2013

Plan Topics

Climate Change

Climate Change

Section 7 of the RMA requires that particular regard shall be given to matters related to climate change. These matters include the efficiency of the end use of energy, the effects of climate change, and the benefits to be derived from the use and development of renewable energy.

The aim of this Guidance Note is to:

- Promote understanding about the effects of climate change; and
- Provide best practice information on how to assess the significance of, and respond where necessary to, the effects of climate change. A particular focus is how this can be done within local authorities' existing risk assessment, policy-making and decision-making processes.

The Guidance Note covers:

- An overview of how particular regard may be given to the effects of climate change.
- Information on expected climate change effects in New Zealand.
- Advice on methods for considering and addressing climate change effects under the RMA.

Guidance note

Introduction

Section 7 of the RMA requires that particular regard shall be had to:

"(ba) - The efficiency of the end use of energy;…
(i) - The effects of climate change; and
(j) - The benefits to be derived from the use and development of renewable energy".

In the context of the RMA, there are two ways in which particular regard may be given to the effects of climate change:

1. As an integral part of making decisions on resource consent applications and notices of requirement under the RMA for which the effects of climate change may be significant; and
2. In proactively assessing RMA policy statements and plans, as they come up for review or other changes are proposed, to identify whether more explicit and/or up-to-date policies are needed to address the effects of climate change than are currently provided.

The second point directly relates to **councils' broader strategic planning initiatives**. The effects of climate change can be integrated into local authorities' longer term planning under the Local Government Act, as part of their mandate to meet the current and future needs of communities for good quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost effective for households and businesses.

Climate change and its effects

Expected climate change effects in New Zealand

The climate is changing. Increased greenhouse gas concentrations have already started to affect the climate in ways that will take time to reverse. Even if significant global action is taken now to reduce these, a degree of climate change is inevitable in our lifetime. New Zealand, as a country heavily dependent on agriculture and tourism for its revenue, can expect to be affected by even small changes in climate.

We cannot predict exactly what climatic changes will occur in New Zealand over future decades, both because of uncertainties around levels of future greenhouse gas emissions and incomplete knowledge about the processes governing climate and natural climate variability. Changes in rainfall, temperature and sea level will also vary from region to region.

However, the trend of change is well accepted. For example, on average, New Zealand can expect the following climate change effects:

- A rise in sea level. The Ministry recommends planning for the following projection of future sea-level rise:
  - For planning and decision timeframes out to 2090–2099, a base value sea-level rise of 0.5m relative to the 1980–1999 average be used along with 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 0.8m relative to the 1980–1999 average.
  - For planning and decision timeframes beyond the end of this century an additional allowance of 10mm per year be used.
- Average temperatures across the country are projected to increase about 0.9°C by 2040, 2.1°C by 2090.
- More rain is likely to fall in the west of the country and less in the east.
- Extreme weather events (e.g. floods, droughts and storms) are expected to become both more frequent and more intense.

The Ministry for the Environment has developed up-to-date information on climate change impacts for New Zealand by region. It is recommended that councils use this information as a basis for assessing the effects of climate change, unless more detailed local modelling is available.

Further background information on climate change science and the international context is available.

What could climate change mean?

A changing climate is expected to create both opportunities and risks for New Zealand, including:

- agricultural productivity is expected to increase in some areas but there is the risk of drought and spreading pests and diseases. It is likely that there would be costs associated with changing land-use activities to suit a new climate
- people are likely to enjoy the benefits of warmer winters with fewer frosts, but hotter summers will bring increased risks of heat stress and subtropical diseases
- forests and vegetation may grow faster, but native ecosystems could be invaded by exotic species
- drier conditions in some areas are likely to be coupled with the risk of more frequent extreme events such as floods, droughts and storms
- rising sea levels will increase the risk of erosion and saltwater intrusion, increasing the need for coastal protection
- snowlines and glaciers are expected to retreat and change water flows in major South Island rivers.

Both potential opportunities and risks should be considered when making decisions relating to climate change effects.

Climate change effects are expected to affect a number of key local government functions and operations which are outlined in further detail in this guidance note.

Assessment of climate change effects

As a general guide, wherever current climate is significant to an activity, hazard or plan, expected future climate should also be assessed for its impact.

Councils should explicitly consider whether the effects of climate change have significant implications for:

- natural hazard management
- land-use planning;
- the design and location of new infrastructure/assets with a lifetime of more than 30 years.

Of particular importance, given their long-term effect, are decisions relating to:

- housing and infrastructure development in areas prone to natural hazards such as river and sea flooding, erosion, slippage and inundation;
- stormwater system capacity and design;
- water allocation and irrigation in areas prone to drought.

Identification of significant climate change effects

When assessing whether climate change is likely to have a significant impact on a particular activity, hazard or plan, key factors to take into account include:

1 - Duration of activity. Local government decisions have a range of implications in terms of time horizons. Climate change should be considered for all climate-sensitive decisions with a long-term horizon (if the effects of the decision will last 30 years or more). Local government decisions have a range of implications in terms of time horizons. For example:

- Approval for a new development area or a coastal reclamation is effectively permanent.
- A building consent assumes new structures have a life of 50 years but many structures are intended to, or do, last much longer.
- Infrastructure decisions generally assume a 50 to 80-year life, but some can be designed to be built on a staged basis to provide extra capacity in response to climate change over time.
- Decisions on structures in rivers, most coastal structures, and infrastructure that involves regional council consents, have a term of 35 years or less, but in reality their lifetime may be much longer (e.g. significant bridges). Some should be recognised as near-permanent.
- Decisions on land care, biodiversity and pest management strategies may be in the context of a three, five or 10-year strategy, but some decisions may have enduring consequences so a long-term view may be appropriate.

2 - Presence of a particular 'driver'. Climate change considerations are particularly important for infrastructure decisions. Any significant investment should be preceded by a risk assessment that includes climate change implications and a cost-benefit analysis. Climate change effects should be factored in to infrastructure design where the resulting asset 'life-cycle' costs are less than the expected additional costs from premature retirement of the asset or unprogrammed upgrades. In some situations, the design of new infrastructure may 'lock in' resource requirements in a way that makes later upgrading virtually impossible.

Decisions on subdivisions and developments are most usually driven by applications from the private sector. Councils are required to make decisions quickly. But decisions need to be carefully made if there is a high likelihood that climate change effects will exacerbate existing natural hazards. If such factors are relevant, and the council thinks an application has shown inadequate consideration of climate change effects, further information should be sought in preference to proceeding without that information.

