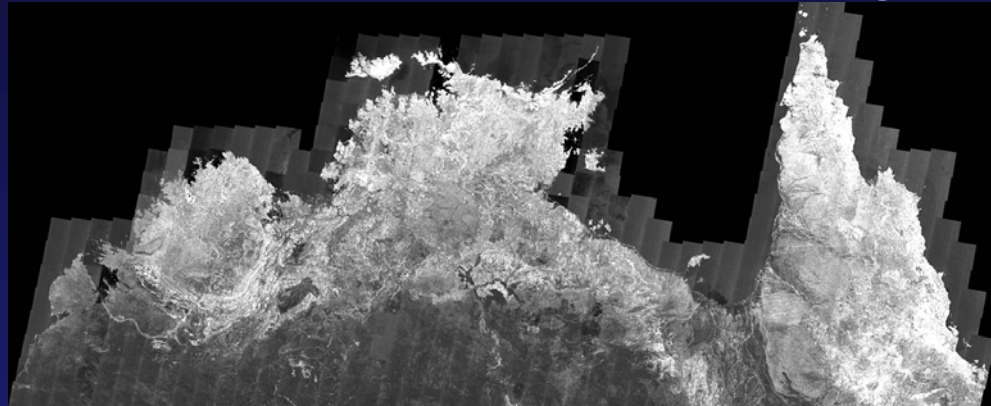


ALOS Kyoto and Carbon Initiative

7th Science Team Meeting



Richard Lucas

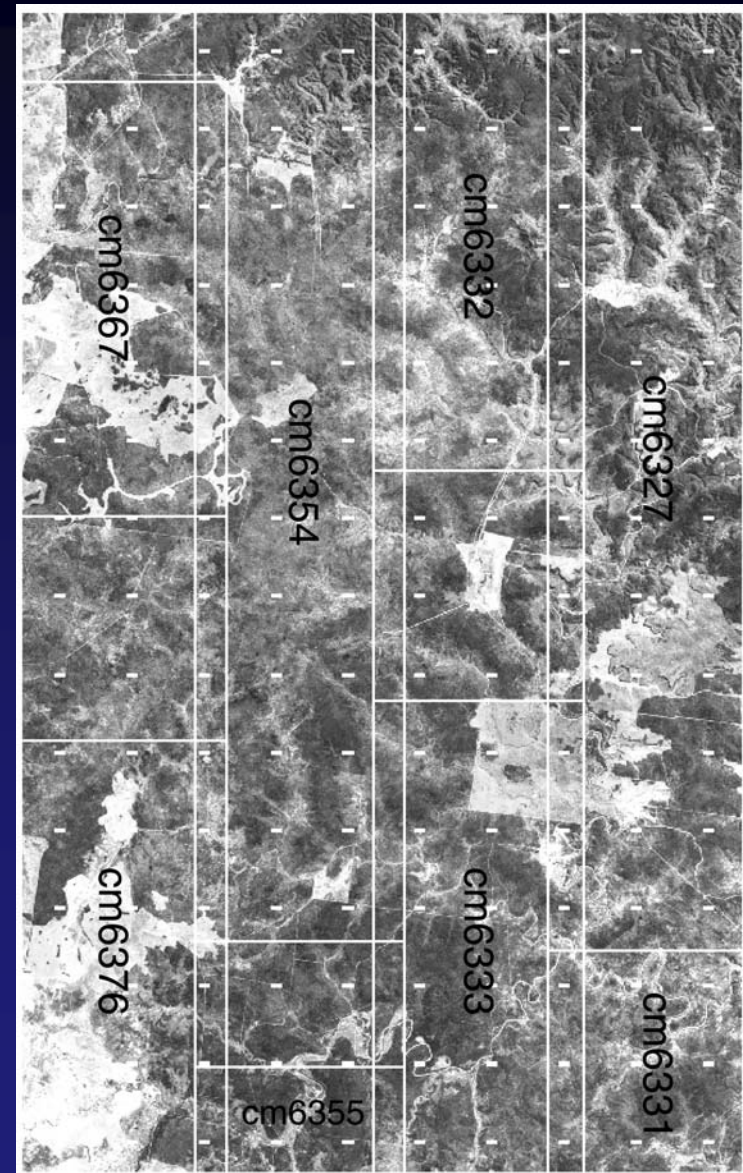
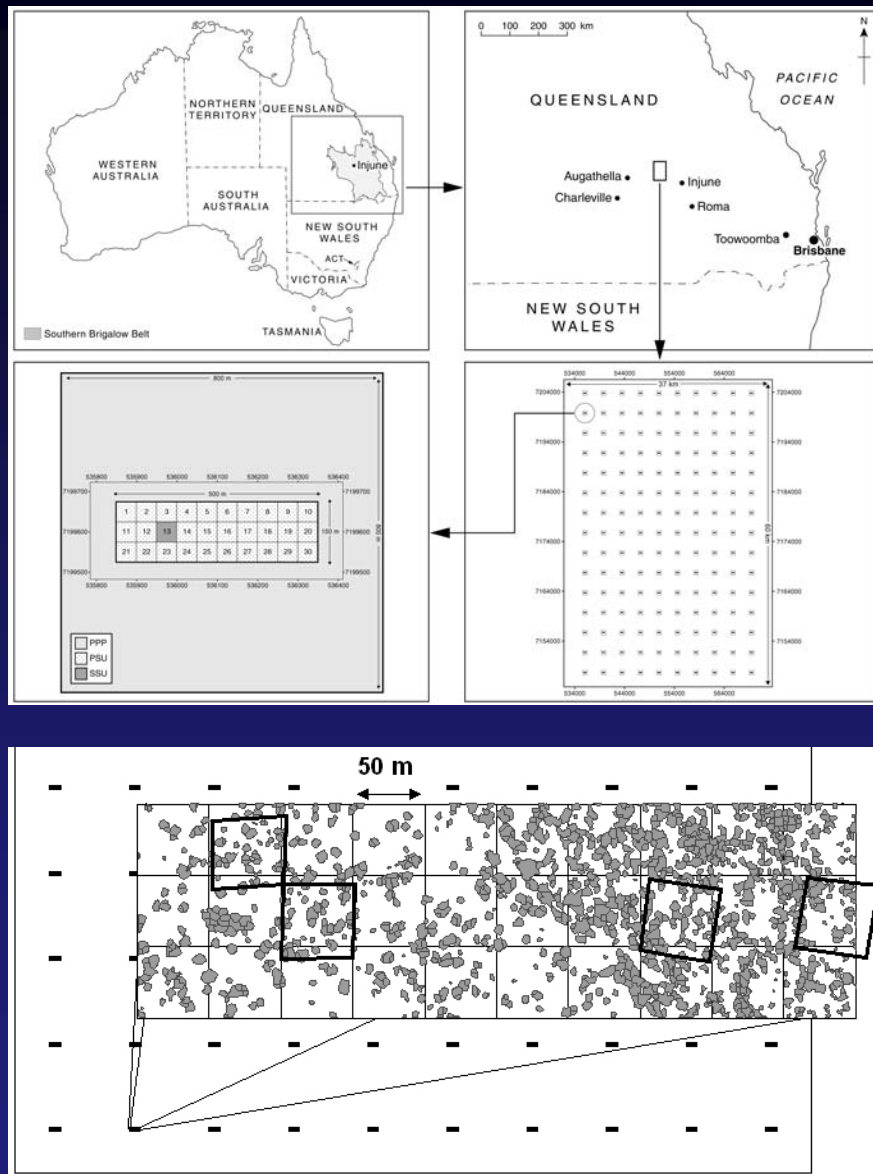
*Institute of Geography & Earth Sciences
The University of Wales Aberystwyth*

K & C Projects

- Subtropical forests (wooded savannas) in northern Australia
 - Woody regrowth
 - Structure/biomass
 - Change
- Mangroves (tropics)
 - Extent and change

