

CAT Resource Center Post-Event Report

NORTH ISLAND FLOOD

Report Date: February 10, 2023

North Island Flood Headlines

Information as of 9 February, 2023



State of Emergency
Regions: [Auckland, Waikato](#)



Rain Gauge: [Auckland Airport](#)
24-hour Precipitation: 245.0 mm
Jan. 2023 Precipitation: 419.6 mm



Houses Requiring Assessment: ~ 5,000
Red-stickered houses: >270
Yellow-stickered houses: >1,600



Fatalities: 4

- Biggest weather-related claims event on record, according to Insurance Council of New Zealand (ICNZ).
- ICNZ reported 20,000+ claims as of 3 February, more than any previous flood event.
- Worst-affected areas are northern regions of the North Island centering around Auckland City.
- Flood-induced landslide is a major sub-peril driving damages in this event.

The North Island Flood post-event report comprises the following sections:

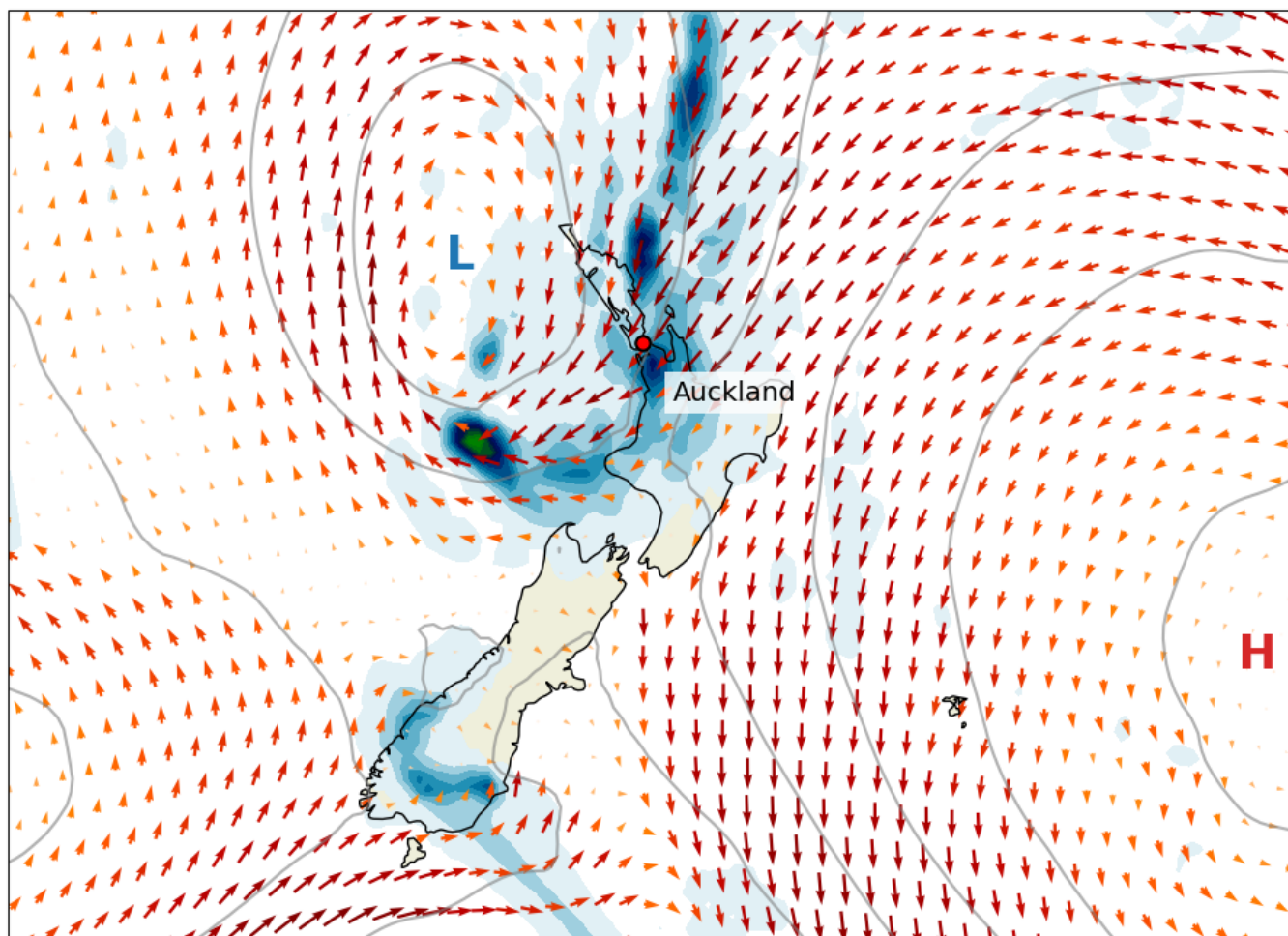
- Meteorological Background
 - Regional Vulnerability
 - Damage Impacts
 - Portfolio Properties in Flood Event
 - Large Industry Insured Losses
-