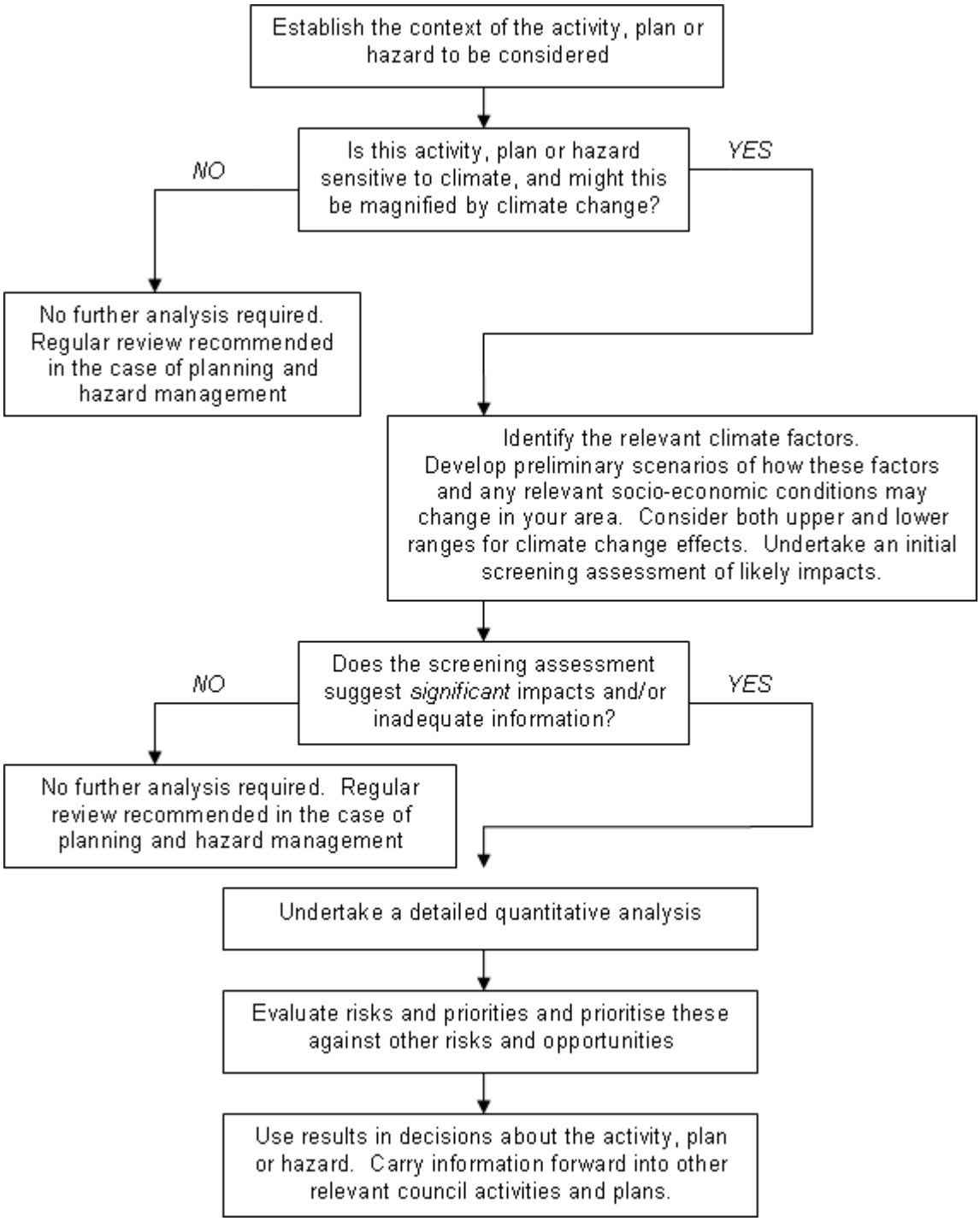
3 - Location of activity. Some locations are particularly vulnerable to climate change. Decisions on significant activities near the coast should consider expected sea-level rise over the next century, as well as other consequential effects such as increased coastal erosion and salt water intrusion into aquifers. Development in flood plains should factor in potentially reduced flood return periods and greater peaks.

4 - Extent of activity. Decisions that involve, for example, a single building or a small part of an infrastructure asset (unless the latter constrains the rest of the system) are less likely to have fundamental and long-term implications than decisions that affect larger areas. The exception is where a small development sets a precedent, leading to acceptance of subsequent applications.

5 - Nature of activity. An activity may be affected by a single climate change parameter, or by complex parameters with multiple effects and implications over time. The latter can best be addressed at the policy level, with decision-making applied consistently over time. Relatively general information may be adequate to start policy development and information can be refined over time within a generic policy context. For example, in planning an urban extension, if there are options, low-lying coastal areas should be avoided, and if flood plains are being considered, higher and more frequent floods than in the past should be assumed.

Decision-making frameworks

Councils may find it helpful to use a series of 'decision-making steps' of increasing complexity to assess whether climate change is significant for a particular activity, hazard or plan, and how significant its impact might be.



The first step is to identify qualitatively whether a specific activity, hazard or plan could be significantly affected by climate change. Special consideration should be given to activities, hazards or plans which are vulnerable at present to climate and climate variability.

If a potentially significant climate change effect is identified at this stage, a brief quantitative assessment or 'screening' analysis can be undertaken. This consists of considering the expected climate change effect (for example, a rainfall increase of between 2%-10% by 2030) and any other relevant planning variables that may change over the period in question (for example, a projected population increase of 15% by 2030), to develop scenarios in order to test quantitatively the likely significance of climate change. From this screening analysis, further analysis can be made as to whether existing planning provisions and/or hazard management responses have a sufficient safety margin to cover any resulting change in risk or resource availability.

If it appears that existing provisions/responses do not adequately cover the future change in risk, a more complex technical risk assessment can be undertaken, followed by an analysis of response options to manage the risk over appropriate timeframes.

Integrated assessment

Climate change is not a stand-alone issue. Councils already consider and respond to climate and climate variability as they develop plans, mitigate risks and provide services and facilities to the community. Climate change considerations will therefore not drive or initiate local government action on their own. Rather, they may modify an outcome. It is therefore recommended that, where possible, councils consider climate change within the context of existing resource management, risk-assessment and policy-making processes.

The primary effect of climate change is expected to be in changing the level of risk from weather-related natural hazards. Such hazards are already addressed in district plans and in many regional plans.

Similarly, the methods available to councils to respond to the effects of climate change are generally those contained within the toolbox for natural hazard management. It is expected, therefore, that climate change effects can be assessed and managed through existing hazard management plans and/or other processes which are used to control or manage natural hazards (e.g. s106 of the RMA, s36 of the Building Act, the Long Term Plan process, and other RMA requirements to plan for natural hazards).

Response framework and options

Response framework

Responses by decision-makers to a changing climate can be classified into eight different categories (also known as 'adaptation measures'). These categories are listed below in descending order from no action to proactive response:

- Bear losses - "Do nothing". The costs of adapting to climate change effects are considered too high in relation to the risk/expected damages.

