



## Climate Change and Agriculture What is going on?

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**Hamilton Island – 7 Aug 2007**




## The Twin Barrels of Climate Change: Cause and Effect

1. Greenhouse Gas Emissions: Why Worry?
  - Towards Emissions Trading
2. Adapting to Climate Change

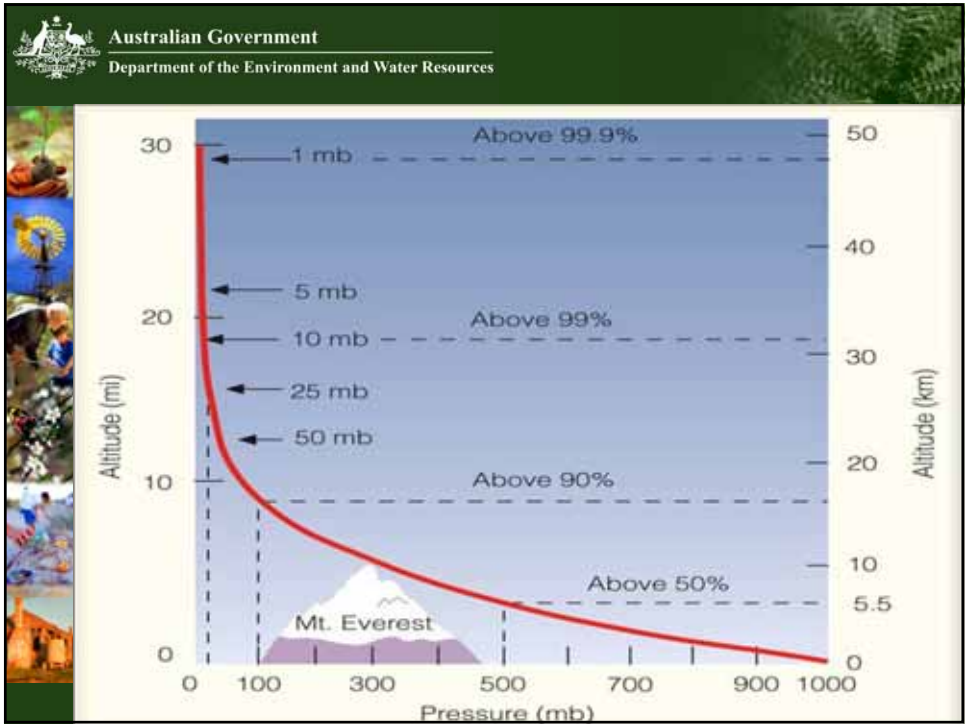
*A couple of weeks after **The Great Climate Change Swindle**  
– You've all been told lies! –*

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## Reducing Greenhouse Gas Emissions

