

Impacts of Climate Change on Urban Infrastructure & the Built Environment



A Toolbox

Message 5.2: Keeping Up-to-Date

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1. Introduction

1.1 Background

Local authorities have key roles and responsibilities relating to natural hazards, including hazards arising from climate change. Local authorities will also want to identify and encourage communities to respond to opportunities which arise from climate change. In addition, local authorities have a strong interest in encouraging resilience in communities. Resilience is a concept which transcends climate change responses, but which is also particularly relevant to climate change impacts and the adaptive capacity of any community.

Inherent in the concept of climate change is uncertainty. Thus it is necessary for local authorities to keep as up-to-date as possible with their understanding of the nature and implications of climate change for the local authority's own area. As knowledge about climate change and its potential impacts, and knowledge about potential responses to climate change, are rapidly expanding, relying on knowledge from previous decades may lead to either complacency or missed opportunities.

In order to maintain an understanding of the implications of climate change for an area it is useful for local authorities to regularly review international, national and local information about climate change. At the local level, local authorities may generate their own targeted information to assist in addressing prioritised risks.

Urban environments themselves are subject to constant changes, physically, socially and economically, due to a wide range of factors. Local authority intervention and influence is but one of these factors. Local authorities can however initiate and/or support changes in no-regrets or low-regrets ways, and they play key roles in long-term management of the community components of urban environments.

1.2 Purpose of this Tool

This “message” tool provides ideas on how local authorities can go about ensuring that their knowledge and understanding of climate change, and responses to it, is current. It acknowledges and builds on concepts identified particularly in [Tool 4.1: Climate change adaptation – key concepts] and references identified in [Tool 1.7: Sources of information, help and expertise for climate change impact assessments & glossary].

The discussion that follows firstly considers whose role it should be within a local authority to ensure continuity and updating of information relating to climate change and its impacts. It then addresses three aspects of practical information where regular updates are highly desirable.

2. Whose Role?

Councils working directly as a corporate body of elected representatives or through officers acting under delegated responsibility, make numerous decisions every day. Many decisions are reactive to existing situations, but many have a proactive component.

A range of commentators has seen the most effective adaptation to climate change as being incremental modifications to existing initiatives, or emerging from risk assessments undertaken in relation to investment analyses or community decision-making activities [see Tool 4.1].

Although the climate change implications of council decisions are not yet a standard consideration in New Zealand (as is, for example, alignment with existing policy), it is an increasingly frequent matter raised by councillors or the community in the lead-up to significant decisions.

As climate change considerations become mainstream or part of conventional wisdom, councils are increasingly identifying the need to have competent advice and information available on the climate change implications of significant policy or investment decisions. For this, a council needs to have access to advisers with specific responsibilities related to climate change.

Staffing models adopted by councils may comprise:

- An elected representative portfolio position, supported by a dedicated officer or officers (wholly within the strategic policy, or similar, section) with a “whole of business” responsibility (e.g. Wellington City Council).
- An officer position (with or without support staff) within the strategic policy section, with a “whole of business” responsibility (e.g. Auckland Council, Christchurch City Council, and Otago Regional Council).

Smaller councils may not have a dedicated officer or elected representative role related to climate change. However, it is desirable, as climate change impacts become more apparent, that a council has an officer position with specified responsibility relating to climate change. This role should encapsulate the following responsibilities:

- to keep abreast of international and national information on climate change and potential impacts;
- to keep abreast of New Zealand good practice concepts in adapting to climate change;

- to ensure that climate change information is included in considerations relating to policy development on, for example, urban development, provision of community infrastructure and lifelines;
- to ensure consistency of risk-based information, and that appropriate processes are applied when climate change-related considerations are being integrated into council decisions; and
- to act as the “go to” person for enquiries from elected representatives, council officers, community groups and the general public.

The role must be at a level of responsibility appropriate to the significance of the climate change issues facing the council, and adequately resourced. Because of the cross-sectoral nature of climate change issues, the role will usually sit most comfortably within the strategic planning and/or policy development section of a council. However, close links with other sections of the council, from infrastructure planning to emergency response, are essential.