- Share losses - Work with the wider community to share the costs of any losses (i.e. through private insurance schemes, post-hazard reconstruction and rehabilitation of land)
- Modify the threat - Exercise control over the risk e.g. modify flood prevention works or seawalls.
- Prevent effects - Avoid exacerbating/creating new risks by "down-zoning", increasing restrictions/imposing prohibitions to avoid intensification or commencement of at-risk development, and designing assets to cope with future climate conditions.
- Change use - Encourage or require changes in land use away from high-risk use to uses not susceptible to a changing climate.
- Change location - Direct development away from areas susceptible to a changing climate.
- Research - Support research into new technologies to minimise risks from a changing climate and new methods of adaptation.

Strategic responses

Responding to the effects of climate change will involve the planning sections of councils (possibly both policy and consents sections, where these are separate). A number of operational arms within a council may also need to be involved, such as those responsible for:

- Infrastructure and asset management (roading, water supply, wastewater, stormwater);
- Reserves management and planning;
- Finance (particularly where there are likely to be implications for capital or operational expenditure).

Strategically, a regional-local or cross-council approach is the best way to ensure that climate change is adequately considered in line with RMA requirements.

Such inter- and intra-council consideration of the effects of climate change under the RMA can also occur as part of wider planning and programming processes. Coordination will ensure the most effective strategic and cost-effective combination of response actions, including in terms of both public investment and the management of private development.

The principles for guiding the development of strategic responses are:

- Know your community's risks: hazard, vulnerability, and exposure;
- Avoid new development in hazard areas to minimise future losses;
- Locate and configure new development that occurs in hazard areas to minimise future losses;
- Design and construct new buildings and structures to minimise damage to cope with future hazards and pressures on resources, and assess the likelihood and relative importance of future climate change to altering those risks over time;
- Protect existing development from losses through redevelopment, retrofit, and land reuse plans and projects;
- Take special precautions in locating and designing infrastructure and critical facilities to minimise damage; and

- Plan for contingencies (for example, evacuation, progressive retreat)

In the case of a coastal development project, coordination between various council sections is recommended in order to ensure climate change effects are adequately considered in:

- decision-making with regard to the location of public and/or private development
- the development and funding of coastal protection works
- the design of coastal reserves
- the type, design and location of infrastructure such as roading or reticulation systems.

Response options

The methods available to councils respond to the effects of climate change are generally those contained within the toolbox for natural hazard management.

There are a number of regulatory methods available under the RMA and through RMA plans, e.g. building setbacks, minimum floor areas and levels, restricted development areas, special zones or management areas, consent processes, and designations.

Outside of the RMA context, councils may use a number of other non-regulatory methods to facilitate consideration of and response to climate change effects. These include:

- Structure and development plans;
- Emergency Response Plans/Recovery Plans;
- Protective works;
- Local authority asset and infrastructure management;
- Community initiatives (for example, coastal dune care programmes);
- Codes of Practice; and
- Integrated input into other plans and strategies

Individually, none of these methods will be fully effective in addressing the effects of climate change and the effectiveness of each method will vary according to the circumstances. An integrated approach, which incorporates a number of these methods, is likely to be needed. The choice of methods that are used will be determined by a number of factors, such as:

- The nature of the hazard (both at present, and in light of expected future climatic conditions) and the level of information available;
- The nature and values of the area (developed vs. undeveloped);
- The assessed level of risk;
- Community expectations and levels of acceptance of risk;
- Costs and benefits; and
- Existing assets in use to mitigate the hazard (for example, seawalls).

Good practice for developing strategic response frameworks for any natural hazard generally includes some or all of the following aspects. They are equally applicable for consideration of climate change effects, which are primarily linked to a changing level of hazard risk:

- Management strategies are an effective way to coordinate and integrate actions on areas that require particular focus, especially where ongoing public investment needs to be coordinated with the regulatory framework under the RMA. Any strategic response can be developed within the framework and context of the broader community outcomes sought through a Council's Long Term Plan, prepared under the Local Government Act 2002.
- Ideally, a strategic management framework should be in place before the review of RMA planning policies. This framework would identify priorities, allocate funding for specific works and programmes, and identify community aspirations, expectations and roles
- A programme of consultation must be undertaken with the community and key stakeholders before instituting changes to RMA Plans. Given the increasing property values the consultation process on this issue is unlikely to eliminate controversy about including climate change effects in the Plan-making process, particularly if there are new restrictions proposed (e.g. coastal setback zones for areas expected to be at risk under a rising sea-level). The strategic management process will provide additional robustness and support for the RMA policy-making process by placing the regulatory framework within a wider programme of action that is put to the community for input.
- Sound technical input should be sourced from experts with knowledge of the expected localised effects of climate change to improve the overall robustness of the policy approach and to address the complexity of the methodologies involved. Technical input may also be useful from other relevant statutory bodies, where appropriate, including regional councils, other territorial authorities, the Department of Conservation, etc.
- The widely-used Hierarchy of Natural Hazards Management Options is a useful tool when considering how to respond to the effects of climate change. The Hierarchy recommends starting with avoidance and preventative methods, moving through to reactive methods, with hard defence mechanisms usually considered to be least preferable. This correlates with the priorities expressed through the New Zealand Coastal Policy Statement, which seeks to avoid the use of hard protective mechanisms as much as practicable.
- An ongoing monitoring programme is key to an effective and responsive strategy to address hazard risk. Even in areas with well-known risks from natural hazards, there is often a lack of comprehensive, long-term information on which to undertake risk assessments and consequentially to develop robust response policies. As climate change can make itself felt over a long period of time, any response strategy to address the effects of climate change should include the development of a regular monitoring programme that can be sustained over the long term.

A risk assessment process is recommended to evaluate the level of risk from coastal hazards under a changing climate. Such an approach could be adopted for developing strategic responses to other forms of natural hazards affected by climate change, including discussions about whether a response is warranted now or can be deferred until later.

Development and review of local government plans

A checklist has been developed to help councils consider climate change effects in a more strategic way during the development and review of statutory plans, policy statements and reports developed by councils, including those required under the RMA.

Statute/name of plan Duration and purpose	Checklist for considering climate change effects in plans
Statute: Local Government Act 2002 **Name of plan**: Long term plan **Duration**: 10 years, but reviewed every three years. Can be changed at the same time as an annual plan is prepared **Purpose**: • Provide a long-term focus for local authority decisions • Provide financial estimates to manage council/community assets	• Are the long-term implications of climate change identified anywhere? Is any statement clear and able to be measured or monitored? If not, is there an explanation? • How is the timeframe of climate change effects handled? Is there adequate explanation of the need to act within the framework of the current plan, although effects may only be apparent during future plans? • Are adaptive responses to potential climate changes identified in relation to specific assets or activities (water supply, wastewater, stormwater, roading, pest management, parks and reserves management etc)? Are these specific and targeted to the asset? • If a change in level of service, or additional capacity is planned due to climate change (i.e. beyond the level of service or capacity based on other considerations), is this explicit and explained? • Are other programmes or plans relating to climate change identified (e.g. biosecurity, biodiversity) and details and budgets specified? • Is a monitoring regime relating to the aspect involving a climate change response identified and mechanisms, costs and duration foreshadowed? • Are the levels of uncertainty involved in the forecasts of climate change explained, and an estimate of the uncertainty provided?

