Ministry for the Environment
Manatū Mō Te Taiao

# Making Good Decisions – Climate Change Effects

## INTRODUCTION

As local decision-makers, you will be wondering how and when to address the impacts of climate change. This factsheet provides some basic guidance and lists other resources available to help you in your decisions.

## THE EFFECTS OF CLIMATE CHANGE

The expected physical effects of climate change in New Zealand include:

- average temperatures are projected to increase by about 1˚C by 2040 and by about 2˚C by 2090
- drier conditions in the north and east of New Zealand
- wetter conditions in the south and west of New Zealand
- higher sea levels – plan for at least 50cm rise and assess the sensitivity of the activity to a possible 80cm rise by 2090.

These physical effects are likely to exacerbate or intensify the sort of events and processes that already occur in New Zealand, including:

- increased frequency and intensity of storm events
- natural hazards such as flooding and landslips associated with extreme weather events
- coastal natural hazards such as coastal erosion and coastal inundation
- the occurrence and significance of droughts.

There are some general triggers for deciding whether to include climate change considerations in resource consent assessments. Notably, activities to manage flooding, or activities affected by flooding, natural water and stormwater management, water harvesting, hill-slope and river erosion, coastal inundation and coastal erosion may all be affected by the physical impacts of climate change.

## SENSITIVE ACTIVITIES

Some activities are more sensitive to the effects of weather and climate than others. Climate change will change the way these activities are undertaken. The following types of activities are particularly sensitive to the impacts of climate change:

- the location of infrastructure such as bridges, roads, stormwater systems and irrigation storage and supply systems in areas subject to flooding or coastal erosion
- land development (including subdivision and building) in areas subject to flooding, land slippage or coastal erosion
- development such as marinas, jetties, port facilities and coastal protection; works within or close to the coastal marine area, and particularly in the area around marine high water springs
- irrigation schemes and hydroelectric plants in dry areas of New Zealand.

Where the physical impacts of climate change may exacerbate an existing resource management issue – such as flooding in low-lying areas, land slippage, or coastal erosion – a good decision should consider how climate change might affect the proposed activity. In these situations, the assessment of environmental effects (AEE) associated with a consent application should provide adequate assessment of the issue.

## STATUTORY PROVISIONS

The requirement to have particular regard to the effects of climate change was introduced into the Resource Management Act 1991 (the RMA) by the Resource Management (Energy and Climate Change) Amendment Act 2004. Section 7 of the RMA relevantly states:

*"In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to—*

*...*

*(i) the effects of climate change:"*

*...*

In considering the effects of climate change, section 106 of the RMA is important, because it allows the consent authority to refuse to grant a subdivision consent, or may impose specific conditions, if certain natural hazards are present, or are likely to be made worse by the use of the land. Many natural hazards will be



exacerbated by the physical impacts of climate change so councils may be required to apply section 106 in more circumstances than is presently the case.

## SECTION 106: CONSENT AUTHORITY MAY REFUSE SUBDIVISION CONSENT IN CERTAIN CIRCUMSTANCES

*"(1) Despite section 77B, a consent authority may refuse to grant a subdivision consent, or may grant a subdivision consent subject to conditions, if it considers that—*

*(a) the land in respect of which a consent is sought, or any structure on the land, is or is likely to be subject to material damage by erosion, falling debris, subsidence, slippage, or inundation from any source; or*

*(b) any subsequent use that is likely to be made of the land is likely to accelerate, worsen, or result in material damage to the land, other land, or structure by erosion, falling debris, subsidence, slippage, or inundation from any source; or*

*...*

*(2) Conditions under subsection (1) must be—*

*(a) for the purposes of avoiding, remedying, or mitigating the effects referred to in subsection (1); and*

*(b) of a type that could be imposed under section 108."*

The meaning of "effect" is outlined in section 3 of the RMA. It is important to note that "effect" includes future effects as well as past and present effects.

## SECTION 3: MEANING OF "EFFECT"

*"In this Act, unless the context otherwise requires, the term effect [ ] includes—*

*(a) Any positive or adverse effect; and*

*(b) Any temporary or permanent effect; and*

*(c) Any past, present, or future effect; and*

*(d) Any cumulative effect which arises over time or in combination with other effects— regardless of the scale, intensity, duration, or frequency of the effect, and also includes—*

*(e) Any potential effect of high probability; and*

*(f) Any potential effect of low probability which has a high potential impact."*

Section 104E of the RMA also directs that a consent authority must not have regard to the effects of greenhouse gases on climate change when considering applications for discharge or coastal permits, except in very limited circumstances. Further, section 70A directs that a regional council must not have regard to the effects of greenhouse gases on climate change when making a rule to control such discharges, except in very limited circumstances.

