Bryan Jenkins
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Presentation

Legislative changes in New Zealand to address climate change: Do they provide an adequate basis for tomorrow's challenges?

Biography

Prof Jenkins is Professor, Strategic Water Management at the Waterways Centre for Freshwater Management, a joint centre of the University of Canterbury and Lincoln University. The Centre provides undergraduate and postgraduate courses in water resources management and coordinates research across the universities in water resource issues.

Prior to this appointment he was chief executive of Environment Canterbury for more than seven years. Environment Canterbury is the regional council for Canterbury whose responsibilities include natural resource management and the development of the Canterbury Water Management Strategy.

He was chief executive of the Department of Environmental Protection in Western Australia for seven years. He was Chair of the WA Greenhouse Council and a member of the Australian delegation to COP 4 in Buenos Aires. Before that, he had more than 20 years' experience in environmental management consulting throughout Australia, South East Asia, India and China.

He has a PhD in environmental planning from Stanford University, a masters and first class honours degrees in civil engineering from Adelaide University and a master of administration from Monash University.

Abstract

The paper considers the legislative changes that have occurred in New Zealand to address climate change. The Resource Management Act 1989 was implemented prior to the significance of climate change being apparent and was amended in 2004 to incorporate energy and climate change provisions. The Climate Change Response Act 2002 was passed to provide a legal framework for New Zealand to meet its international obligations under the Kyoto Protocol. An amendment in 2008 established a greenhouse gas emissions trading scheme which has been subject to further amendments.

New Zealand has a long term target of reducing net emissions by 50% below 1990 levels by 2050. However New Zealand's greenhouse gas emissions have risen 26% since 1990 and are officially projected to be 42% above that benchmark by 2030. The current New Zealand emissions trading scheme is projected to achieve a 0.4%

reduction in emissions by 2030 compared to the government taking no action. New Zealand has accumulated international emission reduction units of dubious efficacy and very low cost to meet its Kyoto Protocol obligations. The carbon price of the international units has been so low that it has provided no incentive to reduce domestic emissions.

The current legislative regime is ineffective in dealing with mitigation of greenhouse gas emissions and with adaptation to climate change. Agriculture, which represents 49% of New Zealand's current emissions and 77% of the projected growth in emissions between now and 2030, has been indefinitely excluded from its emission trading scheme. Agriculture continues to increase principally through conversions to dairying and deforestation. Greenhouse gas emissions have been specifically excluded from consideration by local government authorities in the consenting process (New Zealand's impact assessment process). This was on the basis that there would be a national approach through a National Environmental Standard. However no NES has been promulgated. While the purpose of the 2004 RMA amendments was to require local authorities to plan for the effects of climate change no legislative provisions have been introduced to facilitate this planning. Only guidance has been provided by central government. Local authority efforts to plan for sea level rise have led to concerted community opposition.

Tomorrow's challenges include the adoption of a policy and legislative framework that provides an effective basis for addressing climate change and the formulation of implementation strategies to reduce emissions and adapt to climate change. Examples are provided in the paper of ways that mitigations and offsets for dairy conversions could be incorporated in the consenting process. In addition examples of the need for adaptation and potential approaches for addressing the climate change implications for water management in Canterbury and for addressing sea level rise in Christchurch are discussed.

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LEGISLATIVE CHANGES IN NEW ZEALAND TO ADDRESS CLIMATE CHANGE:

DO THEY PROVIDE AN ADEQUATE BASIS FOR TOMORROW'S CHALLENGES?

EIANZ Annual Conference 2016, Brisbane

Professor Bryan Jenkins
Waterways Centre: University of Canterbury and Lincoln University

PRESENTATION

- Legislative provisions for climate change in New Zealand
  - Resource Management Act
  - Climate Change Response Act
- Tomorrow's climate challenges for New Zealand
  - emission reduction
  - adaptation to projected climate effects
- Conclusion
  - (in)adequacy of current approach

NZ CLIMATE CHANGE LEGISLATION

- Resource Management Act 1991
  - promulgated prior to recognition of significance of climate change
  - amended in 2004 to incorporate energy and climate change provisions

Resource Management Act 1991

- Climate Change Response Act 2002
  - legal framework to meet UNFCCC and Kyoto Protocol obligations
  - amended in 2008 to establish NZ ETS
  - ETS modified in 2009 and 2012

Climate Change Response Act 2002

RMA 2004 AMENDMENTS

- "Effects of climate change" added
  - s7: other matters "shall have particular regard to"
  - not s6: matter of national importance "provide for"
- Local authorities **not** to consider greenhouse gas emissions
  - national issue to be addressed through National Environmental Standard (NES)
  - no NES has been promulgated
- Local authorities to plan for effects of climate change
  - stated in purpose of amendments
  - no legislative provisions only guidance

CLIMATE CHANGE RESPONSE ACT 2002

- Meet Kyoto Protocol first commitment period (2008-12) targets
- Establish national inventory agency to record and report greenhouse gas emissions
- 2008 Emission Trading Scheme amendment:
  - all gases, all industries but different entry times
  - compliance: surrender NZ unit or international unit for each tonne of emissions
  - allocation by grandparenting (gifting) or auctioning
  - trade-exposed industries: 90% free allocation to 2018 with phasing out by 2030
  - pre-1990 forests allocated units; post 1989 earn credits; purchase units for deforestation

