



Fact sheet: Interpreting information from BIGG's telemetry based monitoring stations

This fact sheet explains the data collected from the Barossa Improved Grazing Groups (BIGG's) telemetry based monitoring stations located at Flaxman Valley, Keyneton and Koonunga. Each station comprises a sub-surface capacitance probe measuring moisture to a depth of 85cm, an automatic rain gauge and sensors measuring air temperature, relative humidity, wind speed, solar radiation and net radiation. These are connected to a solar powered telemetry unit with the data being recorded in near real-time.

Data for each monitoring stations can be accessed via the [BIGG website](#) at:

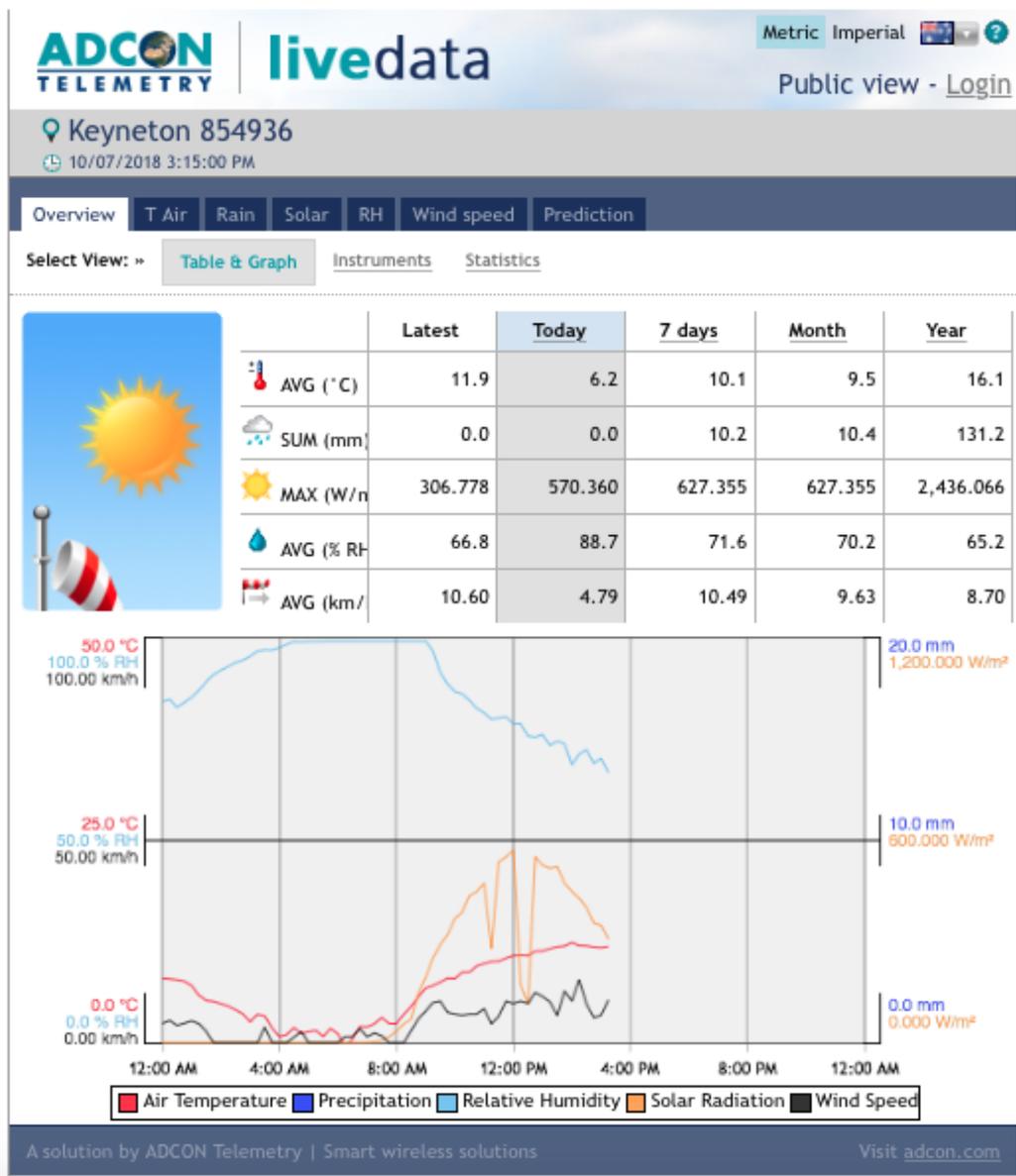
- [Flaxman Valley](#)
- [Keyneton](#)
- [Koonunga](#)

These links default to the '**Live instrument panels**' webpage, while further information (in the form of graphs) can be viewed on the '**Trends**' webpage. Users are able to switch between two pages by clicking the link located at the top right hand corner of each page.