3. Keeping up with Climate Science Understanding

3.1 International Sources

The Intergovernmental Panel on Climate Change (IPCC) is the international organisation which has developed and reported climate change information regularly since 1988. It is the core source of relevant information on climate change. The regular Assessment Reports present the key findings of the scientific consensus basis, taking into account current global climate-related information, a range of global greenhouse gas emission scenarios, and applying a range of global climate models [see Tool 1.2, for more information about the IPCC and global climate models]. The 4th Assessment Report was produced in 2007, with the 5th due for completion in 2012/13. The Assessment Reports are accompanied by Synthesis Reports, which are particularly intended for policy-makers.

As international consensus is that warming of the world’s climate system is unequivocal, the IPCC’s focus is now on improving predictions of the types and rates of change, on greenhouse gas inventory methods, and on providing concepts and advice on means of mitigation and adaptation to climate change.

The IPCC’s website <http://www.ipcc.ch/index.html> is regularly updated. It provides fundamental information for those seeking to understand climate change and potential effects.

Working Group II of the IPCC looks at impacts, vulnerability and adaptation to climate change. It has an Australasian regional sub-group which contributes to the overall Assessment Report (The Australia and New Zealand chapter will be Chapter 25 of the Working Group II Report). This sub-group provides a summary of the main climate information for the region and documents observed changes which are considered to be associated with climate change.

3.2 Local Translations of International Understanding

While a wide range of organisations (including universities and specialist consultancies) are able to assist local authorities to translate global information into regional and sub-regional scenarios, there are two primary organisations that local government and other agencies in New Zealand can turn to in terms of available information for their areas, as discussed below.

It is noted that the IPCC timetable results in new tranches of global information on a 5-yearly cycle. Translation of this information into national and regional scenarios tends to follow the IPCC cycles, and thus a 5-yearly update is an appropriate aim for local authorities.

As the global science understanding has been enhanced over past decades to the point where refinements, rather than step changes, in understanding are being made, it should be expected that national and regional updates will show incremental changes, rather than substantial shifts.

3.2.1 Ministry for the Environment

The Ministry's website <http://www.mfe.govt.nz/index.html> has a specific section dedicated to climate change. This provides links to the three current MfE publications which provide national and more detailed climate change information, including the main publication giving across-the-board guidance to local government, and two publications providing guidance relating to sea-level rise and assessing climatechange-related flooding. The Ministry also hosts the Climate Change Information website, <http://www.climatechange.govt.nz/>.

3.2.2 National Institute for Water and Atmospheric Research (NIWA)

As a Crown Research Institute, NIWA has a mandate and a responsibility relating to national climate information, including climate change.

NIWA has a National Climate Centre which, amongst other responsibilities, contributes to the work of the IPCC, including assessing regional impacts. NIWA's website <http://www.niwa.co.nz> links through "climate" to "climate change".

NIWA provides source information from the application of a regional climate model (with an estimated resolution of 30 to 50km), and has been the sole contributor to MfE's national guidance in terms of climate science.

Information is posted on the website as it is released. However, NIWA also responds to requests for up-to-date commentary on regional climate change scenarios from local government.

3.2.3 Others

As noted at the start of this section, there are other sources of local climate science information.

The New Zealand Climate Change Centre (<http://www.nzclimatechangecentre.org/>), which is a joint initiative of the eight Crown Research Institutes, along with Canterbury and Victoria Universities, has the goals “*to enhance the capacity of New Zealand, both domestically and in partnership with other countries, to anticipate, mitigate, and adapt to climate change*” and to facilitate “*collaboration to develop, communicate, and apply science-based solutions to climate change-related issues*”. As part of this, member organisations are frequently involved in research about the science of climate change, including local aspects.

The Royal Society of New Zealand also has a climate expert panel – the New Zealand Climate Committee – see the website at <http://www.royalsociety.org.nz/organisation/panels/climate/>. The terms of reference for this committee include a monitoring function on “*the present state of knowledge of climate science, of climate variability on all time scales ... for New Zealand, the South Pacific and Ross Dependency*”, and “*to make recommendations and provide advice on New Zealand research and monitoring needs, priorities and gaps regarding climate, its impacts and responses, including application of climate information*”. While its role is broad, climate change is a key area in which the New Zealand Climate Committee maintains an interest.

