

Title: Balloon Imagery for Assessing Wetland Sites and Invasive Species Distribution

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A novel balloon based imaging device was developed to acquire extremely high resolution images (1/4 inch pixels) for the purposes of characterizing wetland sites, ground truthing wetland vegetations assemblages and verification of wetland re-vegetation cover.

The aim was three fold: 1). Determine new common reed (*Phragmites australis*) invasion areas from recently planted low and high marsh areas. 2). use balloon images of mixed vegetation areas as ground truth for linear unmixing classifications to determine the abundance of common reed using hyperspectral remote sensors and 3).use panoramic images from the balloon to visualize the surrounding land use and surface characteristics of properties containing native wetland communities.

The presentation will show how balloon images helped identify invasion fronts in newly planted areas that were later targeted for control. It will also show how images of plant mixture types were use to calibrate the linear unmixing classifications and separate areas where native high marsh species or the invasive *Phragmites* were dominant.

The presentation will also show how images were captured and georeferenced. Issues derived from elevation differences and shutter speed and intervals will also be discussed.

Keywords: Balloon imagery, Remote Sensing, Vegetation Mapping, Wetland monitoring, Invasive species