

Identification of Invasive Vegetative Species Using Remote Sensing

Invasive species are a problem that affects large portions of the world. Invasive species have no native predators or other methods of biological control. When invasive species are introduced to a location, the effects drastically change the ecology of the site, and if left untreated, can cost taxpayers millions.

Remote sensing technology can be used to identify invasive species in forested, rangeland, aquatic, or pasture environments. As well as more accurately track the trend of invasive species on a site.

The reflectance values of native species are different than the reflectance values of invasive species. Using multispectral imagery; Moderate Resolution Imaging Spectroradiometer (MODIS) or Airborne Visible and Infrared Imaging Spectrometer (AVIRIS), these values become detectable.

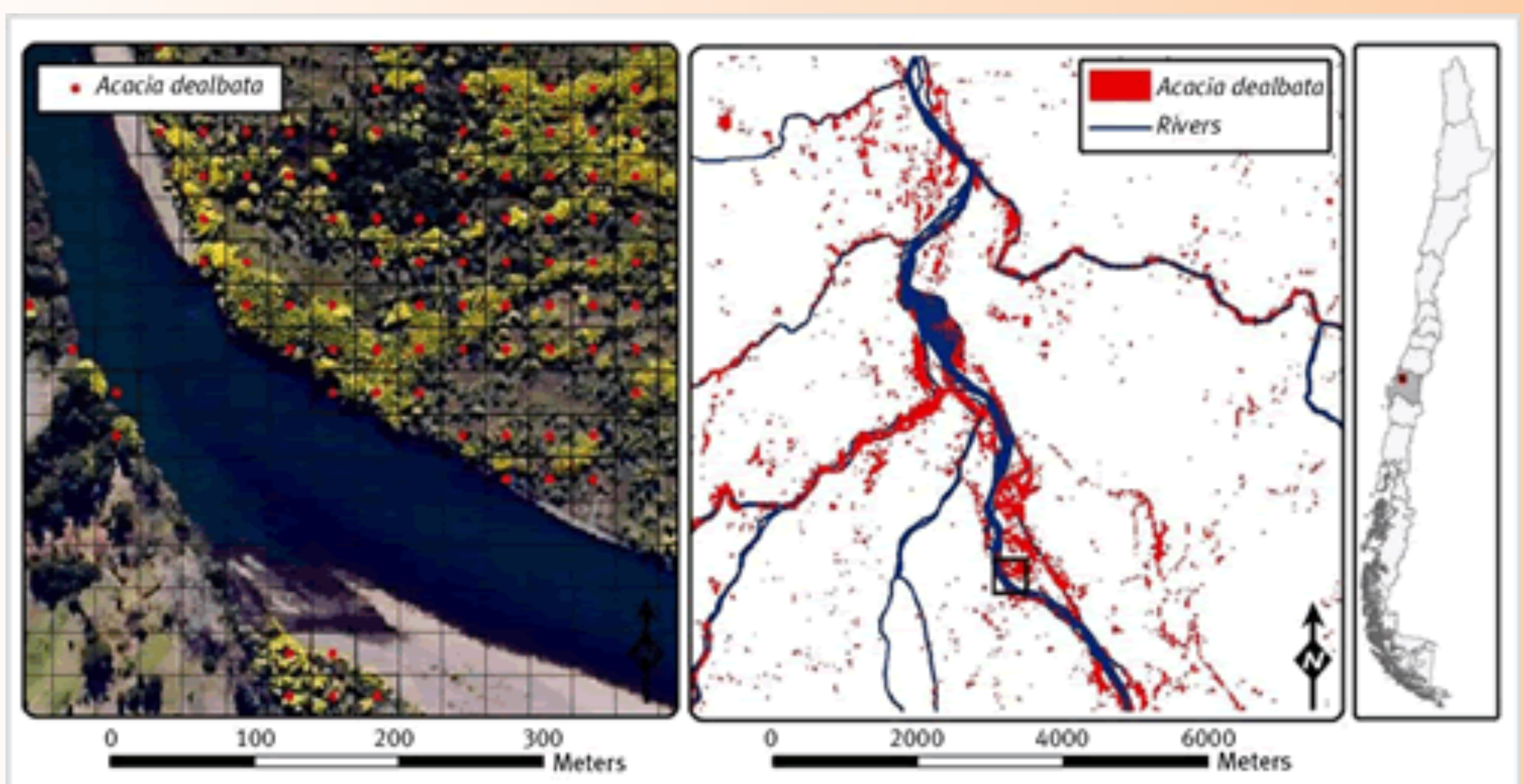


Figure 11.5. Grid cells identified with *Acacia dealbata* present using colour aerial photographs, final classification across study area, and location map of the study area in Chile.

Emma Underwood, Dept. of Environmental Science and Policy, University of California—Davis; IUCN Invasive Species Specialist Group

Susan Ustin, California Space Institute Center of Excellence, University of California—Davis

Use of the full spectral range maximizes the ability to identify the invasives from the native species, as the water content, pigmentation, leaf area, and other physiologic factors.

