ALOS

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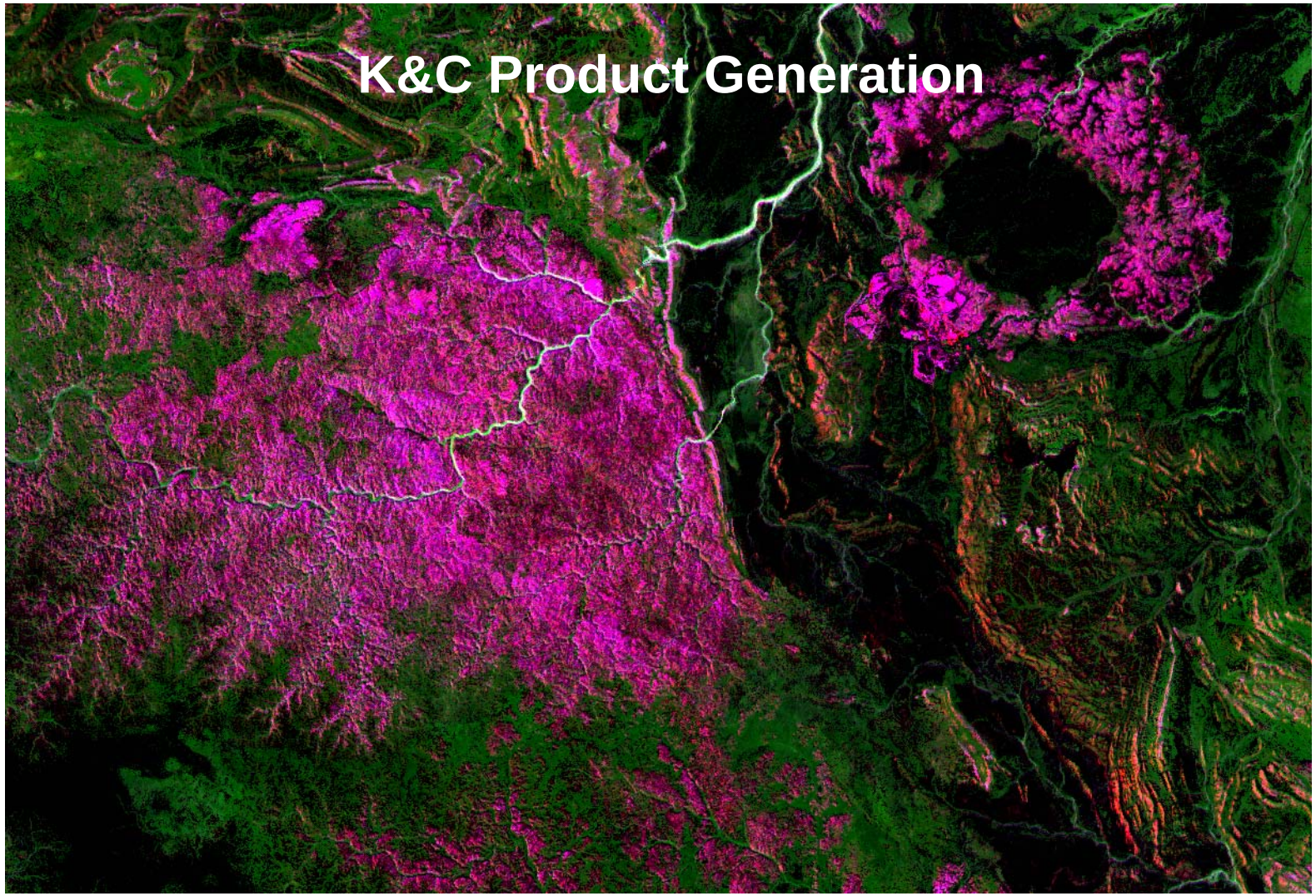
K&C Product Generation



Richard Lucas, Institute of Geography and Earth Sciences

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FOREST THEME

Forests (primarily wooded savannas), Australia

WETLANDS THEME

Mangroves and wetlands
(selected tropical/subtropical regions)

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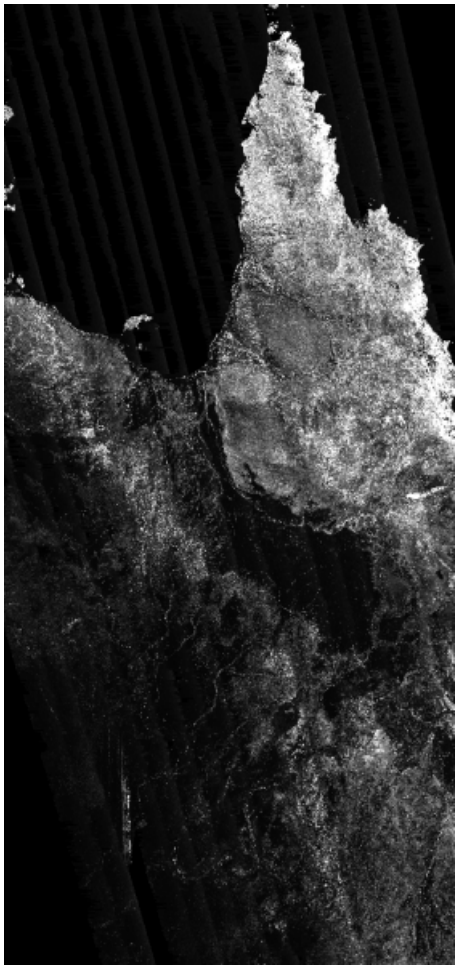
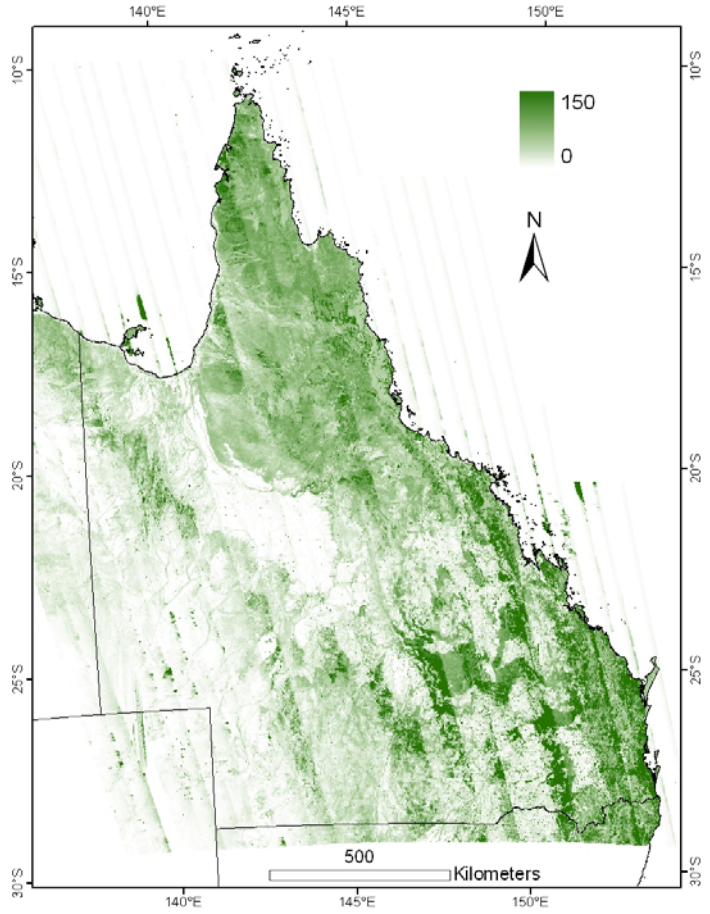
1a) Generation of forest growth stage map, northern Australia

- Relative biomass estimates
  - Generated using combination of L-band HH/HV and over 5000 biomass (field-based) estimates
- Algorithms and draft products generated
  - 2007
  - 2008
- Final validated product
  - Delivered August, 2009
- Additional datasets required
  - Missing strips for Northern Territory (2007)
- Product deliverables
  - Growth stage as a function of biomass
- Other info
  - Links with forest structural classification





PRIFYSGOL ABERYSTWYTH UNIVERSITY

1a) Generation of forest growth stage map, northern Australia

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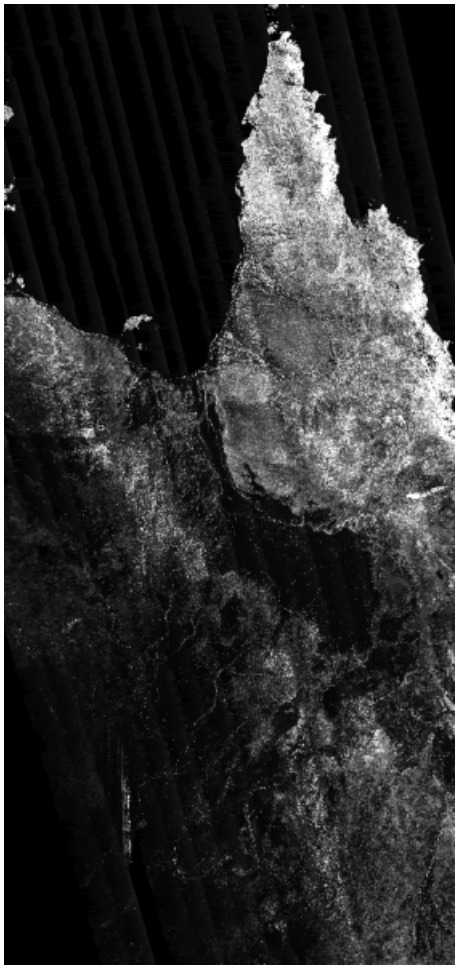
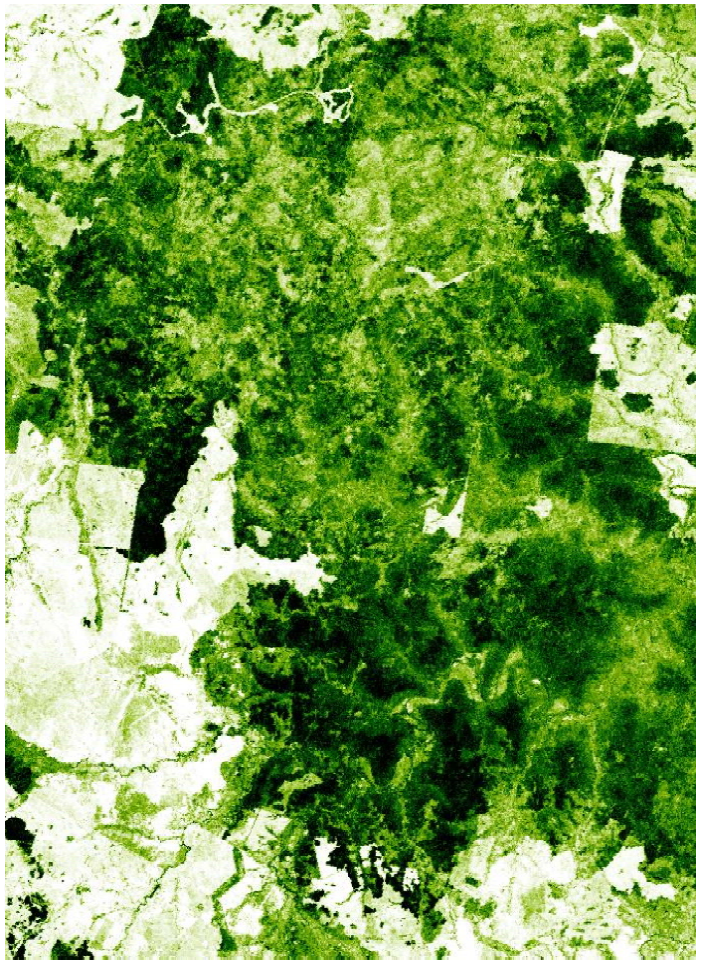
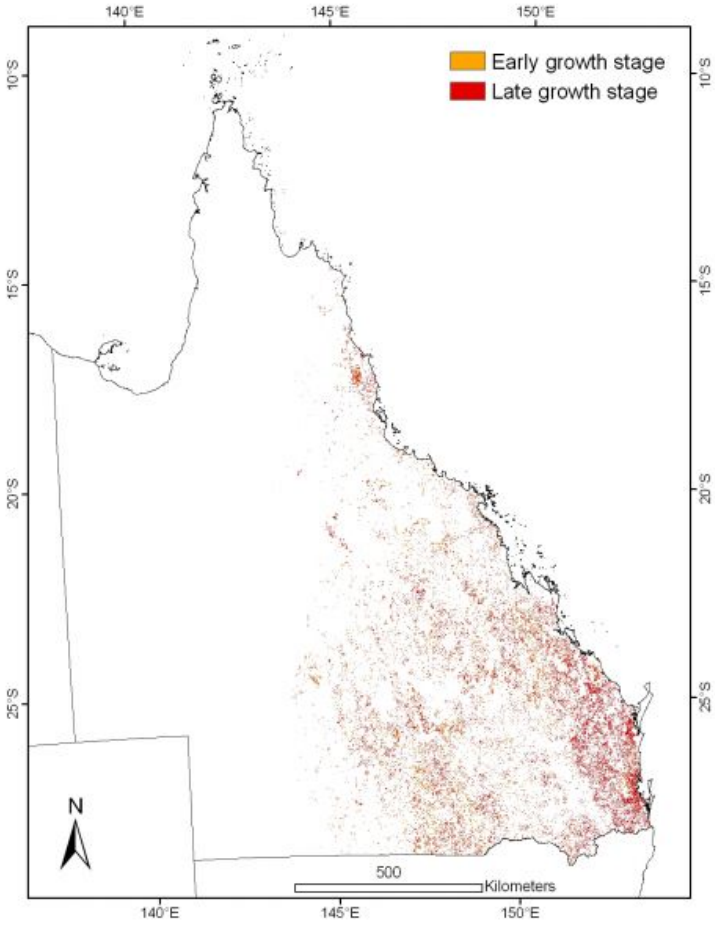




