CoastAdapt

Snapshot

Extreme rainfall and flood event in Mackay on 15 February 2008

Summary

Mackay experienced an extreme rainfall event and flash flood on 15 February 2008. Over a period of six hours, rainfall intensities of up to 184 mm in an hour and more than 600 mm in total caused significant flash flooding. More than 4,000 homes were damaged, which is approximately 10% of Mackay's households. The peak flood levels are now used by the council in the calibration of flood studies.

Keywords

Extreme rainfall, flash floods, Mackay, February 2008

On 15 February 2008, Mackay—a coastal city in North Queensland with a population of around 100,000—experienced an extremely rare and intense rainfall event. The rainfall occurred in the lower Pioneer River catchment in the early morning, commencing around 2:30 am. More than 600 mm of rainfall was recorded in approximately six hours in the Goosepond Creek catchment. A private rainfall gauge in the catchment at Glenella recorded 985 mm of rainfall in a 24-hour period.

Warnings to expect heavy rain were broadcast on television the night prior to the flood yet, despite this notice, the local community did not expect such a rare event or such devastating consequences. Rainfall intensities of up to 184 mm in an hour, and more than 600 mm in six hours, caused significant flash flooding in Mackay (see Figure 1 and 2); more than 4,000 homes were damaged by flooding (approximately 10% of Mackay's households).

The intensity-frequency-duration (IFD) analysis of the rainfall at Gooseponds and Mackay by the Bureau of Meteorology (2008) identified that the rainfall intensities from 30 minutes to 72 hours significantly exceeded the 1% Annual Exceedance Probability Event (AEP) (1 in 100-year Average Recurrence Interval). This means that, on average, the probability of rainfall intensities being exceeded in any future years is less than 1 in 100. The event in Goosepond Creek exceeded the 0.2% AEP (1 in 500-year Average Recurrence Interval) event. In Goosepond Creek, the 2008 flood levels were approximately 0.6 m to 0.9 m higher than the design 1% AEP event which has historically been used in the setting of building floor levels (Figure 3).

Very intense rainfall has previously been recorded in the Mackay area and in the Pioneer catchment. In November 2000, intensities of 110 mm/hr were experienced in Gooseponds with nearly 250 mm recorded in three hours. In the record Pioneer River flood of February 1958, the Mt Charlton station recorded 589 mm in around 10 hours and Elaroo had 538 mm in around five hours.

The February 2008 event was declared a catastrophe by the Insurance Council of Australia and 14,000 insurance claims had been made by December 2008. The total cost of general insurance claims paid out was approximately $410 million as detailed in the Insurance Council of Australia's Historical Disaster Statistics. Repair works to Mackay Regional Council's roads and drainage infrastructure amounted to $55 million.

Mackay Regional Council surveyed peak flood levels resulting from the flood and now uses these data in the calibration of flood studies. The rainfall figures are also used in flood studies to estimate the likely impact of extreme rainfall and to ensure that there are no surprises if similar rainfall events occur in the future.

References

Bureau of Meteorology, 2008: Report on Queensland floods: February 2008. Accessed 20 February 2017. [Available online at www.bom.gov.au/qld/flood/fld_reports/queensland_floods_february_2008.pdf].

GHD, 2012: Report for Gooseponds/Vines creek flood study: Final Report. Prepared for Mackay Regional Council. Accessed 20 February 2017. [Available online at www.mackay.qld.gov.au/__data/assets/pdf_file/0007/134890/Gooseponds-Vines_Creek_Flood_Study_GHD,_Feb_2012_1.pdf].

Further reading

All links accessed 25 May 2017:

A case study of vulnerability, resilience and adaptive capacity (2008 floods in Queensland). [Available online at www.nccarf.edu.au/sites/default/files/attached_files_publications/Apan_2010_The_2008_Floods_in_Queensland.pdf].

A report of Mackay's flash flood event in the year 2000. [Available online at www.bom.gov.au/qld/flood/fld_reports/mackay_nov2000.pdf].

