

Climate and economic activity in New Zealand

APCC 2007 Symposium

James Renwick

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NIWA

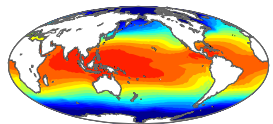
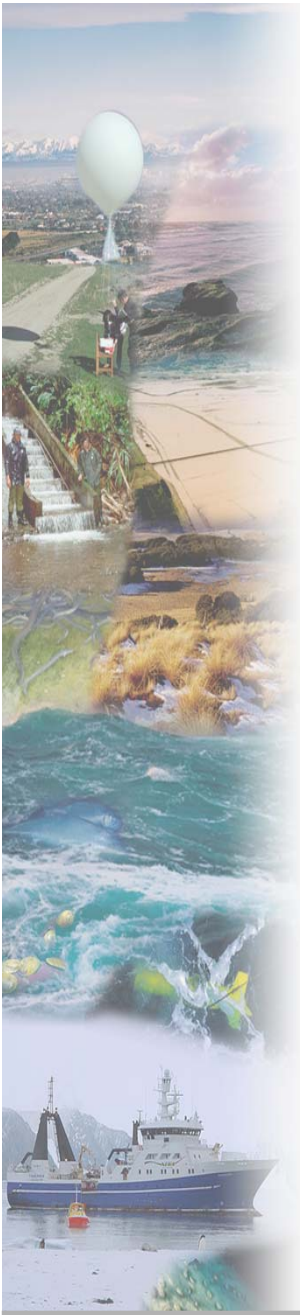
Adolf Stroombergen

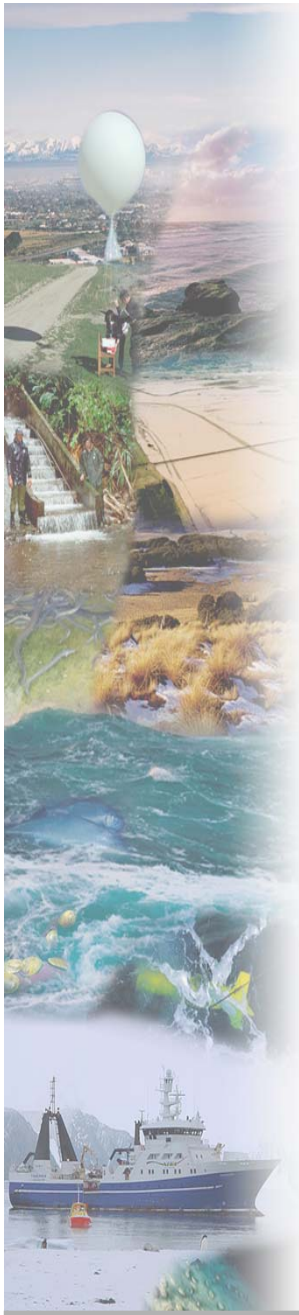
Infometrics

www.niwascience.co.nz/ncc/

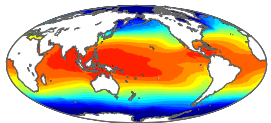
Outline

- Application of historical observations
 - Optimal agricultural practices
- Use of seasonal predictions
 - Combining observations and probabilistic outlooks
- Economics of climate change
 - Mapping change
 - Climate and economic sectors
- EcoClimate





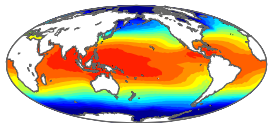
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Virtual Climate Network



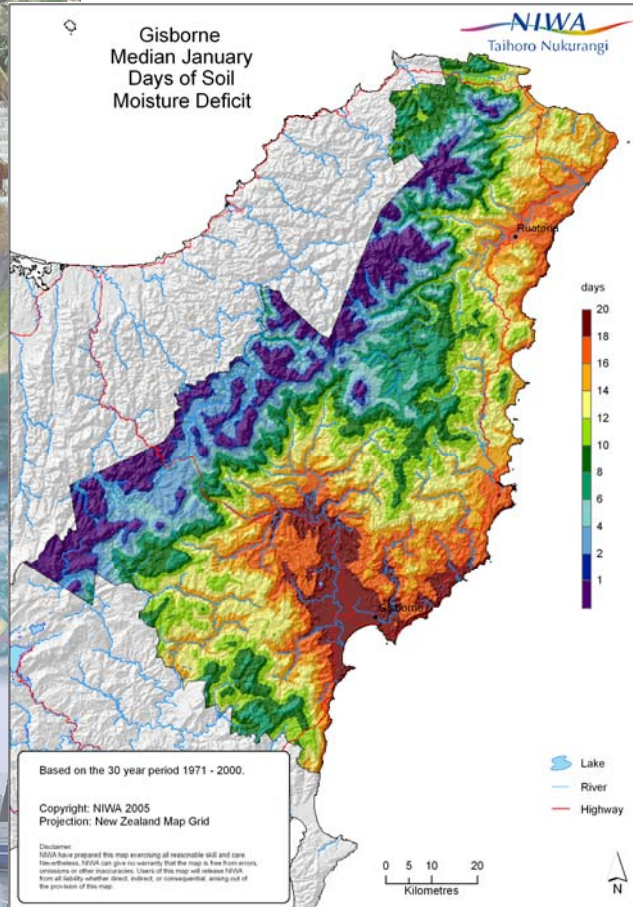
- Spatial interpolation of daily data
 - $0.05^{\circ} \times 0.05^{\circ}$ latitude/longitude grid
 - Rainfall, Relative humidity
 - Soil moisture
 - Max/min temperature
 - Soil temperature
 - Solar radiation
 - Wind speed
 - Potential Evapotranspiration
- Historical series: 1972 – present