Savanna woodlands

The Injune Landscape Collaborative Project



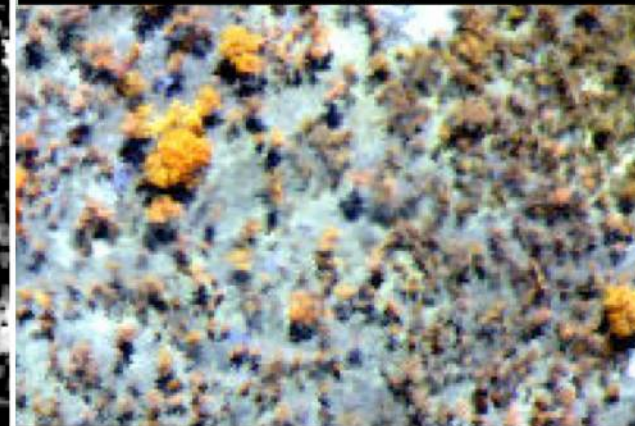
20 cm Aerial Photography



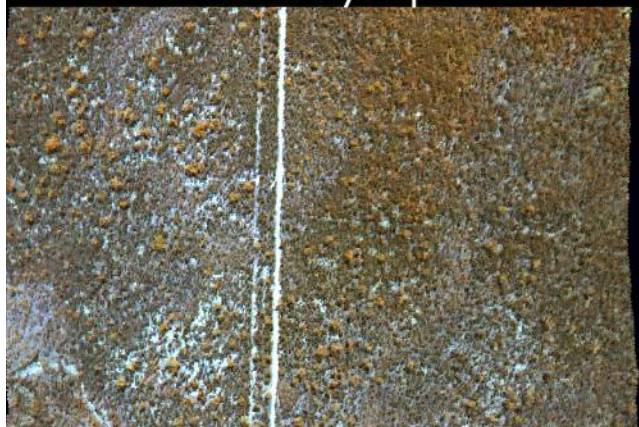
1 m LiDAR



1 m CASI



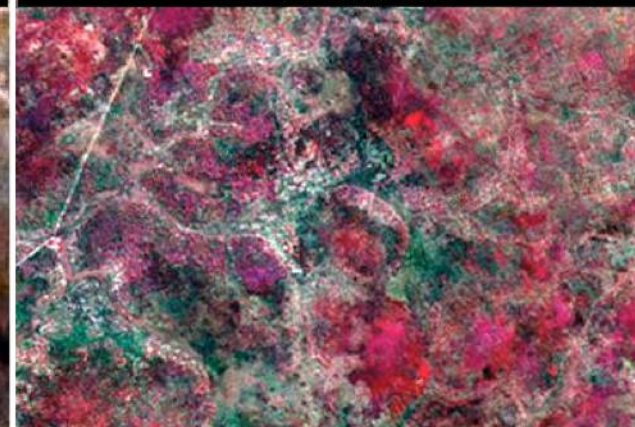
2.6 m HyMap



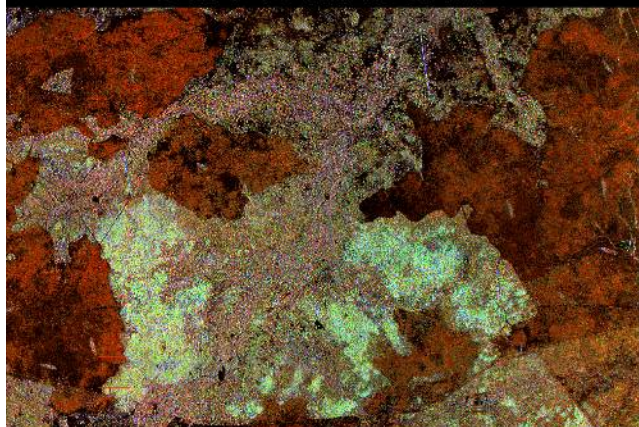
20 m Hyperion



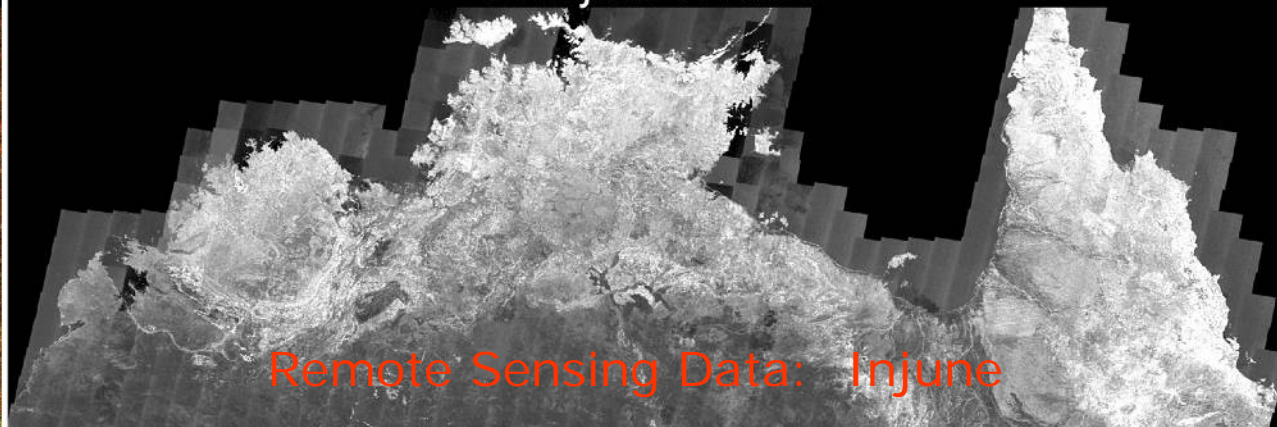
25 m Landsat



3 m / 10 m AIRSAR



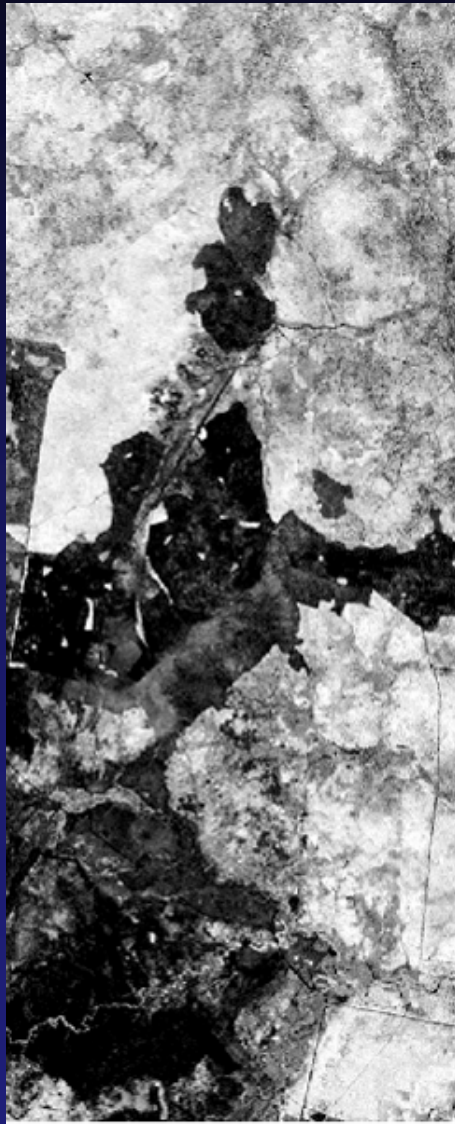
20 m JERS-1 / ALOS



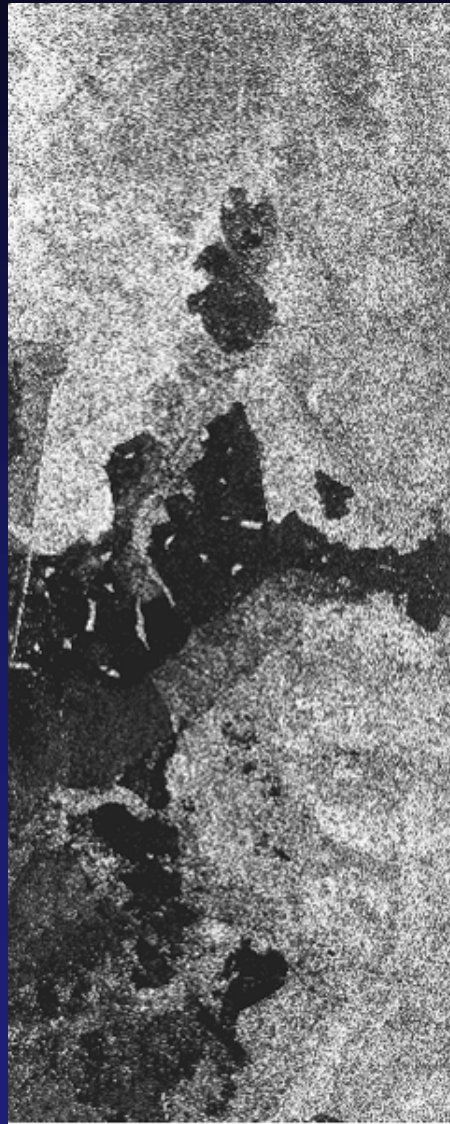
Remote Sensing Data: Injune

Biomass Mapping Using Empirical Relationships

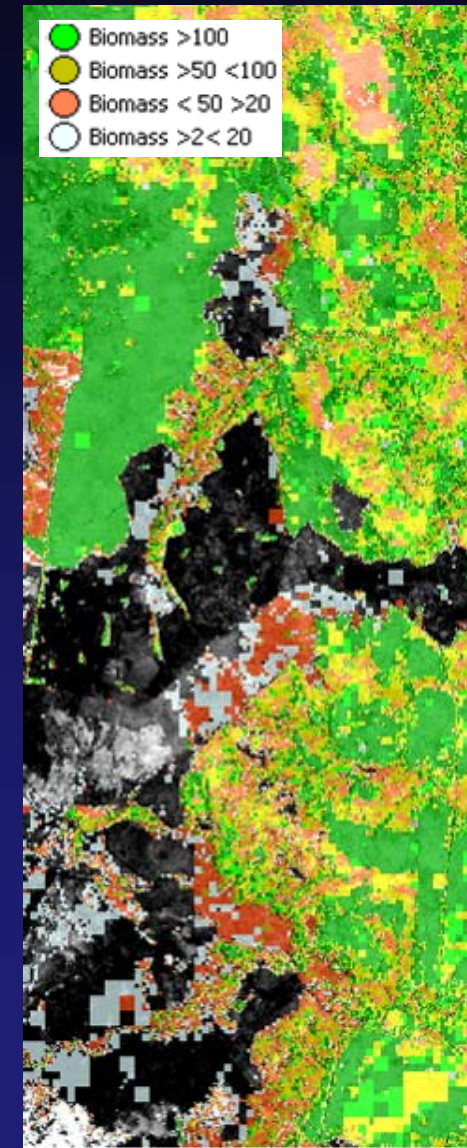
FPC layer



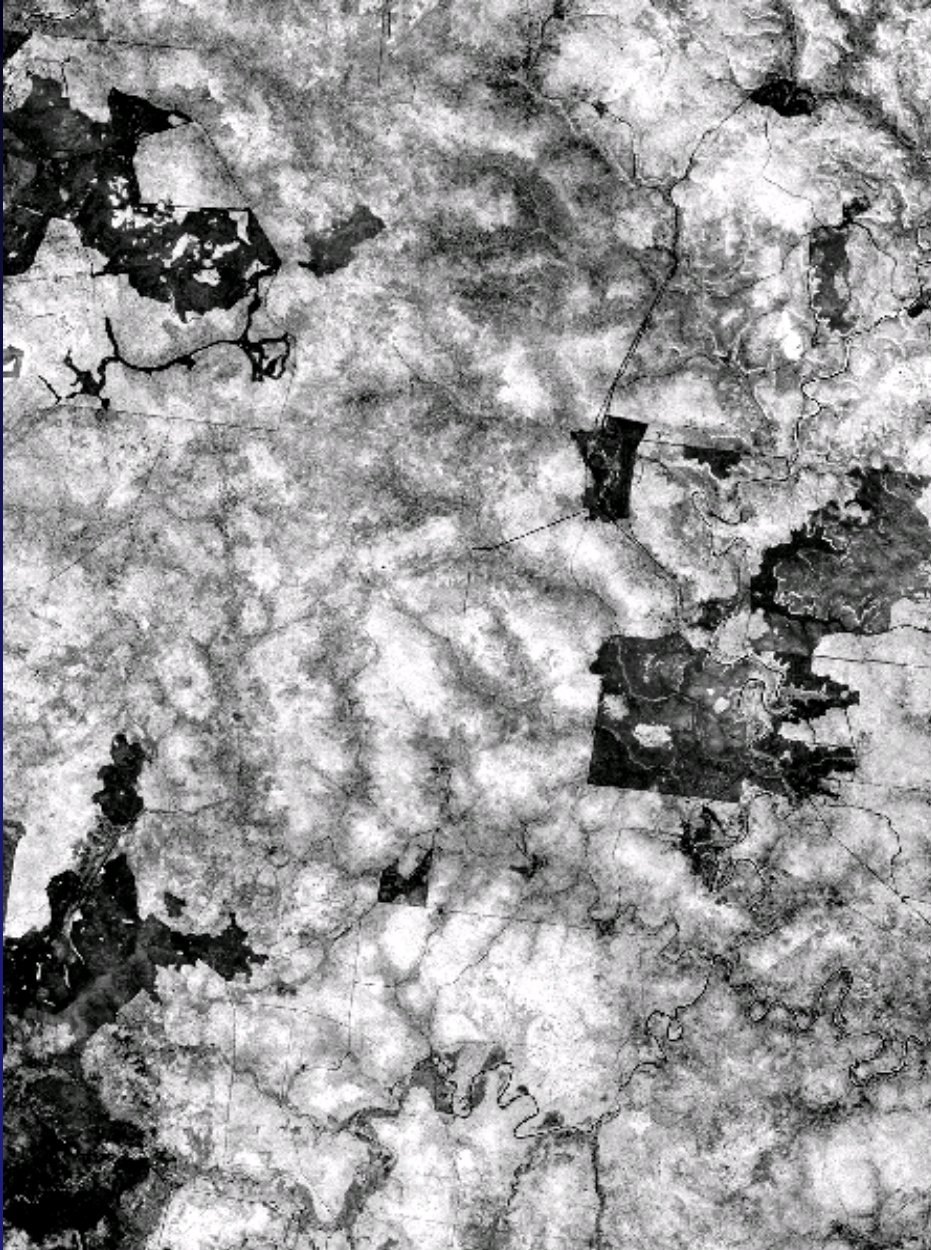
P-band HH



Biomass



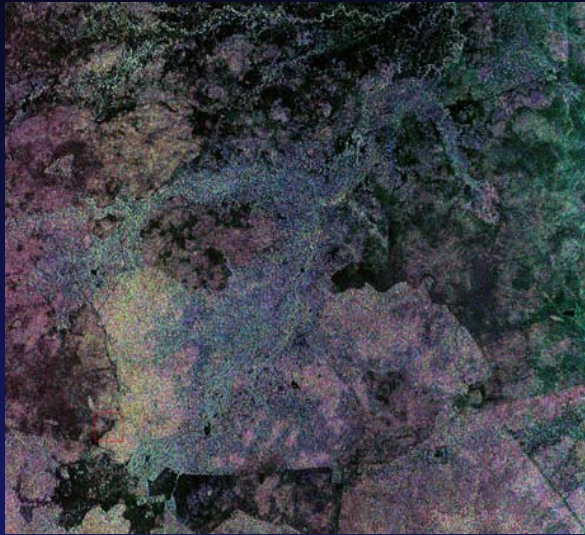
Foliage Projected Cover (FPC)



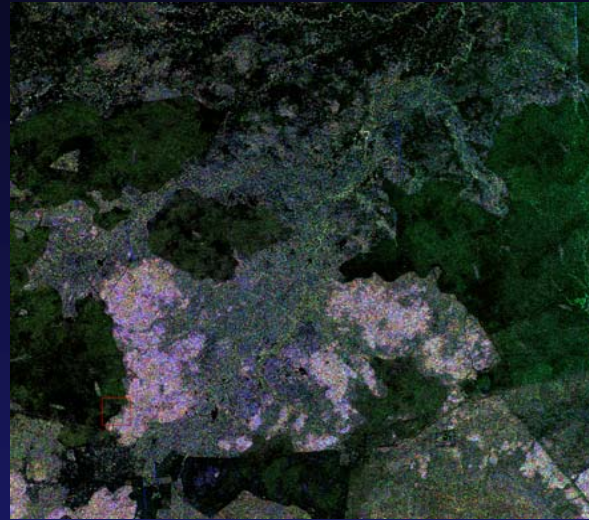
- FPC generated from Landsat TM and ETM+ data
- Relates to the amount of foliage cover
- 12 % threshold separates forest from non-forest.
- Equivalent to 20 % canopy cover.
- Generated routinely for Queensland through the QDNRM Statewide Trees and Land Cover Study (SLATS)

SAR Observations of Brigalow -dominated regrowth

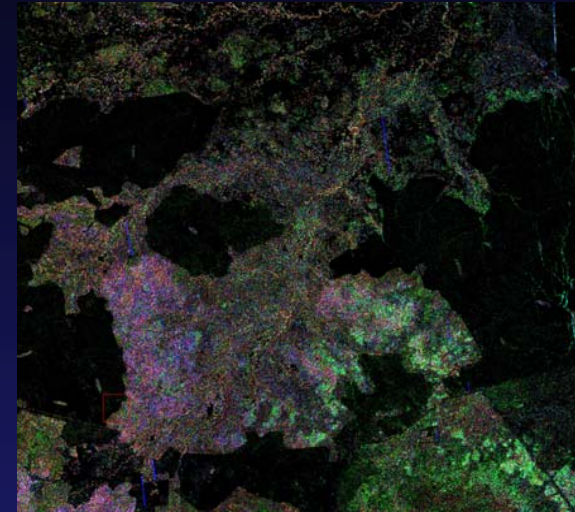
C-band



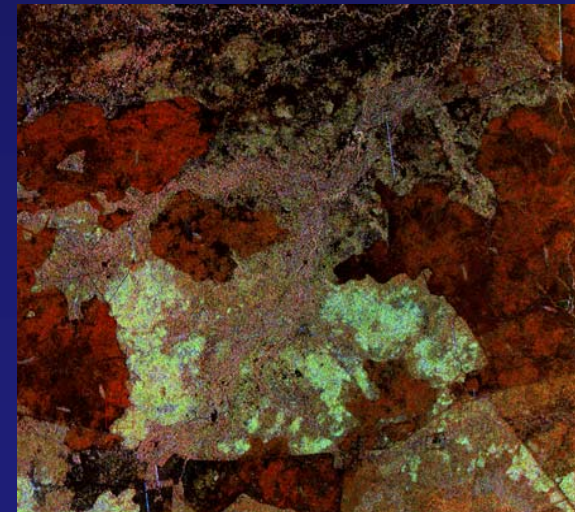
L-band



P-band



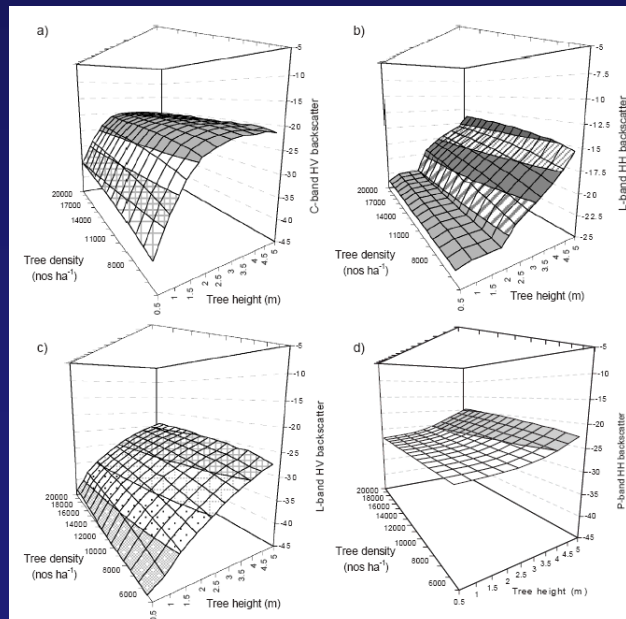
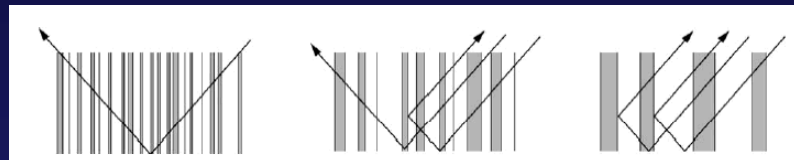
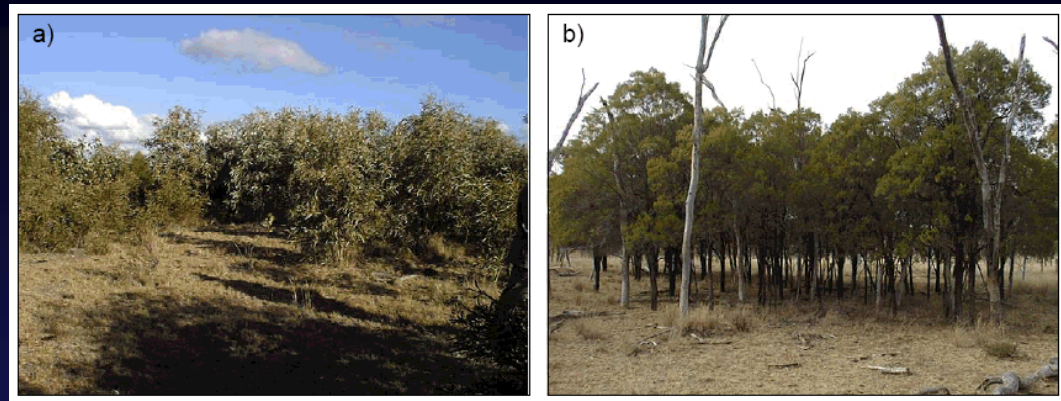
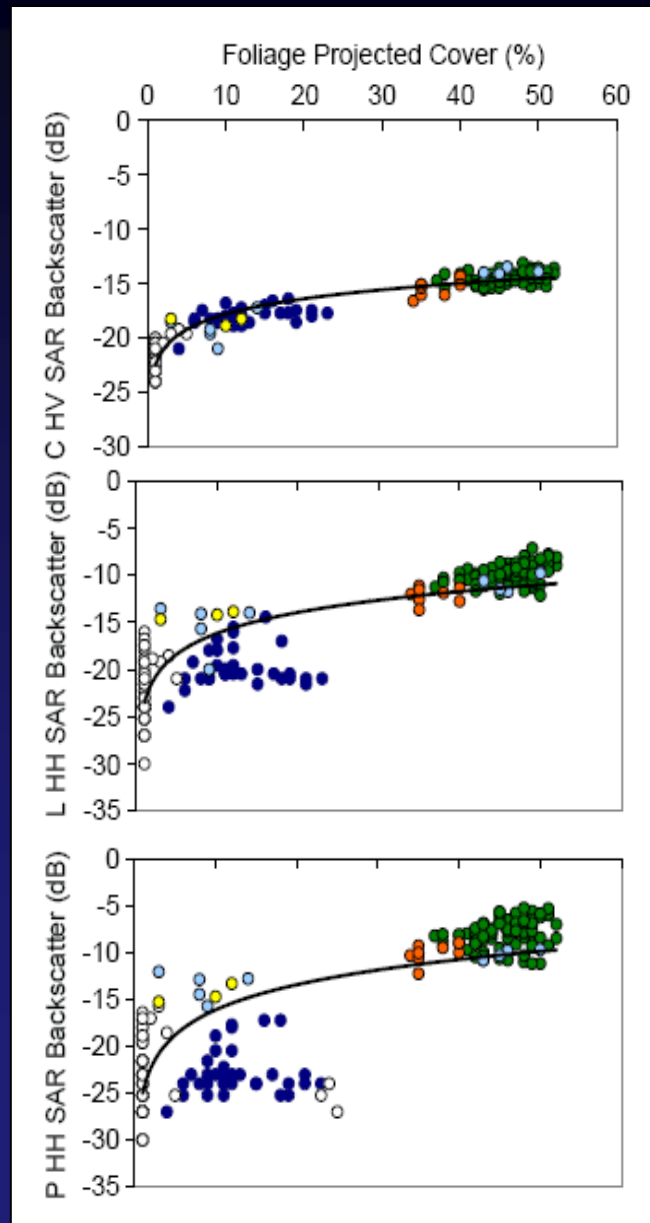
Total Power



