



Australian Government  
Australian Bureau of Agricultural and  
Resource Economics and Sciences



# Modelling impacts of climate change on Australia's forests and forestry

**Part I:**

**Matthew Miller**

*Greenhouse 2011, 4 – 8 April 2011, Cairns*

# Project Aim and Objective

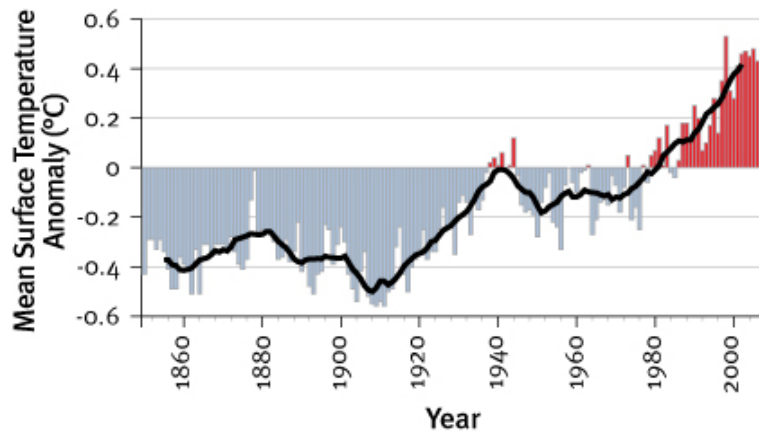
## *Aim*

- *Model the biophysical impacts of the expected changes in climate on production forests and forestry across Australia*
  - *to understand future wood yields, economic impacts and identify which communities exhibit the greatest vulnerability to climate change.*

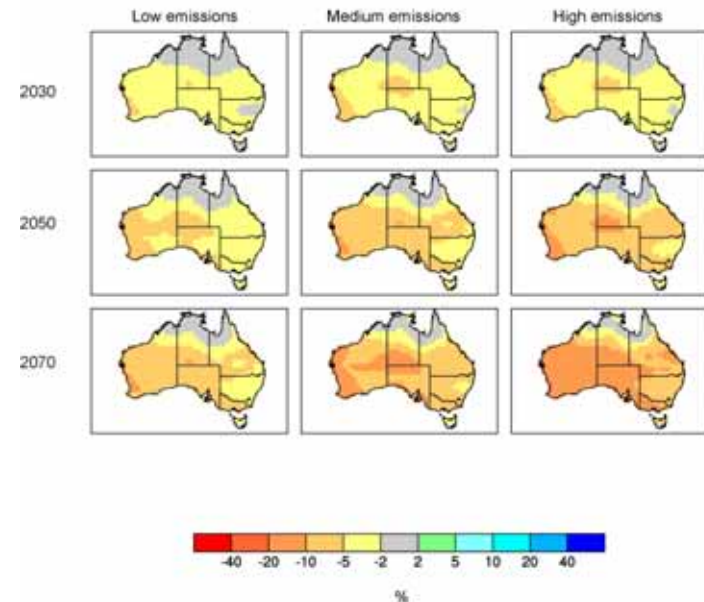


# Challenges

- Further global warming likely this century
- Changes to Australia's annual rainfall also likely
- Impact on forestry sector likely to vary by region



