Project objectives

- **Develop methodology for mapping changes in forest cover from ALOS PALSAR data**

- **Generate**
  - **Maps of forest cover**
  - **Maps of forest changes**

- **Product validation and accuracy estimation**

Original focus - temperate forests (UK, France).

Changed because of the much greater importance of tropical forests under the UNFCCC Reduced Emissions from Deforestation and Degradation mechanism

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Focus area: Riau, Sumatra

Fine Beam Dual Polarisation

June 2007
July 2007
August 2007
November 2007

WWF Riau landcover DB 2007

North
South
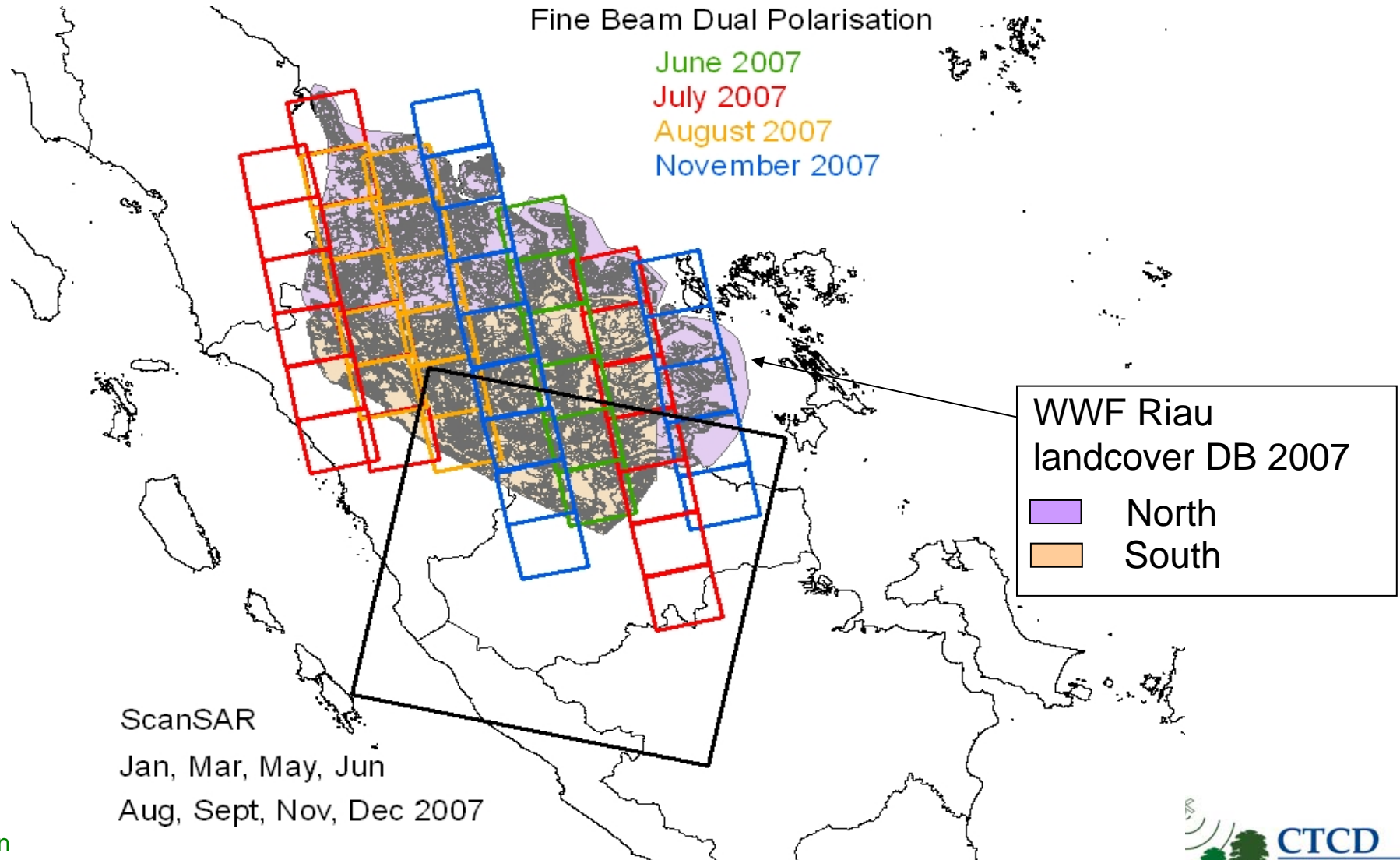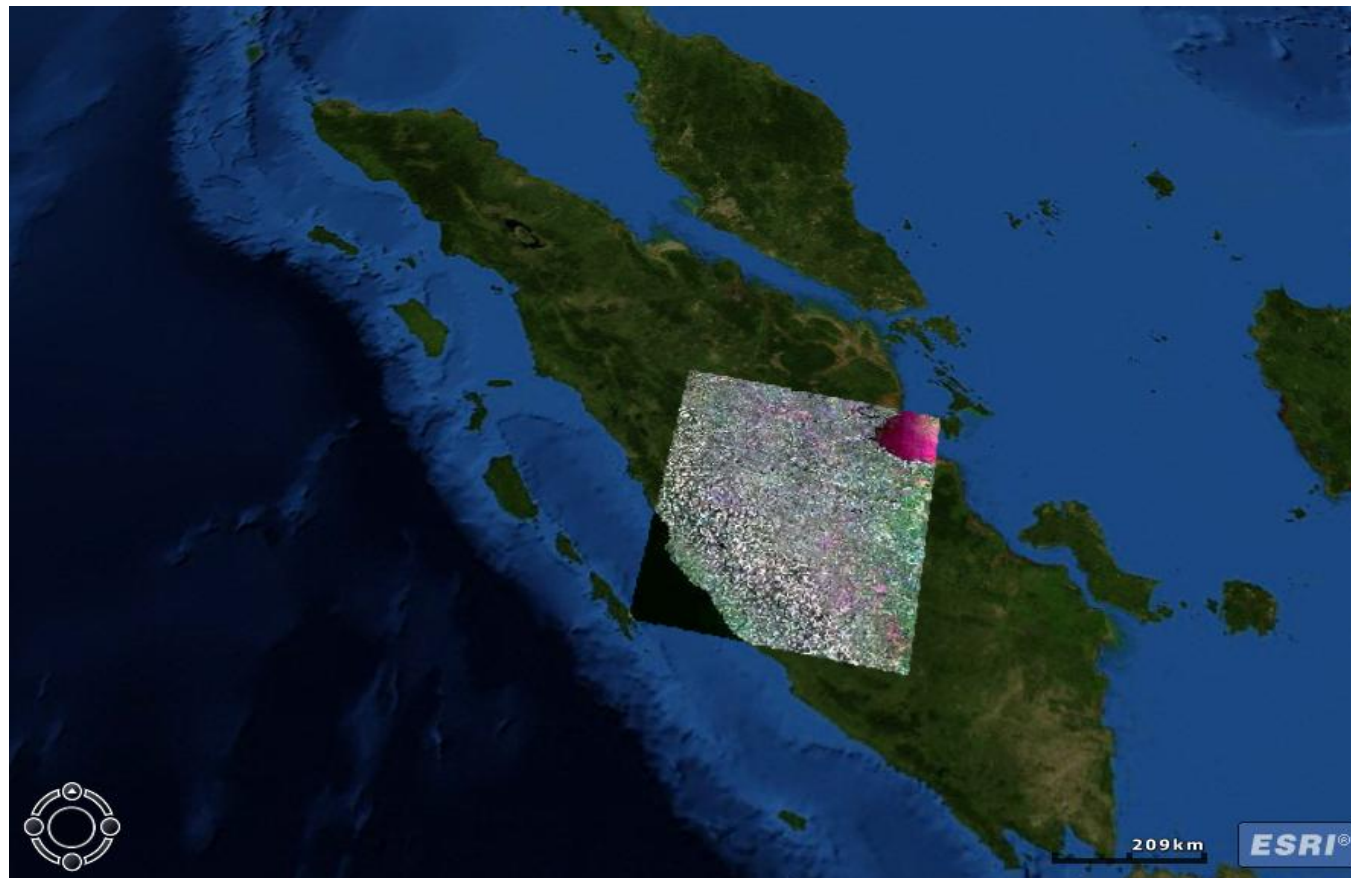
ScanSAR

