Supporting land use change modelling with automated monitoring of land use dynamics in the La Plata River Basin

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A critical part of sustainability impact assessment lies in the process of building models that can actually capture public policies´ essential socio-economic-environmental consequences. However, in order to build, test and validate such models, it is necessary to gather a wide range of data regarding the observed behavior of these complex interactions. In this context, the observation of actual processes of land use dynamics constitutes essential input information for better understanding and modeling the factors that drive land use change. Unfortunately, however, the land use information available in many regions of the world is often scarce, spread out across different institutions and above all inconsistent. This is particularly true for developing countries that do not share a central government, as is the case of the Plata Basin in South America, a SENSOR-TTC study area comprising 5 different countries (Argentina, Bolivia, Brazil, Paraguay, and Uruguay). Thus, it is suggested that a land use monitoring process for the whole region is crucial in order to provide reliable land use information that is consistent over time. In order to address this issue, an automated system for monitoring land use changes over time is being developed, based on the interpretation of annual temporal profiles of vegetation indices provided by the Moderate Resolution Imaging Spectroradiometer (MODIS). As such, the generated information will serve to better understand and identify the drivers of land use change, so as to set up an appropriate configuration for the CLUE-s land use change model. More than that, this information will be crucial for validating land use change predictions given by the model, enabling not only a refinement of the modeling process as a whole but also an assessment of the reliability of its output results, an information that is essential for the policy maker, the intended final user of the system.