1. 'Live instrument panels' webpage

The near real-time information on the 'Live instrument panels' webpage shows air temperature, rainfall, solar radiation, relative humidity and wind speed data. The default view ('Table and Graph' view) gives a summary of the data but by clicking on the respective climate tabs more detailed data is shown. Also, if the table headers (i.e. 'Today', '7 days', 'Month', 'Year') are clicked, the corresponding graph below changes.

The 'Prediction' tab shows the Bureau of Meteorology's seven-day forecast for the stations location. The live data is also displayed in the form of 'panels' ('Instruments' view and permanently at the bottom of the webpage), whilst daily data from September 2013 can be viewed by scrolling across the page ('Statistics' view).



2. 'Trends' webpage

To better understand the soil moisture and climate data recorded from BIGG's monitoring stations, the data has been 'converted' into the following graphs:

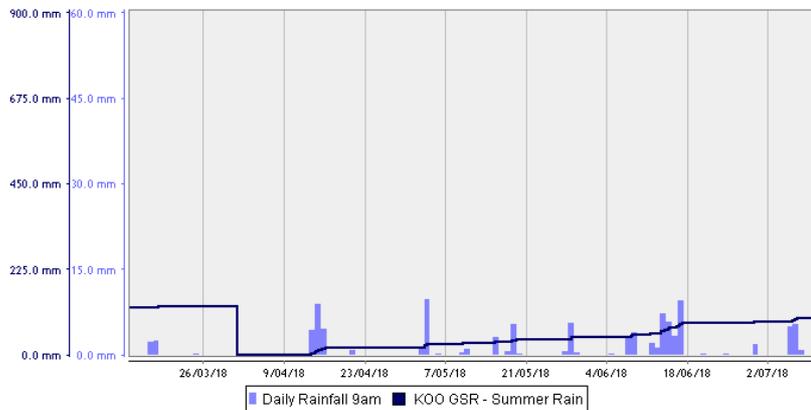
Plant Available Water (PAW) estimate

Shows the daily rainfall and PAW. Plant available water is an estimate of the total amount of moisture (mm) that plants can access in the soil profile (15-85cm). The green line is a measure of the amount of moisture in the soil profile that is readily available to plants at any one time. While the green horizontal line is an estimate of soil saturation (or Drained Upper Limit) and the red line an estimate of when plants cannot physically extract any more soil moisture (or Crop Lower Limit). The area between the two horizontal lines is the PAW, which in the below example from the Koonunga station is 82mm.



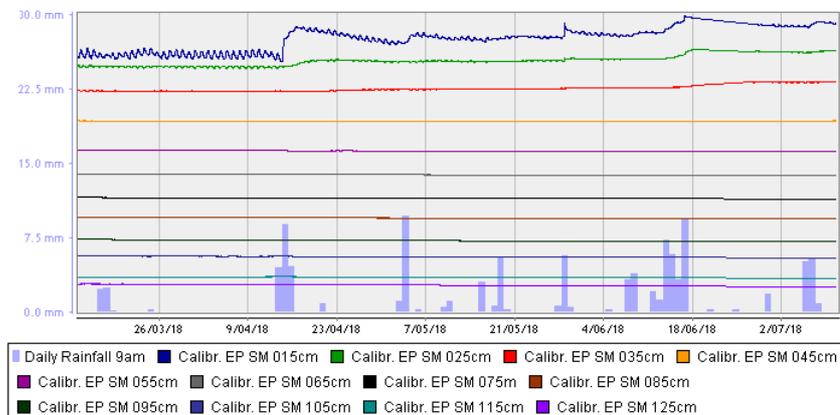
Growing season rain

Shows both the daily and cumulative rainfall throughout the growing season (between 1 April and 30 September).



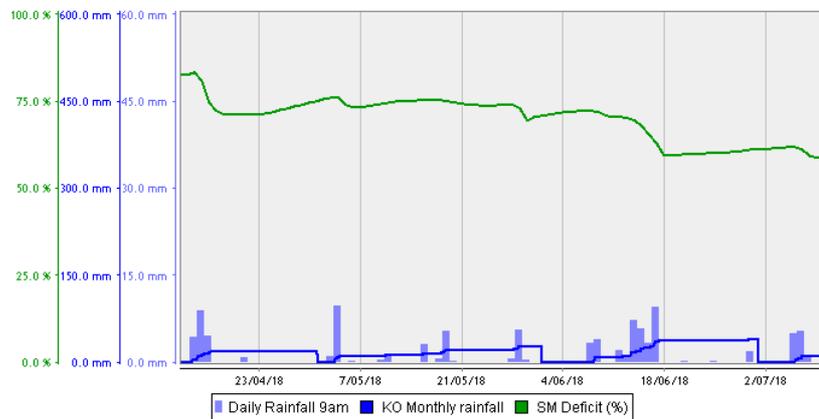
Soil moisture stacked

Shows the daily rainfall and amount of water available at various depths between 15 and 85cm. The stacked graph builds a vertical representation of moisture through the profile and highlights the change in moisture levels at different depths. This is useful after a rainfall event so to identify how far moisture may have moved down the profile or how far down the root zone plants are accessing water.



