RMetS
Royal Meteorological Society

University of Reading

WEEK 1 SUPPLEMENT

COME RAIN OR SHINE

Understanding the weather

INTRODUCTION TO DEPRESSIONS

FIGURE 1

A weather map or synoptic chart showing a typical mid-latitude depression approaching the UK.

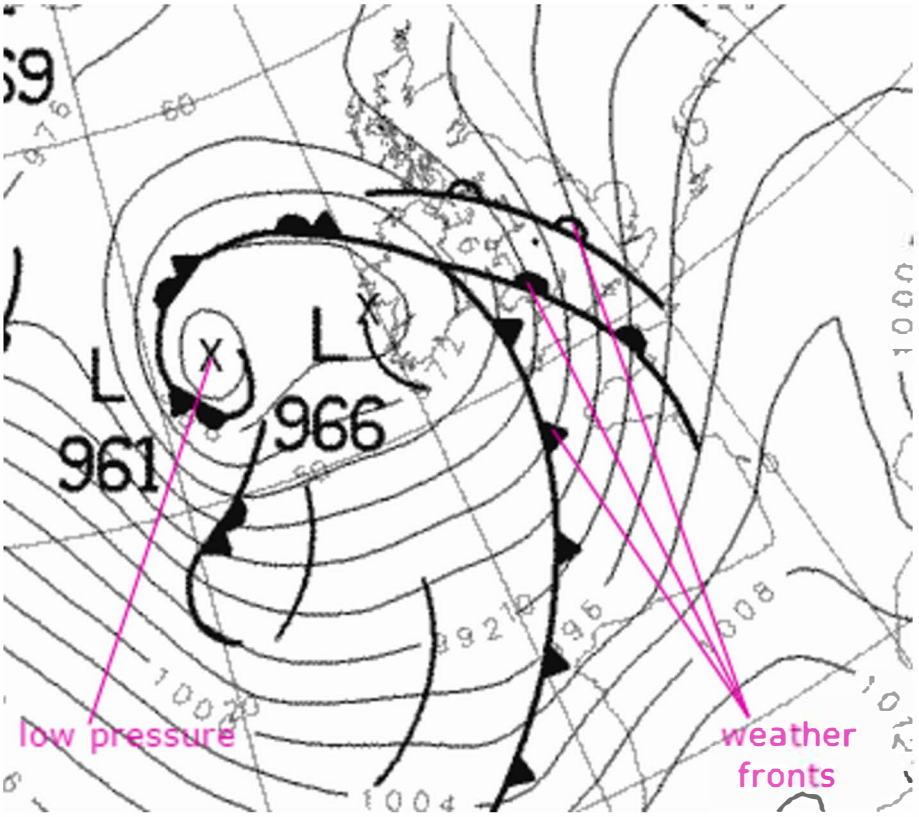


FIGURE 2

Somewhere on the Earth's surface will always be at right angles to the Sun's rays, such that the Sun's light is fairly concentrated (a). In contrast, in other areas on the Earth's surface which slope away from the Sun's light, the Sun's light will be more spread out (b). As the Earth's surface is warmed by the Sun, the more concentrated light falling on (a) will warm the surface more than in area (b). This is why the Tropics are always warmer than the poles.

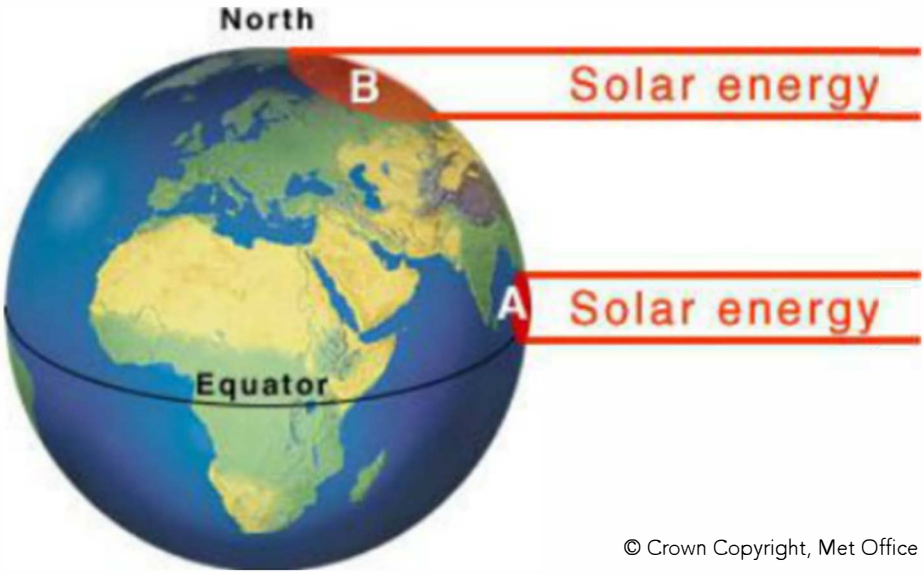


FIGURE 3

A graph showing how the amount of energy the Earth receives from the Sun (blue line) and the amount of energy the Earth loses to space (red line) varies with latitude. If the blue line is above the red line, the Earth is getting more energy than it is losing at that latitude. If the red line is higher, the Earth is losing more energy than it is getting

