

Satellite Images as a Tool for Hydrodynamic Modelling

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Abstract – The development and construction of a hydrodynamic distributed model designed to simulate discharge and water levels as a function of space and time depends strongly on the knowledge of the vegetational, edafological and topobathymetric aspects of the physical system under study.

In the specific case of the Esteros del Ibera, a large freshwater wetland located in the Province of Corrientes, NE region of Argentina, more than ten million hectares of flooded lands, which are difficult to access, prevent any in situ collection of the required information. The complex geological evolution of the Iberiana depression, that includes successive displacements of riverbeds, the effects of exogenous processes of erosion, and the succession of vegetation, strongly conditions the general flow of the system.

Based on the study carried on by INCyTH-ICA in 1980, we propose in the one hand an updating of information through the use of satellite images that allows the inference of the submersed bathymetry in a digital elevation model (DEM). On the other hand, the processed satellite information using habitat classification techniques, allows the fitting of Manning's roughness parameters that condition the surface flow. Both techniques converge in the formulation of the physical foundation of the hydrodynamic model for the Esteros del Ibera.