### Why worry!



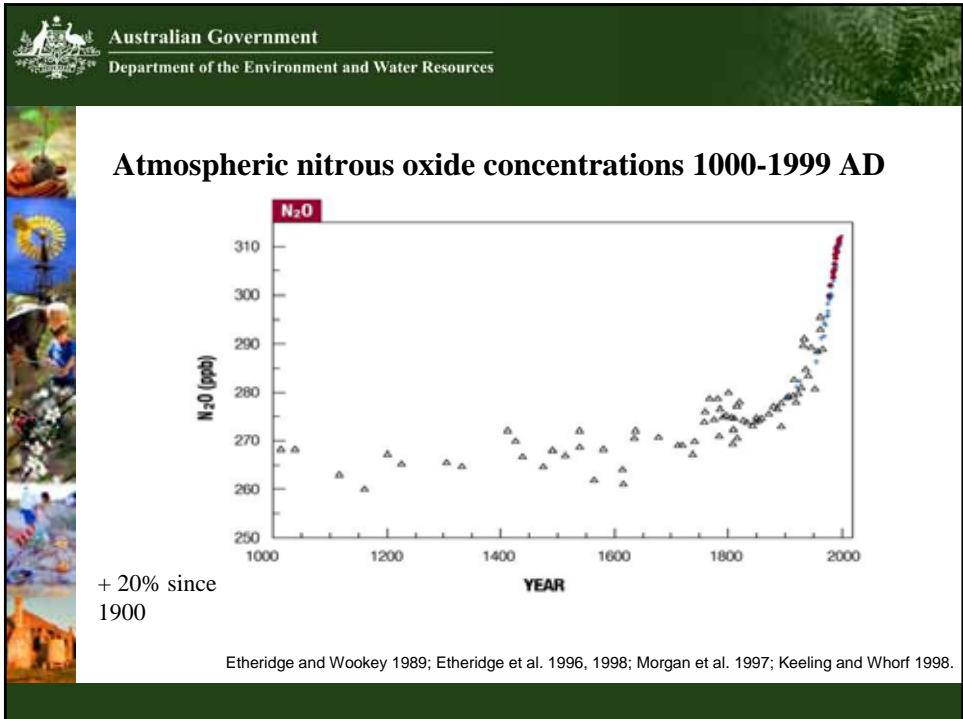
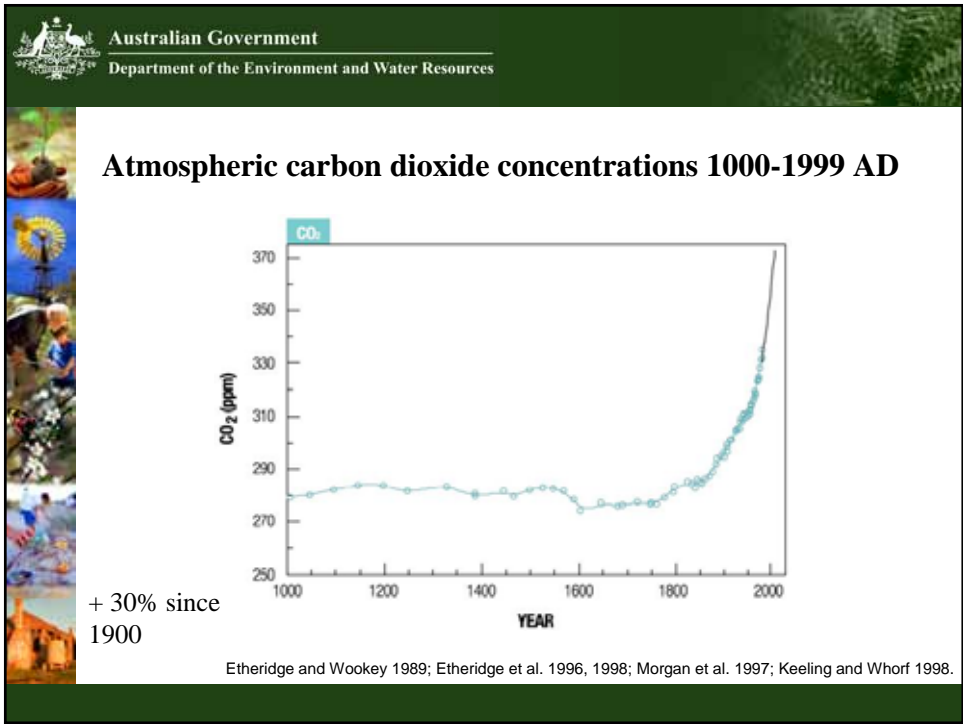