Reduced return from Brigalow-dominated
regrowth with decreasing frequency

Areas of Brigalow particularly prominent
(red) in Total Power image (C-band in red)

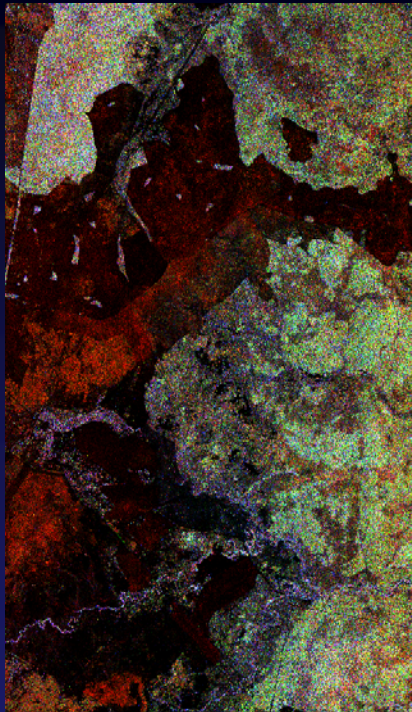
Simulations of CHV, L HH, LHV and PHH backscatter



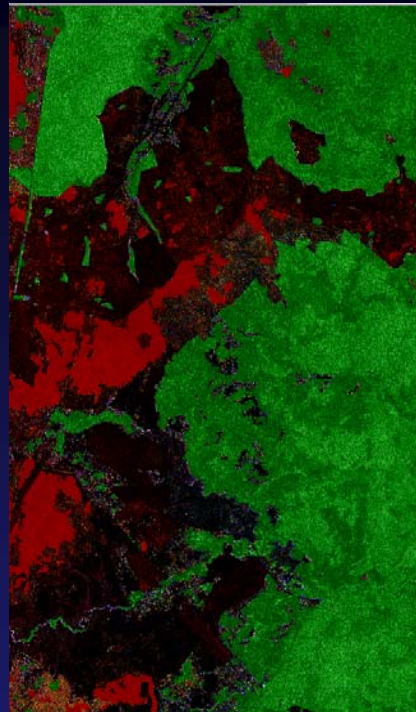
Model of Durden
et al. (1989)

Allometric
equations for
Brigalow
(Scanlan, 1991)

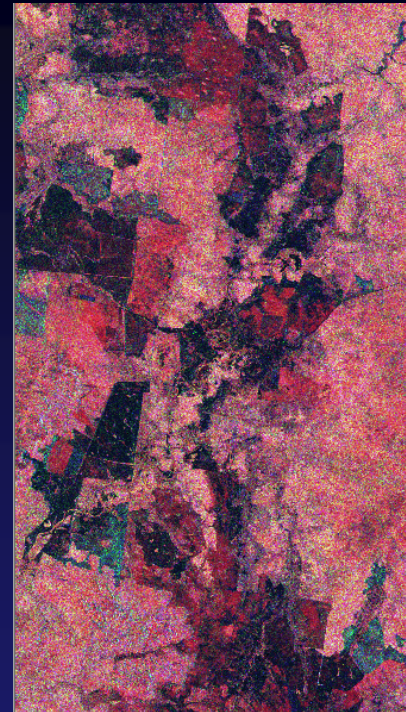
Woody regrowth mapping using AIRSAR and JERS-1 SAR data with FPC



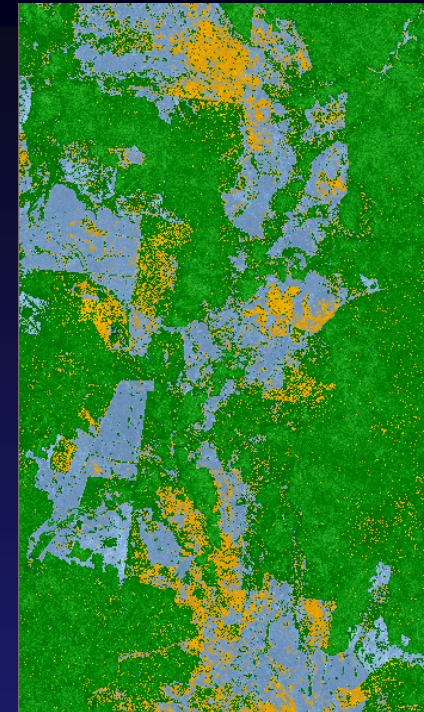
AIRSAR
Data
Composite
(C, L and P
Total Power)



AIRSAR
L-band HH/
FPC
classification
(Regrowth in red)

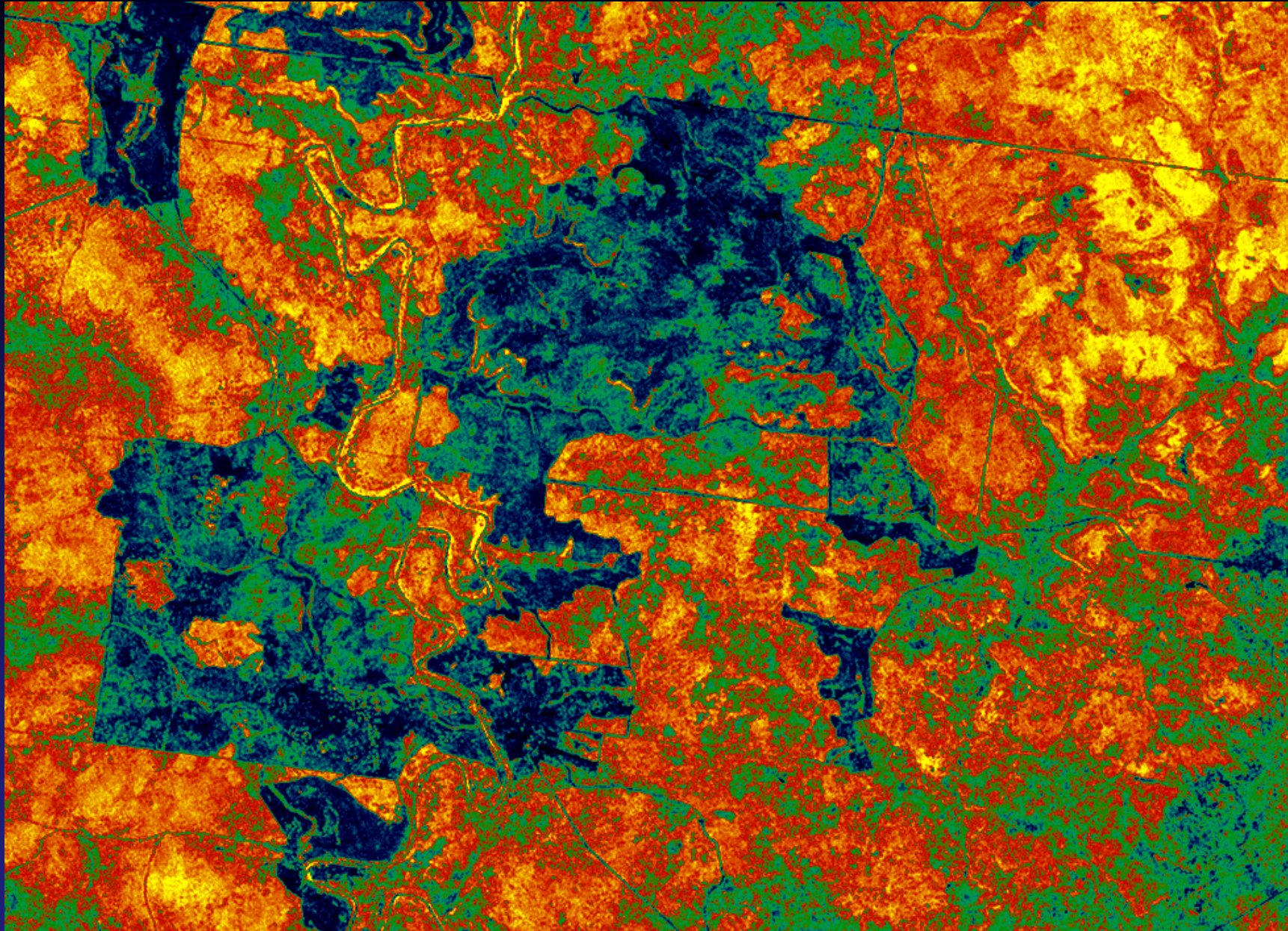


JERS-1/
FPC
composite

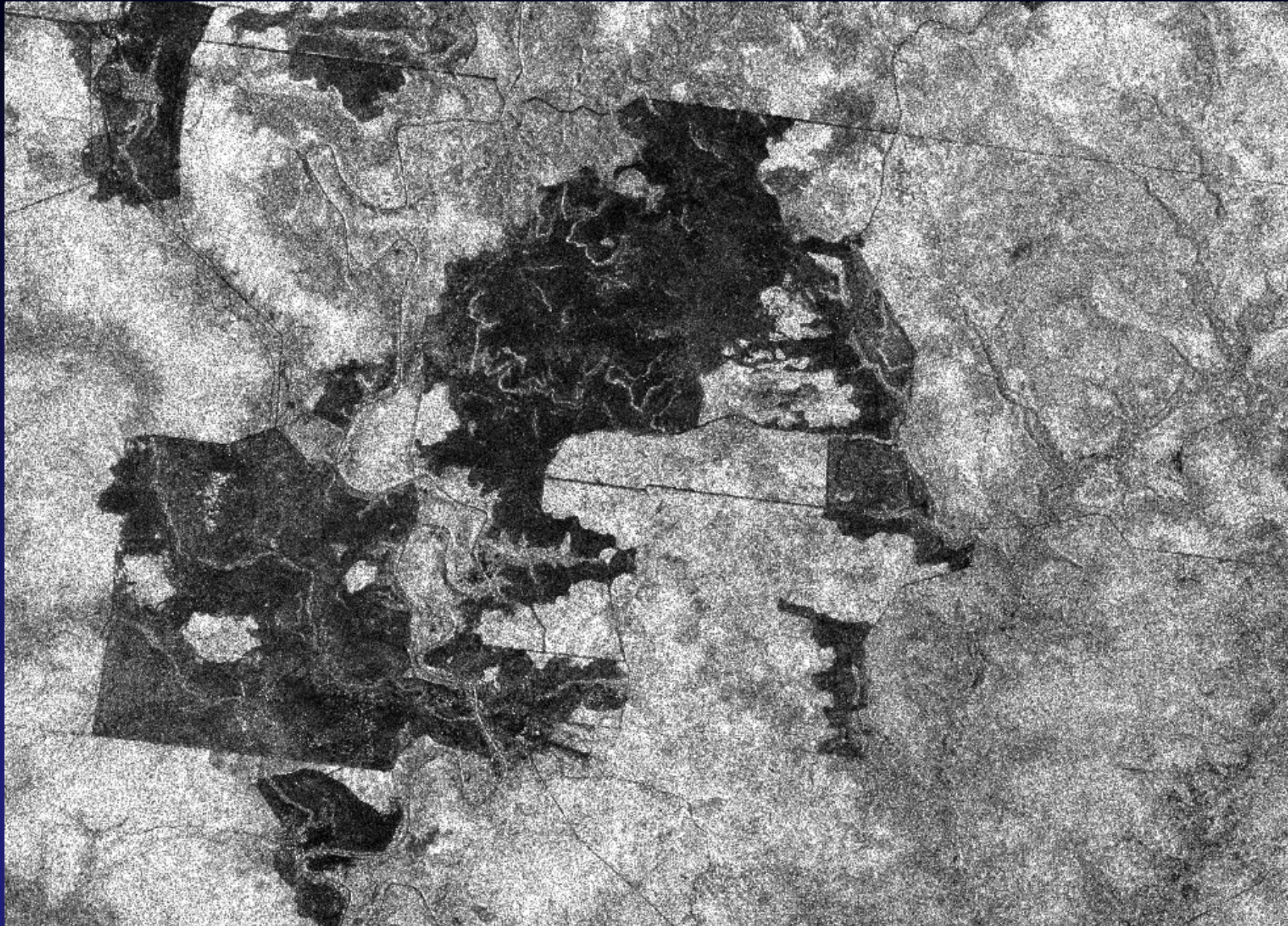


JERS-1/FPC
classification
(Regrowth in
orange)

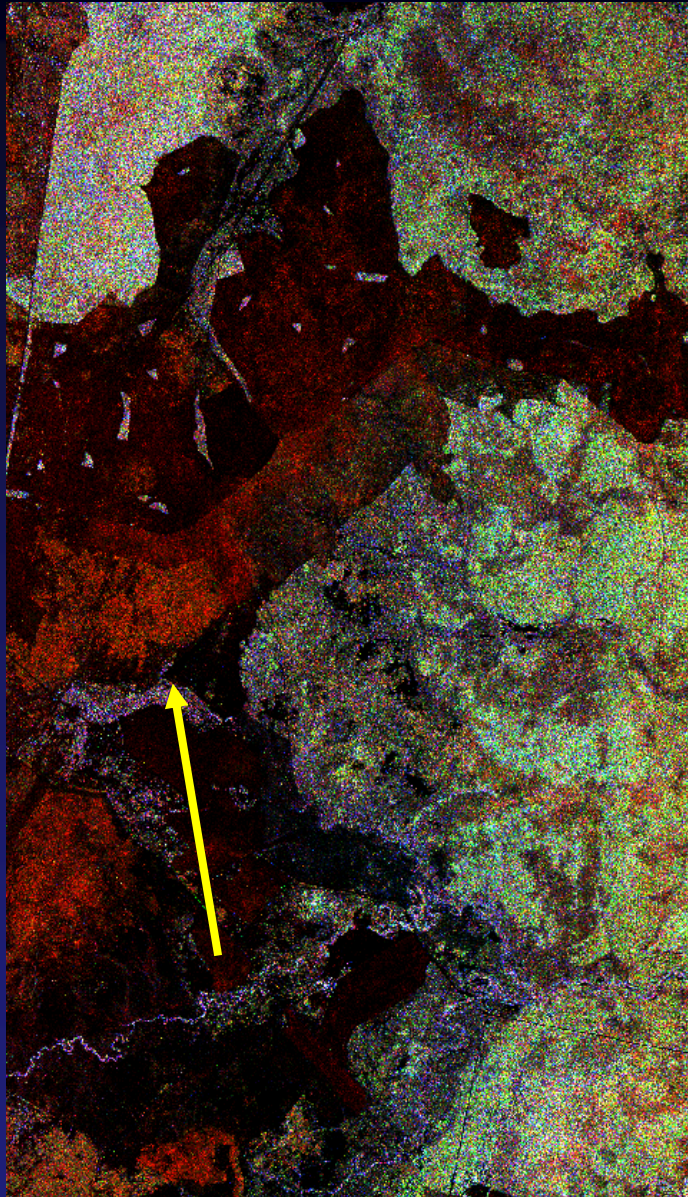
Woody Regrowth Mapping using ALOS PALSAR and FPC



