

Skill 2 – Flooding in the Hawkesbury-Nepean Catchment

Syllabus

Water Resources

- investigate the characteristics and spatial distribution of global water resources (ACHGK037)

Outcomes

- GE4-1** locates and describes the diverse features and characteristics of a range of places and environments
- GE4-7** acquires and processes geographical information by selecting and using geographical tools

Geographical Tools

MAPS – identifying direction and using political maps

Introduction

The size and unique physical structure of the catchment makes the Hawkesbury-Nepean Valley prone to deep flooding. Aboriginal people have told of flooding prior to European settlement in the area.

A number of major towns, dams and rivers are located within the Hawkesbury Nepean Catchment area. This lesson will explore the location of major towns and rivers and develop students understanding of the geographical skill of scale and distance.

Activity 1 – Bathtub Effect

Watch the video “*Why Hawkesbury-Nepean floods are so dangerous*” on the NSW SES website to answer the following questions. (<https://www.ses.nsw.gov.au/hawkesbury-nepean-floods>)

1. How many main tributaries (rivers) drain into the valley?
2. Which river contributed the most water in floods? How much did it contribute?
3. Identify the other rivers and how much they contribute to floods.
4. Explain a choke point and how it influences floods.
5. Describe the features of the choke point between Wallacia and Regentville.
6. What limits some of the floodwaters entering Penrith?
7. What happens to the water upstream of Sackville?
8. How does understanding the bathtub effect help people when flooding occurs?

Geographical Concept - Environment

The concept of environment relates to the significance of the environment in human life and the important interrelationships between humans and their environment.

There are important steps that people must undertake to prepare for floods and to understand their environment and the risks associated with that environment.

Use the **NSW SES website** to answer the following question: (<https://www.ses.nsw.gov.au/hawkesbury-nepean-floods>)

9. Outline the steps involved in preparing for a flood that the NSW SES recommends
See website for answers

Use the NSW **SES suburb location tool** to assist you in the question below: (<https://www.ses.nsw.gov.au/hawkesbury-nepean-floods>)

10. As a class/individual discuss the flood risks of your school/home location.
Identify factors associated with the risk
Answers will vary with locations.

Activity 2 – Scale and Distance

Skills Tips

Scale and Distance

Scale

Definition: The scale of a map shows the relationship between distances on the map and distances on the ground or real world. This means the scale can be used to calculate distances and areas.

Features of Scale

- Scale is always expressed as a ratio of the distance on the map to the distance on the ground.
- Scale is shown on maps in three ways:
 1. **A sentence** – 1cm represents 1km or 1cm represents 100000cm.
 2. **A ratio or fraction** – 1:100000 or 1/100000 this means 1cm represents 100000cm.
 3. **A linear scale** –



Skill Steps

1. Identify the type of scale used on the map (sentence, ratio/fraction or linear).
2. Work out what 1cm equals in kilometres or metres.

Distance

Definition: is the measurement of distance on map then converting that measurement into a real distance by using the scale of the map.

For example, what is the distance of Penrith from Sydney?

If it is measured as 10cm on a map and the scale on the map is 1cm represents 5 kilometres, to work out the actual distance multiply $10 \times 5 = 50$ kilometres.

Skill Steps

1. Measure the distance between the two points on the map in centimetres.
2. Check the scale of the map to find out what 1 centimetre represents.
3. Calculate the distance by multiplying the centimetre value measured on the map by the scale.

Distance Questions

Use Map 2 to complete this activity

1. What is the distance from Sydney to Parramatta?
2. What is the distance from Sydney to Penrith?
3. What is the distance from Sydney to Windsor?
4. What is the distance from Parramatta to Sackville?
5. What is the distance from Penrith to Richmond?
6. What is the distance from Mulgoa to Windsor?
7. What is the distance from Sydney to Mulgoa?
8. What is the distance from Richmond to Windsor?
9. What is the distance from Marsden Park to Windsor?
10. What is the distance from Mulgoa to Sackville?

Flooding in the Hawkesbury-Nepean Catchment

High volumes of rainfall can cause flooding in a river system. When flooding occurs, the water breaches the banks of the river and flows onto the surrounding low-lying land called the floodplain.

The Hawkesbury Nepean Catchment has three (3) main floodplain areas:

1. **Wallacia Floodplain** (south of Mulgoa and east of Warragamba Dam)
2. **Penrith-Emu Plains Floodplain** (Penrith, Penrith Lakes and Emu Plains)
3. **Richmond-Windsor Floodplain** (northern end of South and Eastern creeks, east of Grose River and south of Sackville)

Activity 3 – Floodplains in Hawkesbury-Nepean Catchment

Using Map 2 complete the following activities, calculating the **length** (longest distance north to south) and **width** (longest distance east to west) of the Probable Maximum Flood (PMF) that will occur in each floodplain area.

1. **Wallacia Floodplain** (south of Mulgoa and east of Warragamba Dam)

Length: _____

Width: _____

2. **Penrith-Emu Plains Floodplain** (Penrith, Penrith Lakes and Emu Plains)

Length: _____

Width: _____

3. **Richmond-Windsor Floodplain** (north of South and Eastern Creek, east of Grose River and South of Sackville)

Length: _____

Width: _____