

# **Impacts of Climate Change on Urban Infrastructure & the Built Environment**



**A Toolbox**

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## **Tool 2.5: Overview of Potable Water Tools**

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## 1. Introduction

In some regions of New Zealand, and particularly northern and eastern areas, climate change is expected to increase the frequency and severity of droughts (Hennessy et al. 2007, IPCC 2007). Dry conditions affect both supply and demand for water, and in general an increased frequency and severity of drought will increase the overall variability of water supply and demand that must be ‘managed’, and in particular the risk of water shortages.

Designing and developing potable water supply infrastructure to be more resilient to climate change effects does not require fundamentally different solutions, rather designs need to be made taking account of changing climate-related effects. Climate change effects influence design through increased ‘loading’ requirements, and add to other uncertainties because the rate and magnitude of the changes in climate are not known with certainty.

The Tools in Bin 2.5 of this Toolbox provide some background on water supply and demand issues and modelling for New Zealand cities and provide some modelled examples for Wellington city. It is also recognised that population increase and other societal pressures, as well as the climate, are likely to change over the coming decades, and that these pressures are likely to have a significant effect on water supply and demand.

## 2. Description of the Potable Water Tools

Table 2.1 outlines the Potable Water Tools in this Toolbox. The methods and statistical models described in the Tools are used for demonstration purposes only. It is recognised that other methods and models are available which can be used to perform functions similar to those described here.

**Table 2.1: Tools associated with the evaluation of potable water demand and supply**

Tool Name	Tool Reference	Purpose of the Tool
General information on water supply and demand approaches and issues	[Tool 2.5.1]	Acknowledges the complexity and interconnectedness of human and natural resource systems and uses systems-thinking tools to explore the complex dynamics of urban water supply and demand approaches, including relevant social factors, with particular regard to communities adapting to the effects of climate change.
Bulk water demand trend modelling for climate change	[Tool 2.5.2]	Describes the WaterTrac climate correction modelling tool, which is designed to monitor trends in bulk water production and to provide water utilities with information about climate influences on water demands and underlying trends in water demands after climate correction.  Further describes the ClimateTrac modelling tool, which was developed for annual and monthly forecasting of the impacts of climate change on water demands and uses the relationship between climate and demand that is produced by WaterTrac as one of its inputs.
SYM approach to present-day and future potable water supply and demand	[Tool 2.5.3]	Looks at interactions between water supply and demand factors, and climate change trends. This is addressed through the use of scenarios and projections based on water use in Wellington, and using Greater Wellington Regional Council's hydrological computer model, the Sustainable Yield Model (SYM).
Linkages to risk assessment, adaptation options and decision tools	[Tool 2.5.4]	To identify the next stages in an assessment of potable water supply and demand impacts and climate change.

### 3. References

Hennessy, K., B. Fitzharris, B.C. Bates, N. Harvey, S.M. Howden, L. Hughes, J. Salinger and R. Warrick. 2007: Australia and New Zealand. Climate Change 2007:

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IPCC 2007b. Summary for Policymakers. In: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 7-22.