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DECISION SUPPORT SYSTEMS FOR ENVIRONMENTAL MANAGEMENT AND CONSERVATION: A GIS-BASED MODEL

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ABSTRACT Geographic Information System (GIS) applications for environmental data analysis and planning are gaining interest in different disciplines concerning Environmental Management. Some of these GIS-based applications are already playing an important role in decision making at various levels, both in government and private organization such as ecology labs, planning departments, parks, agencies, and non-profit organizations to promote sustainable growth. In this research, we devise a conceptual framework for designing a GIS-based decision support system that encompasses and synthesizes a broad spectrum of data into four basic components, namely: the water component, the land component, the wildlife component, and the vegetation component. The proposed system leads environmental managers to support managerial decision making in some important issues concerning environmental hazards, environmental health, and some human and ecological impacts. In order to analyze the applicability of the proposed system in Puerto Rico, we are considering two environmental problems in a case study: the impact of reducing vegetation in urban areas in Puerto Rico, and the action plan for conserving the fragile ecosystem in the San Juan Bay Estuary.

Keywords: GIS (Geographic Information Systems), Decision Support Systems, Environmental Management.