Jan, Mar, May, Jun

Aug, Sept, Nov, Dec 2007

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Coverage by single ScanSAR image

209km

ESRI®

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WWF database

The image overlaps with the southern portion of the 2007 WWF Riau landcover database.

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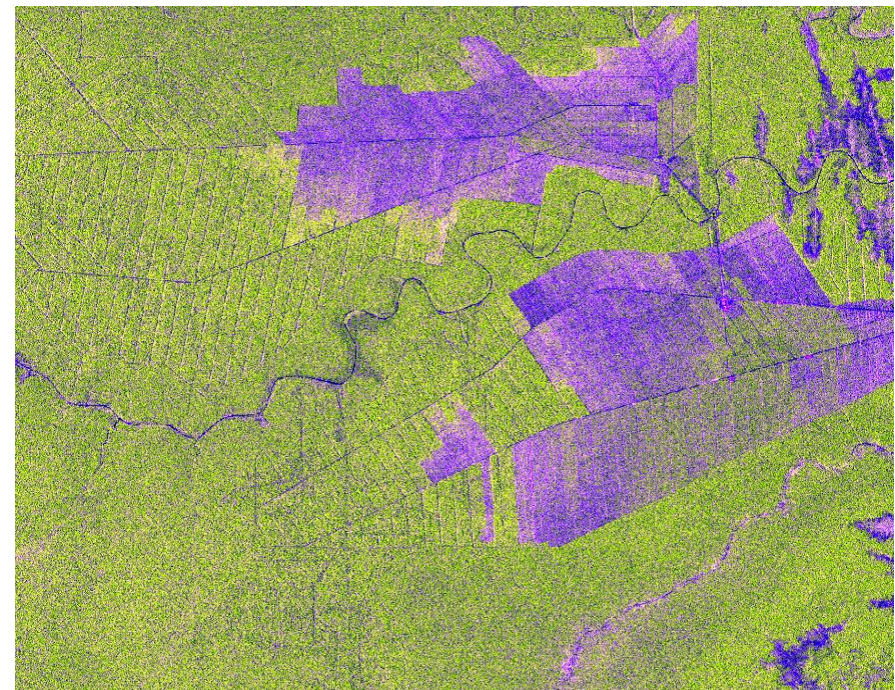Yumiko Uryu, WWF Indonesia