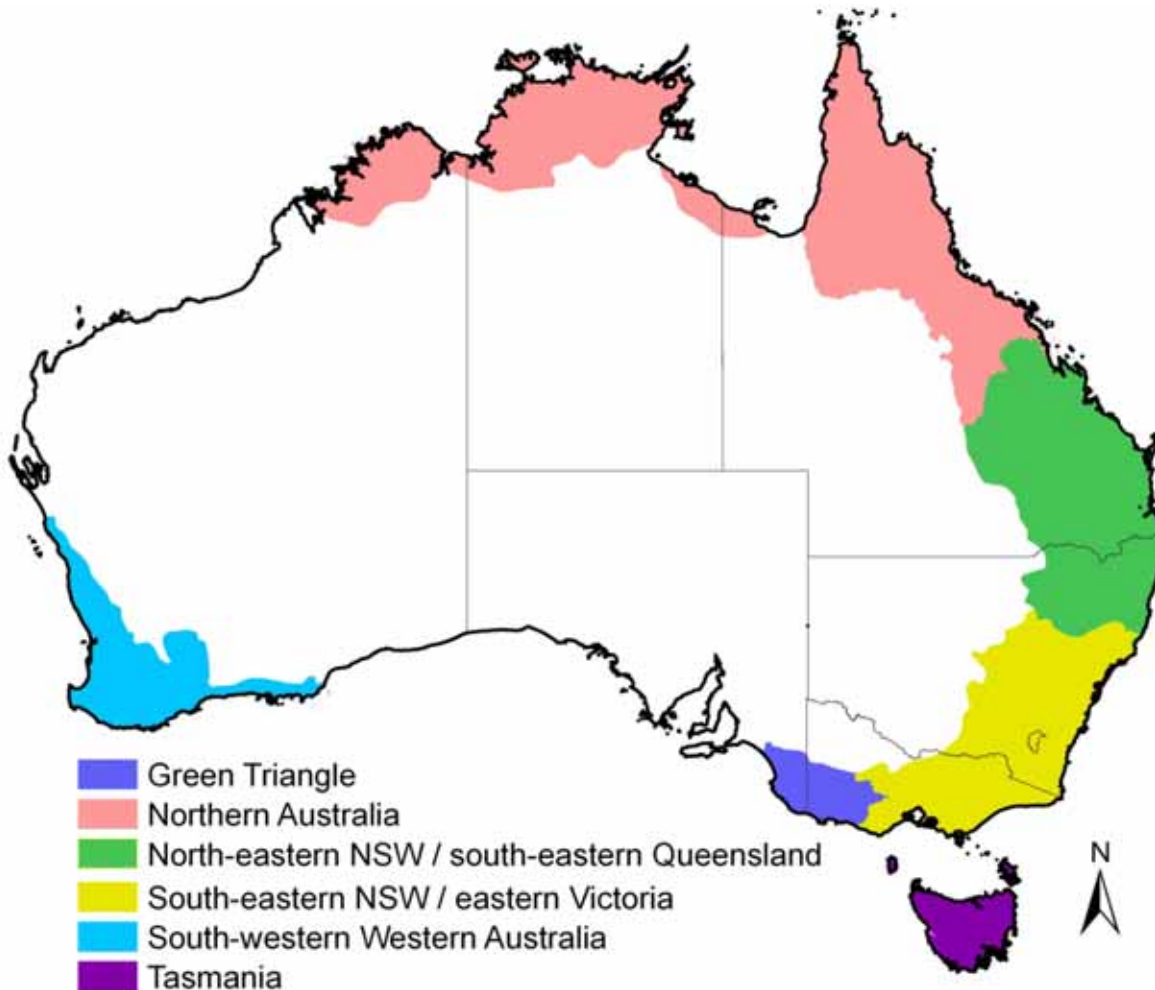
Time-series (1850–2007) of annual global mean surface temperature anomalies



Best estimate (50th percentile) of % projected rainfall change for 2030, 2050 and 2070 relative to 1990 under three emissions scenario.



# Forest regions and tree species



*Eucalyptus globulus*

*E. grandis*

*Pinus caribaea*

*P. pinaster*

*P. radiata*

*Corymbia maculata*

# Climate and forest growth methods

- Projections from all available General Circulation Models
  - A1B and A2 emission scenarios
- Downscaled monthly climate surfaces (CSIRO)
- Regional forest growth projections
  - 2005 baseline
  - 2030 and 2050



# Tree growth projections

- 3-PG spatial model
- Calculated Mean Annual Increments from each species across each study region