PRIFYSGOL ABERYSTWYTH UNIVERSITY

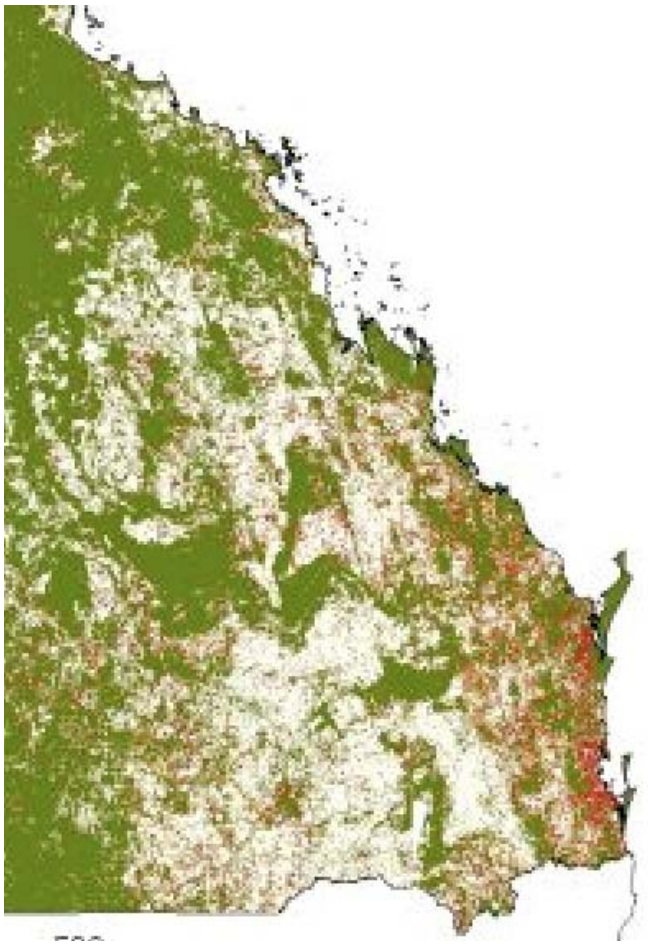
1a) Generation of forest growth stage map

- Regrowth classification based on integration of L-band HH/HV and Landsat-derived Foliage Projected Cover (FPC)
  - Two regrowth stages
- Algorithms and draft products generated
  - 2007
  - 2008 (Requires 2008 Landsat FPC coverage)
- Final validated product
  - Delivered August, 2009
- No additional datasets required
  - Some missing strips.
- Product deliverables
  - Regrowth map (non-renmant areas in Queensland only)
- Other info
  - Links with land cover change datasets



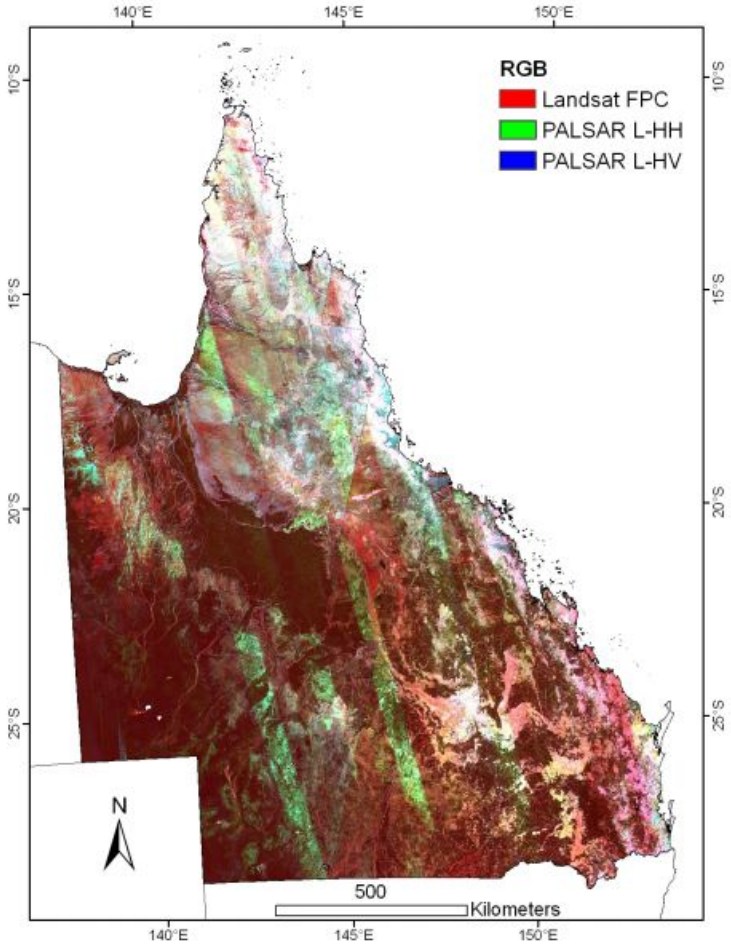
PRIFYSGOL ABERYSTWYTH UNIVERSITY

1a) Generation of forest growth stage map



PRIFYSGOL ABERYSTWYTH UNIVERSITY

1a) Growth stage classification: Integration of Landsat-derived FPC and ALOS PALSAR data



- Composite images based on integration of L-band HH/HV and Landsat-derived Foliage Projected Cover (FPC)
- Algorithms and draft products generated
  - 2007
- Final product
  - Delivered August, 2009
  - 2008 (Requires 2008 Landsat FPC coverage)
- No additional datasets required
  - Some missing strips.
- Product deliverables
  - Contributions towards growth stage map
- Other info
  - Links with land cover change datasets

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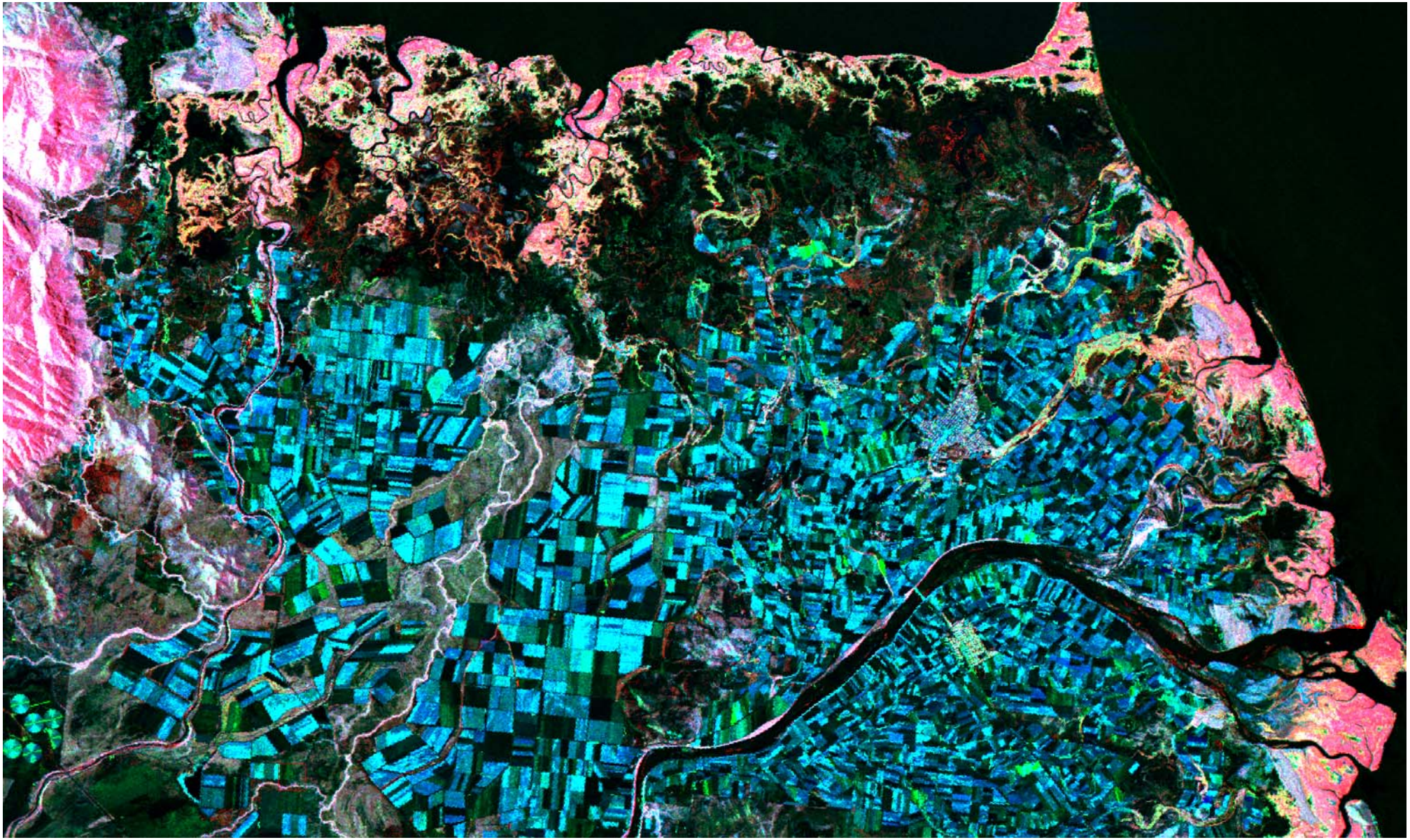

ALOS

K&C Initiative

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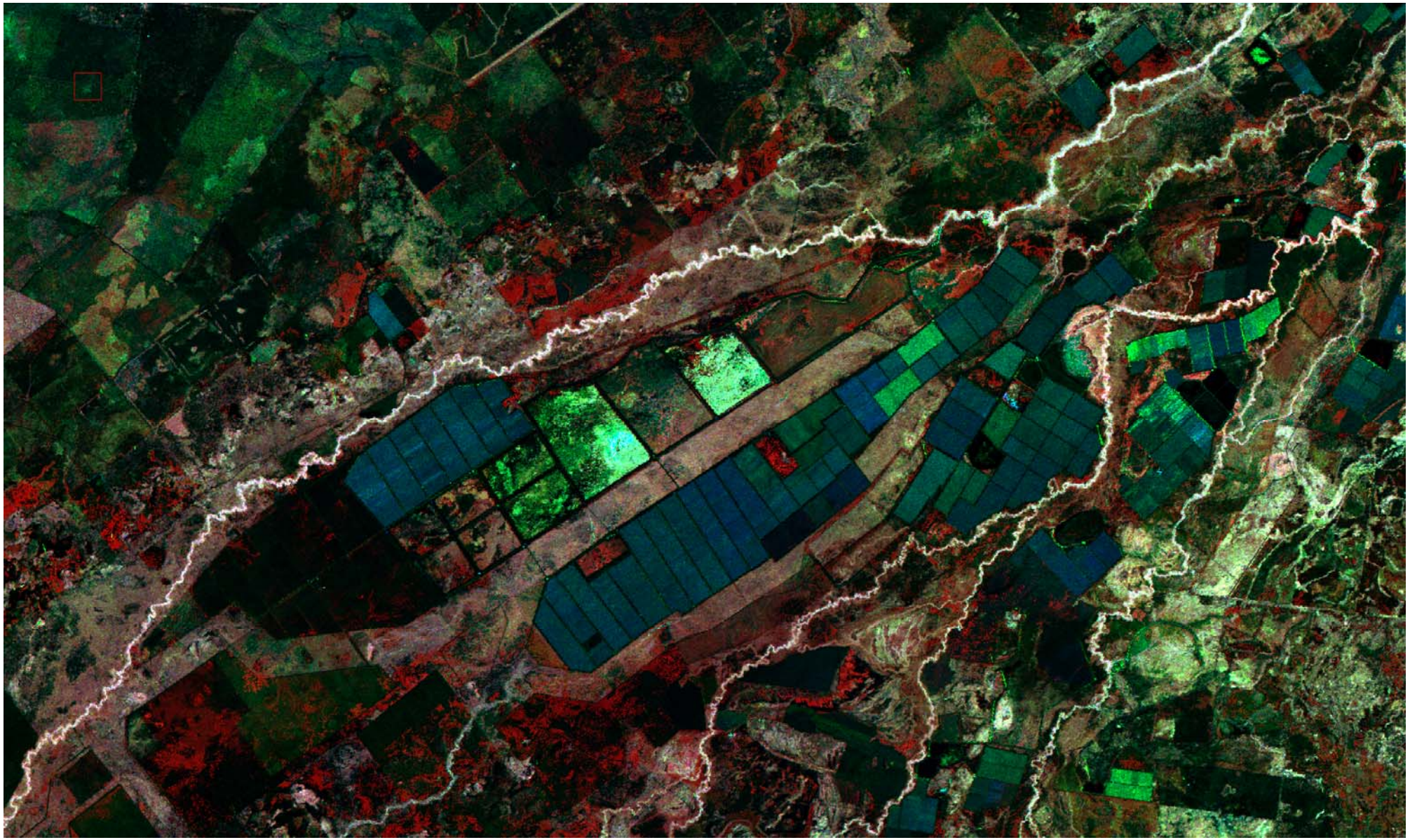