The New Zealand Climate Committee issues occasional statements and commentary relating to climate change, with the main recent commentary relating to drought risk in New Zealand. Their web page (see reference above) has a range of useful links to other New Zealand and international organisations.

4. Keeping up with Adaptation Concepts

While the science aspects of climate change are focussed on a scientific consensus and a small range of information providers, adaptation concepts are the subject of a current major proliferation of effort, driven by the recognition that some level of climate change effects are now inevitable over most of the globe.

The relevance and potential effectiveness of adaptation concepts for any local authority will depend very much on physical, social, economic and institutional (including legal) circumstances. It is likely that New Zealand-specific concepts will be most relevant to New Zealand local government, although international concepts may also bring important initiatives and novel ideas which are adaptable to New Zealand circumstances. Adaptation to climate change relies on innovation and dispersion of ideas and practices.

4.1 Keeping up with Local Concepts

The 2007 IPCC Working Group II Report: Impacts, Adaptations and Vulnerability assesses how well the authors considered that New Zealand was engaged in the adaptation process. The report notes that adaptation is being “mainstreamed” into a range of social, civic and business practice, and that New Zealand has a relatively high, and growing, level of adaptive capacity.

The Ministry for the Environment includes a wide range of information and advice about the need to adapt to climate change, along with case studies, on its websites. However, given the fast moving nature of adaptation ideas, this may not always be up-to-date.

Many local authorities in New Zealand have well-developed climate change policies. These often include both mitigation (reducing greenhouse gas emissions) and adaptation (adapting to the effects of climate change) policies. There is currently considerable work being done in these areas arising from the need to review regional policy statements and regional and district plans under the Resource Management Act, as well as councils’ long term plans under the Local Government Act.

Council documents tend to adopt an integrated and holistic approach, and to include policy and practical approaches relating to mitigation as well as adaptation concepts. These are sometimes found within an overall “sustainable city” or “sustainable community” framework.

Keeping up-to-date with adaptation concepts thus should involve regular checking of the MfE website, and a scan of the websites of a range of New Zealand local authorities.

However, New Zealand local authorities are often members of composite organisations. Examples are the Communities for Climate Protection™ - NZ Programme, which is part of the Australian/New Zealand Local Governments for Sustainability (ICLEI – or International Council for Local Environmental Initiatives) network, to which many New Zealand local government agencies belong. This organisation collects and shares adaptation ideas, including through an on-line

electronic newsletter <http://www.iclei.org/index.php?id=856>. The organisation has a particular focus on resilient cities. Local Government New Zealand (<http://www.lgnz.co.nz/>) itself fosters sustainability and an awareness of climate change and its website links to relevant publications and organisations.

Universities may also have specific departments or centres with a climate change adaptation focus. Most prominent is the New Zealand Climate Change Research Institute (NZCCRI) at Victoria University of Wellington.

The aim of the NZCCRI is “*to produce high-quality, decision-relevant climate change research, and to deliver it to private and public sector decision-makers*”. The organisation has a strong policy, research and practice base. Its website provides useful information and links and is regularly updated – see <http://www.victoria.ac.nz/sgees/research-centres/ccri-about.aspx>.

The Ecological Economics Research New Zealand (EERNZ) Centre and the Joint Centre for Disaster Research, both at Massey University, include climate change within their scopes. Waikato University includes climate change adaptation research within its International Global Change Institute (IGCI). Otago University has a number of research centres which, *inter alia*, encompass climate change adaptation, such as the Oceans and Climate Change Research Centre and the New Zealand Centre for Sustainable Cities.

A range of other organisations, including most of the Crown Research Institutes, and independent organisations such as the Building Research Association of New Zealand (BRANZ), from time to time produce information relevant to climate change adaptation. The Crown Research Institutes frequently collaborate, through the New Zealand Climate Change Centre, as noted above. While much of the current research interest is focussed on the rural area and its productive environments, and is not directly relevant to the urban environment, other research, including into social and health impacts, is highly relevant for local authorities. A regular scan of the websites of these organisations enables local authorities to identify current work that may be relevant, and published material of value.

A council wishing to identify and/or address specific adaptation options may wish to commission review work. Consultancy firms and private researchers are able to undertake such work and this may integrate most up-to-date information on adaptation approaches applicable to local circumstances.

