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# Application of Remote Sensing for Long-term Monitoring of Coral Reefs in the Gulf of Thailand



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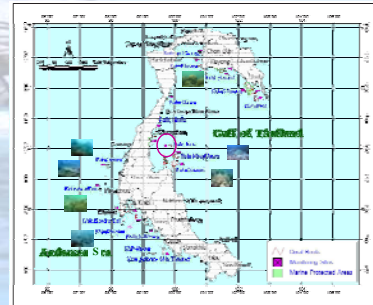
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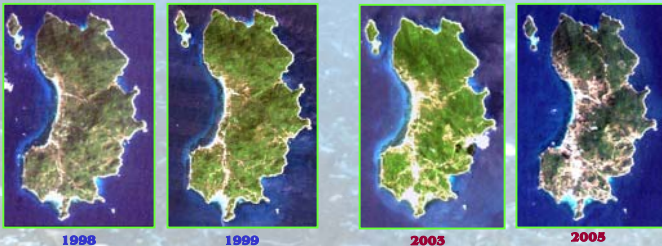
Tao Island is located approximately 70 km, east of Surat Thani Province in the South of Thailand. It is one of the most popular tourist destinations for a few decades, especially for snorkeling and SCUBA diving.



This research aimed to study on capability of remote sensing techniques for long-term monitoring of coral reef conditions in the Gulf of Thailand by using LANDSAT 5 TM and LANDSAT 7 ETM+.



Based on analysis of images during 1997 - 2005 at five study sites, i.e., Hat Sai Ri, Ao Mae Hat, Ao Chalok Ban Kao, Ao Thian and Ko Nang Yuan using band ratios and color composition of bands 3, 2 and 1 (RGB), supervised classification with maximum likelihood classifier. Four components of coral reef were detected, i.e., live coral, other hard substrate component except coral, soft bottom in coral reef and sandy beach. The overall accuracy ranged 60 - 67%.



1998 Before the coral bleaching  
1999 After the coral bleaching

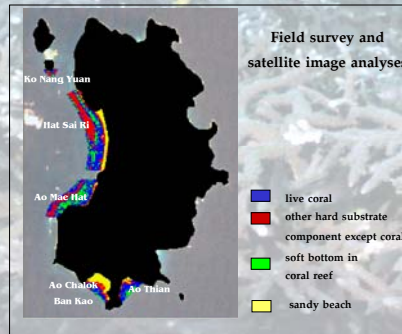
LANDSAT-5 TM

LANDSAT-7 ETM+

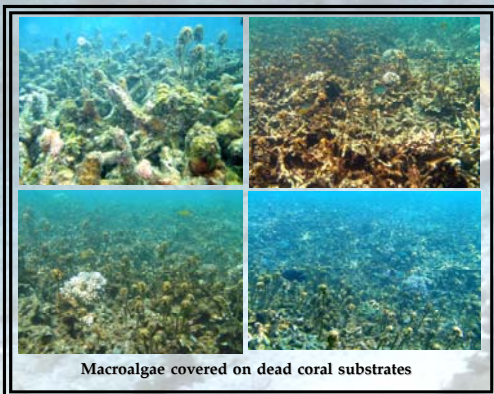
Live coral areas decreased remarkably due to mainly the severe coral bleaching phenomenon in 1998.



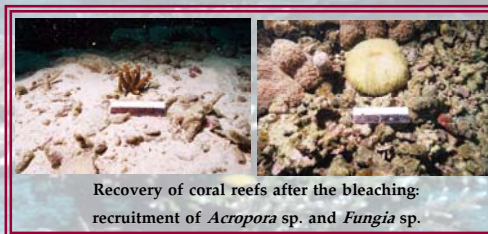
Coral reef bleaching in 1998 at Koh Tao



Coral reef recoveries in 2002 and 2005 were different among the study sites. Live coral areas at Hat Sai Ri and Ko Nang Yuan increased considerably while those at Ao Chalok Ban Kao, Ao Thian and Ao Mae Hat were no change.

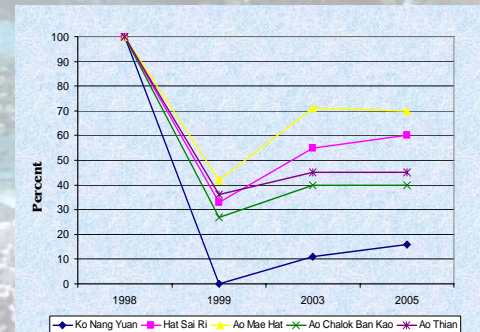


Macroalgae covered on dead coral substrates



Recovery of coral reefs after the bleaching: recruitment of *Acropora* sp. and *Fungia* sp.

The present study highlights the importance of coral reef monitoring by using remote sensing to assess coral recovery after coral reef bleaching.



Changes of live coral coverage during 1998 - 2005 analyzed from LANDSAT images

### Acknowledgement

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