

# THE ECONOMIC IMPACTS OF CLIMATE CHANGE ON CANTERBURY DAIRY FARMS

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# INTRODUCTION

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- How does farm production react to climate change and variability?

# QUESTIONS

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- How would these changes affect farm profits?

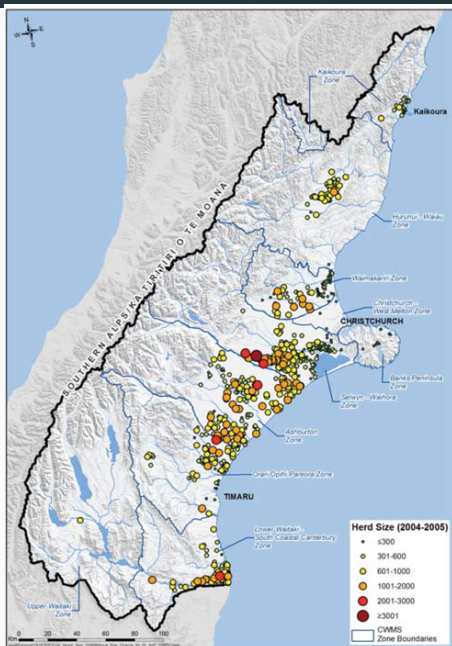
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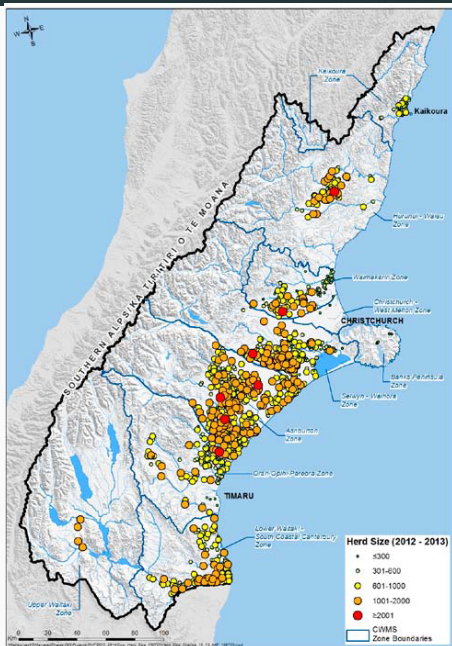
# DAIRYING IN CANTERBURY



2004 – 2005

Representation of farms  
and herd size (Burns, 2013)

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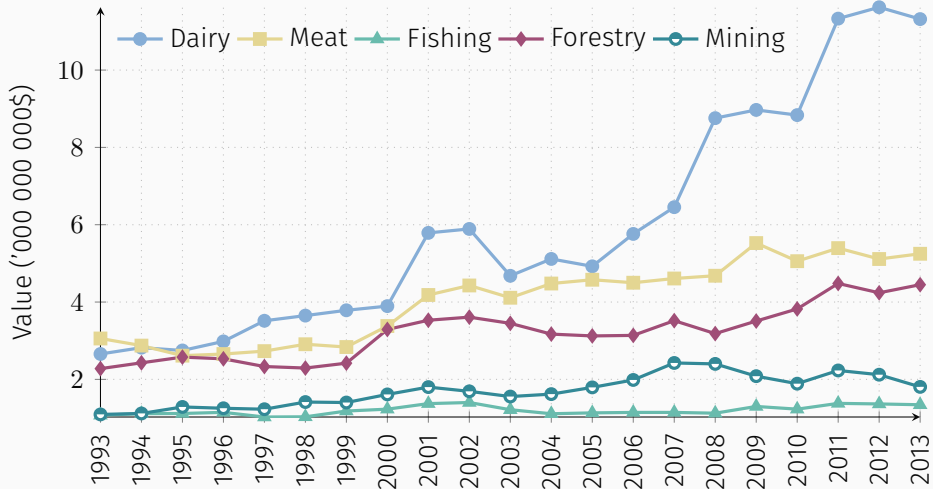


2012 – 2013

Representation of farms  
and herd size (Burns, 2013)



# EXPORT VALUES FOR SELECTED SECTORS (1993–2013)



Source: Statistics New Zealand (2013)

# METHOD

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### DAIRYMOD

- Developed by Johnson, et al.