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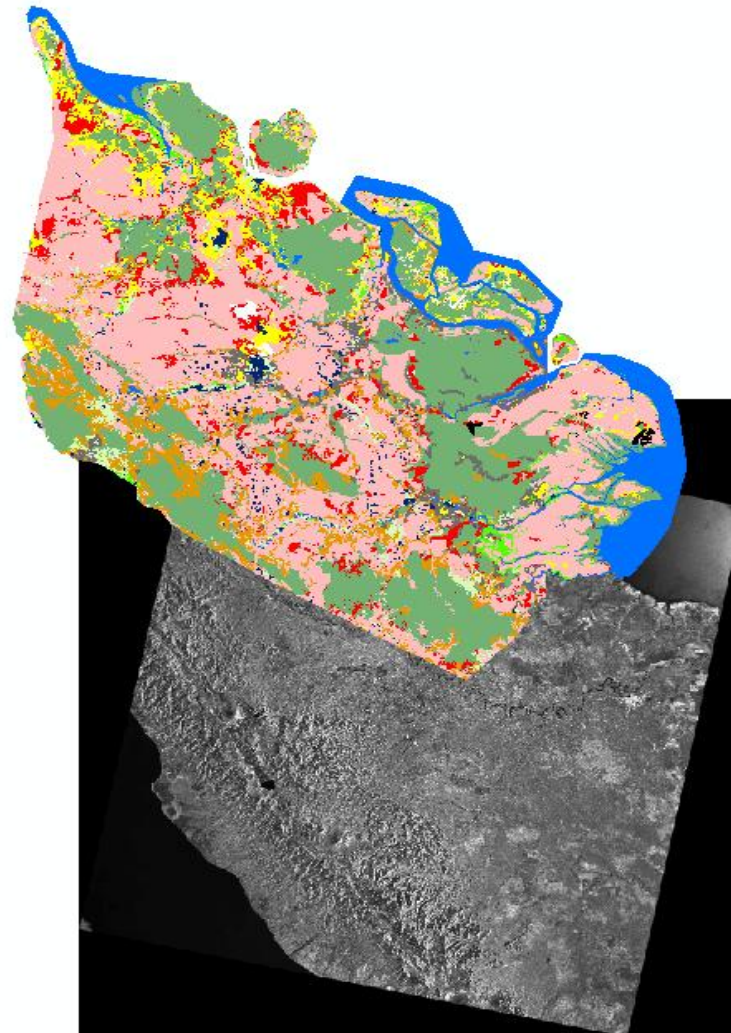
Temporal ScanSAR

Temporal ScanSAR compares well with FBD

Temporal ScanSAR

🟥	Jan
🟩	June
🟦	December

FBD

🟥	HH
🟩	HV
🟦	HH/HV

10 Km

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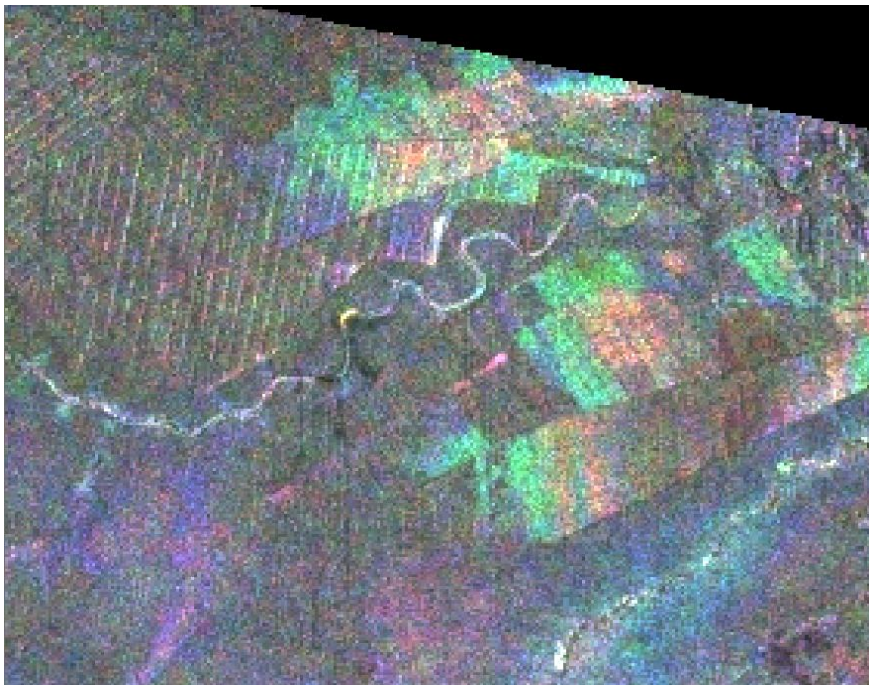
Detecting deforestation by temporal change

WWF designations:

