WHAT ARE TEMPERATURE EXTREMES?

Temperature extremes are able to be defined in three different ways: using a threshold definition, a statistical definition or an event-based definition. A threshold definition defines an extreme by a particular point, for example over 35 degrees may be designated extreme heat. The issue with this is that it is not relevant for all locations and therefore not necessarily meaningful. Conversely, a statistical definition is based on a normal distribution where events on the tails are designated extreme. An event based definition of an extreme is founded on experienced high-impact weather event. An advantage of this is that it is meaningful information but there is not necessarily a link between events and temperature extremes. The timescale is also important depending on the application for instance the duration of a hot day vs a heatwave.

WHY ARE TEMPERATURE EXTREMES SIGNIFICANT?

Temperature extremes are important because they impact people, in particular in terms of mortality and infrastructure.

WHAT CAUSES TEMPERATURE EXTREMES?

Temperature extremes are caused by atmospheric pressure patterns. As winds move anti-clockwise around high-pressure systems, heat from the centre of Australia where heat has built up over time can be pushed to the coast. This is done through the movement of air masses which are large areas of relatively uniform temperature and humidity on a horizontal plane. These air masses can be persistent meaning that they sit over an area for a long period of time.

HOW IS CLIMATE CHANGE CHANGING TEMPERATURE EXTREMES?

Climate change changes the likelihood of extreme heat occurrences. Temperature is arranged in a normal distribution, but climate change alters where the mean lies. The images below show how moving the mean on a normal distribution alters the frequency of hot days with the orange dashed line showing the mean and the yellow dashed line on the second figure showing the new mean in relation to the old mean revealing that warmer days are much more frequent.