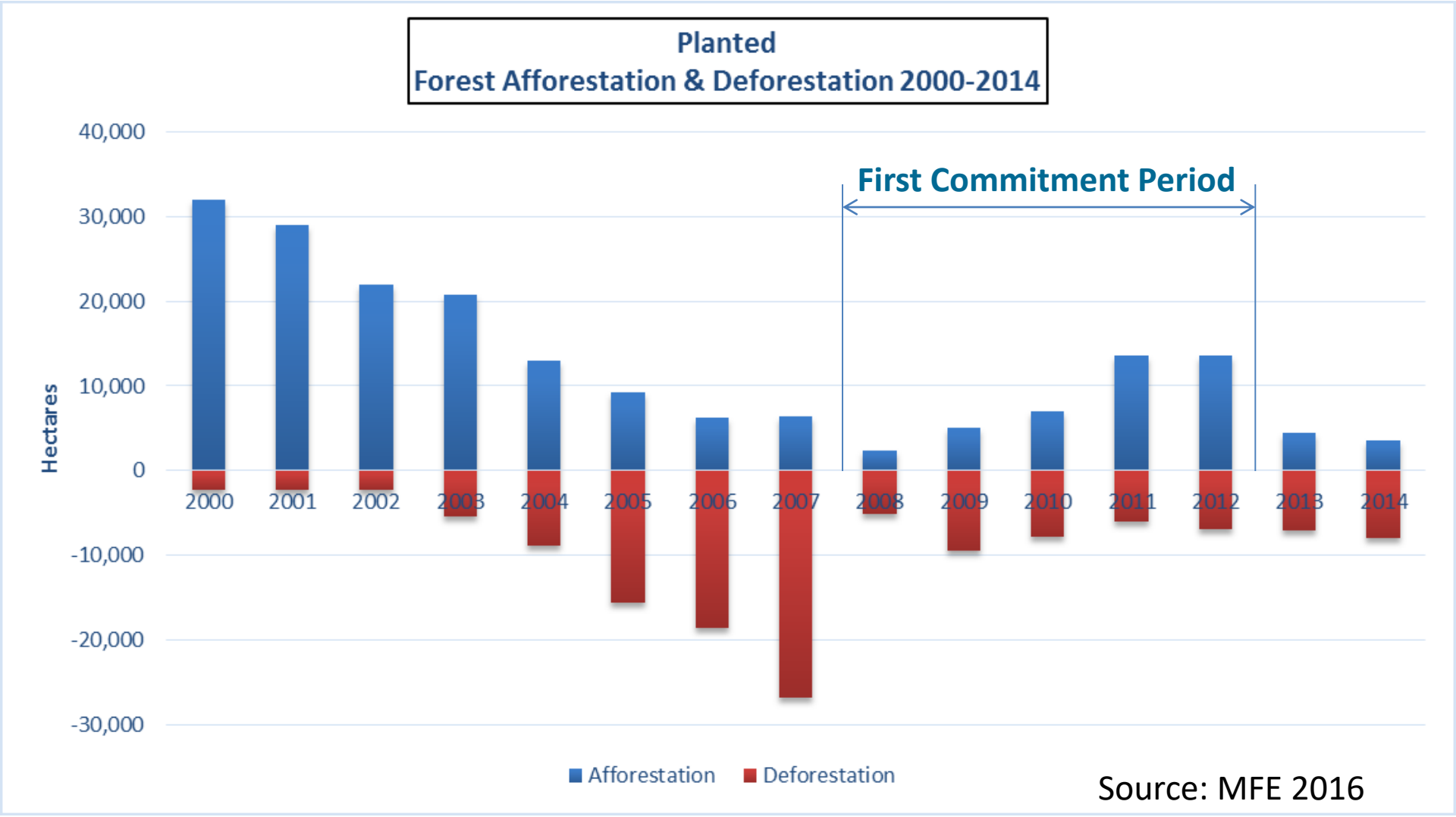
SUBSEQUENT AMENDMENTS TO ETS

- Removal of cap on NZ emissions
- Unlimited international units could be imported
- Surrender one unit for every 2 tonnes of emissions
- Trade-exposed, emission-intensive industries get free allocation based on production
- Slower phase out of free allocations
- No allocations to industry that can pass on costs to consumers
- Indefinite deferral of agricultural emissions

