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Environmental sensitivity assessment as a tool for sustainable development in coastal lagoons: Case study on Lake Brollos

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Remote Sensing has a great capability especially from the scope of coastal environments, as it is rapidly making visible what had previously been hidden or inaccessible. Also, it has helped overcoming most difficulties of data collection from field. Moreover obtaining up to date data and tracking changes of environmental characteristics, the GIS and Remote Sensing have provided great opportunity for integrating interdisciplinary studies and analyses, which required for environmental planning in coastal areas. On the other hand, coastal lagoons are presenting very sensitive and dynamic ecosystems which facing different natural and human challenges. From here, this paper presents a new developed technique of Environmental Sensitivity Assessment 'ESA', which has been designed to meet the special features of coastal lagoons and the special requirements land use/physical planning in order to achieve sustainability in these areas. However the paper focuses on the role of GIS and Remote Sensing in this new technique, it starts with a quick introduction of the ESA, and then it moves step by step throughout the application procedure. Lake Brollos in the northern coast of Egypt was chosen as a case study for the application; and a quite long time series of satellite images (i.e. years 1984-1993-2000-2010) were used for the purposes of this study. The results show a dramatic deterioration of sensitive and productive areas; huge shrink of the water-body and the associated flora of wetlands; and accelerated erosion in certain parts of the shoreline. However the study approved that: certain areas/locations in this ecosystem are the most sensitive and significant, and they would be in the top of ES scoring list even over long period. Thus, guidelines for future land uses, development decision, and protection decision could be drawn upon clear evidence of ES for each sub area of the case study.

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Modern sediments and sedimentary processes at the Baram river mouth, Sarawak, Malaysia

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The Baram Delta is located in the northern part of Sarawak and extends into south western part of Sabah through Brunei extending over an area of approximately 300 sq km. The proto delta formed during the Middle-late Miocene and has since been prograding onto the marine continental shelf. During the last 5,400 years, it has been depositing sediments in the form of clays, sands, gravels and peat rich alluvium at an enormous rate of 10 meters per year. The currently active delta front is represented by the Baram River and is largely influenced by coastal processes dominated by waves arriving from the North and North-East forcing the marine extension of the channel to drift in a West to South-Westerly direction. Seasonal variation in long shore drift direction is largely responsible for the symmetrical shape of the delta around its major distributary. Of the fluvially derived sediments, sand is deposited on the offshore bars whereas finer silt and mud is spread further out on the shelf. Of special interest are the anthropogenic influences on the depositional environment: the high tide mark is dominated by sawn log, branch and leaf debris that has "escaped" during forest clearing for oil palm plantations. The article discusses the coastal processes influencing the sediment transport and depositional processes at the Baram River mouth vis-à-vis the sedimentological analysis of the sequences in Miri Formation. The methodology of the study is based on analysis of satellite imageries, field observations of the adjoining Miri formation and the coastal processes around the western flank of the present delta lobe.

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