TRANSPORTATION, DEVELOPMENT, AND LAND COVER CHANGE IN A COASTAL CORRIDOR...

The National Consortium on Remote Sensing in Transportation - Environmental Assessments (NCRST-E) is one of four consortia established by the US Department of Transportation and NASA to lead in the application of remote sensing and geospatial technologies in the transportation industry. The primary mission of the consortium for Environmental Assessment is to develop and promote the use of remote sensing and geospatial technologies and requisite analysis products by transportation decision-makers and environmental assessment specialists to measure, monitor, and assess environmental conditions in relation to transportation infrastructure.

The three coastal counties in Mississippi have undergone considerable change in land use, population, wildlife habitat, demographics, and socio-economic conditions in the past 30 years. In that time, Interstate 10 (I-10) has been completed, extensive population growth has occurred, and the coastal counties have changed from being mostly small fishing and shrimping communities to communities with a complex mixture of residential, commercial, industrial, urban, resort, and relatively unspoiled coastal wilderness areas. The population has gone from around 240,000 in 1970 to over 350,000 in 2000.

The I-10 and Coastal Corridor project will investigate the changes that have occurred over the previous 30 years in the Mississippi coastal corridor’s land cover and land use as well as the change in transportation infrastructure for the area over the same time period. The research objectives of this project will include the completion of a baseline study of historic land cover and land use, an analysis of land cover and land use change, an analysis of the relationships between land cover and land use change and transportation infrastructure development, and an assessment of transportation corridor preservation opportunities and priorities in a coastal zone area with sensitive habitat areas and considerable population growth. An important goal of the project is to provide guidance and assistance in the detection of trends and spatial patterns that threaten environmental sustainability in a fragile coastal ecosystem. Also, work will be coordinated and communicated with resource agencies that have responsibilities in the area to assure the effective transfer of technology and results as well as to provide valuable ground-truthing and verification of the finding of the research components.
During the first year of the study, a significant part of the project’s resources were allocated to the compilation and procurement of data for the investigation. Landsat data for the 70’s, 80’s, 90’s, and present were purchased to facilitate the study of historic land use and land cover and land use changes. Other data such as Global Terrain elevation and image data from InterMap have been compiled for the area and were provided by vendors who are partners in the environmental consortium. The elevation and image data will be used to assist in the development of an elevation and image base for the area. An example of the Intermap image data is shown in figure 2 in which roads and rail transport are seen moving across the coastal area and across a water body. In the elevation data shown in figure 3, the location of I-10 can be seen in the center of the figure in an east-west orientation. Other features can likewise be detected from the elevation data.

During the second year of the project, baseline historic analyses of the transportation infrastructure, population changes, and socio-economic changes will be completed as will a comparative analysis of existing land cover and land use data from USGS 1:250,000, data compiled in the late 70’s, and a land cover land use data layer developed by Mississippi Automated Resource Information System (MARIS). These baseline and comparative investigations will provide direction to the classification and analysis of the Landsat data scenes that were purchased during year one. The analysis of Landsat image data for the identification of land cover and land use changes will be completed in the second year and will provide guidance to further investigation of wildlife areas, wetlands, and sensitive habitat areas. To facilitate these advanced environmental analyses, hyperspectral data have been collected and are being processed. These data will be used to assess various habitat areas that are under pressure from continued development, and to assist in the task of identifying and prioritizing corridor preservation opportunities in a sensitive coastal ecosystem area.

**Figure 3.** GT 2 digital surface elevation data.

**Figure 4.** Flight lines for hyperspectral data acquisition mission.

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