



Australian Greenhouse Office



AUSTRALIAN
Greenhouse
Office



Key Project Areas

- Land Clearing
- Biomass Estimation
- Soil Carbon Estimation
- System Framework and Decision Support



Land Clearing Projects

- 4 pilots - 1st round
- 12 - 2nd round pilots
- scene identification
- Year 2000 mosaic
- 1972-1991
- 1992-2002



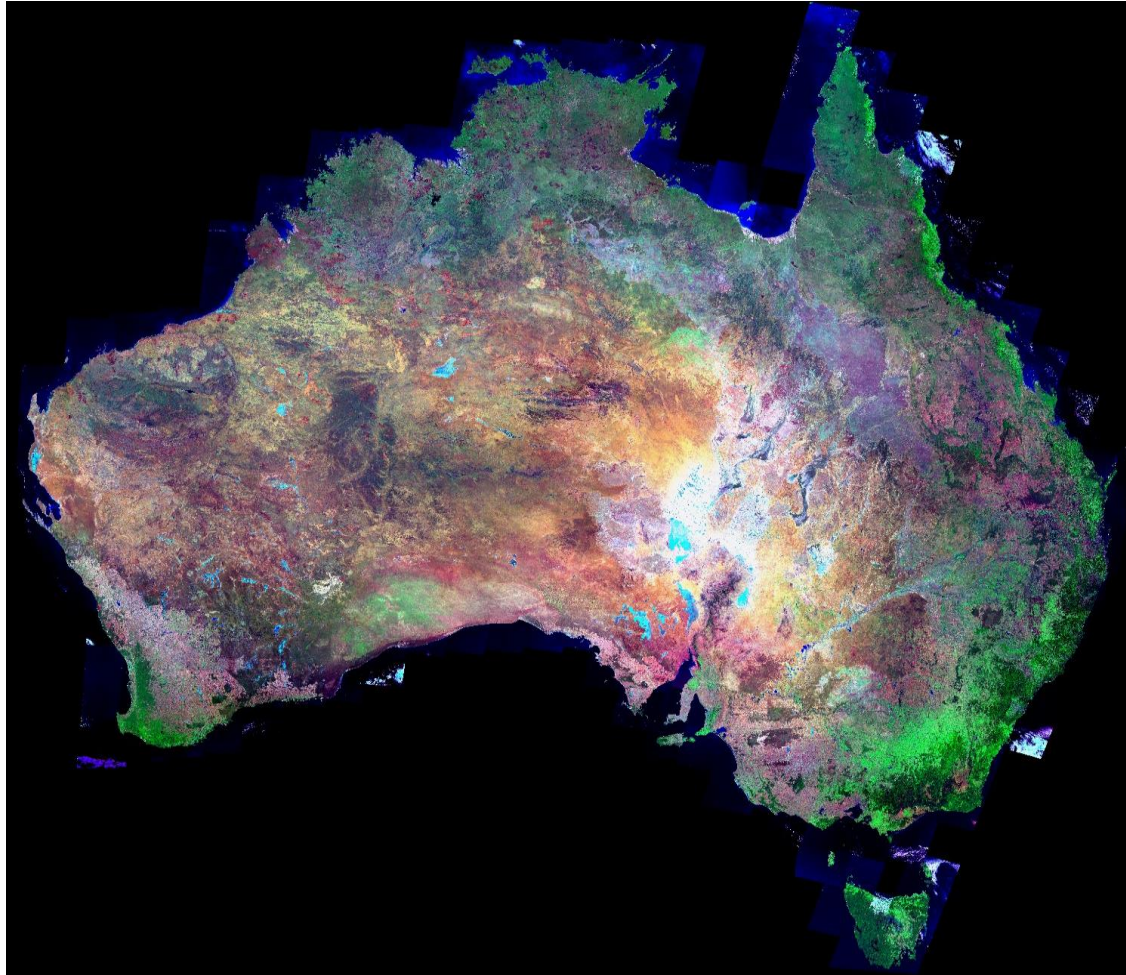
Scene Search/Purchase

2. Scene Search/Purchase

- 1972-3, 1976-8, 1980, 1985, 1988, 1989, 1991 identified and purchased (2,040 images @ 185 km²)
- 1992, 1995, 1998 identified
- 2000 - purchased and processed



