

Snapshots of the Hawkesbury-Nepean Valley

Focus: These resources provide snapshots of the Hawkesbury-Nepean Valley and may be used to assess students' understanding following the field trip. The learning intention of the tasks is to ensure students have understood the geographical characteristics of the Hawkesbury-Nepean Valley and made connections about flood mitigation strategies. There is a strong Literacy and Numeracy focus for these tasks.

Inquiry Questions

- What human activities occur in the Hawkesbury-Nepean Valley?
- How could climate change affect the Hawkesbury-Nepean Valley's flood hazard?
- What contributions to flood events do the rivers and main tributaries have in the Hawkesbury-Nepean Valley?
- When did a 1 in 500 chance per year affect the Hawkesbury-Nepean Valley?
- How could future growth and development impact the Hawkesbury-Nepean Valley?
- What impacts would a major flood event have on the people, economic activities and properties of the Hawkesbury-Nepean Valley?



Castlereagh Road, Penrith; Carroll, K., Western Sydney University, 2019

Geography Review.

This task assesses a student's understanding of the following **Stage 4 NSW Geography Syllabus (2015)** outcomes;

- **GE4-2:** describes processes and influences that form and transform places and environments
- **GE4-3:** explains how interactions and connections between people, places and environments result in change
- **GE4-8:** communicates geographical information using a variety of strategies

The following **Life Skills outcomes**;

- **GELS-1:** recognises features and characteristics of places and environments
- **GELS-2:** demonstrates an understanding that places and environments change
- **GELS-8:** communicates geographical information

Complete the following assessment questions using the **Field Notes** you have gathered and some of the text below from the *Resilient Valley, Resilient Communities. Hawkesbury-Nepean Valley Flood Risk Management Strategy*, (2017). http://www.insw.com/media/1534/insw_hnvfloodstrategy_1_v2.pdf

The Hawkesbury-Nepean Valley is a floodplain that is valued for its biodiversity and agriculture due to its rich soil. In the last decades the Hawkesbury-Nepean Valley is changing from a semi-rural landscape to an urbanised community. Up to 134 000 people live and work in this area that includes parts of Greater Sydney's rapidly growing North West Growth sector. In 2017 over 25 000 residential properties and 2 million square metres of commercial space were susceptible to flooding.

Changes in climate have the potential to alter the frequency and severity of rainfall. Any increase in the number, severity and frequency of rainfall events could increase the likelihood of flooding in the Valley.

The main way of reducing the impact on life and property during a major flood event is by evacuating people safely and early. This is complicated by the limited road capacity in the Hawkesbury-Nepean Valley. More than 64 000 people would need to be evacuated in a flood with a risk factor of 1 in 100 (that means that each year there is a 1% risk that a flood this size will occur). This would rise to 90 000 people if a 1 in 500 chance per year flood happened, the same size as the one that occurred in 1867. As the population continues to grow these numbers will keep increasing.

Assessment:

1. What are some of the main benefits of a floodplain such as the Hawkesbury-Nepean Valley?
2. How do we know that the Hawkesbury-Nepean Valley is changing from semi-rural to a more urbanised community?
3. Explain how changes in climate could alter the flood likelihood in the Hawkesbury-Nepean Valley?
4. What is the main method of protecting life, property and economic activity in the Hawkesbury-Nepean Valley in the event of a major flood event?
5. Identify some of the issues associated with evacuation.
6. How many people would need to be evacuated in a 1 in 500 chance per year flood, such as the one in 1867?
7. Using your field trip and this information explain using at least three geographical terms some of the features of the Hawkesbury-Nepean Valley, and some of the challenges during a major flood event.

Marking Criteria for Question 7:

Using your field trip and this information explain using at least three geographical terms some of the features of the Hawkesbury-Nepean Valley and some of the challenges during a major flood event.

Numeric Mark	Descriptor
10-8	<ul style="list-style-type: none"> ▪ Extensively describes processes and influences that form and transform places and environments within the Hawkesbury-Nepean Valley. ▪ Explains using relevant data from the field trip and notes how interactions and connections between people, places and environments result in change in the Hawkesbury-Nepean Valley. ▪ Communicates effectively using relevant and accurate geographical information the features of the Hawkesbury-Nepean Valley.
7-5	<ul style="list-style-type: none"> ▪ Soundly describes processes and influences that form and transform places and environments within the Hawkesbury-Nepean Valley. ▪ Explains using some data from the field trip and notes how interactions and connections between people, places and environments result in change in the Hawkesbury-Nepean Valley. ▪ Communicates using some relevant and accurate geographical information the features of the Hawkesbury-Nepean Valley.
4-1	<ul style="list-style-type: none"> ▪ Identifies some processes and influences that form and transform places and environments within the Hawkesbury-Nepean Valley. ▪ Identifies using basic data from the field trip some interactions and connections between people, places and environments result in change in the Hawkesbury-Nepean Valley. ▪ Describes some general features of the Hawkesbury-Nepean Valley with limited or no reference to geographical terms or information.