OUTCOME OF ETS

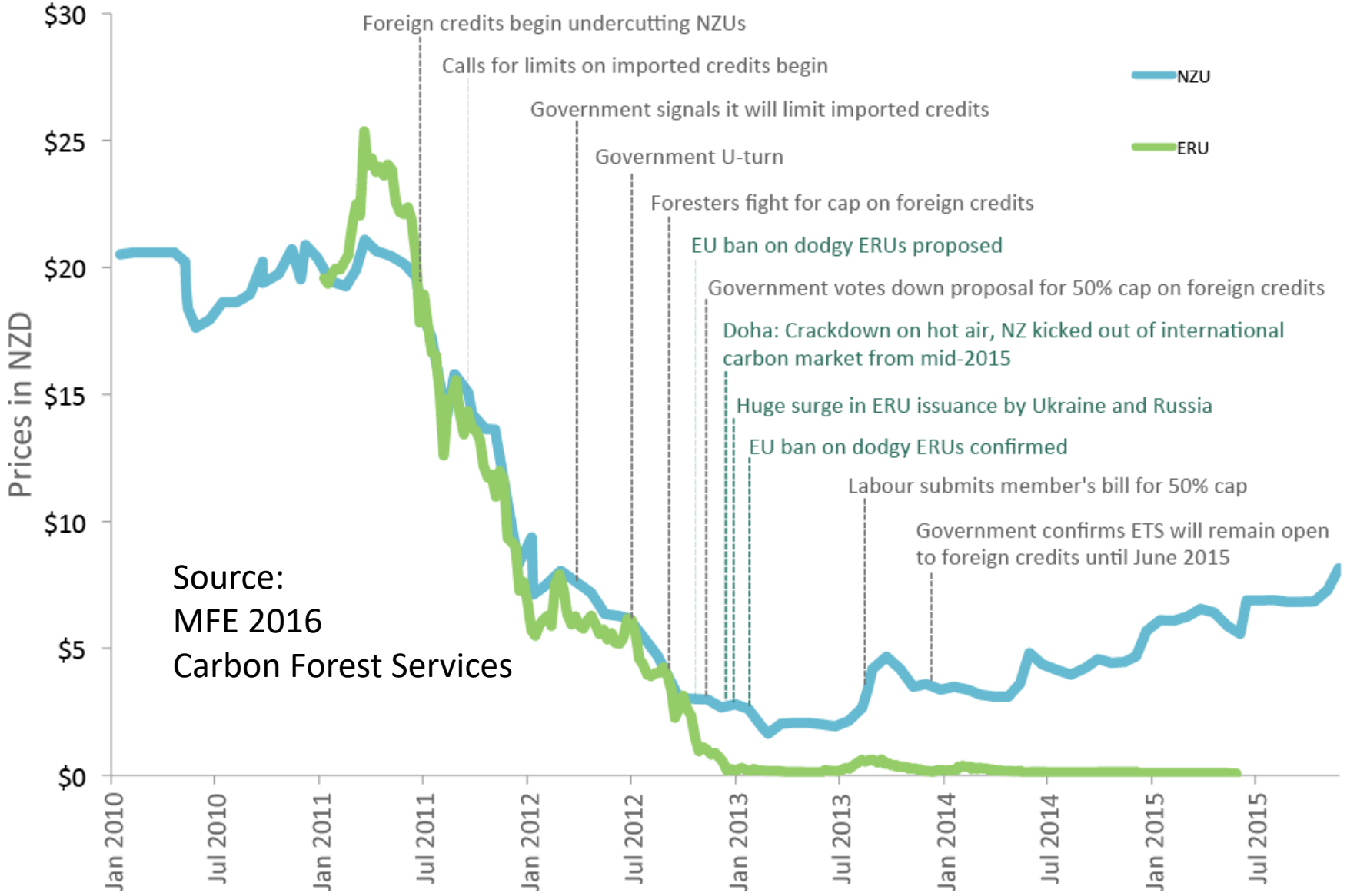
- Significant deforestation before commitment period
- International units of dubious efficacy has removed carbon price signal
- Free allocations to industry transfers costs to taxpayer
- Uncapped systems with low carbon cost leads to growth in current and projected emissions

