



Groundwater and land use changes in the pampas of Argentina

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The impact of climate and land use changes on groundwater in Argentina offers opportunities and threats. Lowering groundwater generally causes drought followed by crop and yield damage. Rising groundwater may limit drought as capillary rise may support root water uptake, crop growth and narrow yield gaps. However it may also limit soil water storage, cause flooding in larger areas and have a negative impact on crop yields. This negative impact is enlarged when groundwater is saline.

We quantified these impacts using an integrated dynamic modelling system for crop (WOFOST) and soil hydrology (SWAP). The system was tested at field scale using local dataset from Argentina. We then applied a modelling experiment at a regional scale to evaluate impacts using historical and future climate data.

The experiments showed that threats come from continuous monotone land use; opportunities are found when a proper balance can be found between supply and demand of soil water using a larger differentiation of land use. Modelling tools support the evaluation of different changes on vadose zone and groundwater.