



INTER-AMERICAN INSTITUTE FOR GLOBAL CHANGE RESEARCH

From farm-level management to governance of landscapes: Climate, water and land use decisions in the plains of Southern South America (SGP-CRA 2031)

Groundwater is a major link between climate and food/energy production. In flat plains groundwater is close to the surface and can have either positive and negative impacts on natural and human systems depending on its depth. In turn, land use can have strong effects on the quantity and quality of groundwater. Being responsive to collective land use decisions, groundwater introduces interdependency among land users. Our main scientific questions: What are the two-way linkages between climate, land use and groundwater in the Pampas? What landscape management practices help maintain groundwater at optimal levels? What coordination approaches are needed to deal with groundwater interdependence?

Goals

Model non-linear and bidirectional relationships between groundwater, climate and land use decisions, focusing on the northwest portion of the Río Salado basin, in Argentina, a major agricultural area.

First results

- Land use affects water table depth (WTD) dynamics: pastures consume more water than agricultural crops (soybean, wheat-soybean double crop, maize) leading to deeper groundwater levels.
- All agricultural activities consume similar amounts of water; none of them have advantages as a flooding-prevention strategy.
- Land use decisions at a farm affect groundwater levels on neighboring ones. There is interdependence among spatially-close decision-makers.
- Most farmers measure groundwater levels and make land use decisions based on this information. They are willing to coordinate actions in order to manage a common good.
- Crowd-sourced web-based platform for the spatial and temporal monitoring of WTD in progress.

Principal investigators and lead agency

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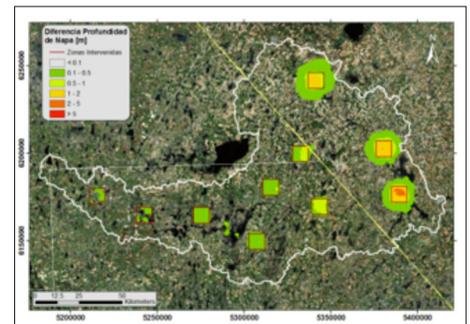
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Links to other projects

Collaboration with the project *From farm-level management to governance of landscapes: Climate, water and land use decisions in the Argentine Pampas* supported by the CNH program from NSF, US and with the project *Floods, Droughts and Farming on the Plains of Argentina and Paraguay: Adapting to climatic and hydrological changes in the Pampas & Chaco* supported by IDRC-CRDI, Canada.

Project web page: <http://platabasin.unsl.edu.ar/>



Modeled depletion of water tables in response to pasture establishment in 9 specific areas of the study basin



Group activity during a workshop focused on floods and droughts in a town of the study region



Screens capture of "Red mate" a crowd-sourced platform for the spatial and temporal monitoring of WT depth developed by project participants