Name of plan: Annual plan
 	
Duration: Annual
 	
Purpose: Support the Long Term Plan in integrated decision-making and coordination of the local authority resources; and provide an annual budget and funding impact statement for the local authority
	• Are budget requirements in relation to climate change responses identified in the long term plan explicitly followed through:
	  ○ generally in relation to development/maintenance/ management of specific assets?
	  ○ in terms of any investigation or research needs for the year?
	  ○ in terms of ongoing monitoring?

Name of plan: Annual Report **Duration**: Annual **Purpose**: A report on the annual plan, measuring activities and expenditure against sustainable development.	• Are any specific annual plan provisions relating to climate change reported appropriately, including asset management? • If the expected outcome has not been achieved, has this been explained?

Resource Management Act 1991
 	
Name of plan: Regional Policy Statement
 	
Duration: 10 years, but can be reviewed or changed at any time
 	
Purpose: Achieve the sustainable and integrated management of natural and physical resources, by providing an overview of a region's resource management issues, policies and methods
	• Are climate change and its effects identified as a regional issue requiring a response?
	• Does the policy statement explain the national policy context?
	• Does the regional policy statement specify the time horizon for different types of decisions on climate change and its effects?
	• Does the regional policy statement give pointers for the formulation of regional and district plan contents relating to managing the effects of climate changes?
	• Are the respective roles and responsibilities of the regional and district councils in managing natural hazards in the region set out?
	• Does the regional policy statement promote consistency of approach towards climate change by local authorities within the region and across boundaries with neighbouring regions?
	• Does the regional policy statement promote public education as a method of response to climate change and its effects?
	• Does the regional policy statement promote avoidance or limitation of damage and costs from natural hazards, including those exacerbated by climate change, such as:
	  ○ sea-level rise
	  ○ increased rainfall intensity
	  ○ increased incidence of severity or drought
	  ○ wind events?
	• Does the regional policy statement include any provisions for monitoring effects of climate change, and any relevant statements of environmental outcomes?

Name of plan: Regional plans **Duration**: 10 years, but can be reviewed or changed at any time **Purpose**: Achieve the integrated management of natural and	Depending on the plan ... • Are climate change and its implications identified as an issue? If it is not, is there an explanation as to why not? • Is the approach and policy for climate change consistent with the regional policy statement?

physical resources; managing and controlling land for soil erosion and natural hazards; managing and controlling water resources and beds of rivers and lakes; and managing and controlling the coastal marine area	• Are there one or more objectives relating to climate change, which are adequately explained and integrated with policy and rules? • If there are rules or methods which relate to, or rely on climate change as a partial or complete justification for their existence (e.g. water allocation, flood design clearances, prohibiting building areas), is the provision clearly explained? • Are there any decision-making criteria related to taking the implications of climate change into account? Are these explained? • Are there any provisions for monitoring relevant to climate change effects, and any relevant statements of environmental outcomes as a result of the provision? • Is there a specific commitment that the council will keep up-to-date with changing understanding of climate change and its implications?
Name of plan: District plans **Duration**: 10 years, but can be reviewed at any time **Purpose**: Integrated management of the effects of use, development and protection of a district 's natural and physical resources; and control of land in relation to natural hazards	• Is climate change identified as an issue in the district plan with adequate explanations? • How is the issue expressed in terms of objectives and policies? • Is the approach and policy for climate change consistent with the regional policy statement? • Have areas of enhanced risk (e.g. hazard zones, building lines) due to climate change been identified, with appropriate policy and rules? • Do the decision-making criteria relating to natural hazards refer to climate change and its implications?
Civil Defence Emergency Management Act 2002 **Name of plan**: Civil Defence Emergency Management Group Plan **Duration**: Five years, but can be reviewed sooner **Purpose**: Developing an integrated community-based response to the sustainable management of hazards	• Does the risk management analysis taken into account changes due to climate change? • Does the recognition of the effects of climate change reflect the current level of uncertainty in the region and adopt a cautious approach as a result? If not, is this explained? • Does the plan include a specific commitment to keep up to date with changing understanding of climate change and its implications, including any relevant local monitoring or liaison?
Plans under other legislation, and/or plans which have no	Depending on the plan ...

specific statutory basis **Name of plan**: For example, Reserve Management Plans, Asset Management Plans, Catchment Management Plans, Landcare and Biosecurity Management Plans **Duration**: Usually no set times. Plans should state their review periods. **Purpose**: Plans should explain their purpose through stated objectives and policies.	• Are there any statements or provisions relating to climate change and managing the effects? • If there are, are these appropriately linked to aspects of the plan that have long-term consequences (e.g. Reserve Management Plan may appropriately incorporate climate change considerations in relation to species choice for major planting programmes, or recognition of increased drought or flooding in design and subsequent maintenance costs of playing fields; Asset Management Plans may include expectations of changed levels of service needed in the future due to climate change; Landcare Plans may identify aspects such as reduced soil moisture in an area and promote a gradual shift in types of production/management as a response). • What monitoring regimes are incorporated?

RMA policy-making

Where climate change effects are expected to be significant (e.g. in areas where coastal erosion along a heavily developed foreshore is expected to exacerbate under a changing climate), a precautionary approach is appropriate, reflecting the direction set by the New Zealand Coastal Policy Statement (for example, see ss3.3 and 3.4).

While climate change may appear a gradual process the impacts of which are difficult to determine with accuracy, the development and use of land usually brings about long-term changes that are difficult to reverse once the effects of climate change manifest themselves. For example, an area may not be susceptible to the effects of climate change (e.g. sea level rise) for the next twenty years, but may subsequently become at risk after that time. If the effects are significant, this could create lock-in problems for future generations.

Land use planning decisions should integrate consideration of future climate, and cover a sufficiently long-term horizon, particularly given the permanency of structures and the expectations and values inherent with increased development. Both territorial and regional authorities can mitigate some of this risk by ensuring that there are robust land use policies and provisions within their plans, and that current policies and strategies are reconsidered as necessary.

The tools for managing natural hazards are well known and developed, and can be found in district and regional plans throughout the country.

- When plans or relevant part of plans are proposed to be reviewed, studies should be programmed to ensure the necessary data and supporting technical information is available for the policy analysis. For example, studies on how sea-level rise might affect local coastal inundation and erosion risks in highly developed areas may be

necessary if the information-base is not sufficiently current or comprehensive to provide for robust analysis and policy development.