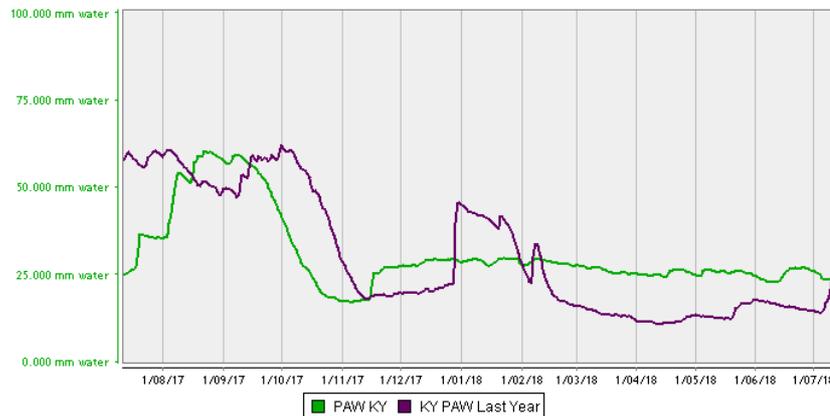
Percentage soil moisture deficit

Shows the daily (blue bars) and monthly (blue line) rainfall, including the moisture percentage that the soil profile is deficient (green line).



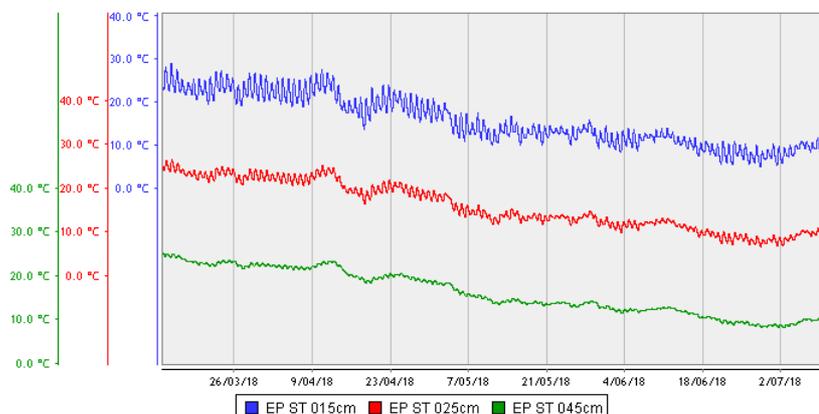
PAW – This year vs last year

Shows the comparison between years of readily available water for the current 12 months (green line) and previous 12 months (purple line).



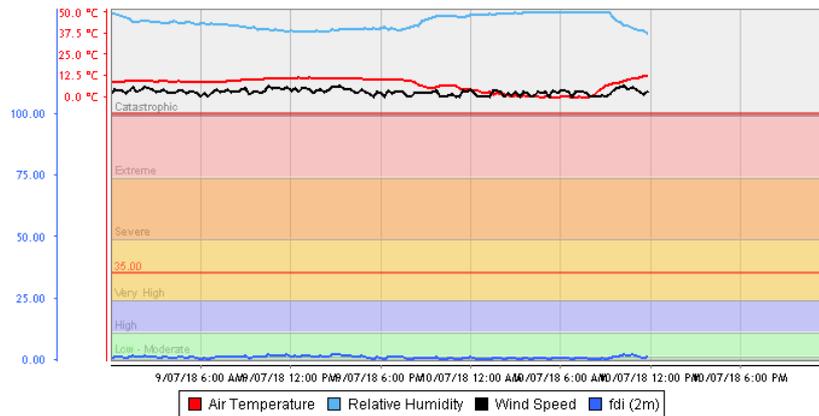
Soil temperature

Shows the soil temperature at 15, 25 and 45cm depth. Soil temperature data is useful to identify if the soil is warm enough for specific nutrients to be taken up by plants, when perennial pasture species may come out of dormancy or when annual pasture species may germinate.