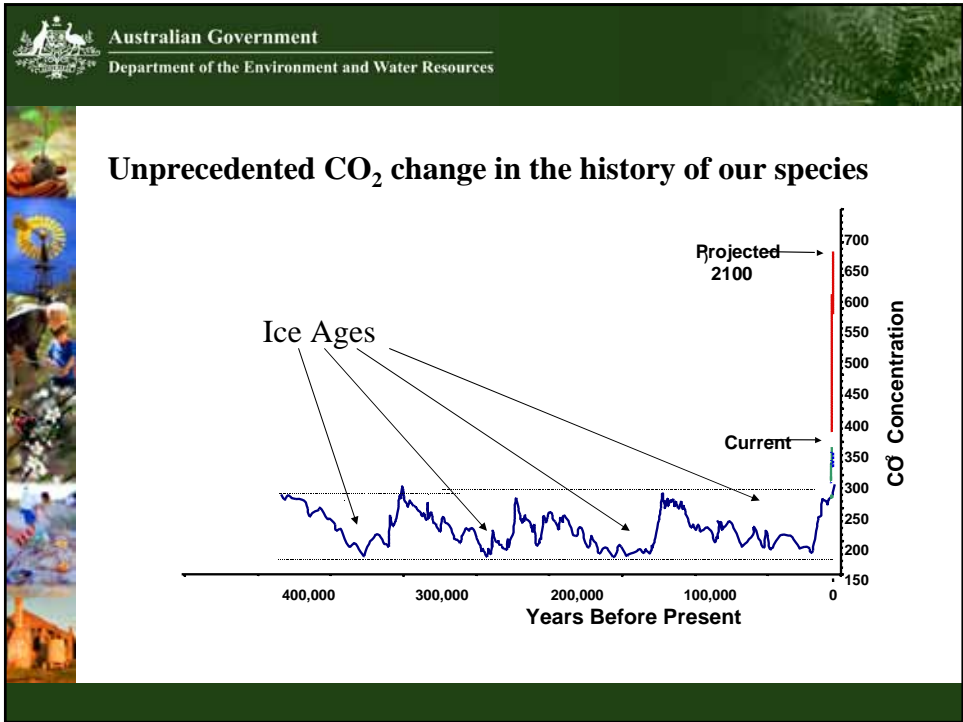
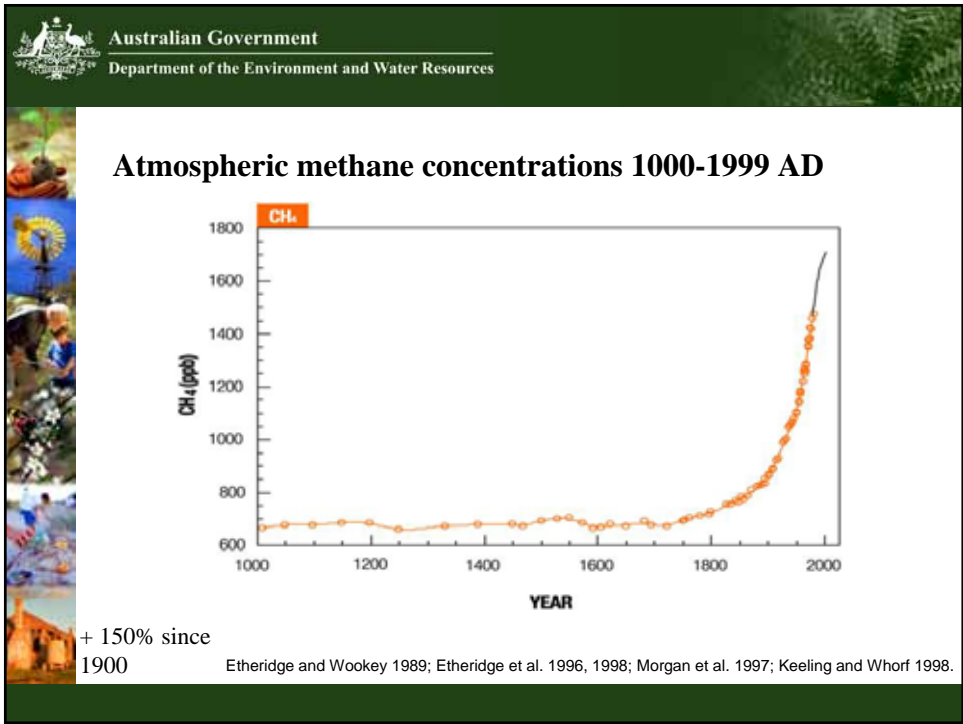
## Climate Change / Global Warming