PLANTED FOREST CHANGES



Source: MFE 2016

NZ AND ERU PRICE HISTORY



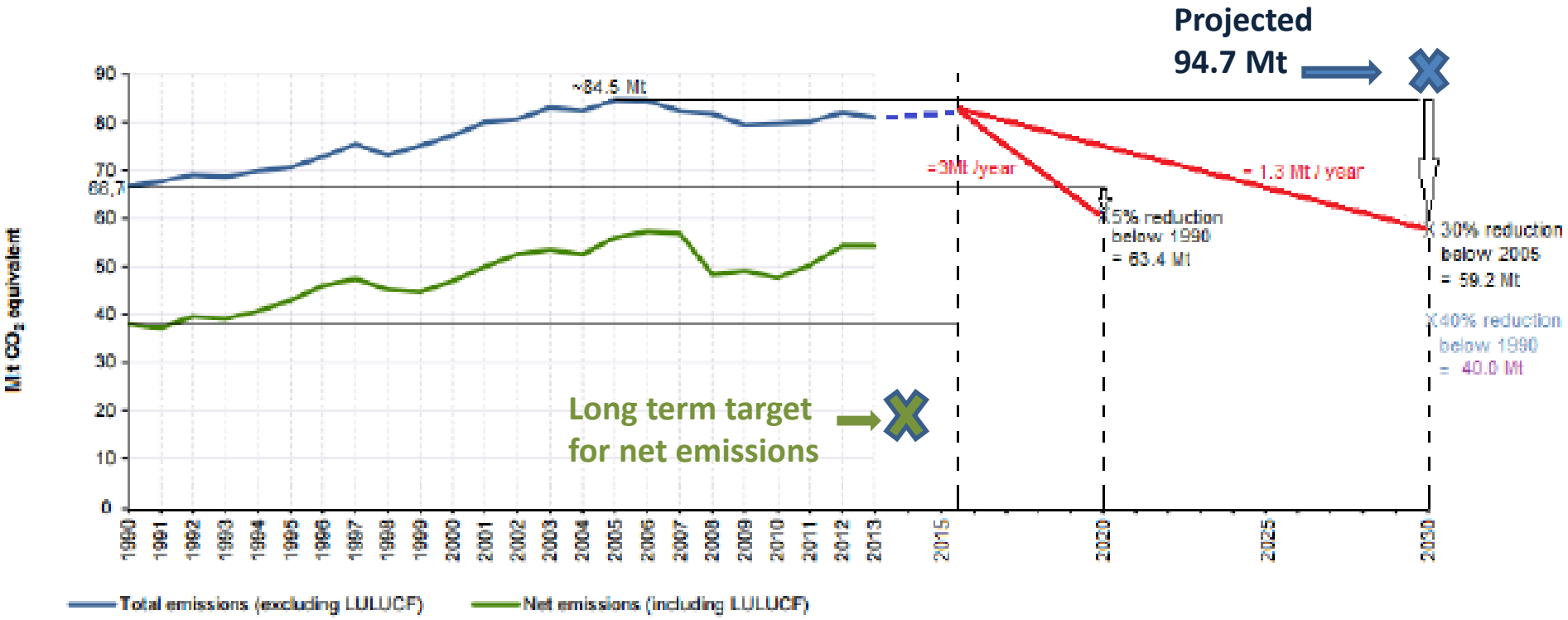
Source:
MFE 2016
Carbon Forest Services

NZ EMISSION POSITION

- Long term target
  - reduce net emissions by 50% from 1990 levels by 2050
- Current gross emissions (81.1 Mt CO_2e in 2015)
  - increase of 23% above 1990 levels (66.7 Mt CO_2e)
- Projected gross emissions (93.4 Mt CO_2e in 2030)
  - increase of 42% above 1990 level in 2030
- Provisional gross emission target (59.2 Mt CO_2e)
  - 30% below 2005 emissions by 2030
- Effect of Emission Trading Scheme
  - projected 0.4% reduction in emissions by 2030

Sources: MfE 2013, 2016; Sustainability Council 2015

EMISSION LEVELS, PROJECTIONS AND TARGETS



Science requirements for 2°C limit 40% reduction by 2030, 90% by 2050 and 100% by 2060

Source: Simms 2013, Renwick 2013, Sustainability Council 2015

NEW ZEALAND EMISSIONS PROFILE

- Total Emissions
  - 81.1 million Gg CO_2 equivalent (2014)
  - 17.2 tonnes per capita (5th in Annex 1 countries)
  - 7.7 tonnes per capita (energy only)

- Gas contributions
  - carbon dioxide: 44%
  - methane: 43%
  - nitrous oxide: 11%
  - HFCs: 2%