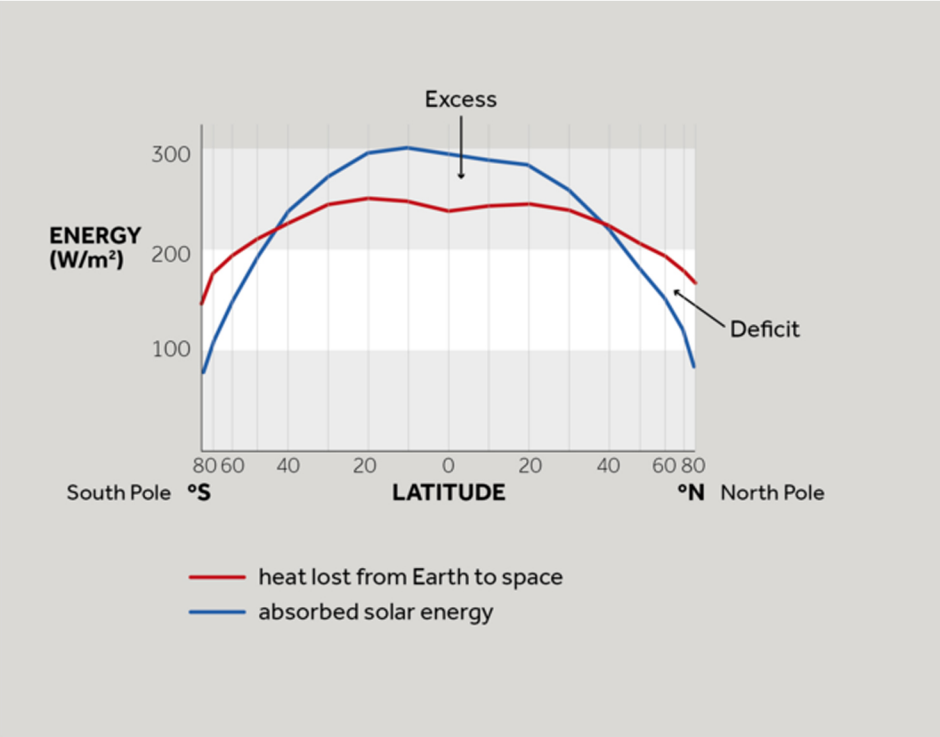
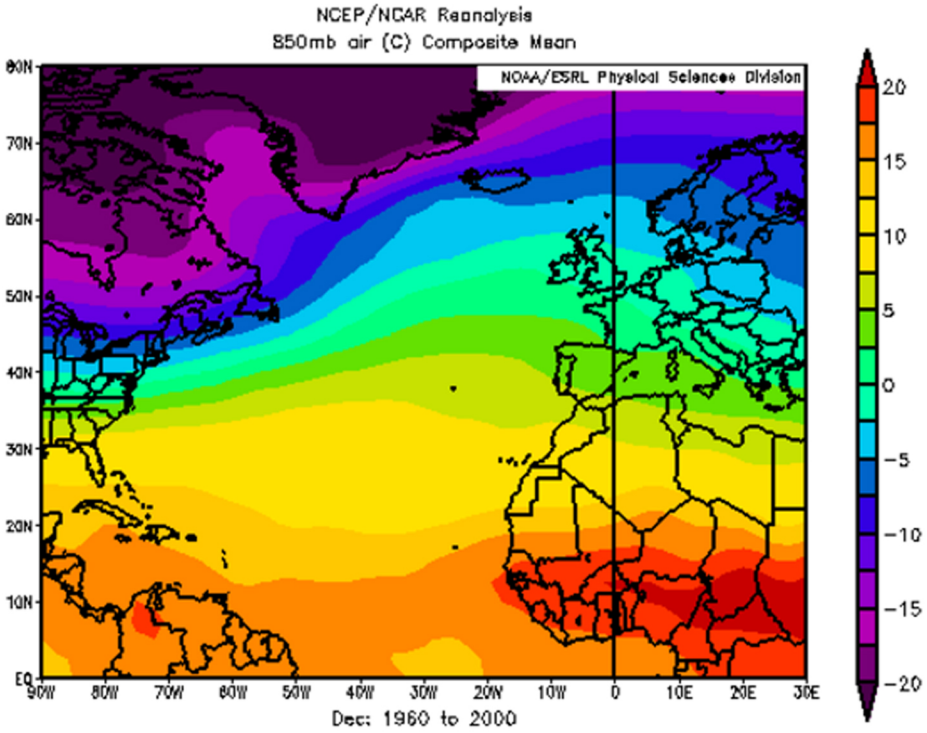


FIGURE 4

A map of average December temperature of the atmosphere about 1.5km above the ground.



© NOAA-ESRL Physical Sciences Division, Boulder Colorado. Data source NCEP/NCAR Reanalysis 1: Summary