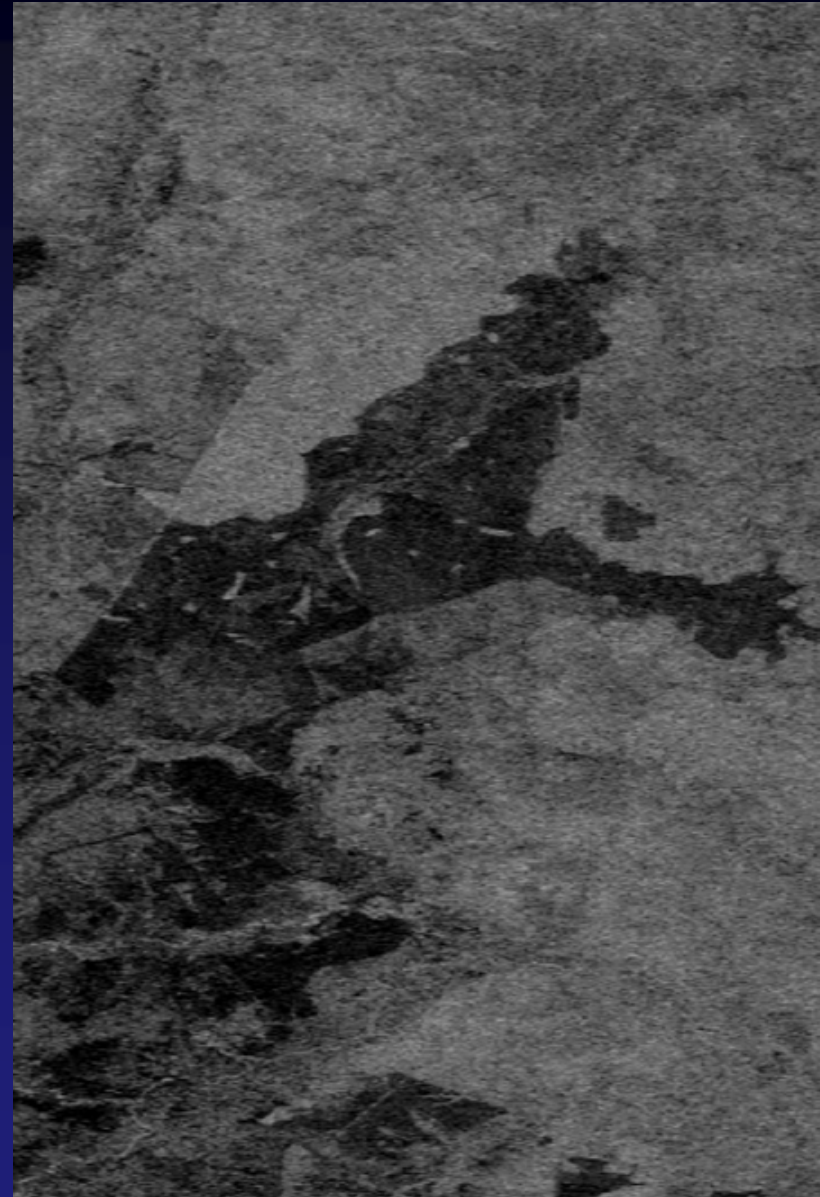
Woody Regrowth Mapping using ALOS PALSAR and FPC



Woody Regrowth Mapping and Characterisation

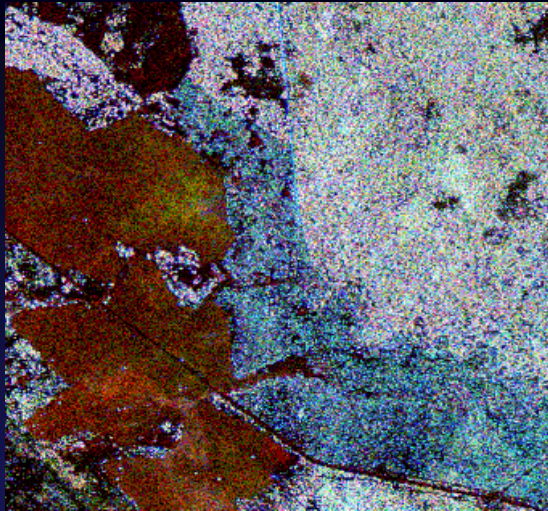


AIRSAR 2000

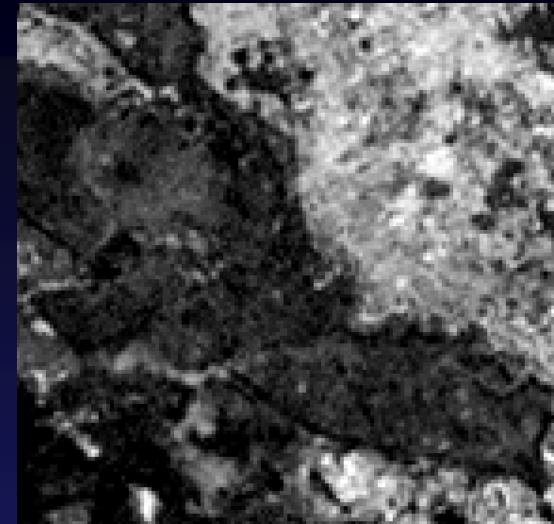


ALOS PALSAR 2006

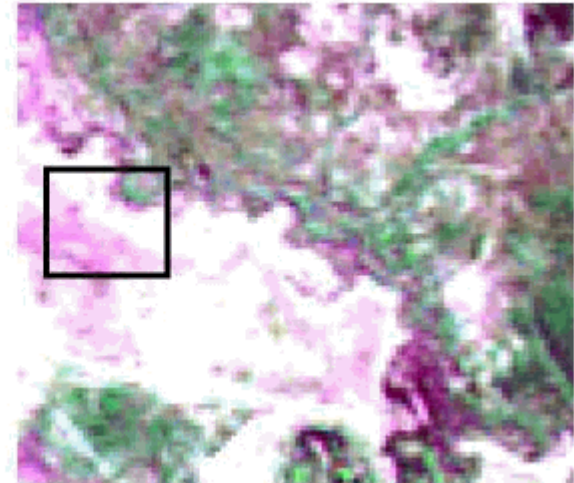
Stem Injection



High L- and P-band HH
Low C-band HV

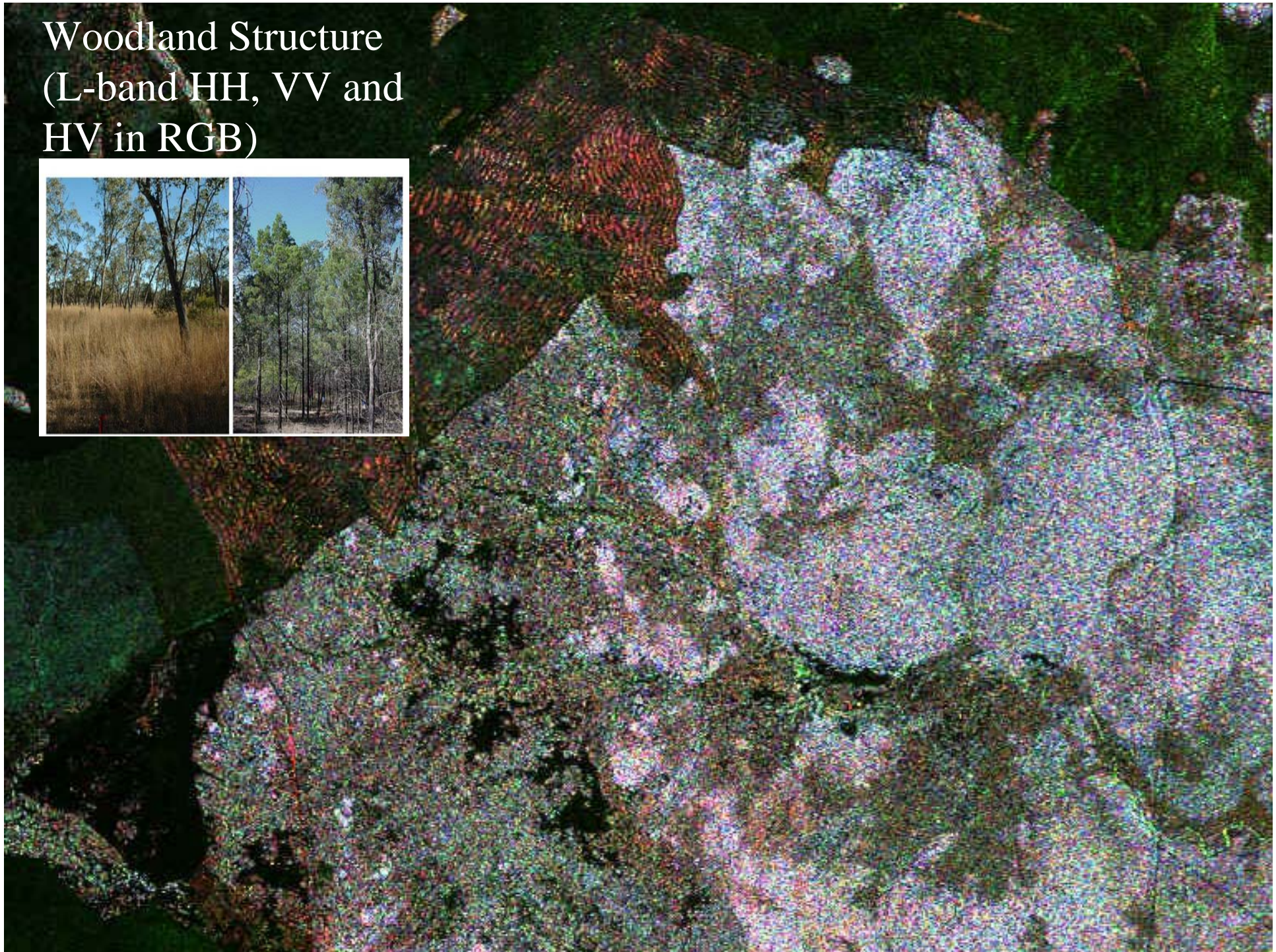


Low FPC

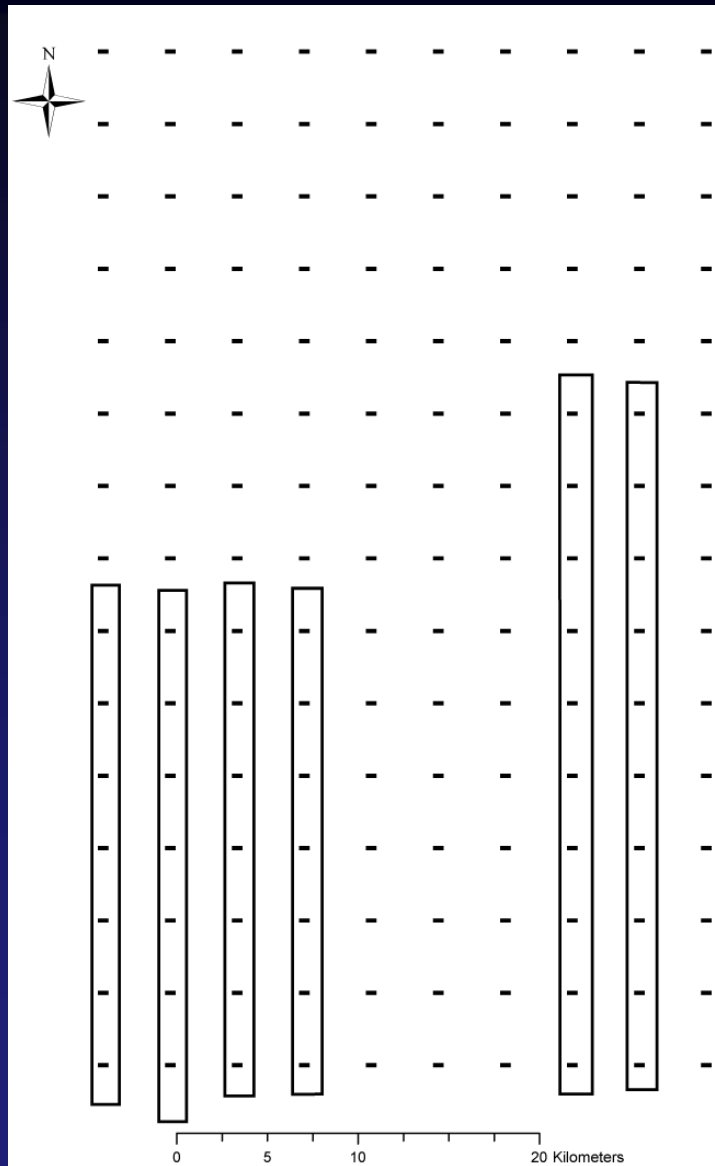


- Reflects presence of dead standing trees with no foliage

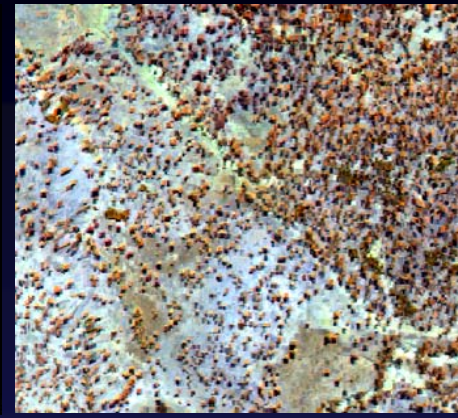
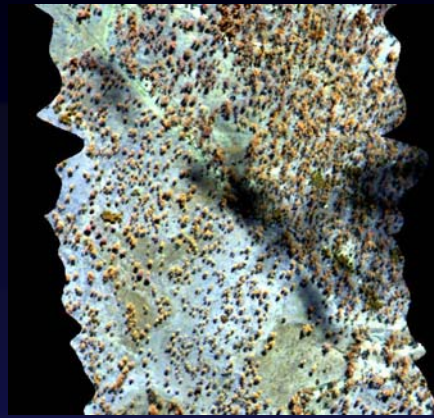
Woodland Structure (L-band HH, VV and HV in RGB)




HyMap Data (September, 2000)

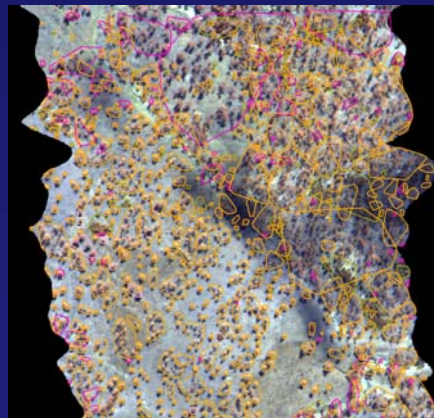
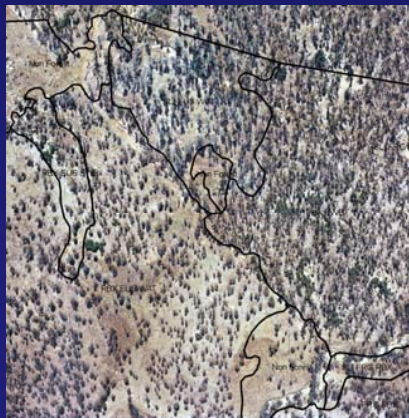
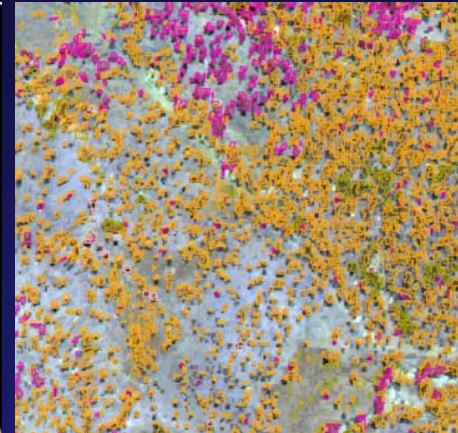
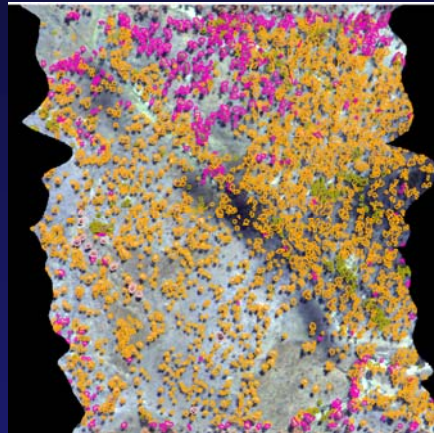


