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
Focus area: Riau, Sumatra

Fine Beam Dual Polarisation

- June 2007
- July 2007
- August 2007
- November 2007

ScanSAR
Jan, Mar, May, Jun
Aug, Sept, Nov, Dec 2007

WWF Riau landcover DB 2007
- North
- South
Coverage by single ScanSAR image
The image overlaps with the southern portion of the 2007 WWF Riau landcover database.
Temporal ScanSAR compares well with FBD.
Detecting deforestation by temporal change

WWF designations:
- Red: Cleared
- Green: Primary forest
- Yellow: Shrubs
- Blue: Paddy fields

Temporal ScanSAR
- Red: Jan
- Green: June
- Blue: December

Standard deviation of 8 Scansar images from 2007

10 Km
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
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.
Temporal intensity plots

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)
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 km²
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.