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CONDITION AND CHANGE ANALYSIS OF TIDAL WETLANDS ON THE SQUAMSCOTT RIVER, GREAT BAY ESTUARY, NEW HAMPSHIRE USING REMOTE SENSING

Larry G. Ward
University of New Hampshire, lgward@ad.unh.edu

Kevin Trainer
University of New Hampshire

David M. Burdick
University of New Hampshire, david.burdick@unh.edu

Arthur Mathieson
University of New Hampshire, Arthur.Mathieson@unh.edu

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Principal Investigators: Dr. Larry G. Ward, Kevin Trainer, Dr. David M. Burdick and Dr. Arthur Mathieson, University of New Hampshire

Descriptors: Tidal wetlands, remote sensing, marsh loss and degradation

Problem and Research Objectives:

Central to all management programs of coastal ecosystems is the ability to recognize whether habitat degradation or losses are occurring. This project utilizes a relatively new technique (marsh condition and change analysis) to assess salt marsh health that was based on aircraft photography (generally readily assessable via new overflights and archived photography), desktop computer analysis facilities (PC or Macintosh), and standard software (e.g. Adobe Photoshop).

Principle Findings:

The Marsh Condition and Change Analysis was applied to ten marsh systems along the tidal portion of the Squamscott River in the Great Bay/Piscataqua River Estuary, New Hampshire. Results show that numerous changes have occurred within the tidal marshes along the Squamscott River during the last 40 years due to both anthropogenic and natural causes. However, where the marshes have not been destroyed or manipulated by humans, degradation was uncommon (not severe when found) with most marsh sites showing reasonable stability. Nevertheless, there are several sites where increases in the extent of interior ponds or salt pannes have occurred in the lower river (i.e., closer to Great Bay). The probable causes of increased salt pannes or interior ponding include: (1) marsh sediment compaction; (2) differential accretion rates on marsh surfaces; (3) ice effects; (4) changes in sediment supply; (5) sea level rise, and (6) the accumulation of wrack. Although these causes of tidal marsh degradation are only beginning to be understood, potential sites at risk have been identified.