

## Adaptation in New Zealand



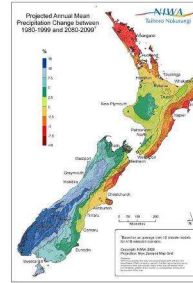
An overview and some examples

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## New Zealand

A brief overview



- 268,680 sq km
- 4.37 million people
- Agriculture and tourism both very important to the economy
- A mild climate, but very variable ...

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## Climatic variability and extremes... can have a significant cost to the economy

- Cost of 2007/08 drought NZ\$2.8 billion
- In 2007 weather related events cost more than NZ\$96 million in damage



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## Late 80s to 1990

- Ministry for the Environment (MfE) established under the Environment Act 1986
- 'Climatic Change: Impacts on New Zealand', published May 1990 by MfE
  - Comprehensive expert assessment of climate change impacts

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## The 1990s

- The Resource Management Act (1991)
- No explicit requirement for councils to plan for the effects of climate change
- National climate change policy focus developed around mitigation
- The CLIMPACTS research programme focused on development of an integrated assessment model
  - Project discontinued
  - No uptake of the software within NZ
  - Subsequent duplication of effort with related work

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## The 2000s

- MfE produced a series of summary publications on climate change impacts in 2001
- '4 million careful owners campaign', focused on climate change mitigation
- Amendments to the Resource Management Act (2004) requiring that 'particular regard' be given to the effects of climate change
- MfE Policy guidance for councils regarding impacts of climate change and for coastal zone management
- No coordinated focus on adaptation
- No consideration of potential co-benefits from a coordinated sustainable development approach

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## Adapting to climate change in eastern New Zealand, 2003-2005



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## The approach



- Overview of the science
- Summary of regional impacts
- In-depth farmer interviews and case studies
- A series of farmer workshops
- Regional workshops and case studies
- Science/Art interaction

**Outcomes praised.** Approach encouraged by MfE and former deputy Minister of Agriculture

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## Farm resilience

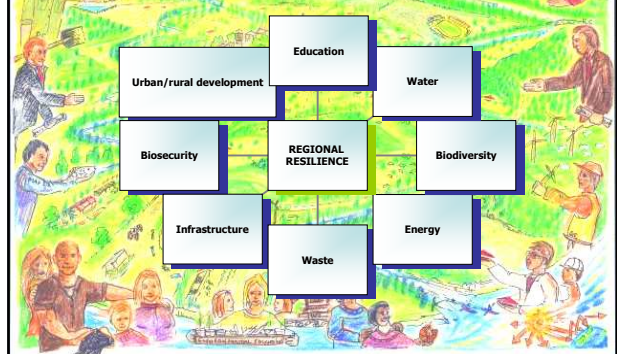


Source: Kenny, 2011

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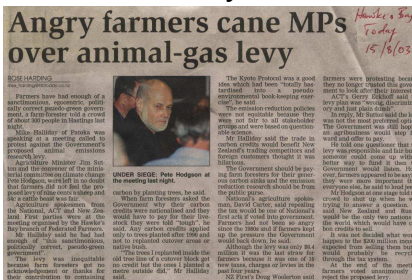
## Regional resilience



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## Government approach in the early 2000s



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## 2007 – MAF Plan of Action

- \$175 million programme, principally focused on mitigation
- Minimal, if any, focus on co-benefits
- No critical analysis of potential maladaptations
- Adaptation work through:
  - Tech Transfer Programme (by tender)
  - Sustainable Land Management and Climate Change Programme (specific projects, contestable)
  - Sustainable Farming Fund (contestable)

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## Other current activities

- A few research projects through the Foundation for Research Science and Technology
- Funding cuts to Ministry for the Environment – minimal activity
- Other small ad hoc projects

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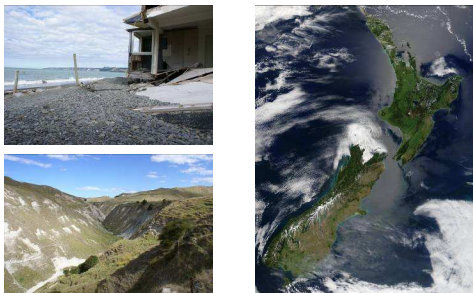
## On-going issues

- No clear national coordination of adaptation, nor wider consideration of a sustainable development context
- No capacity building prior to launch of MAFs Plan of Action
  - On-going 'tech transfer' approach as against developing adaptive capacity
- Tensions between economic drivers and long-term sustainability and resilience issues/needs (potential for maladaptation)
- Inconsistent regional policy actions
- Cross-sectoral integration non-existent

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## What's happening on the ground?



