

# SFEI

# BROWN BAGS



San Francisco Estuary Institute Lunchtime Seminars

## TITLE:

Using remote sensing to map the evolution of marsh vegetation in the south bay of san francisco: methods and results for 2009-10

**SPEAKER:** BRIAN FULFROST, DCE Planning

## ABSTRACT:

The South Bay Salt Pond (SBSP) Restoration Project is the largest Federal restoration effort outside of the Everglades. The accretion of sediment and subsequent colonization of vegetation by endemic marsh vegetation is crucial to the restoration effort. Classic field mapping of this large project area would be time consuming and costly. In our three year pilot project (2009-11), we have implemented a semi-automated approach to annually map vegetation and sediment using supervised classification (maximum likelihood) of 1 meter Ikonos multispectral imagery. This has been accompanied by an extensive two-step ground truthing process using sub meter GPS. First we characterize vegetation associations found in salt, brackish and fresh water marshes to identify image training sites. We then return to the field to calibrate and validate classification results. In order to normalize annual images to provide effective habitat classification throughout this three year process, we utilize both histogram matching and an iterative review of classification results to modify training sites. Significant effort was taken to accurately characterize the spatial and taxonomic range of vegetation in our habitat classifications so that they meet project needs but are also spectrally and spatially distinct enough to be accurately classified. This semi-automated remote sensing model has great potential to track changes to marsh vegetation with 80% or more accuracy at scales relevant to the larger SBSP adaptive restoration effort.

## OUR PRESENTATION PROVIDES AN OVERVIEW OF

- field methods for developing habitat classifications, training sites and validation measures*
- image processing techniques*
- the iterative process for reviewing and improving vegetation classifications*
- our preliminary results (and lessons learned) for 2009 – 10.*

Tuesday,  
Feb 15, 2011  
12-1 p.m.

1ST FLOOR  
CONFERENCE ROOM