⬚ Cleared	⬚ Plantation	🟩 Paddy fields
⬚ Primary forest	🟨 Shrubs	🟦
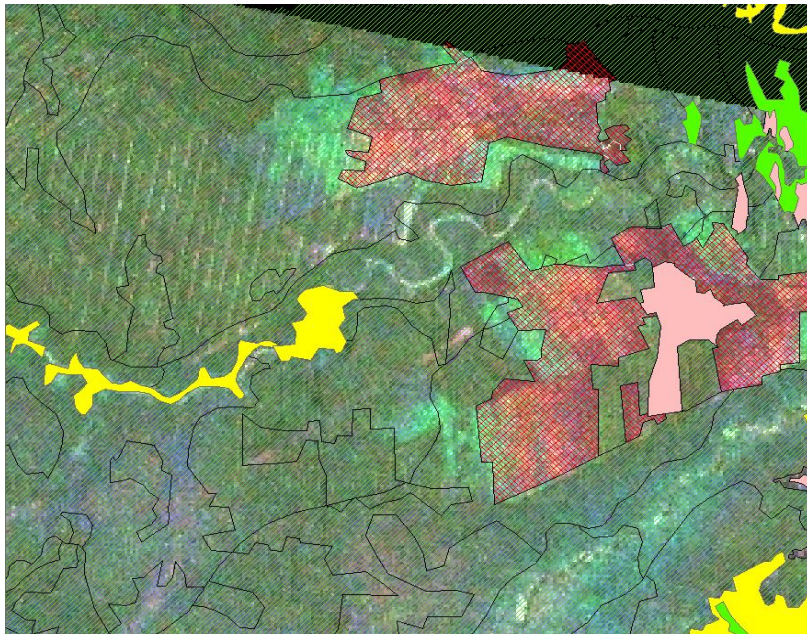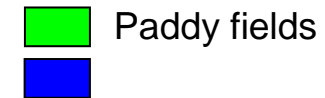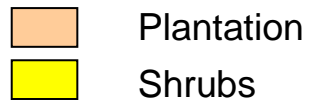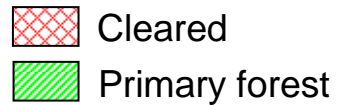
Temporal
ScanSAR

🟥 Jan
🟩 June
🟦 December
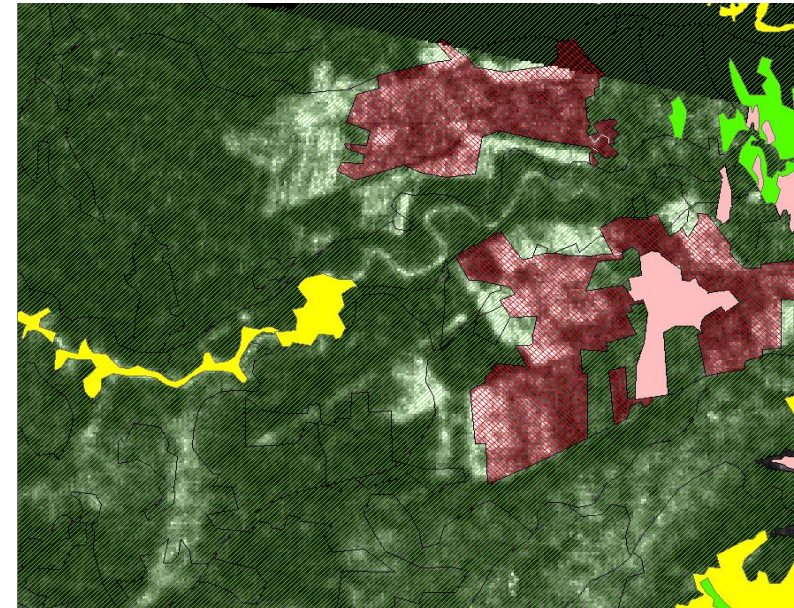
Standard deviation
of 8 Scansar images
from 2007