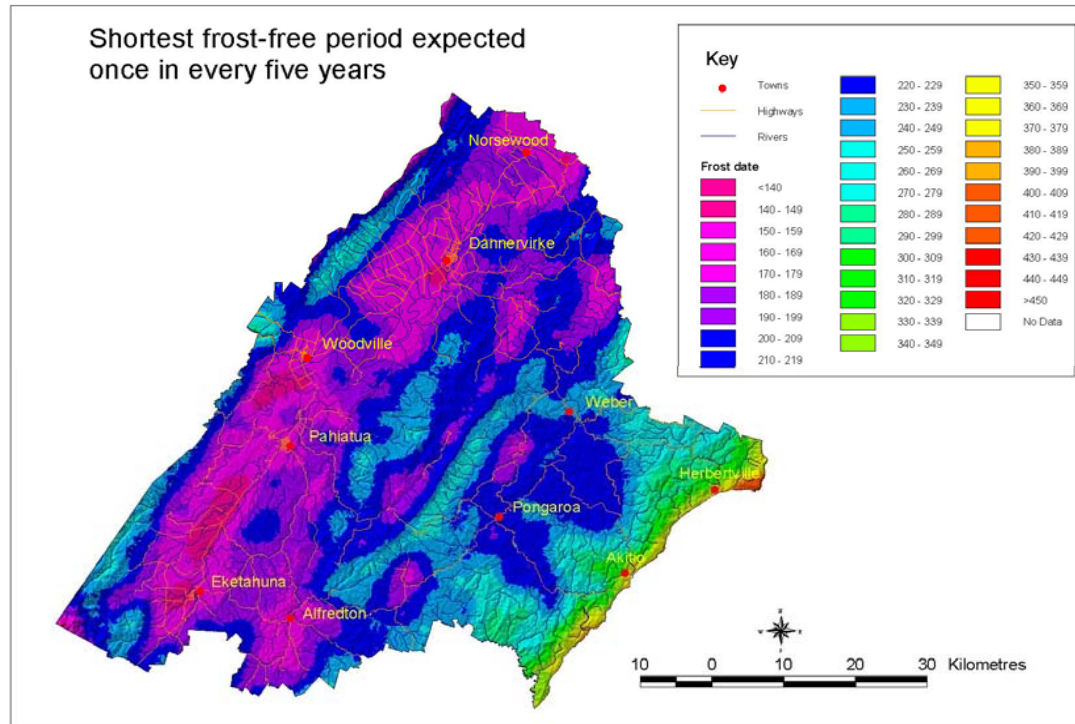
High resolution derived fields



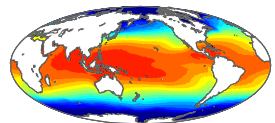
Median days of SMD



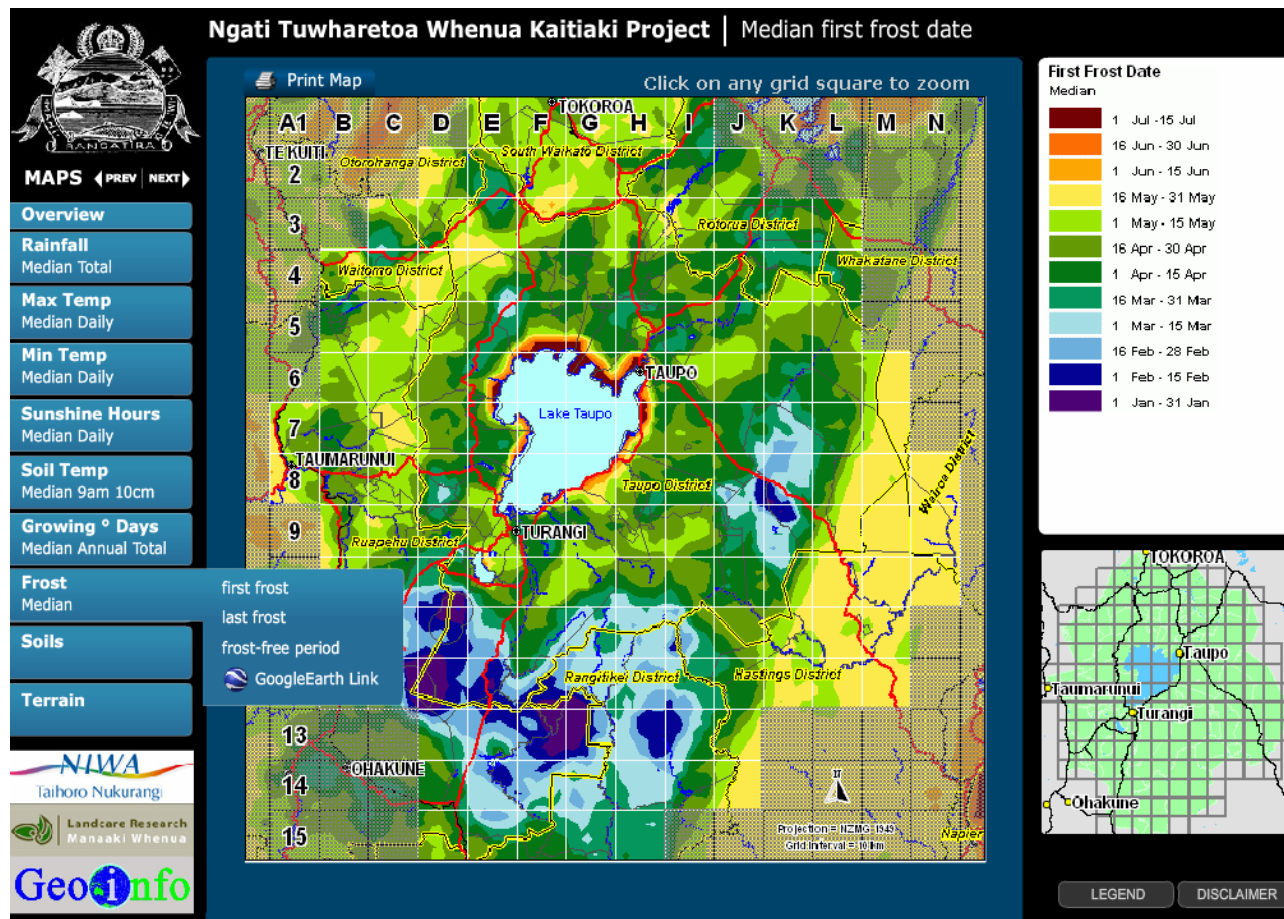
Shortest frost-free period, 20th percentile



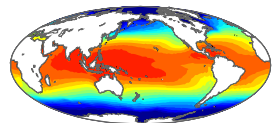