Advanced Mapping of Forest Communities

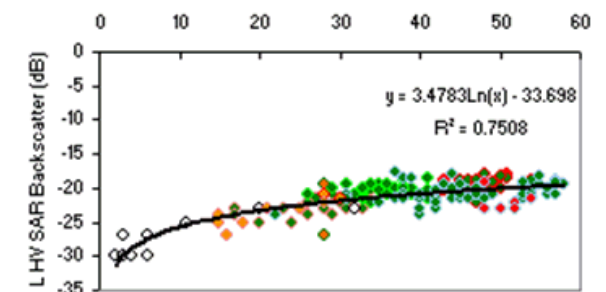
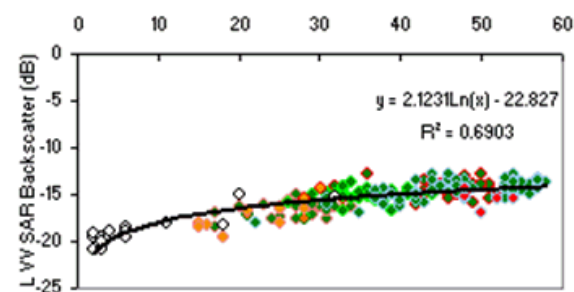
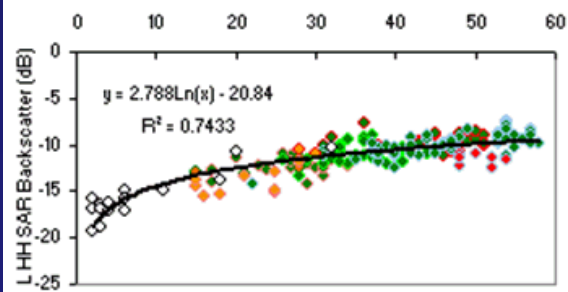
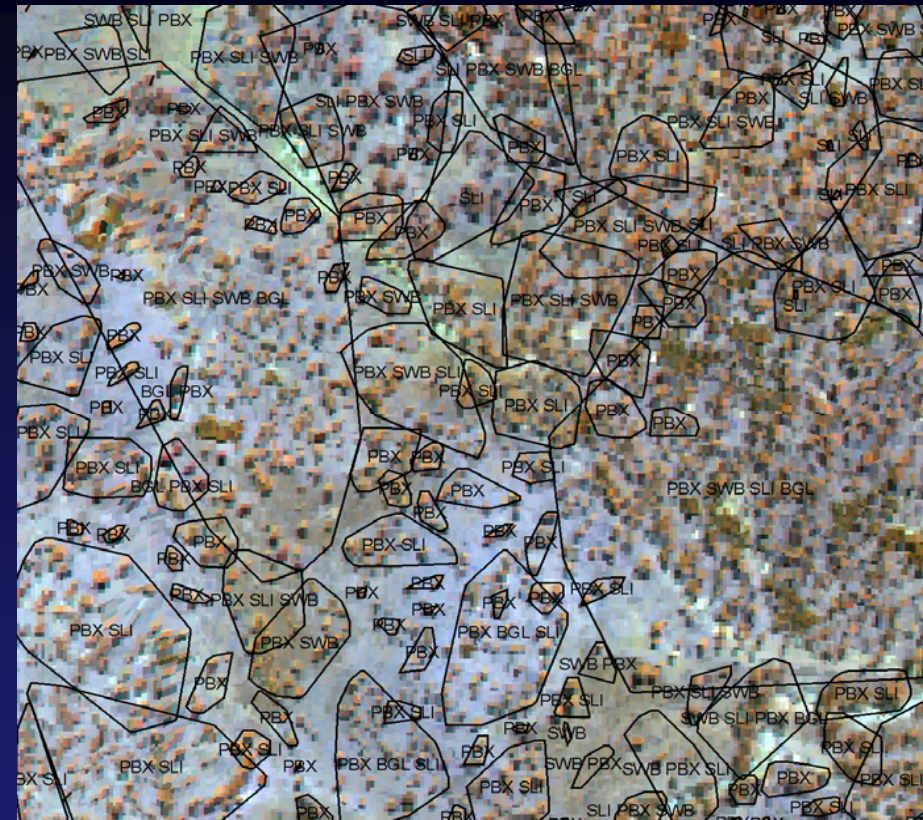


SPECIES

	BGL
	PBX
	SLI
	SWB



Forest Community Classification

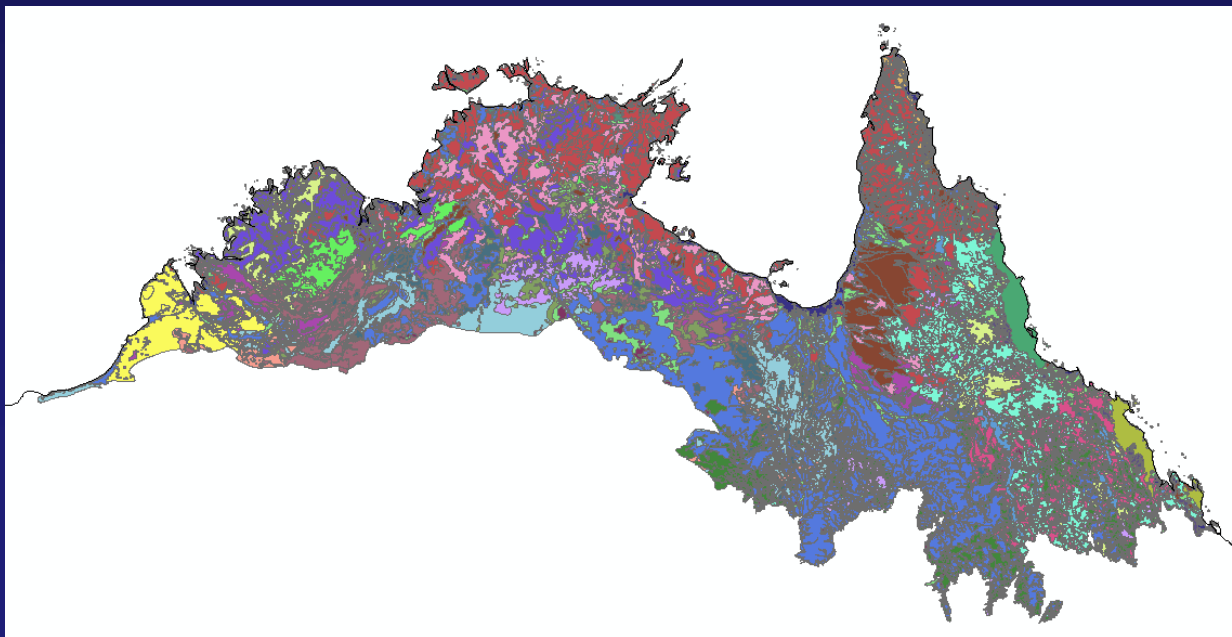
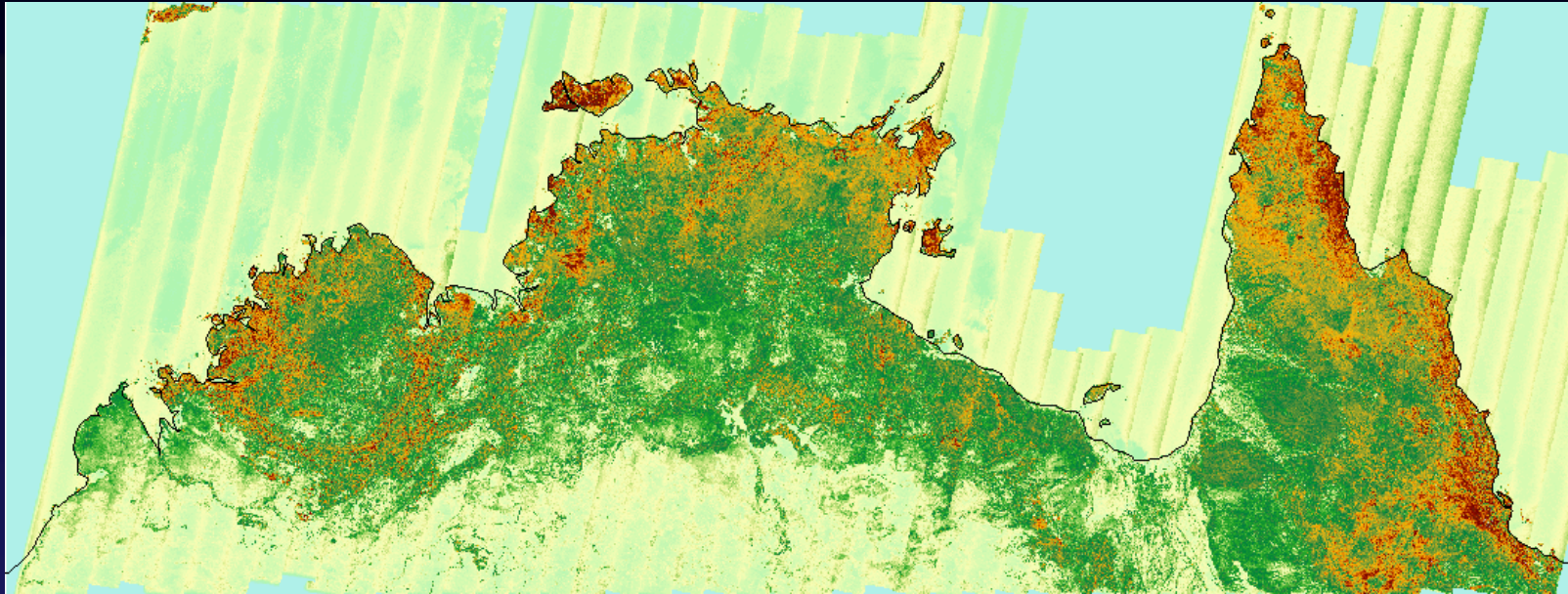


Hyperion Data (January/March 2001)

- 30 m Spatial Resolution
- 176 Wavebands
- Blue (427 nm) - SWIR (2385 nm)
- Spaceborne
- Corrected to surface reflectance using CSIRO atmosphere correction software.

