

Clouds

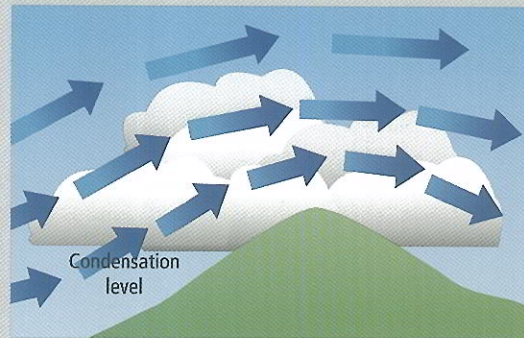
Of all weather phenomena, clouds are among the most fascinating. From the silky filaments of high altitude cirrus to the towering, threatening mass of storm-bearing cumulonimbus, clouds are as varied as the weather itself.

Apart from their beauty and interest, clouds can provide a useful indication of weather conditions, and weather observers at some 500 locations around Australia send regular reports to Bureau of Meteorology forecasting offices on cloud types, height and the amount of sky covered.

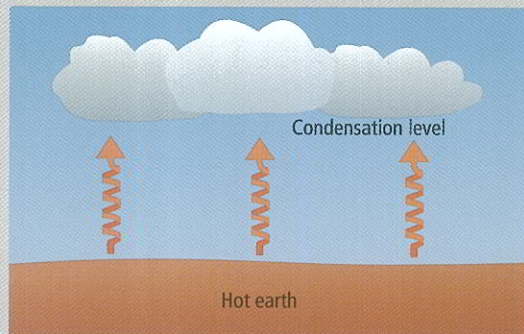
Cloud formation

Clouds have their origins in the water that covers 70 per cent of the earth's surface. Millions of tons of water vapour evaporate into the air daily from oceans, lakes and rivers, and by transpiration from trees, crops and other plant life.

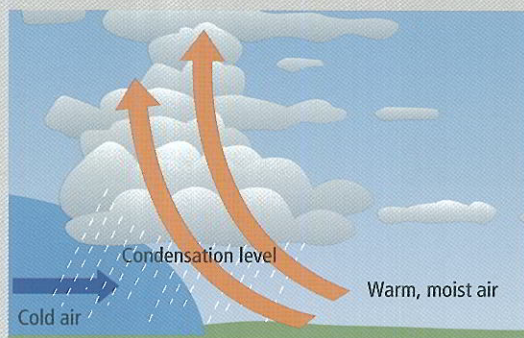
As this moist air rises it encounters lower pressures, expands as a result, and in doing so becomes cooler. As the air cools it can hold less water vapour and eventually will become saturated. It is from this point that some of the water vapour will condense into tiny water droplets to form cloud (about one million cloud droplets are contained in one rain-drop). Thus, whenever clouds appear they provide visual evidence of the presence of water in the atmosphere.



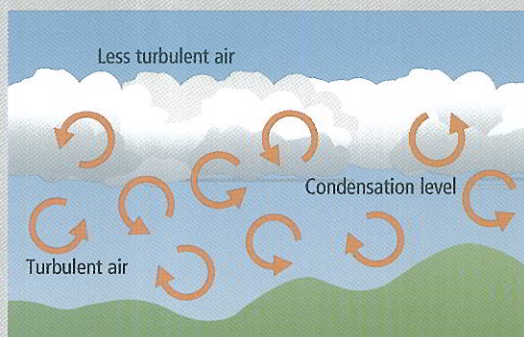
Orographic lifting occurs when air is forced upwards by a barrier of mountains or hills.



Convective lifting occurs when air heated at the earth's surface rises in the form of thermal currents or bubbles.



Widespread ascent results from the interaction of air masses, or the movement of a cold air mass forcing warm air to rise ahead of it.



Mechanical (or frictional) turbulence occurs when air flow is broken into a series of eddies as it moves over uneven surfaces.

The four ways moist air can be lifted to form clouds.



Cloud classification

There are ten main cloud types, which are further divided into 27 subtypes according to height, shape, colour and associated weather. Clouds are categorised as high (above 6 km), middle (2.5 to 5 km), or low (from the earth's surface to 2.5 km). Their Latin names describe their characteristics, e.g. cirrus (a hair), cumulus (a heap), stratus (a layer) and nimbus (rain-bearing).

It's an interesting fact that all clouds are white, but when viewed from the ground some appear grey or dark grey according to their depth and shading from higher cloud.

Typical examples of the ten main cloud types are shown.



Cirrus high level, white tufts or filaments; made of ice crystals. Precipitation: none.



Cirrocumulus high level, small rippled elements; made of ice crystals. Precipitation: none.



Cirrostratus high level, transparent sheet or veil, halo phenomenon; made of ice crystals. Precipitation: none.



Altostratus middle level layered cloud, rippled elements, generally white with some shading. Precipitation: may produce light showers.



Altostratus middle level grey sheet, thinner layer allows sun to appear as though ground glass. Precipitation: rain or snow.



Nimbostratus thicker, darker and lower based sheet. Precipitation: heavy rain or snow.



Stratocumulus low level layered cloud, series of rounded rolls, generally white. Precipitation: drizzle.



Stratus low level layer or mass, grey, uniform base; if ragged, referred to as 'fractostratus'. Precipitation: drizzle.



Cumulus low level, individual cells, vertical rolls or towers, flat base. Precipitation: showers of rain or snow.



Cumulonimbus low level, very large cauliflower-shaped towers to 16 km high, often 'anvil tops'. Phenomena: thunderstorms, lightning, squalls. Precipitation: showers of rain or snow.