# Using Normalized Difference Vegetation Index Imagery to Model Cape Cod Shoreline Change

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Coastal regions worldwide are experiencing great shoreline recession due to an increased rate of erosion. The high rate of erosion is a result of normal erosion and accretion patterns combined with rising ocean level, severe weather, and human alterations. The shoreline located around the town of Sandwich, Massachusetts in Cape Cod Bay has a history of erosional problems caused by its unique position and past human interference. In this paper, Normalized Difference Vegetation Index (NDVI) satellite images were used to measure the density of vegetation in Cape Cod every 16 days from 2000 to 2006. The NDVI data associated with each image was broken down into multiple categories that represented the different amounts of vegetation seen- no vegetation (water), light vegetation (sand and stones), medium vegetation (grassland and shrubs), and dense vegetation (trees and forests). The shoreline was defined from these categories and graphically represented. The graphs were then compared against one another to show the change in coastal area over the six years. The future goal of this project is to quantitatively describe the change that had occurred so it can be precisely modeled. A more accurate shoreline model will be beneficial in predicting what might happen in years to come, and what changes could be made to slow down the erosion process in this delicate section of Cape Cod.