



## What causes floods in the Hawkesbury-Nepean Valley?

Rainfall events known as East Coast lows are the primary weather systems behind large floods in the Hawkesbury-Nepean Valley. The extent and depth of flooding is also influenced by the unique ‘bathtub’ effect of the floodplain.

Most river valleys tend to widen as they approach the sea. The opposite is the case in the Hawkesbury-Nepean Valley. Narrow downstream sandstone gorges between Sackville and Brooklyn create natural choke points. Floodwaters back up and rise rapidly, causing deep and widespread flooding across the floodplain. Much like a bathtub with five taps turned on, but only one plug hole to let the water out.

## What is the risk of flooding?

It’s important to think about flood risk both in terms of the flood’s likelihood and its consequences.

### *Likelihood*

Floods are most often described in terms of the chance that floods of a certain size could occur. The terms ‘1 in 100 flood’ or ‘100-year flood’ refer to a flood that has a 1 in 100 (or 1%) chance of happening or being exceeded in any one year. It does not mean a chance of happening once every 100 years. For example, every year there is a 1 in 100 chance (or 1% chance) there would be a flood reaching around 17 metres or higher above normal river level at Windsor. Said another way, it means a person living to 80 years of age has a 55% chance of experiencing this type of flood during their lifetime.

The flood in March 2021 is described as having a likelihood of approximately 1 in 10 (10%) to a 1 in 20 (5%) chance per year at Penrith and Windsor, or almost a 98% chance of occurring at least once in an 80-year lifetime.

### *Consequence*

The Bureau of Meteorology has 3 categories for describing the consequences of flooding: minor, moderate and major:

- **Minor:** causes inconvenience. Low-lying areas next to watercourses are inundated which may require the removal of stock and equipment. Minor roads may be closed and low-level bridges submerged.
- **Moderate:** in addition to the above, the evacuation of some houses may be required. Main traffic routes may be covered. The area of inundation is substantial in rural areas requiring the removal of stock.
- **Major:** in addition to the above, extensive rural areas and/or urban areas are inundated. Properties and towns are likely to be isolated and major traffic routes likely to be closed. Evacuation of people from flood affected areas may be required.

There have been more than 130 moderate to major floods in the Hawkesbury-Nepean since European settlement. The flood in March 2021 peaked in the minor range at Wallacia, the moderate range at Penrith, and the major range at Windsor.

## What are the impacts of floods in the Hawkesbury-Nepean Valley?

The March 2021 flood in the Hawkesbury-Nepean was the largest flood in the region since August 1990, peaking at 12.9m above sea level at Windsor. Evacuation Warnings and Orders were issued for numerous communities within the Hawkesbury Nepean Valley. There were:

- approximately 610 residences impacted by floodwaters
- more than 30 caravan parks severely impacted by floodwaters, including 1450 manufactured homes
- approximately 30 communities isolated by flooding, some for more than a week
- severe damage to some local roads, turf farms and vegetable farms
- several hundred million dollars estimated in direct and indirect damages.

If an even bigger major flood happened in the valley today (approx. 1 in 100 (or 1%) chance per year event) – similar to the flood in Brisbane in 2011 – it would pose a significant risk to life. Around 55,000 residents would need to be evacuated, and more than 7,600 homes would be impacted.

The largest flood in the valley since European settlement happened in 1867. That flood reached around 19.7m above sea level at Windsor, caused massive and widespread damage, and resulted in the loss of 13 lives. If a similar flood happened now the consequences would be catastrophic – many lives would be at risk and almost 90,000 people would have to evacuate. Recovery from major floods like these can take years, and the personal and financial effects on people and communities can be devastating.

## How do people know if they are in a flood-prone area?

The NSW State Emergency Service (NSW SES) has a tool for Hawkesbury-Nepean Valley residents to understand their flood risk, based on their suburb. Go to [www.myfloodrisk.nsw.gov.au](http://www.myfloodrisk.nsw.gov.au) to find out more. Residents can also contact their local council to request flood information related to their property.

## What can people do to prepare for flood?

It's vital to plan for natural disasters before they happen. Like droughts, fires and storms, floods are unpredictable, damaging and dangerous. It's vital for people who live and work in the valley to be aware of their flood risk and be prepared, be alert to flood warnings and respond to evacuation orders.

Information on what people can do to prepare for a flood can be found on the NSW SES website at [www.myfloodrisk.nsw.gov.au](http://www.myfloodrisk.nsw.gov.au).

## When will the next major flood happen in the valley?

Floods are random, naturally occurring events. It's impossible to predict when the next major flood will happen. History has shown that serious floods can happen many times in a single decade, and not again for many years. For example, there were several major floods in the valley from 1956 to 1964, 2 of which were after Warragamba Dam was built. Following flooding through the 1980s, and a major flood in 1990, the next major flood did not occur until 2021.

## What if a flood happened now in the valley?

In recognition of the significant flood risk in the valley, the NSW SES has prepared the Hawkesbury-Nepean Flood Plan to help manage and respond to floods in the region. This plan allocates responsibilities to government agencies and organisations to prepare, respond to, and aid recovery from floods. This plan is reviewed regularly.



For more information about flooding in the Hawkesbury-Nepean Valley, visit [www.myfloodrisk.nsw.gov.au](http://www.myfloodrisk.nsw.gov.au)

For more information about the Flood Strategy, visit [www.insw.com/flood-strategy](http://www.insw.com/flood-strategy)