Source: MfE, 2016

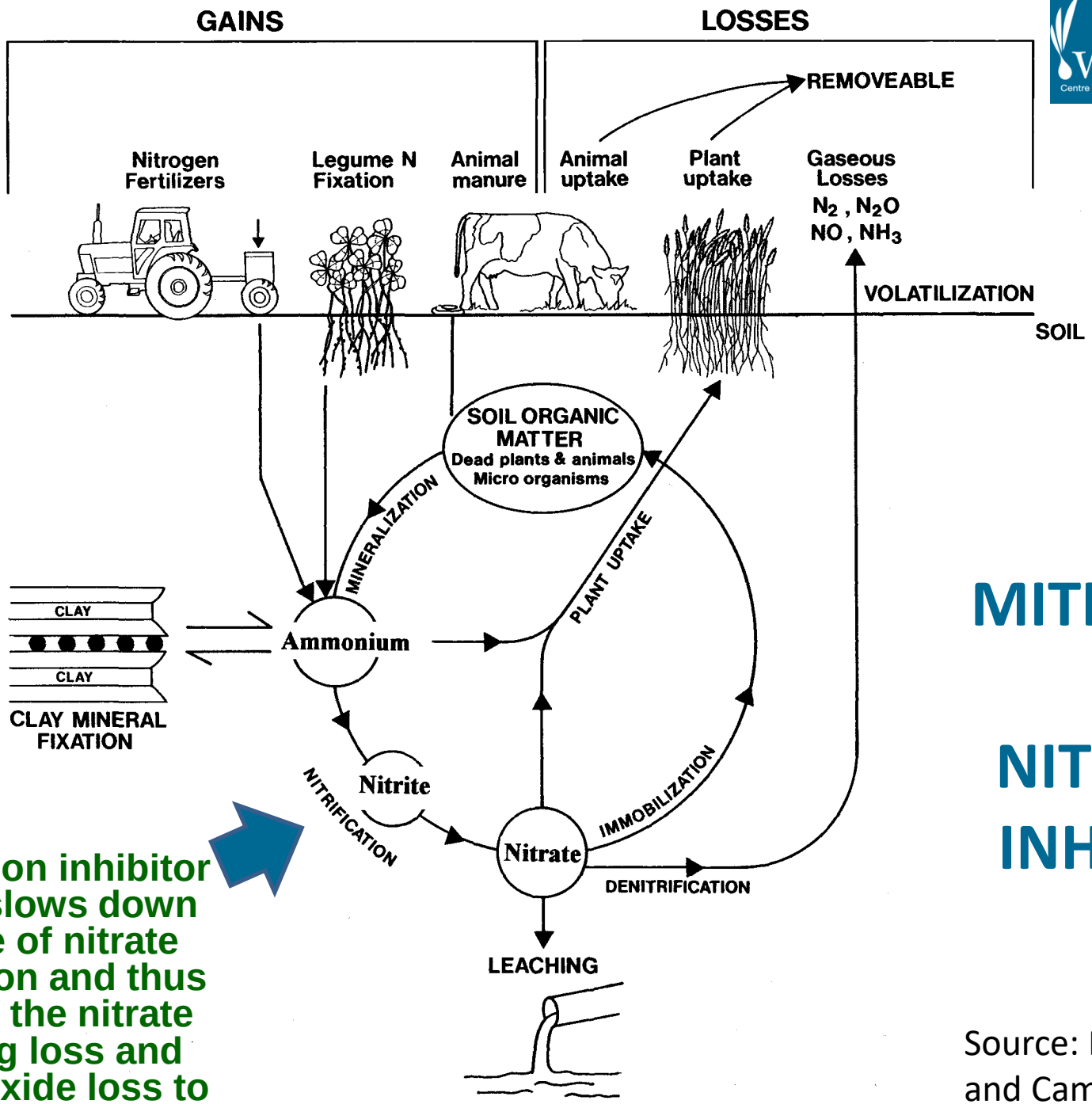
NEW ZEALAND EMISSIONS SOURCES

- Main sources
  - agriculture: 49%
  - transport: 16%
  - thermal electricity: 5%
  - other energy: 18%
  - industry: 6%
  - waste: 5%
  - forest sinks: - 30%

Source: MfE, 2016

AGRICULTURAL EMISSIONS

- Dominant source of NZ emissions
- Not part of Emissions Trading Scheme
- Not subject to EIA evaluation of greenhouse gas emissions
- 77% of projected growth in emissions
- Mitigation measures and offsets available