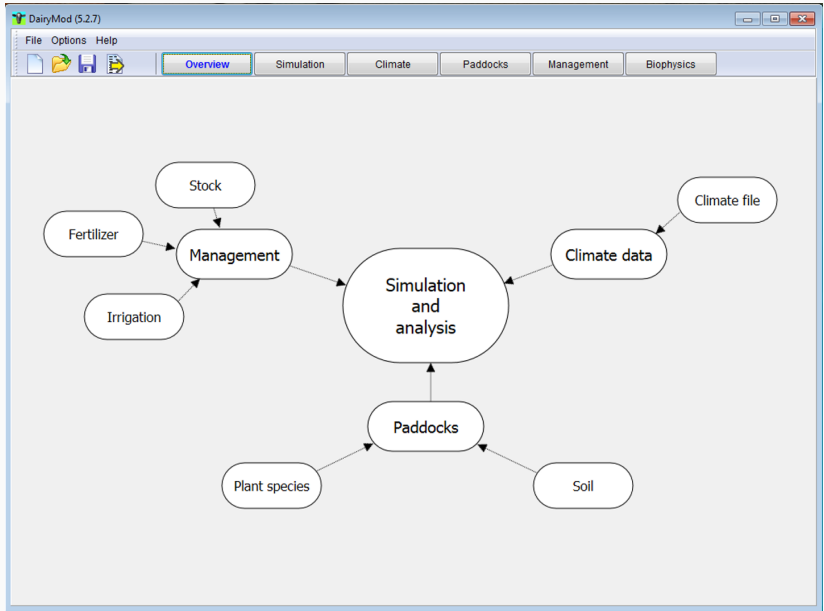
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- Multi-paddock, biophysical simulation model for dairy systems
- Used in previous studies in New Zealand and Australia

# DAIRYMOD



Farm data (Canterbury region)

- DAIRYNZ

Climate data (projections for climate scenarios)

- NIWA

Adapted from the IPCC 5<sup>th</sup> Assessment Report

- **RCP 2.6 (E1):** aggressive mitigation scenario
- **RCP 4.5 (B1):** eco-friendly/globalised world
- **RCP 6.0 (B2/A1B):** high-tech/regionally sustainable
- **RCP 8.5 (A2/A1FI):** divided world/high population growth/poorly-developed institutions and governance



# CLIMATE SCENARIOS

Adapted from the IPCC 5<sup>th</sup> Assessment Report



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# PRELIMINARY RESULTS

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Applied DairyNZ and NIWA data to DairyMod model to analyse climate change effects in:

- Lactation (milk production)

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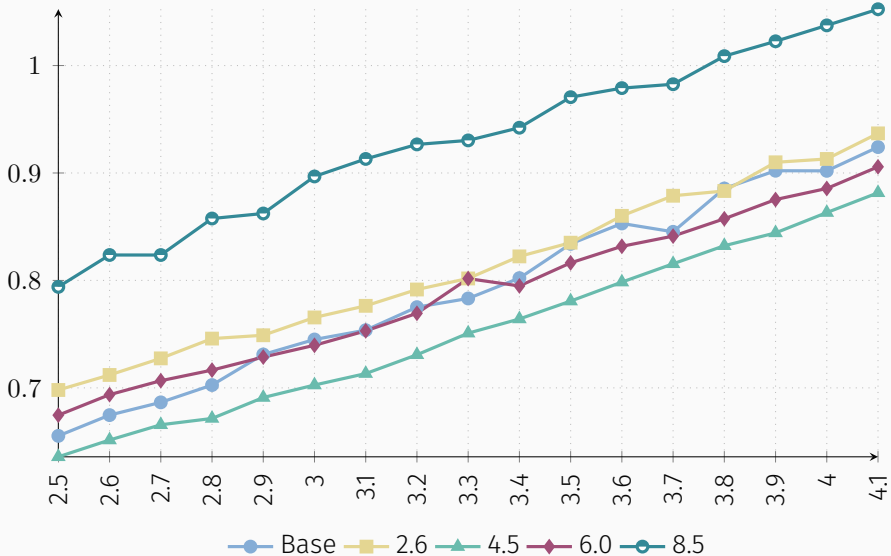
- Lactation (milk production)
- GHG emissions

