

Recent Developments in Vegetation Monitoring Products from Australia's National Carbon Accounting System

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Australia's National Carbon Accounting System Land Cover Change Program (NCAS-LCCP) provides fine-scale monitoring of forest land cover changes for the continent and estimation of greenhouse gas emissions from land use and land use changes. It has been designed and developed by Australia's Department of Climate Change with major contributions from CSIRO and university partners. Following establishment in 1999-2002, it is now run as an ongoing operational system with a significant investment in R&D component.

The monitoring component of the system is built on a sequence of continental coverages of Landsat MSS and TM data from 1972 onwards. At present some 15 'temporal epoch' coverages (approximately 6000 Landsat scenes) have been processed, and updating has been on annual intervals since 2004. In the remote sensing program, all stages of image processing (rectification, calibration, BRDF and terrain-correction, and mosaicing) are conducted to documented specifications with independent QA processes. Images are mosaiced to 1:1million scale mapsheets covering the continent. NCAS-LCCP image data has been made available and is used regionally for natural resource management (NRM) applications.

The NCAS forest change products were first produced in 2002. In response to priorities under the Kyoto agreement aimed at forestry land use and land use change (LULUCF), the first products produced by the program were national maps of forest cover and change spanning the period from 1972-2000 with a focus around the Kyoto baseline year (1990). Forest products are updated routinely in the ongoing system.

The Program has trialled and developed a number of other national landcover-related products based on the Landsat archive for improved GHG accounting and NRM use. These include mapping and monitoring of 'sparse' perennial vegetation, with cover density below the threshold which defines forest.

The forest extent and change products are classifications specifically designed to detect clearing and reforestation (i.e. land use change). More subtle changes in density of perennial vegetation resulting from a range of possible causes are also of great interest for GHG accounting and NRM management. The 'index trends' approach has demonstrated

the capacity to detect and monitor subtle vegetation changes in a range of environments (Wallace et al 1998, 2006; Caccetta et al 2000). In this approach, statistical summaries of the spectral index response are calculated for each pixel over a chosen time series. The results, displayed as image maps, highlight areas of different changes over time, and indicate the approximate timing and magnitude of changes. The approach has been applied to the national NCAS-LCCP TM archive (1989-2006) to produce a 'vegetation trends' monitoring product for forested areas of the Australian continent.

The paper will present a brief overview of the NCAS-LCCP remote sensing program. It will describe the development and production of the national trends product and discuss issues encountered in the production of the products at national scale.