

Workshop on Climate Change and Urban Adaptation Science and Practice: Exploring the Challenges

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Overview

- Context – NZ Situation
- National Legislative and Policy backdrop
- Roles and relationships of Implementing Agencies
- Examples of adaptation issues and design of operational responses
- Summary

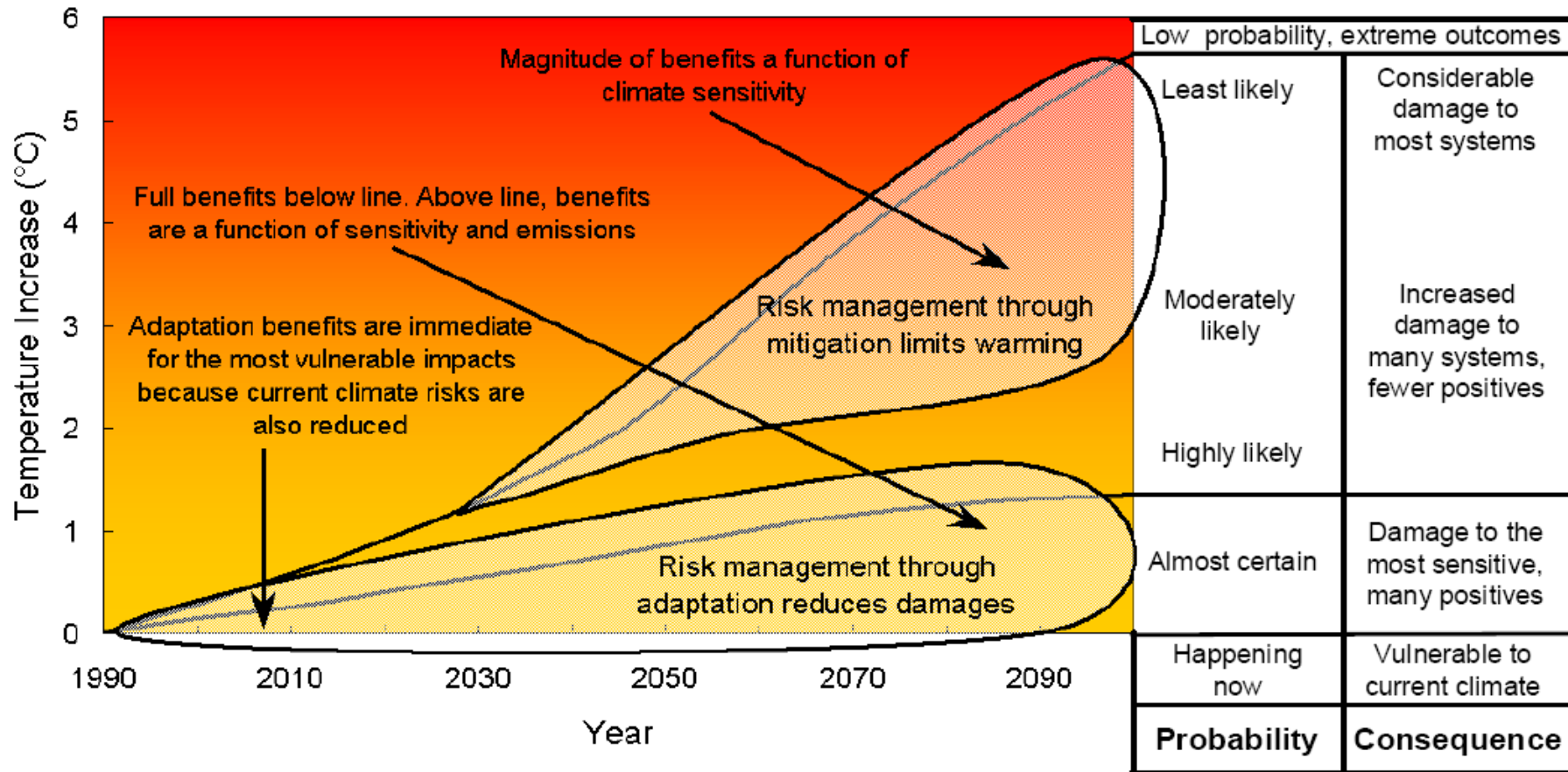
Climate Change: Policy Challenge

- NZ is very small contributor to the global [GHG] (0.2%)
- Will not be as badly affected as many other parts of the world
- Actions required now, but benefits will accrue to future generations

But!