THE UNSTABLE POLAR FRONT

FIGURE 1

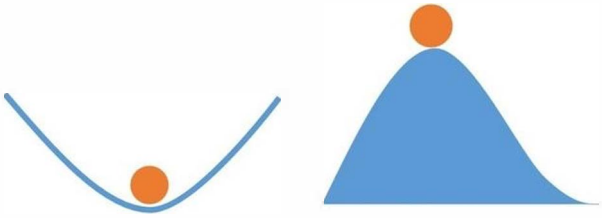


FIGURE 2

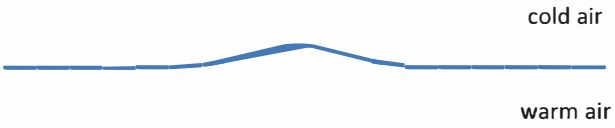


FIGURE 3

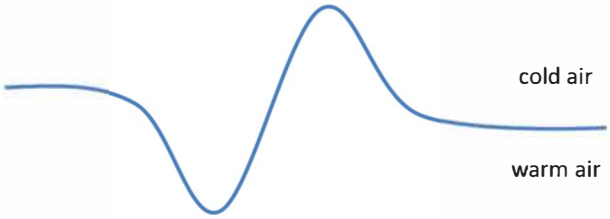


FIGURE 4

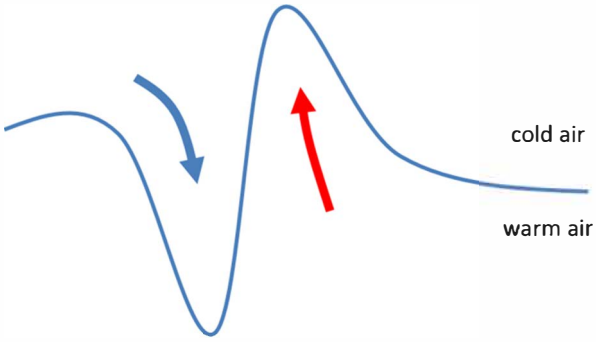
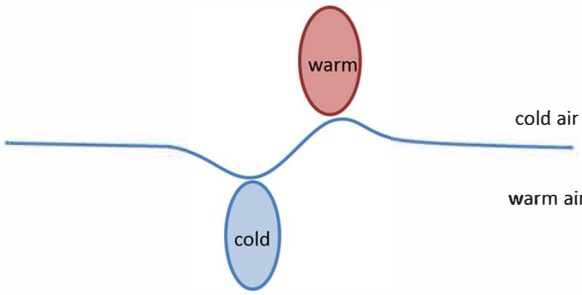