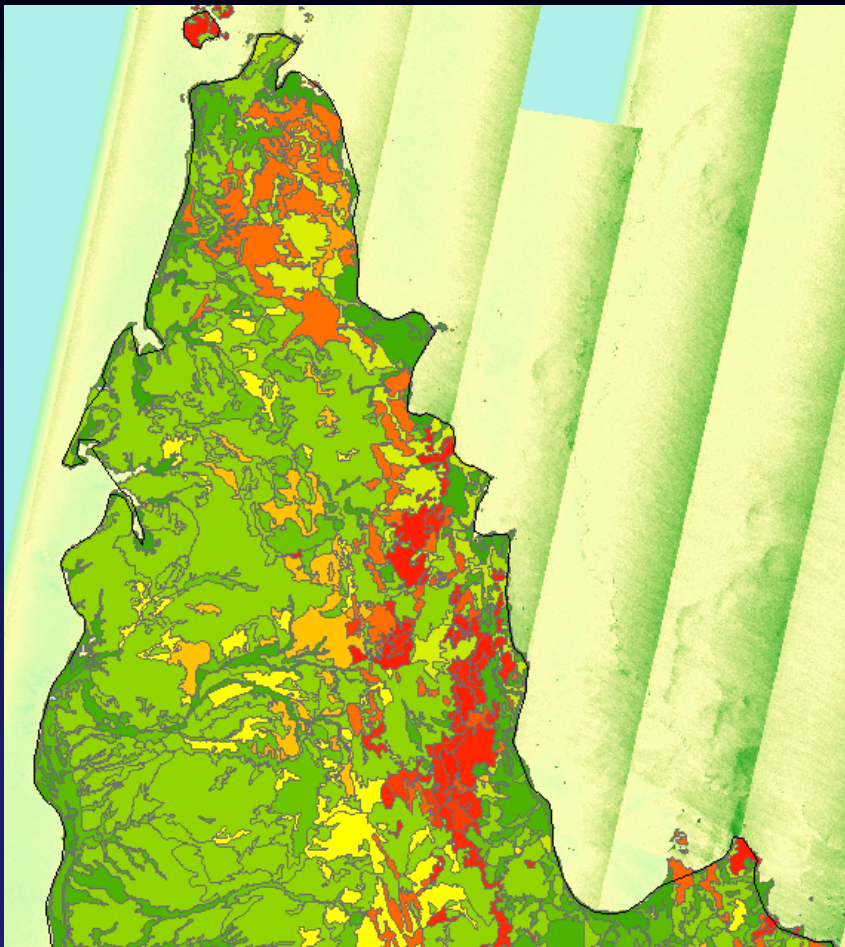


North Australia: Structural Vegetation Mapping

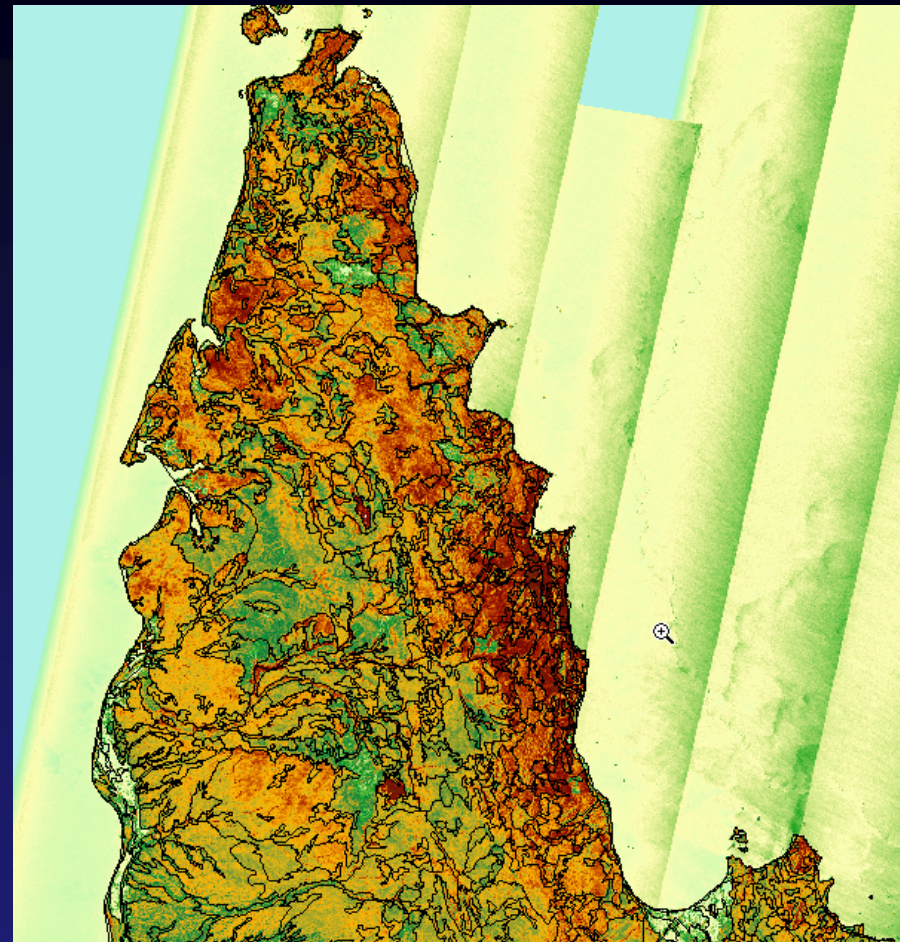


- JERS-1 SAR Mosaic (top)
- Vegetation map of northern savannas

Cape York: Structural Vegetation Mapping

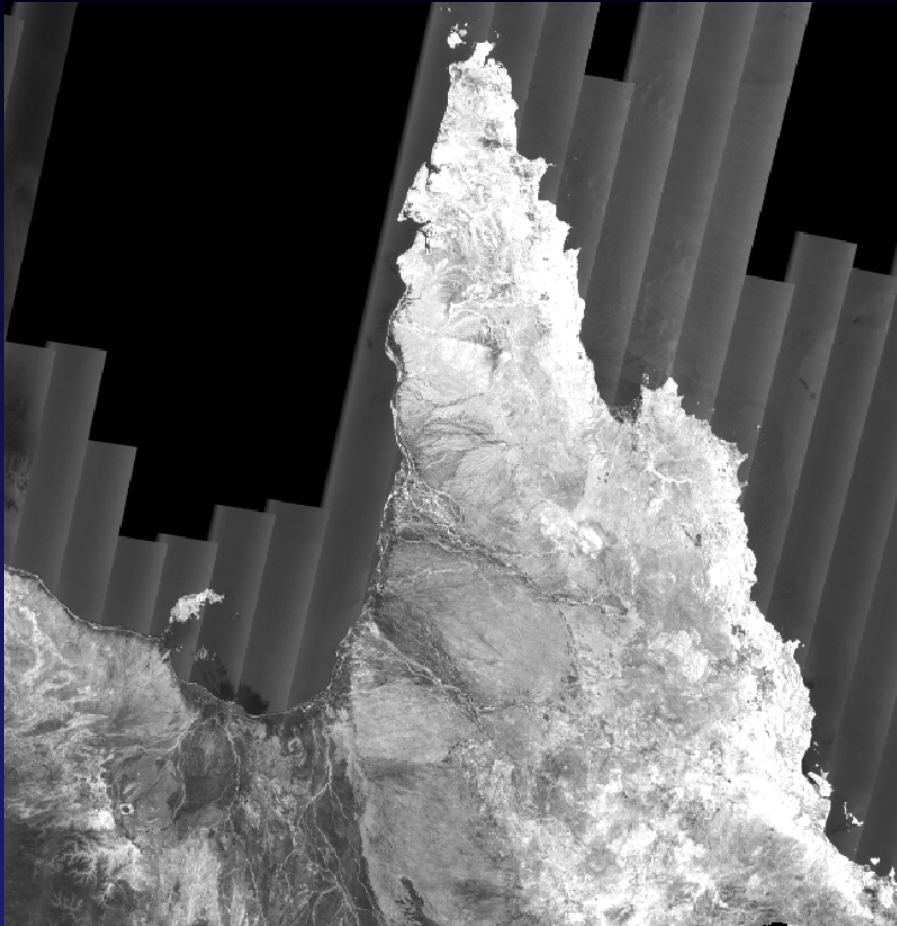


Cape York: Vegetation mapping

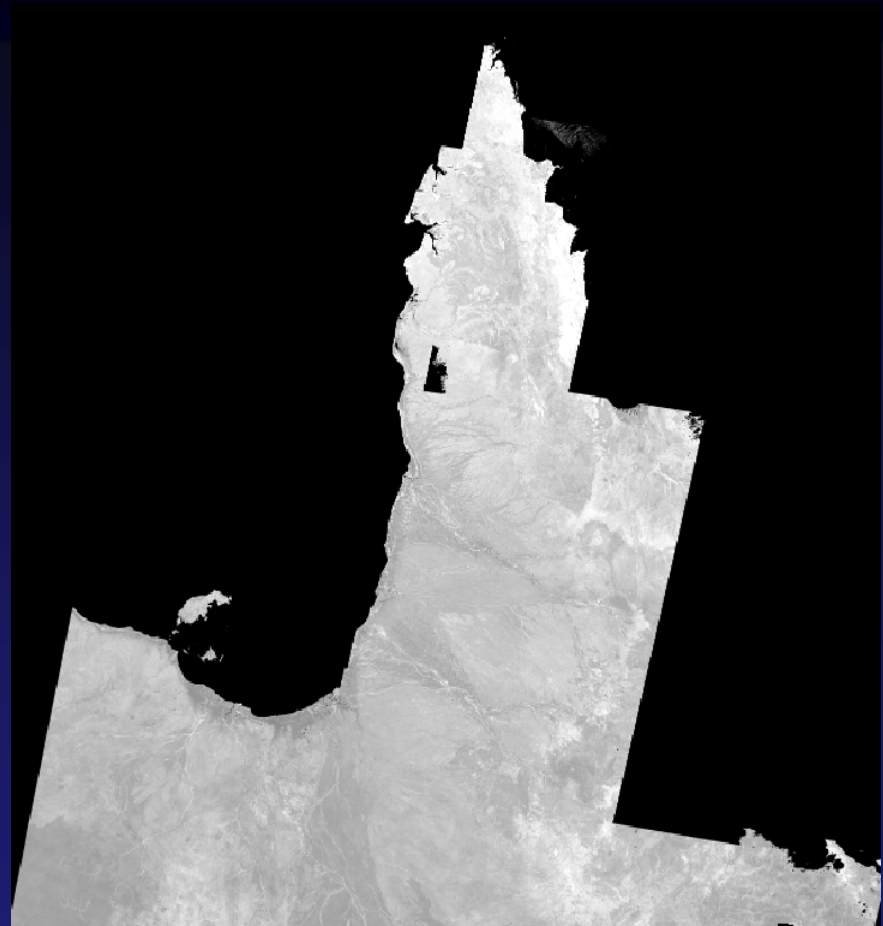


JERS-1 SAR
(Further potential for structural classification using FPC)

Integrating JERS-1 SAR & FPC (1995)

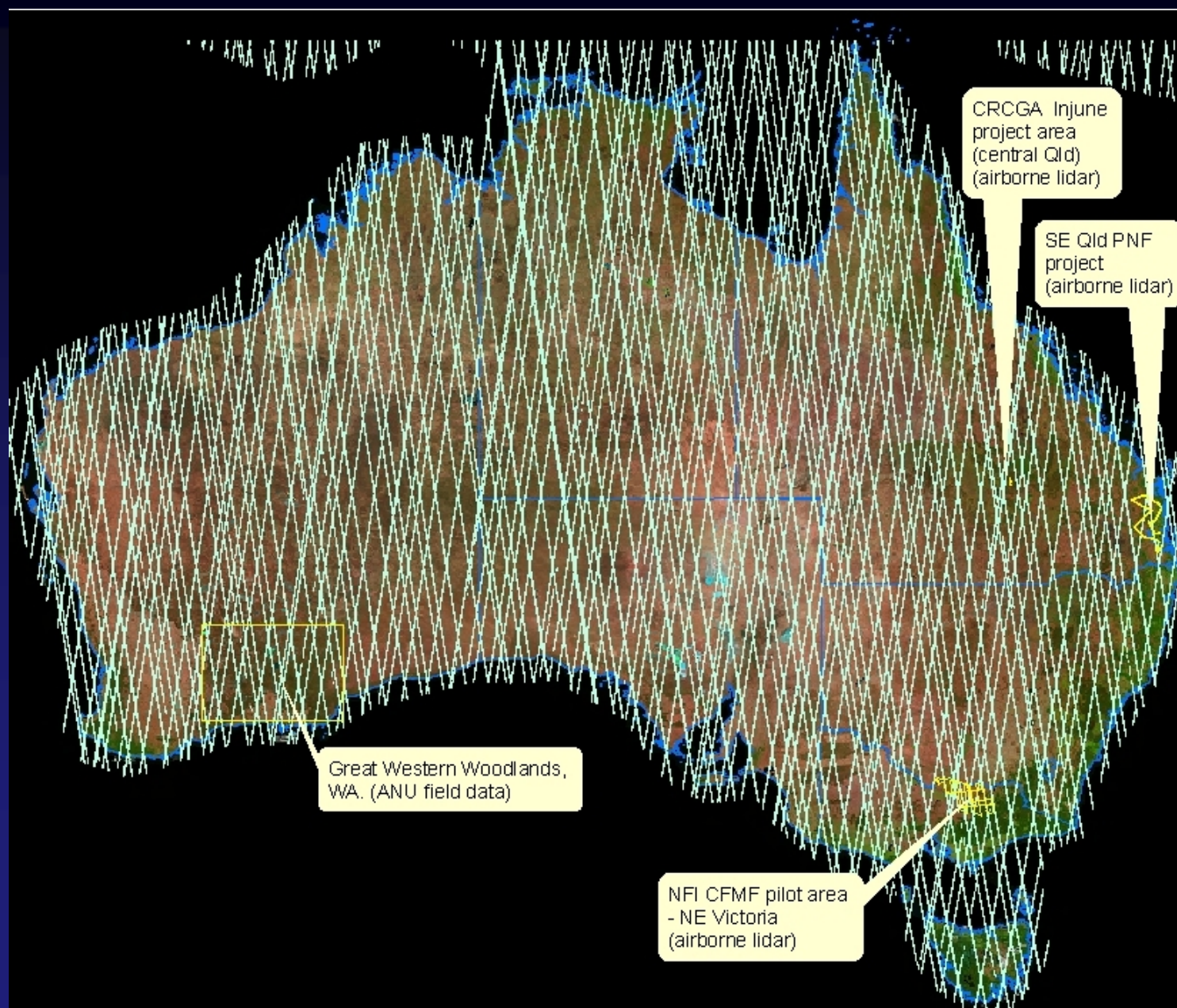


- Woody regrowth mapping
- Forest structural mapping

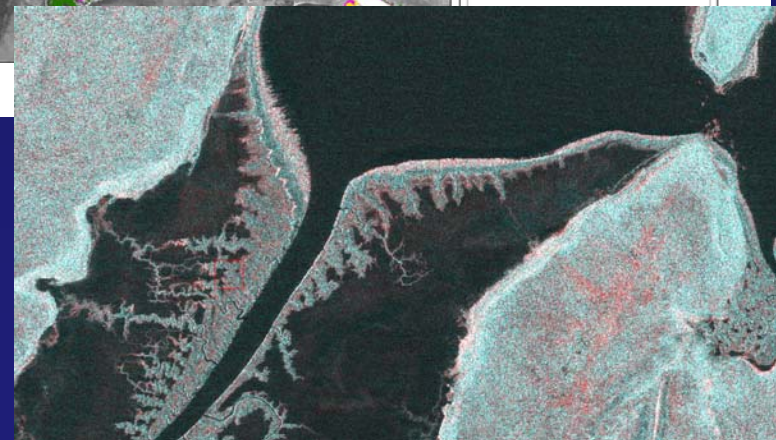
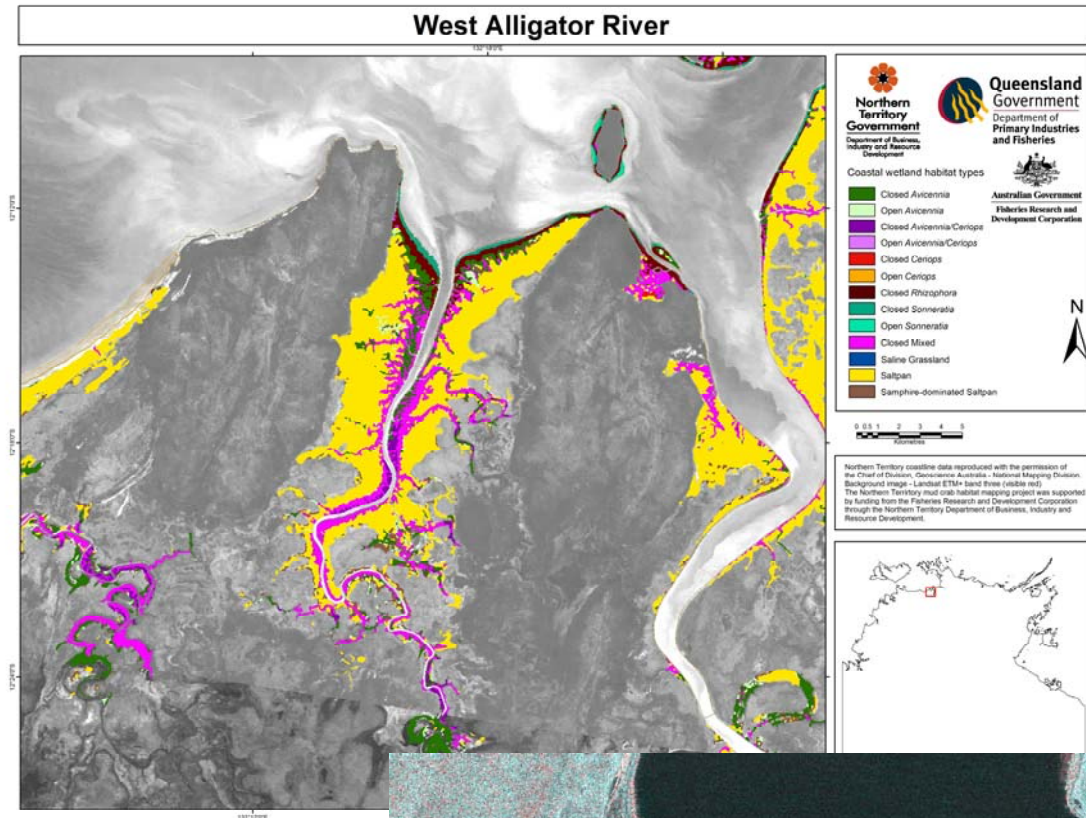
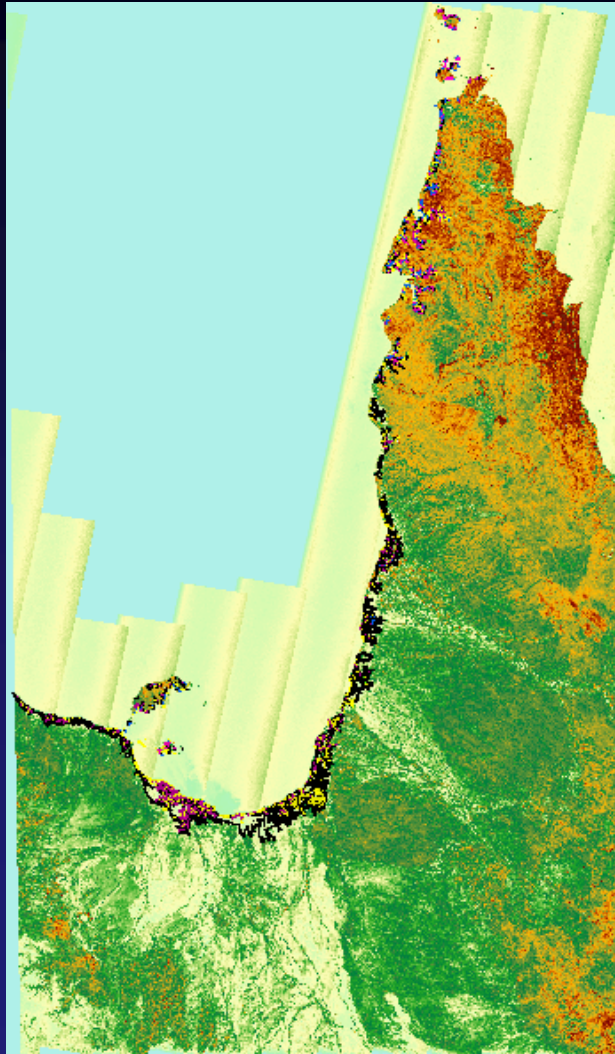


- Standing dead trees
- Biomass retrieval

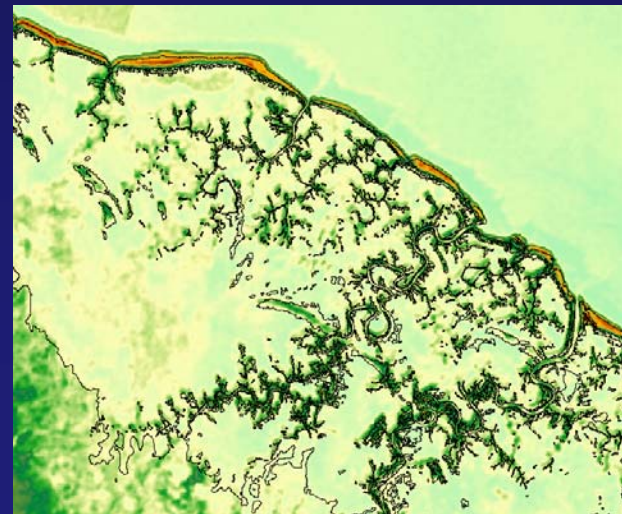
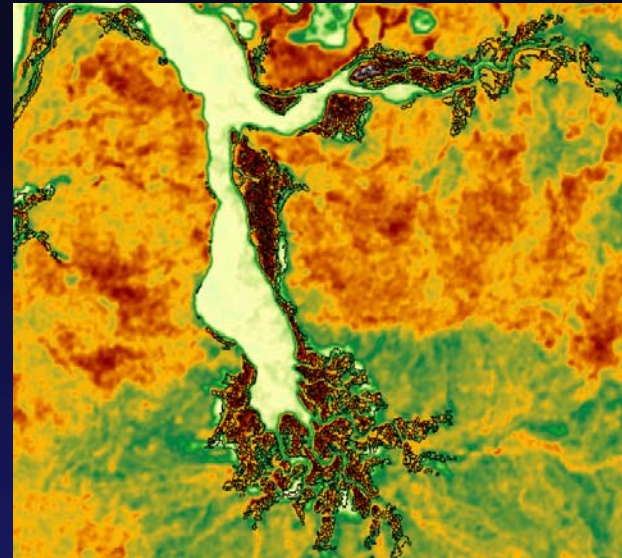
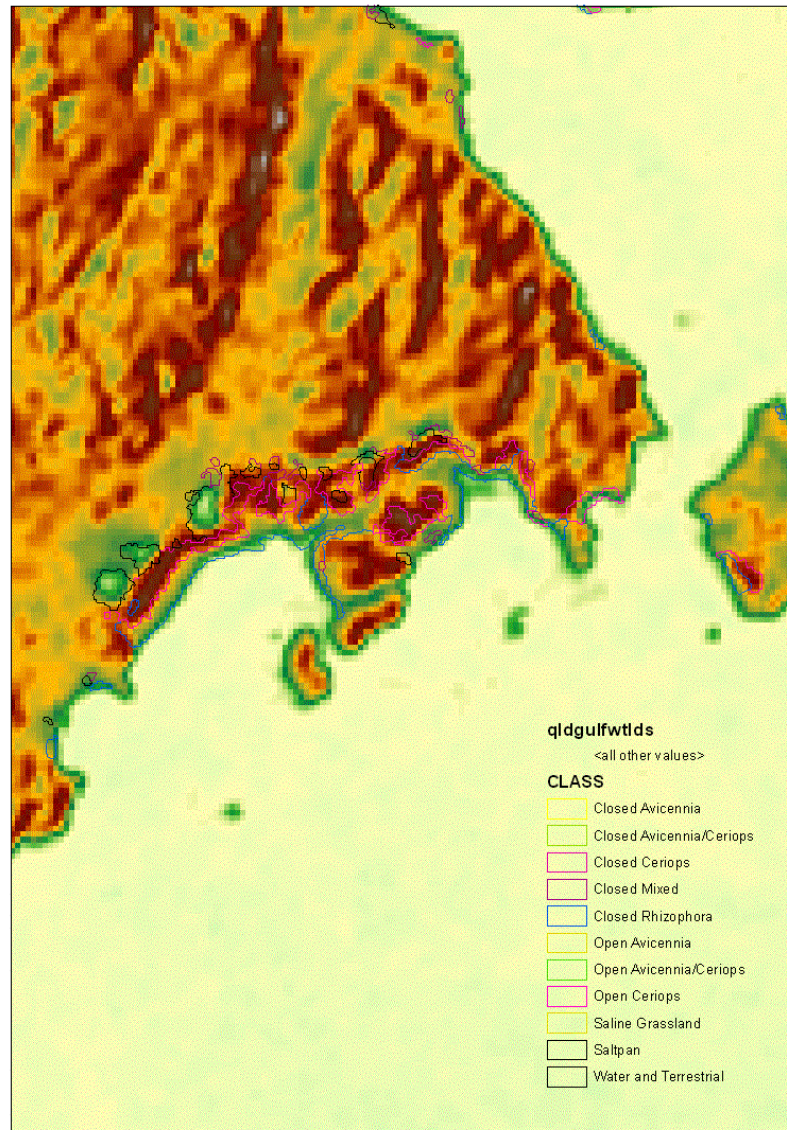
ICESAT: Stand height retrieval