- In areas where the effects of climate change are expected to be significant, particularly those in which coastal and flooding hazards are expected to worsen, it is recommended that explicit policies be formulated and contained within the relevant regional and district plans - including the regional coastal plan.
- A review of significant resources within the local authority that may be affected by climate change may assist in understanding what are the likely resources to be affected, the extent to which impact is likely, what priority resources need protecting, and what avoidance or mitigation measures may be practicable. These may need to be taken into account in the preparation and review of Long Term Plans, Annual Plans, and asset management plans, for example.
- Community education about the expected effects of climate change is an important early element to any policy-making process particularly in the lead up to consultation where it is important that those consulted have adequate sound information upon which they can make informed decisions.

Several policies in the New Zealand Coastal Policy Statement address the effects of climate change.

- Policy 3(2) which refers to adopting the precautionary approach with regard to coastal areas subject to the effects of climate change
- Policy 4(c)(iii) which refers to the need to use an integrated approach to development or land management approaches for land subject to inundation
- Policy 10(2)(a) which refers to the need to consider the potential effects of climate change when dealing with coastal reclamations
- Policy 18(d) which refers to considering the likely impacts of climate change in relation to public access to open space adjoining the coast
- Policy 24(h) which refers to considering the of climate change when identifying areas of coastal hazards
- Policy 27(2)(b) which refers to considering the effects of climate change when protecting significant developments in the coast

Regional policy statements

Under the RMA, regional and district plans must be consistent with the relevant regional policy statement. Taking account of the effects of climate change will be an explicit consideration in the review of the first generation regional policy statements, which all have policies on natural hazards and groundwater resources.

- Where the effects of climate change are likely to be significant resource management issue, effective responses to addressing the effects of climate change and changing natural hazards may require a coordinated approach between regional and territorial local authorities. As an example, coordination is recommended to address coastal hazards and flooding risks, for which both authorities have a role to play.
- Cooperative regional-district partnerships can be promoted and expressed through regional policy statements, particularly in areas where climate change is expected to significantly impact on natural hazard risks.

Regional and district plans

All district plans have policies and provisions on natural hazards. In addition, regional coastal plans also address natural hazards, while flooding hazards and soil erosion are usually addressed in district plans, other regional plans, or both. The effects of climate change could be appropriately addressed largely by reviewing current policies, updating the information base to include information on expected climate change impacts, and reassessing the effectiveness of current methods to implement such policies.

Regulatory controls managing the development and use of land are a principal, but not exclusive, method for addressing the effects of climate change under RMA Plans. This is especially so in areas where existing development is under threat from, or potentially threatened by, exacerbated natural hazards. For example, such regulatory controls include building setbacks, development prohibitions, building floor level requirements, and limitations on land use activities. Where a coastal erosion risk or flood risk is expected to worsen as a result of climate change, regulatory methods may have even greater relevance to limit the exacerbation of risks through further development.

In addition, other commonly used non-regulatory methods include:

- Provision of reserves (for example, esplanade reserves) to act as buffers, or as substitute land uses in place of more vulnerable land uses;
- Guidelines and codes of practice (which may, for example, be used to promote appropriate design specifications for stormwater disposal systems);
- Community education and involvement (for example, dune care programmes to improve resilience to sea level rise, siting and designing buildings); and
- Covenants and consent notices on the title (for example, identifying "no build" areas, or vegetation retention requirements).

Other statutory instruments also need to be considered.

Strategic management planning initiatives are often an effective way of developing an integrated approach to addressing natural hazards. Management plans directly link with other council services and programmes outside the RMA that can be reviewed, updated and revised as progress requires and resources permit, without amending the RMA Plan. However, given that the process of developing strategic responses has to link with the Plan (which has its own formulation process), an iterative approach may be necessary.

RMA plan 'example provisions'

The RMA Plan example provisions have been prepared to illustrate how the effects of climate change relate to various resource management issues. They are based on a fictitious region/district, and are therefore general in nature. That being the case, while the examples can provide direction for those developing plan provisions, it is not advisable to 'cut and paste' the provisions into plans without modification for local circumstances.

No example rules have been proposed, although comment has been made. This is because responding to climate change will most likely influence how other rules (such as

those relating to natural hazard management) work and where they apply, but they are not the 'driver' for the rule.

In some cases however, councils may wish to insert additional provisions into their plans after considering how to respond to the longer term effects of climate change. Such changes could include, for example:

- Adding additional or new setbacks in areas expected to be prone to erosion or flooding;
- Introducing or extending areas that are subject to minimum floor area requirements;
- Introducing or extending the areas where geotechnical reports are required before development takes place (such as on erosion prone or unstable hillsides).

Regional policy statement – Natural hazards chapter

Coastal erosion

Issue
Climate change effects such as sea level rise and increased frequency and magnitude of storm surges will potentially alter and/or increase the risks from coastal erosion.

Issue explanation
Climate change is expected to result in rising sea levels and an increase in both the frequency and intensity of storm events. Both are expected to increase the impacts of storm surge and wave run-up, which will directly affect the location, rate and magnitude of coastal erosion. Areas currently experiencing coastal erosion may see an increase in erosion, and erosion may start to occur at locations where coastal erosion is currently not significant.

Objective
To ensure the effects of climate change are taken into account in avoiding or mitigating the adverse effects of coastal erosion on people and natural and physical resources.

Policy
Where new subdivision, use and development is proposed in the coastal environment, the occurrence and magnitude of coastal erosion must be assessed, including any potential changes to existing risk as a result of climate change.

Method
Identify areas susceptible to future coastal erosion, including via modeling of expected climate change effects.

Flooding

Issue
Climate change is predicted to increase the frequency and intensity of heavy rainfall events, leading to changes in flood risk.

Issue explanation
Increasing air temperatures will bring a corresponding increase in the frequency and

intensity of heavy rainfall events, even in areas expected to experience less average rainfall in future. This change will place pressure on existing stormwater systems in urban areas, and natural drainage systems in rural environments. Areas currently prone to flooding may see an increase in the frequency and scale of future flooding events, and new areas currently not affected by flooding may become susceptible.

Objective
To ensure the effects of climate change are taken into account in avoiding or mitigating the adverse effects of inundation on people and natural and physical resources.

Policy
Where new subdivision, use and development is proposed in areas susceptible to inundation, the occurrence and magnitude of inundation must be assessed, including any potential changes to existing risk as a result of climate change.

Method
Identify areas susceptible to future inundation, including via modeling of expected climate change effects.

Regional plan – Freshwater chapter

Issue

The effects of climate change have the potential to change the quantity and quality of surface water, with increased variability in river flows likely.

