

Application of Remote Sensing for Management of Coral Reefs in Thailand

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The present paper provides a review and recommendations on the use of remote sensing techniques for coral reef management in Thailand. Thailand has a total coastline of approximately 2,600 kilometers. There are over 300 major reef groups, covering an estimated area of at least 150 km². For coral reef management, it is necessary to have monitoring programs to providing information on the biodiversity and condition of particular sites as well as environmental changes caused by natural and anthropogenic disturbances. The *in situ* methods allow for only the study of small part of coral system, as the time and cost required to cover all would be immense. Recent advances in satellite remote sensing are an important alternative technology and methodologies have allowed for long-term change detection studies that can supply the data necessary to monitor coral reefs on a large scale in a cost and time effective manner. Satellite remote sensing in Thailand was set up under the Thailand National Remote Sensing Program (TRNSP) in 1971. National Remote Sensing Coordinating Committee was established with cabinet decision to participate in the United NASA LANDSAT investigation program. Satellite images from SPOT, LANDSAT and IRS-1 have been applied for coral reef monitoring programs in Thailand. The LANDSAT series of satellites are the longest running continuous satellites that can be used for coral reef studies. Remote sensing techniques of Landsat-5 TM and Landsat-7 ETM+ seem to have high potential to provide monitoring data in coral reefs of Thai waters. Time-series of Landsat-5 TM and Landsat-7 ETM+ images were analyzed to detect changes in coral reef conditions. Several corrections were undertaken to gain more accuracy. The results were compared with historical ground-truth data from direct field observations. The impacts of severe coral reef bleaching phenomena on coral reef conditions were remarkably observed, especially in 1998. Future development of remote sensing techniques to study coral reef community structure and health of reef organisms is required.