One of the most effective means of keeping up-to-date with local adaptation concepts is conference attendance and/or review of conference agendas and papers. Organisations ranging from the Institute of Professional Engineers (IPENZ) to the

New Zealand Planning Institute (NZPI), the Environment and Conservation Organisation of Aotearoa (ECO) and the New Zealand Association for Impact Assessment (NZAIA) have conferences, usually on an annual basis, which frequently include sessions or papers relating to climate change adaptation in urban areas. Local Government New Zealand and the Society of Local Government Managers (SOLEM) also have regular conferences, with relevant papers on this topic.

One of the most useful ways of keeping up-to-date is the development and maintenance of local networks of local authorities. This provides effectiveness for sharing of information at local levels. Leading local authorities may be at regional or district level, depending on the level of interest and/or capability, as well as the exposure of local or regional urban environments.

4.2 Keeping up with International Concepts

International adaptation concepts are under constant development through a very wide range of organisations, from grass roots to global. Many of the ideas generated overseas rapidly find their way to New Zealand through the agencies identified above.

As noted earlier, the IPCC has included adaptation as part of its core work since the 1990s, with commentary on adaptation particularly included within the Working Group II reports. These tend to address impacts and vulnerability as well as adaptation options, and give a global perspective on likely effectiveness, costs and benefits, as well as the interrelationships between climate change effects, adaptation and mitigation.

A recent publication “Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation”, a special report of Working Groups I and II of the IPCC (known as SREX), November 2011, gives information on global level of exposure to risks, and concepts of resilience and adaptation. It also gives some examples of significant weather-related events, each with a statement of associated generalised risk management and adaptation options. This information can provide a useful high-level checklist for local evaluation and consideration of options.

Internationally, specific events often lead to comprehensive inquiries, and the rapid evolution of adaptation techniques. These types of examples receive significant international press coverage at the time. An example is the Pitt Review which followed the widespread 2007 flooding in the UK. The report contained sections on adaptation based around improving planning and reducing risk, maintaining power and water services and protecting essential services, better advice and helping people protect their families and houses, recovery, and means of implementation of the many recommendations. Similarly, the Brisbane 2011 floods triggered a Commission of Inquiry which reported to the State Government in September 2011. While this is

largely about disaster management, there is also information relating to adaptation through community and infrastructure management.

The European Environment Agency (an agency of the European Union) maintains a website for its 32 member nations (<http://www.eea.europa.eu/themes/climate/national-adaptation-strategies>). This website sets out the current climate change related strategies, including mitigation and avoidance, and sets out overall EU and national policy. The European Union is currently developing a comprehensive climate change adaptation strategy for completion in 2013.

Such resource information provides ideas, and confirmation (or otherwise) of effectiveness of known approaches.

5. Keeping up with Legislation, Powers and Opportunities

Opportunities and powers available to local government relating to adaptation to climate change can be constrained by legislation. As identified in other parts of this Toolbox, legislation such as the Building Act contains some constraints on what would otherwise be appropriate adaptive practice, whereas the Resource Management Act can create opportunities which may not always have been applied to the fullest extent by local authorities.

Legislative mandates and opportunities periodically change due to a range of pressures. Local authorities usually contribute to such changes, either on their own or through organisations such as Local Government New Zealand. Individuals within local authorities may contribute towards submissions to Parliamentary Select Committees through professional organisations.

It is important that the powers and opportunities that are available to local authorities through legislation are regularly reviewed by local authorities, and particularly that new opportunities that may be created for adaptive responses to potential climate change impacts are identified and applied. Similarly, when local government units identify constraints or issues with achieving appropriate adaptive responses within existing legislation, this should be brought to the attention of Local Government New Zealand, and other agencies such as MfE and the Department of Internal Affairs, so that the need for changes can be evaluated.

The Phase 2 review of the Resource Management Act, and “normalising” legislative changes which may follow the Christchurch earthquake, are likely to be the key empowering opportunities for adaptation and improved resilience to natural hazards over the next few years.

As with other climate change-related information which local authorities need to continually update themselves on, there is a plethora of useful source information. The responsibility for keeping up-to-date with such information should ideally rest with one, or a small group of dedicated professional(s) with a “whole of Council” mandate.