- Means and probabilistic information
- Farm-scale resolution



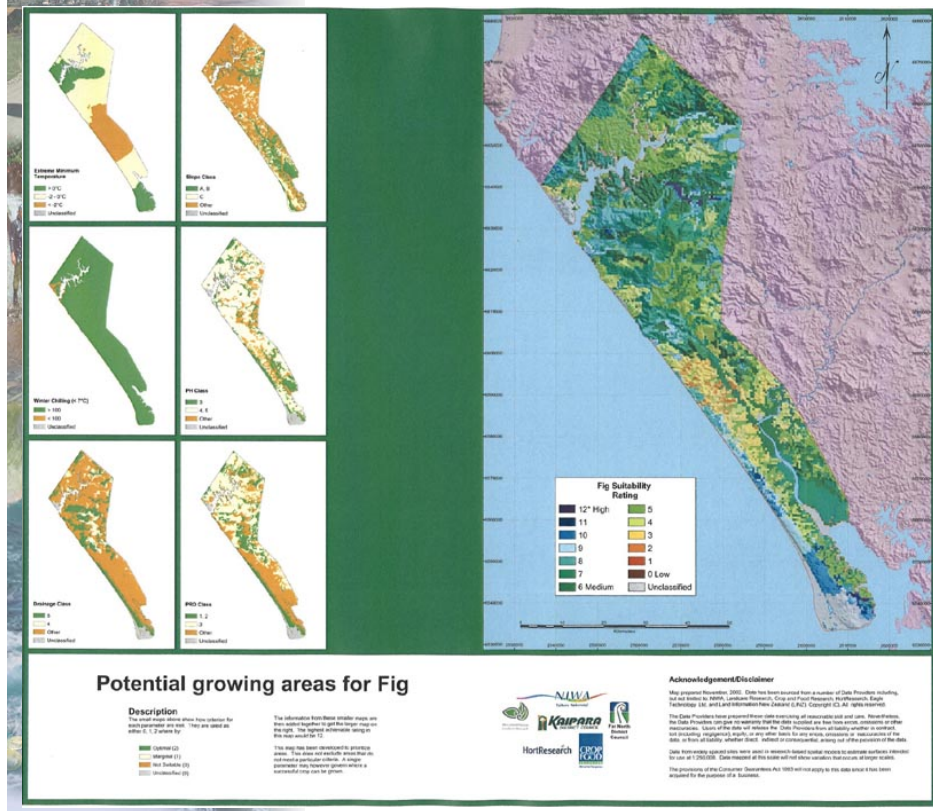
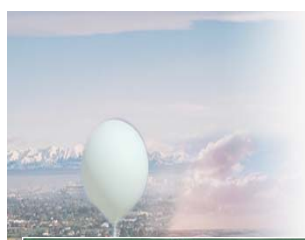
Tools for users



- CD-based GIS browser
 - Climate, soil, topography
 - For Maori community use, central North Island



