

Impacts of sea-level rise on the Avon River, Christchurch



What's the issue?

Christchurch is the biggest New Zealand city to be built on a flood plain. As the climate changes, it is likely that Christchurch will face increased flooding in some areas, particularly around the lower Avon River and the area where it flows into the sea.

To address these concerns, Christchurch City Council undertook a study in 2003 to examine the potential effects of climate change on the Avon catchment and associated coastal areas and to assess how these risks could be managed.

While the stopbanks on the Avon flood plain currently provide adequate flood protection for most properties, in the future they are likely to be overtopped with greater frequency. This is due to the projected increase in the frequency and intensity of storms, storm surge, flooding and sea-level rise.

Finding solutions for future flooding risks

As part of the 2003 study, the Council evaluated how climate change impacts could be integrated into risk management planning for the Avon catchment and associated areas. It focused primarily on an economic analysis of likely damages, and the response options available to local government to mitigate these.



The Avon River mouth, Sumner, Christchurch.

Options considered, and results of the study show:

- **Minimum floor levels** would be particularly beneficial in areas with relatively low stopbanks. The report recommended that Christchurch City Council considers setting different minimum floor levels for each ponding basin.
- **Subdivision restrictions** would not offer a net aggregate economic benefit in terms of preventing flood damage over the next 100 years. However, it was recommended that this option should be revisited in the future.
- **Stopbank improvement** – only one area (Hulverstone stopbank) would show an immediate benefit from improvements. Other areas could be worth upgrading in the future but would not benefit under current conditions. It was recommended that this option be revisited in the future.
- **Tidal barrages** were considered unlikely to be feasible. They would not yield a net benefit and have considerable environmental and amenity issues. This option was not recommended for future consideration.



Heathcote River.



Heathcote River in flood.

Conclusion

Since this report was undertaken, changes have been made to the City Plan and aspects incorporated into the Urban Development Strategy that seek to reduce the risks to the community from climate change.

Links to further information:

- **Adapting to climate change:**
www.mfe.govt.nz/issues/climate/adaptation/
- **Local Government New Zealand – Adapting to climate change workshops:**
www.lgnz.co.nz/projects/ClimateChange/workshop.html
- **Climate change mitigation:**
www.climatechange.govt.nz
- **Household sustainability:**
www.sustainability.govt.nz

Publications:

- **Environment Canterbury's Climate change report** is available on:
www.ecan.govt.nz/climate
- See amendments to **Christchurch City Council's city plan** on this site:
www.ccc.govt.nz/cityplan/proposedvariation48
- **Greater Christchurch urban development strategy:** www.greaterchristchurch.org.nz/
Reference to climate change can be found in Section 6.15 Natural hazards and climate change (page 90) and Section 6.12 Fresh water, estuaries and the coast (page 82).

See Ministry for the Environment publications:

- Climate change effects and impacts assessment
- Preparing for and adapting to climate change. Look ahead to the future

These are available on www.mfe.govt.nz/publications/climate/ and by emailing publications@mfe.govt.nz

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