



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

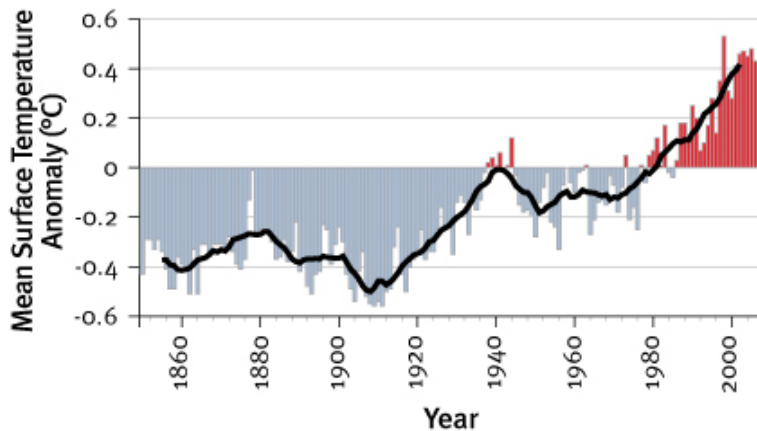
Project Aim and Objective

Aim

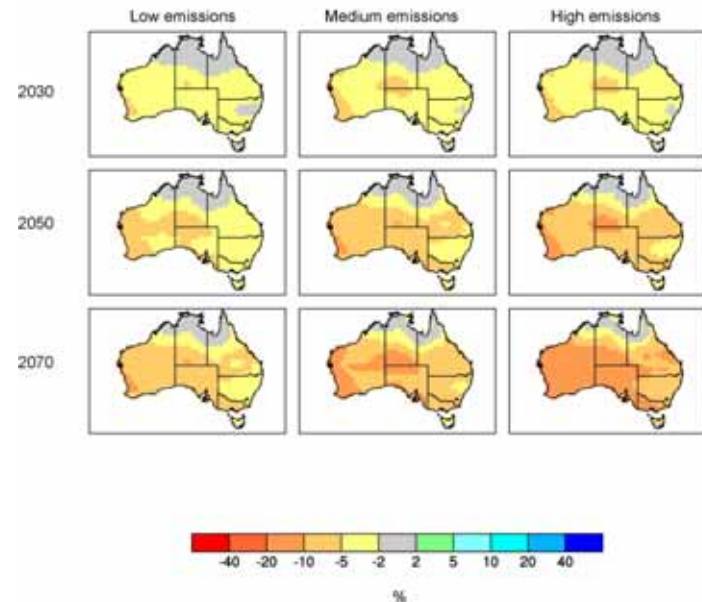
- *Model the biophysical impacts of the expected changes in climate on production forests and forestry across Australia*
 - *to understand future wood yields, economic impacts and identify which communities exhibit the greatest vulnerability to climate change.*