FIGURE 5

FIGURE 6



CLOUDS AND RAIN

FIGURE 1

Four stages in the life-cycle of a depression

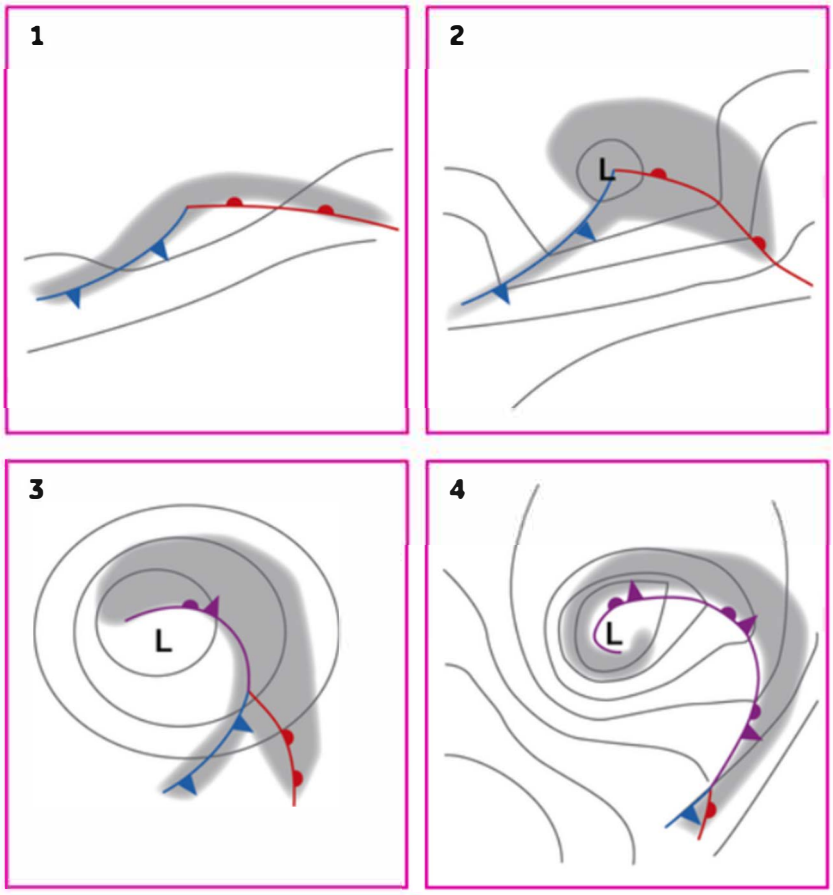


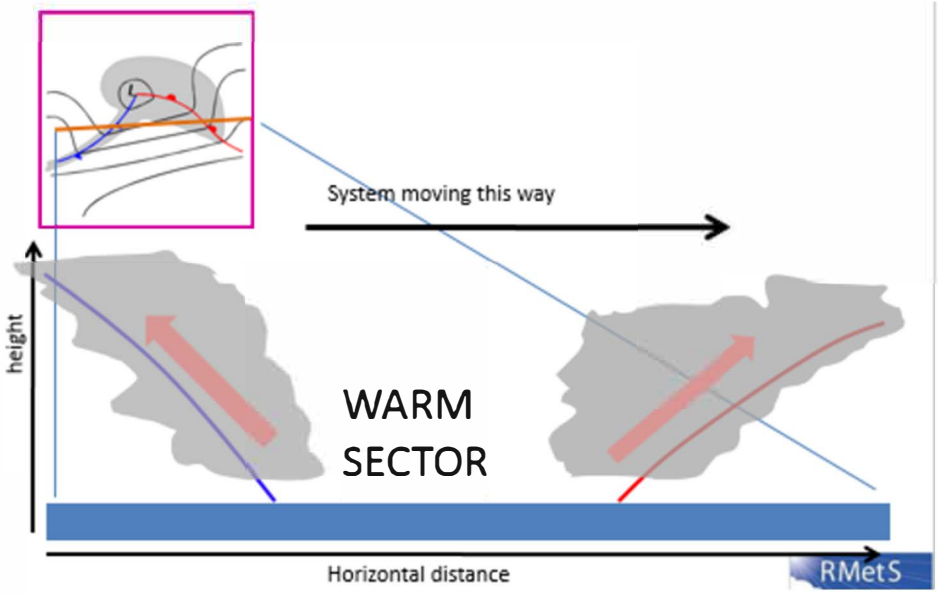
FIGURE 2

Cumulus clouds are indicative of convection. You can sometimes watch them billowing upwards as the air rises within them.

CLOUDS AND RAIN

FIGURE 3

A cross section through a depression at stage 2.



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A PASSING DEPRESSION

FIGURE 1

The weather associated with a warm front

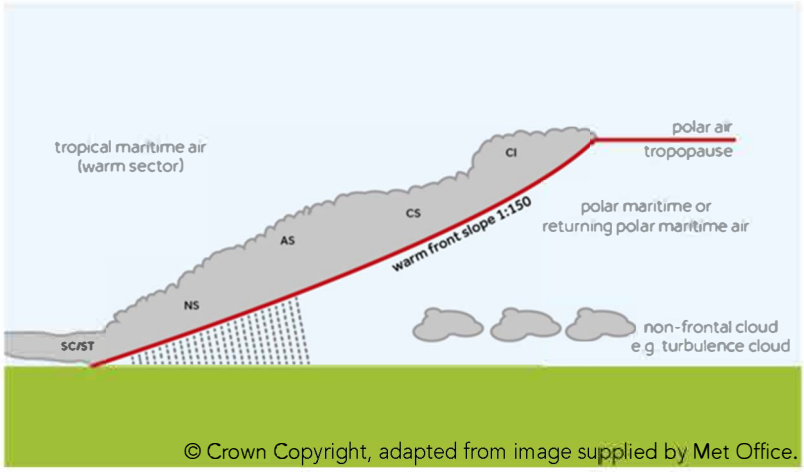


FIGURE 2

Cirrus clouds.

FIGURE 3

Nimbostratus.

FIGURE 4

The weather associated with a cold front

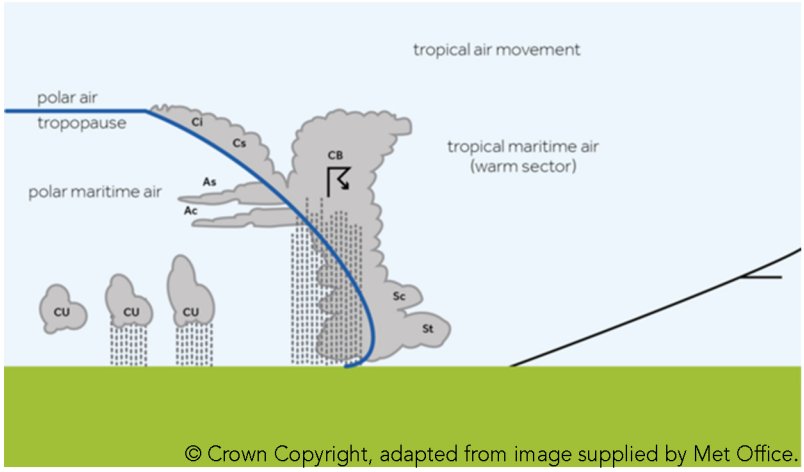


FIGURE A

Sun setting in the west

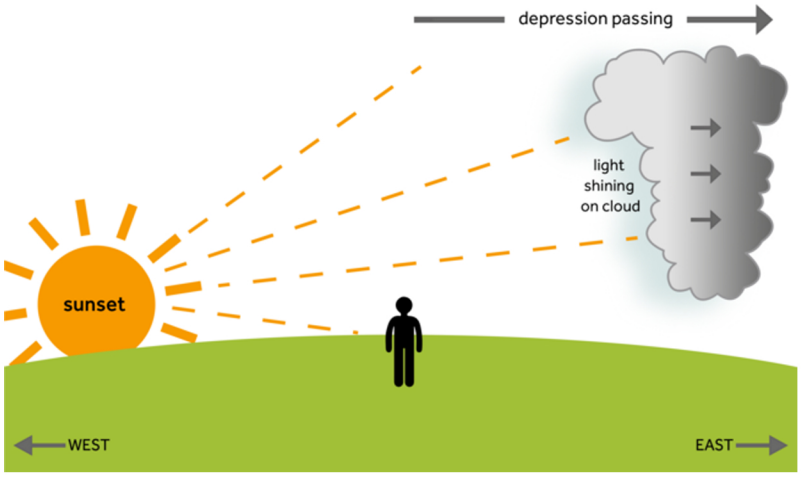


FIGURE B

Sun rising in the east.

