



INVESTIGATING THE PASSAGE OF A COLD FRONT - JUNE 2021



FOR THE TEACHER

1. Study the weather map above and answer the following questions:

What was the air pressure at each of the following places -

Perth **1016 hectopascals** Brisbane **1012 hectopascals** Adelaide **1022 hectopascals**

Describe the extent of the precipitation shown on the map.

Precipitation has fallen through the southeast of the country in a line from Brisbane through Sydney, Melbourne, to Adelaide and extending a few hundred kilometres inland. Precipitation has also fallen across Tasmania (Note - snow fell along the Great Dividing Range so some students may mention this although it can't be determined from the map)

What is the pressure gradient (difference in air pressure) between Adelaide and Melbourne?

1022hPa - 1010hPa = 12hPa

How does this compare to pressure gradients across northern Australia?

Pressure gradient across northern Australia is much lower - across a similar distance in the Northern Territory towards Darwin the pressure gradient is a little over 4hPa

This was a period of near gale force winds across Victoria. What information on the weather map tells you this?

The isobars are very closely spaced indicating a high pressure gradient hence faster winds.

What is the general direction of movement of cold fronts across Australia?

Cold fronts move across the continent from west to east.

How fast was the cold front in eastern Australia moving?

25 knots (i.e. 44.4 km/hr)

This time of the year is the "dry season" across northern Australia. What causes this extended period of dry weather across the north?

During the winter months northern Australia is dominated by high pressure systems as per the map (dry air is moving out from the centre of high pressure towards the northern coasts from the desert inland areas)

2. Use the link to the ABC's website and the Australian Bureau of Meteorology's website to find out more about the passage of a cold front (make sure you watch the video at these websites!) Write **brief notes** in the spaces provided:

<https://www.abc.net.au/news/2019-07-12/what-is-a-cold-front/11303562>
<http://media.bom.gov.au/social/blog/1001/the-big-chill-what-is-a-cold-front/>

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What is a cold front?

A cold front is the leading edge (front) of a relatively cool to cold air mass that moves into a region of warmer air. In Australia, warm moist northerly winds often occur ahead of the cold front, while colder dry southerly winds typically follow behind the cold front.

Why do cold fronts bring bad weather?

Cold fronts bring an abrupt change in weather and may be accompanied by high damaging winds (particularly where the cold and warm air mix violently at the leading edge of the front), cumulonimbus clouds, thunder, lightning and heavy flooding rains.

Describe the weather that summer cold fronts bring.

Strong hot, dry northwesterly winds ahead of the cold front can bring this weather from inland over southeast Australia. High temperatures and dry conditions persist until the arrival of the cold front when wind arrives from the south, cooler conditions prevail and rain may occur.

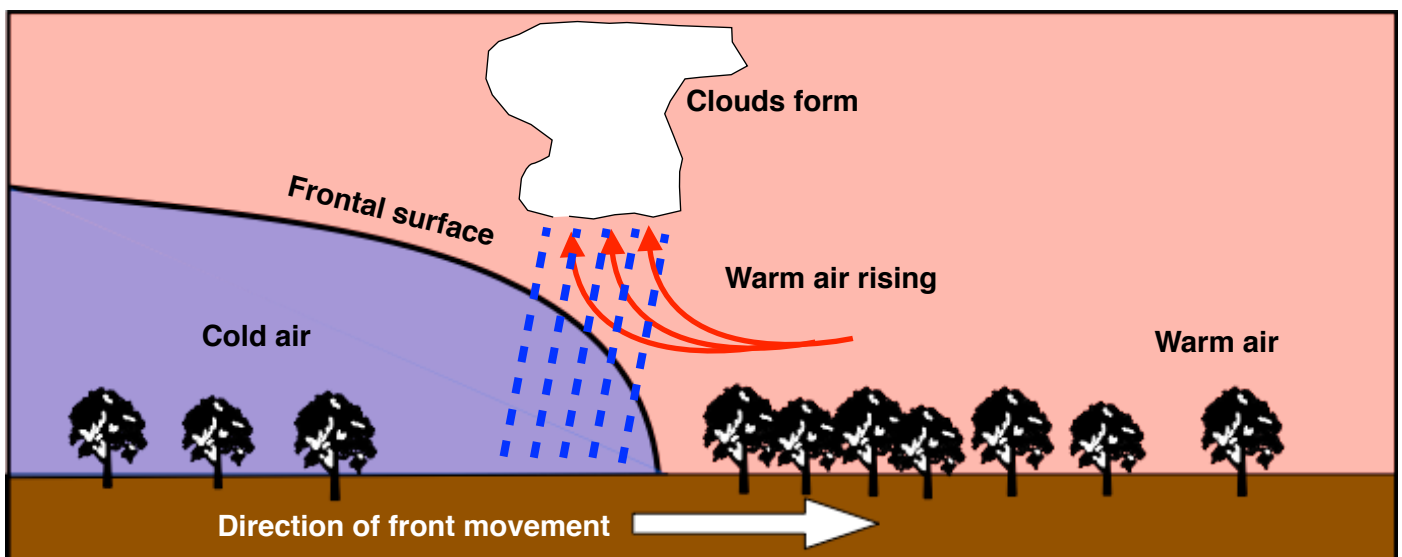
Describe the weather that winter cold fronts bring.

