

VEGEMIX

MULTI-TEMPORAL UNMIXING OF MIXED VEGETATION SYSTEMS

A FOCUS ON INVASIVE PLANT SPECIES MONITORING



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mixed vegetation systems?



agricultural fields



savannas

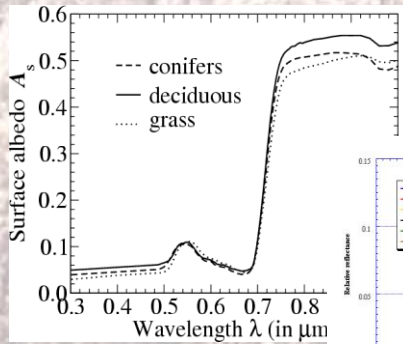


forests



RS in mixed vegetation systems?

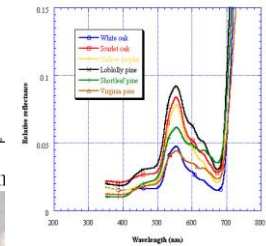
spectral similarity



white oak



virginia pine



Yellow poplar

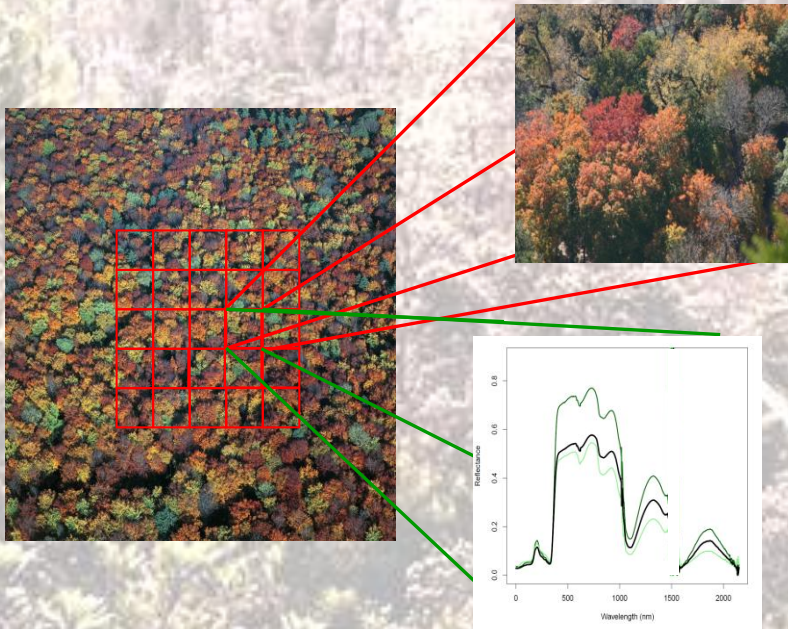
HYPER SPECTRAL

MULTI-TEMPORAL

Van Aardt & Wynne, 2001, PEARS

RS in mixed vegetation systems?

spectral similarity & spectral mixture problem!