ALOS

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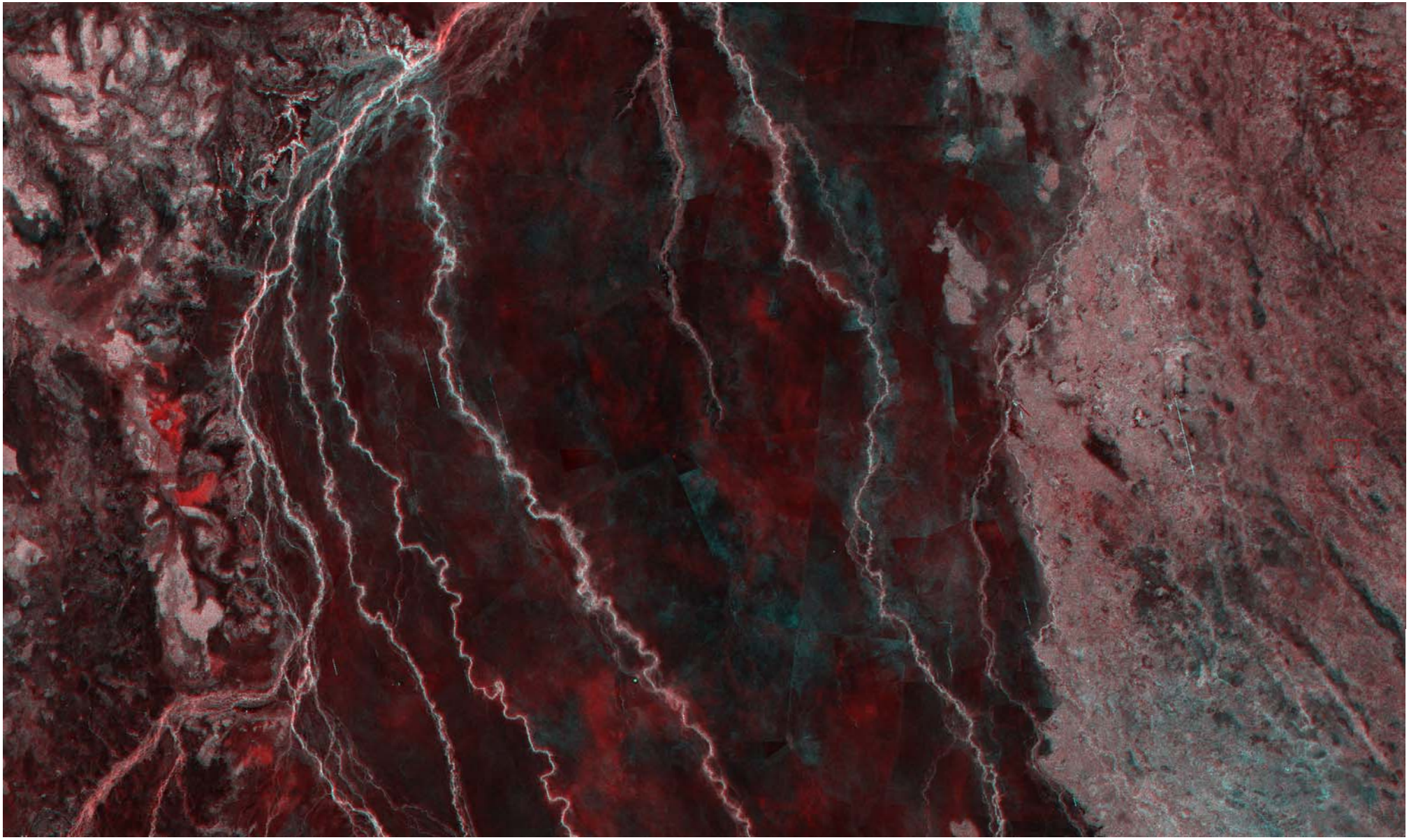

ALOS

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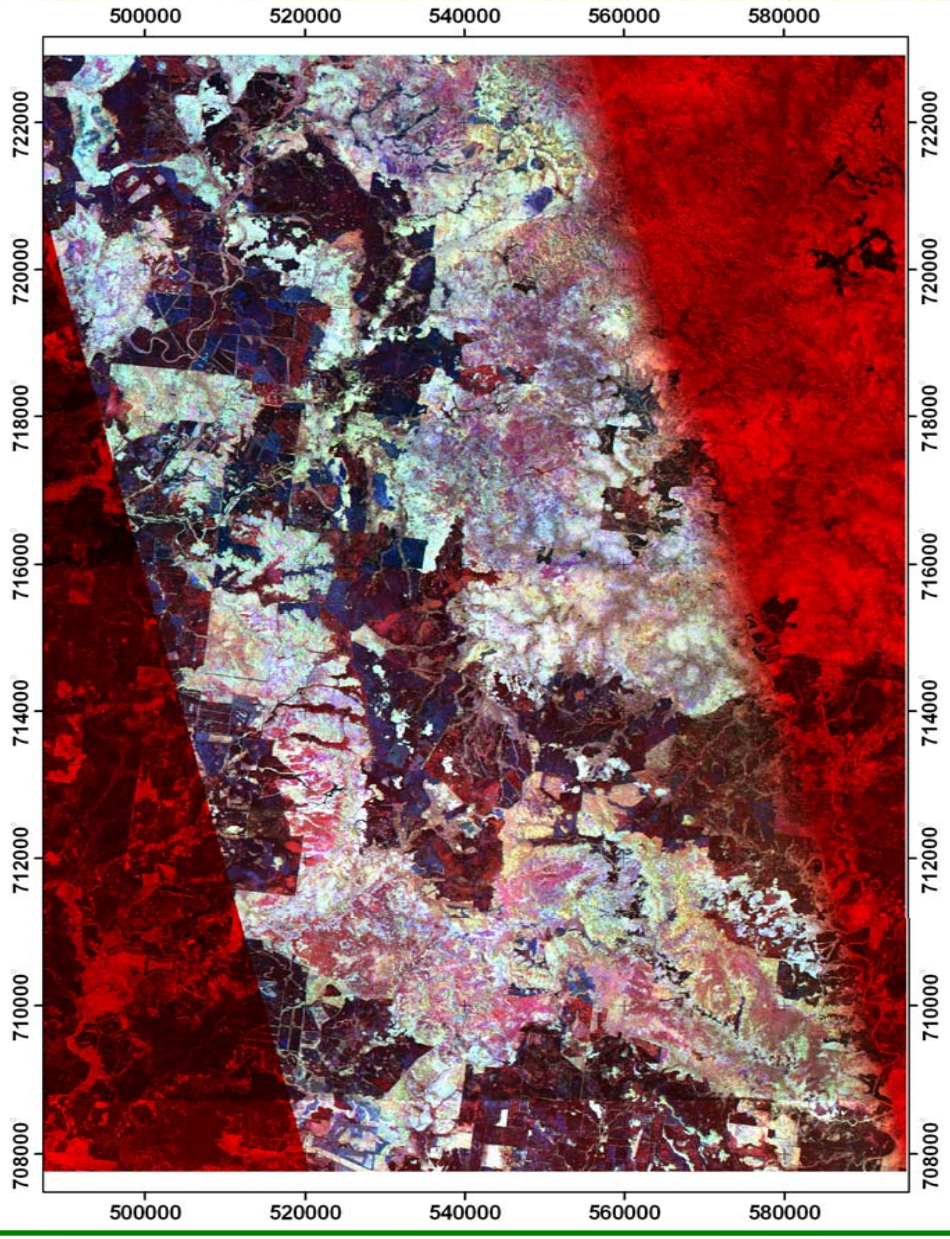
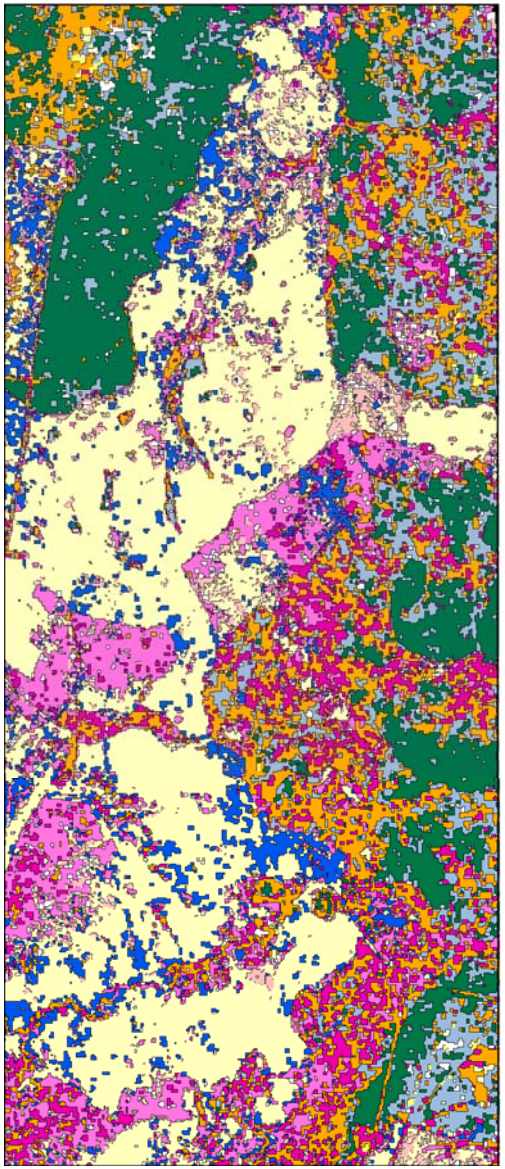




Legend

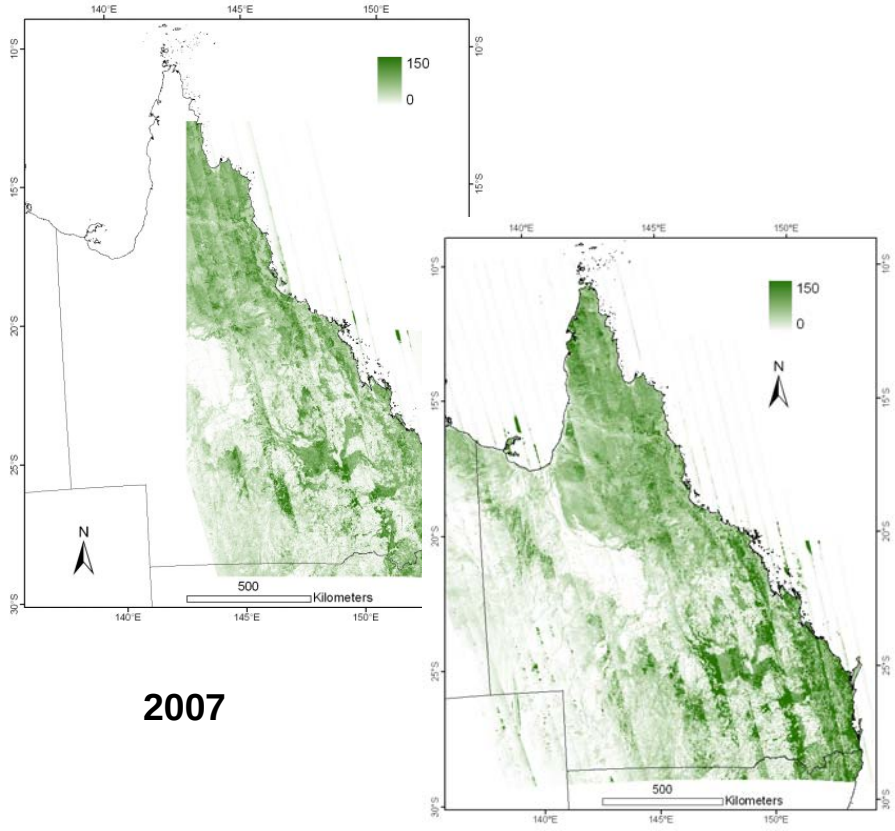
- Acacia
- Background
- Callitris pine
- Dead standing trees
- Early regrowth
- Eucalyptus
- Forest
- Ironbark
- Late regrowth
- Medium regrowth
- Non-forest
- Regrowth