10 Km

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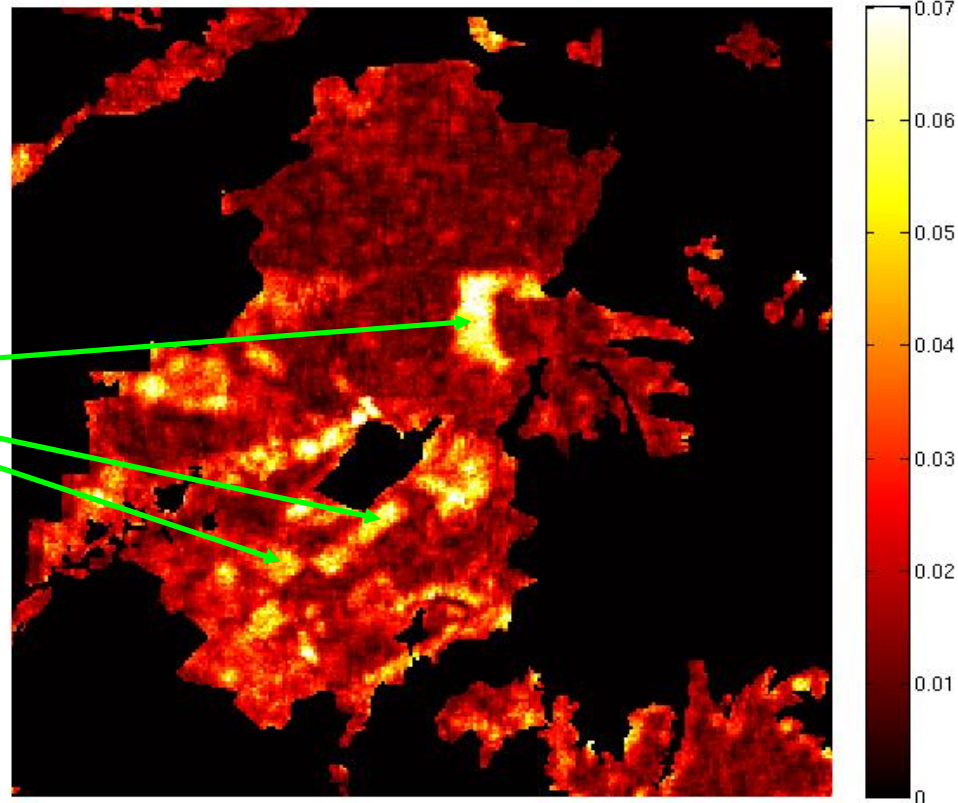Deforested regions