Issue explanation
Changes in the intensity and frequency of extreme weather events are one of the expected effects of climate change. These events include increased incidence of drought in Eastern areas, and increased floods in all areas after major heavy rainfall events. Either could result in significant changes in the amount of water flowing in a number of rivers and streams throughout the region. Abstractions, damming and diversions of freshwater must consider this increased fluctuation in flows.

Objective
To manage the effects of climate change resulting in increasing variability of flows in rivers and streams by controlling the taking, use, damming and diversions of fresh surface water.

Policies
Manage the abstraction of fresh surface water based on hydrological modelling/predictions including the effects of climate change.

Limit the abstraction of fresh surface water during extreme low flows.

Methods
Regulatory:

- Rules setting minimum flow levels in streams and rivers throughout the region.

- Assessment criteria for determining resource consents for water abstractions from low flowing rivers and streams.
- Conditions on resource consents in water abstraction water permits.

Non-regulatory:

- Provision of information material to inform the public about the minimum flows in rivers and streams, and the hydrological analysis including climate change predictions used to calculate the minimum flows.
- Undertake further hydrological research into the effects of climate change on fresh water resources, in particular minimum flows and extreme flood events.
- Encourage water efficiency measures in the community
- Commission regional economic study into drought-tolerant agricultural and horticultural practices.

Rules
Existing rules associated with the abstraction of fresh surface water should be audited to ensure climate change predictions have been incorporated into the minimum flow calculations.

District plan - Natural hazards chapter

Issue
The effects of climate change have the potential to change and/or worsen the effects of existing natural hazards on people and natural and physical resources in the District.

Issue Explanation
Based on current predictions, climate change has the potential to affect the scale and intensity of existing natural hazards in the District, in particular, the natural hazards of coastal erosion, coastal inundation, storm surges, flooding and droughts. In managing land use and subdivision in areas prone to natural hazards, the Resource Management Act requires the effects of climate change to be considered.

Objective
To minimise the effects of climate change in areas subject to natural hazards, by managing activities and development within areas at risk from each hazard.

Policies
To identify natural hazard prone areas in the District incorporating the current modelling/predictions of expected climate change impacts.

Subdivision and development in areas prone to natural hazards should be avoided, or permitted only where it is demonstrated that the risks from the hazard(s) can be effectively mitigated.

Methods
Regulatory:

- Rules and the resource consent process to manage subdivision and development in areas subject to significant risk from natural hazards.

- Assessment criteria for determining resource consents in hazard prone areas.
- Conditions on resource consents in hazard prone areas to avoid or mitigate the risks of natural hazards.

Non-regulatory:

- Provision of information on the location and characteristics of natural hazards (climate change adjusted) through Land Information Memorandums (LIMs).
- Undertake research into natural hazards, including modelling the effects of climate change on areas susceptible to natural hazards.
- Protection works to safeguard existing development from changes in the scope and intensity of natural hazards (e.g. flood protection works).

Rules

Existing rules should provide an appropriate framework, but may need adjusting to take into account climate change effects (i.e. the inland boundary of the foreshore protection zone, location/extent of flood hazard areas).

RMA decisions on resource consent applications / notices of requirement

Under s104 of the RMA councils must take into account the effects of climate change. Decisions on proposed subdivision and land developments need to give due regard to climate change effects where those effects are likely to exacerbate natural hazards.

Those preparing or assessing resource consent applications, particularly for proposals in areas susceptible to natural hazards, should consider whether the expected effects of climate change are a potentially significant issue to address for design and location, and what consequent mitigation measures might be required. Most plans specify information that must be provided with applications for subdivision or development in locations that are likely to be affected by hazards.

- As a guide, the development of assets and land-uses with a life-span of more than 30-years may have particular vulnerability to being affected by climate change impacts, given the long-term nature of the issue. Decisions relating to these activities will require particular care.
- Where plans have not incorporated the effects of climate change, it may be appropriate to explicitly assess the effects of climate change through the resource consent process in terms of:
    - Subdivision and developments in floodplain areas, close to rivers, or within or over river channels; close to or within the coastal foreshore (cliffs, beaches or low-lying areas); on or close to steeper hillsides (including at the top and bottom of the hill);
    - Lifeline infrastructure components in the above locations;
    - Subdivision and developments that rely on rain water or ground water for supply;
    - Earthworks in hazard prone areas (coastal dunes, erosion-prone hill country, and floodplains); and
    - High density or essential community uses in identified hazard areas (for example, schools, and hospitals).
- Determine whether the plan under which consent is being sought has explicitly incorporated the effects of climate change into the setting of hazard management areas and/or associated development standards. For applicants, this may mean making enquiries with the local authority concerned, as, even with recent plans, it may not be obvious whether the plan is based on current data and scientific assumptions.
- Where the effects of climate change may be a significant issue, it is good practice to demonstrate how a proposal takes the effects of climate change into account as an integral part of the hazard assessment, along with measures incorporated to avoid or mitigate such effects. For example, in locations where flooding and coastal erosion are likely in future, information may be needed on risk levels, building setbacks and siting, floor levels, and contingency response plans. Information to support applications may include existing ground levels and 50 and 100-year flood levels or erosion levels from district/regional councils.
- Provide information and resources to people within the community about the effects of climate change, and the types of responses that communities can take.
- In terms of climate change impacts on the coast, the increasing values of coastal property strengthen the need to have this matter addressed quickly and effectively.

Climate change science and the international context

Climate change science

Climate change is defined as "a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods" (Article 1, United Nations Framework Convention on Climate Change). More recently, the Intergovernmental Panel on Climate Change (IPCC) defined climate change as both natural and human-caused: "a change in the state of the climate that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use."

Our climate has undergone many changes over the last million years. While natural changes in climate have been gradual, over the last 50 years the Earth's atmosphere has been heating up at an unprecedented rate, an effect known as global warming. Since this warming also affects global weather patterns and climatic conditions, it is more accurately referred to as "climate change".

Modern human activity (such as global industrialisation, agriculture and transportation) is increasing the amount of greenhouse gases being released into our atmosphere.

The main greenhouse gases released by human activity are carbon dioxide (CO_2), methane, nitrous oxide and some synthetic industrial gases. In New Zealand, 47.1% of greenhouse gas emissions are produced by the agriculture sector (methane and nitrous oxide) and 43.4% from the energy sector (CO_2).
Emissions from the industrial processes and waste sectors are a much smaller component of New Zealand's inventory comprising 4.8% and 2.8% respectively.

More information on climate change science and associated international initiatives can be found on the Ministry for the Environment website.

United Nations Framework Convention on Climate Change (UNFCCC)

The United Nations Framework Convention on Climate Change (UNFCCC) was adopted by the United Nations at the "Earth Summit" in Rio de Janeiro in May 1992. The UNFCCC took effect on 21 March 1994.

The long-term objective of the UNFCCC is to prevent "dangerous anthropogenic (man-made) interference with the climate system". The Convention sets out broad principles for change and has set up a process for governments to meet regularly. It encourages scientific research, sharing and exchange of technology and know-how, education about the effects of climate change and how we can deal with them.