Challenges

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



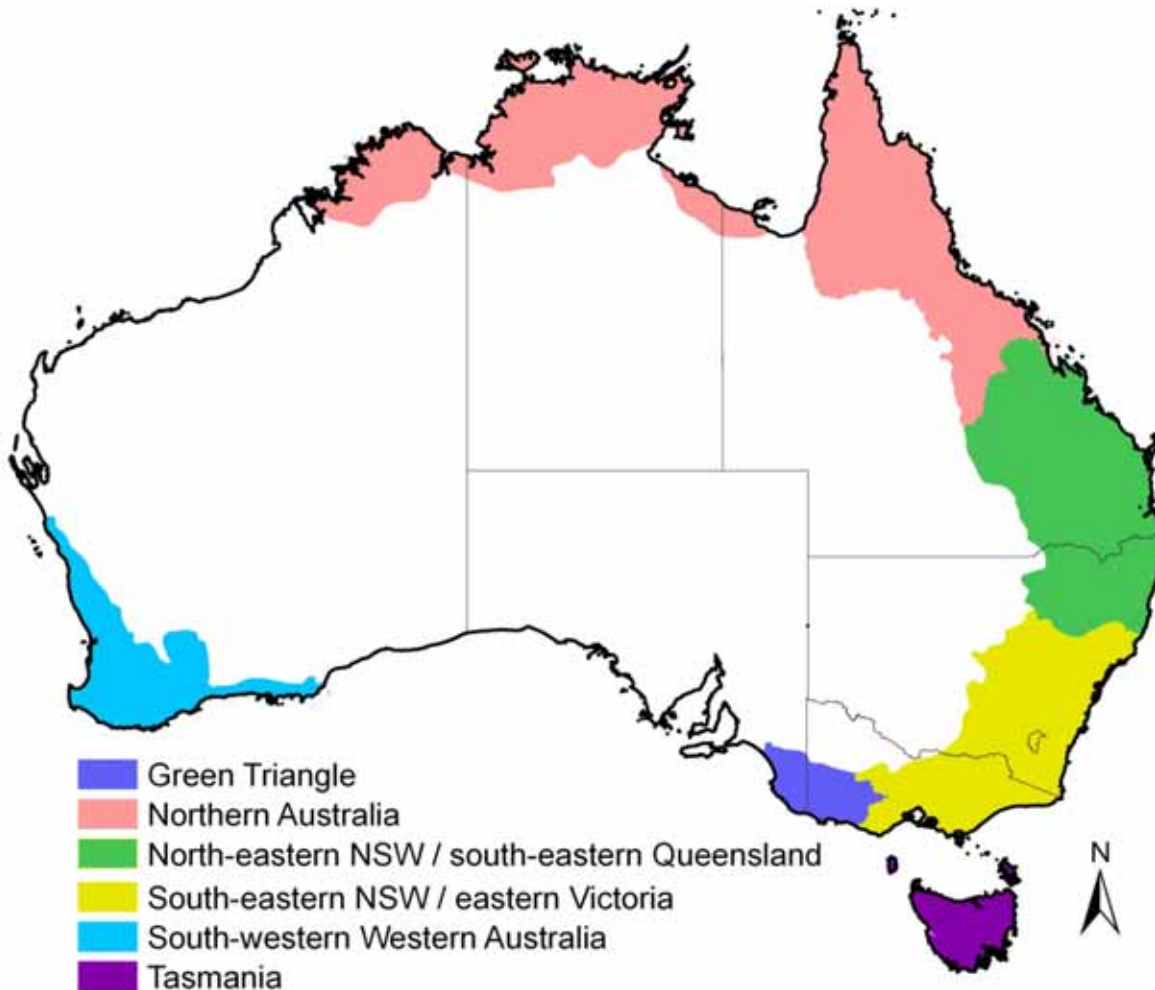
Time-series (1850–2007) of annual global mean surface temperature anomalies



