Water in the World
Flooding in the Hawkesbury-Nepean Valley
Stage 4 Geography Resources

Skill 3– Climate and Causes of Flooding in the Hawkesbury-Nepean Valley

Syllabus

Natural hazard

- investigate ONE contemporary atmospheric hazard or hydrologic hazard including causes, impacts and responses (ACHGK042)

Outcomes

- **GE4-3** explains how interactions and connections between people, places and environments result in change
- **GE4-7** acquires and processes geographical information by selecting and using geographical tools

Geographical Tools

Graphs and Statistics
- climate graphs

Visual Representations
- use of multimedia

Introduction

A better understanding of flooding comes from understanding the climatic conditions of the area. Geographers can develop a greater understanding of climate through the study of climate graphs of specific locations. Once you understand the climate you can further develop your understanding of floods by investigating weather features that can cause flooding, such as East Coast Low pressure systems.

This lesson will explore the climate of two major locations within the Hawkesbury-Nepean Catchment: **Penrith Lakes and Richmond**. It will also focus on the weather feature of **East Coast Low pressure systems** and how they can be a major factor in the cause of flooding within the catchment.

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Activity 1 – Climate Graphs

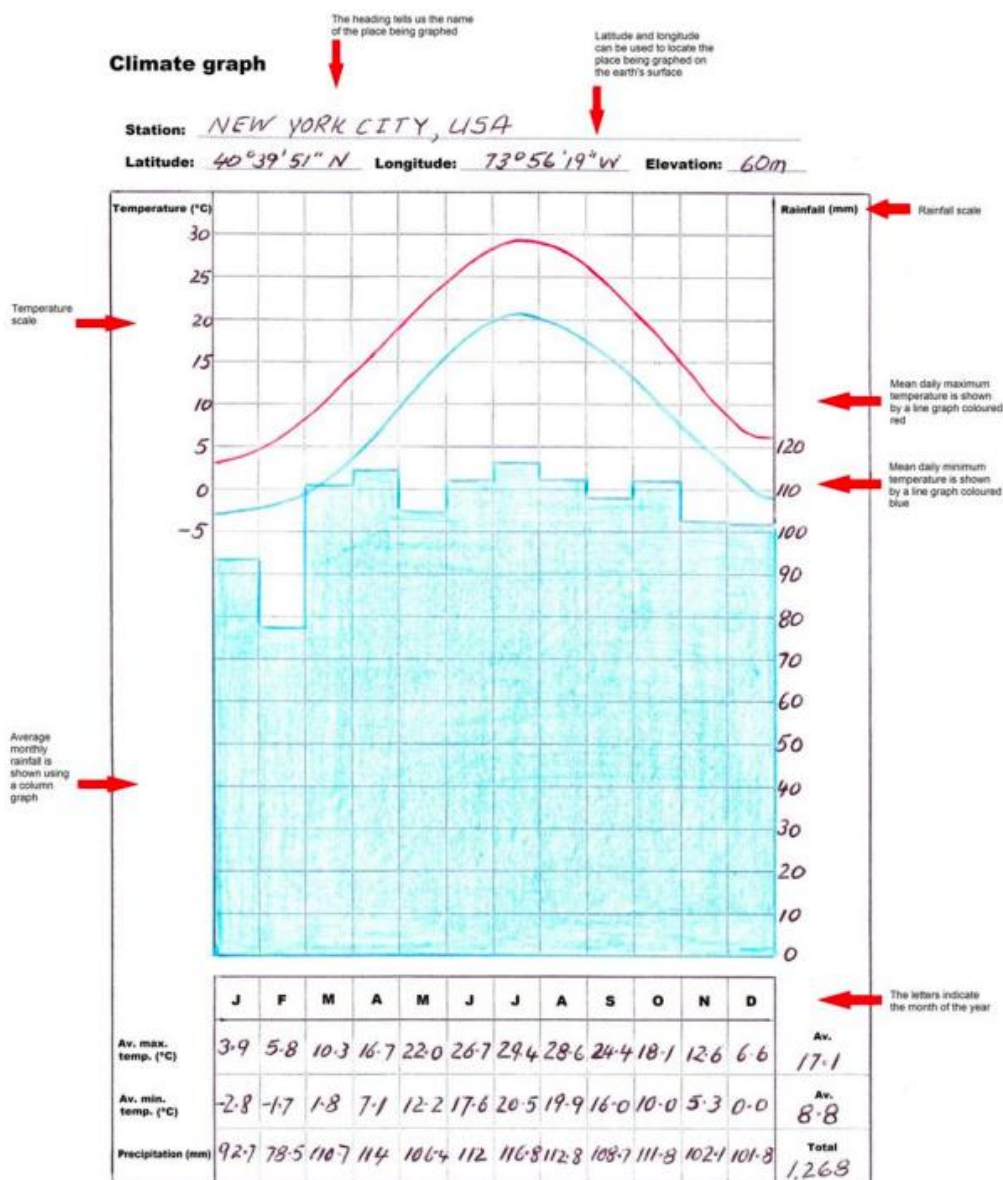## Geographer Skills Tips

Climate Graph

Climate Graph
Definition: Climate graphs are used to show the average temperature and rainfall experienced at a particular place