Year 2000 Mosaic





Biomass Projects

- 'grey' literature
- wood densities
- carbon contents
- inventory data
- wood products
- estimation methods - multi-phase sample
- plant productivity
- destructive sample protocols



Biomass Method Selection

2. Method selection has involved extensive testing and review

- testing highlighted problems in using typical forest ‘inventory’ data
- multi-phase approaches on total mass provide a more reliable and progressively improvable approach
- multi-phase can be founded on a productivity surface
- demands for no. of ‘plots’ reduced dramatically using multi-phase techniques



Productivity Model Attributes

1. Model Attributes

- Model - a 3PG derivative
- Predicting a relative index (long-term) of woody-biomass productivity



Productivity Surface Key Inputs

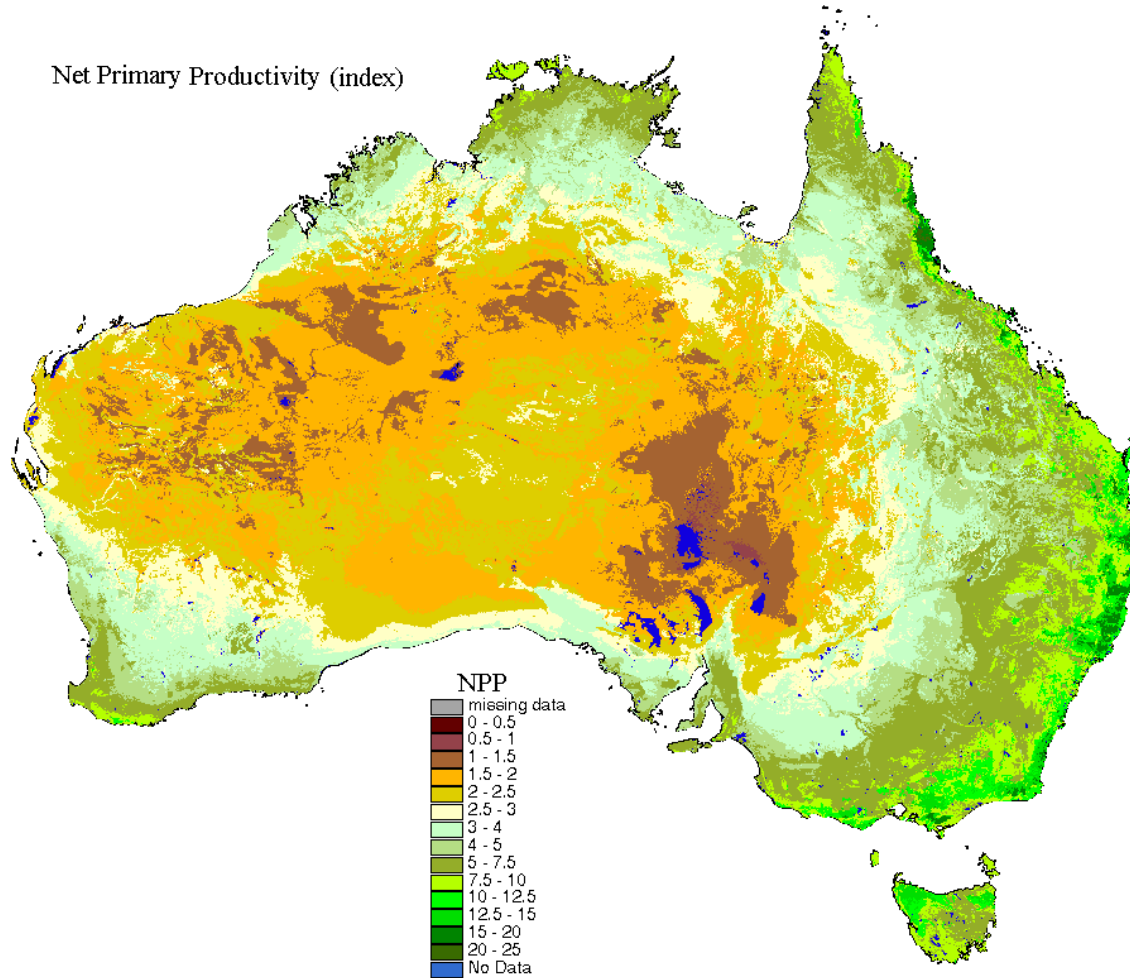
2. Key Inputs

- Temperature
- Rainfall
- Frost
- Vapour Pressure Deficit
- Soil (nutrient and moisture holding capacity)
- LAI
- Solar Radiation