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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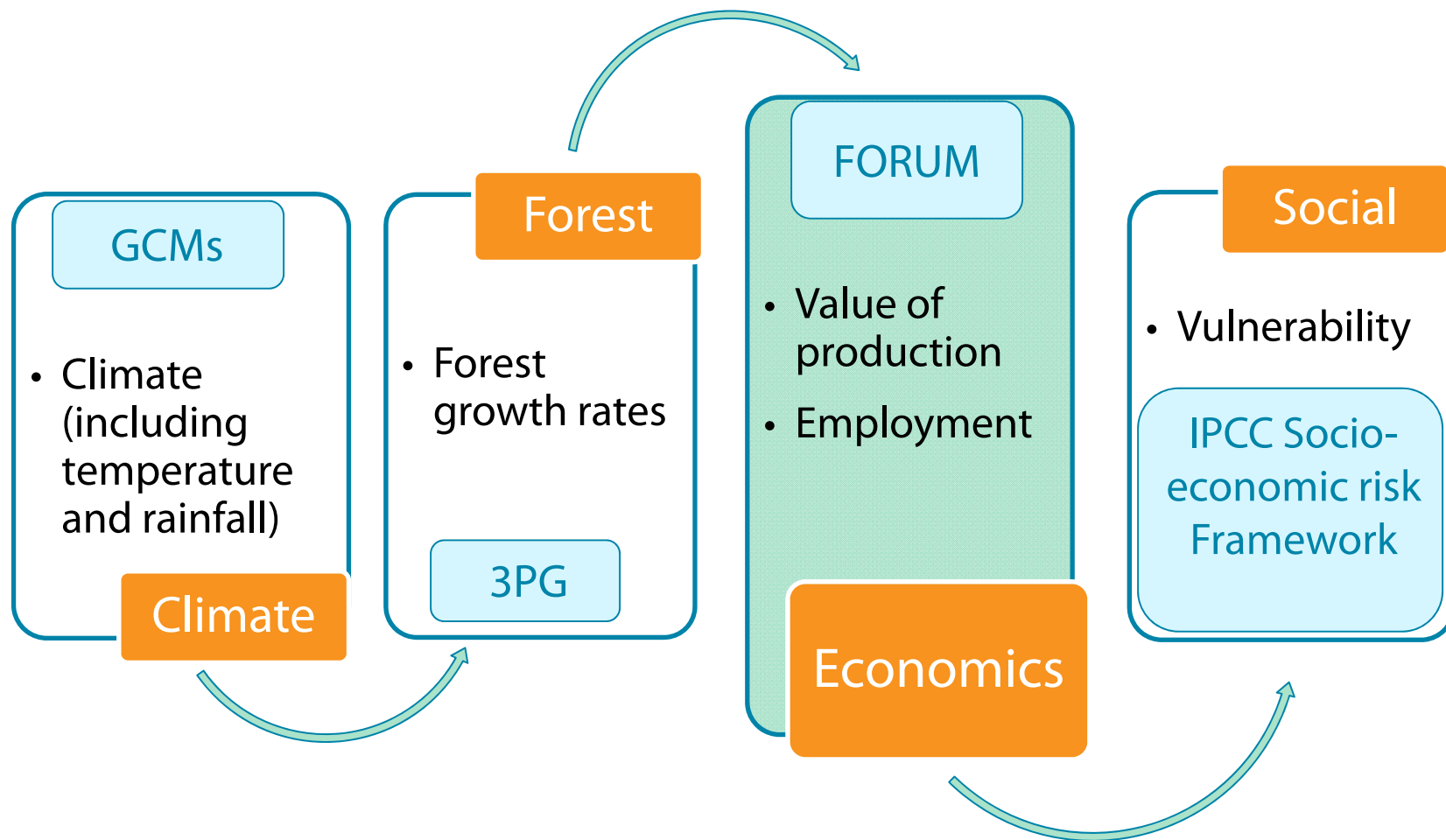
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Part II:

Kevin Burns

Greenhouse 2011, 4 – 8 April 2011, Cairns

Project overview



Economic modelling framework: FORUM

Forest



- Location
- Species
- Log volume
- Harvest costs

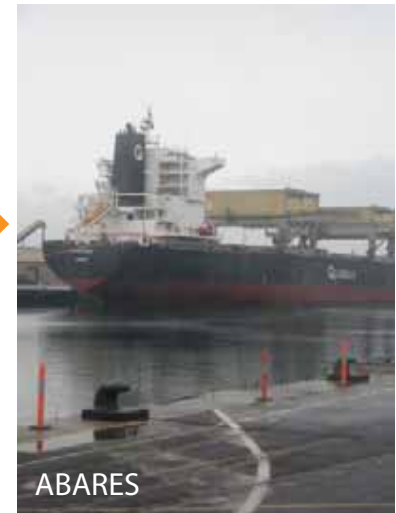
- Distance
- Haulage costs

Mill



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

Market



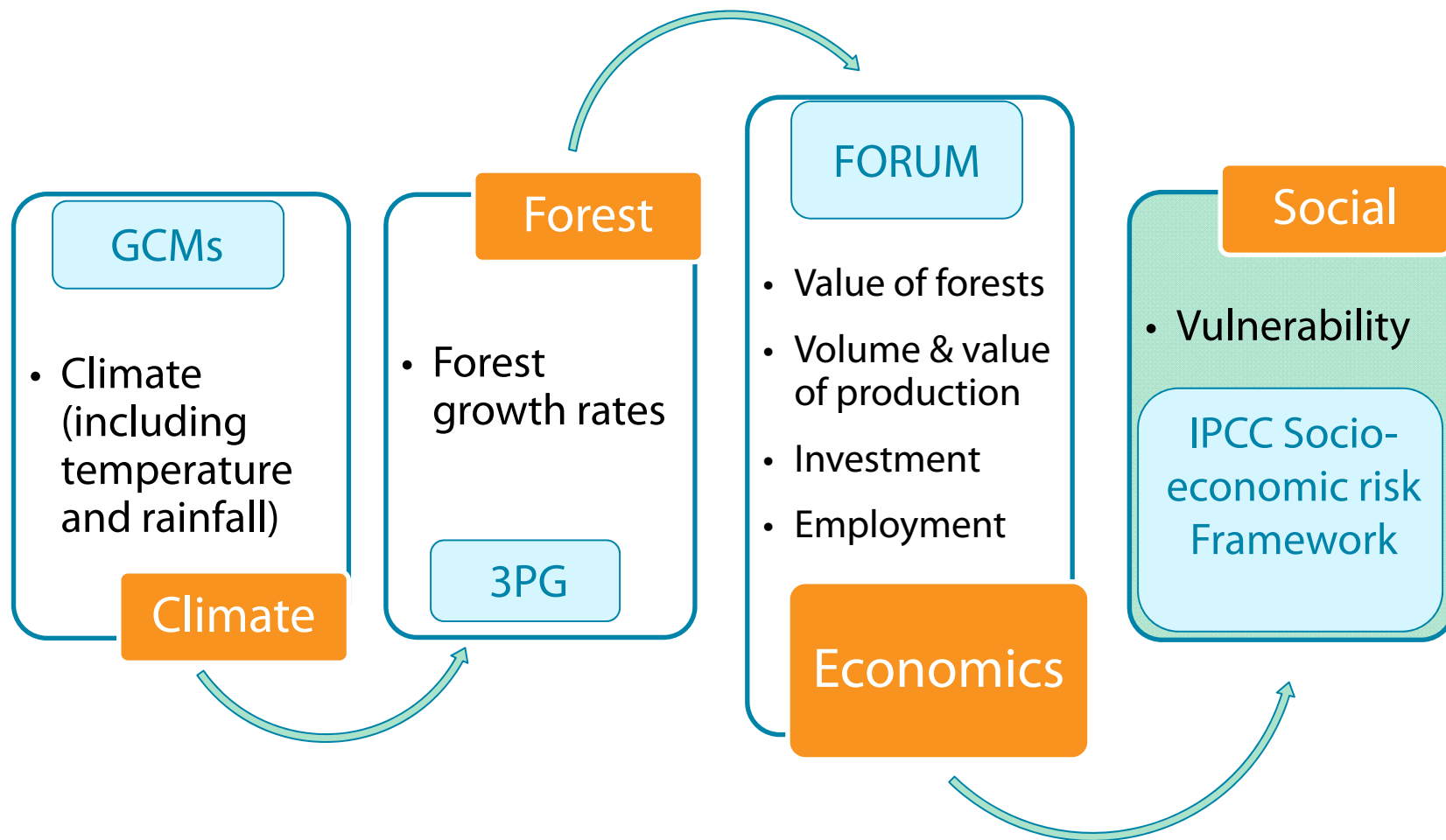
- Location
- Prices
- Distance
- Haulage costs