Structural Classification

(Contribution towards Growth stage Classification)

1b) Detection of annual change in forest structure

- Time series comparison of ALOS PALSAR data
  - 2007 and 2008 biomass maps
- Algorithms and draft products generated
- Final validated product
  - Delivered August, 2009
- No additional datasets required
  - Some missing strips
  - Implementation of better within and between strip correction
- Product deliverables
  - Forest biomass change (based on comparison of biomass maps generated using ALOS PALSAR data for 2007 and 2008).
- Other info
  - Links with land cover change datasets and forest structural maps



2007

2008

PRIFYSGOL ABERYSTWYTH UNIVERSITY

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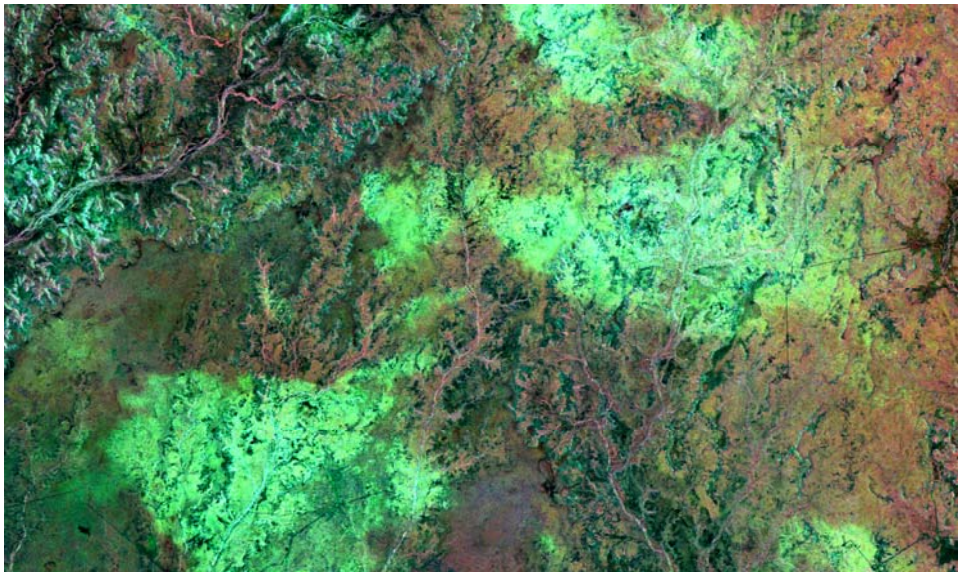

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- Other info
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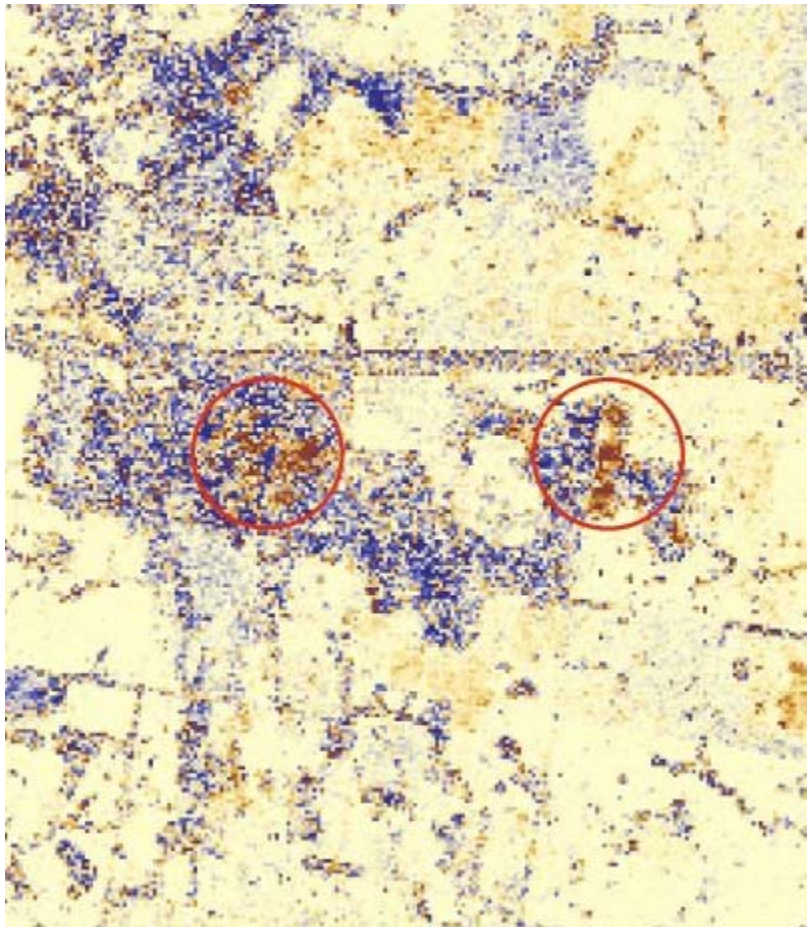

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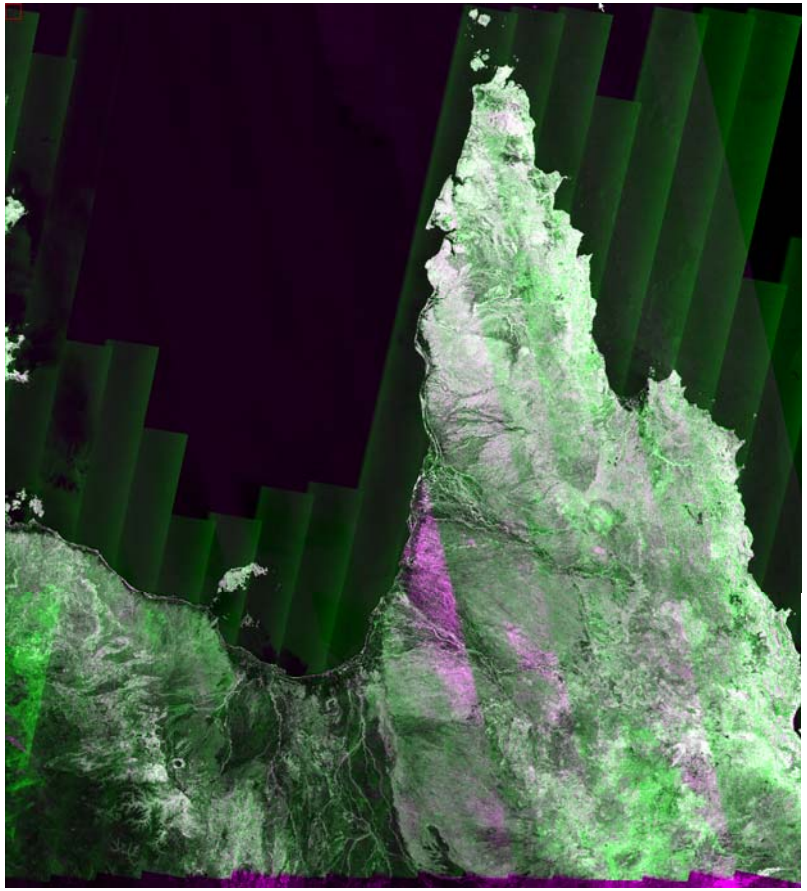
1b) Detection of decadal change in forest extent and structure

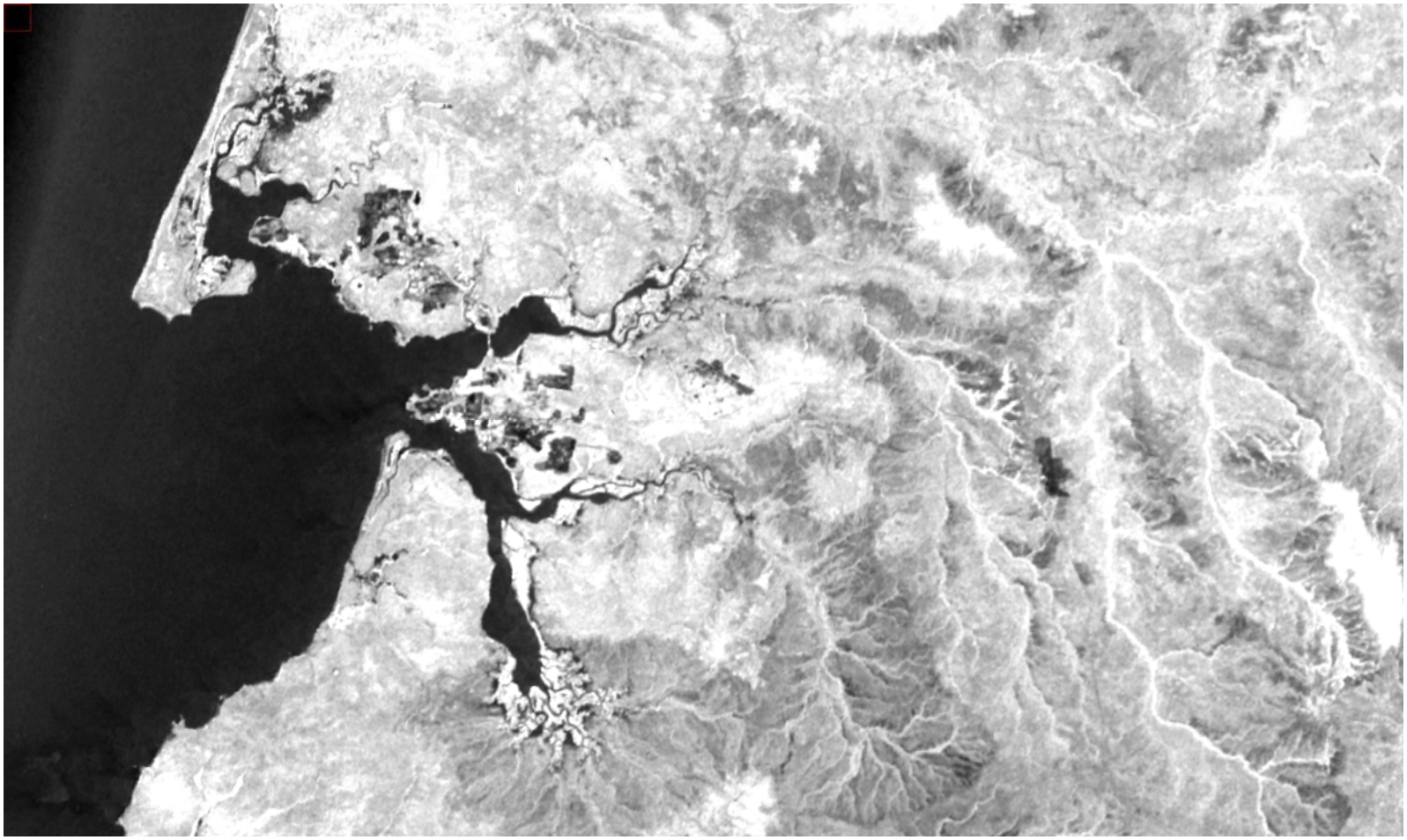
- Time-series comparison of JERS-1 SAR and ALOS PALSAR data
- Algorithms and draft products generated
  - Preliminary JERS-1 SAR/ALOS PALSAR comparisons undertaken
- Final product
  - Delivered August, 2009
- No additional datasets required
  - Implementation of better within and between strip correction
- Product deliverables
  - Forest structural change (based on JERS-1 SAR/ALOS PALSAR) comparison
- Other info
  - Links with land cover change datasets and forest structural maps
  - Lack of HV data (JERS-1) and coverage south of 10ºS



ALOS (R), JERS (G), ALOS (B)