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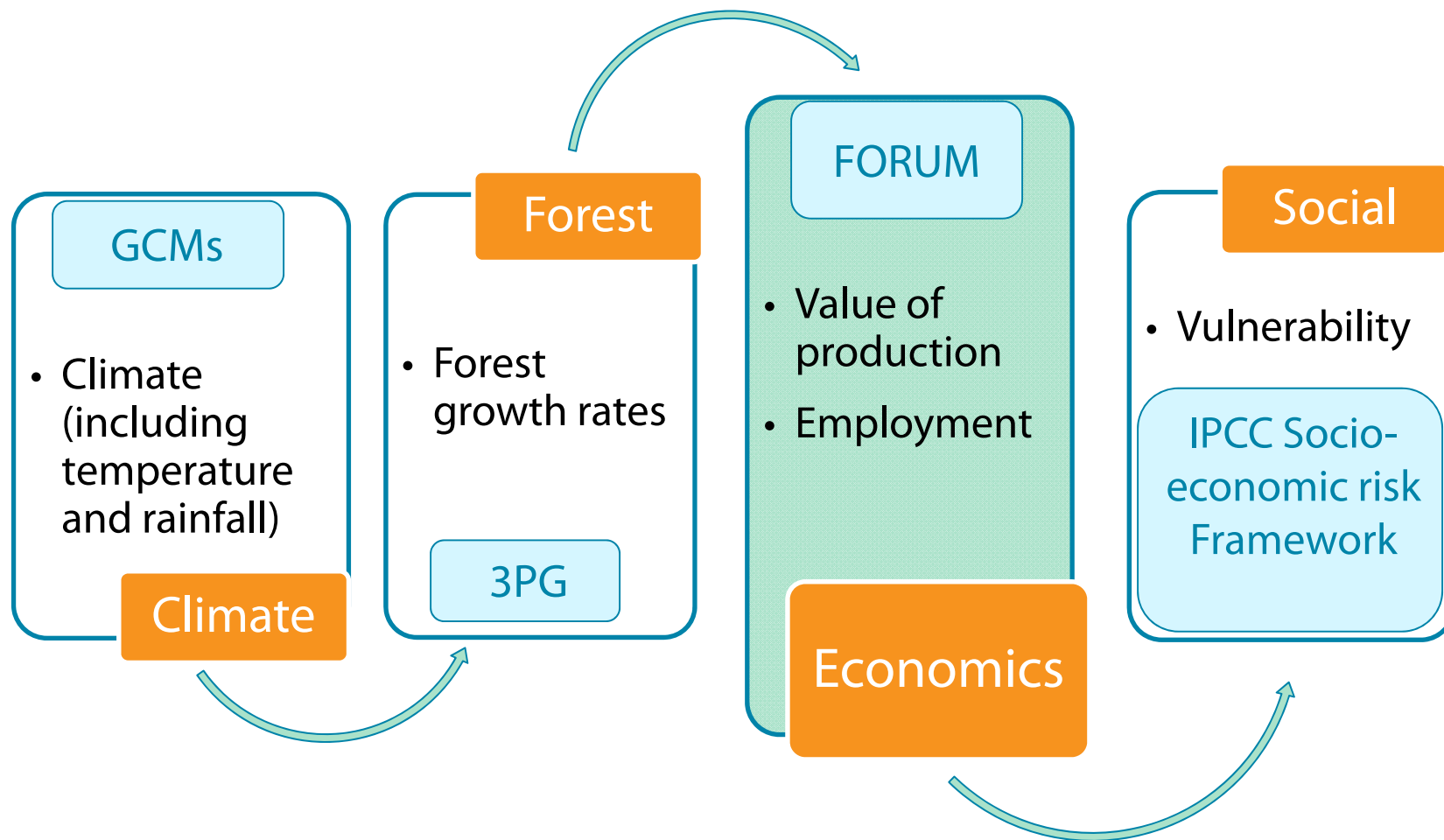
# Modelling impacts of climate change on Australia's forests and forestry