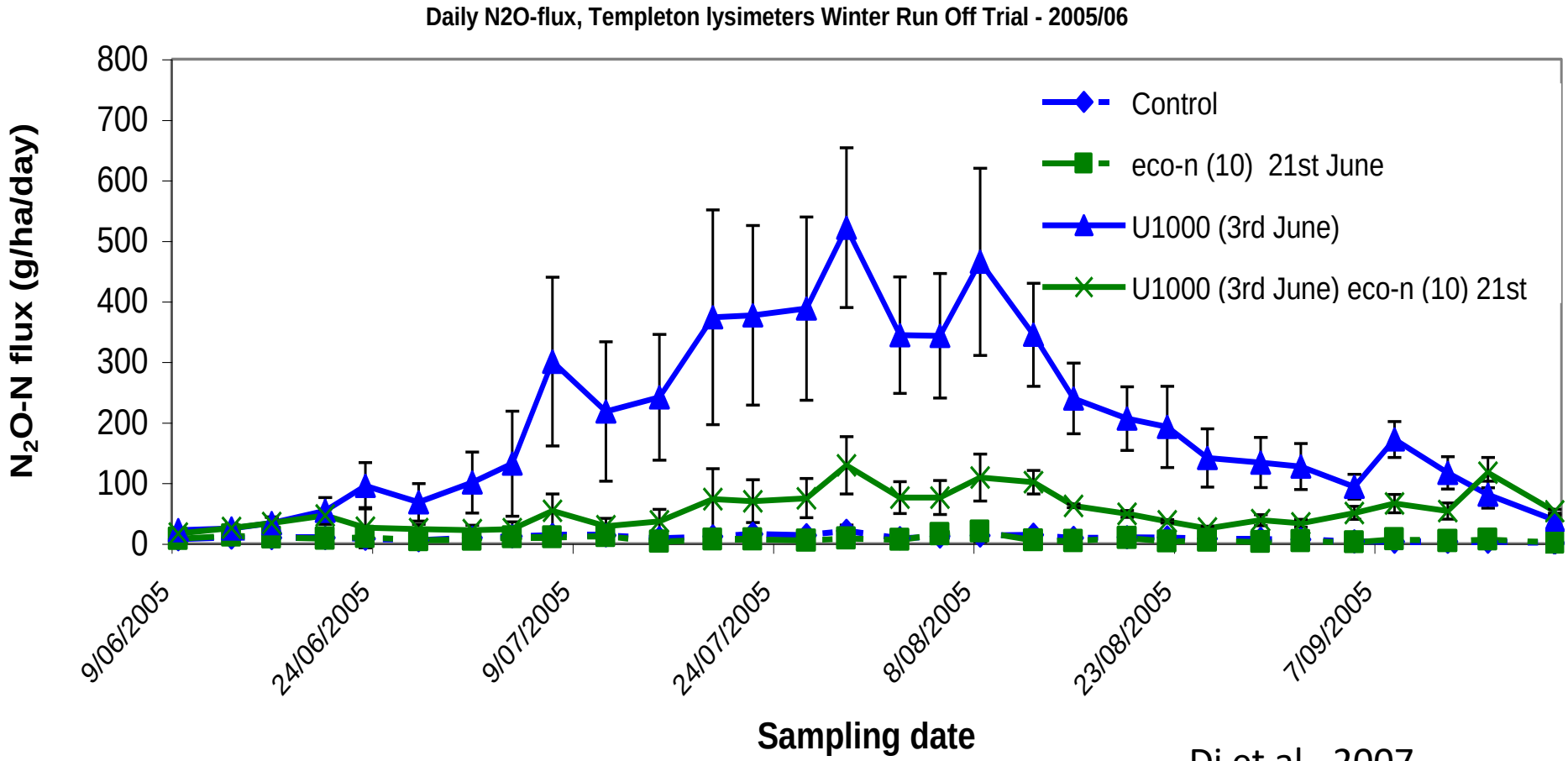


MITIGATION BY NITROGEN INHIBITOR

Nitrification inhibitor '*eco-n*' slows down the rate of nitrate production and thus reduces the nitrate leaching loss and nitrous oxide loss to atmosphere

Source: McLaren and Cameron 1996

IMPACTS OF ECO-N



Di et al., 2007

Di and Cameron, 2004

FORESTRY OFFSETS FOR DAIRY FARMS

- Currently deforestation for dairy farms
  - loss of sink and increased emissions
  - 12,700ha: 2003-2012 in Canterbury

Forest clearance for dairy conversion

- Dairy farm greenhouse gas emissions
  - about 9,000 kgCO2-e per ha

(Mason and Ledgard 2013)

- Forestry offset
  - 0.8ha pine plantation per ha of dairy farm

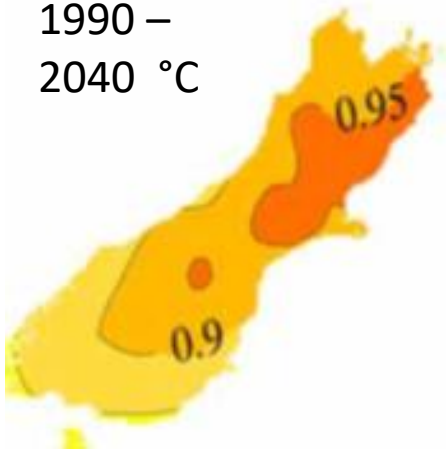
HYDRO GENERATION OFFSETS FOR DAIRY FARMS

Highbank power station on RDR tail race

- Incorporate hydro generation with irrigation schemes
  - Opuha Dam
  - Highbank and Mintalto with RDR
- Fossil fuel avoidance: 513t CO2-e per GWHr
- Hydro generation offset
  - 98 GWHr for Highbank and Mintalto offsets
    5,500ha of dairy farms of RDR (64,380ha)

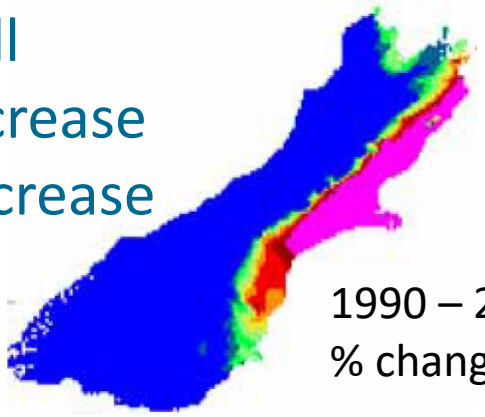
CLIMATE CHANGE PROJECTIONS

1990 – 2040 °C

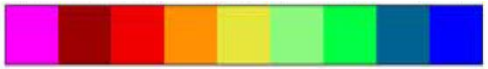


Increased Temperature

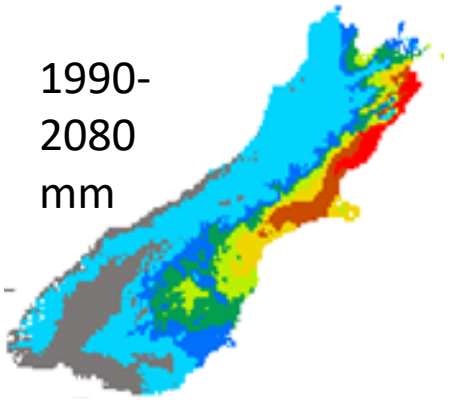
Winter Rainfall
East Coast decrease
West Coast increase