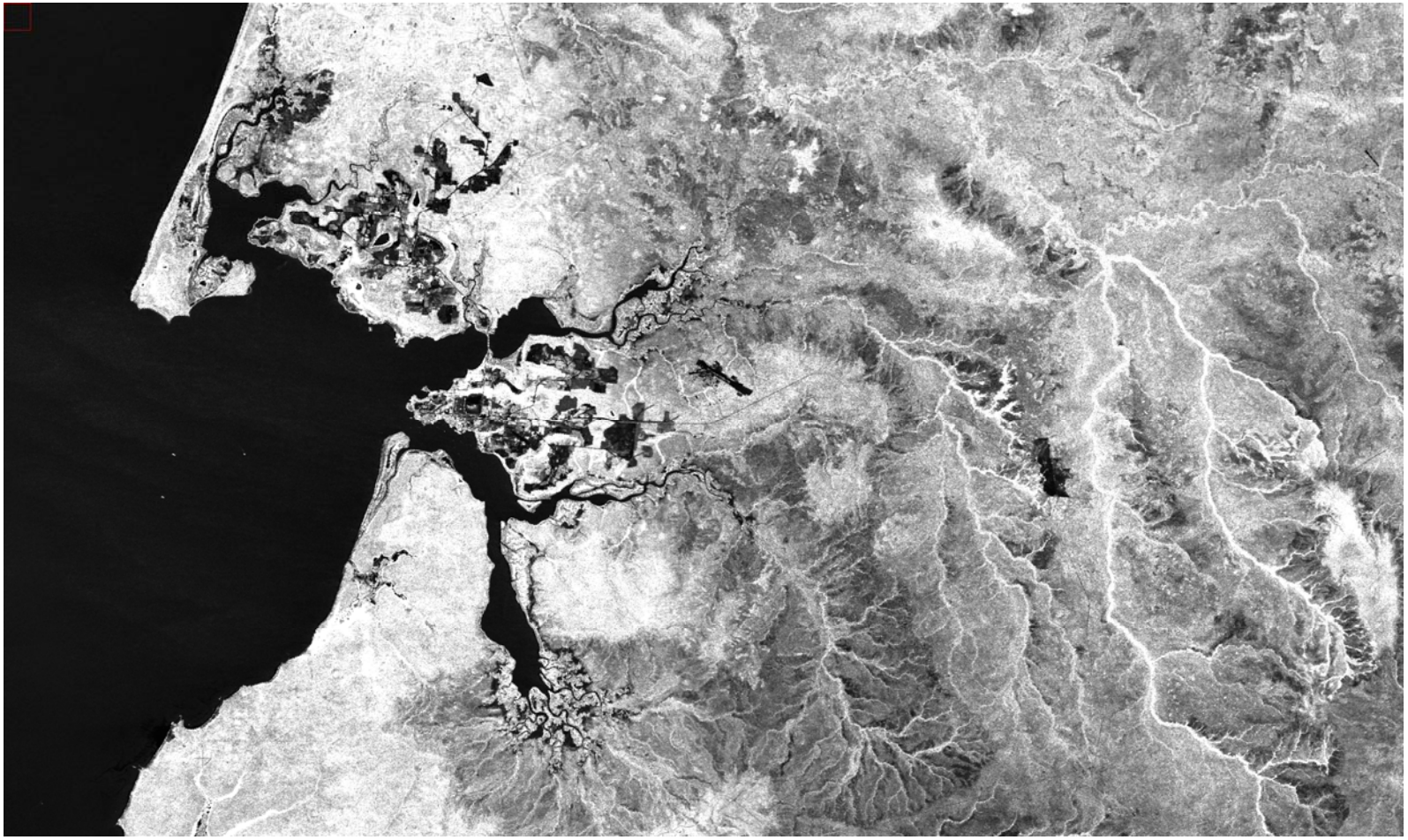
PRIFYSGOL ABERYSTWYTH UNIVERSITY

1b) Detection of decadal change in forest structure



JERS-1 SAR data (1996)

1b) Detection of decadal change in forest structure



ALOS PALSAR data (2008)

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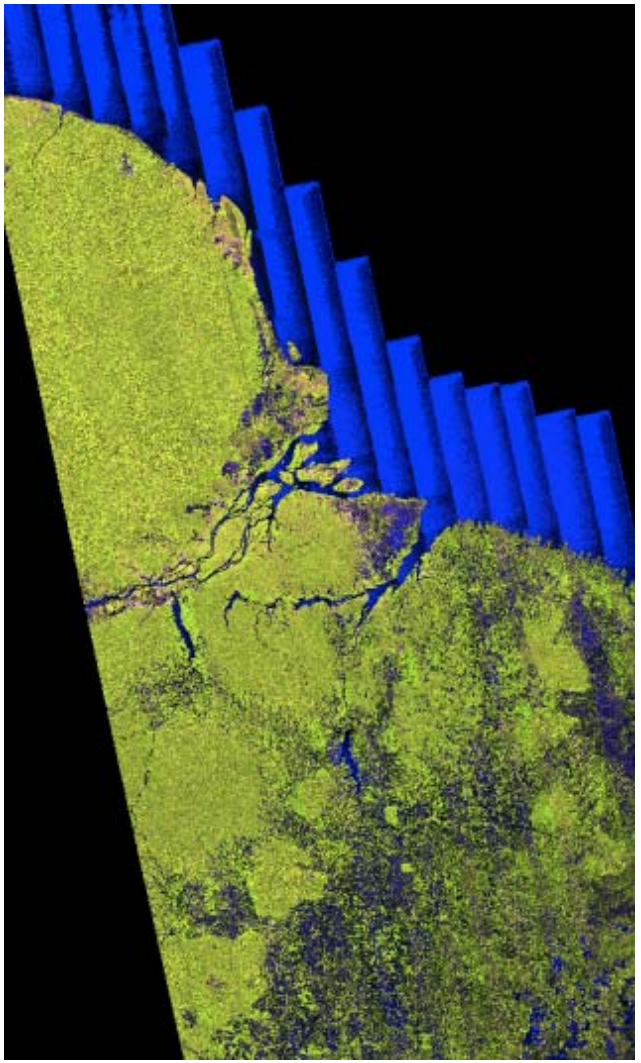
1a) General of annual to decadal changes in mangrove extent

- Tropical/subtropical regions
  - Amazon coast (French Guiana and Brazil)
  - Belize
  - Northern Australia
  - South east Asia
- Based on changes from established baselines
- Algorithms and draft products generated
  - Two mosaics (2007 and 2008)
- No additional datasets required
- Product deliverables
  - Maps of mangrove changes
- Other info
  - Provides better understanding of natural and anthropogenic drivers of change



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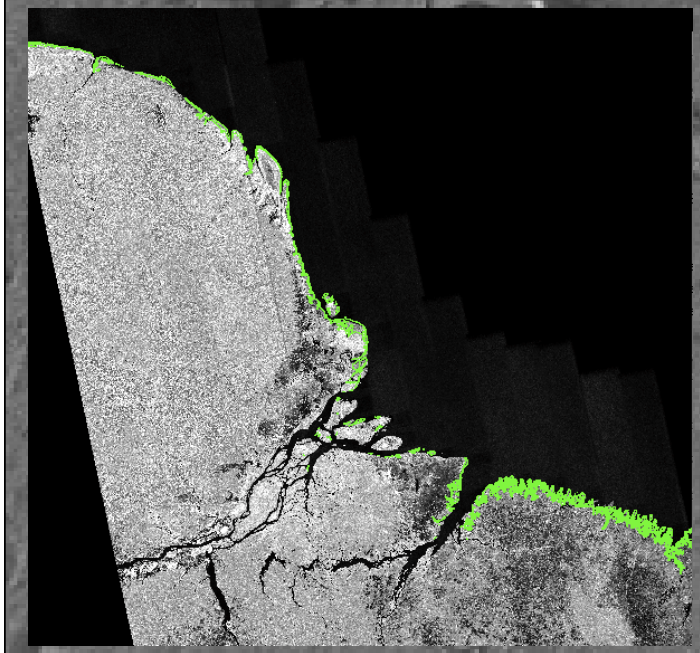
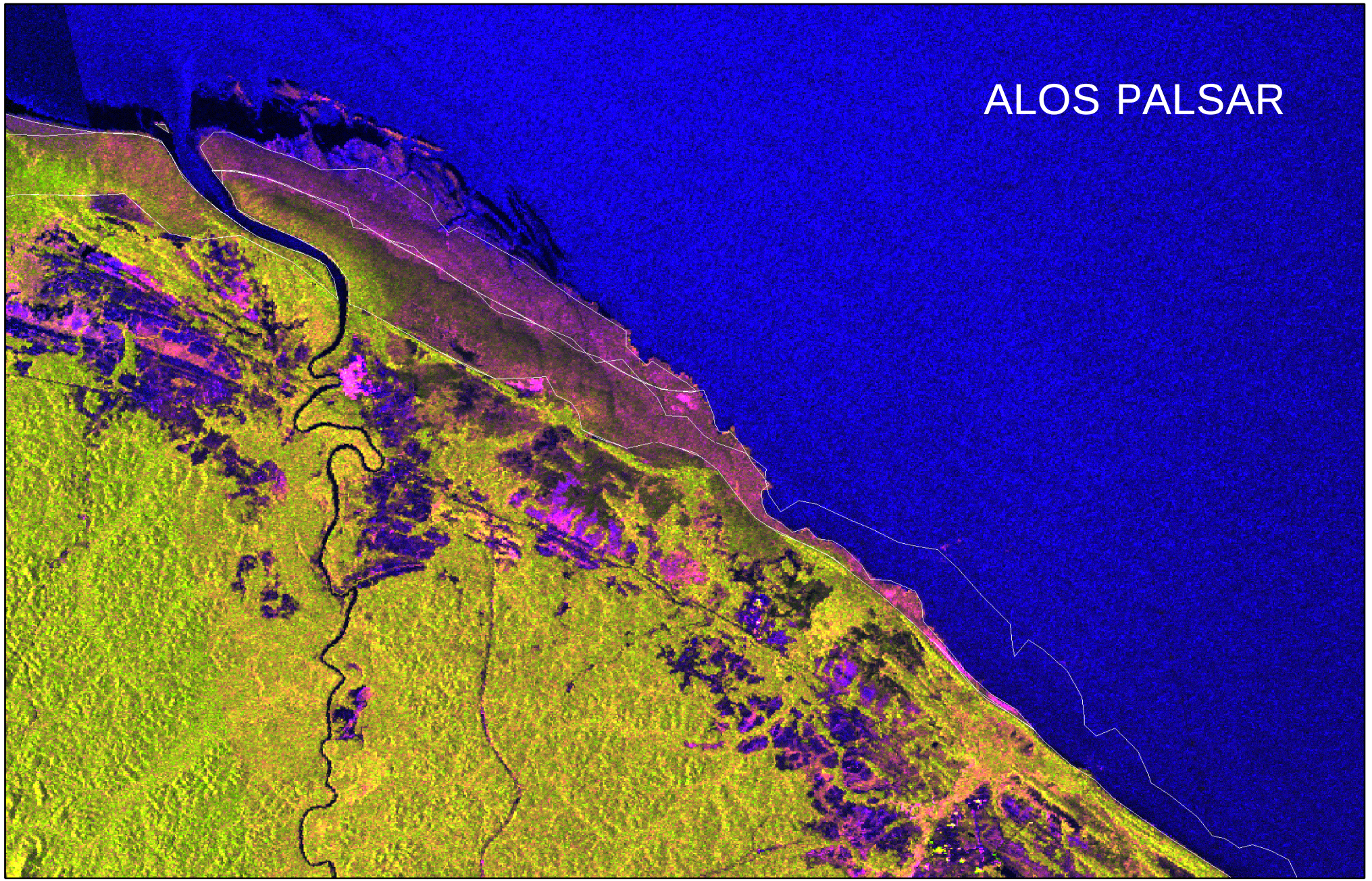
Change in Amazon Coast Mangroves

