ROLE OF REMOTE SENSING AND GIS FOR COASTAL WETLANDS RESTORATION PLANNING AND IMPLEMENTATION

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The U.S. Geological Survey's National Wetlands Research Center (NWRC) and its partners have been using remote sensing and GIS technologies for the past 25 years to conduct wetland status and trend studies, to monitor wetland restoration efforts, and to predict large scale effects of future ecosystem restoration projects. Case studies from various coastal ecosystems along the Gulf of Mexico (United States) coast will be highlighted. For example, using remote sensing technologies, we calculated that over 1.2 million acres (485,623 square hectares) of coastal wetlands have been lost during the 20th century in Louisiana. We developed a model in support of the Louisiana Coastal Area Comprehensive Coastwide Ecosystem Restoration Study which indicated that an additional 513 to 674 square miles (1,329 to 1,746 square kilometers) may be lost from 2000 to 2050. Additonally, by combining two different and innovative applications of radar and interferometric radar, we designed tools and techniques that can be implemented to help resource managers in determining and monitoring wetland conditions with satellite remote sensing data. The presentation will also describe newly developed remote sensing tools to map the localized occurrences and regional distribution of widespread invasive species. Using the Hyperion sensor onboard the EO1 satelite, atmospheric correction and spectral unmixing tools were utilized to provide the necessary subpixel detection to detect the invasive species within the matrix of native plants.