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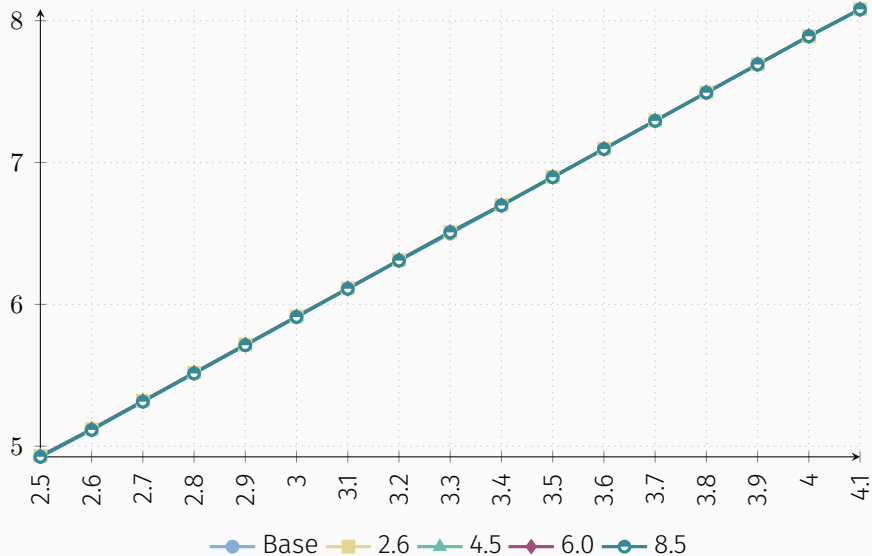
- Increase in  $CO_2e$  from  $N_2O$  (but very small)
- No change in  $CO_2e$  from  $CH_4$
- Irrespective of the increase in stocking rate

# CO2E FROM N2O

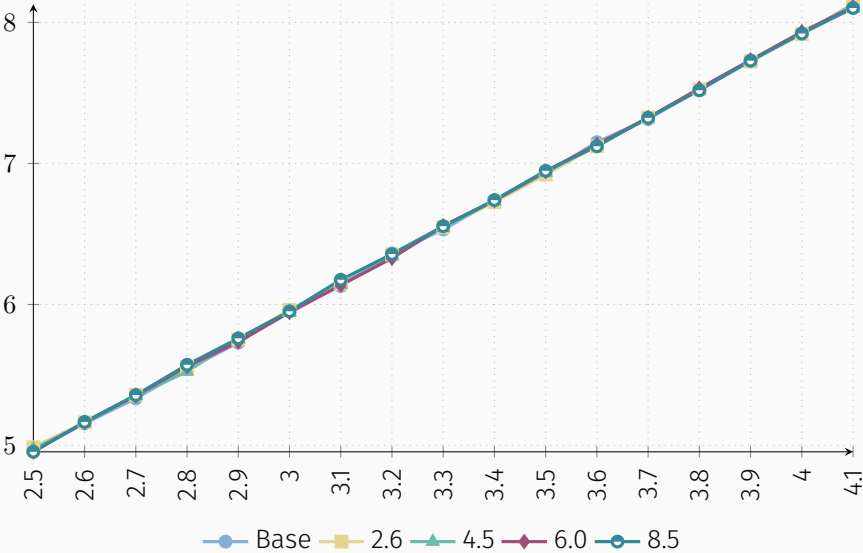




# CO<sub>2</sub>E FROM CH<sub>4</sub>



# NET CO2E EMISSION



Decrease in lactation across climate scenarios

Decrease in lactation across climate scenarios

- **Expected decrease in profits**

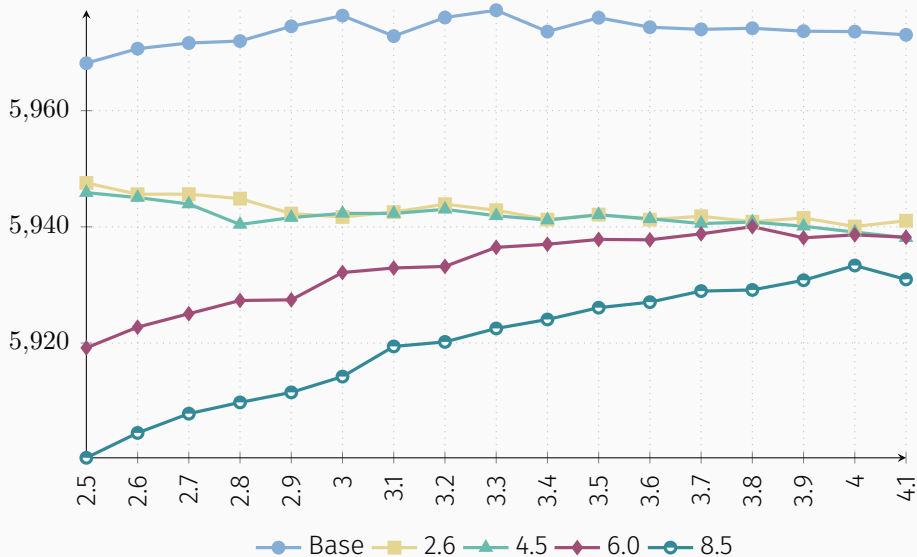
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- No radical environmental impact in terms of GHG emissions

END

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Thank you!!!  
And any question/s?