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## Coastal zone



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## The Resource Management Act (1991)

- The Resource Management Act 1991 (RMA) requires all local authorities to address coastal hazards in order to promote the sustainable management of natural and physical resources
- This includes taking future sea-level rise into account
- Hazard zones need to be identified but they can be (and are) contested through the environment court

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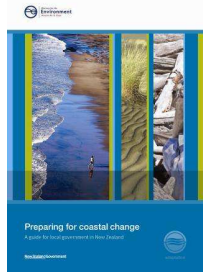
## Defining coastal hazard in Hawke's Bay

- A regional approach to planning for coastal hazard
- Proposed Regional Coastal Environment Plan (RCEP) publicly notified in August 2006
- Approved in 2008
- Hazard zonation based on now outdated IPCC estimates

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## NZ Ministry for the Environment guidelines (2009)



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## NZ Ministry for the Environment guidelines (2009)

We recommend that for planning and decision timeframes out to the 2090s (2090-2099):

1. a base value sea-level rise of 0.5 m relative to the 1980-1999 average be used, *along with*
2. an assessment of potential consequences from a range of possible higher sea-level rise values.

At the very least, all assessments should consider the consequences of a mean sea-level rise of at least 0.8 m relative to the 1980-1999 average.

For longer planning and decision timeframes beyond the end of this century, we recommend an additional allowance for sea-level rise of 10 mm per year beyond 2100.

Table 1: Possible sea level rise recommendations for different future timeframes, in metres relative to the 1980-1999 average.

TIME FRAME	BASE SEA LEVEL RISE ALLOWANCE (m)	ALSO CONSIDER THE CONSEQUENCES OF SEA LEVEL RISE OF AT LEAST (m)
2030-2039	0.75	0.70
2040-2049	0.20	0.27
2050-2059	0.25	0.36
2060-2069	0.37	0.48
2070-2079	0.37	0.58
2080-2089	0.44	0.66
2090-2099	0.50	0.80
Beyond 2100		10 mm/yr

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## Royal Society of NZ summary September 2010

Source	Sea level rise by 2100 (m)
Pfeffer <sup>13</sup>	0.8 plausible (2.0 maximum possible)
Rahmstorf <sup>15</sup>	0.5 - 1.4
Horton <sup>16</sup>	0.5 - 1.0
Grinstead <sup>17</sup>	0.3 - 2.2
Vermeer <sup>18</sup>	0.75 - 1.9
Jevrejeva <sup>19</sup>	0.6 - 1.6

Table 2: Recent scientific projections of sea level rise by 2100

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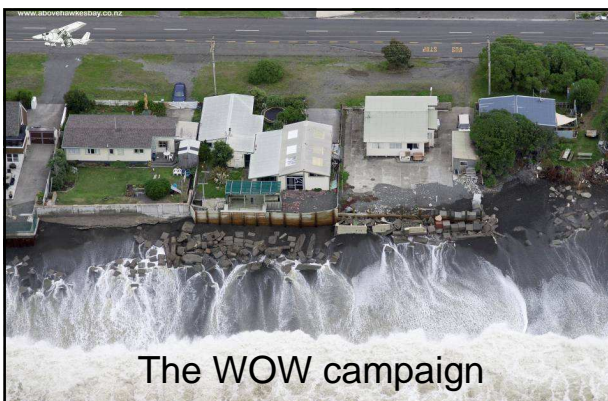