JERS-1 SAR




ALOS PALSAR

ALOS

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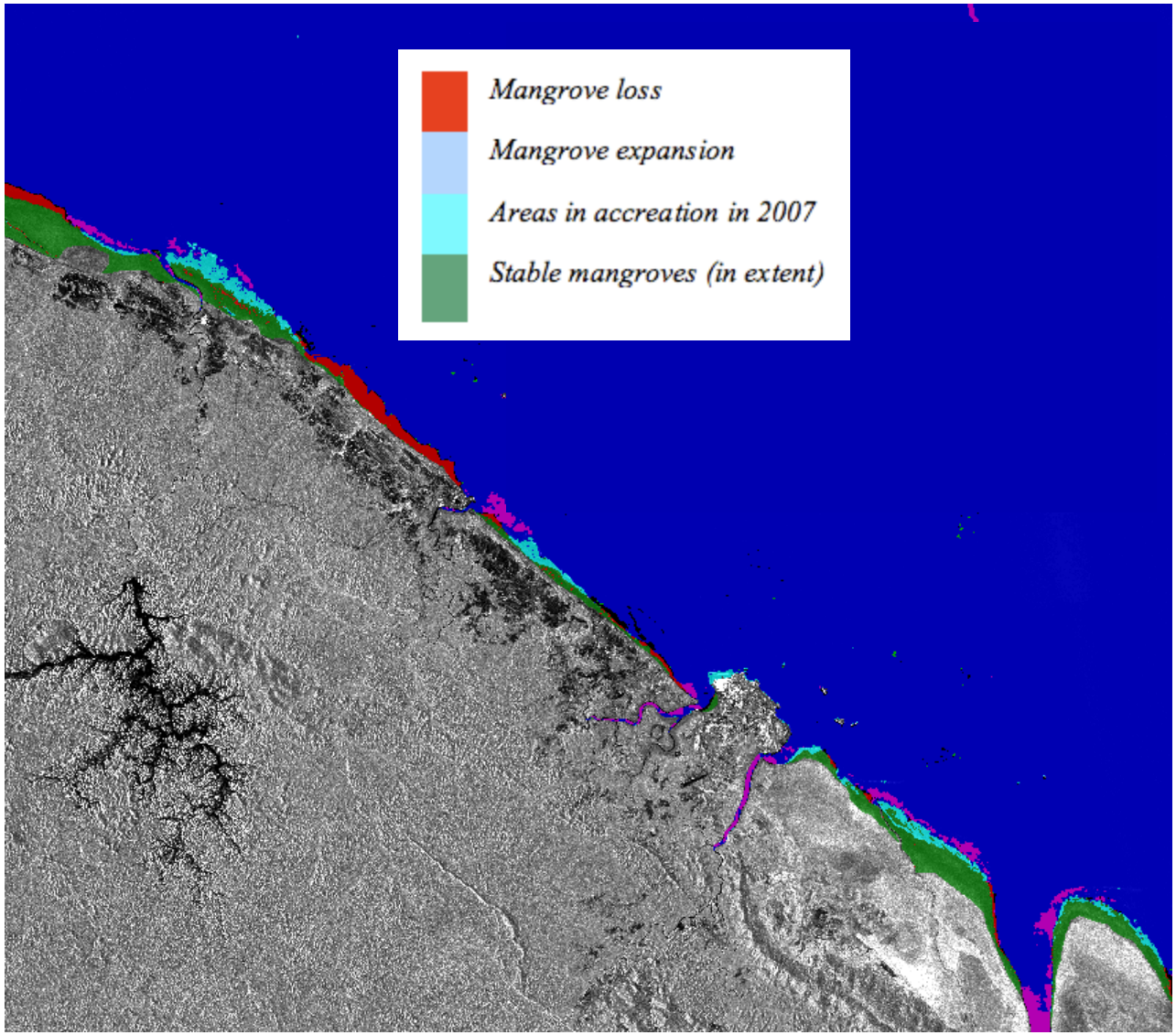
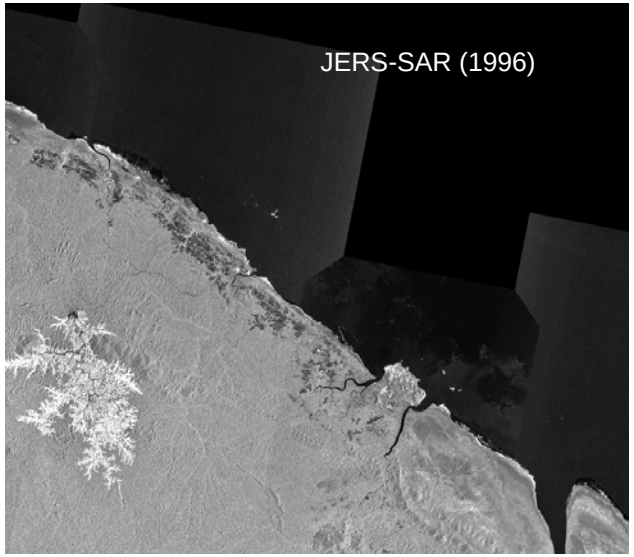
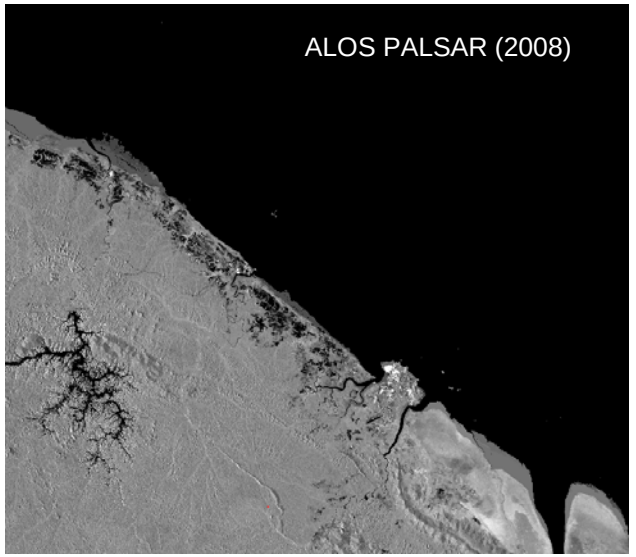
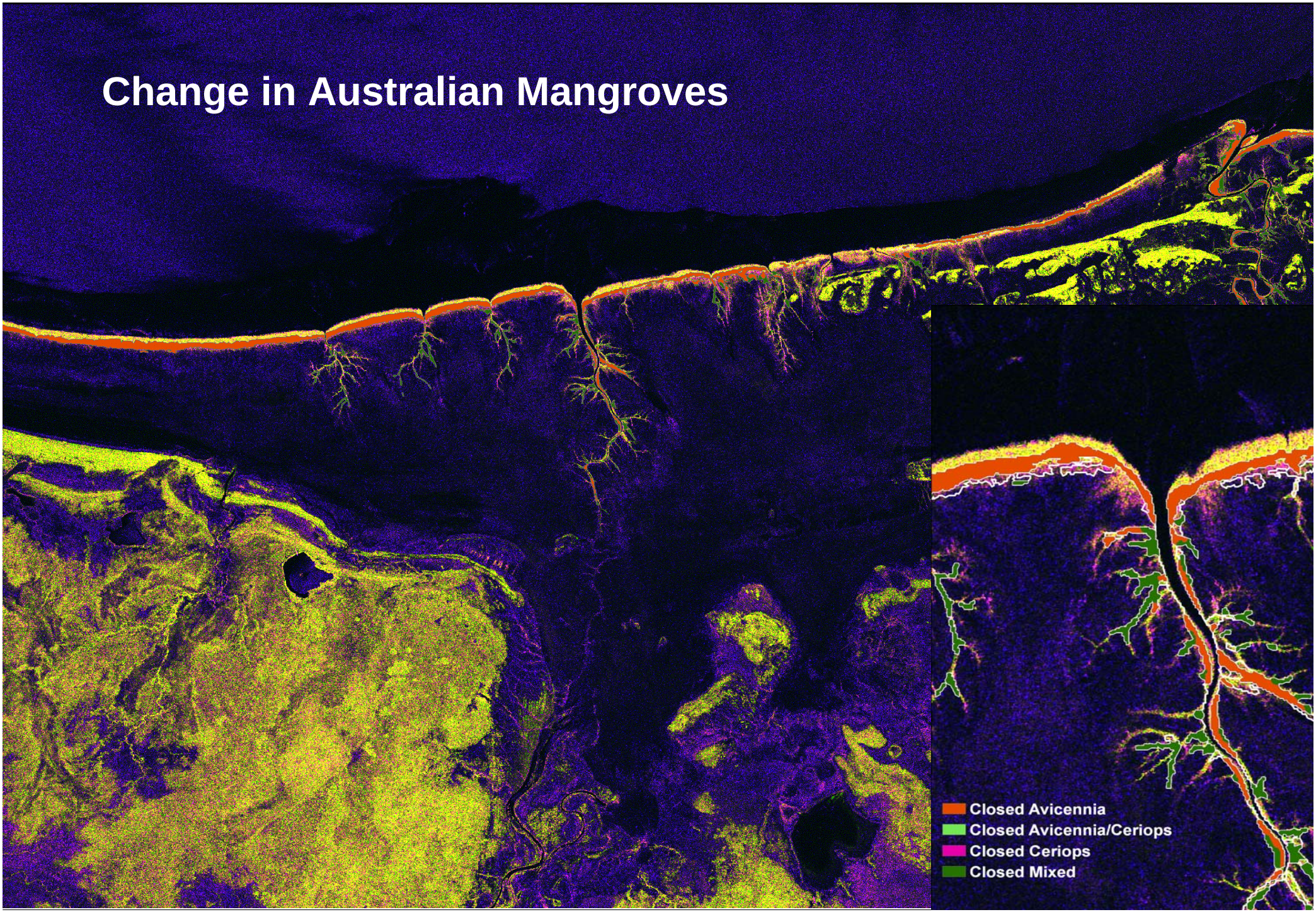






Changes in mangroves along the French Guiana coast (1996 to 2008)

Change in Australian Mangroves



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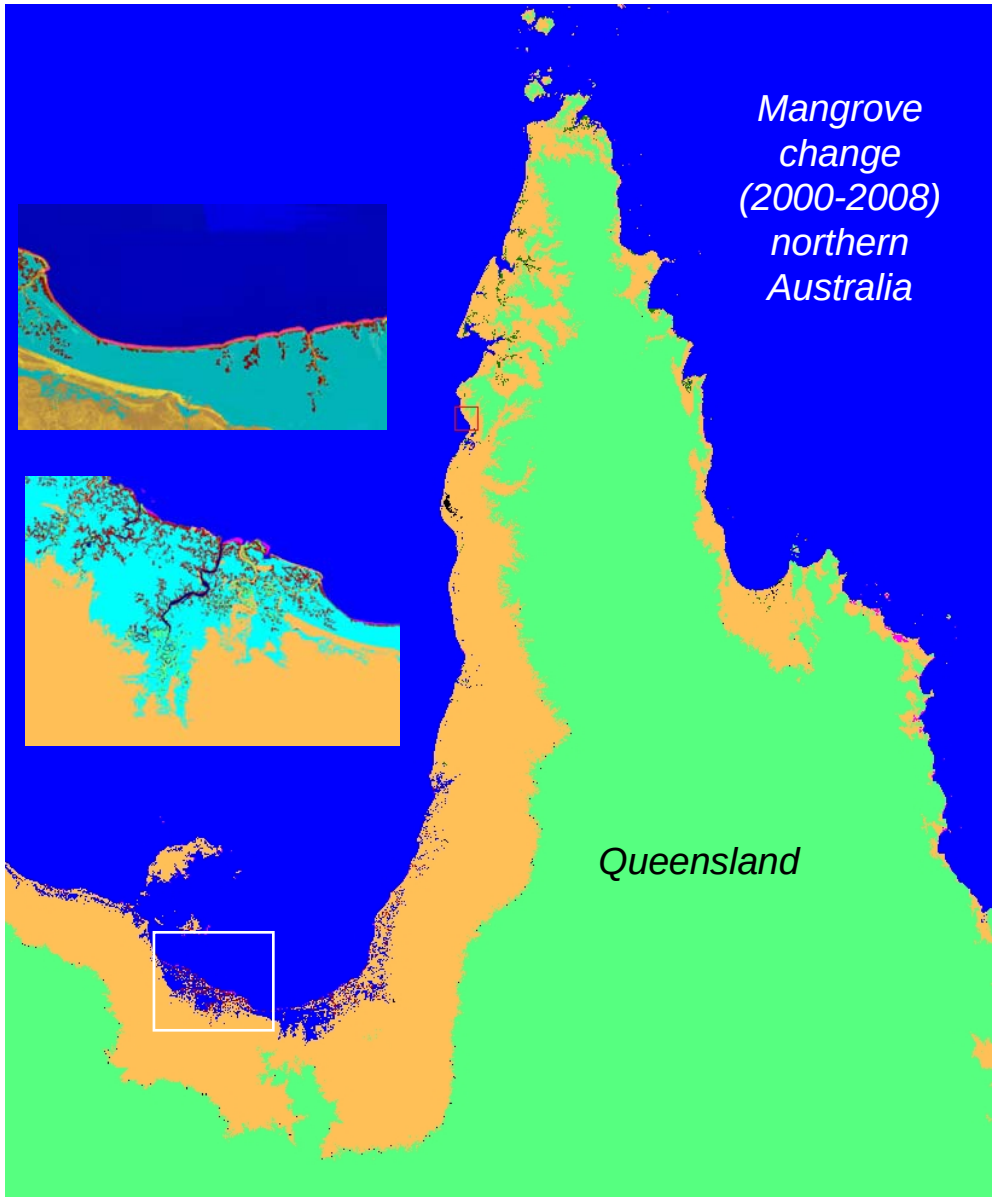
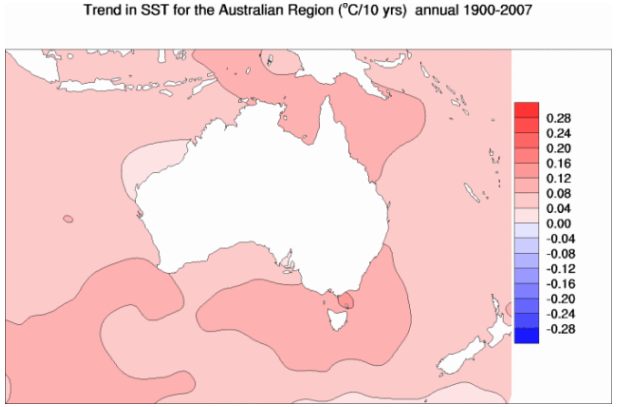
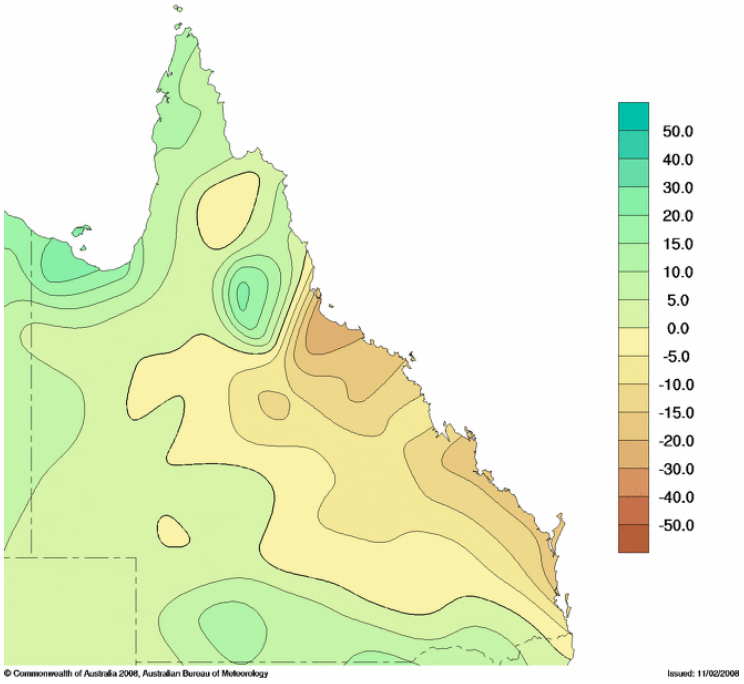
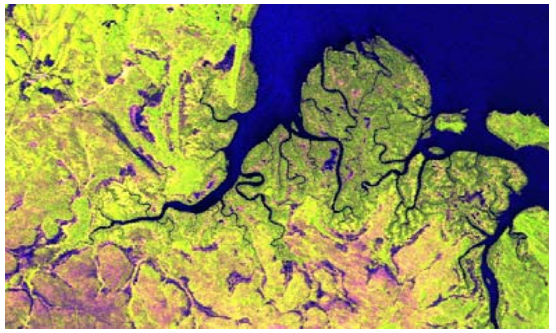




