

Mapping Coastal Vegetation of Central America Using JERS-1 and Landsat TM Image Mosaics

Sassan Saatchi¹, Erika Podest¹, Steven Sader²,

*1. Jet Propulsion Laboratory (JPL)
California Institute of Technology
4800 Oak Grove Drive
Pasadena, California 91109*

*2College of Forest Resources
University of Maine
Orono, ME 04469*

Abstract

Marine and coastal region of Central America supports of the most complex and distinct ecosystems, with one of the highest biodiversity and productivity in the world. In some countries such as Panama and Costa Rica, coastal ecosystems represent more than 50% of the total area. These coastal ecosystems have been threatened by a Varsity of effects such as increasing migration of people to the coast, deforestation and degradation of mangroves and coastal wetlands, increasing cultivation and over harvesting, El Nino and flooding impacts, and shipping and industrial pollution. In recent years, the mapping and monitoring of this ecosystems have become the focus of many conservation and governmental institutions. In this study, we use radar images acquired by JERS-1 sensor in 1996, and the most recent Landsat TM mosaic of Meso America to map the vegetation types along the coast. The methodology is based on a synergistic classification approach that combines radar backscatter and texture measures and TM bands 3,4, and 5. The classifier uses a probabilistic decision rule approach trained by signatures extracted over known vegetation types. The classification has been performed over coastal areas by including mangroves and wetlands and excluding the interior vegetation using distance from the coast and digital elevation data. The paper discusses the classification procedure and the validation of the vegetation map with existing image and ground data.

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