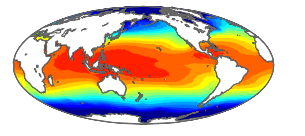
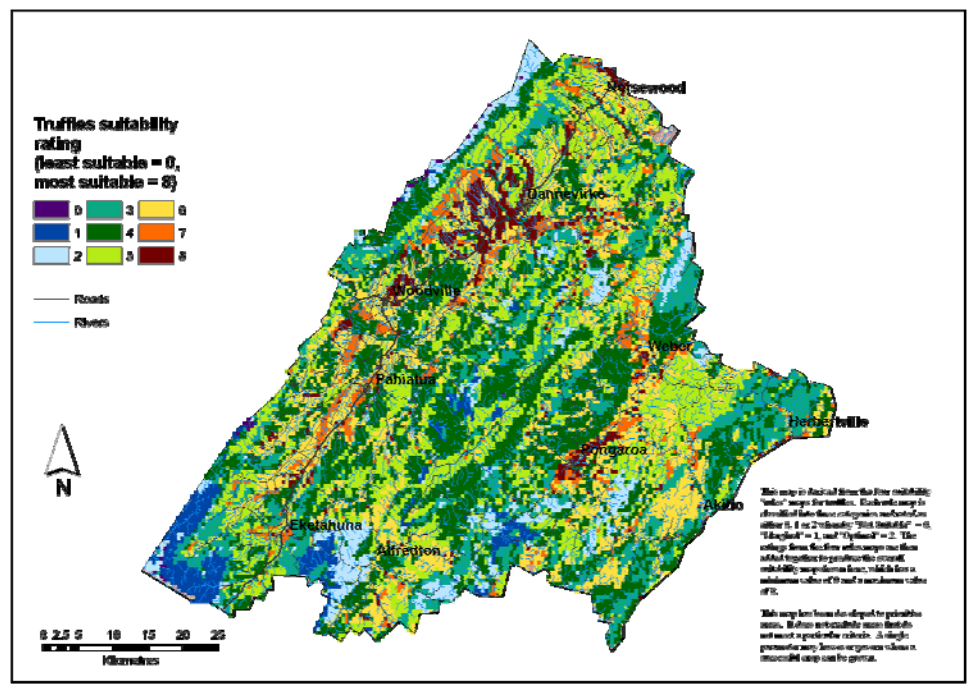
Integrated products