- NZ has high per capita emissions
- NZ relies on engagement to make its way in the world –
 - Risks being excluded from export markets
 - Risks to tourism

CSIRO: Responding to climate change



Risk = probability x consequence

Adaptation & mitigation are complementary. Adaptation manages unavoidable warming & gives earlier benefits, while mitigation helps to avoid larger rates of warming and bigger impacts

Climate Change Responses

• Mitigation

- New Activity
- Immediate focus
- Targets politically easy to explain
- Personally relevant
- Feelgood factor
- Quick financial benefits for action

• Adaptation

- Continuation of existing activities
- Unpopular – constraining
- Agency focus
- Future orientation
- Current costs, future benefits
- Hard to quantify

The action imperative for New Zealand ?

- We need to **adapt** to changes in climate that are already happening and for those that are locked into the system
- We also need to take actions that **mitigate** future effects to avoid climate change at scales that we cannot adapt to.

NZ Projected Climate Changes

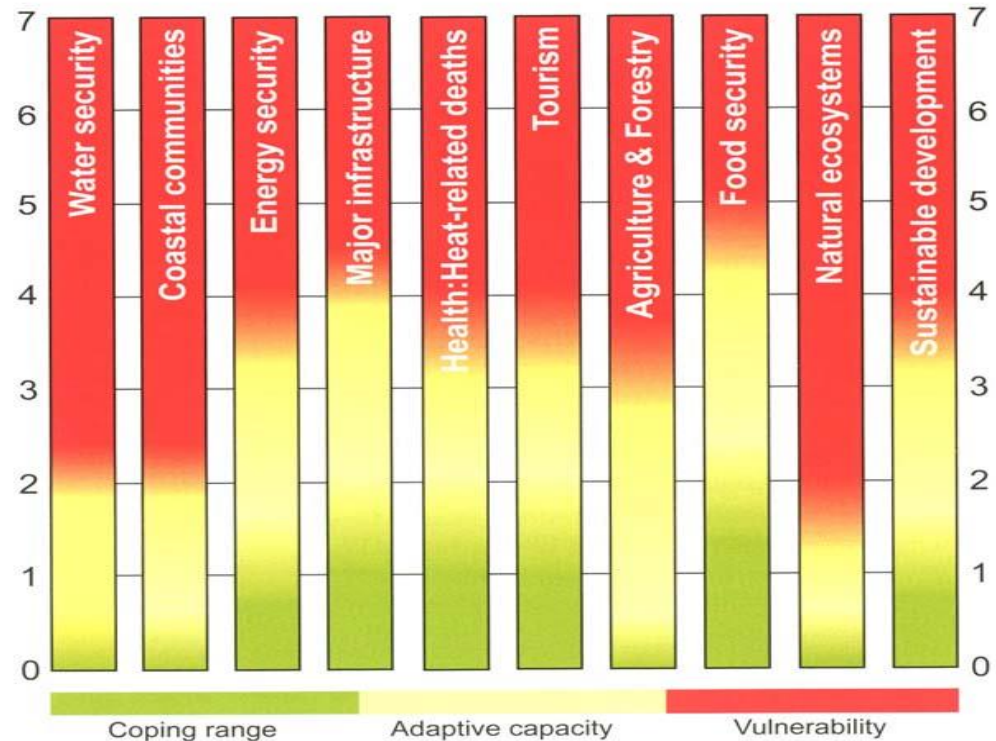
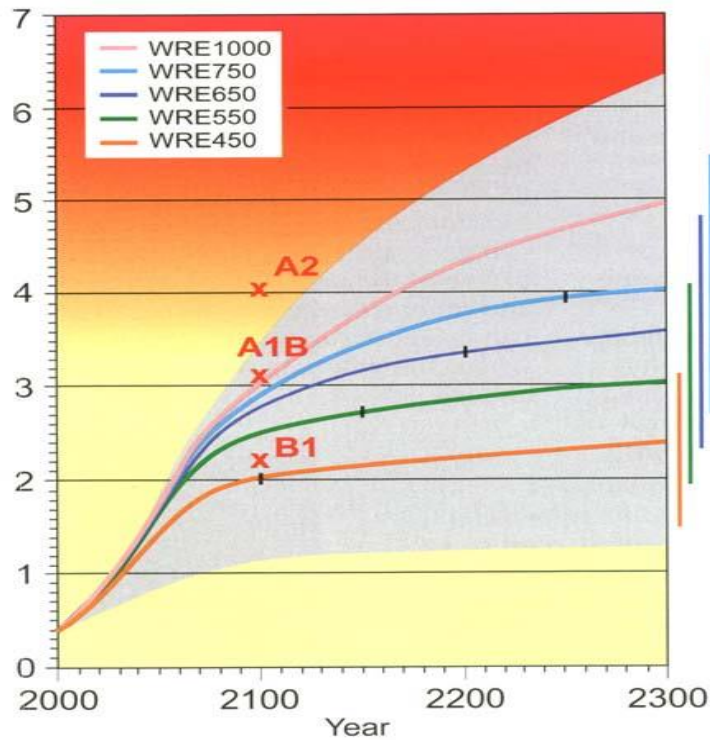
- Annual / seasonal averages
 - Warmer, drier summers
 - Milder winters
 - Rising sea levels
 - Shifting seasons
- Extreme weather events
 - More very hot days
 - Reduced night temperatures
 - More droughts
 - More frequent and intense rainfall events
 - Increased wind