Net Primary Productivity

Net Primary Productivity (index)





Ancillary Information

3. Ancillary information is still needed

- wood density (Ilic *et al.* in press, NCAS TR no. 18)
- carbon content (Gifford 2000, NCAS TR no. 7 & 22)
- allometry/partitioning (Snowdon *et al.* in press, NCAS TR no. 17)
- forest type (National Veg. Info. System)
- disturbance (from remote sensing program)
- age and site index based growth (RWG II)
- biomass literature (Grierson *et al.* in press, NCAS TR no. 25)



Soil Carbon Projects

- soil/litter sample protocol
- analytic method corrections
- modelling
- plant inputs
- inventory and mapping
- soil pairs
- management practices
- afforestation soils



New Paired Sites & Enhanced Paired Site Data

1. New Paired Sites and Enhanced Paired Site Data

- Approximately 80 new pairs in key systems
- Approximately 20 further pairs with enhanced data



Soil Sampling Protocols

2. Soil Sampling Protocols

- This task has been completed by CSIRO (Neil McKenzie / Phil Ryan) and approved by the Australian Collaborative Land Evaluation Program (ACLEP).
- Published as McKenzie *et al.* in press, NCAS TR no. 14.



Correction of Analytical Techniques

3. Correction of Analytical Techniques

- This task has been completed.
- Published as Skjemstad *et al.* 2000, NCAS TR no. 15.
- Soil samples were provided by State Laboratories / archives and the analysis completed by CSIRO.



Soil Properties Data

4. Soil Properties Data Map

- This is completed by relevant State / Territory agencies to the extent of current knowledge for most States.
- Ongoing works in the NT and Victoria.
- A synthesis of reports is currently being prepared by the NCAS.



Land Use & Management Information

5. Land Use and Management Information

- This task has been completed by a variety of States / Territories (or agreed agents).
- Published as Swift & Skjemstad in press, NCAS TR no. 13.



Plant Residue Inputs in Agricultural & Grazing Lands

6. Plant Residue Inputs in Agricultural and Grazing Lands

- Main focus on grazing systems
- Also considers ancillary data such as root:shoot



Forest Soils

1. Forest Soils

- State of knowledge, particularly models, not as advanced as in agricultural applications
- State of knowledge assessment complete (Polglase *et al.* 2000, NCAS TR no. 20)
- NCAS model framework and knowledge and data from the agricultural program will accelerate understanding
- Model tests have been positive - to be published as NCAS TR no. 31



Model Framework

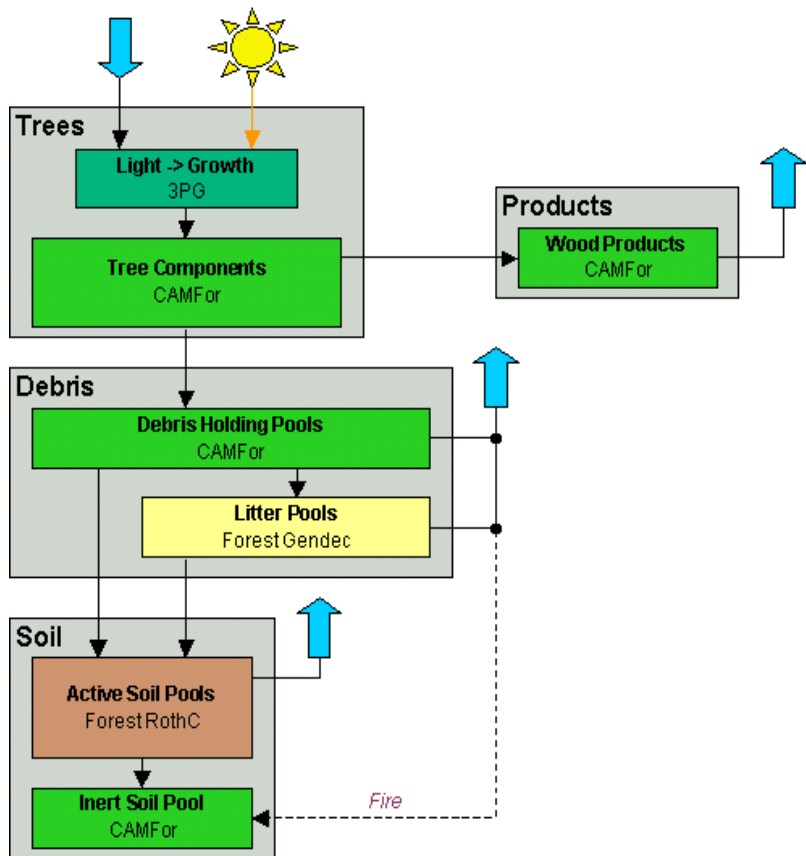
FullCAM is an integration of existing products:

