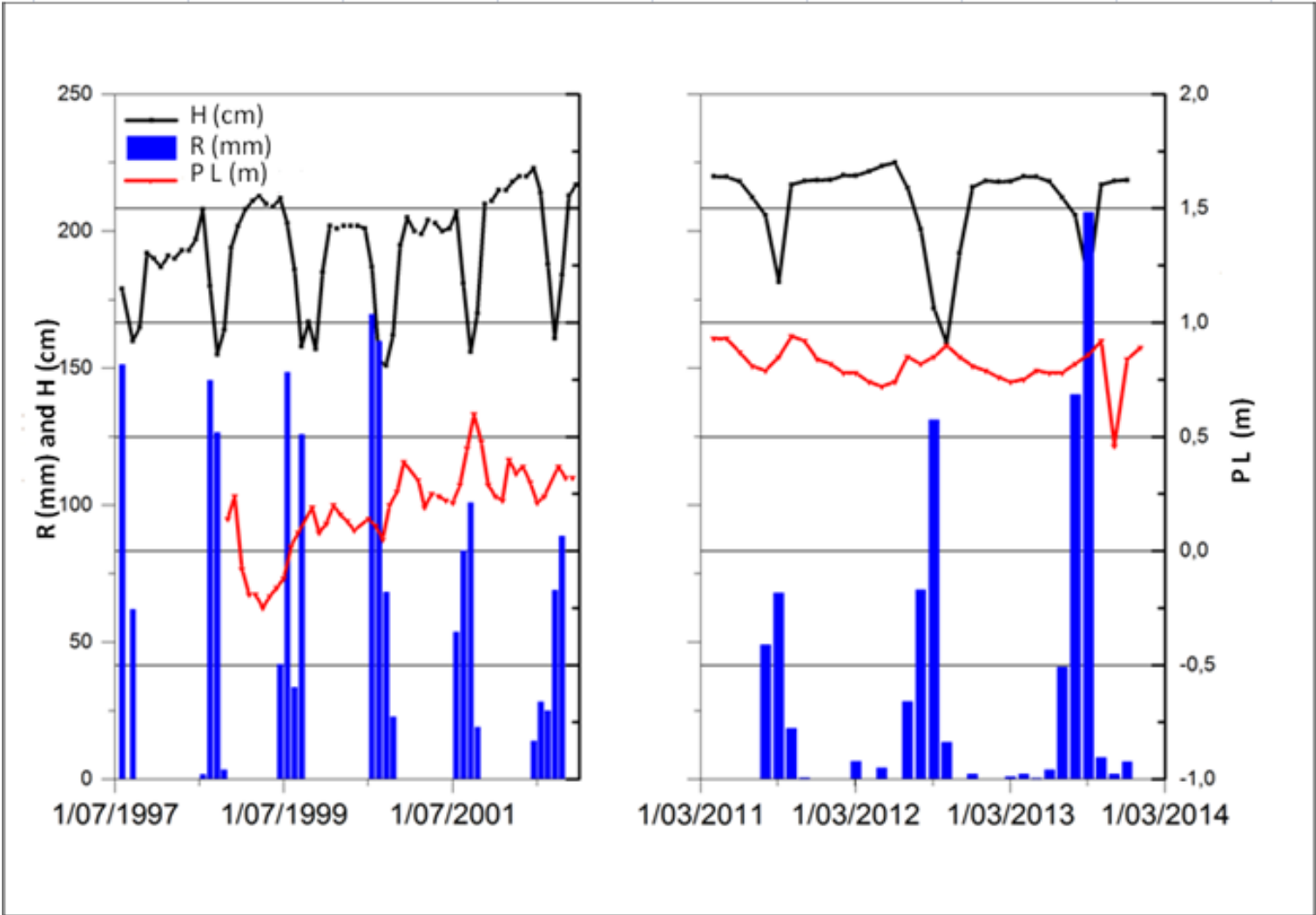
RESULTS AND DISCUSSION Dynamic of the shallow aquifer in the Senegal river delta