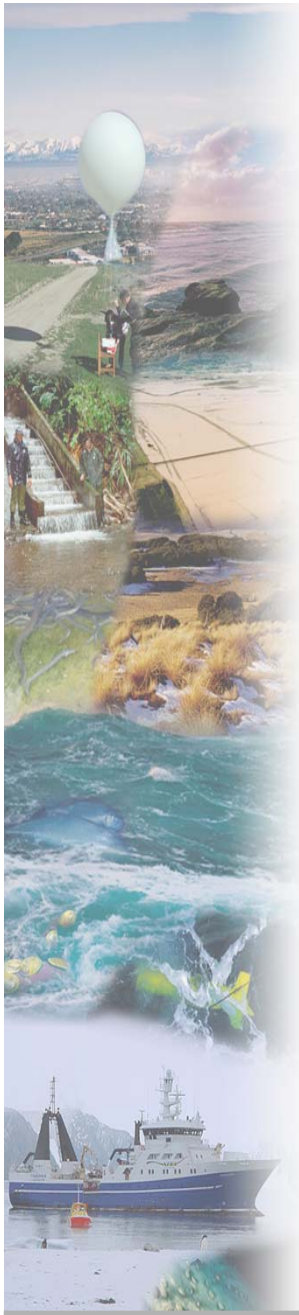


Figs, far north

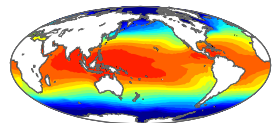


Truffles, central region

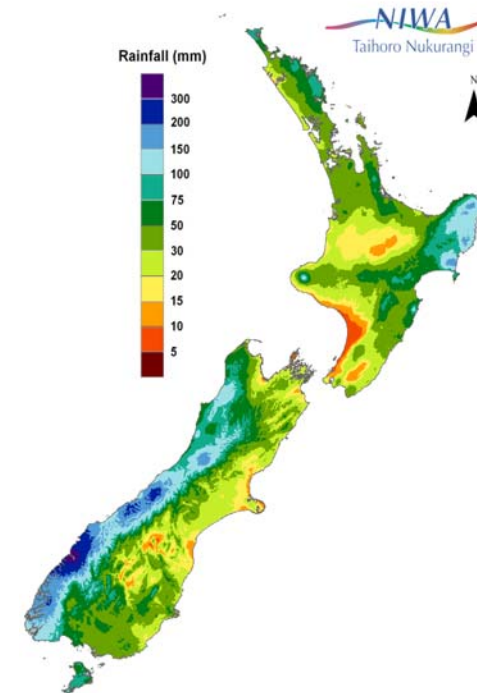
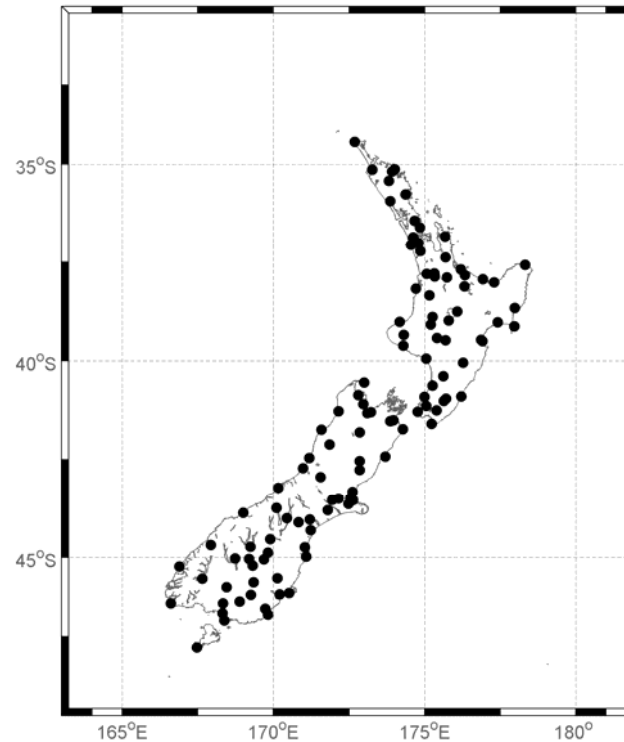




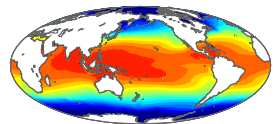
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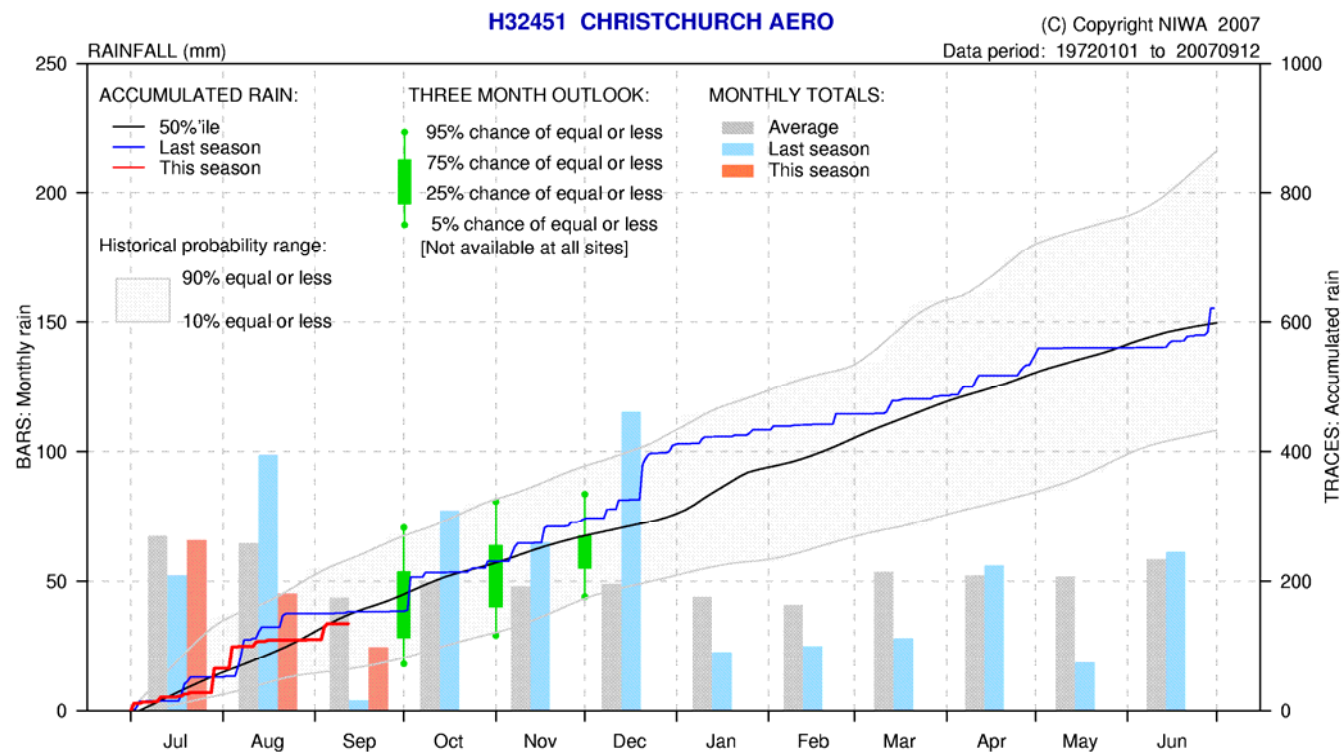
Real-time observations



