Change Detection on the Mississippi Gulf Coast

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The National Consortium on Remote Sensing in Transportation – Environmental Assessment (NCRST-E) has conducted an assessment of land cover and land use change in the Mississippi coastal corridor with the purpose of identifying changes due to transportation and land development. This paper presents the results of a series of image analysis and changes detection techniques performed on multi-temporal satellite image scenes of the Mississippi coastal corridor.

Initial exploratory comparative analysis of existing land cover classification data for the area compiled at various times over the past 30 years provided results that were not adequate for the identification of development trends or for spatially characterizing land cover and land use change. However, image and change detection analyses performed on satellite images acquired for the area for the past 30 years provided valuable insight as to development patterns and trends while also indicating areas where future growth patterns may cause potential stress on sensitive wildlife habitat areas. The image processing and analyses performed included image co-registration, radiometric normalization, NDVI and tasseled cap transformation, supervised and unsupervised classification of the entire area of interest, and the use of transformation analysis data products to provide analysis masks for supervised or unsupervised classification of portions of the area of interest.

Through the use of a combination of image processing and analysis techniques it was possible to identify and spatially quantify areas of land use development, areas where forestry practices have periodically altered the land cover, areas of growth in the vicinity of major transportation corridors, patterns and trends in development and growth, natural and man made barriers to growth, and areas where ongoing development may eventually stress sensitive coastal habitat areas.