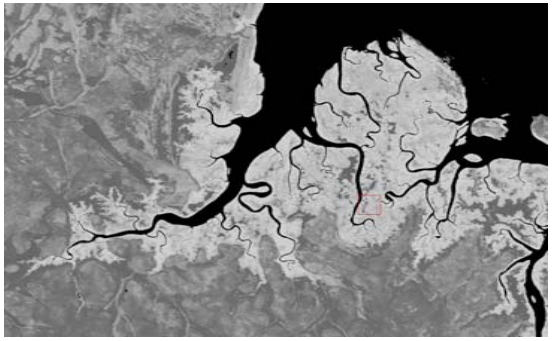


1b) Mangrove structural and relative biomass classes

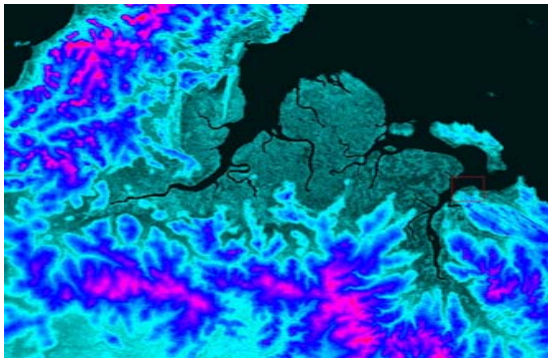
- Segmentation and rule-based classification
  - ALOS PALSAR HH/HV data
  - SRTM height data
  - Landsat-derived FPC
- Algorithms and draft products generated
- No additional datasets required
- Product deliverables
  - Mangrove forest structural classifications (selected regions)
- Other info
  - Links with World Conservation Monitoring Centre (WCMC) global mangrove maps



ALOS



FPC



SRTM

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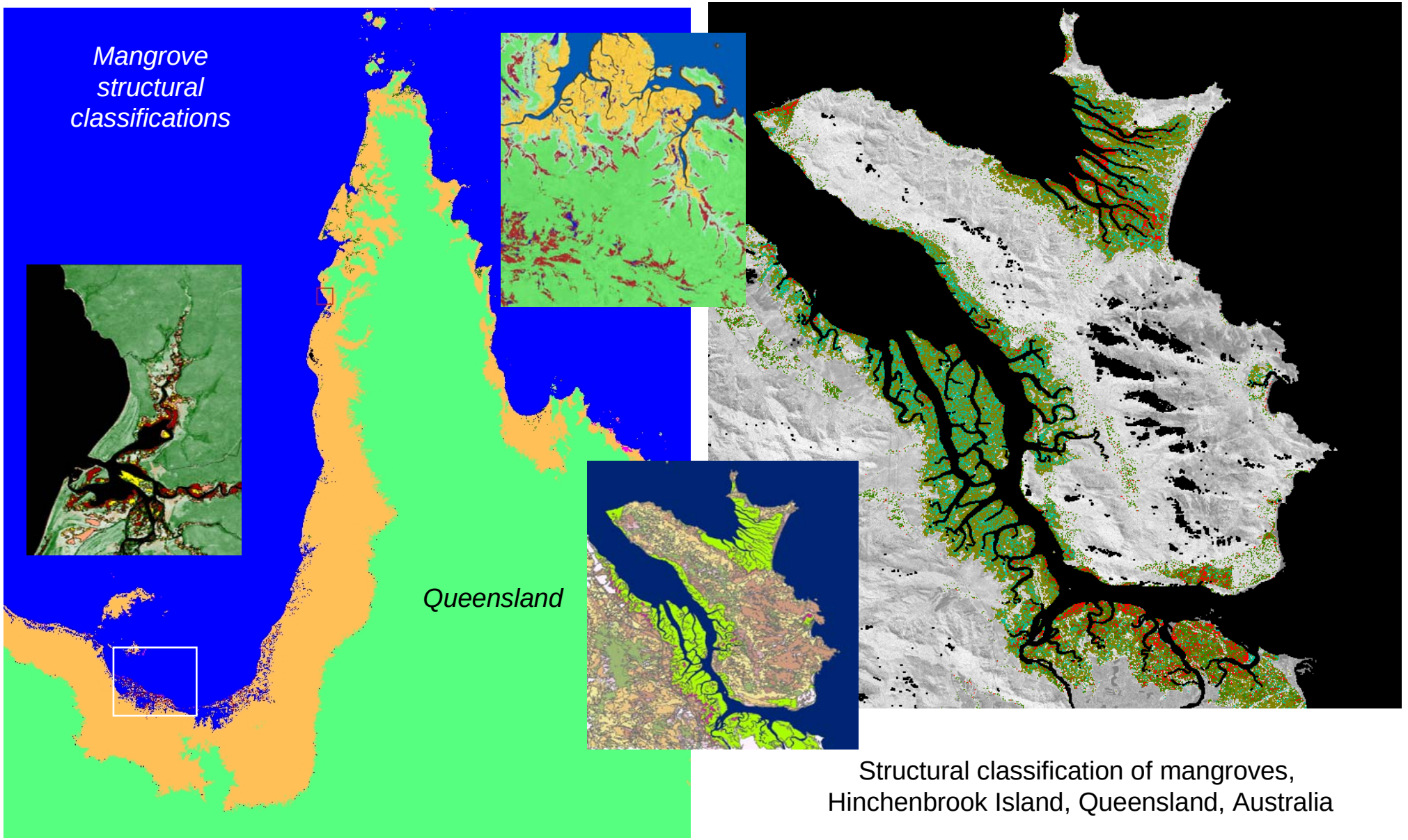
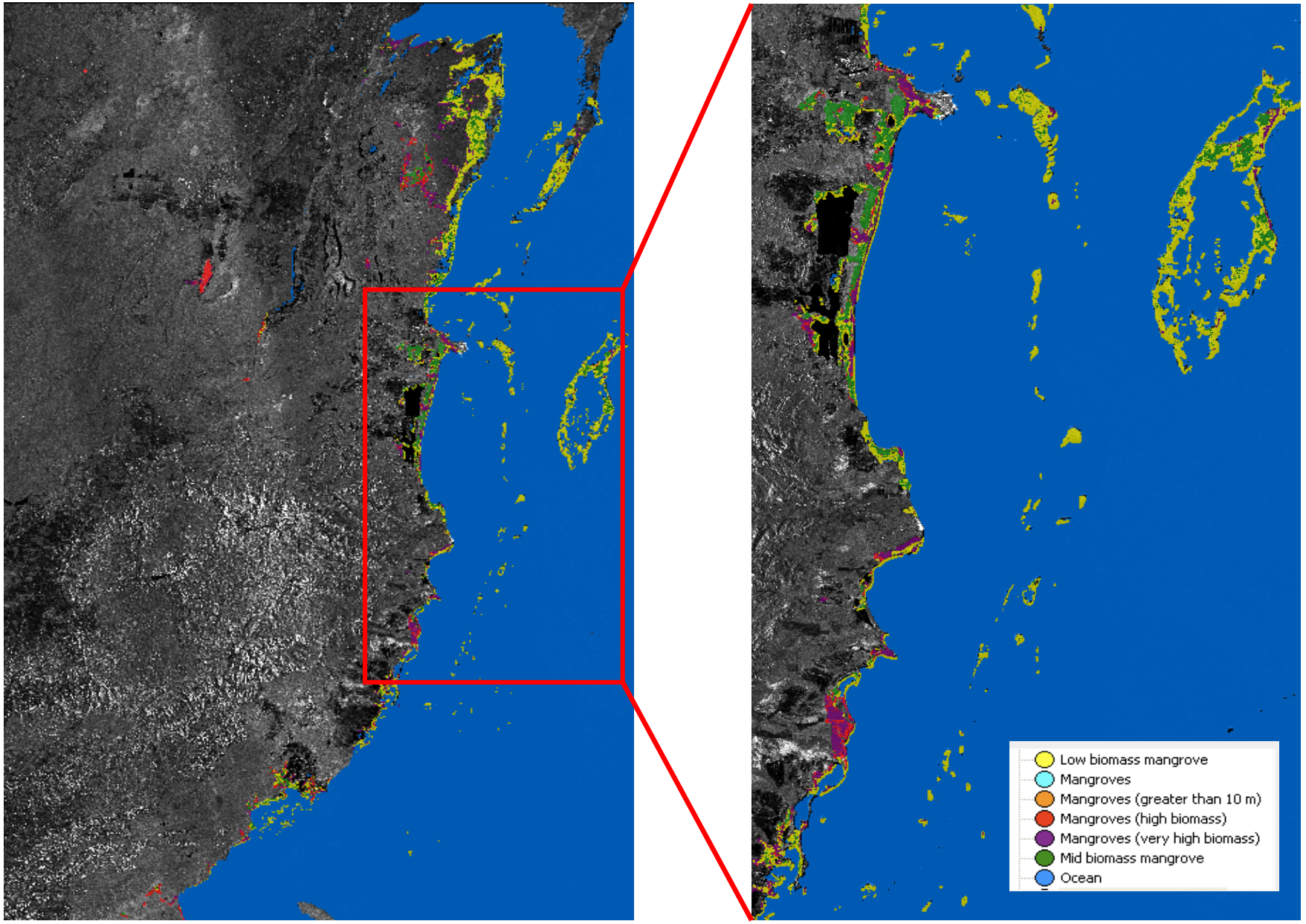
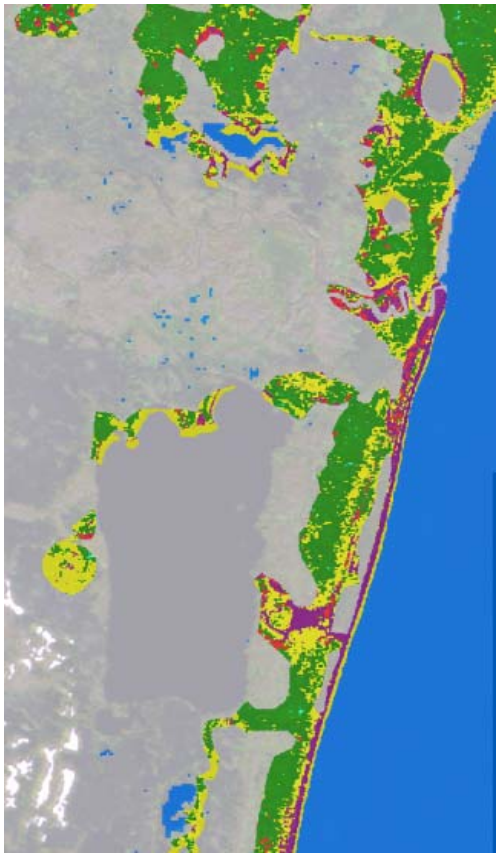


