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Spatial Mapping and Change Detection of a Coastal Woodland Mangrove Habitat in Fiji

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Abstract : Mangrove patches are the foundation species located in the estuarine land areas. These patches provide a nursery, food source and protection for numerous aquatic, intertidal and well as land-based organisms. Mangroves also help in coastal protection, maintain water clarity and are one of the biggest sinks for blue carbon sequestration. In the Pacific Island countries, numerous coastal communities have a heavy socioeconomic dependence on coastal resources and mangroves play a key ecological and economical role in structuring the availability of these resources. Fiji has a large mangrove patch located in the Votua area of the Ba province. Globally, mangrove population continues to decline with the changes in climatic conditions and anthropogenic activities. Baseline information through wetland maps and time series change are essential references for development of effective mangrove management plans. These maps reveal the status of the resource and the effects arising from anthropogenic activities and climate change. In this study, we used remote sensing and GIS tools for mapping and temporal change detection over a period of >20 years in Votua, Fiji using Landsat imagery. Landsat program started in 1972 initially as Earth Resources Technology Satellite. Since then it has acquired millions of images of Earth. This archive allows mapping of temporal changes in mangrove forests. Mangrove plants consisted of the species Rhizophora stylosa, Rhizophora samoensis, Bruguiera gymnorrhiza, Lumnitzera littorea, Heritiera littoralis, Excoecaria agallocha and Xylocarpus granatum. Change detection analysis revealed significant reduction in the mangrove patch over the years. This information serves as a baseline for the development and implementation of effective management plans for one of Fiji's biggest mangrove patches.

Keywords : climate change, GIS, Landsat, mangrove, temporal change
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