Summary of projected New Zealand Climate changes

(NIWA)

Vulnerability of NZ Economic Sectors



Note water security, coastal communities and natural ecosystems have low adaptive capability and are pushed beyond their coping range at just 1.5 - 2°C global temperature rise. This is the target rise to which international mitigation efforts are aimed.

NZ Legislation: Adaptation



- Resource Management Act (1991)
 - s7 Other Matters
 - Must have particular regard to the effects of climate change (2004)
 - s30 Functions of Regional Councils
 - Water quantity (Allocation) (1991)
 - Strategic Integration of Infrastructure with land use (2005)
 - s62 Contents of Regional Policy Statements
 - Natural Hazards (1993)
 - NZ Coastal Policy Statement
 - Policy 3.4.4 Subdivision, Natural Hazards & sea level rise (100yrs out)

NZ Legislation: Adaptation *cont'd.*



- National Policy Statement: Freshwater Management,
 - Policies A1 and B1 -setting objectives for Quality and Quantity (reasonably foreseeable effects of climate change).
- Local Government Act 2002
 - Ability to provide services to the community
- CDEM Act 2002
 - Waikato CDEM Group Plan identified top 20 natural hazards in the region with 13 exacerbated by climate influence
- SCRC Act 1941
 - No explicit mention

Healthy environment

Strong economy

Vibrant communities

Local Government - Background

- NZ is an island nation
- High level of variability both communities and natural resources
- Shares few natural resources (migratory marine species and air) with other countries
- Resource management is not a matter of national security – can be devolved effectively to sub-national government,
- Leads to a highly devolved structure of autonomous authorities with high level of responsibility to local communities

Local Government Agencies

- Popularly elected every 3 years under the Local Electoral Act 2001
- Regional Councils (11)
 - Predominantly integration and allocation of resources,
 - Physically defined boundaries – typically water catchments
 - Chairman elected by fellow councillors
- Territorial Councils (67)
 - Either City or District Councils depending upon size
 - Defined by social and political boundaries (communities of interest)
 - Mayor elected at large
- Unitary Councils (5)
 - Territorial Councils that administer regional functions
 - Includes Auckland – NZ largest city

Local Government Act (2002)

- Purpose is to:
 - Enable democratic local decision-making and action by, and on behalf of communities; and
 - ~~Promote the social, economic, environmental and cultural wellbeing of communities now and in the future~~
 - Efficiently provide core services to communities and to undertake legislative functions
- Provides the machinery of local government
- Creates Regional, District and Unitary Councils
- Allows them to tax (called rates) citizens of the area for work done on their behalf
- Council employs one staff member (Chief Executive Officer) who employs all others in the organisation
- Requires administration of other Acts
- Currently under review (again)

Local Government Comparison

Regional Council

- Predominantly resource based
 - Geothermal
 - Soil Conservation
 - Air
 - Water
 - Coastal
 - Biosecurity
 - Regional Transport
 - Civil Defence

Unitary Council

- Both roles and functions

Territorial Council

- Predominantly service delivery
 - Land use
 - Noise/litter/dogs
 - Water supply
 - Sewage
 - Building
 - Rubbish
 - Roads
 - Parks/libraries
 - Liquor licensing
 - Parking
 - Health inspection
 - Housing
 - Civil Defence

CLIMATE CHANGE

LOCAL GOVERNMENT LEADERS POSITION STATEMENT



This statement defines the position that Councils have collectively adopted on climate change. We commit to playing our part in helping New Zealand face the climate change challenge. The key role we will play is to lead community responses to the risks and opportunities of climate change.

