

GIS Based Ecological Planning and Sustainable Management Models for the Laguna Madre, Tamaulipas, México

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ABSTRACT

Ecological Planning is a process that evaluates the alternative land uses in relation to its environmental and socioeconomic surroundings, with the purpose of manage the natural resources, preserve the ecosystems and solve or diminish possible environmental conflicts. With an area of 215.160 hectares, the Laguna Madre is the largest coastal lagoon in Mexico separated from the sea by barrier. The Laguna Madre region has acquired international importance when the Western Hemisphere Shorebird Reserve Network pointed out its potential to house more than 100.000 coastal birds along the year and has been proposed by the Comisión Nacional para el Conocimiento y Uso de la Biodiversidad as a High-priority Area for Conservation. The objective of this work was to generate a series of remote sensing and GIS based diagnostic models in agriculture, forestry, nature services, livestock, fisheries and ecotourism, whose implementation will allow the rational use of the resources of the area, keeping in mind its conservation, and their capacity to provide ecological services to both the human and wildlife inhabitants of the area.

The project involved four phases: characterization, diagnosis, forecast and proposals. In the first phase, both natural socioeconomic aspects are described and delineated; in the diagnosis phase, the actual conditions are identified and evaluated, analyzing its origins and condition; the third phase, forecast show the more likely trends in natural resources conditions if the actual use is maintained; finally; in the proposal phase, the land capability is defined based upon the diagnostic models.

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