GROUP 3 : piezometers are located in an irrigated area and far from the River



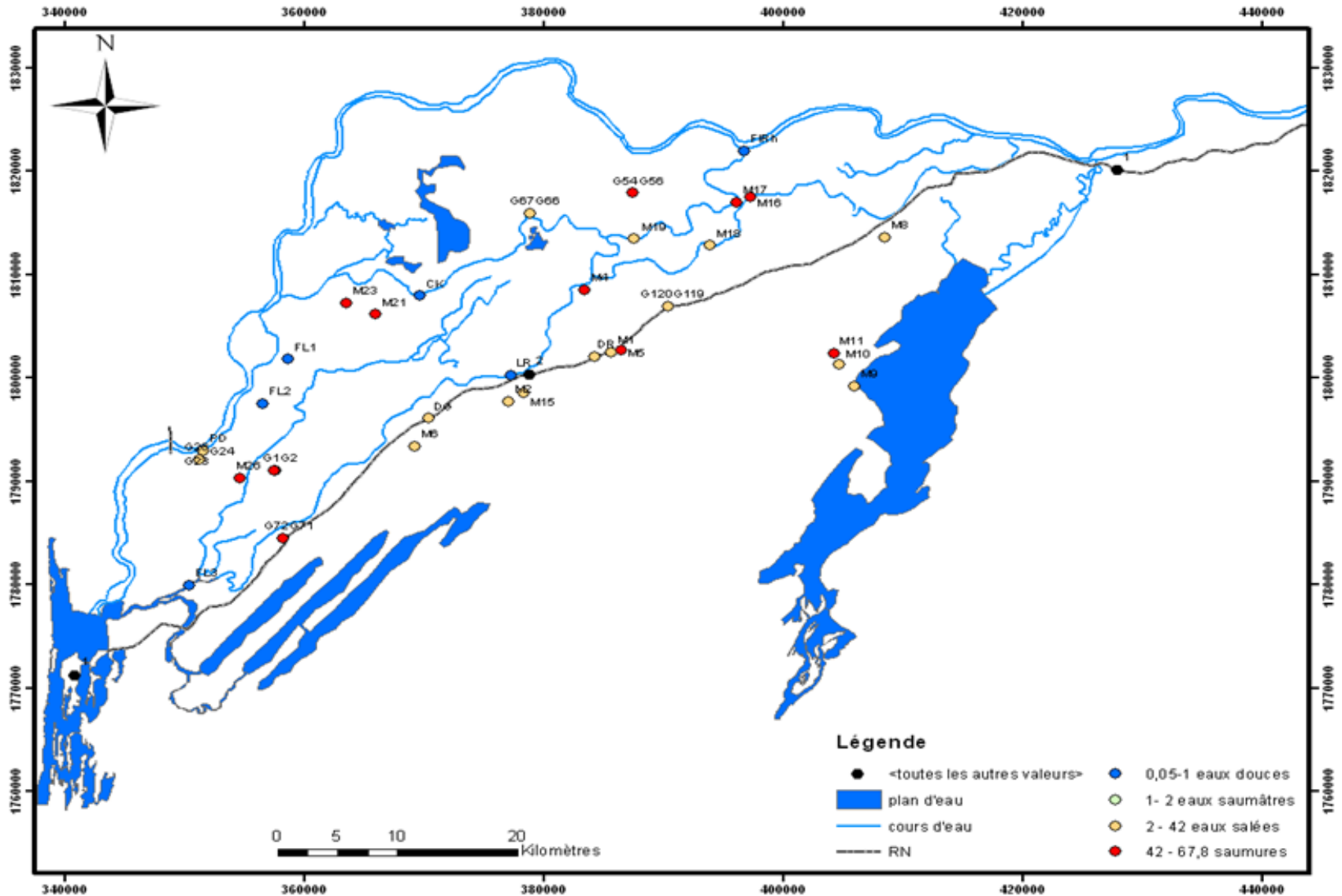
RESULTS AND DISCUSION Dynamic of the shallow aquifer in the Senegal river delta