Councils provide a wide range of ratepayer funded services which will be impacted by climate change. These include stormwater management, flood control, biosecurity, land-use and transport planning, civil defence emergency management and water supply. Council services need to be future proofed and made resilient to the impacts of climate change.

We acknowledge that the evidence shows that climate change is occurring and that our understanding of climate change impacts in New Zealand will continue to grow. We will work with our communities to prepare for the future.

OUR POSITION ON CLIMATE CHANGE

We recognise that we must respond to both the actual and potential physical impacts of climate change.

We understand that there are challenges, risks and opportunities for local communities in responding to and managing the impacts of climate change.

We recognise that action now will reduce the future threats and costs of climate change. We know we must plan ahead.

Solutions to climate change challenges will not be a matter of "one size fits all" and we recognise that climate change impacts on communities will vary around New Zealand.

Councils will individually show leadership and environmental responsibility by adopting mitigation and adaptation practices that fit with their community's needs and aspirations.

We have an active interest in shaping Central Government's mitigation policy. We will assist Central Government help local communities to prepare for climate change.

We will work with Central Government to make sure information and research is accessible to our communities. It should help them make informed choices about responding to climate change risks and opportunities.

OUR POSITION ON ADAPTATION TO CLIMATE CHANGE

We have a responsibility to help our communities prepare for and to adapt to the physical effects of climate change.

We will build on the existing work of Councils and communities – recognising that "business as usual" will not get us to where we need to be and that a community-wide effort will be needed to address the impacts of climate change.

Councils will support and actively engage with initiatives that provide guidance and expert advice on adaptation that can be applied at the regional and local level.

We will seek Central Government's support for the development of climate change information and modelling that delivers "local numbers" for local use.

We acknowledge that we will often need to lead on developing engineering and resilience responses to climate change impacts.

Councils will ensure that Resource Management and Local Government legislation is used to encourage adaptation to climate change – particularly when dealing with land-use change.

OUR POSITION ON CLIMATE CHANGE MITIGATION

It is Central Government's role to engage internationally on climate change and to lead mitigation action on behalf of New Zealand.

We have an active interest in providing advice to Central Government on the local consequences of, and the opportunities presented by, international and national policies to reduce green house gas emissions.

Councils will choose their own mitigation projects to meet Central Government requirements and to assist in delivering New Zealand's emission reduction targets.

Councils will support individuals, communities and businesses to lower their emissions and will advocate for Central Government to develop tools that will assist the development of low carbon options for goods and services.

THE FOLLOWING LOCAL GOVERNMENT LEADERS SUPPORT THIS POSITION STATEMENT:

| | | | | |
|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|
| Mayor of District Council | Mayor of District Council | Mayor of Unitary Authority | Mayor of City Council | Mayor of City Council |
| Chair of Regional Council | Mayor of District Council | Mayor of District Council | Mayor of District Council | Mayor of Unitary Authority |
| Mayor of City Council | Mayor of District Council | Chair of Regional Council | Mayor of District Council | Mayor of District Council |
| Mayor of Unitary Authority | Chair of Regional Council | Mayor of City Council | Mayor of District Council | Chair of Regional Council |
| Mayor of City Council | Mayor of City Council | Mayor of Unitary Authority | Chair of Regional Council | Mayor of City Council |

DESIGN DRAFT

Business case for Climate Change Adaptation Strategies

- Less risk on Investment
- Lower Insurance Costs
- Less risk of ‘Blighting’ through abandonment (location)
- Location and Design of property reflected in long term value
 - Design (e.g. low water / low energy designs)
 - Location (out of floodway close to public transport)
- Improved staff retention
- Market differentiation (more for commercial companies)

Natural and Physical Resource Allocation Policy

- In New Zealand the sustainable management of natural and physical resources has been devolved to local government (RMA 1991)
- Sustainable Management or the process of determining who gets what is primarily a resource access / allocation function
- Policy for access to natural resources and marine space is a Regional Council function
- Policy for access to space on land is a Territorial Council function
- Integration of these functions is the role of the Regional Policy Statement

