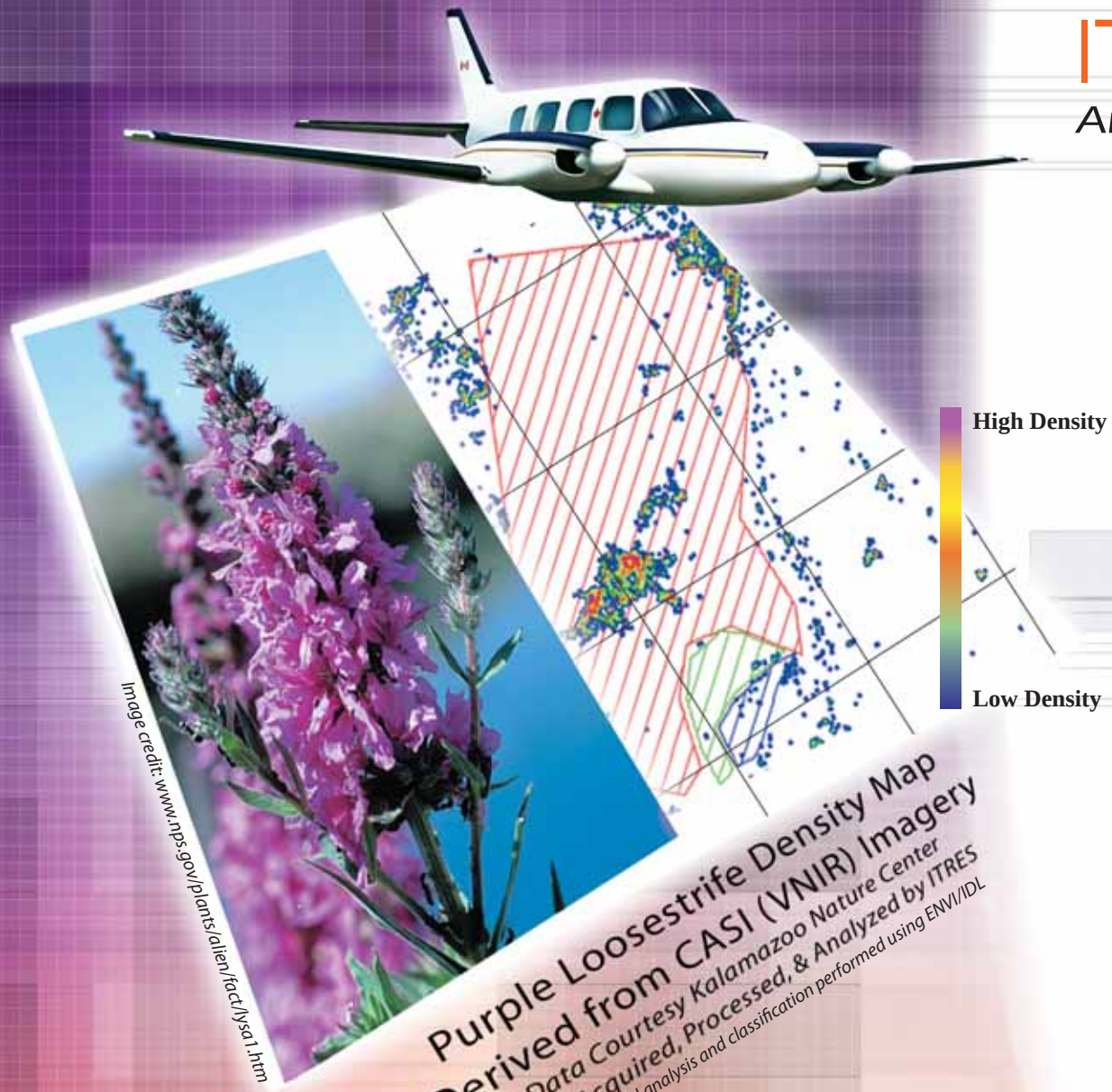
ITRES Applications

Airborne Hyperspectral Mapping

Noxious Weed Mapping

Hyperspectrally Detecting the "Beautiful Killer"



Wetlands Near Kalamazoo, Michigan

Purple Loosestrife (*Lythrum salicaria*)

Hyperspectral Visible Near-Infrared CASI Sensor (80 cm Resolution)