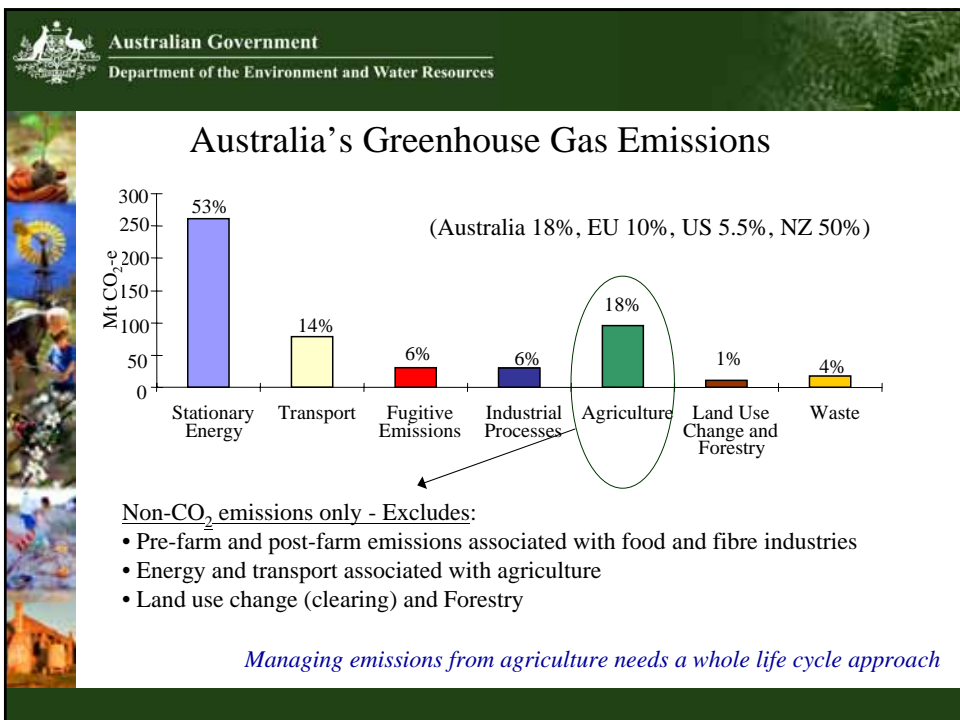
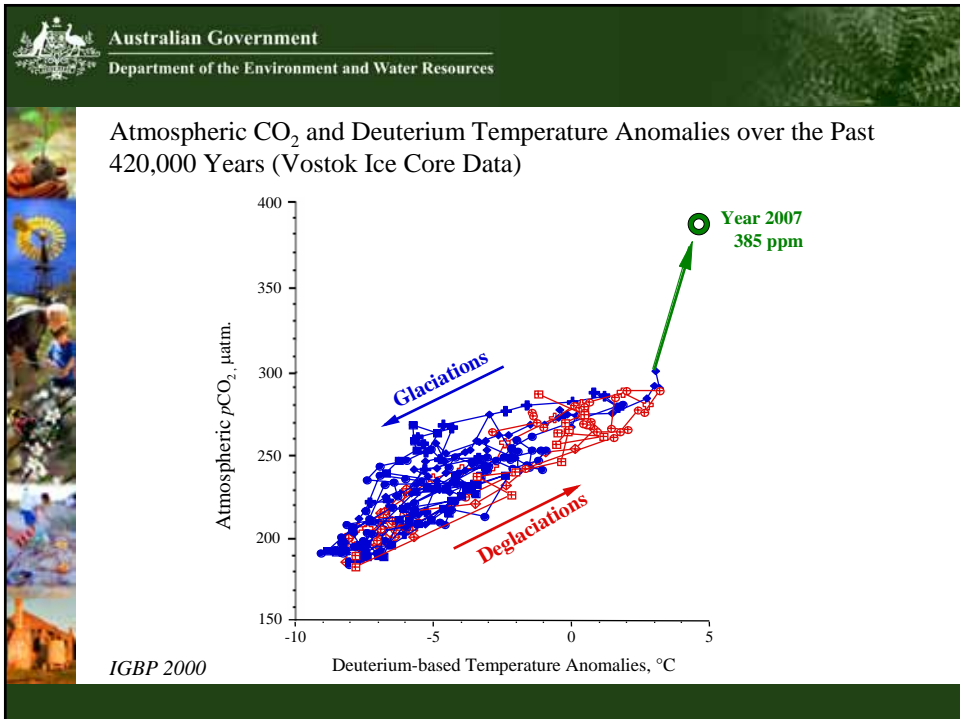
1. A change in **temperature function** (average and extremes) at the earth's surface (over the last 100 years)
2. Caused by increasing concentrations:
  - Carbon Dioxide +30% (69% of warming)
  - Nitrous Oxide +20% (12% of warming)
  - Methane +150% (19% of warming).
3. Largely driven by:
  - Burning of fossil fuels
  - Agriculture
  - Extensive global land clearing.

Is observed climate change a part of normal climate perturbation?









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## Key Greenhouse Gases from Australian Agriculture

**Nitrous Oxide**


- 5% of Australia's total emissions
- Primarily from agricultural soils

**Methane**

- Enteric fermentation from livestock
- 13% of Australia's total – same as all of transport

**Carbon Dioxide**

- Energy use on farms
- Transport
- Pre-farm and post-farm manufacturing emissions




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## Nitrous oxide from crops and pastures

**Only 30-70% of nitrogen added to Australia agriculture used for production – the rest goes missing**

- Major cost to industry
- Focus on **Improving Nitrogen Use Efficiency**
  - Increase productivity and profit
  - Reduce nitrogen runoff and leaching
  - AND reduce nitrous oxide emissions at the same time





## Methane from sheep and cattle

### 10-15% of feed energy lost as methane

- Major cost to industry
- Focus on **Improving Feed Conversion Efficiency**
  - Increase productivity and profit
  - AND reduce methane emissions at the same time



## Carbon dioxide from fuel, energy, and soils

### Energy use on farms – especially in tillage

- Major non-fixed cost of farming operations
- Focus on **Increasing Fuel/Energy Efficiency, and Building Soil Organic Matter**
  - Reduce fuel and energy costs
  - Productivity gains
  - AND reduce carbon dioxide emissions at the same time





## So why worry –Achieve multiple benefits

### Greenhouse gas emissions are a loss of resources:

- Reduce emissions and improve efficiencies
- Deliver productivity, financial, environmental benefits through ‘greenhouse’ action
- There appear clear opportunities to:
  - a) Identify management options
  - b) Achieve management change for improved productivity and reduced emissions



## *But how do we do it.....Best practice and benchmarking*

- The approach is outlined in a soon-to-be-released book
- It focuses on emissions management for multiple benefit
- Based on an EMS framework
- Uses self-assessment benchmarking towards *best practice*
- FIFA’s membership of *Greenhouse Challenge Plus*.





## A New Issue: Emissions Trading

- **PM's Task Group report delivered 31 May**  
(<http://www.pmc.gov.au/publications/emissions/index.cfm>)
- **Some key messages:**
  - Climate change is a global challenge - but Australia should not wait for global response – benefits of early action outweigh the costs
  - Benefits in setting a post 2012 emissions target in the near future
  - The overriding goal of Australia's efforts should be to lower emissions at least costs
  - Australian business requires certainty for investment.