All coloured regions are shown as forest in the WWF database

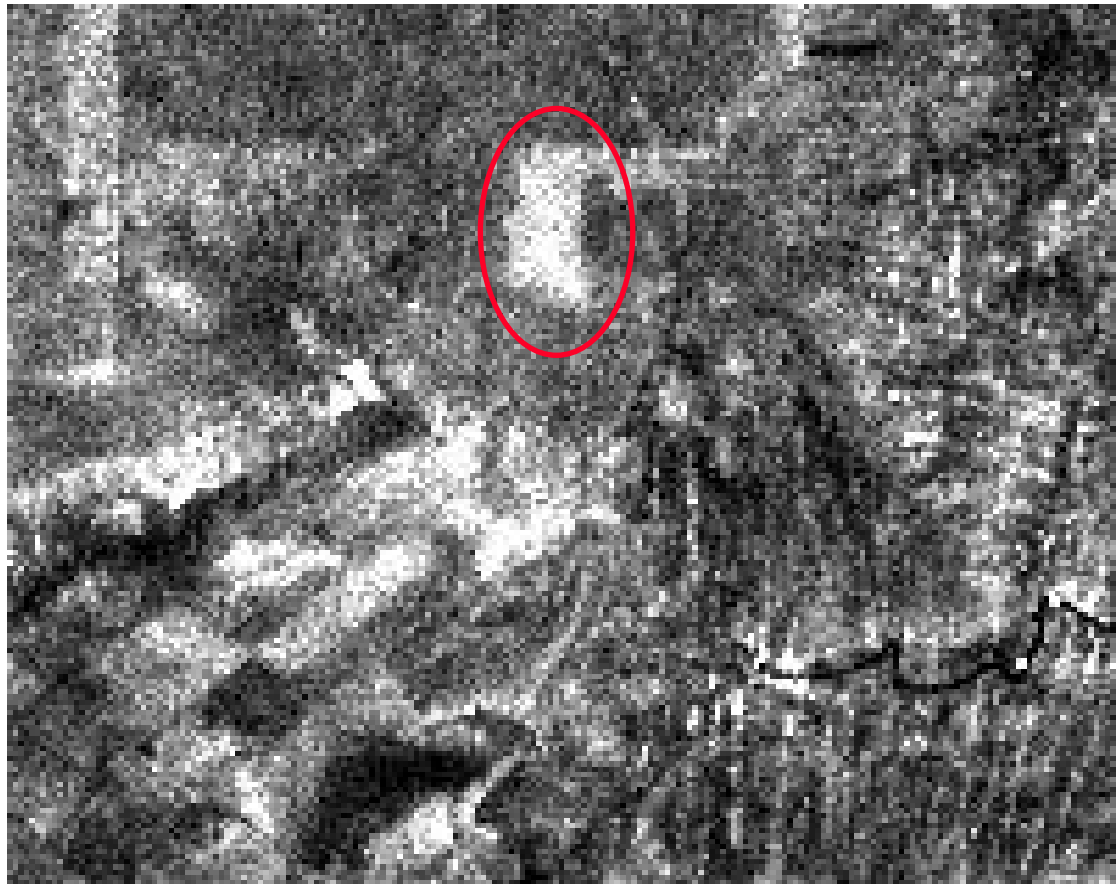These regions with anomalously large intensity deviations are certainly not forest

10 Km

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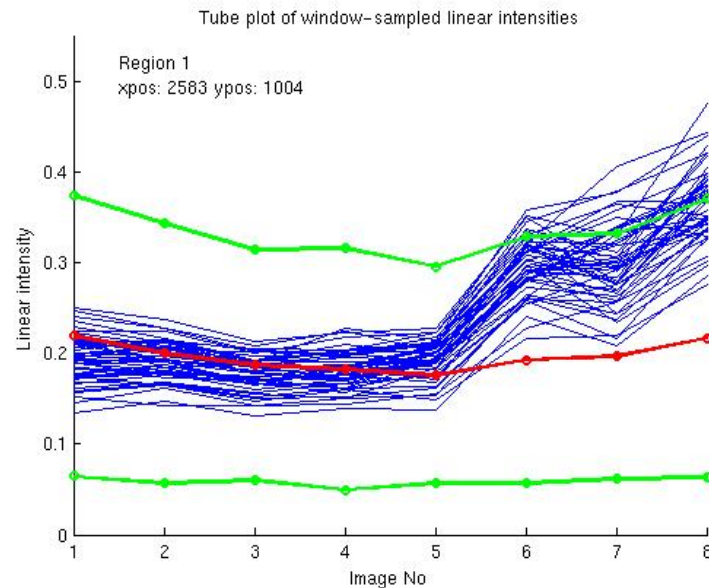Yumiko Uryu, WWF Indonesia

Animation

This animation covering the whole year confirms that the suspect area extends from the known cleared region over the last few months.