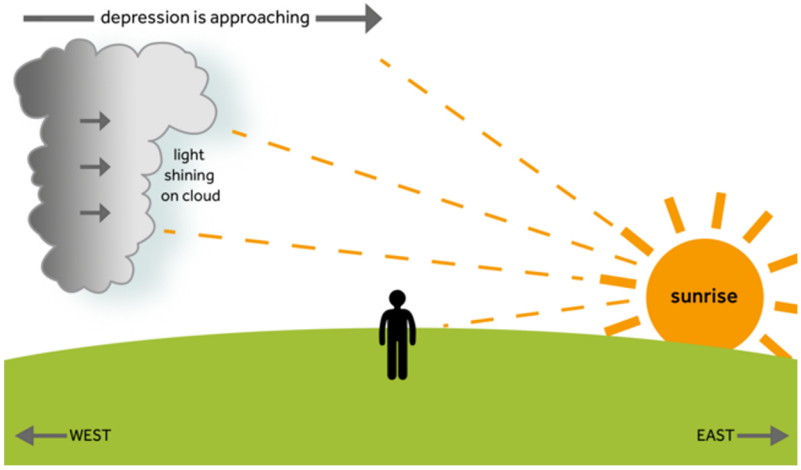


FIGURE 5

Four stages in the lifecycle of a depression.

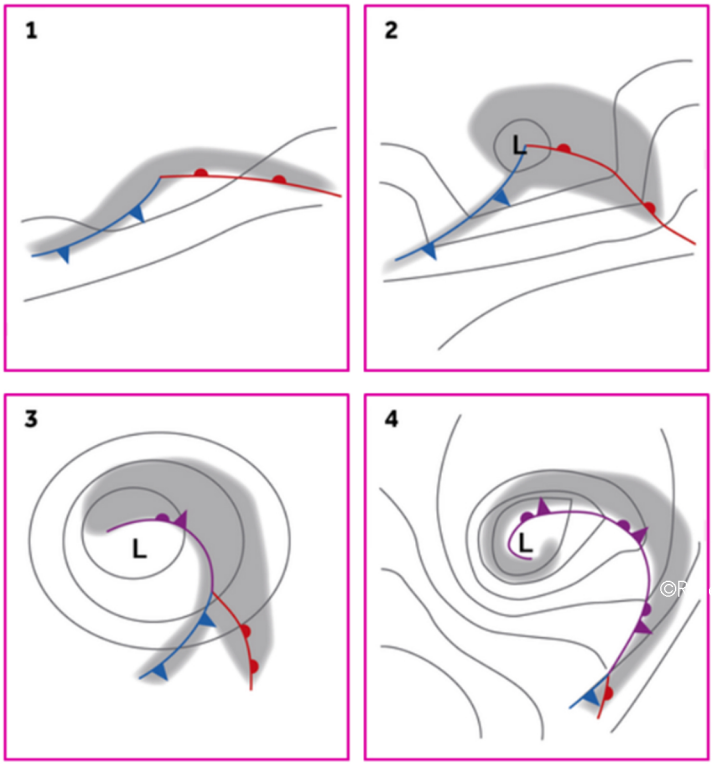
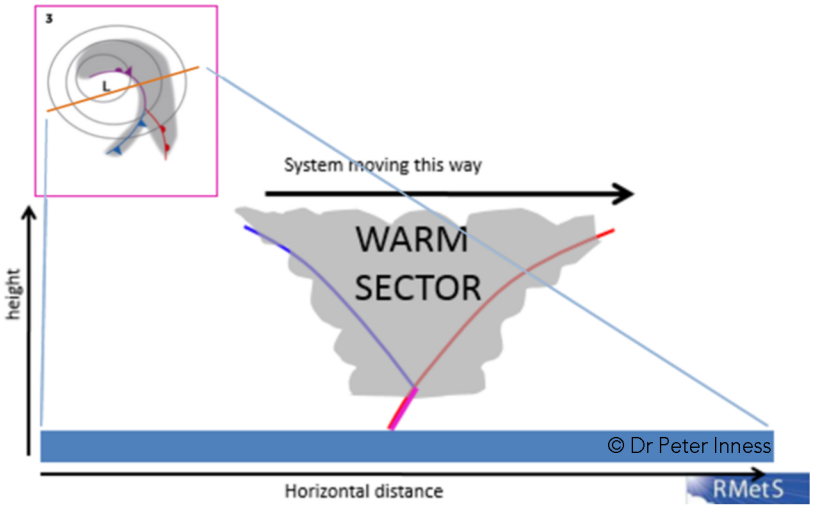


FIGURE 6

A cross section through a depression at stage 3 .



PRESSURE AND WIND

FIGURE 1

Air pressure is a measure of how much air is above your head

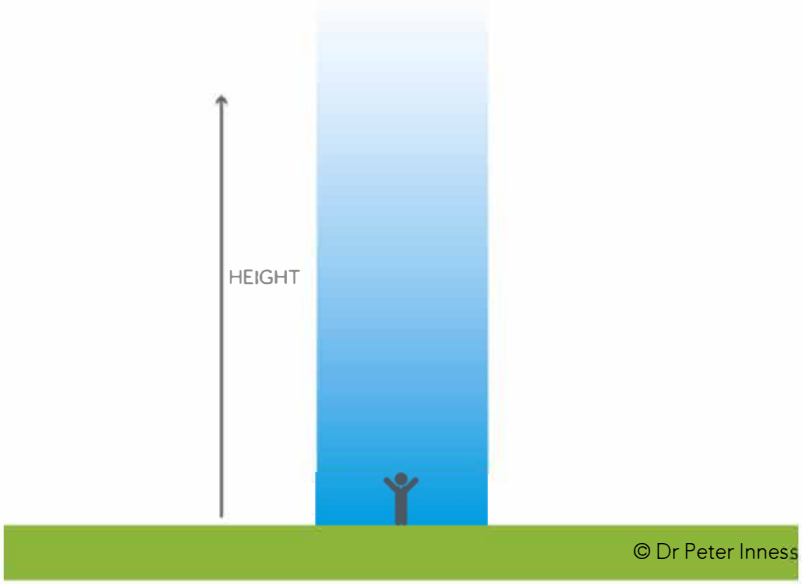


FIGURE 2

Near the centre of a depression, more air is spreading out at the top than is coming in at the bottom.

