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PARALLEL SESSION C : IMPACTS AND APPLICATIONS
C3: REGIONAL SCALE HYDROCLIMATE: FROM OBSERVATIONS TO MODELLING TO APPLICATIONS

Spatio-temporal analysis of the coupling between soil moisture and surface climate in the La Plata Basin: combining results from regional climate models and satellites

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The La Plata Basin (LPB), located in southeastern South America, has been identified as a hotspot of soil moisture – atmosphere coupling, that is, a region where land surface impacts substantially on the atmosphere, and in particular where seasonal climate predictions could be improved by incorporation of realistic soil moisture information. Furthermore, the monitoring and forecast of the hydrological status of LPB is very important since it is affected by cyclical drought and flood episodes that impact on the large agricultural, hydroelectrical and industrial production of this densely populated region.

Strong soil moisture – precipitation and evapotranspiration coupling during austral summer in LPB has been found in studies using different tools such as regional climate models, off-line land surface models and different definitions of coupling. Nevertheless these studies have several limitations related to model assumptions and vegetation parameterizations, as well as the lack of observational data for the evaluation of models performance.

On the other hand, in the last decade several instruments on board satellites are providing soil moisture products globally and in a continuous way. A recent work has shown that satellite soil moisture can capture the Standardized Precipitation Index pattern under extreme wet and dry conditions over the southern LPB.

In order to deepen and overcome some of the model limitations, this work adds satellite soil moisture and vegetation products in the spatio-temporal analysis of the regions of strong soil moisture – atmosphere interactions. The main objectives and related outcomes are: the verification of already identified regions where soil moisture anomalies may have an influence on subsequent precipitation, evapotranspiration and temperature anomalies, and the study of their seasonal characteristics and land cover influences in LPB.

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