Potential Climate Change Impacts for Council

TO	Audit and Risk Committee
FROM	Bruce Hinson – Group Manager Infrastructure Delivery
DATE	1 March 2019
SUBJECT	**Potential Climate Change Impacts for Council**

1 Purpose of report

The purpose of this report is to provide the Committee with information about the potential impacts of climate change to Council, and the approach to consideration of these impacts.

2 Background

This report was prepared in collaboration with, Policy and Planning staff, as well as the Risk Manager, to ensure the projected impacts of climate change across a raft of Council activities are considered.

Each year there are climatic events (natural hazards) that represent risks to people, businesses, organisations and the natural environment. These risks arise from 'normal' day-to-day, seasonal, and year-to-year variability in climate as well as regional climate differences.

Most businesses and organisations have practices and strategies in place that deal with these routine natural hazards and climate change impact variabilities. For these organisations, climate variability will continue to raise challenges and risks that must be managed.

However, when managing climate variability into the future, the general consensus is that organisations cannot simply rely on the assumption that the prevailing climate will be more or less the same as it was over the past 50 or 100 years.

In New Zealand, natural hazards and environmental change – such as temperature, rainfall and sea level rise – are already occurring. These changes will occur to differing extents in different parts of New Zealand throughout this century and beyond. Supporting data has been well documented in the Ministry for the Environment reports and guidelines [1].

Based on the latest Ministry for the Environment climate change impact projections and guidelines for New Zealand (published in December 2017) [2], by the end of this century we are likely to experience:

- higher temperatures – greater increases in the North Island than the South Island, with the greatest warming in the northeast (although the amount of warming in New Zealand is likely to be lower than the global average)
- rising sea levels
- more frequent extreme weather events – such as droughts (especially in the east of New Zealand) and floods
- a change in rainfall patterns – with increased summer rainfall in the north and east of the North Island

Climate change impact may also create new demands for services, for instance, due to more frequent heatwave conditions or flood events. Thus, TCDC may be faced with a need to raise income accompanied by increased demands for services.

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[1] http://www.mfe.govt.nz/climate-change/likely-impacts-of-climate-change/how-could-climate-change-affect-my-region/waikato

[2] http://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/coastal-hazards-guide-final.pdf

The potential for flooding also places limitations on land that could be developed and economically utilised.

3 Issue

This report presents the approach considered to integrating climate change impacts into risk management and other strategic planning activities at TCDC.

4 Discussion

What do we mean by Climate change impact?

Natural hazards are naturally occurring physical phenomena caused either by rapid or slow onset events which can be geophysical (earthquakes, landslides, tsunamis and volcanic activity), hydrological (avalanches and floods), climatological (extreme temperatures, drought and wildfires), meteorological (cyclones and meteorological (cyclones and storms/wave surges) or biological (disease epidemics and insect/animal plagues).

It is a change or disturbance of the environment most often caused by human influences and natural ecological processes. Environmental changes can include any number of things, including natural disasters, human interferences, or animal interaction.

What is the risk to TCDC getting the balance right between intervention or not?

There is a risk that Council's preparedness and risk mitigation activities may not be adequate to respond, absorb and/or reduce impacts of climate change (including severe weather events) which may result in environmental, economic (disruption to businesses), loss of life/injury, financial and reputation loss.

A risk of physical damage to buildings, roads, bridges, flood protection structures, water treatment plants and environment (e.g. beaches, dunes and wetlands) as a result of flooding / inundation or other extreme weather events can be costly. These events can also disrupt the tourist industry and business by halting manufacturing, making it impossible for employees to get to work or endanger lives of residents and their livestock.

A risk of disruption of food and water supply can create a shortage of drinking water or food affecting residents and businesses in the region. Further risks are more intense storms and rising sea levels that may increase the vulnerability of coastal housing and infrastructure.