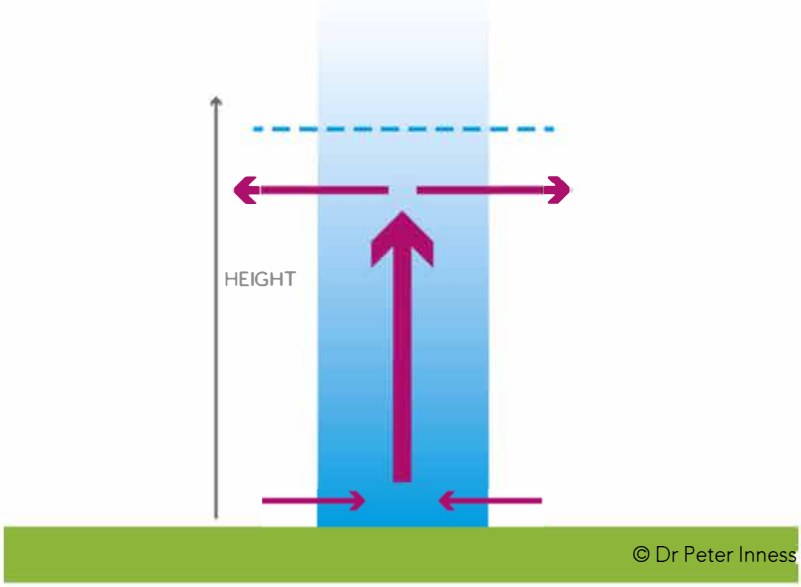
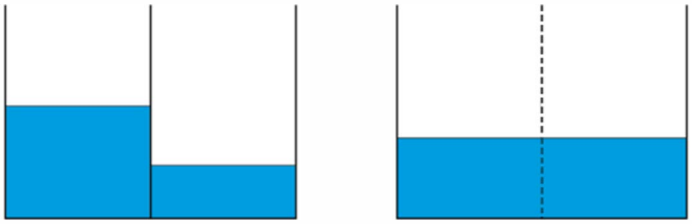


FIGURE 3

If you have two containers, one with more water in and another with less, and you remove the barrier between them, then the water quickly flows to even out the level.



THE CORIOLIS EFFECT

FIGURE 1

Schematic representation of flow around a low pressure area. Pressure gradient force represented by blue arrows. The Coriolis force, always perpendicular to the velocity, by red arrows.

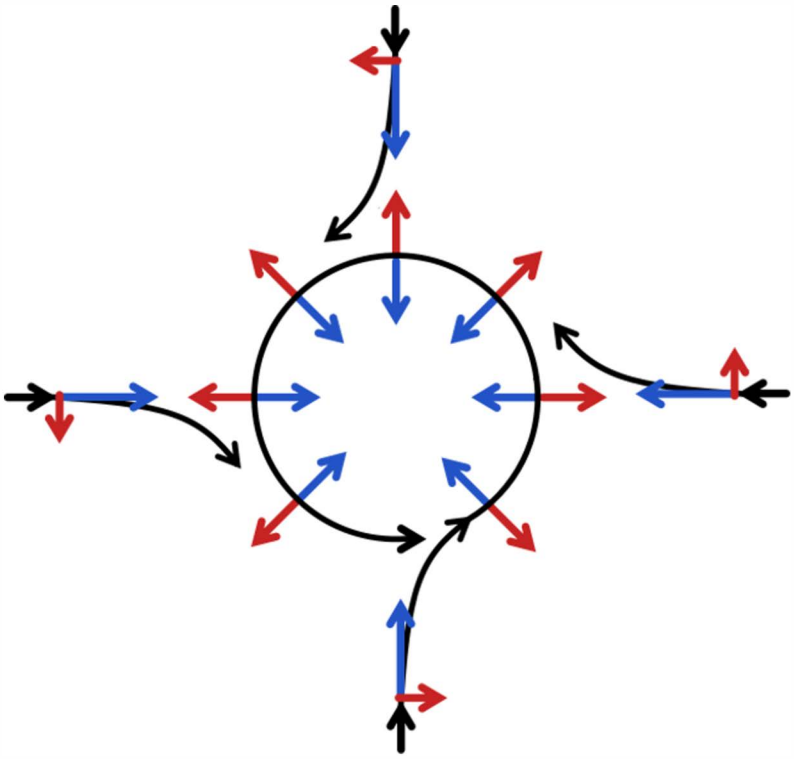


FIGURE 2

Air blows around a low pressure in an anticlockwise direction and around a high pressure in a clockwise direction in the Northern Hemisphere.