Structural classification of mangroves,
Hinchenbrook Island, Queensland, Australia

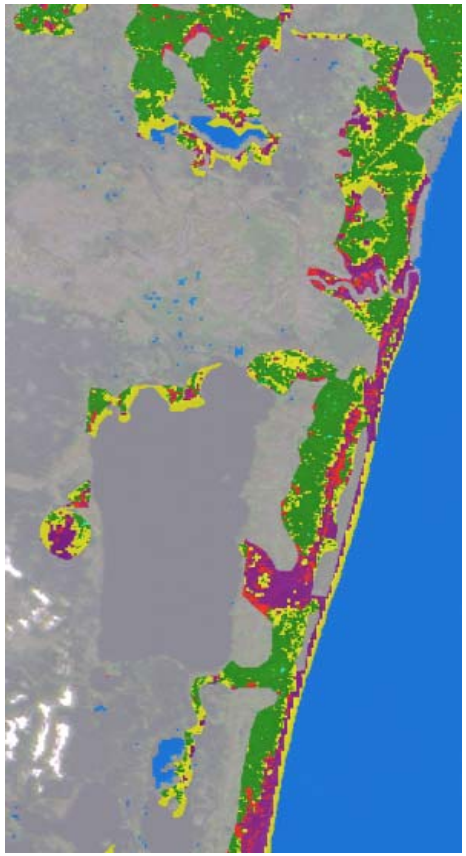
Classification of mangroves, Belize



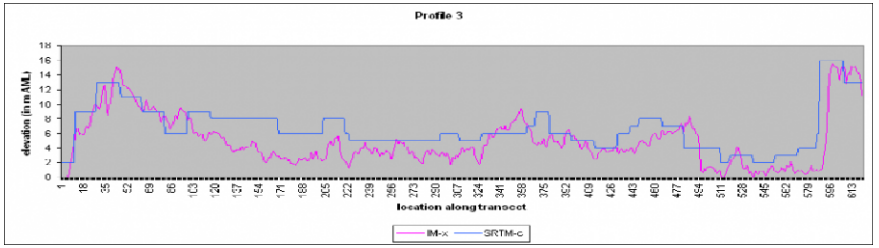
Mangrove Classification, Belize

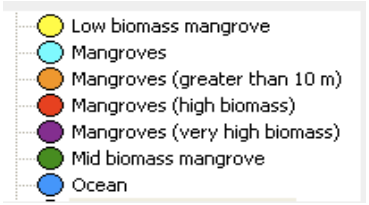


SRTM_derived height



Intermap_derived height





ALOS

Comparison of mangrove distributions

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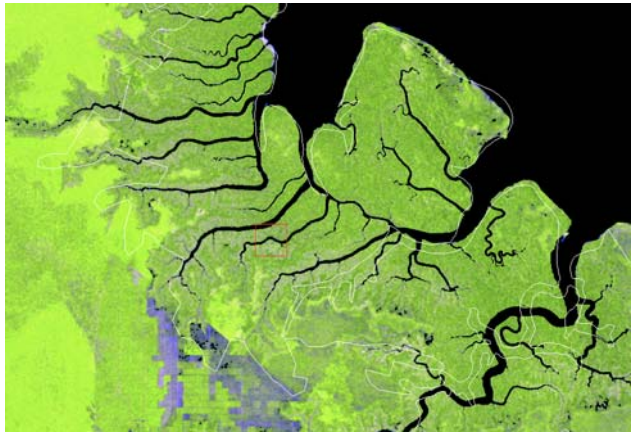
World Conservation Monitoring Centre
Global Mangrove Map



Classification discrepancies

ALOS

Comparison of mangrove distributions, SE Asia

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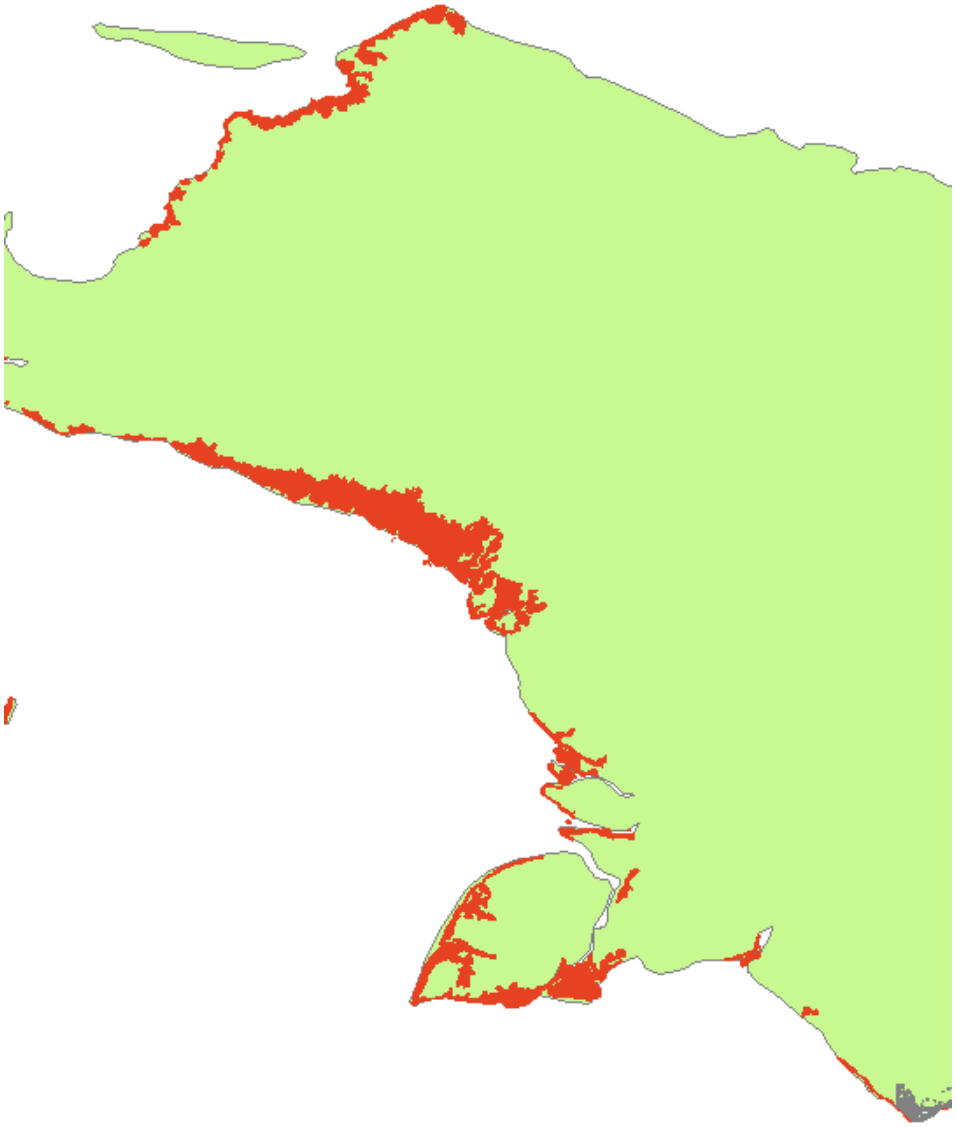
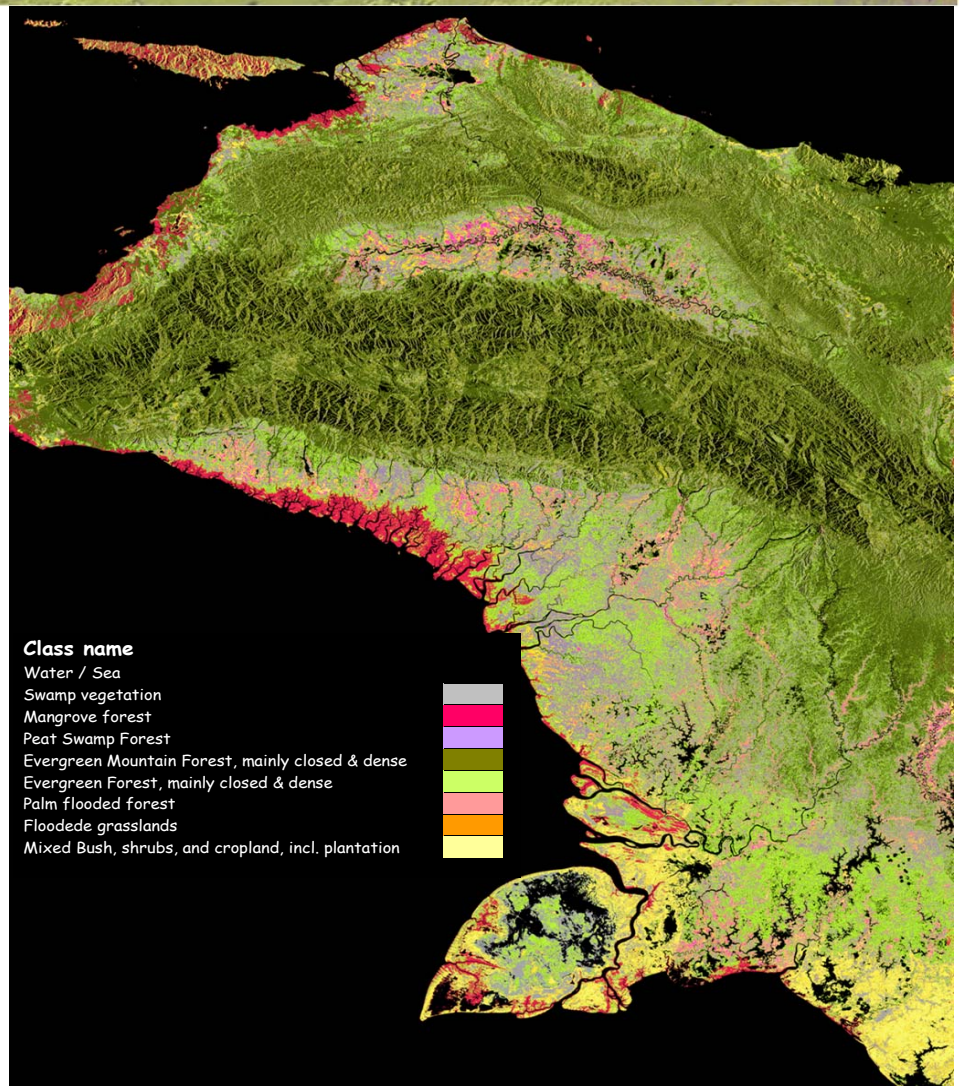


World Conservation Monitoring Centre



SAR Vision Classification

Relevance to the JAXA Kyoto and Carbon (K&C) Initiative

- **Conservation**
  - **Biodiversity and ecosystem restoration**
  - **Mangrove habitats**
- **Carbon**
  - **Biomass stocks and changes in stocks**
- **Conventions**
  - **UNFCCC, Kyoto Protocol and REDD**
  - **CBD**

Acknowledgements

- Everyone at the Japanese Space Exploration Agency (JAXA) and the Kyoto and Carbon Initiative
- Joao Carreiras, Tropical Research Institute, Portugal
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- Karin Viergever/Iain Woodhouse, University of Edinburgh, Edinburgh, UK.
- Christophe Proisy, IRD/UMR AMAP, Montpelier, France.
- Pedro Walfir, Universidade Federal do Para, Brazil.
- Anthea Mitchell/Tony Milne, School of Biological, Earth and Environmental Sciences (BEES), the University of New South Wales, Australia (UNSW).
- Catherine Ticehurst, CSIRO Land and Water, Canberra, Australia.
- Arnon Accad, Queensland Herbarium
- Alex Lee, The School of Resources, Environment and Society (SRES), Australian National University (ANU), including the *WildCountry* Science Project
- Peter Bunting, Dan Clewley and Rachel Bott, The Institute of Geography and Earth Sciences (IGES), University of Wales, Aberystwyth (UWA)
- Queensland Environmental Protection Agency
- Dirk Hoekman, University of Wageningen
- Maurizio Santoro, Gamma Remote Sensing
- Mahta Moghaddam, University of Michigan.