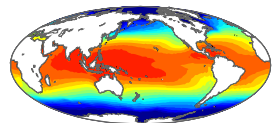
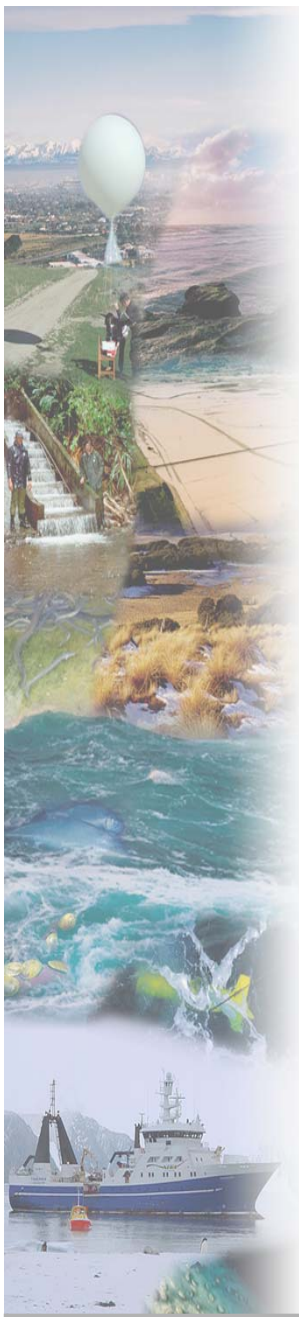
- ~120 real-time reporting sites
- Ability to map many variables
 - Daily, weekly, monthly etc

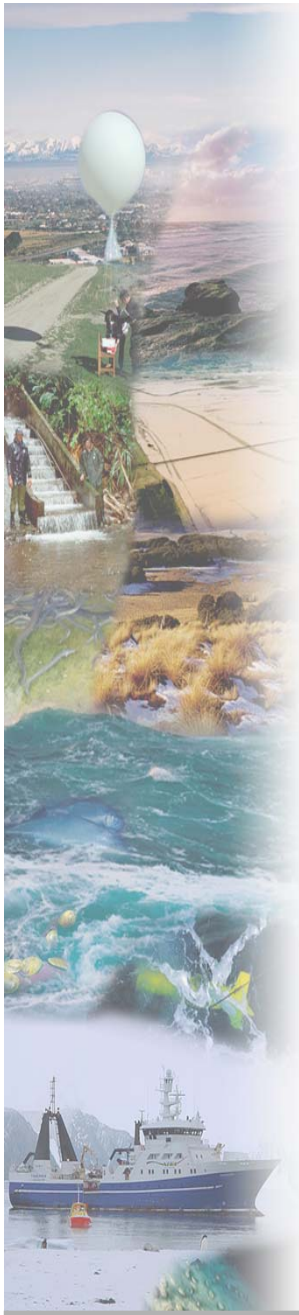


Combining observations and outlooks

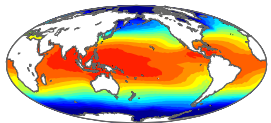


- Latest season rainfall in red
- Likely future as green bars
 - From seasonal forecast probabilities
 - Starting from current accumulation