## SECTION 104E: APPLICATIONS RELATING TO DISCHARGE OF GREENHOUSE GASES

*"When considering an application for a discharge permit or coastal permit to do something that would otherwise contravene section 15 or section 15B relating to the discharge into air of greenhouse gases, a consent authority must not have regard to the effects of such a discharge on climate change, except to the extent that the use and development of renewable energy enables a reduction in the discharge into air of greenhouse gases, either—*

*(a) in absolute terms; or*

*(b) relative to the use and development of non-renewable energy."*

## SECTION 70A: APPLICATION TO CLIMATE CHANGE OF RULES RELATING TO DISCHARGE OF GREENHOUSE GASES

*"Despite section 68(3), when making a rule to control the discharge into air of greenhouse gases under its functions under section 30(1)(d)(iv) or (f), a regional council must not have regard to the effects of such a discharge on climate change, except to the extent that the use and development of renewable energy enables a reduction in the discharge into air of greenhouse gases, either—*

*(a) in absolute terms; or*

*(b) relative to the use and development of non-renewable energy."*

## PROVIDING FOR EFFECTS OF CLIMATE CHANGE IN PLANS

Some regional plans and district plans already contain provisions for climate change effects. For example, the Greater Wellington Coastal Plan includes a policy stating:

*"Structures*

*6.2.5 To ensure that adequate allowance is made for the following factors when designing any structure:*

- *rising sea levels as a result of climate change, using the best current estimate scenario of the International Panel on Climate Change (IPCC);*
- *waves and currents;*
- *storm surge; and*
- *major earthquake events."*

In the Christchurch City Council City Plan, climate change effects are considered in several sections, including section 5.8.2, which explains the rules in the Plan by noting:

*"Filling and building within flood management areas 5.8.2 A number of 'flood management areas' have been identified as being subject to a greater risk of flooding than the City as a whole.*

*An increased frequency and severity of flooding is anticipated within the identified areas as a result of climate change. It is predicted an increased number of buildings could be inundated by flood waters in these areas. This would result in significant adverse effects on the general and economic wellbeing and safety of the community. If infill development and redevelopment of these areas were permitted without additional protection from rules and standards in the City Plan the extent of adverse effects would increase over time. It is also likely that the demand for physical protection works would increase.*

*A requirement has been introduced for a resource consent to be obtained for new buildings and additions within the identified flood management areas. This provides the Council with the discretion over the finished floor level of those buildings.*

*Two distinct levels have been identified as necessary in order to manage the effects of tidal and non-tidal influenced flood risks. Tidal influenced flooding may result directly from seawater during extreme tide and/or storm events. Alternatively, it may result from back up of river waters during such events. 'Non-tidal' flooding results from heavy or sustained rainfall within the catchments of the rivers that flow through the City.*

*An 11.8m level (CCC datum) has been identified with respect to 'tidal' flooding. This level includes a 0.5m allowance for the sea level rise, being the best estimate from IPCC (Inter-Government Panel on Climate Change) for sea level rise over the next 100 years as adjusted for Christchurch's coastline. This level reflects tidal flooding within a 2% to 1% annual exceedence probability storm event, once the sea level rise has occurred, depending upon whether a 300mm or 400mm buffer (or freeboard) is provided. The minimum finished floor level that has been identified with respect to non-tidal flooding is that which would result from 0.5% annual exceedence probability rainfall event plus an allowance for freeboard. Some tidal influenced area such as parts of Sumner and Redcliffs are also subject to local drainage constraints and the minimum finished floor level for these areas will be that which would result from a 0.5% annual exceedence probability rainfall event plus freeboard.*

*These finished floor levels have been chosen because they reduce the potential for damage in moderate to significant flood events over the life of the building, taking into account the anticipated effects of climate change, in particular sea level rise."*

## EXAMPLES OF CONSIDERING THE EFFECTS OF CLIMATE CHANGE

To illustrate how a council may have particular regard to the effects of climate change when making a resource consent decision, two examples are outlined here:

***Example 1: Structure Requiring Coastal Consent in Breeling Harbour***

Applicant "J" has applied to Breeling Regional Council (BRC) for resource consent for 35 years to place a restaurant on a pier in the coastal marine area. The applicant acknowledges that the coastal structure may be inundated by the sea, or that it may be affected by waves. The potential consequences are:
a) contaminants such as grease or chemicals may be released from the building directly into the sea; and
b) the structure may collapse as a result of wave impacts.
The BRC's Regional Coastal Plan clearly requires applicants to demonstrate how they can minimise the risk of these particular outcomes. The application is notified and a hearing is scheduled to hear the case.

