



# Assessing flood impacts – Flood hazard and how to use it

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## ABSTRACT

Auckland Council has experienced several recent high impact flood events – including the ‘Tasman Tempest’ in March 2017. During this event, there was overtopping of Great North Road causing flood damage to the adjacent properties, underlying services and the road itself. It also became quickly apparent that there were substantial wider community impacts – including exposure of underground services, traffic congestion (locally and regionally) and loss of business to the adjacent commercial properties. The traditional metric in New Zealand for assessing the impact of flooding is the number of habitable floors inundated. The Tasman Tempest demonstrated the need to assess the impact of flooding in a broader context. The review will enable Healthy Waters and other asset owners to understand the potential impact of flooding on the community and essential services. It included an evaluation of local and international approaches for good practice in assessing flood impacts using modelling outputs.

Using habitable / non-habitable floor flooding is the most common approach to impact assessment in New Zealand. Some areas count the number of floors, while others extend the analysis through the following:

- Damage analysis using generic or locally specific damage curves
- Non-habitable landuses broken down into commercial, industrial and ‘other’
- Hazard rating for quantifying impacts on people, vehicles and / or buildings

The review of practices in Australia and the UK showed a wide range of approaches. In Australia, national and regional level guidance considers people, property and infrastructure flood impacts. The methods for impact analysis are similar to NZ and the UK – use of hazard rating (with impacts to people, vehicles and buildings considered) and flood damage assessment. The overall UK approach is financially focussed with all flood impacts being monetised where possible. There are limited opportunities to include non-financial impacts in a meaningful way in the decision-making process. This is due to the overall long term policy position of better protecting households (which have easily quantifiable damages / impacts) as a priority.

The use of ‘hazard’ is a common approach for assessing flood impact. However, the definition of ‘hazard’ is inconsistent and often confusing for end users. This paper provides a summary of



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approaches, what definition Auckland Council has selected and how it will be applied to understand flood impacts. Work is ongoing, but the initial outcomes include:

- There are no existing frameworks that have a balanced approach to the overall impact of flooding including infrastructure and less tangible outcomes.
- International approaches do not explicitly consider cultural impacts of flooding – which is important in a NZ context.
- Selection of the Australian Rainfall and Runoff Guidelines (2019) definition of 'Flood Hazard'.
- Definition of impact categories based on the four well-beings:
  - Social – People, land use and infrastructure services
  - Cultural - Community and mana whenua's ability to maintain their way of life including community places and cultural practices
  - Economic - The direct and indirect costs that arise because of flooding
  - Environmental - Potential for contamination and physical damage