## Emissions Trading: Some Recommendations

- Comprehensive in approach (All sectors - Ag won't escape)
- Based on a 'cap-and-trade'
- Aspirational emissions targets decreasing over time
- Maximum coverage of all sources and sinks – but some initial exclusions
- Opportunities for offsets
- Opportunities for trading before the whole scheme commences



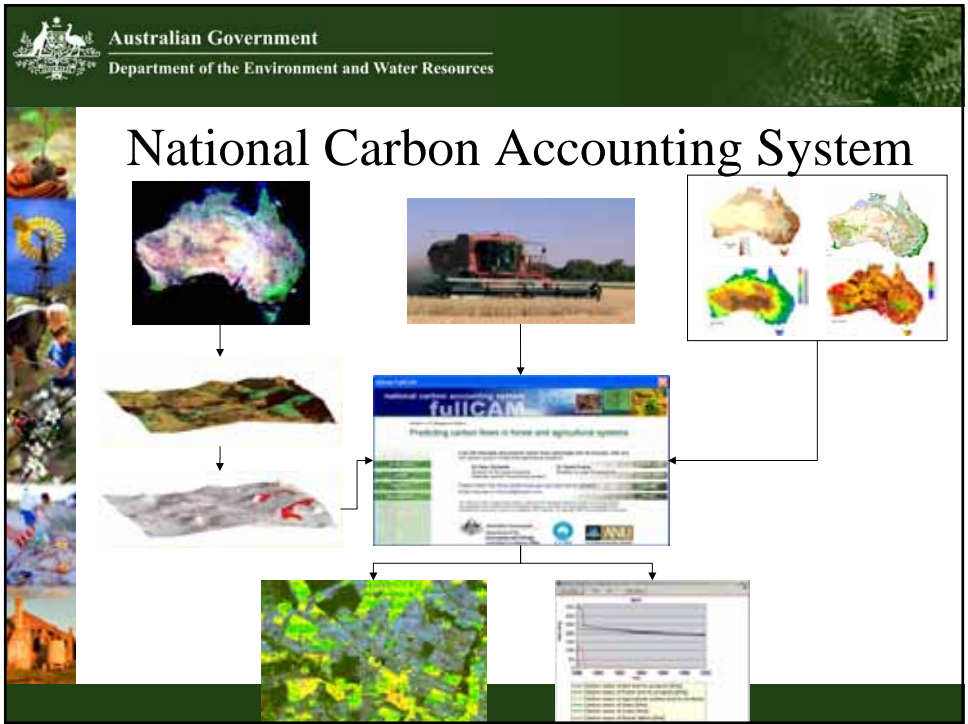
## Emissions Trading: Issues for Agriculture

- Agriculture may not be included initially, but:
- Agriculture will be brought into the scheme as soon as practical issues resolved
- Main focus for the sector initially is to increase low-cost offsets i.e. an initial ‘bonus’
- Fuel and energy use in agriculture to be included
- An immediate priority should be on research to (a) improve understanding of practical abatement opportunities, and (b) improve measurement of agricultural emissions



## Emissions trading for the land sector depends on: A comprehensive accepted method of land-based accounting

- **Australia’s National Carbon Accounting System (NCAS)**
  - A national system providing complete accounting for human-induced sources and sinks from land-based systems (all lands, all gases and all scales – from national to farm)
  - Ready for forestry; developing for agriculture
  - Provides consistency with national accounts



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## Adapting to Climate Change in Australian Agriculture

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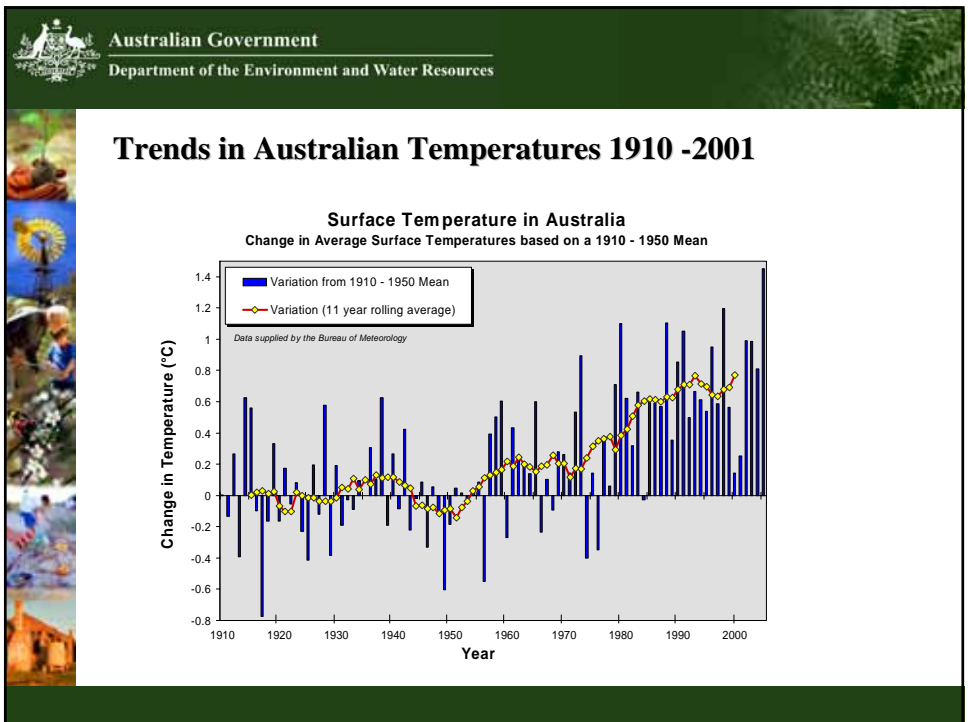
## Observed Impacts