- Forest Growth: *3PG*
- Forest Management: *CAMFor*
- Agricultural Management: *CAMAg*
- Litter Decomposition: *GENDEC*
- Soil Carbon: *Roth C*

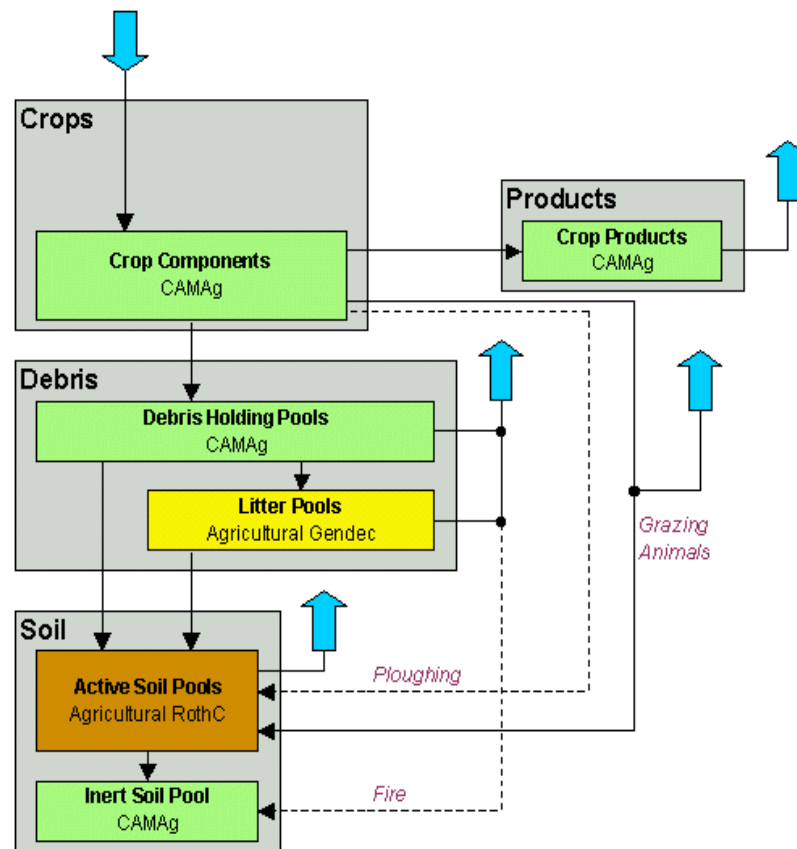


FullCAM Model

Forest

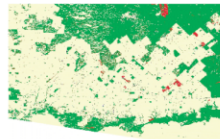


Agricultural System

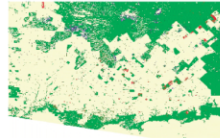




Land Cover Change



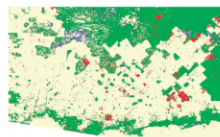
change t_5 to t_6



change t_4 to t_5



change t_3 to t_4



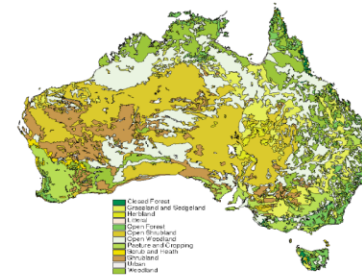
change t_2 to t_3



change t_1 to t_2



Forest Type



Forest

FullCAM

Operation

Forest type harvested