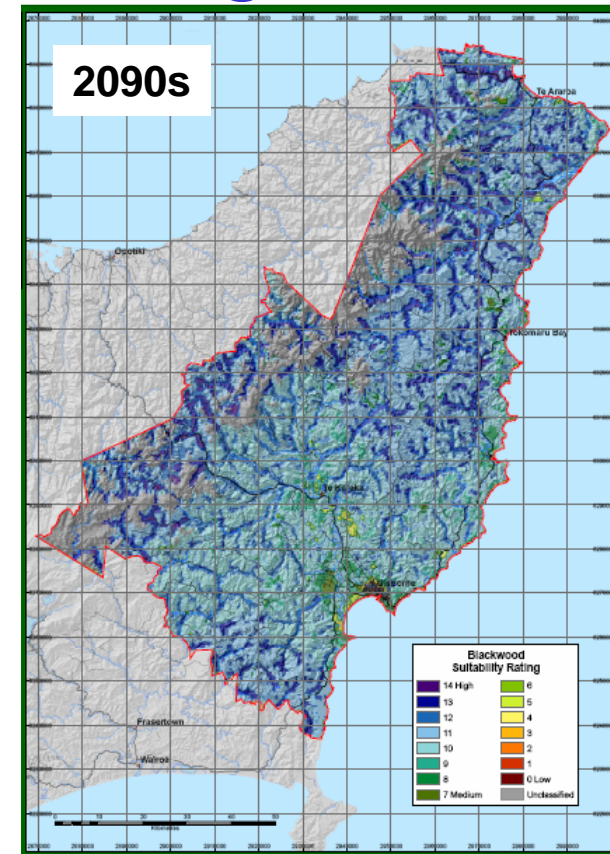
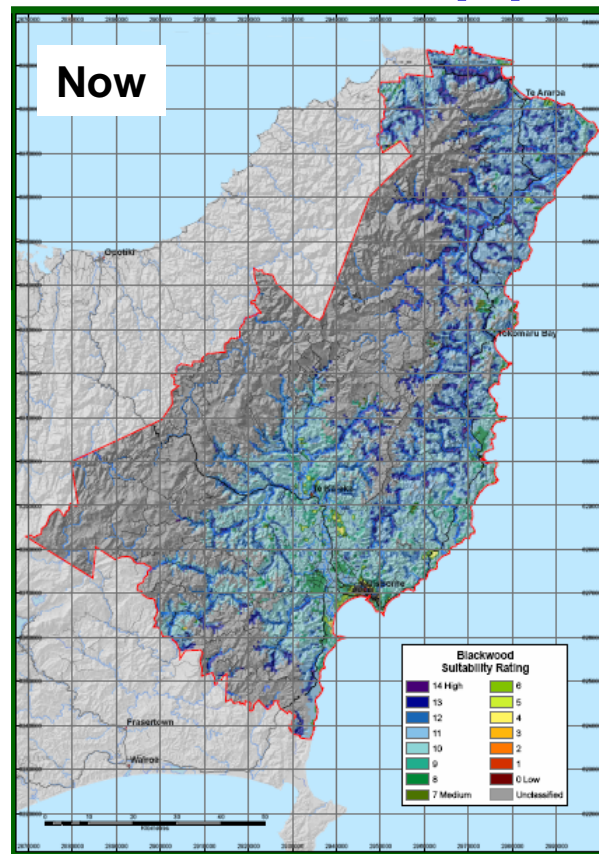
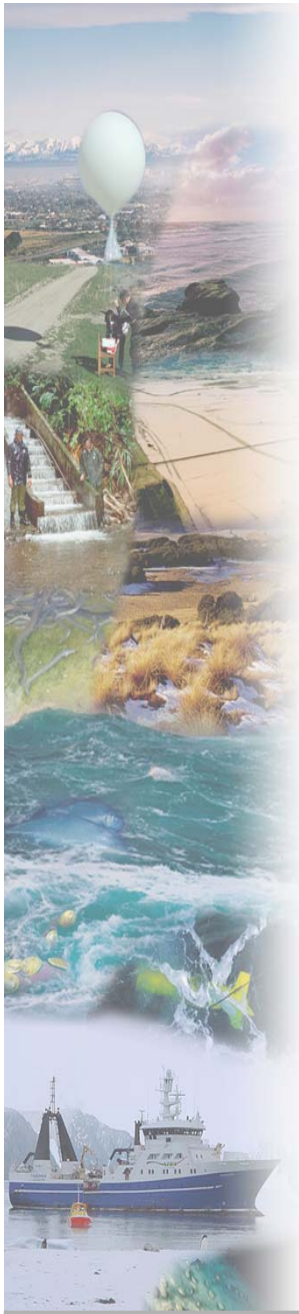




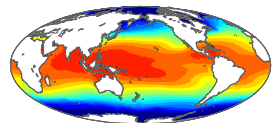
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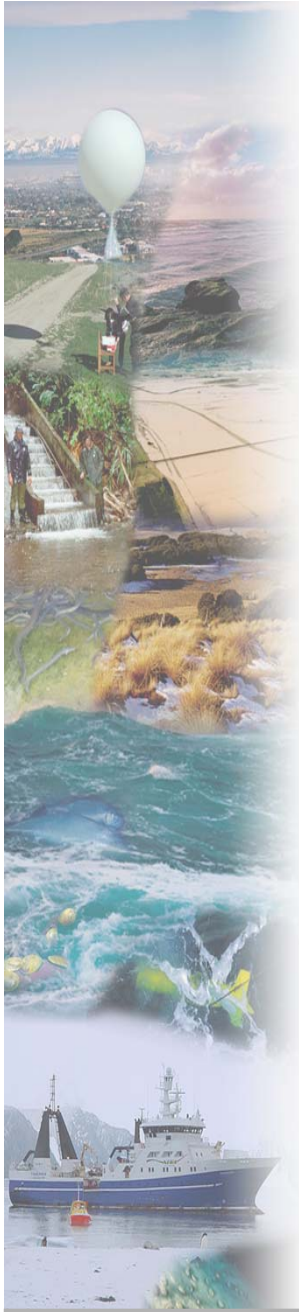
Mapping change



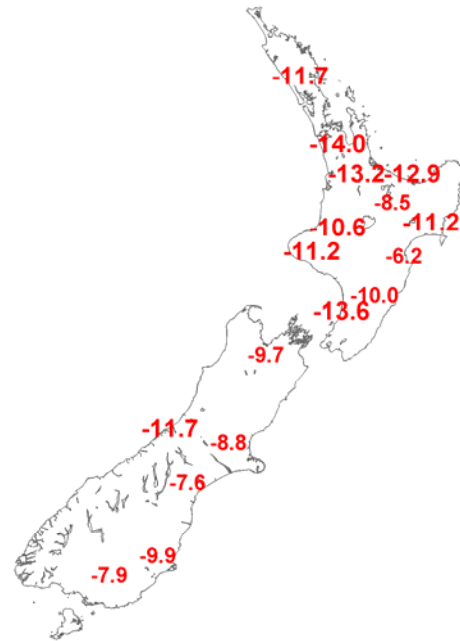
- Blackwood suitability, for North Island forestry business
- Uses present-day time series
 - Offsets (same variability) for temperature
 - Changed distributions for rainfall & wind
- Informed by RCM results