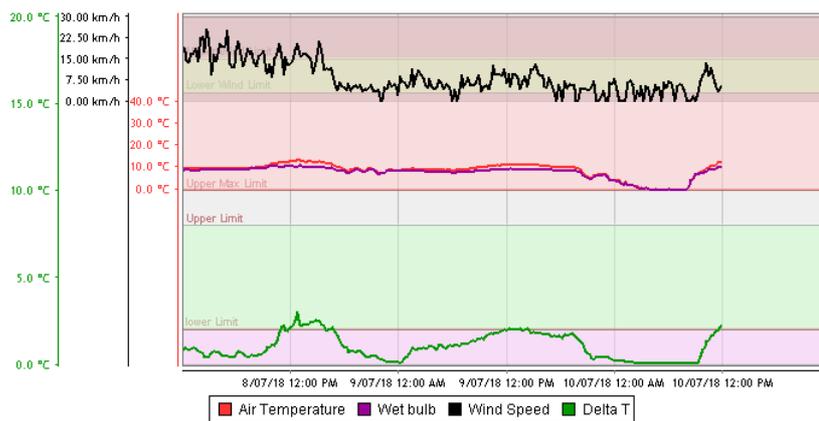
Grasslands fire danger index (2m)

Shows the fire danger index (FDI, blue line), which is derived from air temperature, relative humidity and wind speed data. This index is specifically used at crop harvest time to check if conditions are safe for harvesting (conditions are considered unsafe when the FDI is >35).



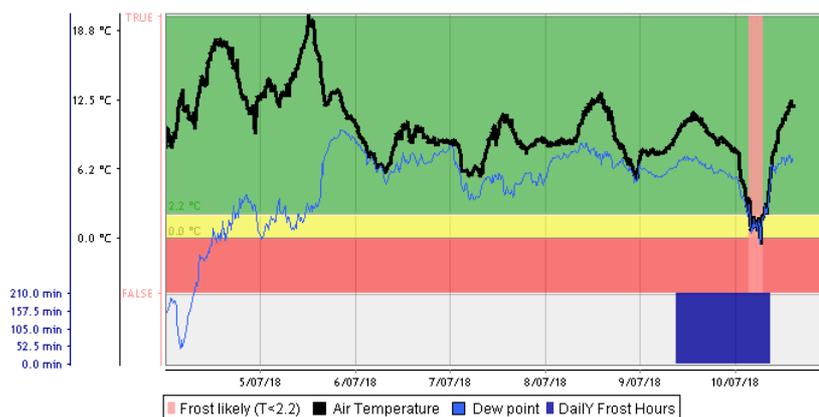
Spray conditions

Shows the air temperature and wet bulb temperature, with the difference between the two determining Delta T, an indicator of evaporative potential of spray droplets. The green shaded area between the 'lower limit' (2°C) and 'upper limit' (8°C) are the preferred Delta T conditions for spraying. The graph also shows the wind speed (black line).



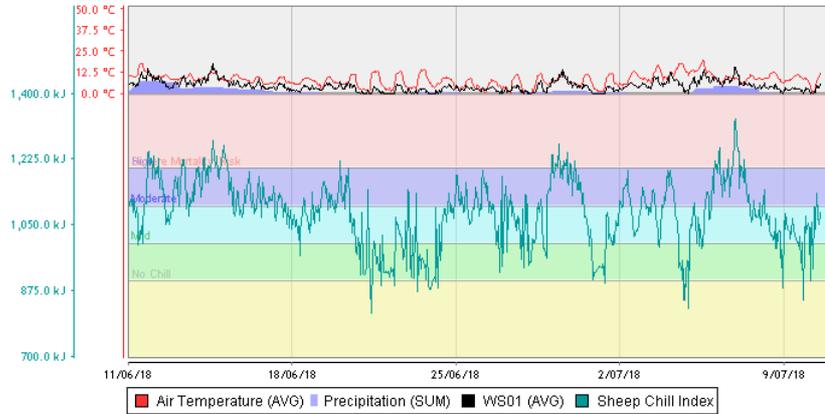
Frost conditions

Shows the dew point (blue line), air temperature (black line) and accumulated hours that temperature is <2.2°C (blue bars). Frost is likely if pink bars emerge on the graph (as below). As growth and development of plants is heavily influenced by temperature, this information may be used to compare the stage of pasture development between sites.



Sheep chill index

Shows the sheep chill index (green line), which is derived from air temperature, rainfall and wind speed data. The graph shows different levels 'of chill'. If for example conditions reach 'severe mortality risk' zone (red area), this is a prompt for sheep to have access to shelter (particularly if they have recently been shorn or are lambing).



Sheep fly strike index (simple model for evaluation)

Shows the sheep fly strike risk index (green bars), which is derived from rainfall, air temperature and wind speed data. The higher the bars the greater the likelihood of sheep blowfly strike.