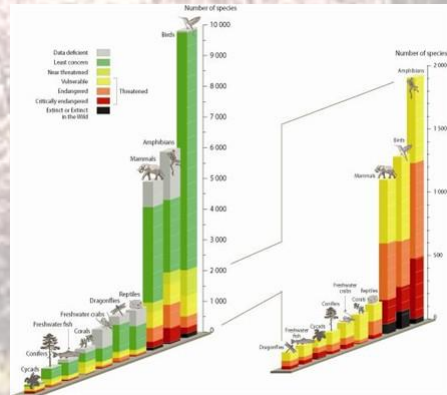
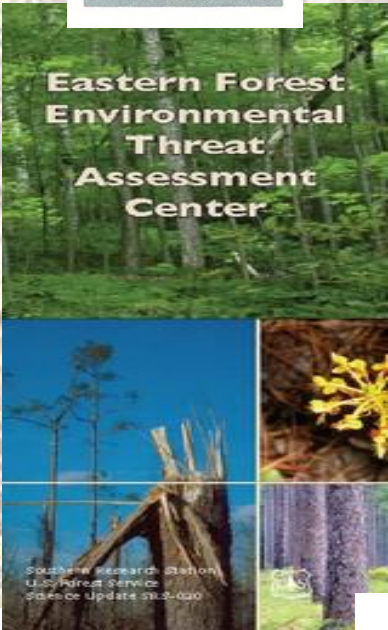
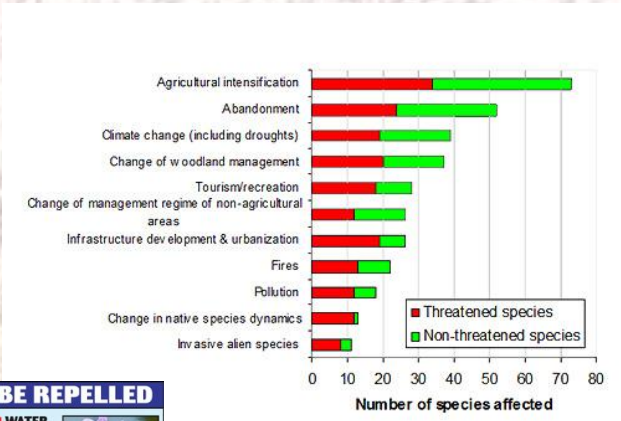
**MULTI-TEMPORAL
HYPERSPPECTRAL
MIXTURE ANALYSIS**

VEGEMIX

MULTI-TEMPORAL UNMIXING OF MIXED VEGETATION SYSTEMS

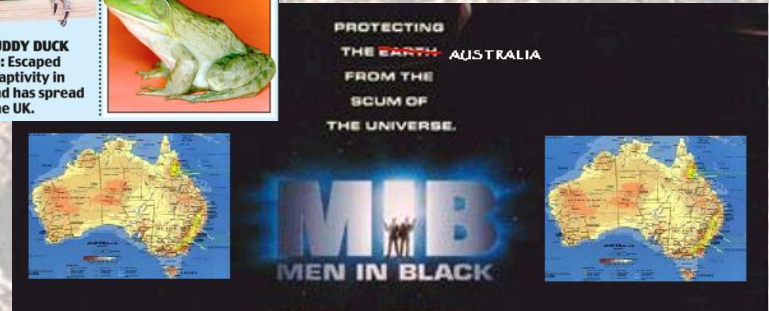
A FOCUS ON INVASIVE PLANT SPECIES MONITORING

invasive species threat?



THE INVADERS THAT COULD BE REPELLED

- VIRGINIA CREEPER** (left): Widely found in verges and hedges and used to adorn houses, it directly competes with native species.
- ROSY-FACED LOVEBIRD** (below): Loud native of southwest Africa, it is a pest for fruit growers.
- WATER HYACINTH**: Floating mats remove oxygen from water and destroy animal life.
- AMERICAN BULLFROG**: One of the most invasive species, it spreads diseases and threatens native amphibians.
- RHODODENDRON**: Shades out native plants in acid woods and heathlands.
- RUDY DUCK** (left): Escaped from captivity in the UK and has spread to the UK.



invasive species monitoring?