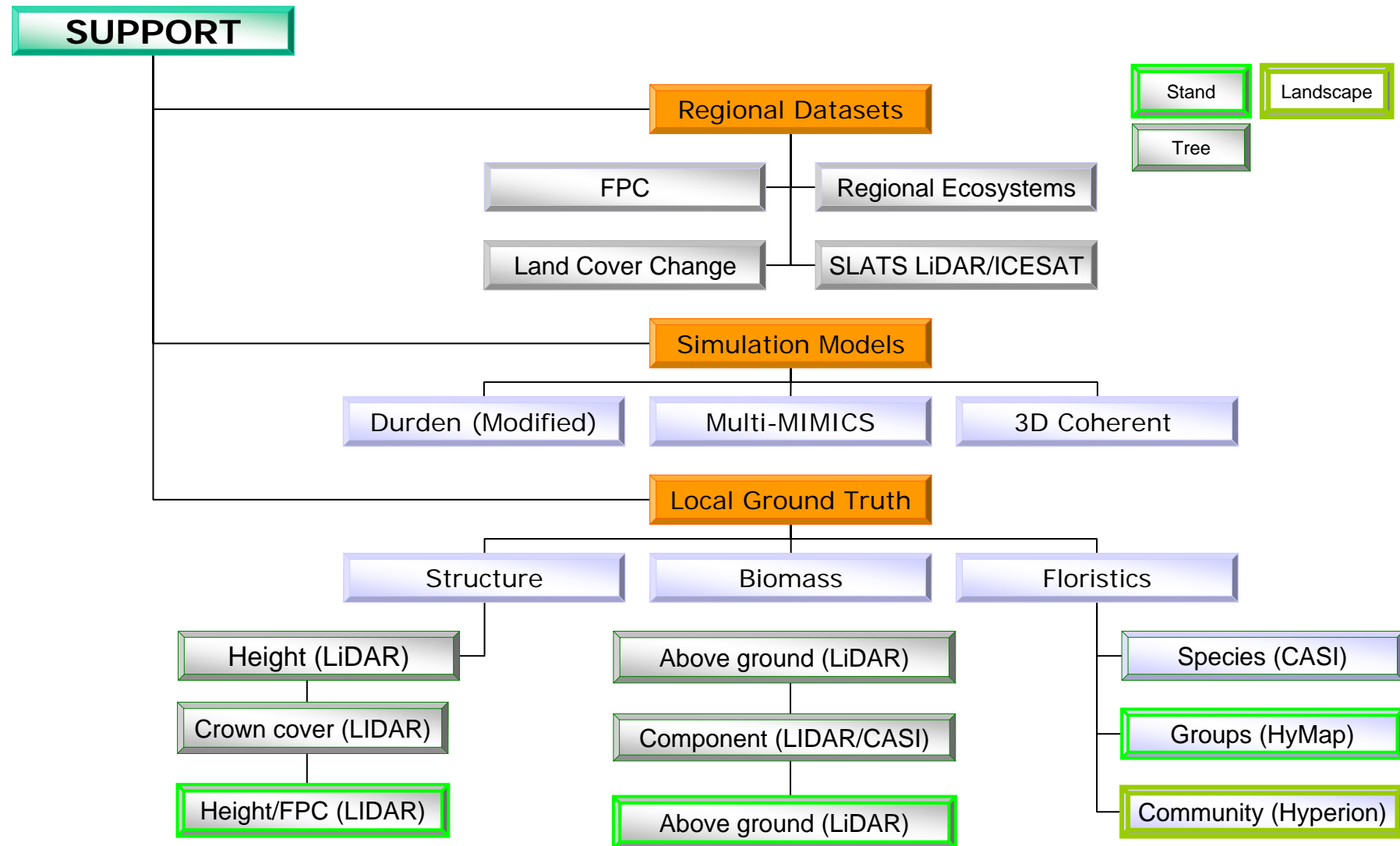
Mangrove Characterisation : Northern Australia



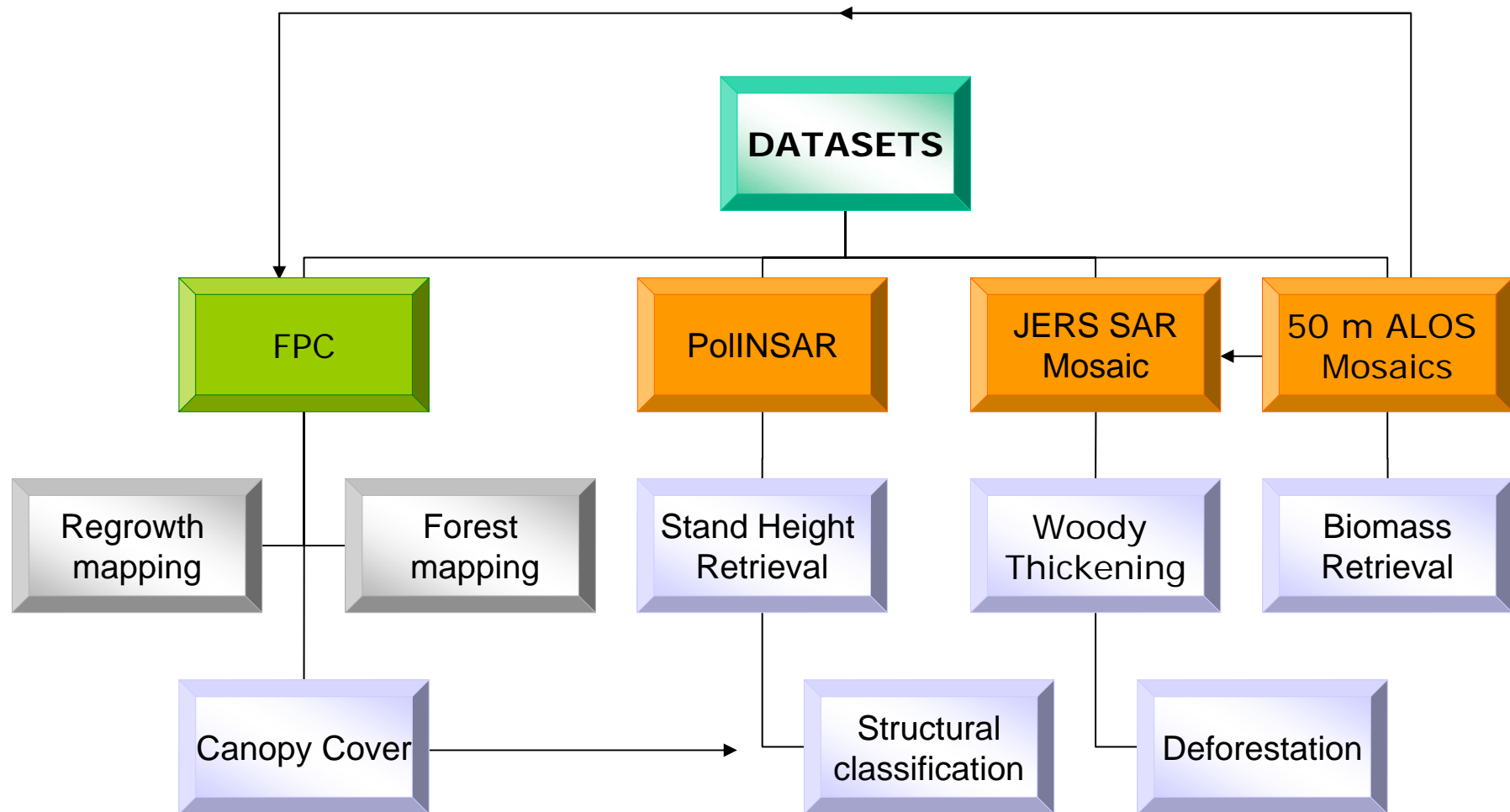
Mangrove examples: JERS-1 SAR Mosaic



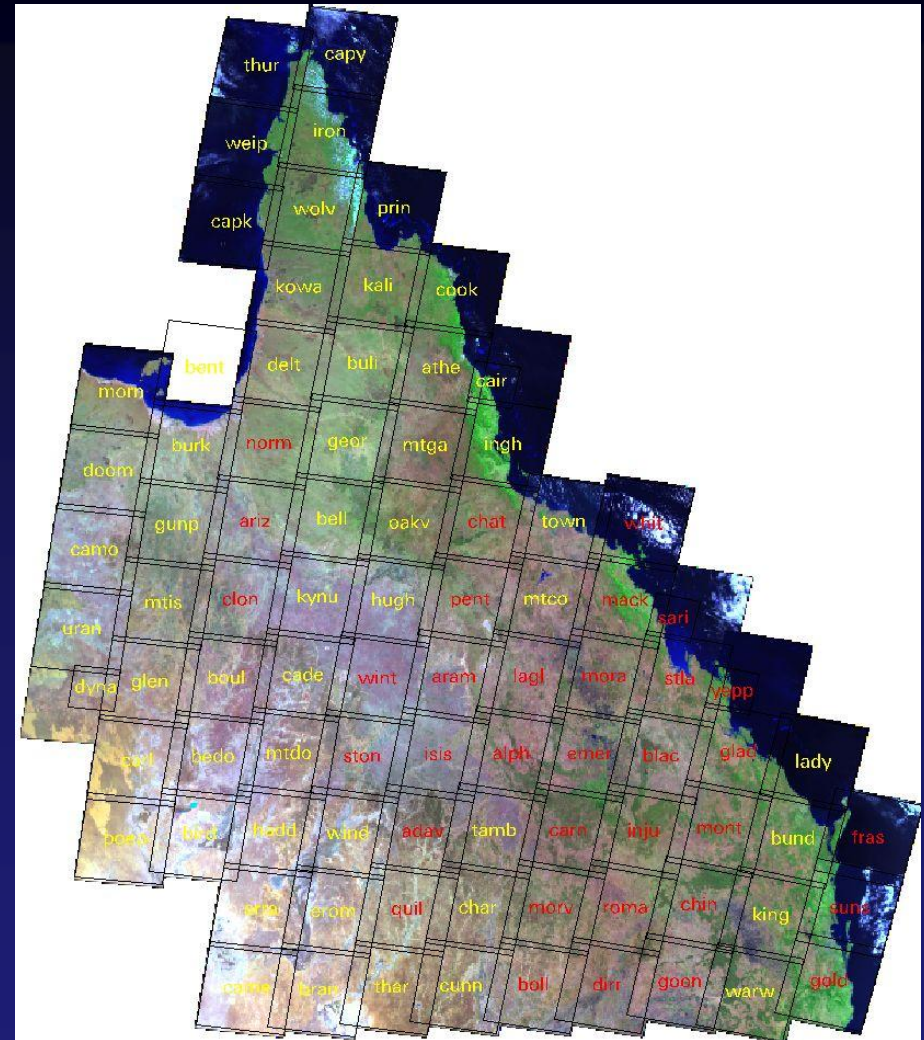
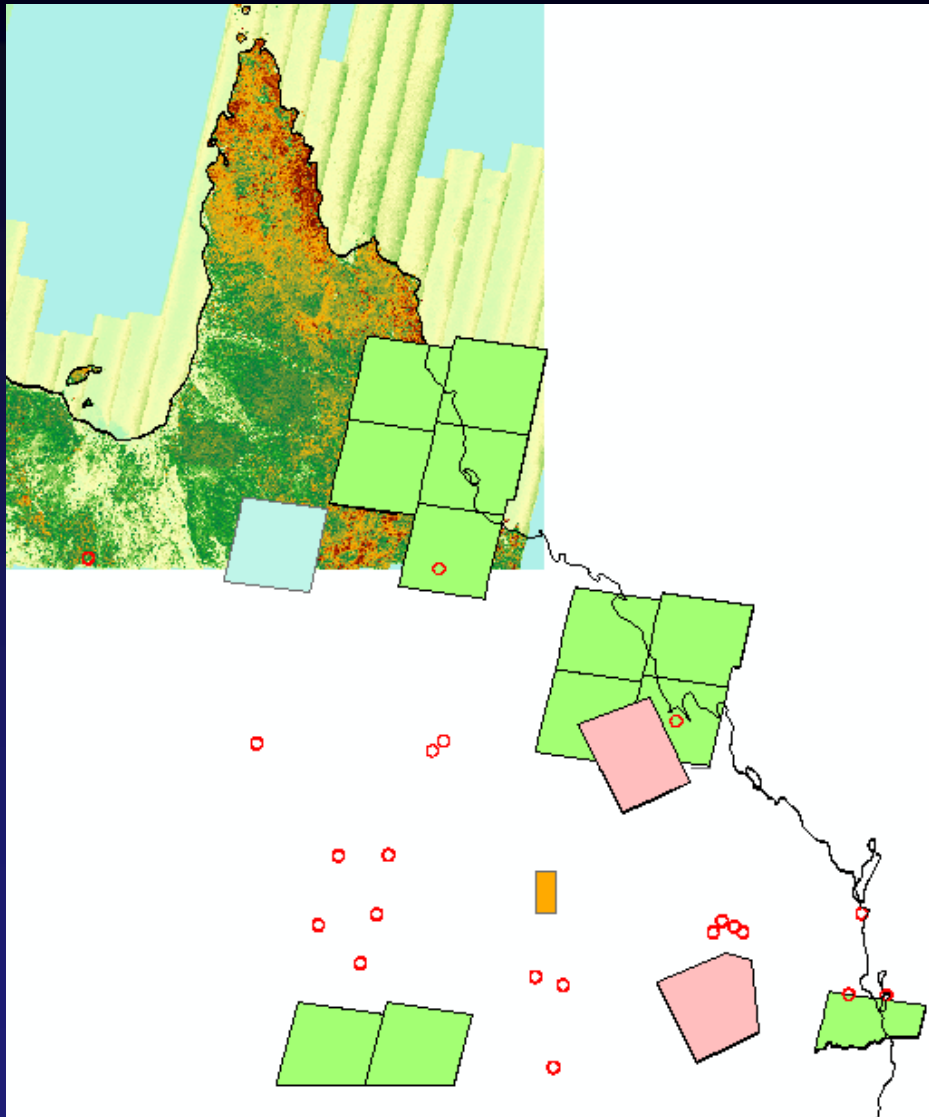
Tools and Datasets for Supporting Interpretation and Use of ALOS

