

## **Report 99.184**

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Report to the Environment Committee  
from Michael Green, Hazard Analyst

### **Climate Change: The Potential Impact on the Wellington Region**

#### **1. Purpose**

To report the findings of a review of climate change information and recommend a climate change policy direction for the Council.

#### **2. Background**

A review of climate change was undertaken to help implement Method 6 of the Natural Hazards chapter of the Regional Policy Statement (the "RPS"). Method 6 states, "The Wellington Regional Council will periodically review the current knowledge on climate change and possible effects on natural hazards". This Method arises from RPS Issue 5 "The frequency and magnitude of natural hazards in the Wellington Region may alter due to climate change". Other RPS methods address natural hazards that result from climate change.

The findings of the review are documented in a comprehensive report "Climate Change" which is available for inspection in the Councillors' lounge. Copies are available on request.

#### **3. A Brief Summary of the Climate Change Review**

This climate change review covers greenhouse gases, the evidence for human induced climate change, the predicted global effects of climate change, international arrangements to address climate change, and some global political issues arising from the Kyoto Protocol. The focus then changes to New Zealand with a brief discussion of the Ministry for the Environment's indicators programme, the latest climate change predictions for New Zealand, the predicted climate changes for the Wellington Region and any associated effects, and the Council's existing climate change policies. A recommendation is made on the

direction the Council should consider in addressing climate change and its impacts on the Wellington Region.

Murray Ward from the Ministry for the Environment made a presentation to the Environment Committee (March 25, 1999) that covered international arrangements and described New Zealand's obligations under them.

#### 4. **Effects on the Wellington Region**

In the Wellington Region we can expect incremental increases in atmospheric CO<sub>2</sub> concentration, temperature, and shifts in rainfall regimes. These changes are not necessarily positive or negative, but are changes from the current state only. The potential implications for ecosystems, hydrology and water resources, agriculture and horticulture, forest resources, fisheries and marine life, coastal zones, human settlements, and human health are presented below.

##### *Ecosystems*

- Possibly well adapted to high climate variability due to ENSO (El Nino and La Nina) events
- May affect soil characteristics, water and nutrient cycling, plant productivity, species interactions (competition, predation, parasitism, etc.)
- Possible increases in fire occurrence and insect and weed outbreaks
- Adaptability the key (species by species basis)

##### *Hydrology and water resources*

- 5% (+/-25%) net increase over the next 70 years (NIWA) but local variation
- Rainfall distribution and intensity important
- May affect the continuity of municipal water supply
- Aquifers near coastline vulnerable to saltwater intrusion

##### *Agriculture and horticulture*

- Affected by temperature and rainfall regimes
- Crop suitability, pasture performance, soil fertility, stock health issues, and problems with weeds, pests
- Land use suitability / conversions to another land use
- Intensified by ENSO events
- Response: plant breeding, crop diversification, climate prediction

##### *Forest resources*

- Changes in forest biomass, geographical range and species composition exposure to pests and disease, and changes in fire intensity
- Increases in plantation forestry tree growth and wood density
- Indigenous forest species would extend their ranges south and upwards

##### *Fisheries and marine life*

- Little work done

- Most likely be governed by the position of the cold/warm current convergence zone south east of Wellington
- Southwards migration of subtropical species as the sea warms

#### *Coastal zones*

- Changes in coastal erosion/deposition patterns, migration of estuaries, coastal inundation, saltwater intrusion into coastal ground water, important wetlands and river mouths, an increase in saltwater wetlands, riverine flooding, and increased sedimentation in estuaries and harbours
- Exposure of low-lying settlements where expansion is likely to occur
- Vulnerability of infrastructure (roads, bridges, storm water systems, etc.)
- Access to traditional Maori sites / food gathering grounds

#### *Human settlements*

- Increased vulnerability to ‘natural disaster’ type events (e.g. fires, floods, and extreme sea level and storm events)
- Climatic impacts on water and air quality, water supply, drainage, waste disposal, energy production and distribution, transport operations, insurance, and tourism
- Direct impact effects likely to be small relative to other economic influences, but the sectors are very large, and the impacts and necessary adaptations may represent major economic losses and costs

#### *Human health*

- Slow increase in environmental health issues related to temperature increases, water quality, and air quality
- Urban pollution-related respiratory problems
- Long term security of water quality-emerging freshwater pathogens
- Tropical vector-borne diseases (dengue fever, malaria)
- Increase in existing diseases

## 5. **The Current Policy Environment**

- Central government wants to manage climate change as a national rather than a local issue
- The issue of climate change and its effects is large and difficult to address
- Climate change predictions at the regional level are uncertain, have wide variability, and are more like scenarios than predictions
- Most natural systems are subject to many interacting stresses
- It is necessary to balance the potential risks and damages that may result from climate change with the potential impacts of ameliorating measures on social and economic development

## 6. **What can the Council do?**

The Council is already undertaking a number of actions that have the potential to reduce the rate of climate change, or to respond to the effects of climate change. These actions include:

- Encouraging transport efficiencies and public transport use through the Regional Land Transport Strategy
- Encouraging energy efficiency at the regional level, for example, through a Regional Energy Forum, as discussed in Report 99.210 to the Committee
- Improving energy efficiencies in its own operations
- Providing for climate induced variability in flood protection activities
- Contributing to national climate change and transport management debates

In addition, there are a number of methods in the Proposed Regional Air Quality Management Plan that will address climate change, including:

- Promoting waste practices that reduce greenhouse gas emissions, including the capture and use of landfill gases
- Preparing an inventory of all significant sources and sinks of greenhouse gases

Other actions that the Council could consider in reviewing its Long Term Financial Strategy include:

- Promote greater development of greenhouse sinks
- Encourage research into the local effects of climate change
- Determine the effects of climate change on key resources managed by the Council (e.g. surface water, groundwater, and soil moisture)

As noted earlier, the RPS requires that the Council periodically review the current knowledge on climate change and possible effects on natural hazards.

## 8. Recommendation

*That the report be received and its contents noted.*

Report prepared by:

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