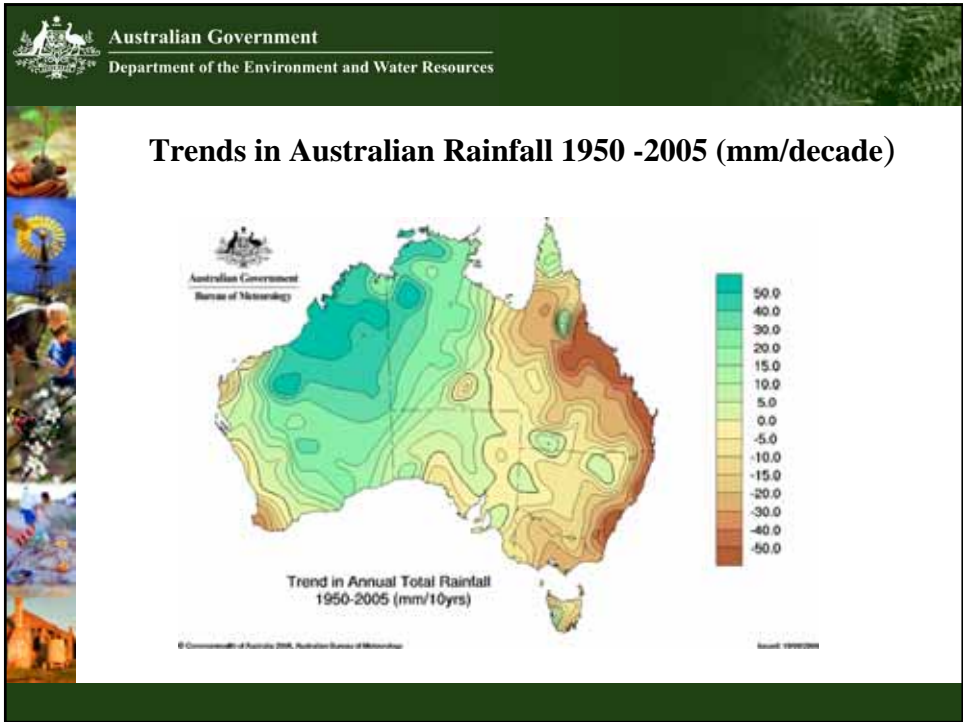
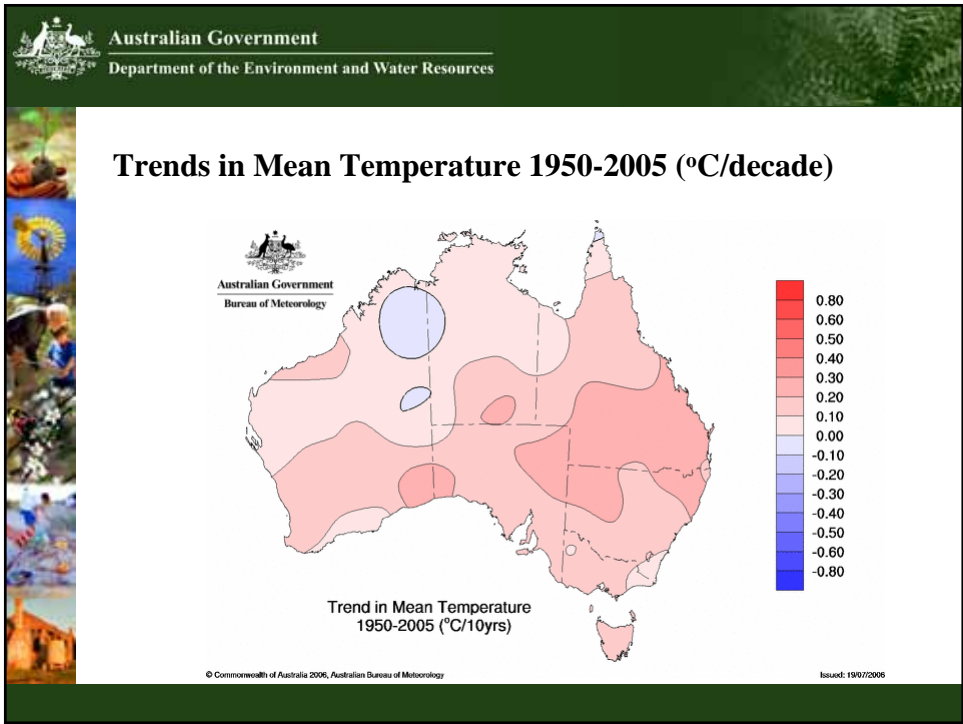
In just 24 Years!