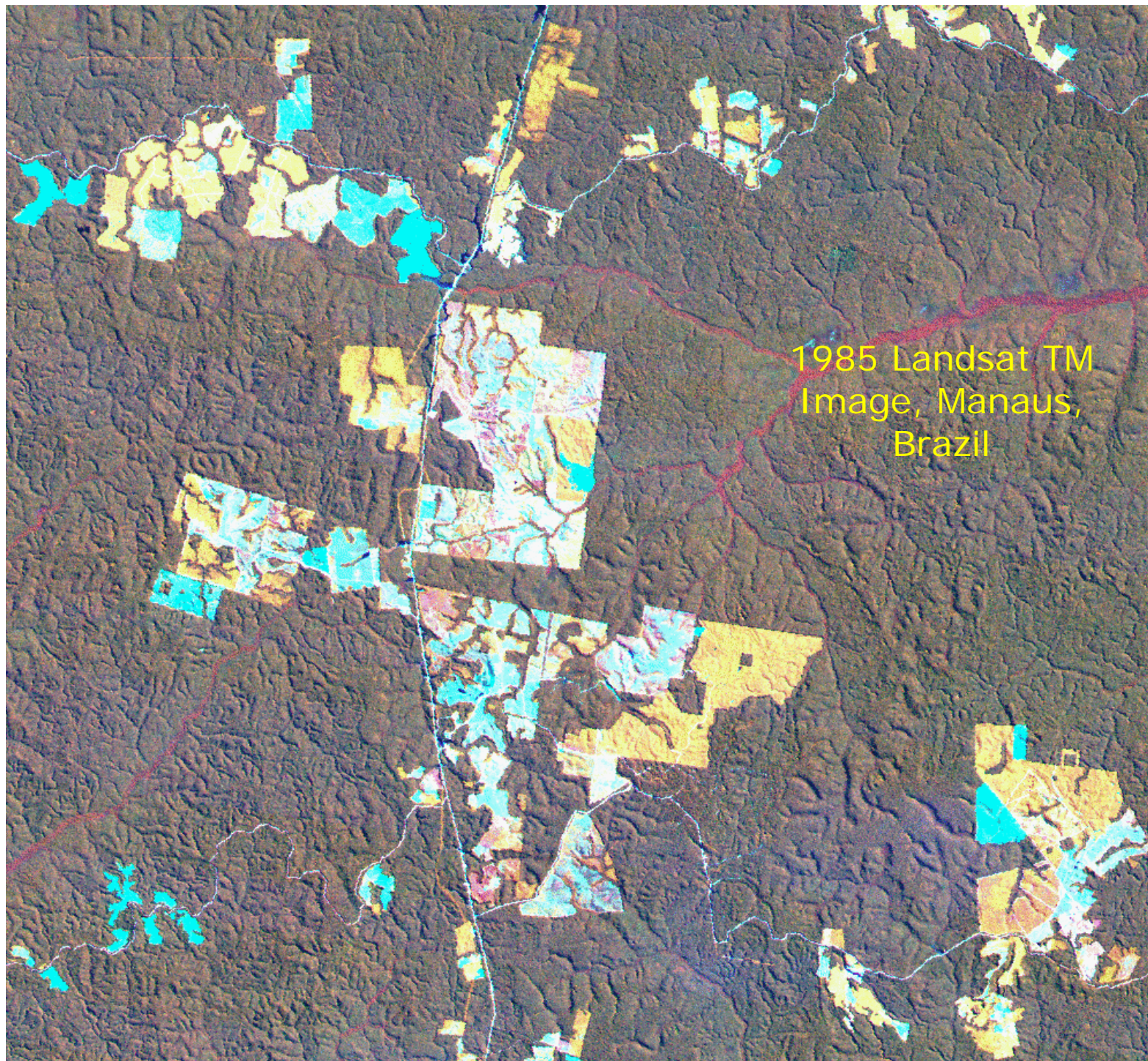


Integration of Remote Sensing Data Mosaics



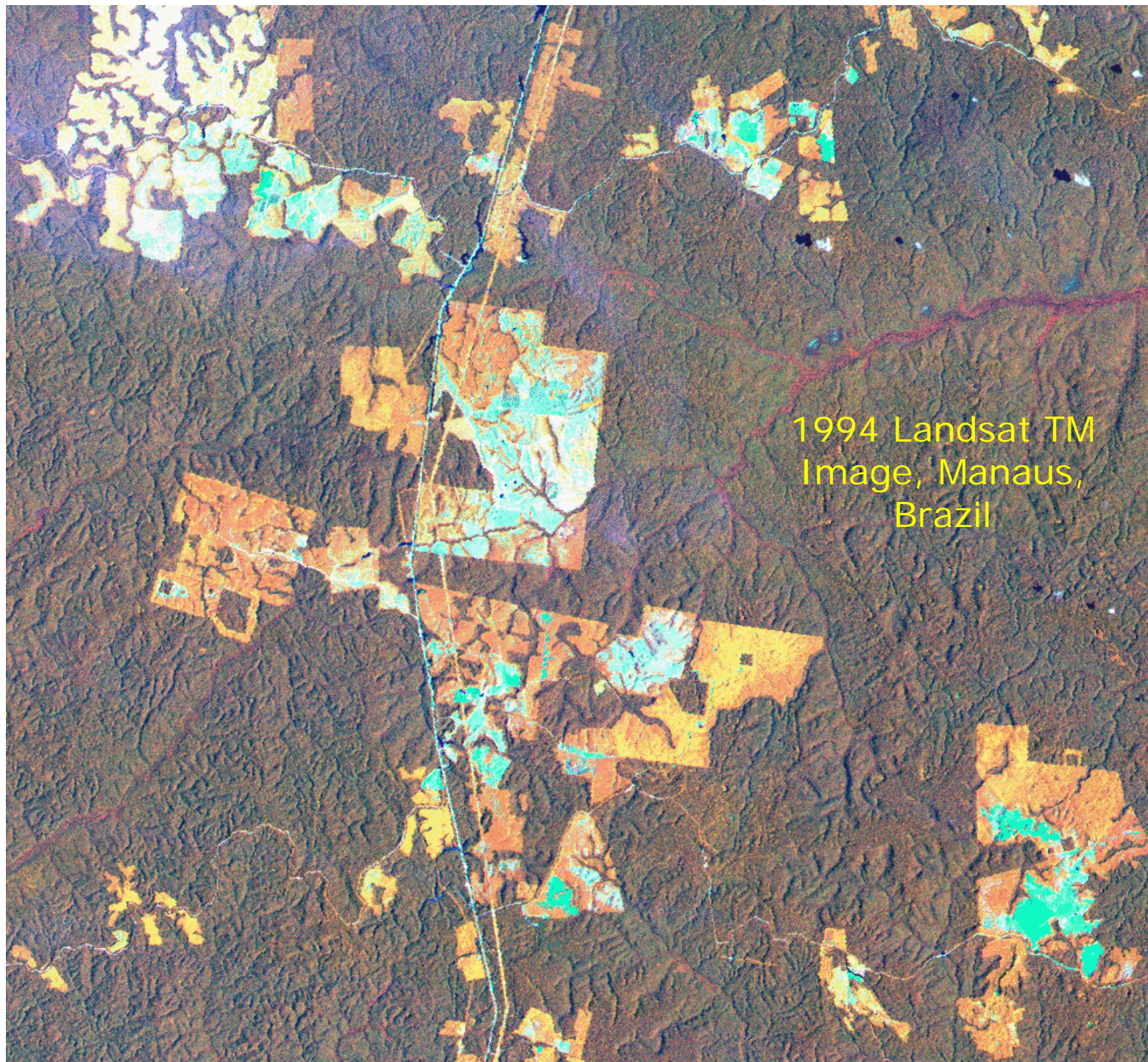
Priority Sites: Queensland





1985

Extensive areas
of mature forest
and deforested
land occupied by
pasture (blue) and
regrowth forest
(yellow/orange)



1994 Landsat TM
Image, Manaus,
Brazil

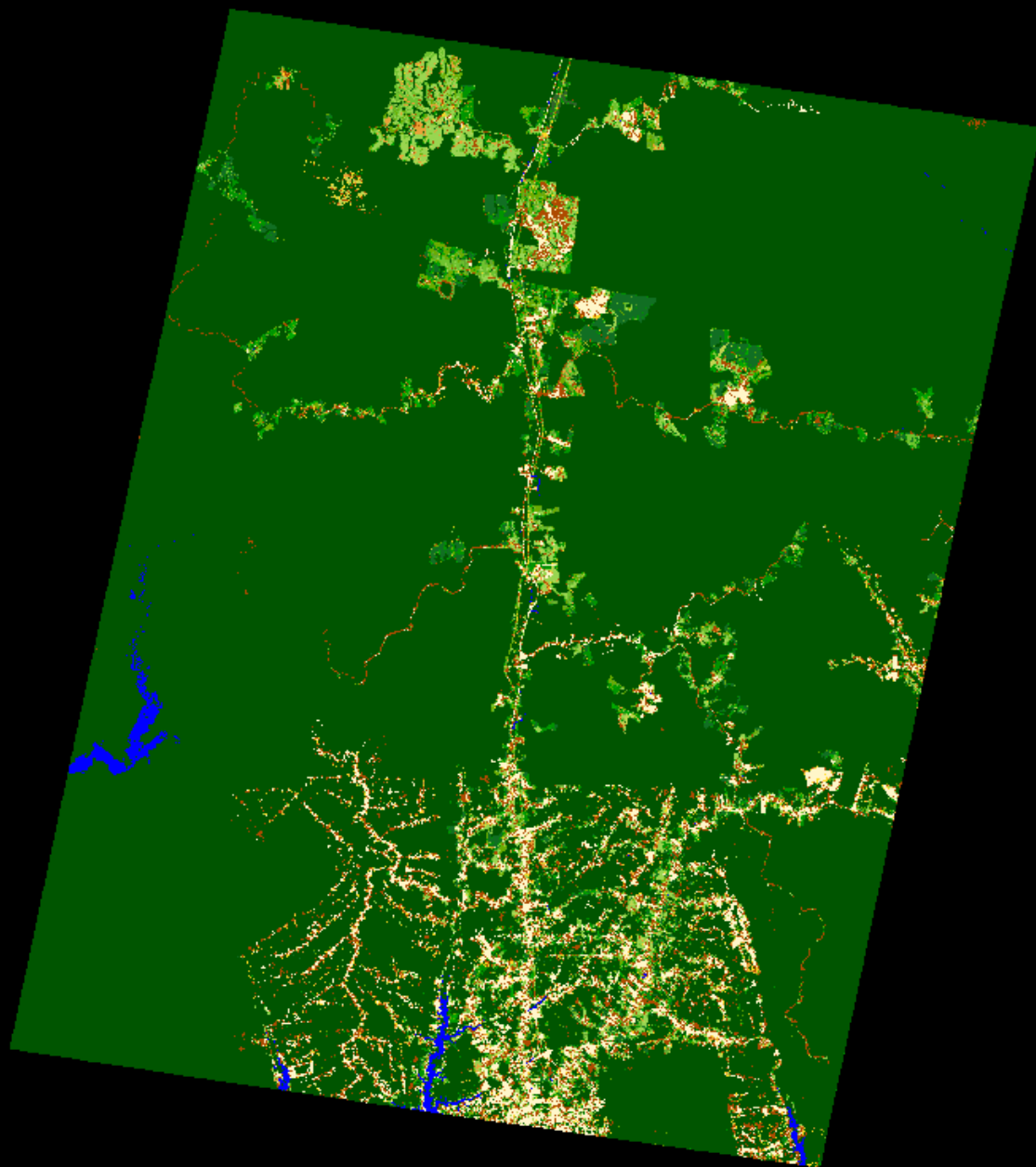
1994

Majority of
cleared areas
occupied
by regenerating
forest.

Area of
deforestation
increased
where
oil palm
plantations
were established.

Some
reclearance
of regeneration
evident

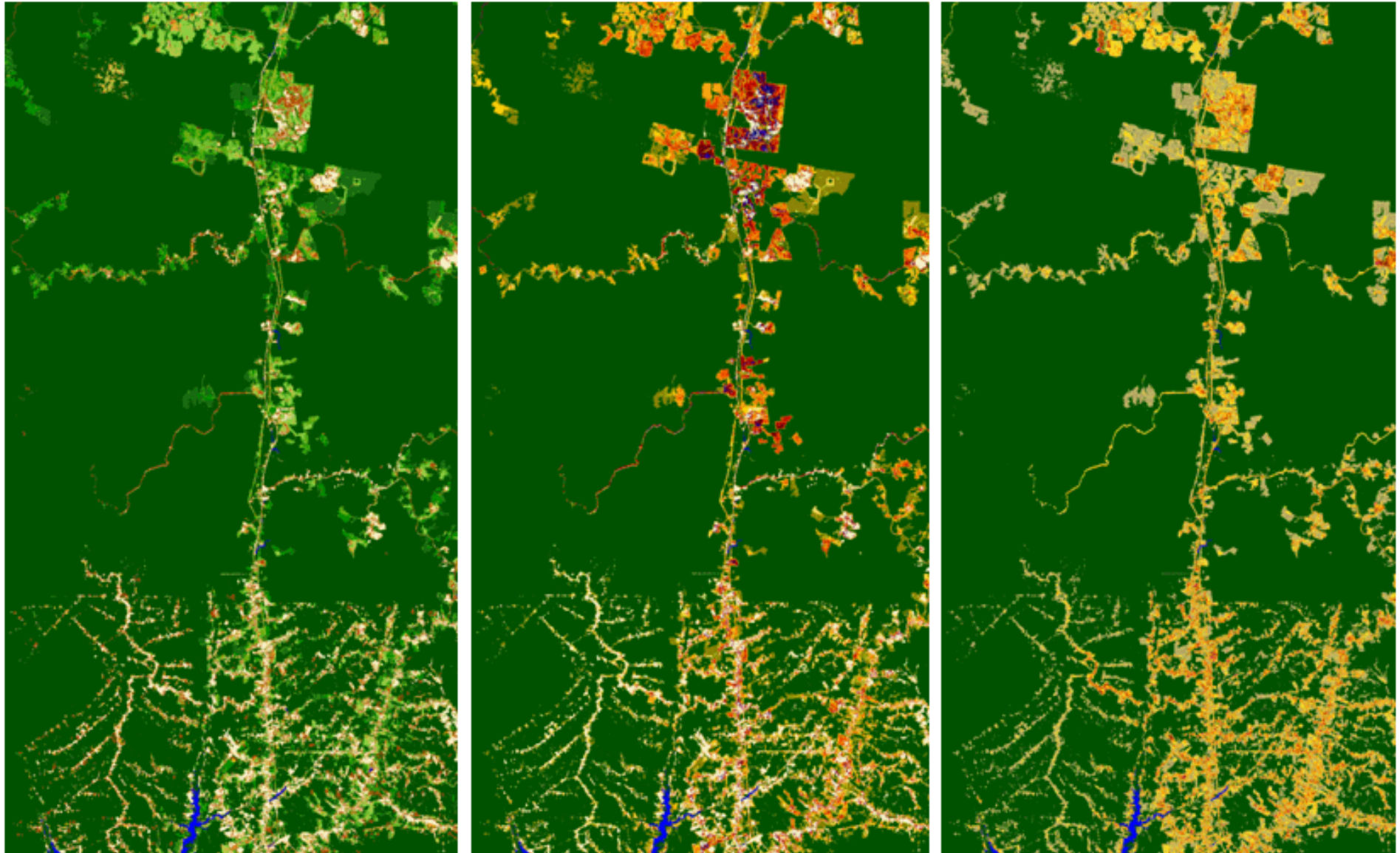
2003



MF	
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Time-series Classifications, Manaus, Brazil



Time-series Classifications, Santarem (Tapajos), Brazil

