The Use of Remote Sensing to Map and Monitor Coastal Dune Vegetation Change at Southampton, Ontario, Canada

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Abstract

Coastal dune ecosystems in the Great Lakes Basin are fragile and rare ecosystems that are under increasing threat due to anthropogenic and natural forces. The Chantry Dune system located in Southampton, Ontario is one of five major sand dune systems along the eastern shoreline of Lake Huron. The dune complex provides habit for a diverse range of vegetation species, some of which are endemic, rare, and threatened. The purpose of this research project is to map and monitor dune vegetation change at the Chantry Dune system located in Southampton, Ontario from 2005-2012. In this study, multi-temporal Normalized Difference Vegetation Index (NDVI) images will be produced from GeoEye-1 and QuickBird imagery acquired in 2012 and 2005 respectively. Next, the post-classification comparison change detection technique will be applied to determine the patterns of change in vegetation cover. Finally, the maximum likelihood algorithm will be applied to GeoEye-1 data from July 2012 to produce a land-use/land-cover map. It is anticipated that results will indicate dune vegetation has increased in both intensity and extent. The results and outcomes of this research study can be used by local stakeholders and authorities to better inform and influence dune management practices.

Keywords: Great Lakes; coastal dunes; NDVI; change detection; vegetation mapping