Resource Management Act

1991

CENTRAL
GOVERNMENT

New Zealand Coastal
Policy Statement

National Policy Statements
and Environmental Standards
(optional)

Vision and Strategy
for the Waikato River

LOCAL
GOVERNMENT

Regional Policy
Statement

Regional
Coastal Plan

Waikato
Regional Plan

District Plans

ACTIONS

Healthy environment

Strong economy

Vibrant communities

Regional Policy Statement: Adaptation

- Significant Resource Management Issue
- Allocation of space
 - Expansion of present and future natural hazards
 - Fluvial, Coastal, Landslip
 - Expansion of biotic transition zones
 - Corridors
 - Coastal transition zones
- Allocation of resources as demand will change over time
 - Water
 - Quantity will vary
 - Quality will change

Adaptation: Water Allocation

- Recognise the future nature of water resource will change into the future
- Policy recently reviewed WRP(Variation 6)
 - Integrated surface and ground water policy
 - Common expiry dates for 9 sub-regions
 - Adaptive Management
 - Max duration of volume consents 15 years (excluding municipal, electricity & domestic)
 - Review allocatable flows for 2 years the allocate for 15
 - Allocation includes any changes in assimilative capacity
 - Provides for recoup investment in infrastructure

Water Security: Supply and Irrigation

- Reduced rainfall and increased temperature
 - Reduction in security of supply – possible lag period
- Sea level rise
 - Possible contamination of water supply – upstream migration of salt wedge
- More storage required
 - Supplementary tankage
- More efficient use
 - Irrigation of greywater
 - Xerophytes in gardens

Response: Sub-surface Irrigation

- Uses 80% less water than sprinkler
- Uses 60% less water than drip
- Safe for greywater irrigation
- Low vandalism
- Reduced fertiliser use and runoff

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Water Security: Wastewater management

- Increased frequency and more intensive rainfall events
 - Increased infiltration into wastewater networks
- Sea level rise
 - Increased pumping needed in coastal areas
 - Networks increasingly vulnerable to coastal erosion

Water Security: Drainage Systems

- Urban – Territorial Authorities - Stormwater Reticulation
- Current focus:
 - historic meteorological records
 - level of service to remove flooding
 - based upon pipes
 - effect of discharge on receiving environments
- New focus upon
 - uncertain futures
 - ensuring overflow capacity provided
 - increased on-site management

Response: Stormwater management



- Building Design
- Green roofs
- Reduce immediate run off
- Co-benefits
- Provide building insulation
- Reduce heat island effect in cities



Stormwater Response - retrofits



- Historic buildings not designed for current or expected future climate conditions
- Damage to historical buildings likely without active management
- Requires sensitivity