Meteorological Background

On Friday, 27 January 2023, torrents of thunderstorms associated with a low-pressure system hit Auckland. According to New Zealand MetService, the rainstorm set a new daily rainfall record of 245 mm (83.2 mm greater than the prior record for Auckland Airport weather station), as well as a new monthly record of 419.6 mm (115 mm more than the previous monthly record, July 1998). Stations across the city also have experienced 250-300 mm rainfall in 1½ days, with peak hourly rainfall of 60-80 mm per hour. Such an unprecedented amount of rain triggered significant flooding across the country's largest city. The weather patterns that produced heavy rainfall are shown in Figure 1.

Figure 1: Surface winds (arrows), precipitation (shadings), and mean sea-level pressure (contours)

12:00 NZT, 27 January 2023.



Source: ECMWF Reanalysis 5 Graphics; Guy Carpenter

Recent ocean-atmosphere conditions increased the destructive potential of the low-pressure system. Prior to the event, January 2023 already had been very wet for the North Island. The 2022-23 summer experienced the third La Niña in a row, a climate state that pushes warmer ocean water toward the western Pacific. Cyclonic circulation became more common in the Coral Sea, driving more moist warm air toward New Zealand. Furthermore, the country experienced 3 back-to-back record warm winters since 2020, as well as 2 record-setting warm years (2021 and 2022). Since warmer air can carry more moisture and warmer sea water evaporates more water into the air, the recent state of the climate likely intensified the low-pressure system as it headed toward land. Some cities experienced extreme rainfall during this period. Below are some examples.

Table 1: Examples of Extreme Rainfall Events Since 2020

	Auckland 2023	Auckland 2022	Canterbury 2021
Dates	27 January, 2023	21 March, 2022	29 May, 2021
Rainfall Record	City's wettest day 245 mm in 1 day Auckland Airport	City's 2nd wettest hour 76.8 mm (8-9 a.m.) Albany, Auckland	Station's wettest period 526 mm in 2 days Mount Somers
Insurance Claims	20,000+ claims	NZD 119.6 million	NZD 46.44 million

According to the latest Intergovernmental Panel on Climate Change (IPCC) report on physical science, a warmer climate increases the supply of moisture to weather systems, intensifying heavy rainstorms at a rate of 7% per 1 degree Celsius. New Zealand MetService reported that climate change intensified the rainstorm responsible for Canterbury Flood in May 2021 by 10%-15%. Warming temperatures thus may have contributed to the intensity of the latest event.

Regional Vulnerability

The Auckland area has many steep hillside slopes with clay-rich soil, which does not drain well. Once the soil is saturated, the weight exceeds a certain threshold and landslides occur. If a property is built without a sufficient setback from a cliff, then it may find itself teetering on the edge or toppled over by a landslide. Instead of damage resulting from disappearing land from below, a property also may be damaged by an avalanche of water-laden soil, tree debris and boulders from above. Surveys must carefully consider the geology of the land before (re)building in this environment.

Urban growth in the Auckland region, with increasing numbers of roads and buildings, has decreased the amount of permeable land surface, making it more challenging to discharge water effectively with the current network of basins and storm-water drainage systems. In addition, torrential rainfall carries debris that clogs street gutters and floods streets, and downpours can overwhelm the drainage infrastructure and cause catastrophic losses.

