



Australian Government

Department of the Environment and Water Resources

Next decade research needs for managing the climate/vegetation nexus in Australia

An NCAS/AGO View

Vegetation Dynamics and Climate Change

14 August 2007





Expanded Topic

- To help position Australian land managers for adapting land based systems to climate change impacts, broadly, what areas of information and understanding are most required that should dictate research over the next decade?





The Issues of Climate and Vegetation

1. Understanding the patterns of sources and sinks, their vulnerability to climate change, and potential for mitigation
 - natural and human dimensions
2. Predicting and adapting to climate change impacts
3. Relationship with other issues such as productivity and impacts on water use etc.





Key Research Guides

- Greenhouse Action in Regional Australia: Strategic R&D Investment Plan, Annual Prospectus 2006-2007
- Blueprint for Australian Terrestrial Carbon Cycle Research
- National Carbon Accounting System: Development Plan 2004-2008





Strategic R&D Investment Plan Priorities

- **Six theme areas with specific research:**
 - livestock
 - agricultural soils
 - savannas
 - planted forests
 - natural resource management
 - farming systems





Blueprint for Australian Terrestrial Carbon Cycle Research

■ Key research areas:

- patterns of sources and sinks of carbon across Australia
- vulnerability of terrestrial carbon sinks into the future
- interactive coupling of the carbon cycle to the physical climate system





NCAS Development Plan 2004-2008

- General areas (iterative towards national wall-to-wall, comprehensive of all sources and sinks)
 - continued spatially explicit monitoring of deforestation
 - spatially explicit capability for planted/regrowth forests and forest management and other land use and vegetation systems
 - coupled nitrogen cycle (non-CO₂)
 - multi-temporal land use mapping
- Improved crop and pasture growth (uptake and residues)
- Fire emissions and recovery
- Impacts of livestock (and of veg on livestock emissions)





Monitoring and Reporting

- NCAS, vegetation monitoring and emissions analysis/accounting
 - remote sensing plus ecosystem modelling, within known empirical bounds
 - continuation and expansion of annual national programs
 - progression toward complete national coverage of all sink and sources, with ability to extract ‘accounts’ under policy rules





Mitigation and Adaptation

- Continued work on potential for carbon sinks – and development of inclusions of carbon offsets in emissions trading
- Announcement of the new Climate Change Adaptations Framework





Predicting Change and Vulnerabilities

- Current work includes:
 - fire and carbon dynamics under climate change
 - patterns of forest cover and climate change effects on surface water yields
 - ‘Hawkesbury’ forest chamber experiments
 - ‘Horsham’ crop FACE experiment
 - ‘Hobart’ native pastures FACE experiment





International Initiatives

- Global Initiative on Forests and Climate
 - \$200M to help address deforestation and sustainable forest management
 - includes new remote sensing infrastructure and capability development
- Global Carbon Monitoring System
 - to work with partner countries to develop a consistent global accounting framework to underpin global action





Areas for further development

- The agenda for this meeting reflects the extent of current areas of interest
 - prioritisation is the next stage
- A key interest is the linkage of the relevant science communities/disciplines to better understand how climate change will impact on Australia vegetation systems – either directly or indirectly





- what (broadly) should dictate research over the next decade?
 - we look forward to the outcomes of this workshop, and to further guidance and community engagement through the academy
 - we hope that the academy can coordinate national efforts in this area
 - we will seek a coordinated picture that can guide funding priorities around evolving needs