

Wetland Image Analysis Project - Problem Definition / Background

Missouri has lost over 90 percent of the wetlands that once covered 4.8 million acres of the state's total land area and were major features on our historic landscape. Wetlands perform many valuable functions including flood dampening, aquatic breeding habitat, and water purification. They offer diverse recreational opportunities such as hunting, fishing and wildlife observation. These unique ecosystems affect many environmental and economic interests of the state and its citizens. (Epperson, 1992). With approximately 10 percent of the pre-settlement wetlands remaining it is important that we inventory and monitor these areas. Federal and state policies mandate "no net loss" of wetlands. Without current data on the location and extent of our existing wetlands we have no way of knowing whether we are meeting this goal. It is also very difficult to monitor the health of our wetlands, and identify areas undergoing change without a base to work from. Traditional ground based wetland identification is a very resource intensive and expensive process; remote sensing technology could provide an economical alternative.

The Wetlands Image Analysis Project will build on the experience and products of the "GAP Wetlands Grant" (Clark, 1997) completed in October 1997. The GAP project used Landsat Thematic Mapper (TM) imagery to evaluate the PCI software package and develop a methodology for identifying wetlands in the mid-continent. The current study will examine the utility of various other remote sensing technologies to aid in the production of an inventory of mid-continent wetland areas. The resultant inventory could be used by natural resource managers to track change, weigh options, set priorities, and educate the public as to the importance of this natural resource.

Remote sensing is a rapidly advancing field which has been routinely applied to monitoring coastal wetlands (Kasischke and Bourgeau-Chavez, 1997) and other natural resources (Verbyla, 1995). The mid-continent represents a region with relatively little applied study, however Landsat TM data has been shown to have potential for inland wetland detection (Jensen, et. al. 1986; Clark, 1997). This pilot project will evaluate higher resolution imagery and alternative image processing techniques to determine their relative effectiveness when applied to wetland identification. What we have learned with the success of the GAP grant project has raised our hopes that remote sensing will become a valuable tool for wetland scientists.

Missouri is not the only state wrestling with the issue of wetland monitoring. This project will develop a methodology that may be used by other mid-continent states to locate and classify their wetland resources using remote sensing technologies. The methods developed by this study could be useful for small site specific projects, such as evaluating sand and gravel operations that impact wetlands, as well as large scale, state wide efforts. This type of analysis may also be used in the future to establish a base wetland inventory for change detection studies. A proposal to inventory Missouri's wetlands could be developed with realistic cost estimates based on projections from this pilot study.

References:

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