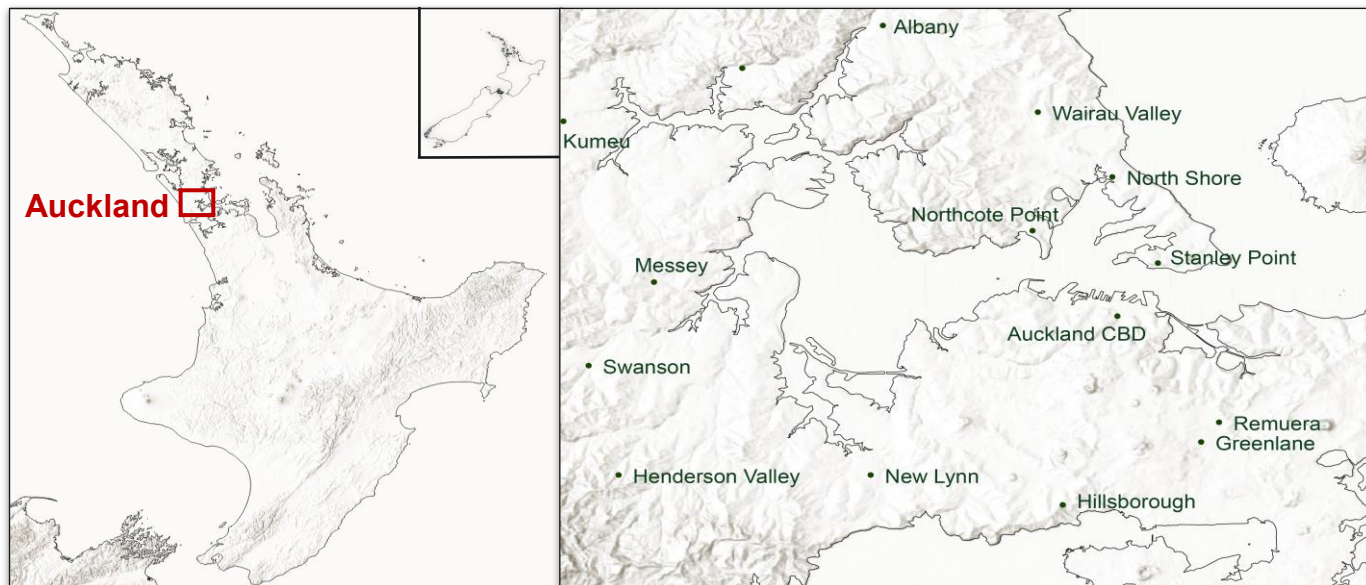
Damage Impacts

Although the Auckland region experienced the greatest damage, nearby areas also were affected. The city of Auckland accounts for more than one-half of New Zealand's population, and the greater Auckland region contributes more than one-third of national GDP. This extreme event not only brought inundation for many properties in the region, but also caused significant damage from landslides, disrupting transport to and from this key economic area.

Major Locations Impacted by Flood

Many homes lost power and water. School closings have been extended to 10 February in the affected areas. The international terminal of the Auckland Airport was inundated, and the Auckland District Court flooded. Several sports stadiums also were flooded, and 2 shows by Elton John at Mount Smart Stadium had to be cancelled. Up to 10 wagons carrying logs on a KiwiRail freight train derailed near Te Puke in the Bay of Plenty. Numerous streets were flooded and several bridges washed away, making rescue and recovery efforts very challenging. Below is a map of the hardest-hit areas.

Figures 2 and 3: Map of the worst affected areas across the North Island (left) and the inset showing the worst-affected suburbs in Auckland.



Source: Guy Carpenter / media articles

The event affected large parts of the Auckland, Waikato, Coromandel, Bay of Plenty and Gisborne regions from the 27 January 2023 onward. In Auckland, there were reports of damage across many suburbs, with the worst-affected areas around Auckland Airport, Auckland CBD, Wairau Valley, Hillsborough, Massey, Stanley Point, Northcote Point and Greenlane.

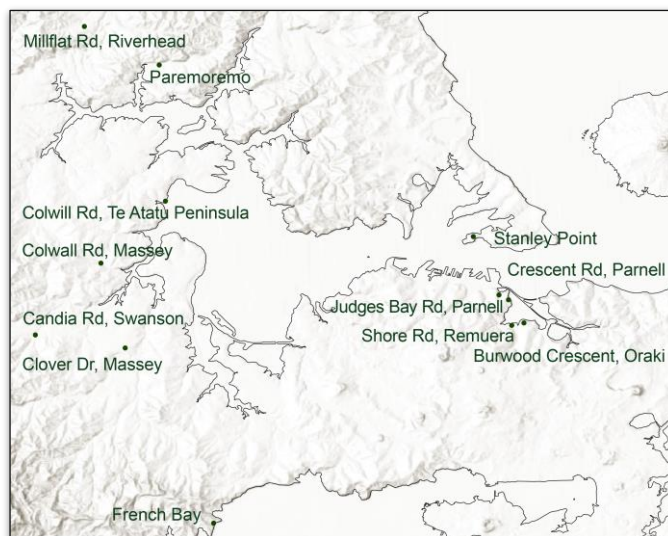
Major Locations Impacted by Landslides

The event also resulted in several landslides across Auckland and Tauranga, causing many properties to be red-stickered, because they had become unsafe to enter and/or uninhabitable. Other properties were yellow-stickered, with access restricted to only certain parts of the buildings, or limited to a short time to remove valuables.