Verification of RAC area estimates

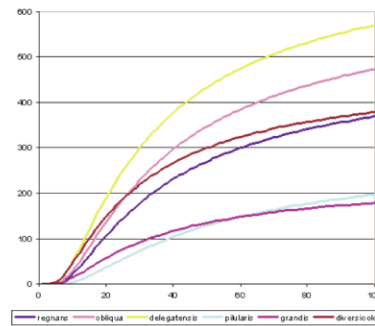
Volume to mass conversions

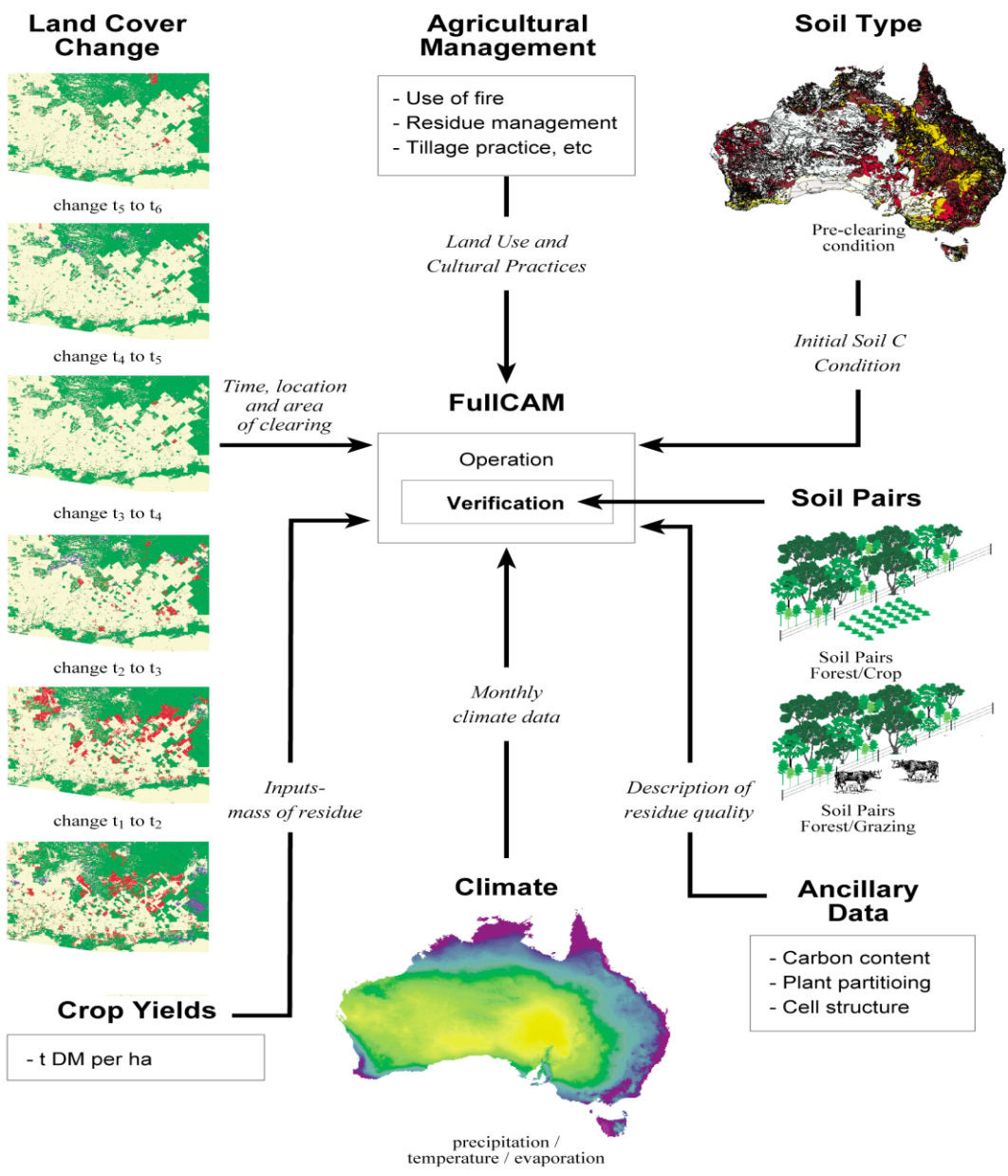
Ancillary Data

- Wood density
- Carbon content
- Allometric relationships
- Decomposition rate
- Wood product life cycle analysis

Verification of growth and yield

Forest Growth





Soils



Model Development

2. Model Development

- Sensitivity testing
- Model testing
- Move from Excel (test) products into efficient ‘code’
- Code engine complete
- User interface designed and now being developed to enable ‘plot’, ‘estate’ and ‘spatial’ operation

