

# What is the weather usually like?

## CLIMATE AVERAGES: Long term averages of weather data

### Missing data

#### Incomplete ('short') months

There are many sites which have not recorded a full month of daily values; in some cases these 'short' months may only have a few days from which the mean daily maximum temperature for example can be calculated. Because of this for most elements the output uses only months which have more than 20 days of observations. Sites which do not report on weekends will usually be included, but their percentage completeness (given at the end of the row) will be lower (about 70%) as compared to a complete unbroken record.

### Extremes

#### Extremes in 'short' months

All data were used for the Highest maximum or lowest minimum temperatures, or for the maximum wind gust as these values are not biased by 'short' months to the same extent.

#### Early and very recent extremes

The temperature extremes given in this report are those values which are in the computer archive. Some sites may have had more extreme values in the 1800s or the early 1900s, which have not yet been computer entered. Extremes which have occurred within the last two to three months of this report, may also not have been entered into the computer archive.

#### Highest daily rainfall

The highest daily rainfall given here is the highest value which has been recorded. Many sites report accumulated falls at the end of a weekend or holiday, and such falls may conceal higher daily amounts than are shown, although this is impossible to identify due to lack of information. These accumulated falls were not included in the calculation of the highest daily total.

### Length of record and missing data

The output indicates the length of the record and how complete that record might be. Together these supply a rough indication of what data are available for the element in question.

- The field '*years of record*' is simply the number of months used divided by 12, and does **not** mean calendar or complete years except for the percentile values. It gives the rough amount of data used between the first date of occurrence and the last data of occurrence *of the element in question*.
- The field '*percentage complete*' gives an estimate of how complete the data are for that element, where a record with no missing values between the first and last dates would be 100% complete. Sites with missing data will be less than 100%.

The '*percentage complete*' and the '*years of record*' for one element are not necessarily related to those for another element. There will often be far more data available for rainfall than there will be for other elements. Similarly there are normally far more years of mean maximum and minimum temperature data, than there are of eg the number of days at or above 40 °C.

The rainfall percentile figures were derived from 'complete' years that is years with no missing monthly totals. Thus the number of years will often be less than for the monthly mean.

### Limited elements

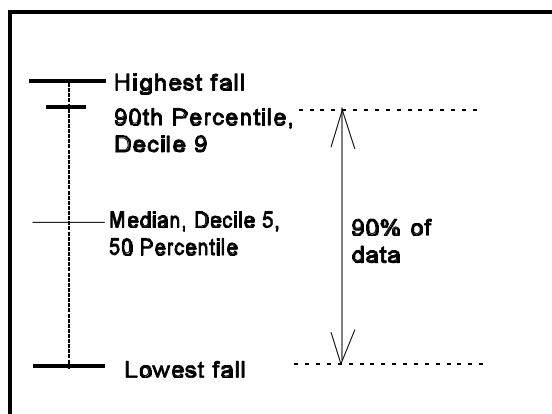
In many cases there will be no data for a particular month or element. The rows for sunshine duration, maximum wind gust or evaporation will usually not be included as these elements are only recorded by a restricted number of sites.

## Statistics used

### Median and percentiles

To calculate deciles (and percentiles), we divide the ranked dataset into ten parts. The median is simply that value which marks the level dividing the ranked dataset in half.

For example 50% of Januaries will have a total rainfall above the January median and 50% will have a total below. The median is also known as the 5th decile, decile 5 and the 50th percentile - they are all the same thing.



Decile 9 or the 90th percentile for January, means that 90% of January totals will be below this figure. In other words there is a 90% chance of a January rainfall being below decile 9 (90th percentile), a 10% chance of it being above decile 9. Similarly there is a 10% probability of it being below decile 1 (10th percentile).

To get the annual percentile or decile value, you do *not* sum the percentiles for the 12 individual months, but must calculate it separately. However it is possible for the two values to be the same by chance.

### Average rainfall

Both mean and median (decile 5, percentile 50) rainfall are included, although median is the preferred measure of 'average' rainfall from the meteorological point of view. This is because of the extremely high variability of daily rainfall - one large fall or a very small fall will affect the arithmetic mean more than it should, but will have less effect on the median. The median is therefore usually considered the

more reliable indicator. It is commonly lower than the mean.

### **Statistics and length of record**

All observations for a site that have been quality controlled were used, regardless of how many years of data there are. Users should be aware that rainfall especially is extremely variable and a period of less than 30 years of rainfall data may not produce reliable statistics. Such information should be used with caution. As a comparison some 5-10 years of temperature data will provide a reasonable estimate of the mean, (although probably not of the extremes).

### **Means for 9 am and 3 pm and Daylight Saving Time**

Due to the effect of Daylight Saving, these values are only nominal for most Australian sites. Daylight Saving has been used in some, but not all, states of Australia, since about 1973. The changeover occurs almost always in October and March but the exact dates vary from state to state and year to year. The averages for a particular hour are hence generally a combination of 8am and 9am values, or of 2pm and 3 pm values. The effect is especially marked at 9 am when the air temperature is often rising quite sharply.