The inland air is cooler, but damaging winds and heavy rainfall can occur with the passage of a strong front. Temperatures can be cold to very cold behind the front, while snow can develop in the coolest air that may arrive from towards the Antarctic.

Complete this diagram showing the following as text and/or graphic:

Cold air Warm air Frontal surface Direction of front movement Warm air rising

Cross-section of a cold front



3. Research and write **brief notes (around the map below) on the impact of the passage of the cold front** that affected southeastern Australia on the 9th June 2021. Find some information to -
- describe the type of weather experienced at different places **and**
 - assess the impact of the weather on people.
 - locate the places affected on the map

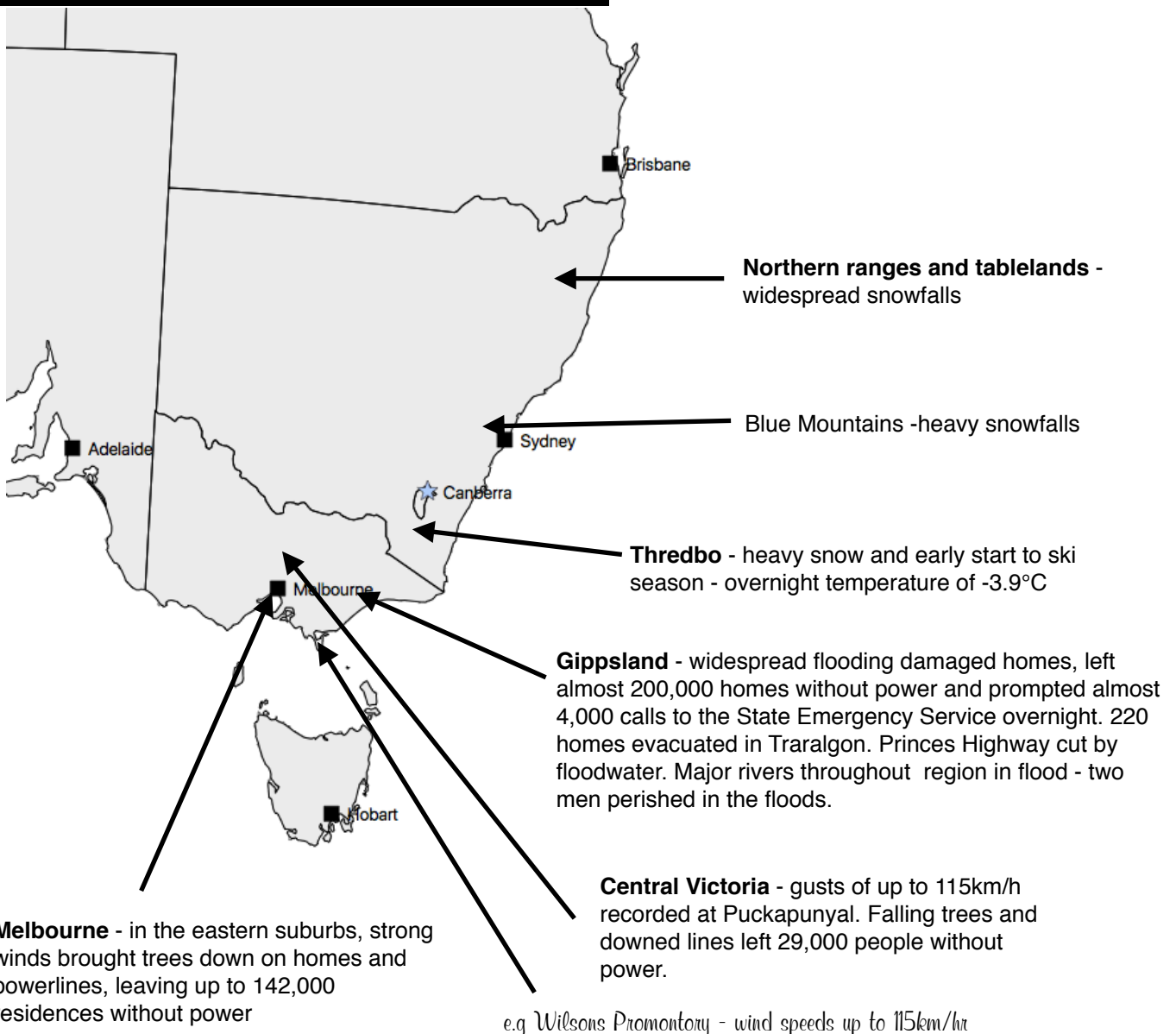
This website may be useful, but, you should also look at other news websites:

<https://www.theguardian.com/australia-news/2021/jun/10/wild-weather-cold-front-wreaks-havoc-on-victoria-and-brings-snow-to-swathes-of-nsw>

Search



Places impacted by cold front on 9th June 2021



This information is only from the weblink above. Students will be able to add to this from other media sources so should make for good class discussion and sharing of the information. I have included an enlarged map on the next page so you can project it onto a whiteboard and get students to add their information.