## Royal Society of NZ summary September 2010

Source	Sea level rise by 2100 (m)
Department of Climate Change, Australia <sup>20</sup>	0.6 m plausible, 1.5 m "cannot be ruled out", risk assessment level 1.1 m
Dept of Environment, Climate Change & Water, NSW <sup>27</sup>	0.9 m
Department of Environment & Resource Management, Queensland <sup>24</sup>	0.8 m
California Climate Change Center, USA <sup>28</sup>	1.0 - 1.4 m by 2100
DEFRA, UK <sup>8</sup>	0.12 - 0.76 m, extreme scenario 1.9 m
Deltacommissie, The Netherlands <sup>14</sup>	0.55 - 1.2 m, planning level 1.1 m
United Nations Environment Programme <sup>21</sup>	0.5 - 1.4 m
Climate Change Research Centre, UNSW <sup>11</sup>	Double IPCC estimates
International Alliance of Research Universities <sup>19</sup>	0.5 - 1.5 m

Table 3: Recent international projections of sea level rise by 2100 relevant to coastal planning

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## The WOW campaign

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## The WOW campaign

- Coastline at Te Awanga and Clifton is actively eroding, even without sea-level rise
- Properties are in a defined coastal hazard zone (includes SLR)
- Local council considered relocation the best option
- Coastal residents don't want to relocate and are actively campaigning for hard engineering protection
- Their properties are uninsurable
- Current cost of hard engineering solutions is nearly NZ\$10 million
- No guarantee that protection will work



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## Land management in Hawke's Bay



- Land area of 1.42 million hectares
- Mountains and hill country make up 75%
  - 33% indigenous forest
  - 10% plantation forest
  - 20% at risk of significant erosion which may take 100 years to reverse (at current rates)

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## Historical context



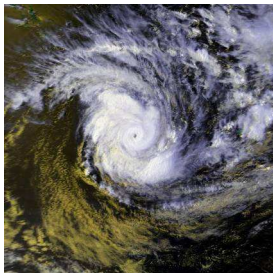
- Pre-European fires
- Further land clearance with European settlement
- Government subsidies for 'scrub' clearing and aerial fertiliser application
- Focus on soil conservation since 1940s
- End of subsidies in 1980s

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## Recent history

Cyclone Bola, 1988

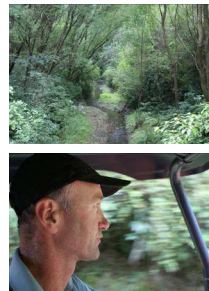


- Severe flooding and erosion
- NZ\$112 million for repair and recovery
- NZ\$37 million for insurance claims (NZ\$60.55 million in 2007 terms)
- Long-term environmental costs

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## Are we getting the message?



- A minority are being proactive in planting trees:
  - Fencing waterways
  - Protecting remnants of native forest
  - Woodlots
  - Shelter
  - Erosion control
  - Drought fodder
- The majority argue that trees cost money, and don't make money
  - What's the cost of doing nothing?
- The proactive farmers argue for education not regulation

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## April 2011 storm



www.abovehawkesbay.co.nz

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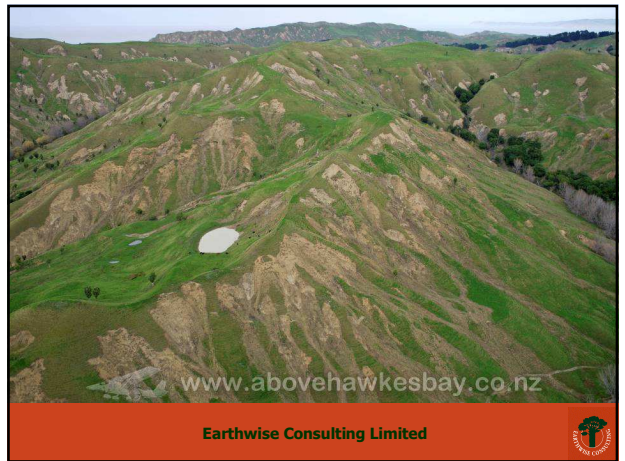
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