

## 6 Climate Change

It is now generally accepted that global warming, caused by human-created emissions of greenhouse gases, will affect the climate, leading to a rise in temperatures and sea levels and changes in weather patterns. However, there is acknowledged uncertainty about the extent of those changes, and changes in the frequency or scale of meteorological hazards such as flood, storm, storm-surge, drought and coastal erosion. While the general direction of future changes is relatively well established, different climate models show different degrees of change, indicating the likely range that a precautionary planning approach should consider.

It is generally accepted that under climate change, New Zealand's risk of heavy rainfall will increase. However, specific model projections for changes in flooding are currently extremely variable. Environment Waikato is working with the Insurance Australia Group (who in turn is working with NIWA) in the interests of reducing this uncertainty.

Adequate planning steps need to weigh the projected range in flood risk against the additional protection costs associated with the plausible future scenario (or scenarios). We therefore need to adopt a conservative approach in our flood assessments for the Thames Coast to allow for any future management requirements or policy changes that relate to climate change. This includes allowance for engineering works to be upgraded where necessary.

# 7 Environmental Management

The works proposed by this investigation have the potential to enhance the existing Thames Coast environment through the stabilisation of catchments, the protection of riparian vegetation and the stabilisation of stream channels. There is however also the potential for short-term adverse effects on the environment during the construction and ongoing maintenance of works. These adverse impacts include:

- Disturbance of the beds and banks of streams.
- Discharge of sediment to streams and the coastal environment (Firth of Thames).
- Interruption of stream habitats.

Environment Waikato will address these impacts through the process of obtaining Resource Consents and by the implementation of good environmental practices such as:

- Sediment control.
- Management of machinery within and near waterways.
- Stream bank planting.
- Habitat enhancement.

Environment Waikato will also actively seek and implement opportunities to enhance the Thames Coast environment in a manner that is consistent with Environment Waikato policies.

# References

Aves, R.J. 1985: *Waihou Valley Scheme – Proposed Tararu Stream Improvement Scheme – Supplementary Report*. Hauraki Catchment Board Report 179, Hauraki Catchment Board, Te Aroha.

Aves, R.J. and Russell, G.H. 1985: *Te Puru Stream Improvement Scheme Reappraisal – Design Office Report*. Hauraki Catchment Board Report 194, Hauraki Catchment Board, Te Aroha

Environment Waikato and Thames-Coromandel District Council. 1993: *Te Puru Flood Management Plan*. Environment Waikato Technical Report 1993/1, Environment Waikato, Hamilton.

Lincoln Environmental. 1995: *Thames Flood Management Plan 1995*. Environment Waikato Technical Publication 1995/4, Environment Waikato, Hamilton.

Hauraki Catchment Board. 1985: *Flood of February 1985 Volume 1 – Design Office Report*. Hauraki Catchment Board Report 190, Hauraki Catchment Board, Te Aroha.

Martin, A. 2002: *Coromandel Flood Hazard – Technical Evaluation*. Environment Waikato Document Number 730208, Environment Waikato, Hamilton.

Ministry of Works and Development. 1975: *Culvert Manual*. Ministry of Works and Development.

Mulholland, M. and Basheer, G. 2002. *Thames Coast Flood Hazard – Engineering Works Options*. Environment Waikato Document Number 840454, Environment Waikato, Hamilton.

Munro, A. 2002: *The Weather Bomb – 21 June 2002 – Final Technical Report*. Environment Waikato Technical Report 2002/10, Environment Waikato, Hamilton.

Russell, G.H. 1982: *Waihou Valley Scheme Tararu Stream Report 1982 – Design Office Report on Works for Stream Waterway Improvements*. Hauraki Catchment Board Report 130, Hauraki Catchment Board, Te Aroha.

Russell, G.H. 1982: *Te Puru Stream Improvement Scheme – Design Office Report on Works for Stream Waterway Improvements*. Hauraki Catchment Board Report 117, Hauraki Catchment Board, Te Aroha.

Ryan, G.J. 2003: *Tararu Stream Hydraulic Investigation – Final Report*. Environment Waikato Document Number 780551, Environment Waikato, Hamilton.

Unknown Author and Year: *Thames Coast – Flood and Erosion Control*

Video Productions. 2002: *Cloudburst – The Tararu Creek and Mangakirikiri Stream Floods – January 2002*. Video Productions, Thames.