Automated Purple Loosestrife Detection

itres

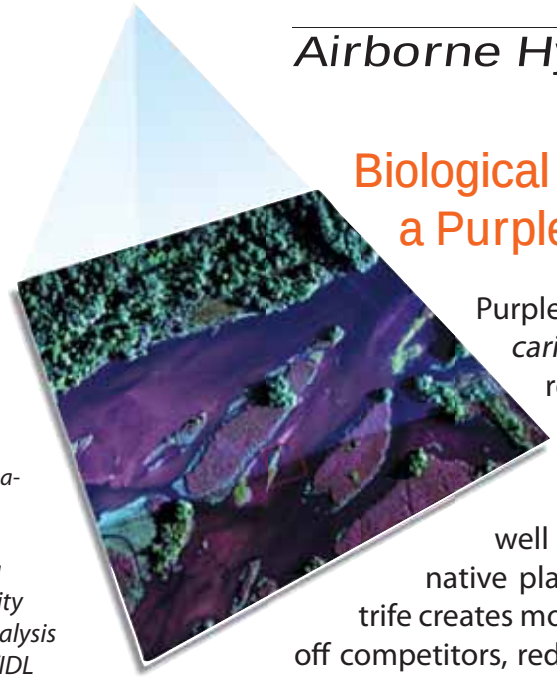
Document ID: U10044-04

ITRES Research Limited Calgary, Alberta, Canada T: 403.250.9944 F: 403.250.9916
In USA, please phone: 228.467.2345 or toll-free (North America) 877.250.9944

www.itres.com
info@itres.com

ITRES Applications

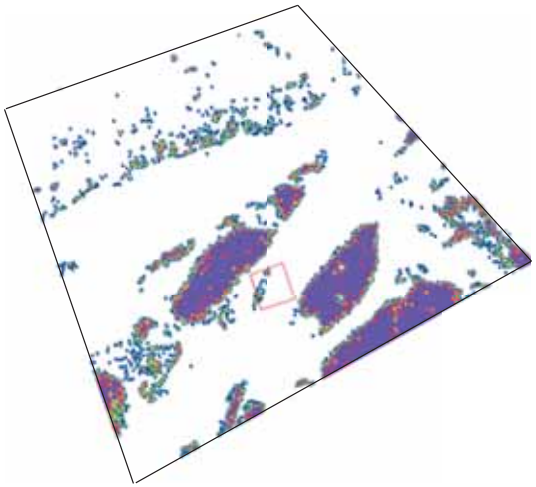
Airborne Hyperspectral Mapping



(Right) True color CASI image subset featuring islands densely populated with purple loosestrife.

Data courtesy KNC; acquired, processed, & analyzed by ITRES.

(Below) Corresponding purple loosestrife density map. Hyperspectral analysis performed using ENVI/IDL



Biological Desertification in a Purple Package

Purple loosestrife (*Lythrum salicaria*) has a well-earned toxic reputation. This invasive wetland plant has spread to wetlands throughout 48 of 50 U.S. states as well as Canada, outcompeting native plant species. Purple loosestrife creates monotypic stands as it chokes off competitors, reducing the nutritional quality of wildlife forage. This process of "biological desertification" has negative economic impacts worth millions of dollars across North America.

Proof of Concept

The Kalamazoo Nature Center (KNC) contracted ITRES through the environmental consulting firm of Kieser and Associates LLC to demonstrate the effectiveness of using high resolution hyperspectral CASI data to accurately detect and map occurrences of flowering purple loosestrife. In this project, 35 flight lines of imagery (80 cm resolution) were acquired over wetland areas, with the CASI programmed to provide 36 spectral bands across 380-1044nm.

Simple & Effective Analysis

Project constraints limited the analysis to a methodology based upon the use of four different spectral indicators with the acquired radiance data to distinguish purple loosestrife from other vegetation. Signatures & statistics generated from identified spectral endmembers were used to guide the analysis. Spectral separability of this weed was further improved using Principal Components Analysis. Thresholds defined through this analysis were then used to create purple loosestrife density maps.

Interested in a similar project? Contact ITRES for further information by telephone, e-mail at info@itres.com, or visit us on the web at **www.itres.com**.

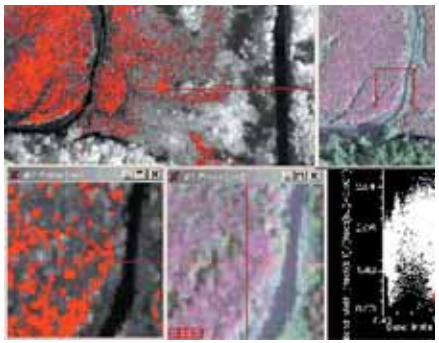


Image courtesy ITRES

ENVI analysis session during incremental spectral discrimination of purple loosestrife based on Standard Level 1 data product.

itres
www.itres.com