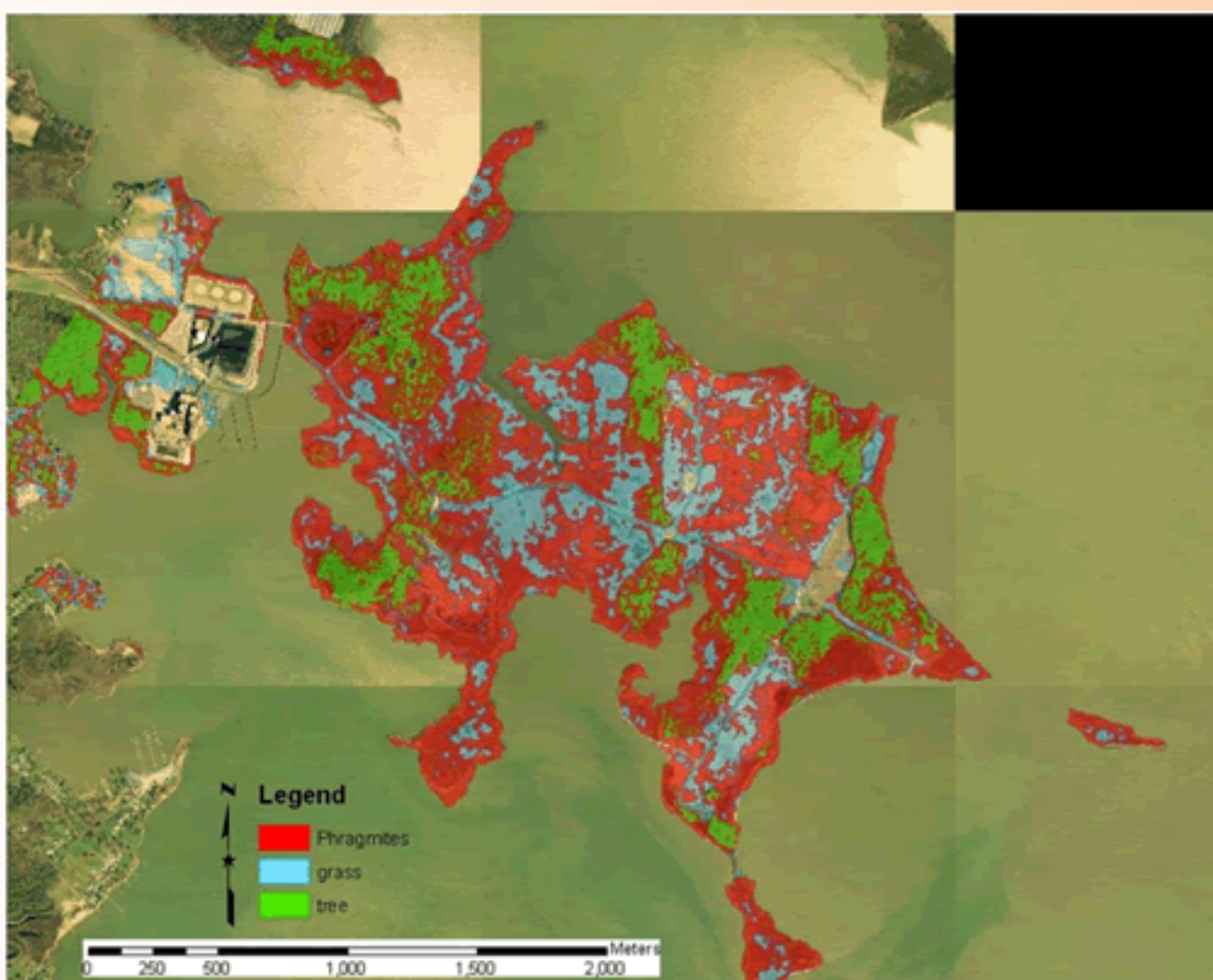


FIGURE 11.2 Classification of common reed (*Phragmites australis*), trees and grasses on Carroll Island in the Chesapeake Bay, USA using hyperspectral AVIRIS imagery. (Source: John Kefauver, unpublished data, CSTARS).

Rosso, P. H., S. L. Ustin, and A. Hastings. 2005. Use of lidar to study changes associated with *Spartina* invasion in San Francisco Bay marshes. *Remote Sensing of Environment* 100:295-306

Remote Sensing for the identification of invasive species is an important multi-faceted tool that can be utilized by private and public sectors to aid in the control, and mitigation of invasive species on a landscape level.

A review of remote sensing of invasive weeds and example of the early detection of spotted knapweed (*Centaurea maculosa*) and babysbreath (*Gypsophila paniculata*) with a hyperspectral sensor
Lawrence W. Lass, Timothy S. Prather, Nancy F. Glenn, Keith T. Weber, Jacob T. Mundt, and Jeffery Pettingill
[Weed Science](#) Mar 2005 : Vol. 53, Issue 2, pg(s) 242-251 doi: 10.1614/WS-04-044R2