In the AEE, the applicant attempts to demonstrate that under **current** conditions the structure is not significantly subject to inundation or waves. However, in considering the effects of the activity on the environment, the BRC hearing panel wants to have regard to the likelihood of **future** sea-level rise and storm events affecting the structure. Key considerations for the hearing panel are the length of time for which the consent is sought and how sensitive the activity is to sea-level rise.

In this case, the BRC hearing panel might – in advance of the hearing, or during the hearing itself – seek further information or commission a report on the effects on the structure of sea-level rise and possibly more storm events over the next 35 years. If the consequences of these effects of climate change are determined to be significant – for example, perhaps resulting in contamination of the foreshore – the hearing panel may choose to apply the most cautious assessment of future sea-level rise.

If the panel concluded that – due to sea-level rise – the proposed structure might prove an unacceptable source of contaminants now or in the future, they could decline the consent or set consent conditions to minimise the risk of contaminants entering the sea or of the building collapsing during high seas.

In this situation, acceptable solutions to the effects of climate change could include elevating the proposed structure above future sea and storm surge levels. A good decision would consider whether the issues had been addressed in sufficient detail by the applicant and whether the methods proposed to mitigate these effects were adequate relative to the consequences of the effects.

***Example 2: Subdivision in the Waiwhakapiki River Floodplain***

Applicants "R" and "W" have applied to the Ayton District Council (ADC) to subdivide land situated in the town of Ayton in the floodplain of the Waiwhakapiki River, on the west coast of the North Island.

The land is known to be subject to floods up to 0.3 m deep, flowing at 0.2 m/s, with a probability of about 0.5 per cent each year. Section 106 of the RMA applies in this context. Under ADC's District Plan, subdivision of land within urban boundaries is a restricted discretionary activity. One of the items ADC includes in its discretion is management of flood hazard. The Ayton District Plan rules require subdivisions to be designed so that floods with a probability of up to 0.5 per cent each year can be managed without damage to buildings.

In their AEE for the subdivision, the applicants propose to mitigate the **current** flood hazard through the design of the subdivision, to prevent damage to buildings. The solutions they propose include elevating the proposed building platforms and providing natural channels to cope with floods up to the magnitude of the 0.5 per cent flood.

The application is opposed in a submission from a local resident who is a retired catchment board engineer. He argues that the applicants have failed to have regard for the likelihood of **future** flood flows – exacerbated by climate change – affecting the subdivision. He believes that the application should be declined in its present form, unless the applicants are prepared to mitigate the increased future flood hazard.

The hearings panel requests further information from the applicants, in the form of a hydrological and hydraulic study of the site. The study reveals that severe floods affecting the Waiwhakapiki River floodplain are more likely to occur in the future, because annual rainfall is likely to increase and severe storms are likely to be more frequent. Floods with a 0.5 per cent probability are likely to increase to 0.5 m deep and the velocity of the flow to increase to 0.4 m/s.

The hearings panel asks the submitter whether a redesign of the subdivision to cope with the increased risk of flooding likely to be experienced in the future might address his concerns. The panel seeks the applicants' response to the submitter's points, and their views on more stringent mitigation conditions. The panel decides to grant consent, subject to a redesign of the subdivision's building platforms and providing natural channels able to cope with the more severe consequences of a 0.5 per cent frequency flood in the future.

## FURTHER INFORMATION

The Ministry for the Environment website has several sections devoted to climate change, including information on the likely physical impacts of climate change. For detailed guidance and case studies on adapting to the physical effects of climate change, go to **www.mfe.govt.nz/issues/climate/adaptation/index.html**

To assist RMA practitioners and decision-makers, a Quality Planning guidance note on climate change is also available. Go to **www.qp.org.nz/plan-topics/climate-change.php**

Together, these sources of guidance provide:

- an outline of the Resource Management (Energy and Climate Change) Amendment Act 2004
- 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
- good practice examples of how local authorities have incorporated consideration of the effects of climate change into existing council decisions, activities and plans
- a summary of current challenges in considering climate change effects.

Information is available from the Quality Planning website on natural hazards. The research report at **www.qualityplanning.org.nz/qp-research/natural-hazards-aug06/html/index.php** includes information on flooding and other natural hazards. A guidance note on the management of natural hazards is also in preparation.