The largest landslide resulted in the closure of part of State Highway 25A, that links the east and west of the Coromandel Peninsula. The local tourism industry is particularly concerned because the repair will take months.

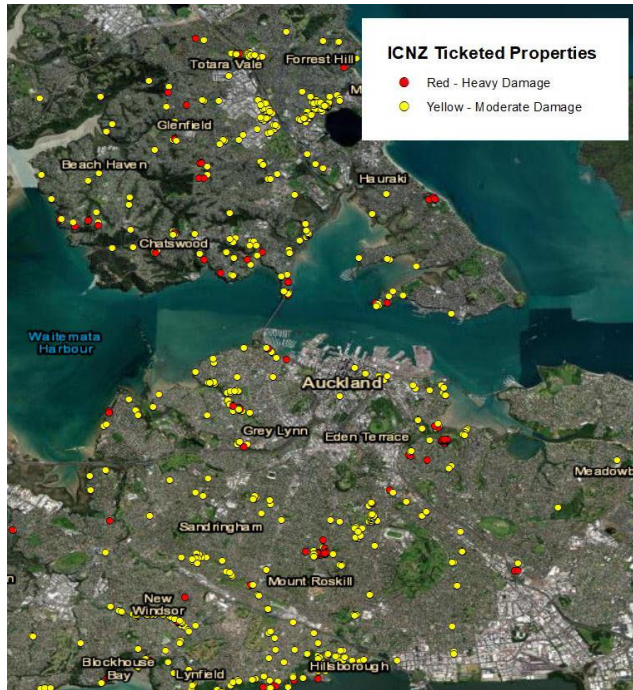
Many other landslides carried homes with them or dumped debris on homes below. They also left large amounts of debris on roads, disrupted traffic, and made travel hazardous. Certain roads have been cordoned off for safety.

Figure 4: Map of streets affected by landslides in Auckland



Source: Guy Carpenter / media articles

Figure 5: Assessed Properties

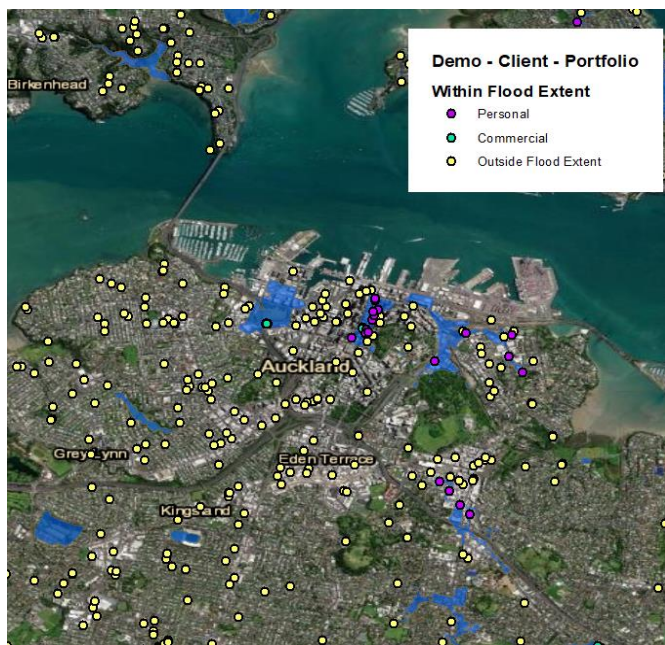


Surveyors have begun assessing property safety for inhabitants regardless of the likely cause (flood or landslide). As of this writing, about 5,000 properties have been assessed and assigned coloured stickers. As noted above, a red sticker means the property is not safe for entry, whereas a yellow sticker means there is permission to enter only a certain part of the property or to enter temporarily to remove items. Figure 5 shows the locations (and sticker colours) of assessed properties around Auckland.

Source: ICNZ

Portfolio Properties in Flood Extent

Figure 6: Portfolio Properties in Flood Extents



Guy Carpenter has undertaken portfolio mapping for several areas across Auckland based on flood extents provided by GeoSpatial Insight (GSI). These flood extents attempt to capture damages from only pluvial flooding, and not from wind, rainwater and/or water ingress. Figure 6 highlights the properties in the flood extents for a sample portfolio.

Source: Guy Carpenter/GSI

Large Industry Insured Losses

According to the latest estimates from the Insurance Council of New Zealand (ICNZ), the recent North Island flood is likely the country's largest-ever non-earthquake event in terms of insurance, surpassing Timaru Hail Storm's NZD 170 million. The table below presents historical flood events with the largest insured loss amounts.