The area on the right hand side of the image is a mixture of paddy fields, coconut plantation, shrubs and forest re-growth
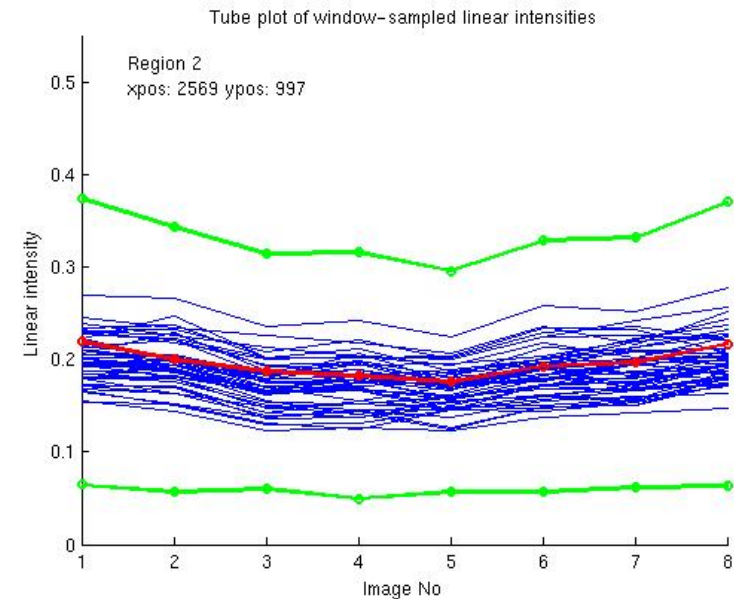

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Temporal intensity plots
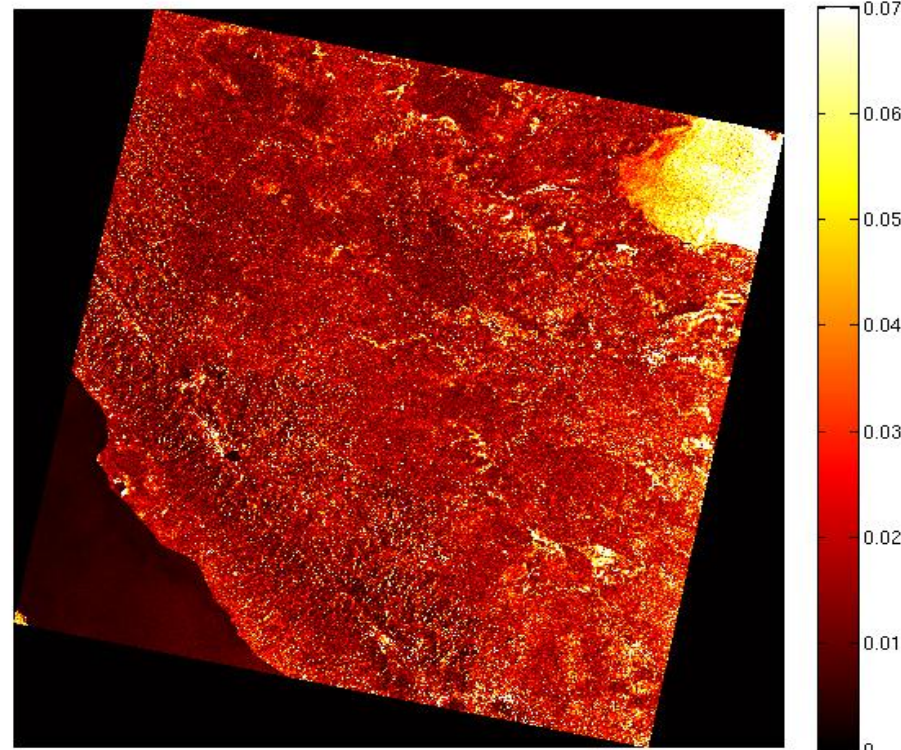
Suspect region

Adjacent forest region

The region on the left shows a distinctive step profile.
Red line shows the forest mean intensity
Green lines show range of the forest intensity (1 standard deviation)

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Large scale mapping

This composite image highlights the regions that changed most in 2007

Regions are coloured according to temporal standard deviation.

Image area ~ 136,000 km^2

400 Km

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Summary

- **Anomalous temporal deviations can be used to narrow search for deforestation over large areas imaged by ScanSAR.**

- **Deforestation can be recognised by distinctive signature intensity changes**

- **We are currently using this to produce an automatic detection algorithm for large areas**

- **Texture or structural measures are likely to be needed to identify deforestation occurring before the start of the ScanSAR sequence.**

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