Literacy Review: Nepean River and Penrith Lakes.



Nepean River, Penrith; Carroll, K. Western Sydney University, 2019

Complete the passage below using the word list.

The Nepean River separates Penrith from the Blue Mountains. The Blue Mountains _____ to the west limits the Nepean River, which is below the escarpment.

The river has changed course over many thousands of years across this area of _____. As it slows and meanders after coming out of the mountains it has deposited millions of tonnes of sand and _____ over the low area between the mountains and the higher ground to the east.

This material has then been buried under several metres of _____ deposited over time when the river floods. The good alluvial soils resulted in this becoming prime farming land since European settlement.

The sand and gravel has been quarried for building products such as _____ and road base and the resulting holes have been turned into a series of lakes.

Word List

sediment, escarpment, concrete, houses, floodplain, gravel

Class Discussion Question: What things may need to be considered if further residential development was proposed in this part of the valley?

Numeracy Review - Yarramundi

Complete the passage below using the word list.

At Yarramundi we are at the _____ of the Nepean and Grose rivers. When they combine they become the _____ River. During flood events, this combination contributes to a choke point and the river backs up towards Penrith. The bridge here at Yarramundi is flooded first, blocking the route to _____. A little later the North Richmond bridge is submerged, isolating North Richmond and the western side from Richmond and Sydney to the east. People need to be alerted early on the hilly _____ side to evacuate. River flow here during dry times comes from releases from Warragamba Dam for downstream water supply; runoff from the local area, seepage from sandstone valleys; groundwater and from _____ treatment plants upstream.

Word List

Springwood, recycling, Hawkesbury, western, confluence

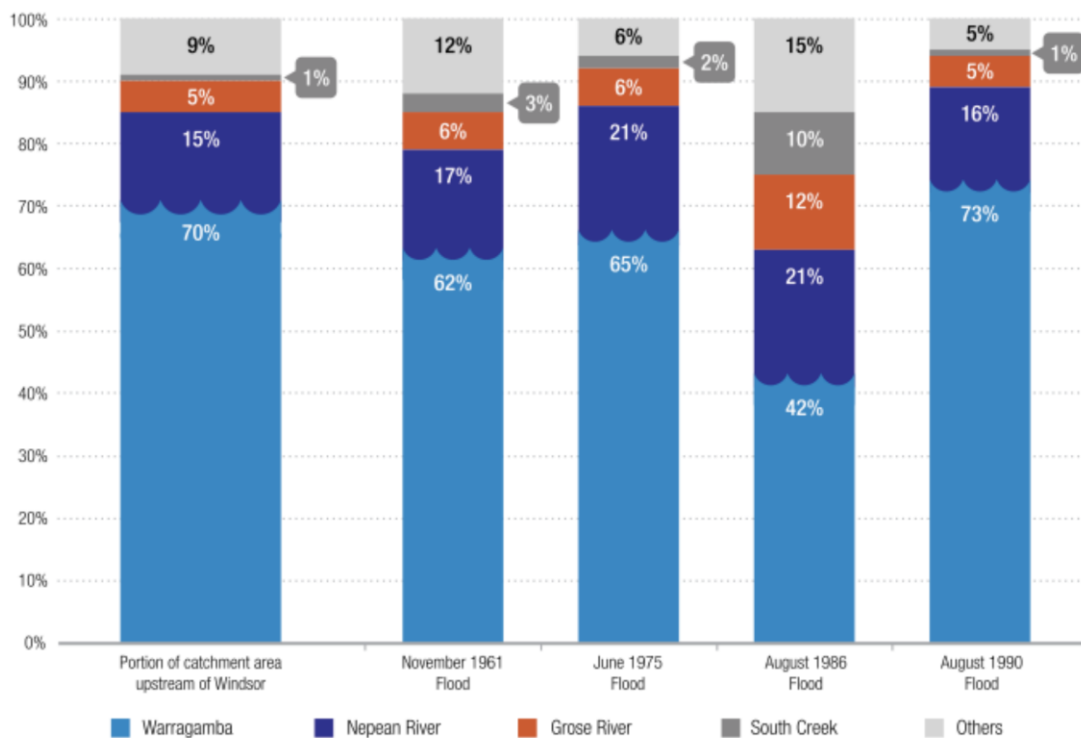


Figure 4 Relative contribution of different river catchments in previous floods in the Hawkesbury-Nepean Valley

Resilient Valley, Resilient Communities. Hawkesbury-Nepean Valley Flood Risk Management Strategy, (2017).
http://www.insw.com/media/1534/insw_hnvfloodstrategy_1_v2.pdf

Class Discussion Question: Why would the contributions of each of these rivers/streams vary between different floods?

Geography Review: Freemans Reach.

Complete the passage below using the word list.

At Freemans Reach we can see the _____ towards Richmond. The area in the foreground is called the Richmond Lowlands as it is the lower river terrace. The viewpoint is on the high _____ above flood levels. A number of creeks and wetlands or _____ are scattered across the area. The land is highly valued for farming because of the rich _____ soil washed in by the river. The creeks and lagoons provide water sources. They are also valuable as _____ for birds, amphibians and reptiles.

