

Remote Sensing of Wetland Vegetation: Experience on the Paraná River Delta Region, Argentina

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ABSTRACT

The Lower Paraná River Delta is a coastal tidal freshwater wetland (2,700 km²) prograding into the De la Plata Estuary. It is located at the end of the De La Plata Basin, one of the three **largest** in South America.

The Delta results **from the synergic interactions between the Paraná and Uruguay rivers and the estuary inflows**. Currently, established plant communities (forests, marshes, and rushes) are effected by the El Niño event through the Paraná River discharges. The stability of these plant communities is also dependent on changes in the rate of sea level rise and on changing human pressures.

Our primary goal is to document remote sensing capabilities and limitations for wetland mapping and monitoring. A second goal is to develop biophysical parameters to monitor ecosystem health (biomass and primary production) and ecosystem changes (between and within ecosystems).

To accomplish these goals, a multisensor approach based on optical multispectral and SAR data was developed. Twenty-five Landsat 7 +ETM, 6 Radarsat and 14 ERS-2 SAR images collected of the Delta from 1997-2002 were acquired and subsequently geometrically and radiometrically calibrated. A Raleigh correction was applied to the optical image data.

SAR multiangle and multipolarization image data were analyzed for changes in the target-signal interaction mechanism and found to be particularly useful for detecting and mapping wetland flood and fire extents. In addition, the normalized vegetation index (NDVI) generated from optical image data and the SAR backscatter image data provide complementary information when applied to monitoring marsh changes throughout the Delta.