Response: Stormwater management

System capacity designed to be exceeded

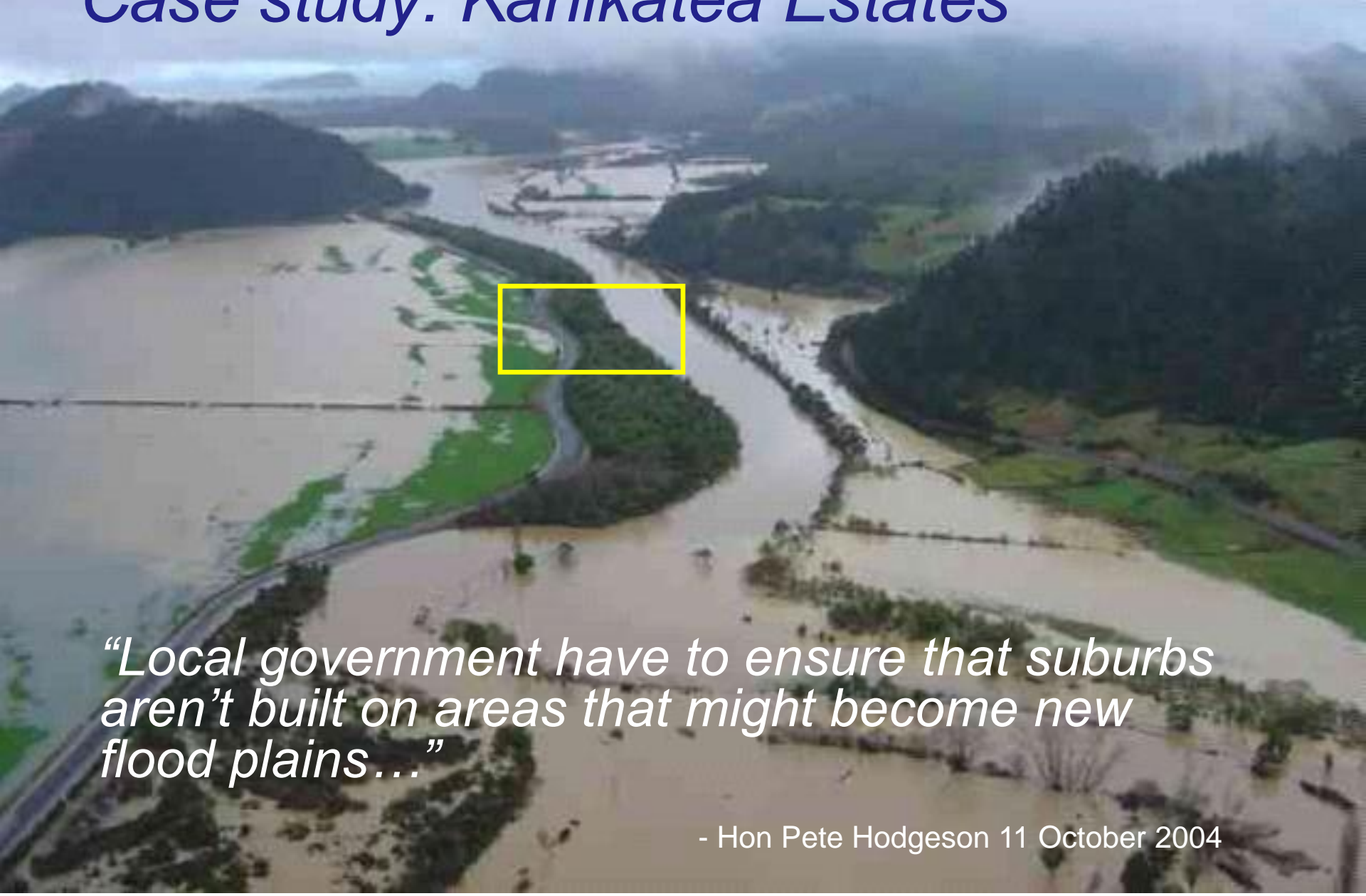
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Adaptation: Natural Hazards

- Allocation of space for **future** hazards - DC and RC function
 - Roles identified in Regional Policy Statement
- Not just rivers but storm water & structures reserving land for expansion greater than design life of infrastructure e.g. detention ponds and buffers like esplanade reserves
- Linked to design of Infrastructure
 - TAs have engineering codes of practice - design standards for developers,
 - Ensures consistent std when works are vested in councils
 - Standards not dynamic - often Climate Change not included

Case Study: Kanihikatea Estates



“Local government have to ensure that suburbs aren’t built on areas that might become new flood plains...”

- Hon Pete Hodgson 11 October 2004

Airport infrastructure is vulnerable



MORE FLOODS: Thames Coromandel mayor Philippa Barriball inspects flooding at Thames airport in July. Barriball says residents accept the risks of living on the peninsula.

PICTURE: Times files

- Airports are particularly vulnerable
- Require large areas of flat land
- cheapest to build on flood plains
- Future climate profile needs to be accounted for.

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Policy Response: Sea level rise and storms surge



Coastal development

- Safe
- At risk now
- Additional coastal development at risk by 2100

Response: Design and operation

- UK Environment Agency T2100 project
 - Staged upgrades (decision points) including spatial planning in response to climate scenarios

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Natural Ecosystems - Biodiversity

- NZ Biodiversity is unique – adapted to wide range of habitats
- Altitude - sequences
- Latitude - clines
- Estuarine and shore line habitats will change
- Coastal – Freshwater interface
 - migration of salinity profile
 - Increased heat stress
 - Ocean acidification exacerbated by agricultural run-off (FoT)
- Sedimentation
- Plant and Animal pest spp – Biosecurity incursions

Coastal transition zones



Response: Provide for the inland migration of habitats



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Possible Future

- A network of Regional Climate Change Response partnerships
- Working through existing laws and agencies
- Adaptation programmes optimised for each area
- Support and membership from relevant partners – inc. Communities, Iwi, Health, Industry, Research Institutes, Government Agencies

*Thank you &
Any points of
clarification?*

