

New Zealand

Climate change impacts on water systems

Observed changes and trends	<ul style="list-style-type: none"> • Average temperatures have increased by 0.9 °C between 1908 and 2006. • Decrease in the number of days of frost in most locations. • Drought over the summer and autumn of 2007 and 2008 affected many of New Zealand's regions, leading to a reduction in agricultural productivity. • Extreme rainfall events (24 hour duration) increased in the West and decreased in the North and East between 1930 and 2004.¹ • Sea level rose at an average of 1.6 millimetres per year during the 20th century, in line with global trends. 				
Projected impacts	<ul style="list-style-type: none"> • Increase in temperatures of 0.9 °C on average for the period 2030-49 and 2.1 °C for the period 2080-99, compared to the period 1980-99. The most significant increase in temperature is expected during summer and autumn and in the North Island and in the northwest of South Island. Temperature rise is projected to be the least significant during spring. • Increase in annual mean precipitation in the West (up to 5% by 2040 and 10% by 2090) and decrease in the East and North (exceeding 5% in places by 2090). Increase in annual mean rainfall is expected in Tasman, West Coast, Otago, Southland, and Chathams; decrease is expected in Northland, Auckland, Gisborne and Hawke's Bay. • Lower river flows in summer and higher flows in winter are likely. • Longer summers with higher temperatures and lower rainfall will reduce soil moisture and groundwater supplies as well as heighten water demand. • Lower river flows in summer will raise water temperatures and aggravate water quality problems. • Heavier and more frequent extreme rainfall, especially in areas where mean rainfall is projected to increase. 				
Primary concerns	Water quantity	Water quality	Water supply and sanitation	Extreme weather events	Ecosystems
				✓ (floods, droughts)	
Key vulnerabilities	<ul style="list-style-type: none"> • Agriculture and forestry are important elements of the New Zealand economy and a key export industry. Both industries are climate dependant. 				

1. This is most likely to be the result of natural decadal variability, although a contribution from climate change cannot be ruled out.

Sources: Ministry for the Environment (2008), *Climate Change Effects and Impact Assessment*, 2nd Edition, www.mfe.govt.nz/publications/climate/climate-change-effect-impacts-assessments-may08/climate-change-effect-impacts-assessment-may08.pdf (accessed 9 July 2012); New Zealand Government (2009), *New Zealand's Fifth National Communication under the UNFCCC*, http://unfccc.int/national_reports/annex_i_natcom/submitted_natcom/items/4903.php (accessed 22 June 2012).

Key policy documents

Document	Reference to water?	Type	Year	Responsible institution
Resource Management Act (RMA) 1991 ¹	Y	Legal act	1991	Ministry of Environment, Local governments are responsible for implementation
Local Government Act 2002 ²		Legal act	2002	Local Governments
Civil Defence and Emergency Management Act 2002		Legal act	2002	Ministry of Civil Defence and Emergency Management, Local government

Key policy documents (cont.)

Document	Reference to water?	Type	Year	Responsible institution
Building Act 2004		Legal act	2004	Ministry of Business, Innovation and Employment (Building and Housing), Local Government

1. To provide greater legal certainty for councils about their responsibility to consider the effects of climate change, the RMA was amended in 2004 to require all persons exercising duties and functions under it to have particular regard to the effects of climate change. The New Zealand Government commenced its water reform process in mid-2009. This process is aimed at addressing the risks to the economy and the environment posed by poor management of our freshwater resource and capitalising on opportunities for economic growth that this resource provides. Reform addressing the management of freshwater takes place within broader reforms to the Resource Management Act 1991. Any proposals for legislative amendment would likely be encompassed within broader reforms to the resource management system in 2013.
2. Under the Local Government Act 2002, local governments are responsible for a range of functions that may be affected by climate change.