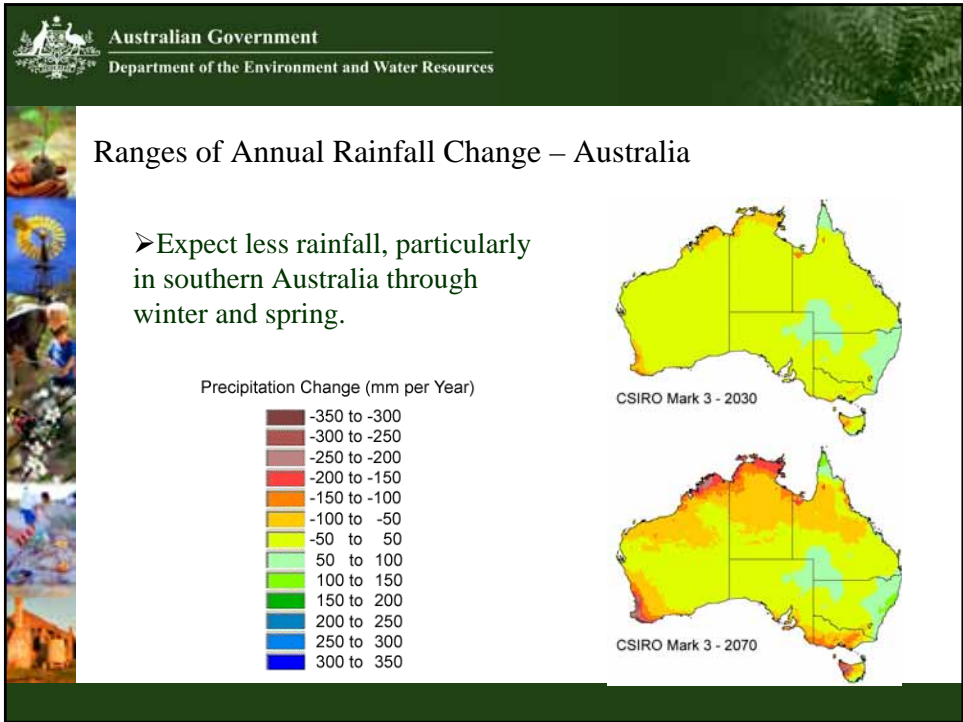
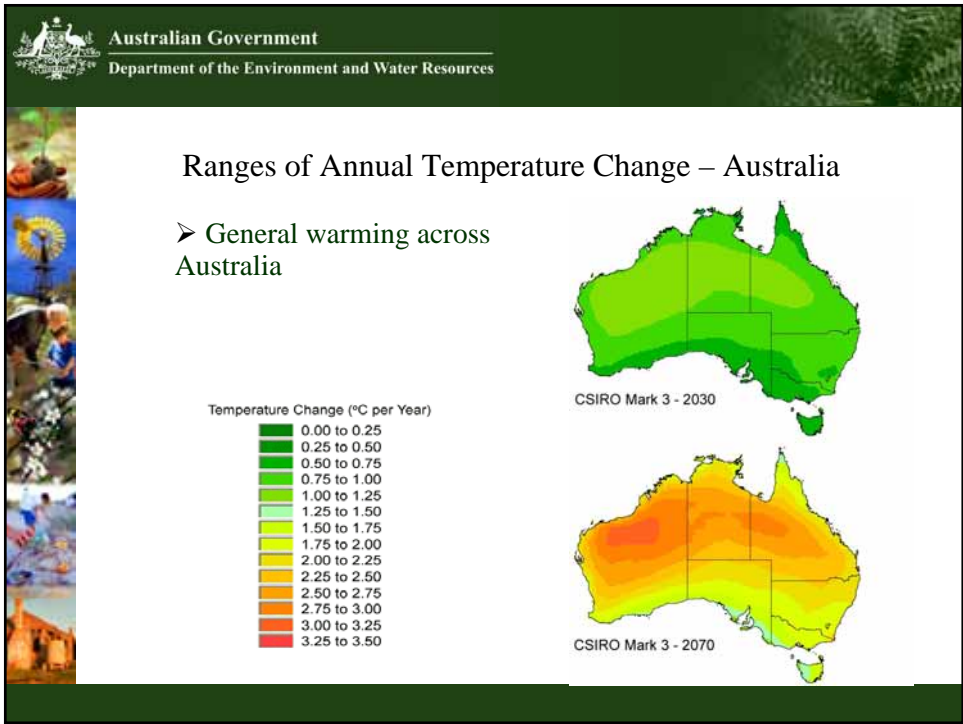
Observed sea ice September 1979