This Snapshot was prepared by Robyn Birkett from Mackay Regional Council. Please cite as:
Birkett, R., 2016: Extreme rainfall and flood event in Mackay on 1 February 2008. Snapshot for CoastAdapt, National Climate Change Adaptation Research Facility, Gold Coast.

Figure 1: Major flooding in a shopping centre at Mackay. Photo: © Robyn Birkett.

Figure 2: Mackay Bucasia Road on 15 February 2008. Photo: © Robyn Birkett.

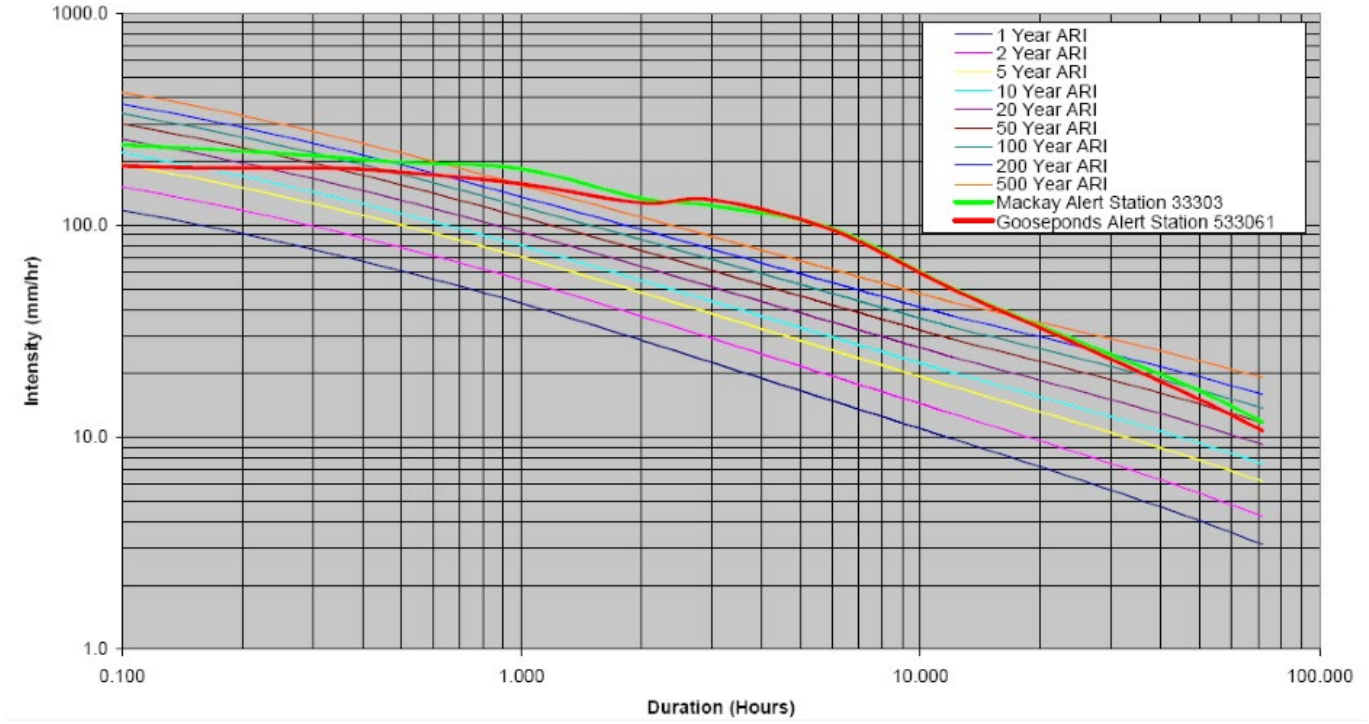

Figure 3: Intensity-Frequency-Duration (IFD) analysis of 15 February 2008 event for Mackay and Goosepond Creek Alert Stations. Source: GHD 2012.