Field Scouting

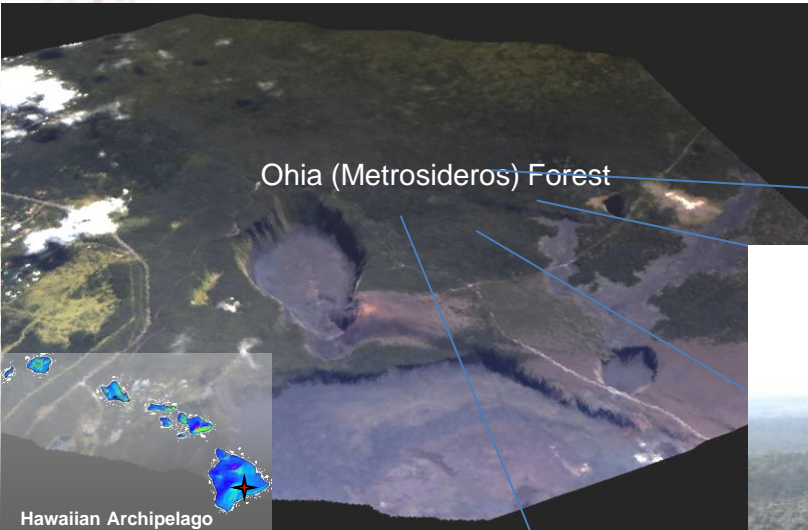


Remote Sensing



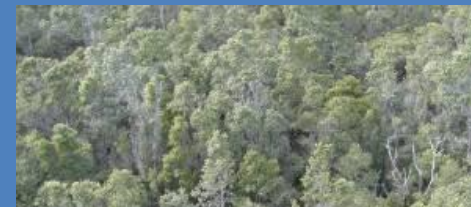
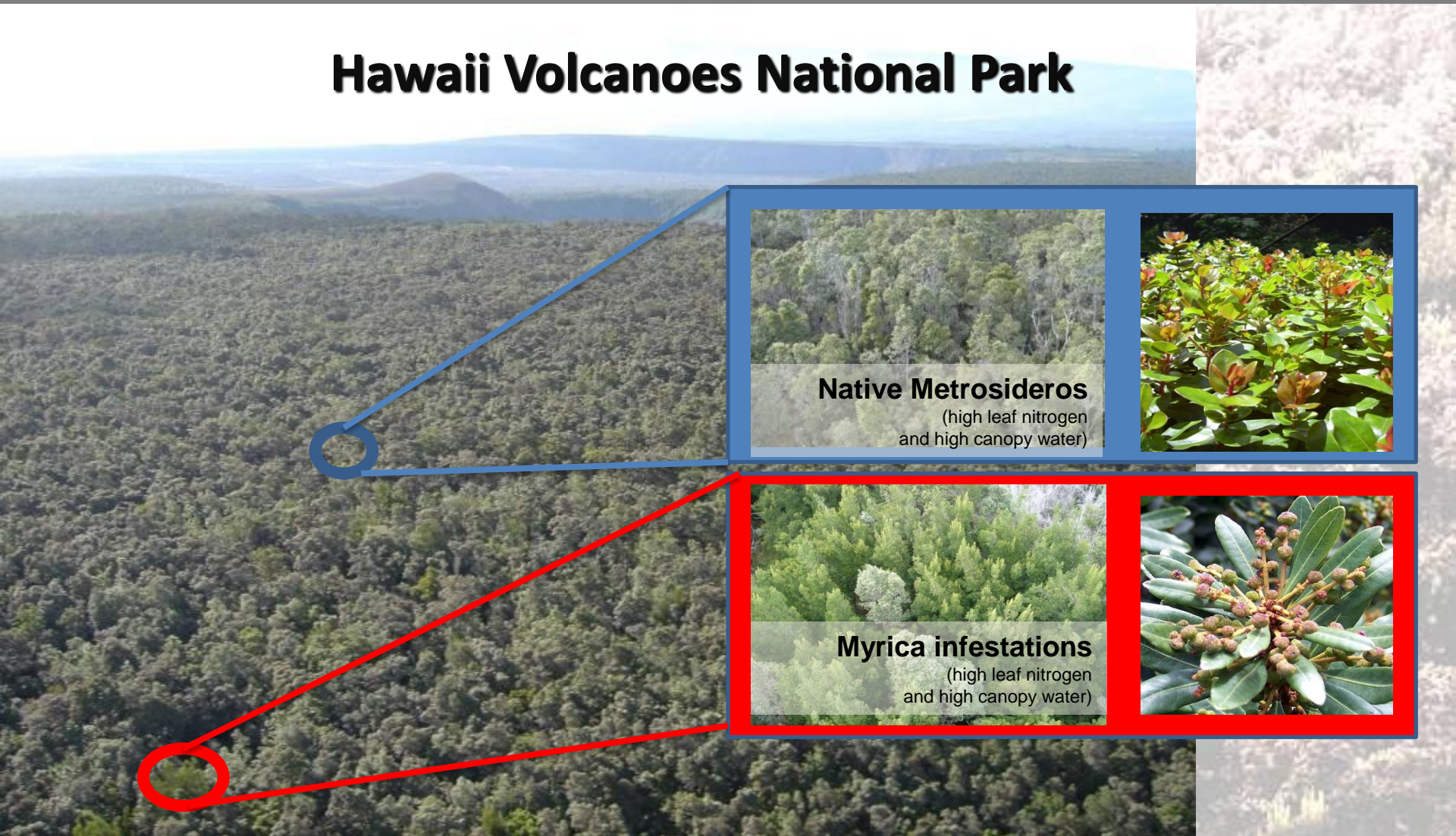
study area