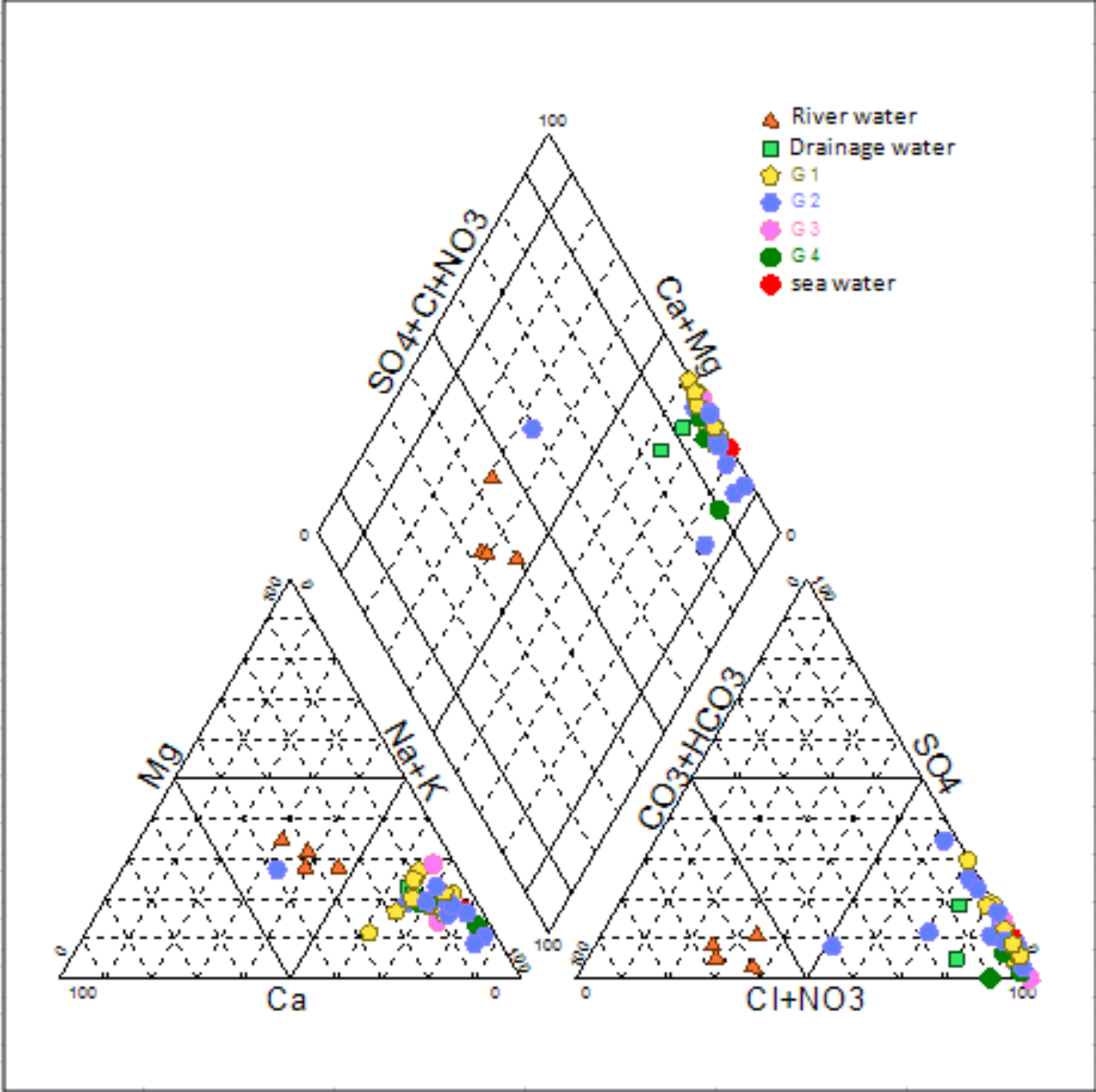
GROUPE 4: piezometers are located in an irrigated area and near the River



