



**Remote sensing to monitor changes in  
forested catchments**

**Research Forum November 2009**



## Remote sensing to monitor changes in forested catchments

The aim of this research is to monitor changes in vegetation structure and health as a result of both catchment operations and natural variability. Remote sensing in the form of images acquired by an airborne digital camera provides the data used for this monitoring.

The project has so far primarily focussed on collecting data but has begun preliminary analysis. Early results are promising from both a mapping and analytic perspective, especially when field-based estimates of crown cover are compared with those derived from the imagery.

The data capture services are provided by SpecTerra Services, a Perth based company who specialise in the provision of high quality airborne remote sensing imagery for vegetation mapping and monitoring projects. The data capture specifications are:

- 0.5m spatial resolution (for comparison Landsat satellite imagery is 25m)
- 16 bit data
- 4 spectral bands, with 20nm bandwidth centred on:
  - band1 Blue 450nm
  - band2 Green 550nm
  - band3 Red 675nm
  - band4 Near Infrared 780nm

The capture program has insisted that re-capture missions are flown as close as possible to anniversary dates of mid November to minimise extraneous differences between images. Initial data capture for the whole catchment in 2005 giving a baseline image.

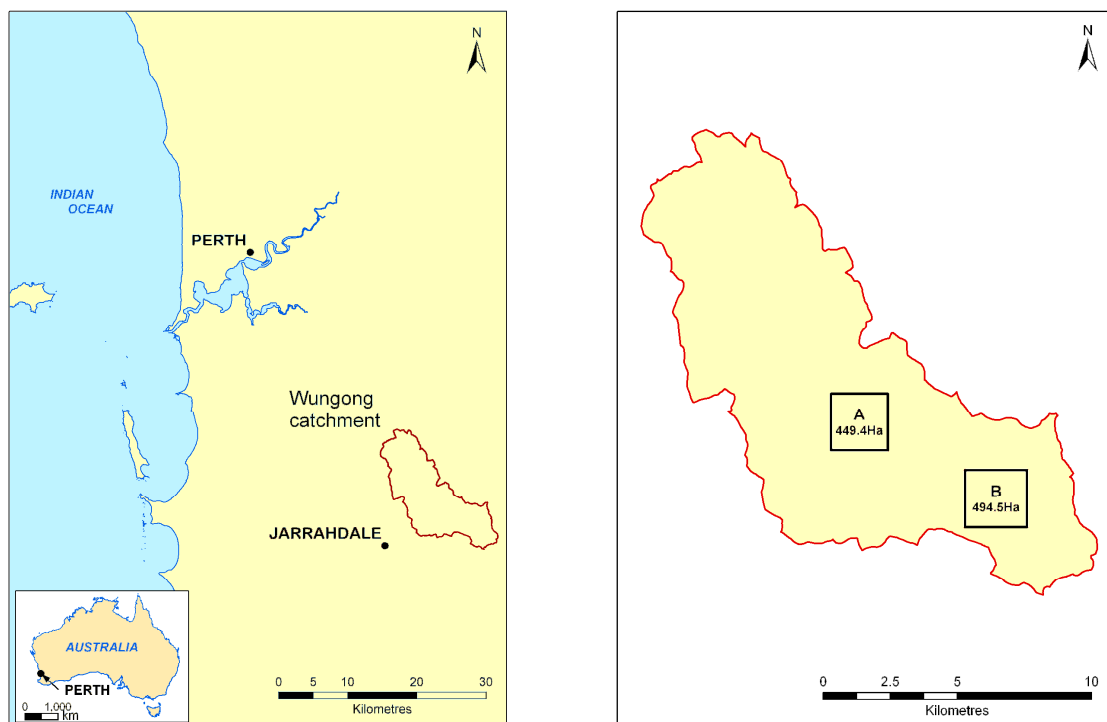


Figure 1: Locality map on left showing Wungong catchment and two sample areas flown in 2007 shown on right

- 2007 two small areas, approx 1,000Ha
- 2008 southern half, 9,800Ha
- 2009 southern half, 12,000Ha

The repeats data capture allows for comparisons to be made to monitor both the catchment operations and for forest health or condition. The spatial extent and accuracy of the data enables forest managers to assess both spatial and temporally. An example of the image change analysis that has been carried out is shown in Figure 2 below.