The 189 countries that have ratified the UNFCCC (including New Zealand) have legally committed to taking measures to address climate change, including greenhouse gas inventories, national or regional programmes, and preparation for adaptation to the

impacts of climate change. More information on the UNFCCC can be found on the Ministry for the Environment website or at the UNFCCC website.

Intergovernmental Panel on Climate Change

The World Meteorological Organisation and the United Nations Environment Programme established the Intergovernmental Panel on Climate Change (IPCC) in 1988. The IPCC's role is to assess what we know about the climate system, the impacts of climate change and possible ways forward. It does not carry out research or monitor climate-related data or other relevant parameters (refer to the IPCC website for further information).

In response to the First Assessment Report of the IPCC, the United Nations' General Assembly convened a series of meetings that culminated in the adoption of the UNFCCC. Assessments Reports are produced about every five years, and the Fifth will be completed in 2013-2014.

The Kyoto Protocol

The Kyoto Protocol, which New Zealand ratified in 2002, is an international agreement to address global warming and delay climate change. It came into effect on 16 February 2005, and aims to reduce the total greenhouse gas emissions of developed countries (and countries with economies in transition) in line with an ultimate objective of stabilizing greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. An extension of the UNFCCC, the Kyoto Protocol set targets for the greenhouse gas emissions of developed countries for the period 2008 to 2012 (the first commitment period). Different countries have to achieve different targets, and international negotiations on the Second Commitment Period of the Protocol are currently underway. More information on the Kyoto Protocol can be found on the Ministry for the Environment and NZ Climate Change websites.

The Government has not yet decided whether to join Europe in inscribing New Zealand's next set of international commitments within the second Commitment Period of the Kyoto Protocol; or to join all the developing countries, the United States, Canada, Japan, Russia and others, in making those commitments under the alternative transitional arrangements.

However, the Government has stated its intention to take on a responsibility target for greenhouse gas emissions reductions of between 10 percent and 20 percent below 1990 levels by 2020, if there is a comprehensive global agreement. The conditions are:

- the global agreement sets to limit global temperature rise to not more than 2°C;
- developed countries make comparable efforts to those of New Zealand;
- advanced and major emitting developing countries take action in line with their ability to mitigate;
- there is an effective set of rules for land use, land-use change and forestry; and
- plans for a broad and efficient international carbon market are underway.

Local government and climate change

Councils may find it helpful to use the following table in order to assess the relevance of climate change effects to a particular local government function or operation. Further guidance for local government is provided by the Ministry for the Environment.

Function	Affected assets or activities	Key climate influence	Possible effects	Sensitivity to Effects
Water supply and irrigation	Infrastructure	Reduced rainfall, extreme rainfall events; increased temperature	Reduced security of supply (depending on water source); contamination of water supply.	Rivers, groundwater, water quality, water availability, coastal areas
Wastewater	Infrastructure	Increased rainfall	More intense rainfall (extreme events) will cause more inflow and infiltration into wastewater network; wet weather overflow events will increase in frequency and volume; longer dry spells will increase likelihood of blockages and related dry weather overflows.	Drainage
Stormwater	Reticulation, stopbanks	Increased rainfall; rise in sea level	Increased frequency and/or volume of system flooding; increased peak flows in streams and related erosion; groundwater level changes; saltwater intrusion in coastal zones; changing flood plains and greater likelihood of damage to properties and infrastructure.	Rivers, drainage, coastal areas
Roading	Road network and associated infrastructure	Extreme rainfall events, extreme winds	Disruption due to flooding, landslides, fallen trees and lines; direct effects of wind exposure on heavy vehicles.	Drainage, natural hazards
Planning/policy development	Management of private sector development; urban expansion; infrastructure and communications planning	All	Inappropriate location of urban expansion areas; inadequate or inappropriate infrastructure, costly retrofitting of systems.	Rivers, groundwater, drainage, coastal areas, natural hazards

Landcare	Rural land management	Changes in rainfall, wind and temperature	Enhanced erosion; changes in type/distribution of pest species; increased fire risk; reduction in water availability for irrigation; changes in appropriate land use; changes in evapo-transpiration.	Water availability, erosion, biodiversity, biosecurity, natural hazards
Watercare	Management of watercourses/ lakes/wetlands	Rainfall and temperature changes	More variation in water volumes possible; reduced water quality; sedimentation and weed growth; changes in type/distribution of pest species.	Rivers, lakes, wetlands, water quality, drainage, erosion, biosecurity
Coastal management	Infrastructure; management of coastal development	Temperature changes leading to sea level changes; extreme storm events	Coastal erosion and flooding; disruption in roading, communications; loss of private property and community assets; effects on water quality.	Coastal areas, natural hazards
Civil defence and emergency management	Emergency planning and response; recovery operations	Extreme events	Greater risks to public safety and to resources needed to manage flood, rural fire, landslip and storm events.	Natural hazards
Biosecurity	Pest management	Temperature/ rainfall changes	Changes in range of pest species.	Biosecurity, biodiversity
Open space and community facilities management	Planning and management of parks, playing fields and urban open spaces	Temperature/ rainfall changes; extreme wind and rainfall events	Changes/reduction in water availability; changes in biodiversity; changes in type/distribution of pest species; groundwater changes; saltwater intrusion in coastal zones; need for more shelter in urban spaces.	Groundwater, drainage, water availability, biodiversity, coastal areas
Transport	Management of public transport; provision of footpaths, cycleways etc	Changes in temperature, wind and rainfall	Changed maintenance needs for public transport (road, rail) infrastructure; disruption due to extreme events.	Drainage, natural hazards
Waste management	Transfer stations and landfills	Changes in rainfall and temperature	Increased surface flooding risk; biosecurity changes; changes in ground water level and leaching.	Biosecurity, natural hazards

Other methods and statutory instruments

Other methods

A range of methods other than regulatory controls imposed under RMA plans could be considered in regard to addressing the effects of climate change, including methods that may also be applied through the use of RMA controls (such as land development and subdivision rules based on structure plans). Some of the key mechanisms within the 'toolbox' that can be used as appropriate include:

Civil Defence Plans - these plans prepared under the Civil Defence Act can identify specific coastal hazards and evacuation and support strategies including training needs and community education.

Emergency Response Plans/Recovery Plans - these plans identify appropriate responses to specific events and what the needs of the community will be in the near future after an event - these mechanisms are likely to be required regardless of the management option chosen.

Protective Works - Constructing protective works such as flood banks, sea walls, beach replenishment and other devices to provide a level of reducing the risks from natural hazards.