Features of Climate Graph

- The graphs consist of a line graph showing average maximum and minimum monthly temperatures.
- Rainfall is shown in blue and as a simple column graph showing average monthly rainfall figures

Below is an example of a Climate Graph:

GeogSpace AGTA; geogspace.edu.au

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Skill Steps *(Source: GeogSpace, AGTA geogspace.edu.au)*

To construct a climate graph, use the climate graph template and follow the steps below.

1. Select a data source.

2. Transfer the temperature and rainfall data from your data source into the table at the base of the climate graph.

3. Locate the wettest month and the months with the highest and lowest temperatures. Use this information to add a suitable scale for both temperature and precipitation (rainfall). Place temperature scale on the graph's right-hand axis and rainfall on the left-hand axis.

4. Plot the rainfall figures. Then colour the columns blue.

5. Plot the average maximum and minimum temperature data, making sure each dot is placed in the centre of the month. Use a red pen or pencil to join the points plotted for the average maximum temperature with a smooth, red curve. Use blue for the line joining the points marking the lowest monthly temperature.

6. Add a heading that includes the name of the place being graphed and its latitude, longitude and elevation.

Climate Graph Questions

The table below shows climate data from the Bureau of Meteorology for Penrith Lakes.

Location: Penrith Lakes
Latitude: 33º72'S   Longitude: 150º68'E
Elevation: 25masl (Metres above sea level)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Temperature monthly average (ºC)	31.2	29.7	27.7	24.6	21.2	18.1	17.9	19.9	23.3	25.8	27.5	29.6
Highest monthly temperature (ºC)	47.3	46.9	40.6	36.6	29.4	26	28.2	29.7	37.3	38.9	44.9	44.1
Minimum monthly temperature (ºC)	18.7	18.5	16.8	13.2	9.3	7.0	5.3	6.1	9.4	12.2	15.1	17.1
Precipitation monthly average(mm)	94.1	112.8	78.9	48.9	36.9	50.4	28.2	29.3	30.5	56.6	82.7	63.3

http://www.bom.gov.au/climate/averages/tables/cw_067113_All.shtml

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The table below shows climate data from the Bureau of Meteorology for Richmond.

Location: Richmond
Latitude: 33º62'S   Longitude: 150º75'E
Elevation: 20masl (Metres above sea level)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Temperature (ºC) monthly average	29.4	28.9	27.1	23.8	20.3	17.4	17.3	18.9	22.1	25.0	27.1	29.1
Highest monthly temperature (ºC)	41.2	41.4	40.3	33.3	28.6	24.7	24.4	28.0	35.3	37.4	42.2	42.5
Minimum monthly temperature (ºC)	16.8	16.8	15.0	11.3	7.3	4.7	3.2	4.4	7.1	10.5	13.1	15.5
Precipitation monthly average (mm)	96.7	94.2	88.8	67.9	56.4	61.6	44.2	42.2	42.0	56.8	73.3	76.0

http://www.bom.gov.au/climate/averages/tables/cw_067021_All.shtml

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1. Using the data supplied, complete the following table:

Climate Graph Data		Penrith Lakes, NSW	Richmond, NSW
a.	**Highest precipitation** (month +value)		
b.	**Lowest precipitation** (month +value)		
c.	**Highest temperature** (month +value)		
d.	**Lowest temperature** (month +value)		
e.	**Total precipitation** (add all precipitation months together)		
f.	**Average monthly precipitation** (Total Precipitation divided by 12months)		
g.	**Temperature range** (highest temperature –lowest temperature)		

2. Using the attached templates construct climate graphs for Penrith Lakes and Richmond.

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Stage 4 Geography Resources

Activity 2 – What is an East Coast Low Pressure System?

Watch the video "East Coast Low" from the NSW Bureau of Meteorology:

https://www.youtube.com/watch?v=FCgULsMi9iQ&feature=youtu.be

1. What is an East Coast Low?

2. What areas of Australia do they impact the most?

3. Are East Coast Low pressure systems slow or fast moving? What impact does this have?

4. How does an East Coast Low form?

5. What months are the peak season for East Coast Lows?

6. What is the difference between a tropical cyclone and an East Coast Low?

Extension Activity

Geographical Concept - Interconnection

Definition: No object of geographical study can be viewed in isolation, eg people are affected by and affect the environment including landscapes, climate natural hazards etc

Discussion Question: How can the study of climate and weather features such as an East Coast Low enable people in the Hawkesbury-Nepean Valley to be better prepared for flooding?