

Coastal Change Analysis Program Implemented in Louisiana

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Abstract

Landsat Thematic Mapper images from 1990, 1993, 1996, and 1999 and collateral data sources were used to classify the land cover of a large portion of coastal Louisiana. Landcover classes followed the definition of the National Oceanic and Atmospheric Administration's Coastal Change Analysis Program; however, classification methods had to be developed as part of this study for attainment of these national classification standards. Classification method developments were especially important when classes were spectrally inseparable, when classes were part of spatial and spectral continuums, when the spatial resolution of the sensor included more than one landcover type, and when human activities caused abnormal transitions in the landscape. Most classification problems were overcome by using one or a combination of techniques, such as separating the coastal region into subregions of commonality, applying masks to specific land mixtures, highlighting class transitions between years that were highly unlikely, and identifying change with spectral extremes. Most classification errors were associated with confusion between managed (cultivated land) and unmanaged grassland classes; scrub shrub, grasslands and forest classes; water, unconsolidated shore, bare land, and floating vegetation classes; and between mixed and conifer or deciduous forests.

To improve the interpretation of landcover change, three indicators of landcover class stability were formulated. Location stability was defined as the percentage of a landcover class that remained as the same class in the same location at the beginning and the end of the monitoring period. Residence stability was defined as the percent change in each class within the entire MRB during the monitoring period. Turnover was defined as the addition of other landcover classes to the target landcover class during the defined monitoring period. These indicators allowed quick assessment of the dynamic nature of landcover classes, both in reference to a spatial location and to retaining their presence throughout the MRB.