

## ABSTRACT

ASSESSMENT OF REMOTE SENSED PRODUCTS FOR MONITORING  
CORAL REEFS ALONG THE COASTLINE OF TOBAGO

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Coral reef degradation is a concern for many tourist-dependent countries within the Caribbean. Unsustainable use and unpredictable climate have resulted in continuous reef degradation. With gaps in field surveys, there is increased dependency on remote sensing to provide continuous monitoring of these high risked reefs. This study assessed the use of (i) Landsat satellite imagery to monitor long-term shallow water coral cover and (ii) Sea Surface Temperature (SST) through the National and Oceanic Atmospheric Administration (NOAA) Coral Reef Watch (CRW) Decision Support System (DSS) to determine the thermal stress of coral reefs. The study sites were the major coral reefs of the Southern Caribbean island of Tobago. Landsat images were evaluated in the Environment for Visualizing Images (ENVI) software where normalization of data and classification analysis were carried out, whilst post processing was conducted using ArcGIS. These results were compared to social data obtained through a Participatory Rural Appraisal (PRA). The new NOAA CRW DSS 5 km and heritage 50 km products were validated and assessed with *in situ* temperature (IST) data and coral bleaching surveys for three reef sites (Buccoo Reef, Culloden and Speyside) of Tobago. Results of the analysis of changes of the classified coral extent reflected an approximate 30% reduction of the coral extent from 2000 to 2014 which could be due to the increased number of anthropogenic stressors as observed by local fishers. Seasonal and annual biases indicated the new 5 km SST represents the conditions at these reefs better than the 50 km SST. The new 5 km DHW products were more consistent with bleaching observations. These results are encouraging for application of the new 5 km SST in monitoring thermal stress of reefs in the southern Caribbean.

Key words: new 5 km SST, Coral reefs, SST, Tobago, remote sensing, satellite, coral bleaching, Caribbean, NOAA CRW, Landsat