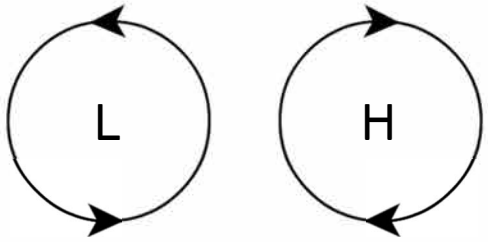
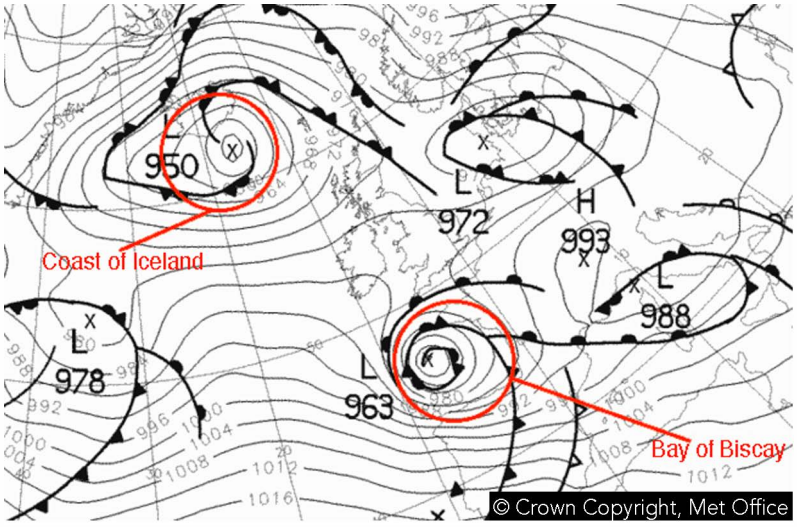


FIGURE 3

A synoptic chart/weather map for 24th January 2009.



RECENT DEPRESSIONS IN THE UK

FIGURE 1

A synoptic chart for midnight, 28 October 2013.

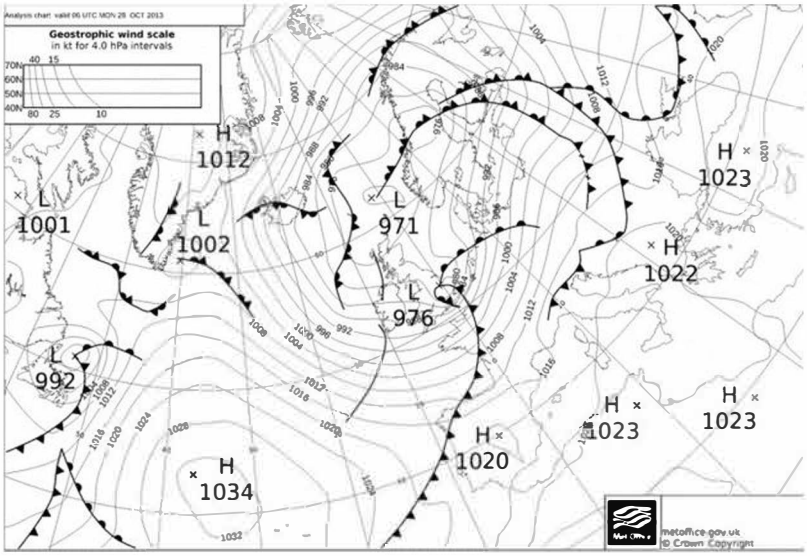


FIGURE 2

A synoptic chart for Midday, 5 December 2013

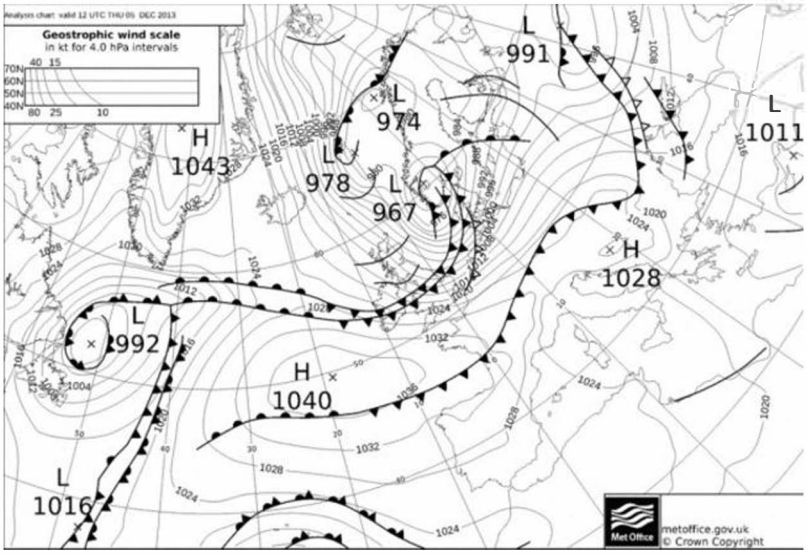


FIGURE 3

This diagram displays the tidal range for 1- 17 December 2013 at Whitby in Yorkshire, a sea-side town on the North East coast of England. The blue bars show the maximum water height at high tide, and the red bars the minimum height at low tide.