Hawaii Volcanoes National Park

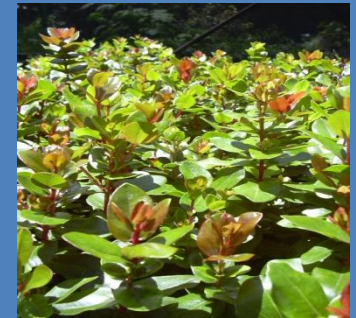


study area

Hawaii Volcanoes National Park



Native Metrosideros
(high leaf nitrogen
and high canopy water)



Myrica infestations
(high leaf nitrogen
and high canopy water)



data

EO-1 Hyperion data: 2004-2008

(resolution: 30m, 400-2500 nm, 200 bands)

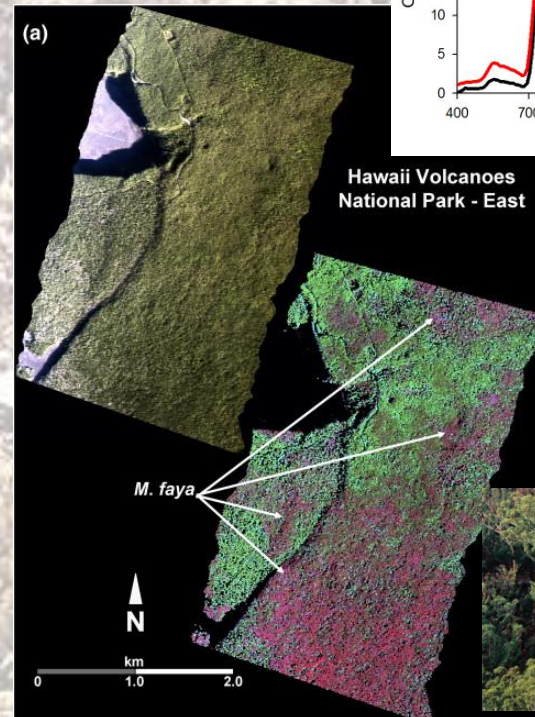
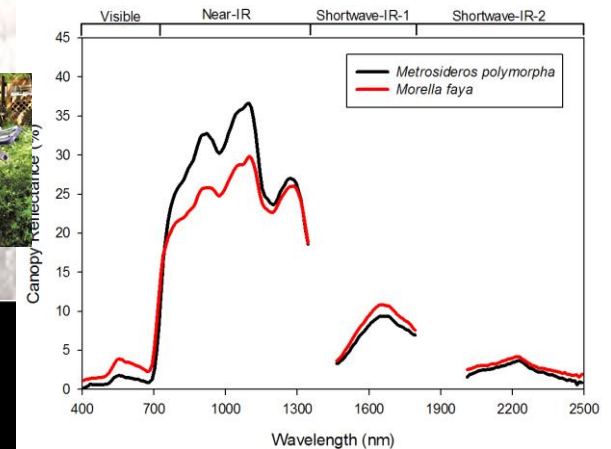
AVIRIS data: 2005

(resolution: 2.5m, 400-2500 nm, 220 bands)

Canopy cover and species dominance (from helicopter and field surveys, for over 600 sampling points for HAVO)

Dendrometric parameters (time series of LAI, leaf N, leaf H₂O, pigments, canopy structural properties) **and climate data**

Support data: CAO Alpha System data: 2009; resolution: 1.0m, 400-1100 nm, 72 bands



thank you!

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