RESULTS AND DISCUSSION

Hydrochemistry : electrical conductivity





Piper Diagram

RESULTS AND DISCUSION

Hydrochemistry : origin of the mineralization of groundwater

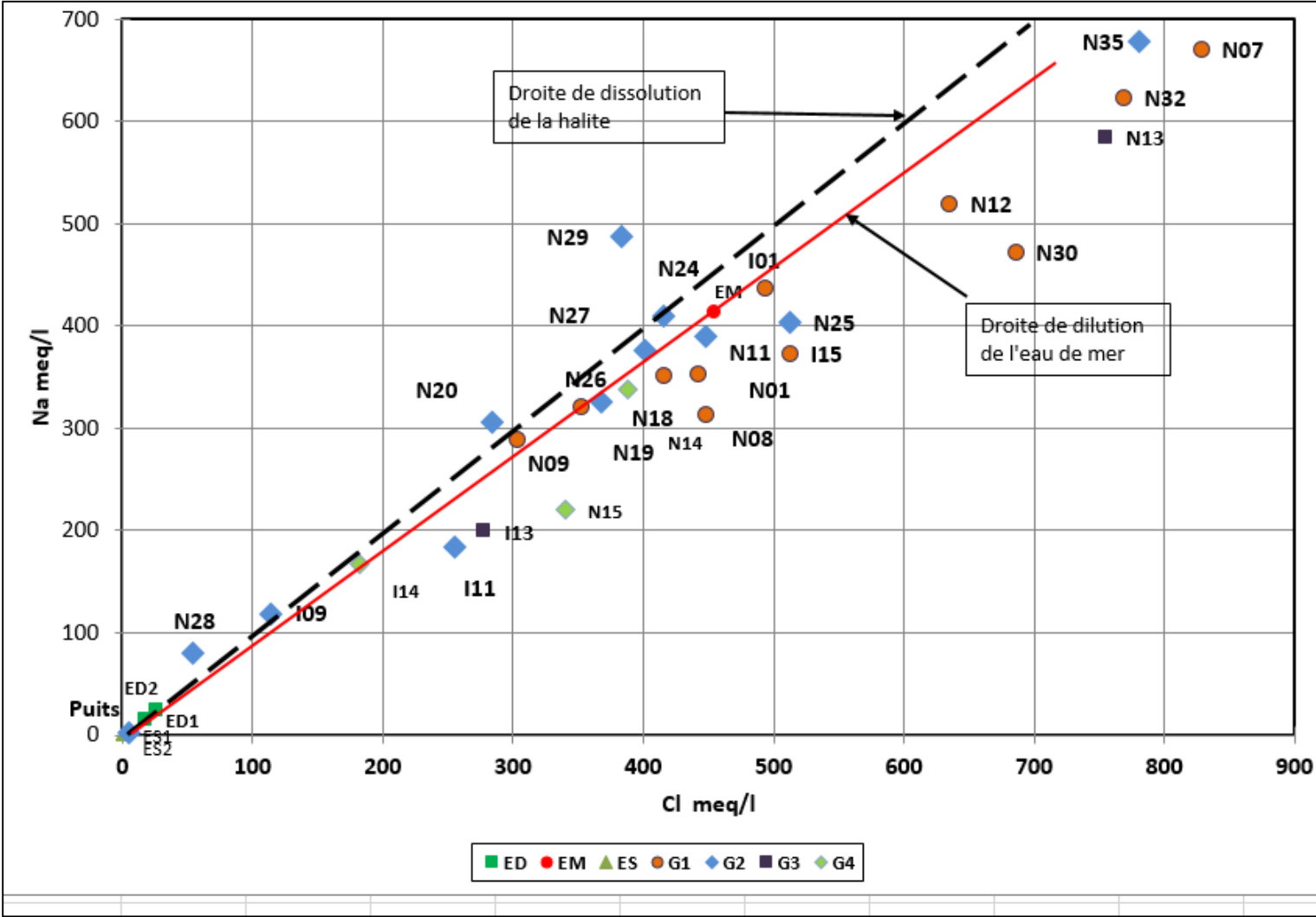
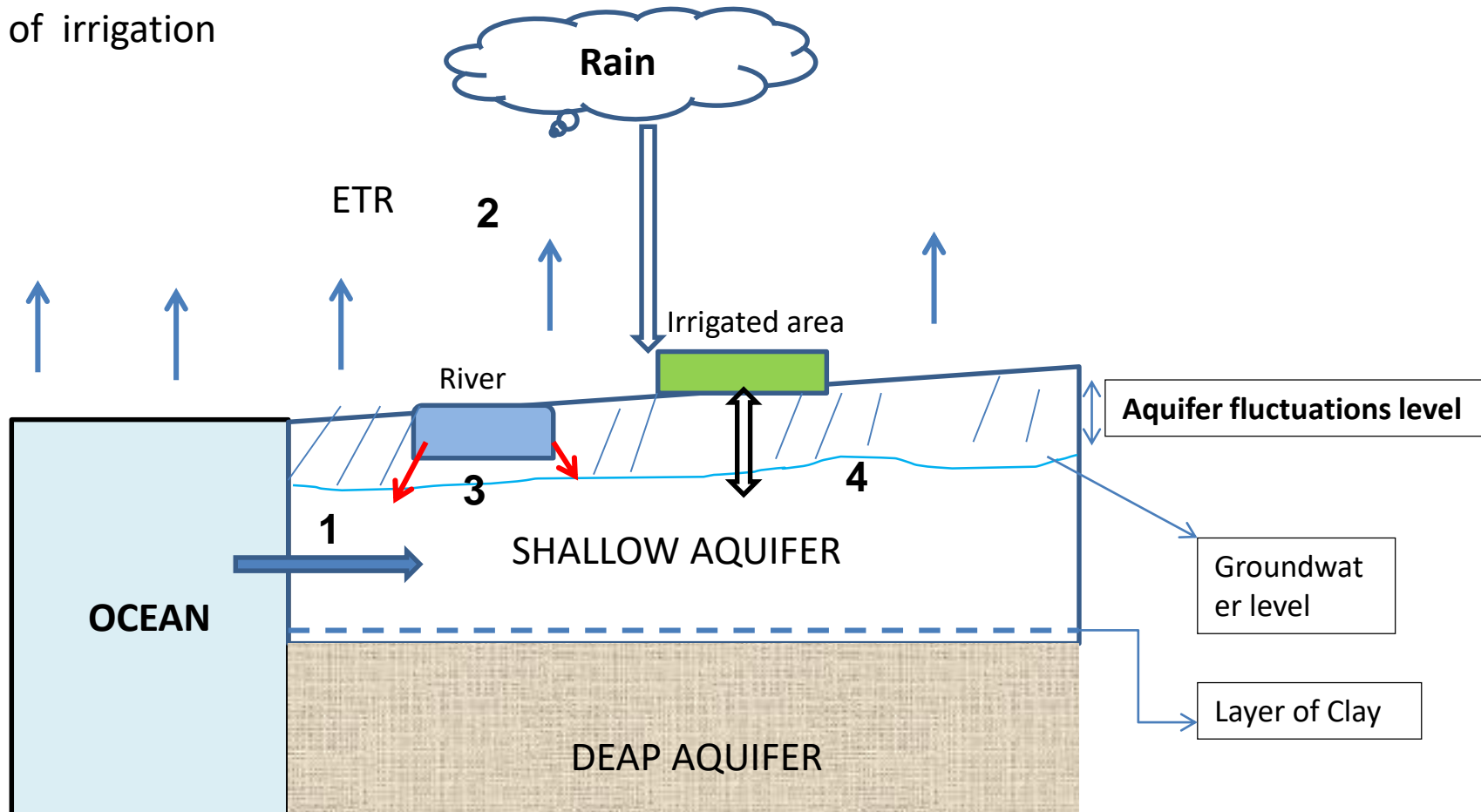


Diagramme de corrélation Na-Cl

CONCEPTUAL DIAGRAM OF EXCHANGE PROCESSES IN THE ALLUVIAL AQUIFER IN THE SENEGAL RIVER DELTA

- 1 Relation nappe/océan
- 2 impacts of climate parameters
- 3 Relation River/groundwater
- 4 Impact of irrigation



CONCLUSION :

This study has brought to light :

- The availability of surface water resources which are no longer a barrier to the development of irrigated agriculture
- The close relationship between surface water (rain, river, irrigation) and groundwater
- The high salinity of groundwater of which rise is a threat towards irrigated lands

A proposal for deep drainage of the water table has been issued and deserves to be tested in experimental plots.

THANK YOU
FOR YOUR ATTENTION