



Report 06.391
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Committee Environment Committee
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The 4-7 July storms: hydrology and meteorology

1. Purpose

To inform the Committee of the completion of a technical report on the hydrology and meteorology of the July storm events, and to summarise its key findings.

2. Significance of the decision

The matters for decision in this report **do not** trigger the significance policy of the Council or otherwise trigger section 76(3)(b) of the Local Government Act 2002.

3. Strategic context

This work supports the Long Term Council Community Plan objective of providing timely warnings of threats to the environment and human life.

4. Background

Hydrological analysis of floods can help us to issue appropriate flood warnings in the future, and to design effective flood protection measures. The storms on 4-7 July 2006 produced a prolonged period of high river flows and surface flooding in many parts of the Wellington region, particularly in the Wairarapa. A technical report analysing the rainfall and river flows that resulted from the storms has been produced.

5. Summary of findings

During the period 4 – 7 July 2006 two storms brought widespread rainfall to the Wellington region. The storms were the result of two separate low pressure systems which brought two distinct periods of rain to the southern North Island.

The rainfall totals produced over the three day period were highest in the eastern Wairarapa hills, the Aorangi Range, Orongorongo Range and

Wainuiomata (Figure 1). Unconfirmed rainfall totals in eastern Wairarapa, to the east of Martinborough (around Hinakura in the mid-Pahaoa catchment), exceeded 400 mm. The estimated return period of the rainfall in this area is 80 years. Totals from automatic gauges indicate at least 330 mm fell in the Aorangi Range and 345 mm in the Wainuiomata catchment.

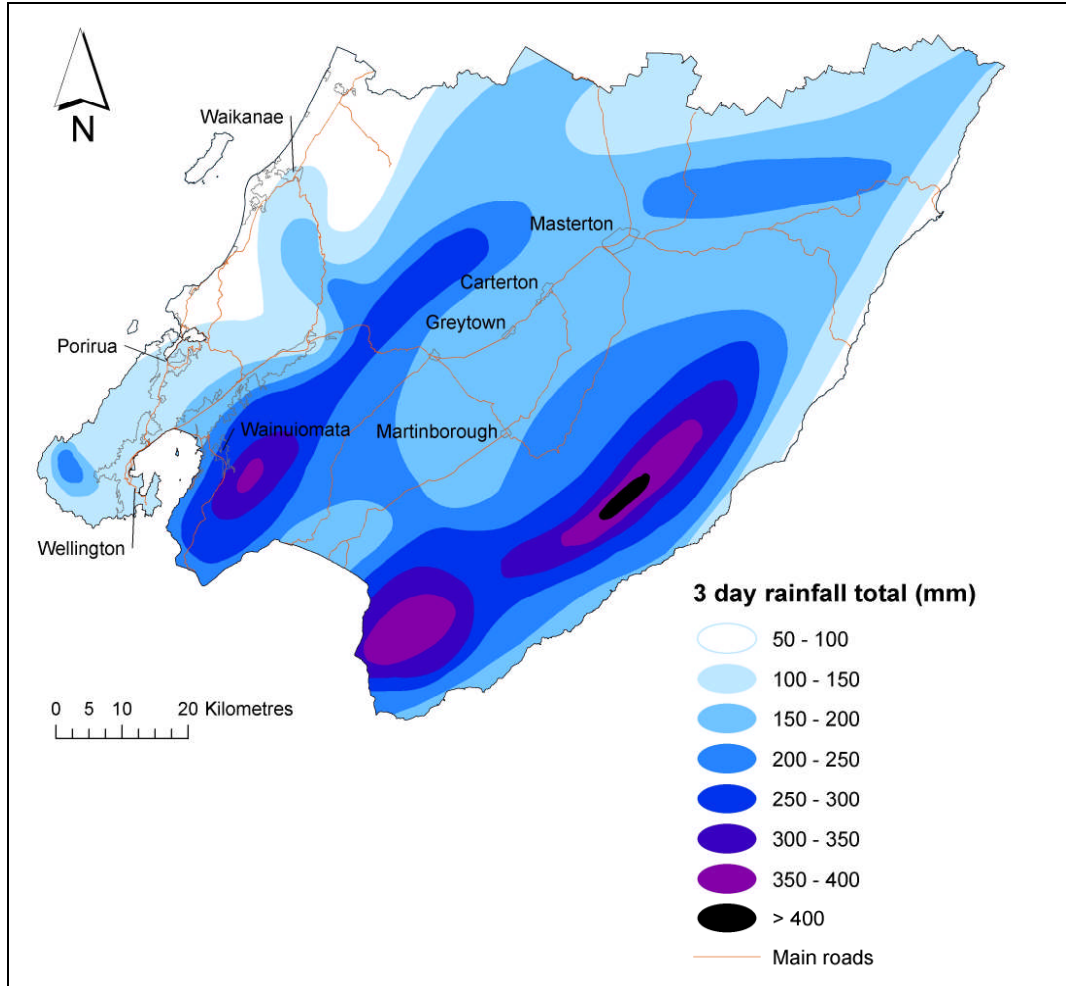


Figure 1: Accumulated rainfall from 4 July 2006, 9 am until 7 July 2006, 9 am

The return periods of the rainfall were most significant for the durations of 24 to 72 hours, highlighting how these events brought long periods of moderately intense rainfall rather than short, very heavy rain. High river flows occurred as a result of the storms, particularly in the eastern Wairarapa rivers, the streams of the central Wairarapa valley, Ruamahanga River, Wainuiomata River, and Mangaroa River. However, in general the monitored rivers did not reach levels as high as during the event of February 2004, or (in parts of the region) March 2005.