Policy instruments

Areas	Policy mix	Regulatory instruments	Economic instruments	Information and other instruments
Water quantity		<ul style="list-style-type: none"> Resource Management Act (RMA): Under the RMA, regional councils must give effect to the National Policy Statement for Freshwater Management 2011 (the "NPS"), www.mfe.govt.nz/publications/rma/nps-freshwater-management-2011. The NPS requires all regional councils to set objectives and limits on quality and water quantity by ensuring that their regional plans have regard to the reasonably foreseeable impacts of climate change.¹ Regional Councils are at various stages in implementing NPS requirements. Regional policy statements, water plans, water consents. 		<ul style="list-style-type: none"> National Policy Statement for Freshwater Management 2011 Implementation Guide (the "Guide"): A non-statutory document that provides guidance to regional councils on how to give effect to the requirement to incorporate impacts of climate change in their regional plans,² www.mfe.govt.nz/publications/rma/nps-freshwater-guide-2011. Information and guidance on climate change adaptation: The Government provides technical manuals, summary publications and guidance to inform local government, businesses and individuals about how they could be impacted by climate change and what they can do to adapt, www.climatechange.govt.nz/physical-impacts-and-adaptation/publications.html. Map of regional climate impacts: Provides an indication of the potential regional impacts of climate change in New Zealand. Refer to: www.mfe.govt.nz/issues/climate/about/climate-change-affect-regions.
Water quality		<ul style="list-style-type: none"> RMA, NPS, regional policy statements, water plans, water consents. 		
Water supply and sanitation		<ul style="list-style-type: none"> Local Government Act regulations, NPS, health standards. 		
Extreme weather events		<ul style="list-style-type: none"> National Civil Defence Emergency Management plan, local emergency management plans, Rural Support Trusts. 		
Ecosystems				<ul style="list-style-type: none"> Sustainable Land Management and Climate Change Programme ("SLMACC"): The Ministry of Primary Industries is working with sector organisations, local government and Māori to ensure that farmers, growers and foresters have the information and tools they need to be prepared for a changing climate. A changing climate presents both challenges and opportunities for land-based sectors. The programme funds research and technology transfer, www.maf.govt.nz/environment-natural-resources/climate-change/impacts-and-adapting-to-climate-change.aspx.

Policy instruments (cont.)

Areas	Policy mix	Regulatory instruments	Economic instruments	Information and other instruments
				<ul style="list-style-type: none"> Local government initiatives: <ul style="list-style-type: none"> www.waikatoregion.govt.nz/tr201137; www.trc.govt.nz/climate-change; www.boprc.govt.nz/Sustainable-Communities/Climate-Change.aspx; http://ecan.govt.nz/publications/Plans/ClimateChangeReport.pdf; www.wellington.govt.nz/services/environment/climate/climatechange.html; www.kapiticoast.govt.nz/Your-Council/A-Z-Council-Services-and-Facilities/Stormwater. Rural Support Trusts: Help people and families in the wider rural community who experience an adverse event (e.g. climatic, financial or personal) to more effectively meet and overcome these challenges. Services are free and confidential, www.rural-support.org.nz.

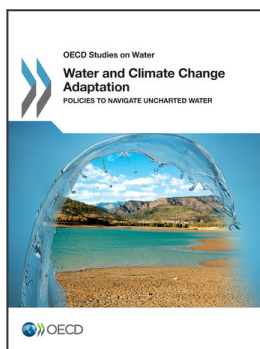
1. See: Policies A1 and B1.
2. The Guide states that the starting point should be guidance documents for local government on climate change published by the Ministry for the Environment, www.mfe.govt.nz/publications/climate.

Main research programmes

- Guidance manuals include:
 - Climate Change Effects and Impacts Assessment: A Guidance manual for Local Government in New Zealand*. Provides information on climate variability and observed changes in the New Zealand climate, www.mfe.govt.nz/publications/climate/climate-change-effect-impacts-assessments-may08.
 - Coastal Hazards and Climate Change: A Guidance Manual for Local Government in New Zealand*, July 2008, www.mfe.govt.nz/publications/climate/coastal-hazards-climate-change-guidance-manual.
 - Tools for Estimating the Effects of Climate Change on Flood Flow: A Guidance Manual for Local Government in New Zealand*, May 2010, www.mfe.govt.nz/publications/climate/climate-change-effects-on-flood-flow/index.html.
- The SLMACC programme funds research and technology transfer, including aspects related to water and agriculture and forestry, www.maf.govt.nz/environment-natural-resources/climate-change/impacts-and-adapting-to-climate-change.aspx.
- The National Institute of Water and Atmospheric Research (NIWA) undertake research into climate-related impacts on water, www.niwa.co.nz/our-science/climate/research-projects.

Principal financing mechanisms and investment programmes

- Government departmental funding and local government funding.
- Funding to NIWA to undertake scientific research into climate impacts.
- The Community Environment Fund, administered by the Ministry for the Environment provides funding for community initiatives that contribute to reduced greenhouse gas emissions and improved freshwater and coastal management, www.mfe.govt.nz/withyou/funding/community-environment-fund/criteria.html.
- The Fresh Start for Fresh Water Clean-up Fund provides funding to local councils, Iwi, and other partnership organisations, www.mfe.govt.nz/issues/water/freshwater/fresh-start-for-fresh-water/cleanup-fund.html.
- The Irrigation Acceleration Fund administered by the Ministry for Primary Industries supports regional-scale rural water infrastructure projects, www.mpi.govt.nz/environment-natural-resources/funding-programmes/irrigation-acceleration-fund.



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