1990 – 2090 % change

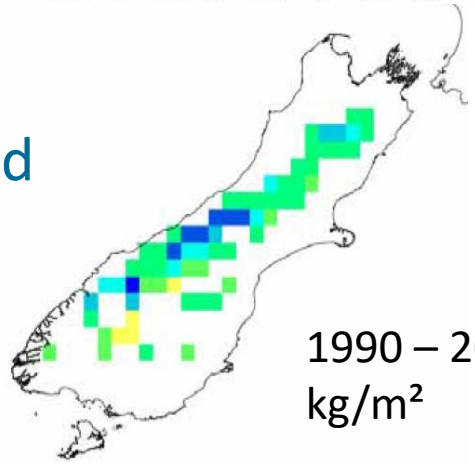


1990-2080 mm

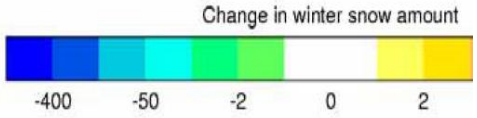


Increased Potential Evaporation Deficit (PED)

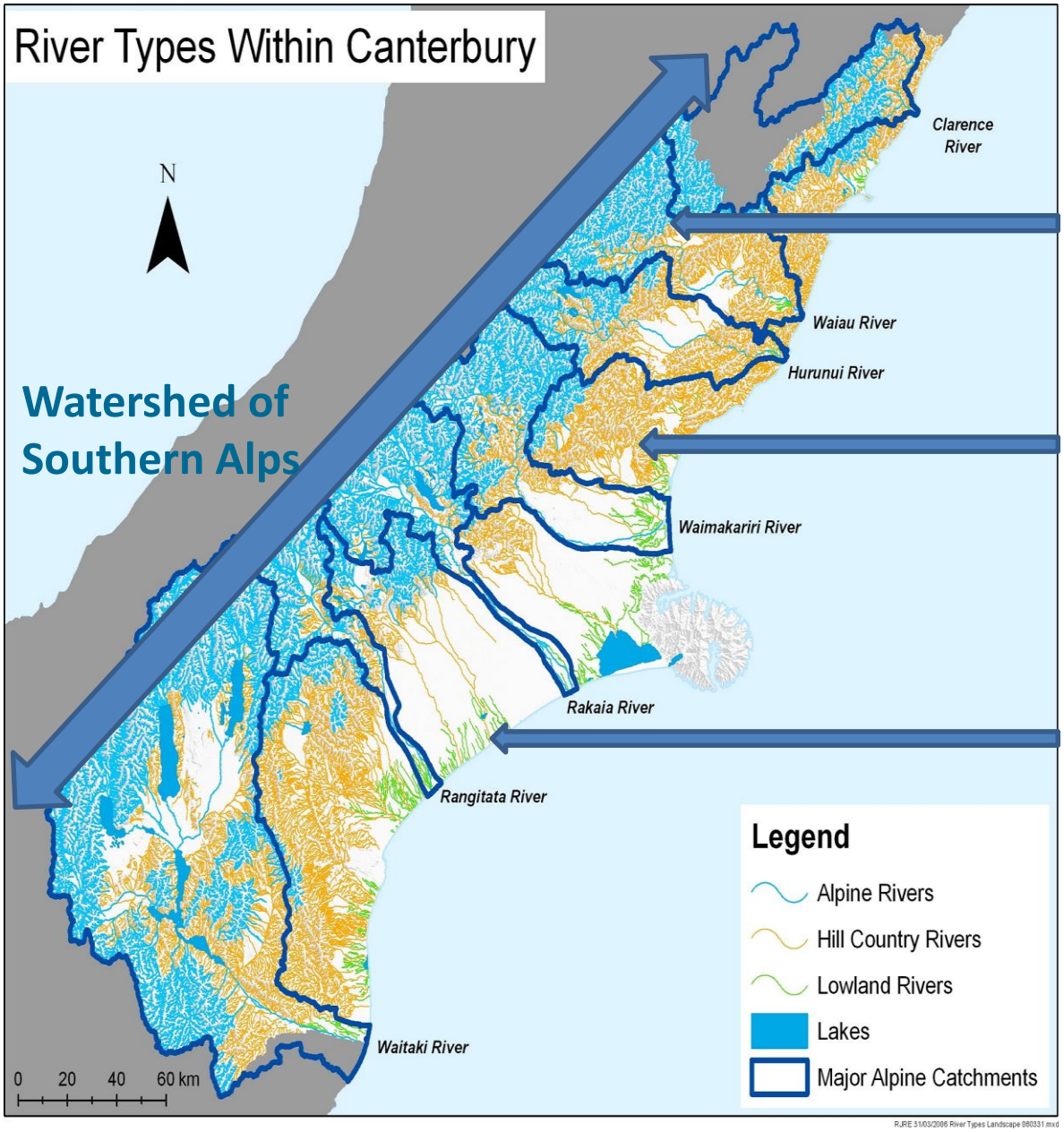
Decreased Snowfall



1990 – 2090 kg/m²



Source: Ministry for the Environment



Alpine Rivers with headwaters in the Southern Alps

Hill Country Rivers with headwaters in foothills of the Southern Alps

Lowland Rivers which are spring-fed from groundwater on the Canterbury Plains

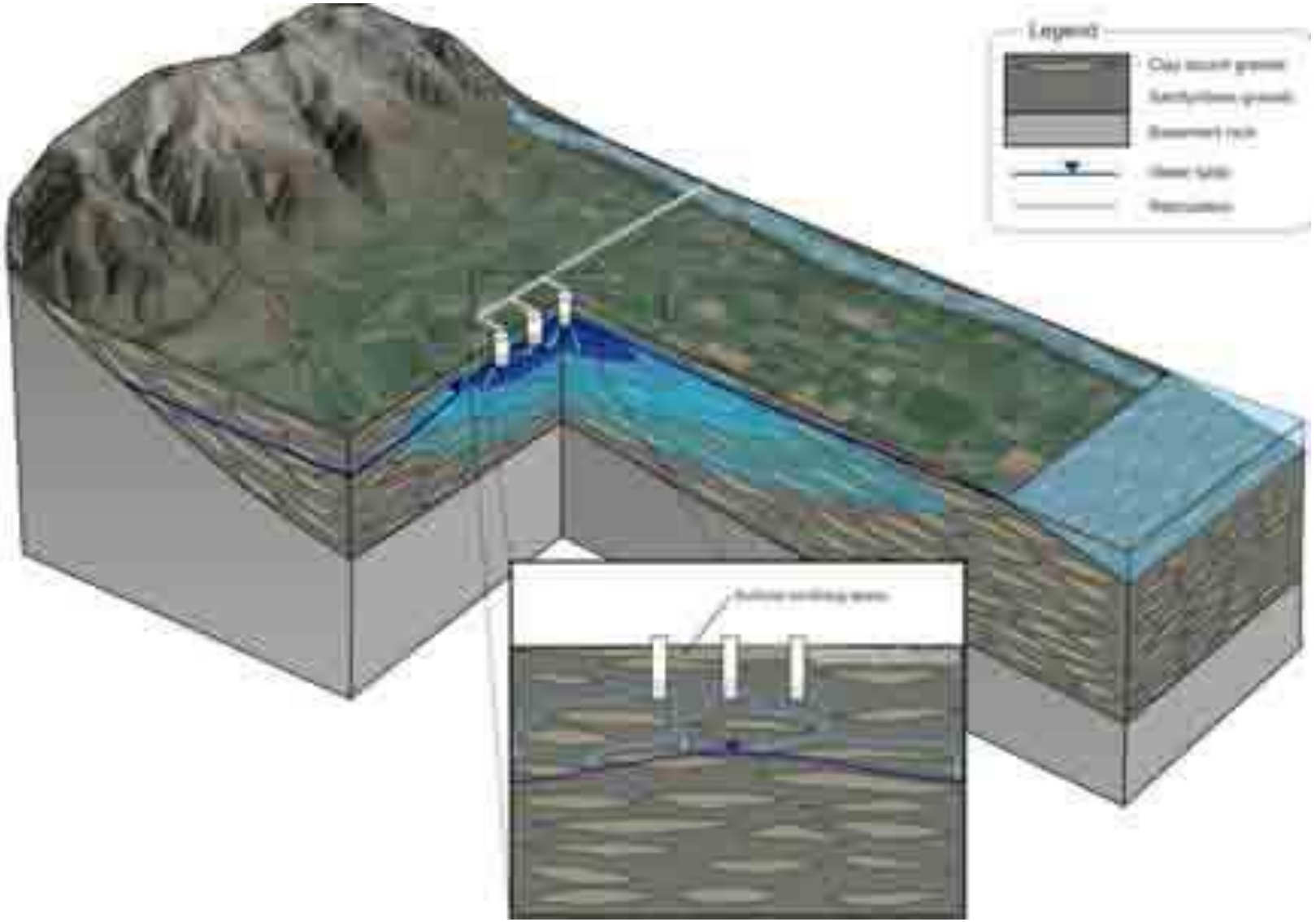
FRESHWATER IMPLICATIONS

- Increased PED – increased irrigation demand
- Decreased winter rainfall on the plains – reduced aquifer recharge, reduced lowland stream flows
- East Coast drier – lower flows in foothill rivers
- West Coast wetter and warmer in winter – reduced snow, increased winter flows and reduced summer flows in alpine rivers

FRESHWATER ADAPTATIONS FOR CLIMATE CHANGE

- Increased demand for water with less reliance on run-of-river and groundwater
- Need to increase water use efficiency and resource productivity
- Potential role for storage and inter-basin transfer (if sustainable)
- Resilient solutions: harvest higher alpine river winter flows for groundwater recharge

MANAGED AQUIFER RECHARGE



CONCLUSION: ADEQUACY FOR TOMORROW'S CHALLENGES?

- Legislation is inadequate to deal with climate change
- Emissions trading scheme is ineffective
- Use of EIA precluded: no National Environmental Standard
- Mitigation measures and offset approaches are available for emission reduction
- Adaptation required for projected climate changes
- Regional adaptation strategies needed
- No action forcing mechanism to generate needed changes