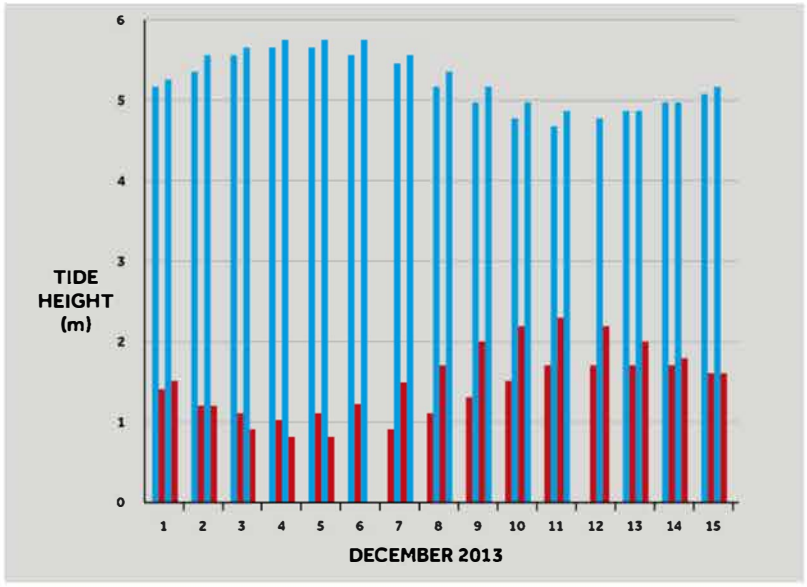


FIGURE 4

A synoptic chart for midnight, 24 December 2013

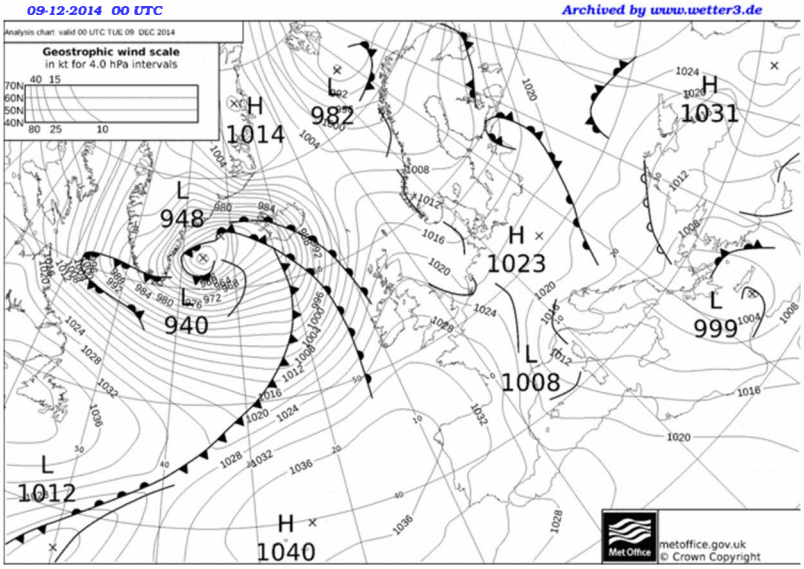


FIGURE 5

A synoptic chart for midnight, 9 December 2014

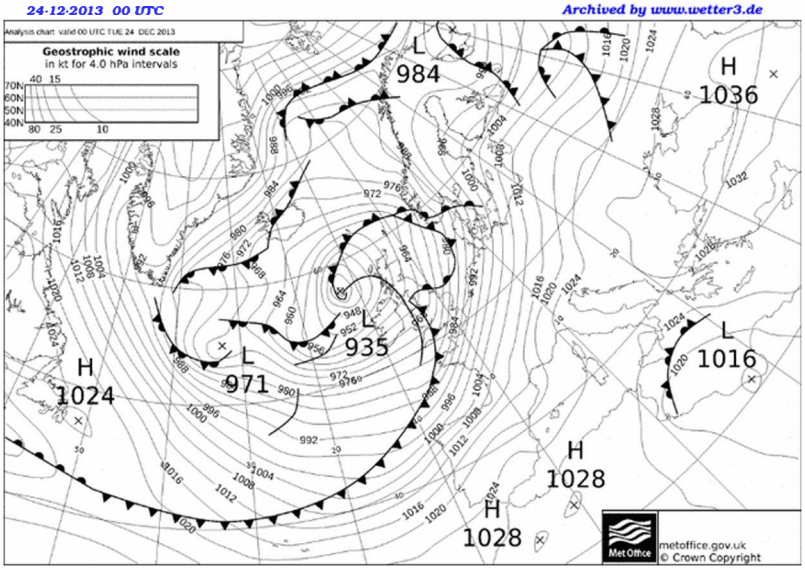
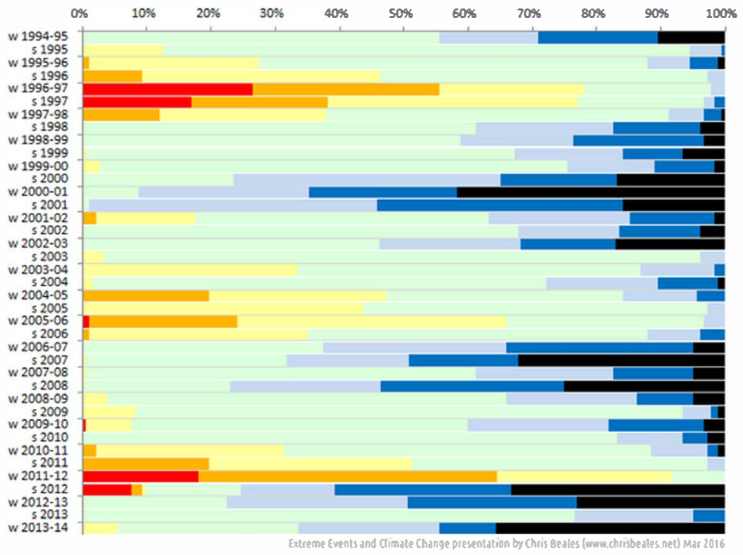


FIGURE 6

River flow in the Thames from Winter 1994/95 to winter 2013/14



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