Figure 2 shows a comparison between the February 2004 and July 2006 floods recorded at *Ruamahanga River at Waihenga*. Although the peak of the hydrograph was considerably higher in February 2004, the flood remained at a high level for much longer in July 2006. In fact, the period that the Ruamahanga floodways were in operation was record-high for a flood event:

approximately 65 hours during 4-7 July 2006, compared to about 38 hours during the flood of 15-16 February 2004.

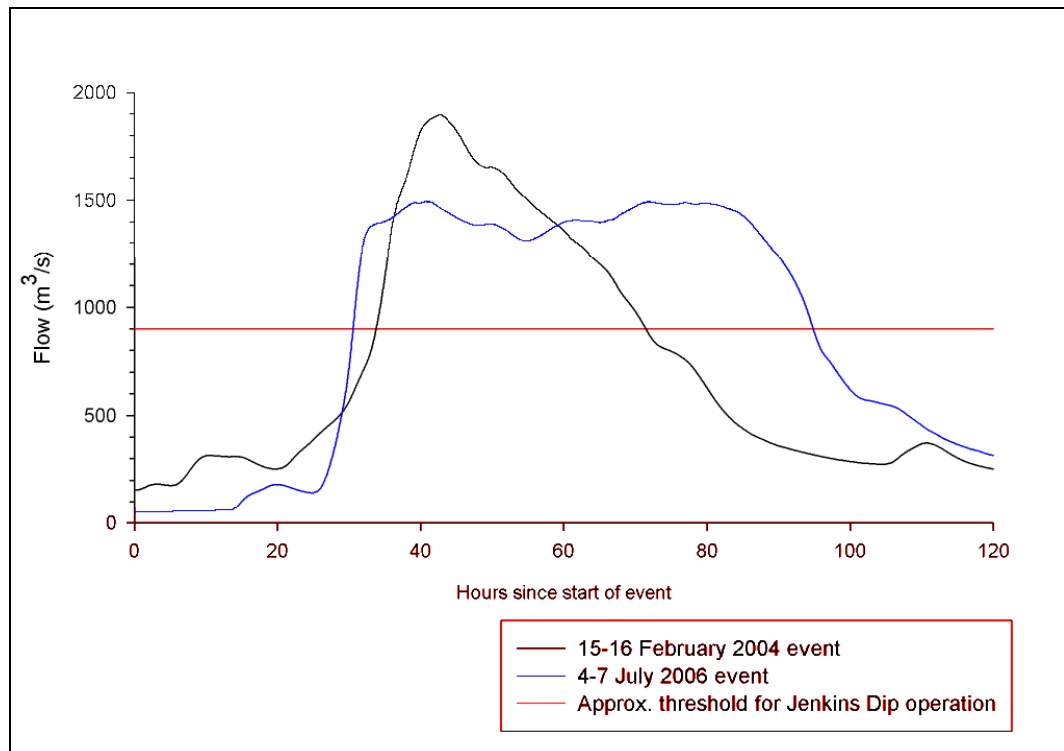


Figure 2: Flood hydrographs for Ruamahanga River at Waihenga – comparison between July 2006 and February 2004 floods

Overall the 4-7 July event was characterised by large volumes of water: surface flooding, and record-high volumes of water passing through the Wairarapa floodways into Lake Wairarapa. These effects were the result of two storms occurring within a three day period producing an unusually long period of rainfall, saturated catchment conditions, and an extended period of high river flows.

6. How can we do better?

The hydrological analysis in the report highlights the inadequacy of the Greater Wellington monitoring network to detect rainfall in the mid-eastern Wairarapa hills. The lack of rainfall information in this area affects our ability to accurately forecast flood peaks in the Ruamahanga River and its eastern tributaries. With a predicted increase in the frequency of easterly or southeasterly storms due to a possible shift in the Interdecadal Pacific Oscillation, and an increase in the risk of heavy rainfall events in the future as a result of climate change, it is important that additional rainfall monitoring is conducted in this area.

7. Communications

The report has been distributed to relevant departments within Greater Wellington and to Territorial Authorities. The electronic version of the report

can be downloaded from the Greater Wellington website. Copies are available to Councillors on request.

8. Recommendations

It is recommended that the Committee:

1. **Receive the report;** and
2. **Note the contents.**

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