**Part II:**

**Kevin Burns**

*Greenhouse 2011, 4 – 8 April 2011, Cairns*

# Project overview





# Economic modelling framework: FORUM

## Forest



- Location
- Species
- Log volume
- Harvest costs

- Distance
- Haulage costs

## Mill



- Location
- Type
- Capacity
- Recovery rate
- Mill costs
- Labour

## Market



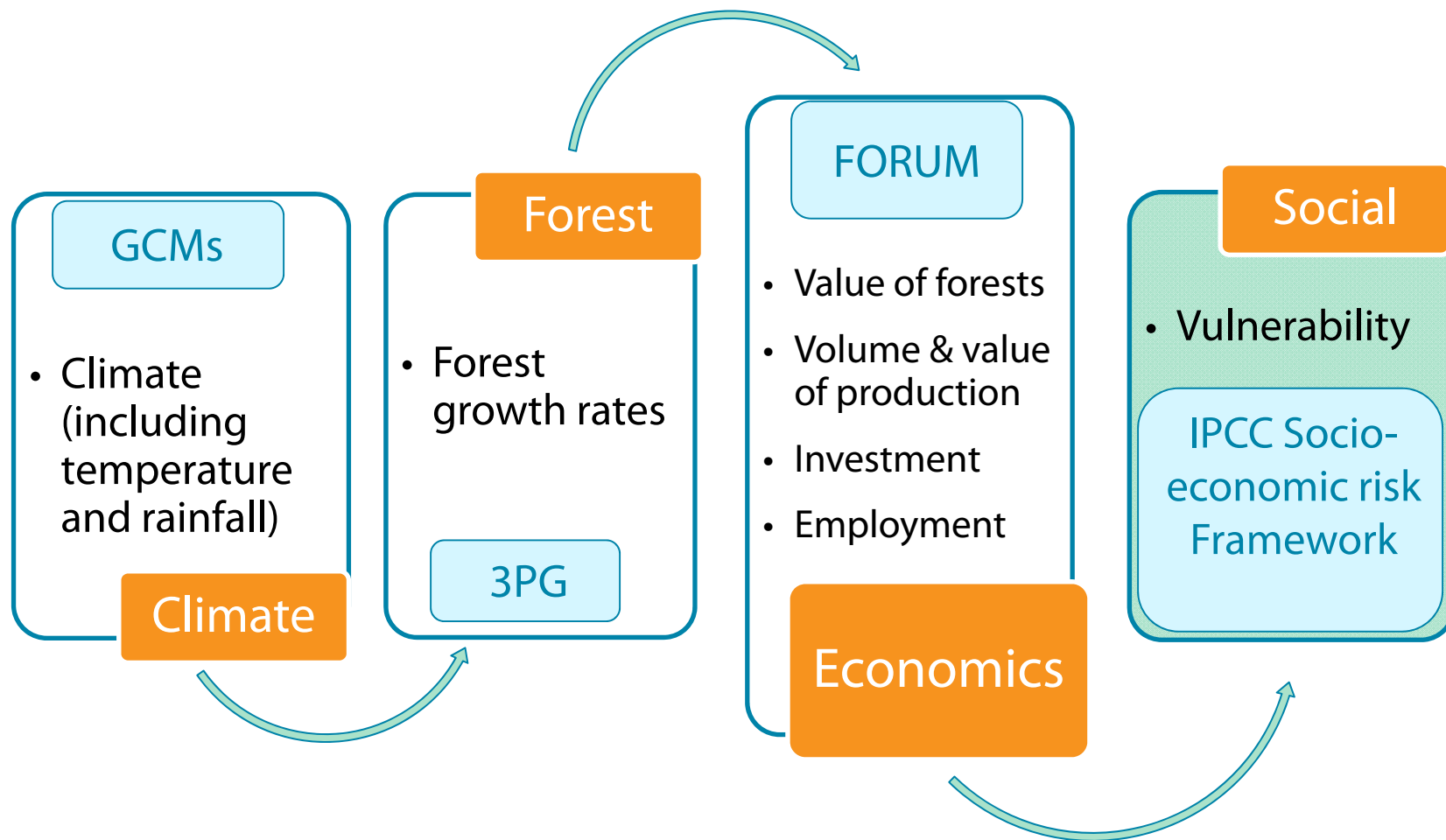
- Location
- Prices
- Distance
- Haulage costs