Observed sea ice September 2003

Source: Arctic Climate Impact Assessment (ACIA), 2004, Impacts of a Warming Arctic.







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## Maintaining the Competitive Edge

- Climate change and its impacts will intersect with different parts of the agricultural industry differently
- The challenge is to maintain (or improve) the competitive edge at each intersection point i.e.:

**Build Adaptive Capacity Across Australian Agriculture – But what do we mean by that?**

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## Building Adaptive Capacity

There are already many factors that impact on Australian agriculture over which we have very little control or influence

– Climate Change is one

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## Building Adaptive Capacity

Adaptive capacity is the ability to successfully cope with the impact - using responses over which we do have a high degree of control or influence

Resilient Sensitive

Adaptive Capacity

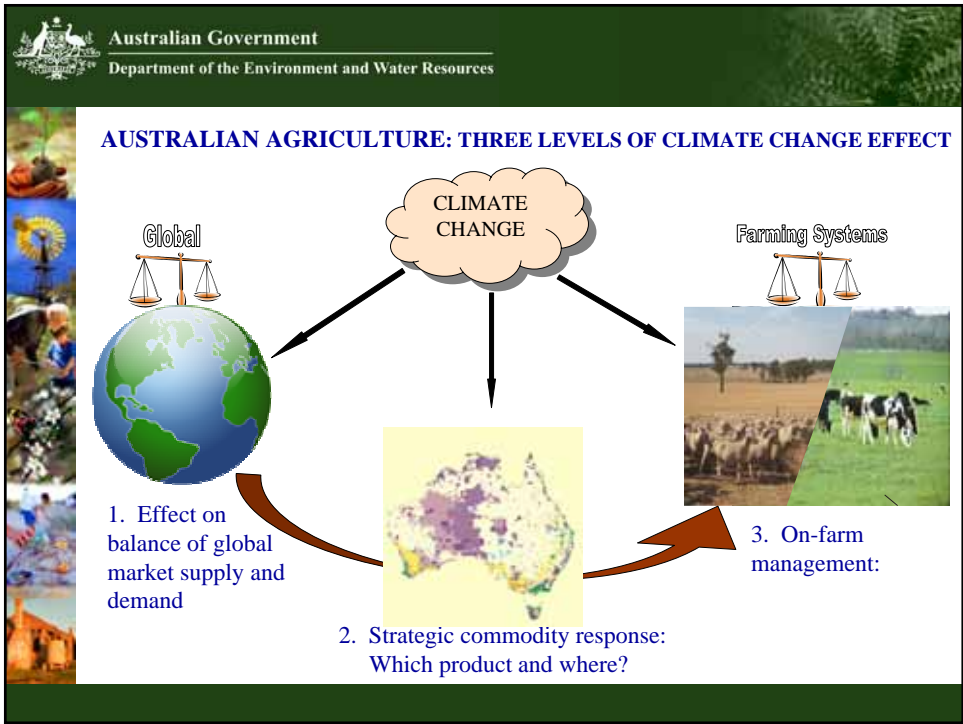
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## What does this mean for the Fertiliser Industry:

Clearly Australia agriculture and industries cannot control climate change – but they have a very strong opportunity to:

- Understand the risk
- Build adaptive capacity – i.e. increase resilience
- Position ourselves most favorably to cope with climate change

All industries (the Fert Industry included) are exposed –  
But they are only vulnerable when the impact of factors that they cannot control outweigh the resilience provided by factors that they can control



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### So where is the Fertilizer Industry with Climate Change?

1. Is Climate Change real? ✓
2. Are the interests of the Fertilizer Industry exposed? ✓
3. Are there opportunities to manage risk? ✓
4. Are you responding sufficiently to be ahead of the game? ?
5. Is the Fertilizer Industry vulnerable to climate change? ?

Maybe there is the opportunity (imperative) for the Australian fertilizer industry to be more strongly on the front foot to address climate change.

**But when should we start?**



## REMEMBER NOAH!



What would have happened if Noah  
had waited until the flood -  
before starting to build the Ark?



**Thank you**