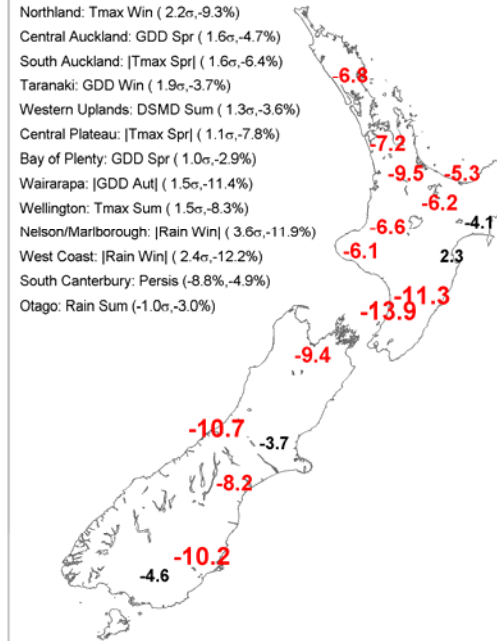
Dairy production



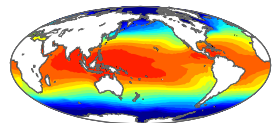
1998-99 Observed (% deviation)



1998-99 Estimated



- Successfully modelled dairy production
 - seasonal climate indicators: GDD, SMD
- Applied to economic model
 - Significant drought → 0.4% drop in GDP
 - Effect for sheep meat around 0.2% GDP

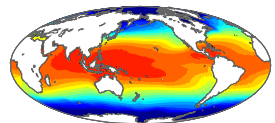
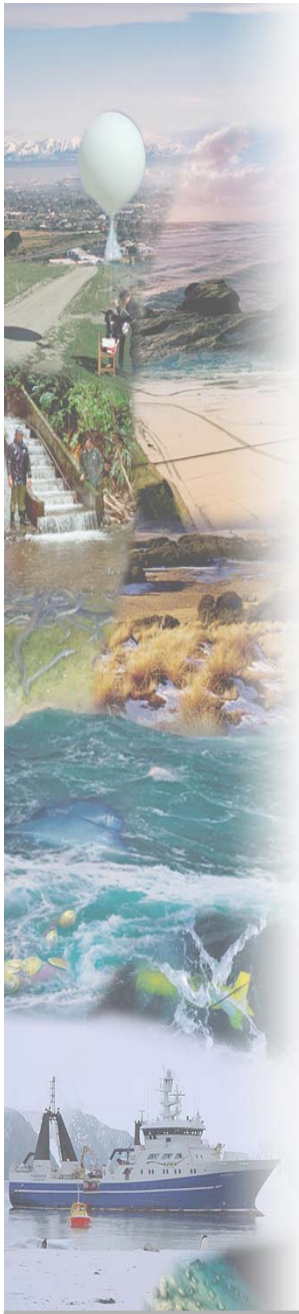


EcoClimate

EcoClimate { Integrated Research on
the Economics of Climate
Change Impacts,
Adaptation and Mitigation



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Introduction
Issues Addressed
People Involved
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Contact us

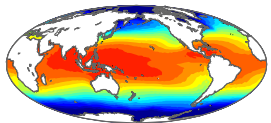
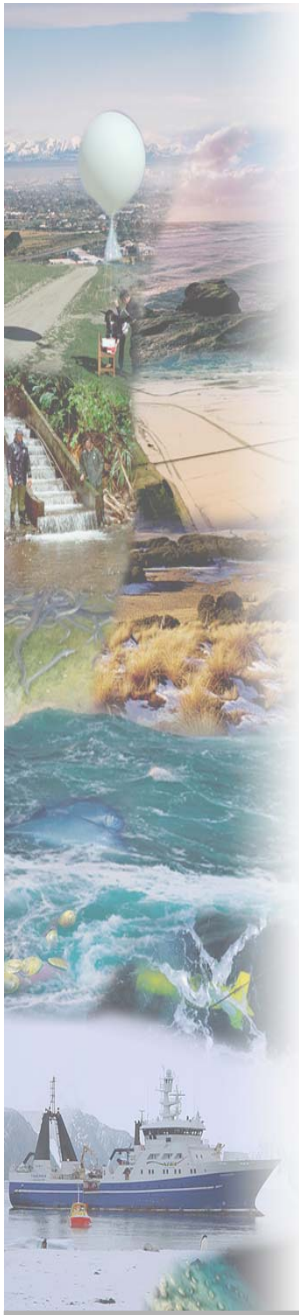


<http://www.ecoclimate.org.nz>



EcoClimate

- Framework to assess risks and opportunities for the national economy from local and global climate variability and change
- Researchers in
 - Climate
 - Agriculture
 - Energy
 - Land use
 - Economics and public policy
- Integrate up the sectoral studies done to date
- Local and global economic effects
 - New Zealand very vulnerable to changing global trade patterns
- Work begins 1 October 2007



Summary

- Products from historical data
 - Better decision making
- Developing ability to merge observed and forecast information
 - Better real-time management
- High-resolution climate change scenarios
 - Combine historical data and RCM output
- Integrated economic analysis
 - Better uptake by policy makers