### Mill options:

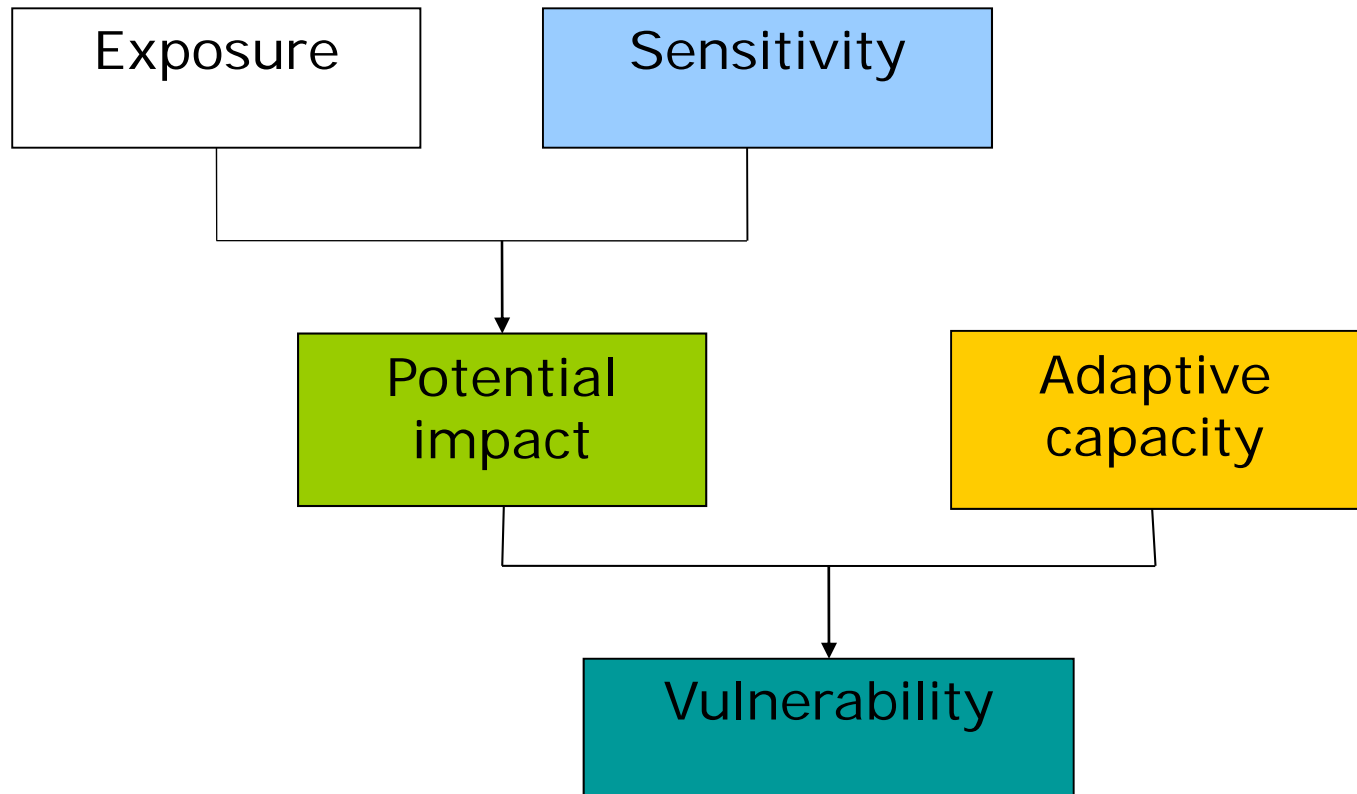
Larger scale HW sawmills (native and plantation),  
Larger scale SW sawmills,  
Hardboard mills,  
mills, Woodchip mills

LVL mills,  
Bioenergy

# Project overview



# Social analysis framework



# Conclusions

- An integrated approach drawing together climate modelling, forest growth, economic analysis and community vulnerability assessment:
  - an important first step in understanding impacts of climate change on forest industries at a regional level
  - allows an investigation of multiple risks
  - establishes a framework to investigate the potential future adaptation responses (silviculture, wood processing, future markets)
- The results of the study will be available in mid 2011



# Questions and comments

*Science and economics for decision-makers*