Table 2: Historical Flood Events with Large Insured Losses

Date	Location	Claims	Insured loss (NZD million) adjusted for inflation
26 January 2023 – current	North Island / Auckland	>20,000	TBC
18 to 21 August 2022	Nelson / Tasman	3,670	67.84
21 to 29 March 2022	North Island	9,973	119.6
30 to 31 August 2021	West Auckland	2,677	62.3
16 to 19 July 2021	West coast	1,864	97.2
29 May to 1 June 2021	Canterbury	3,779	46.44
9 to 10 November 2020	Napier	5,202	87.7
17 to 20 July 2020	Upper North Island	3,490	44.2
7 to 12 March 2017	Upper North Island	7,774	61.7
17 April 2014	Canterbury and Lower North Island	9,936	56.9
19 to 22 April 2013	Nelson / Bay of Plenty	4,523	48.2
1 December 1999	Queenstown	N/A	67.6

Source: ICNZ, as of 3 February 2023

The recent event will add to inflationary pressures in New Zealand's domestic economy, especially relating to rent, construction and food (since the country will need to increase imports to replace crop losses). Furthermore, the global market for automobile parts is already under stress, and the sudden increase in demand for imported repair parts and new vehicles, combined with delays in repair and replacement, will lead to overall increases in claim costs.

One special coverage benefit from New Zealand's Earthquake Commission (EQC) EQCover is that it pays for qualified residential land damage caused by storms and floods. Therefore, the recent event will be insured by both the private market and EQC.

As of this writing, the largest affected insurer, Australia's IAG, received more than 15,000 claims across its insurance brands, AMI, State and NZI. Another Australian insurer, Suncorp, received more than 8,000 claims through its Vero and AA brands. Local insurer Tower received more than 4,800 claims. All together, this gave a total of slightly less than 28,000 claims.

All three insurers disclosed that their losses from this event are eligible for recovery from reinsurance programs. The increased frequency and complexity of pluvial versus fluvial floods and associated landslides make it more challenging and expensive to obtain lower-layer and aggregate protection. Other reinsurance solutions may need to be considered—such as structured and parametric arrangements—to complement traditional coverage if retentions increase because of price and availability pressures.

Sources: *New Zealand Herald*, *Sydney Morning Herald*, *Stuff*, *Reuters*, *Newshub*, *Artemis*, *The Conversation*, *ourAuckland*, *Informetrics*, *Earthquake Commission (EQC)*, *Meteorological Service of New Zealand (MetService)*, *Insurance Council of New Zealand (ICNA)*, *European Center for Medium-Range Weather Forecasts (ECMWF)*, *National Institute of Water and Atmospheric Research (NIWA)*, *Radio New Zealand*, *Intergovernmental Panel on Climate Change (IPCC)*.

About Guy Carpenter

Guy Carpenter & Company, LLC is a leading global risk and reinsurance specialist with 3,500 professionals in over 60 offices around the world. Guy Carpenter delivers a powerful combination of broking expertise, trusted strategic advisory services and industry-leading analytics to help clients adapt to emerging opportunities and achieve profitable growth. Guy Carpenter is a business of Marsh McLennan (NYSE: MMC), the world's leading professional services firm in the areas of risk, strategy and people. The Company's more than 85,000 colleagues advise clients in 130 countries. With annual revenue of over \$20 billion, Marsh McLennan helps clients navigate an increasingly dynamic and complex environment through four market-leading businesses including Marsh, Mercer and Oliver Wyman. For more information, visit www.guycarp.com and follow us on LinkedIn and Twitter

Guy Carpenter & Company, LLC provides this report for general information only. The information contained herein is based on sources we believe reliable, but we do not guarantee its accuracy, and it should be understood to be general insurance/reinsurance information only. Guy Carpenter & Company, LLC makes no representations or warranties, express or implied. The information is not intended to be taken as advice with respect to any individual situation and cannot be relied upon as such. Statements concerning tax, accounting, legal or regulatory matters should be understood to be general observations based solely on our experience as reinsurance brokers and risk consultants, and may not be relied upon as tax, accounting, legal or regulatory advice, which we are not authorized to provide. All such matters should be reviewed with your own qualified advisors in these areas.

Readers are cautioned not to place undue reliance on any historical, current or forward-looking statements. Guy Carpenter & Company, LLC undertakes no obligation to update or revise publicly any historical, current or forward-looking statements, whether as a result of new information, research, future events or otherwise. The trademarks and service marks contained herein are the property of their respective owners.