The risk drivers are:

- Consideration of climate change impacts in land use and urban planning and design.
- Consistent risk perceptions (across public and private sectors) and different understandings and prioritisation of climate change impact risks.
- Quality of advice to decision makers.
- Appropriate response from decisionmakers.
- A focus on building a more resilient community, e.g. education rather than disaster recovery.
- Scarcity of building professionals in Thames-Coromandel district/proximity.
- Sufficient resources and/or capability of staff - this in itself is a major challenge, i.e. despite a major recruitment push, it is challenging to find coastal and hazards professionals willing to move to Thames
- Design quality of coastal and climate change impact resilience projects.
- Strategic approach to coastal erosion and coastal inundation/sea level rise issues.
- Collaboration between internal departments and CCOs.
- Adequate / consistent resource consenting processes.
- Changes to extreme weather patterns (frequency, extent and intensity).
- Legacy risk caused by historic decisions to permit development (including critical assets) in areas of risk (e.g. housing, roads, utilities etc.).
- Rapid urbanisation - Increased population, more property development, increase in infrastructure provision and resource use.
- The complex urban planning system also creates a lack of alignment between spending, policy, regulation and development.

Some of the key impacts of climate change for TCDC are:

- Sea level rise - Sea levels around New Zealand are expected to rise due to the ocean expanding as it warms, as well as the melting of sea ice. Sea level rise around New Zealand is likely to be similar to global projections. Impact of the sea temperature increases and acidification on aquaculture and seawater pests (algae, etc). This rise depends on the amount of warming, and critically on the response of glaciers and sea ice in Greenland and Antarctica.
- Heavy rainfall and flooding - A warmer atmosphere can hold more moisture (about 7% more for every 1°C increase in temperature). Modelling work performed by the Ministry for the Environment[3] suggests that for New Zealand all rainfall extremes can be expected to increase by about this amount. On top of this, local atmospheric circulation changes can further increase or decrease rainfall extremes.
- Drought – Droughts are projected to become more frequent and more intense under climate change. Droughts represent a significant cost to the agricultural sector of the New Zealand economy.
- Strong winds – Climate models suggest that the frequency of extreme winds over New Zealand is likely to increase in almost all areas in winter and decrease in summer. Increases in strong winds may mean that coastal regions exposed to the prevailing winds may be subject to an increase in the frequency of heavy swells, which would add to the effects of higher sea levels
- Daily temperature extremes and frosts – In addition to changes in mean temperature, daily temperature extremes will also vary with regional warming. A large decrease in the number of frost days is projected for the central North Island and in the South Island as the 21st Century progresses. An increase in the number of days above 25°C is also expected, particularly at already warm northern locations. High temperature extremes are known to have impacts on human health as well as economic costs.
- Biological systems - Higher temperatures could favour conditions for the increased spread of exotic diseases and pests, affecting both fauna and flora. Biodiversity loss expected from climate change will have unknown impacts on the functioning of our ecosystems.

What are we doing about it?

Managing the impacts of climate change spans across a raft of Council activities such as district planning, roading, stormwater, coastal engineering and subdivision development, to name but a few examples.

Whilst the proposed Shoreline Management Plans will address some climate change impact issues in coastal communities, it will not address similar issues inland.

Council staff continue to work on all aspects of council operation to ensure that there is a reasonable and measured response to the issues that climate change may bring to Council operation. However these responses can only be limited to operations within our district.

Of course climate change and its effects are in fact global issues that central government must lead. Costs could potentially become crippling to local authorities. Central government must take the lead in ensuring that there is a consistent, rational nationwide response to issues that need to be confronted.

[3] http://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/coastal-hazards-guide-final.pdf

5 Suggested resolution(s)

That the Audit and Risk Committee:

1. Receives the 'Potential Climate Change Impacts for Council' report, dated 1 March 2019.
2. Recommend to Council to direct the Chief Executive to continue to work with central government agencies on matters as they relate to the appropriate responses to the impacts of climate change of the district.