STATEMENT OF SIGNIFICANT RESULTS

Evaluation of Satellite Remote Sensing and Automatic Data Techniques for Characterization of Wetlands and Coastal Marshlands.

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The author has identified the following significant results. ERTS digital data has been used to detect and measure accretion in the large estuarial system of the Atchafalaya River in southern Louisiana. Comparisons of aerial photography taken in October 1970 with a computer printout of ERTS digital data collected on October 1, 1972, show that in a delineated area of 1400 hectares (3460 acres) an accretion of land area in the amount of 112 hectares (277 acres) has occurred. Analysis of Band 3 of the ERTS MSS was used to make a land-water map of the area. The accretion test area was marked on this map and the percentage of elements indicated as land was calculated. This percentage was then multiplied by the total test area to obtain the area of land on the date of the ERTS observation for comparison with the aerial photography.

Significant improvement in classification accuracy of ERTS MSS data has been achieved by use of a priori probabilities of occurrence in pattern recognition programs. Hardwood forest species in the Atchafalaya River basin were classified by a modified version of the Purdue (LARS) pattern recognition programs. These programs have provision for insertion of a priori probabilities of occurrence of each class of material if known. In the absence of any a priori knowledge, equal probabilities are used. Two classifications were made -- the first using equal probabilities and the second using probabilities derived in part from the first classification. The classification accuracy of the training fields were 76.0 percent in the first classification and 81.5 percent in the second. Where no a priori knowledge of the occurrence of the desired classes is available, this iterative procedure is recommended.