Mill options:

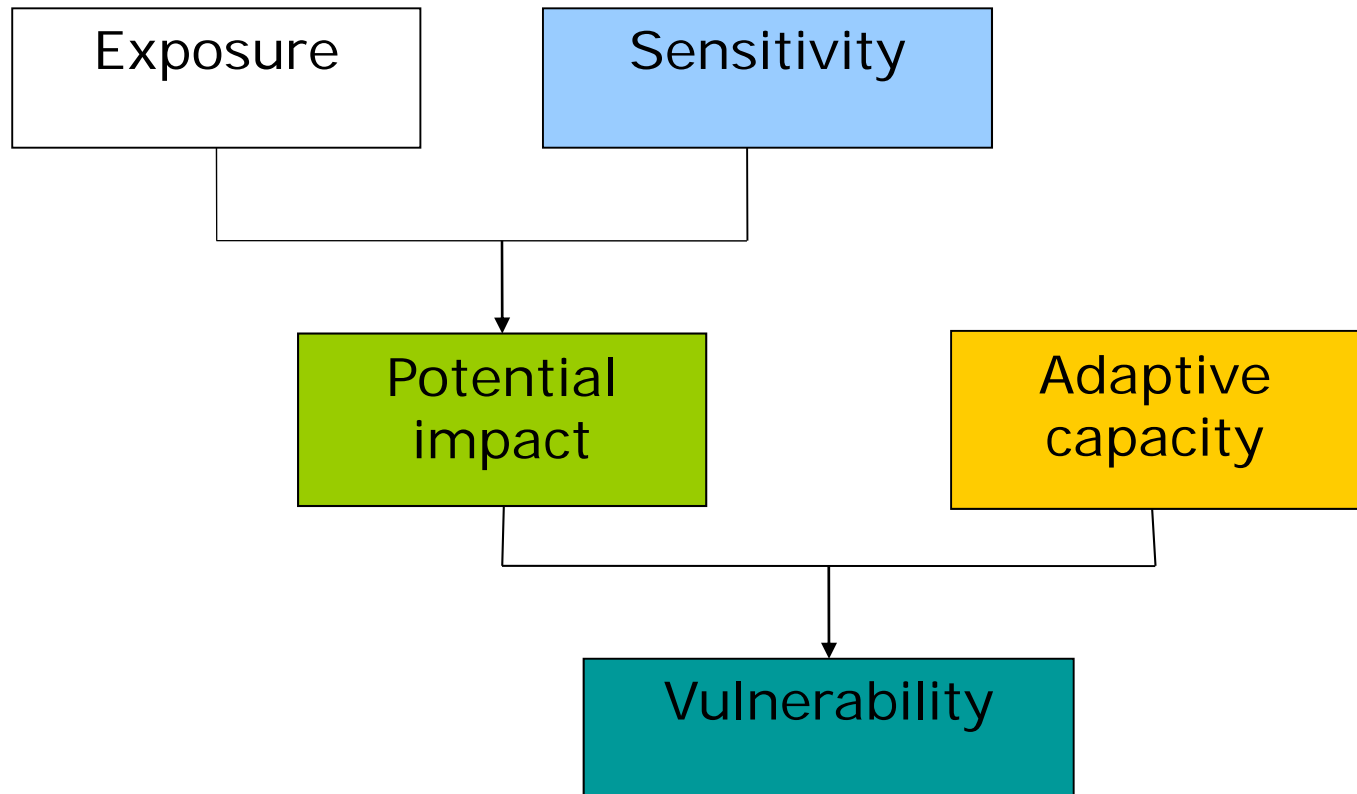
Larger scale HW sawmills (native and plantation),
Larger scale SW sawmills,
Hardboard mills,
mills, Woodchip mills

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