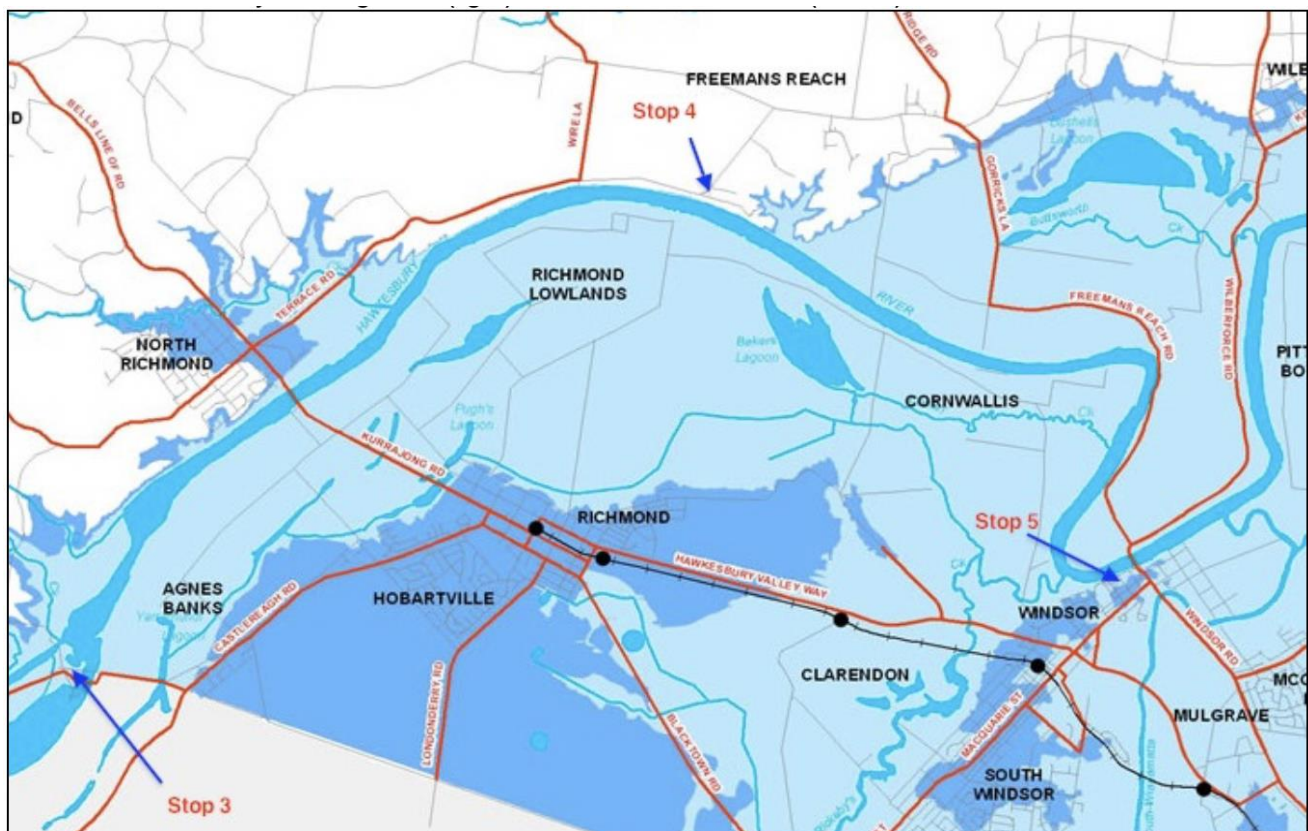
Word List

terrace, alluvial, habitat, lagoons, floodplain

Extent of areas affected by the Hawkesbury flooding in 1867 (light blue) and Probable Maximum Flood, **PMF** (darker blue).

 Hawkesbury Flood 1867 Flood

 Probable Maximum Flood PMF



INSW 2019

Class Discussion Question: What are the evacuation routes for people in Windsor and Richmond during floods of 1867 size or larger?

Literacy Review: Thompson Square, Windsor.



Thompson Square Windsor, 1879, Doctor's House on far right; State Library of NSW

Complete the passage below using the word list.

Flooding is significant in this area because of the “_____ effect”, when extra water flows in from the catchment and cannot move out quickly through the narrow _____ downstream. During major floods Windsor town centre can become an _____ surrounded by flood water. This happened during the 1867 floods and rescue of people in the surrounding area was complicated by darkness, heavy rain and the wind whipping up _____ on the expanse of water. _____ people lost their lives. Today the area has a much larger _____ and more people also travel away from the area for work. The new Richmond Bridge will provide more time for residents to _____ in the event of a major flood. The two-storey house across the road on the corner is the “Doctor’s House”. The 1867 flood reached the _____ on the upper floor.

Word List

gorges, verandah, waves, population, island, bathtub, evacuate, Thirteen

Class Discussion Question: What should residents of Windsor and surrounding areas consider when a flood warning occurs?