Community initiatives (e.g. local dune care groups) can both increase the community's awareness of climate change effects (e.g. the impacts of sea level rise on local beaches and community assets) and also assist in implementing preventative or protective measures (e.g. illustrate that action to protect and establish dune systems can help mitigate the effects of unusually high storm surges and wave run-up impacts which are expected to be the norm with a rising sea level).

Monitoring and Reporting - the process of monitoring and reporting on the state of the environment can identify climate change-induced coastal hazards, trends in coastal processes, changes in risk, and further monitoring required to fill information gaps. Specifically it can identify long-term research and investigation needs.

Covenants on land titles - this mechanism can be used to ensure that development on any site that is at risk from coastal hazards is undertaken appropriately and can influence the ability of the owner to develop the site.

Non-statutory agreements - this involves reaching non-statutory agreements with property owners or managers on how existing or proposed developments may be managed in the future, or to set-up "first option" agreements to ensure properties at risk can be purchased by local authorities in the future when sale is contemplated.

Integrated input into other plans and strategies - as appropriate, councils should address the effects of climate change in other strategies or policymaking areas (for example, transportation strategies which consider design and placement of roadways).

Investigations and research - this covers a range of activities, such as ensuring regular and close interaction with research organisations, links with local education providers, regular consultation with lifeline providers and managers etc.

Structure and development plans - when applied to developments on 'greenfield' sites, these mechanisms provide an opportunity for large developments to be designed and managed taking coastal hazards into account, including the location and provision of infrastructure and placing the onus on the developer to include provisions addressing coastal hazards in their development plans.

NZ Standards/Codes of Practice - engineering solutions that can be adopted to manage certain coastal hazards in certain circumstances to provide some degree of certainty. [Note: may be tied into regulatory methods used under RMA, such as through land development and subdivision codes of practice]

Other strategic level methods include education through strategic planning processes, community education programmes, demonstration projects, urban growth strategies, and urban sustainability initiatives.

Other statutory instruments

The Building Act 1991 addresses building work in the interests of ensuring the safety and integrity of the structure through its construction and subsequent use (as distinct from the RMA, which addresses the effects of that structure (or any activity within it) on the environment, and of the environment on that structure (or activity within it)).

Buildings require building consent under the Building Act. Where controls are imposed under both the RMA and the Building Act, both must be met with generally the practical effect that the more stringent control prevails. The Building Act raises questions of whether the land 'is likely to be subject to erosion, avulsion, alluvion, falling debris, subsidence, inundation, or slippage'; or whether the works are likely to 'accelerate, worsen, or result in erosion, avulsion, alluvion, falling debris, subsidence, inundation, or slippage of that land or any other property'. Under s36 of the Building Act, the existence of these natural hazards can be noted on the title of a property.

Although district councils can exercise some judgement about whether to allow a subdivision or development, councils cannot avoid responsibility for avoiding or mitigating effects of natural hazards in favour of reliance on controls under the Building Act. Because the RMA takes a long-term (intergenerational) view, RMA requirements can be more restrictive than those imposed under the Building Act - for example, standards based on 1:100 year events, rather than 1:50 years under the Building Act. RMA plans are important as they may determine whether a building can be sited in the relevant area in the first place. The Building Act (specifically s36) is particularly important where coastal (or other) hazards are discovered after titles have been created or even after development is already established.

The Local Government Act 2002 (LGA) outlines administrative and management responsibilities for regional and district councils, including land management, utility services, recreation assets, transportation and the associated provision of services.

The LGA requires stopped roads along the margins of the coast (along MHWS) to be vested in Council as esplanade reserves. The LGA also establishes the means by which territorial local authorities may collect financial contributions for funding the acquisition, maintenance and development of reserves.

Section 650A1(i) of the Local Government Amendment (No 2) Act allows for district councils to undertake various works in the coastal environment including the erection and maintenance of: quays, docks, piers, wharves, jetties, launching ramps, and any other works for 'the improvement, protection, management, or utilisation of waters within its district (subject to the controls established by the RMA)'.

Community planning is a cornerstone of the LGA, with the requirement to prepare Long Term Plans. There are also specific consultation requirements when preparing these plans, or bylaws under the Act. This has particular significance for coastal strategies, or other management plans that are adopted as part of the response to coastal hazards, including climate-induced coastal hazards. These strategies and plans can be prepared to meet some of the requirements, particularly the consultative requirements of Long Term Plans.

The Civil Defence Emergency Management Act 2002 (CDEMA) is intended to:

- promote sustainable management of hazards;
- encourage and enable communities to achieve acceptable levels of risk;
- provide for planning and preparation for emergencies, and for response and recovery;
- require local authorities through regional groups to coordinate planning and activities;
- provide a basis for the integration of national and local civil defence emergency management;
- encourage coordination across a wide range of agencies, recognizing that emergencies are multi-agency events; and
- focus on reduction, readiness, response and recovery.

The CDEMA requires that a risk management approach be taken when dealing with hazards. In considering the risks associated with a particular hazard, both the likelihood of the event occurring and its consequences must be considered. The CDEMA is largely an enabling mechanism, which can complement both the BA and RMA. In particular, integration between regional and district councils is achieved with the formation of Civil Defence and Emergency Management (CDEM) Groups comprising representatives from each of the territorial local authorities and the regional council within a region. The CDEMA (s17(1)) outlines the functions of a CDEM Group in relation to relevant hazards and risks. These include:

(a) identify, assess, and manage those hazards and risks;
(b) consult and communicate about risks; and
(c) identify and implement cost-effective risk reduction...

The CDEMA (s48) provides that each CDEM Group must provide a CDEM Group plan and that plan must state the hazards and risks to be managed by the Group and the actions necessary to do so. The CDEMA therefore anticipates that regional and territorial authorities will cooperate in the management of hazards and risk, including coastal hazards.

The Reserves Act 1977 (RA) makes provision for the acquisition, control, management, maintenance, preservation, development and use of public reserves, and includes provision for controlling public access to coastal and rural areas where these are in public reserves. Administering bodies are required to prepare management plans for their reserves, which are open for public comment and review (except most government and local purpose reserves).

While the RA is aimed at providing public use areas and access, these reserve areas may also provide useful buffers from coastal hazards. However, councils must manage reserves to fulfil their purpose(s) under the RA (e.g., whether historic reserve, scientific reserve, scenic reserve etc) and any hazard management function is incidental. Management of the reserves for the purposes of hazard mitigation or avoidance is not expressly covered by the RA and would appear to only be a valid purpose of reserve management to the extent it is compatible with the primary purpose of the reserve. There is also no case-law to support this approach. The concept of a local purpose reserve does appear to be wide enough to include reserves managed for hazard mitigation or avoidance purposes.

The Public Works Act 1981 (PWA) deals with the rights of central and local government to acquire private land for public purposes including for reserves (within the meaning of the Reserves Act), and the procedures for acquiring and disposing of this land. Acquisition of land for reserve purposes is one way of providing for buffer mechanisms.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