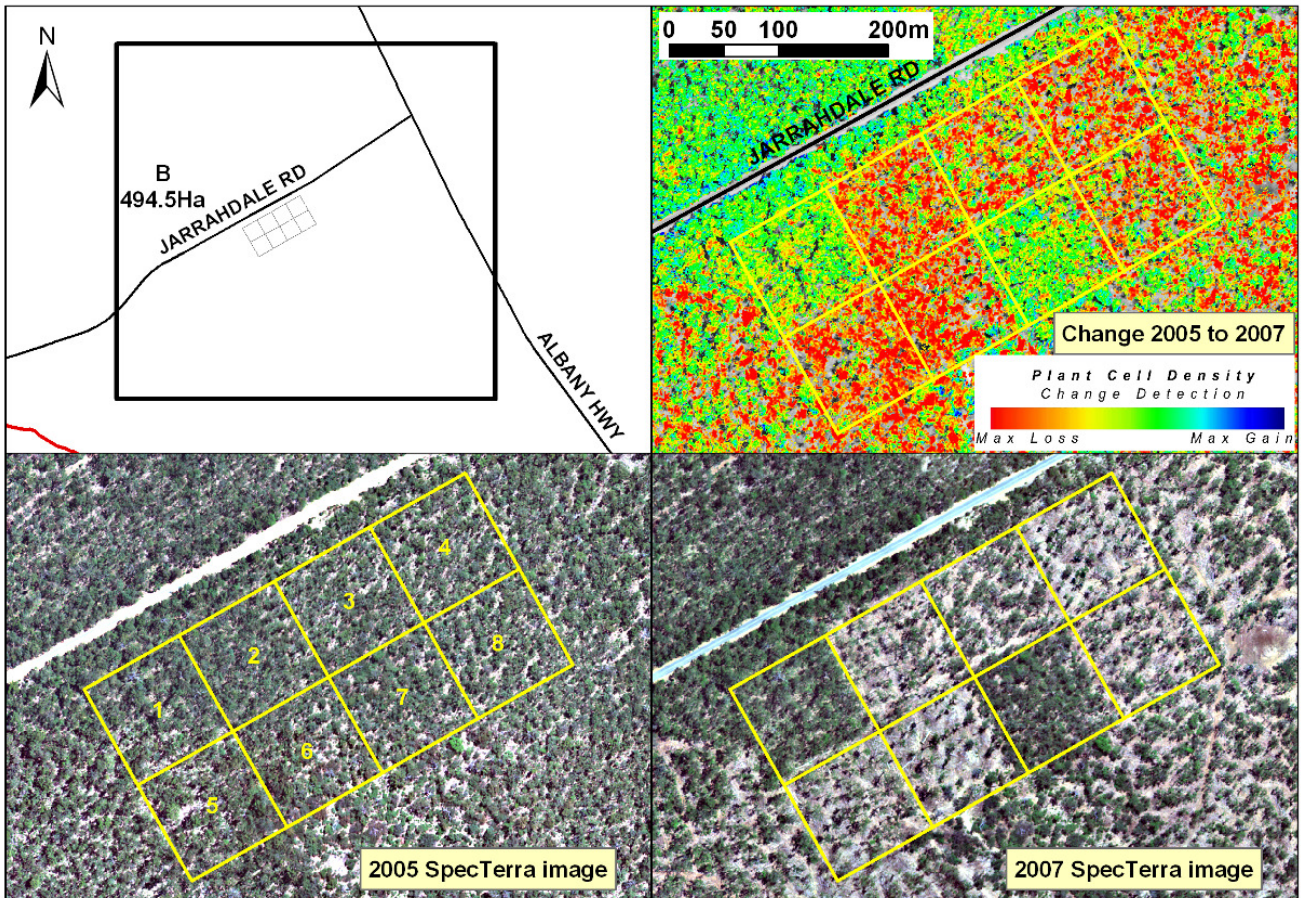


Figure 2: Detail of Area B - demonstration plots near Jarrahdale Road showing changes in crown cover

Future research aims to analyse the data more fully to measure changes in forest crown cover relate these measurement to those obtained from field based measurements.