Australia’s National Carbon Accounting System

A Case Study of Spatially Explicit National Monitoring
National Carbon Accounting System

**Aim:** complete accounting and forecasting for human-induced sources and sinks from land-based systems … an optimum response to the UNFCCC and its instruments.

– The Australian Government has invested approximately $4M AUD per year since 1998 to develop a National Carbon Accounting System.
Key issues from the ‘Aim’

- *Complete* – all lands, carbon pools gases and activities at all scales
- *Accounting and forecasting* – retrospective and predictive
- *UNFCCC and instruments* – designed specifically for this purpose
Key design decisions

- Spatially explicit, through time-series remote sensing (wall-to-wall)
- Underpinned by a single ‘process’, mass balance, full cycle, C:N, ecosystems model
- Integrated – one model application only for all purposes and scales
- Progressive ‘build’ by policy priority – over several 4 year phases – deforestation 1\textsuperscript{st}
Key features of implementation

- Informs and monitors policy formulation and implementation, does not attempt to ‘make’ policy
- Transparent - publication and availability of data, tools and results
- Scientifically validated – QA, QC, CIVP and peer review
- A research adopter, not researcher
- Outsourced – private sector, institutions, governments
- Any secondary benefits not to compromise primary goals
Land Representation

- Land cover change (wall-to-wall national time series of remote sensing at 25m)
- Bio-physical inventory mapping, e.g., soil
- Climate – surfaces developed from weather station data
- Land use and management from remote sensing and survey
Deforestation over time

Deforestation over 30 years in 14 ‘snapshots’ for an area of about 20 million hectares
Emissions estimation

- Spatial by grid analysis using model
- Project by wizard to project results

Across a landscape/country

For a project
Benefits

- a single system reconciles ‘project’ and ‘national’ accounts
- removes potential for sampling uncertainty in monitoring of land use change
- predictive and spatially explicit to assess possible consequence of particular actions
- transparent and verifiable at all scales
Wider Implementation

- Aust. has a large land area and relatively small population – remote sensing is a cost effective solution
- Monitoring has become easier with new technologies and instruments
- Costs are reducing – for Aust. ~$750,000 per national update
- National time-series monitoring is widely achievable