



## Climate Monitor – Quick Guide for new users.

***“Climate Monitor – is an online interactive Agriculture and Horticulture focussed, climate interrogation and analysis tool”***

***Climate Monitor uses official BoM and Qld Dept of Environment and Science “SILO” real-time data to enhance & improve Agriculture and Horticultures’ climate risk decision-making and adaptive capacity to today’s ever-change climate impacts”.***

**The Welcome Screen introduces and explains this DCAP web tool.**

Climate Monitor  
"Better information drives better management decisions"

Welcome Instructions Locations Temperature - Rainfall - Output Information Download

The Queensland Government's Drought and Climate Adaptation Program (DCAP) is helping the horticulture and agriculture industries across Queensland through research, development and extension activities. DCAP aims to help producers better manage drought and climate impacts.

Climate Monitor allows the user to **analyse and graph** minimum and maximum temperature and rainfall for **all** available years, calculate thermal time (chill and heat units) and be able to **retrieve, analyse and graph temperature thresholds** (for a chosen location).

These climate variables are critical drivers of product quality and income potential. This location specific climate analysis capability is equally valuable to **broadacre cropping** (e.g., sorghum, wheat, chickpeas, cotton), **cattle operations** and **horticultural** businesses, where knowledge of planting windows (maximum and minimum temperature) as well as **heat stress** factors are major drivers of potential **yield, sustainability and profit**.

This unique analysis tool will allow horticultural business managers to refine and improve their business decisions around crop choice, variety, planting dates and location, and to maximise their chance of harvesting a high-quality crop, by identifying their optimum crop growth time slots.

Climate Monitor allows improved, detailed location specific (5km grid) climate analysis, supporting and under-pinning better, more informed management decisions.

Business owners and managers can use Climate Monitor to plan and prepare based on location specific comparisons of climate records and the current BoM seven-day forecast data, with historical "norms".

Climate Monitor allows you to **easily review if and how climatic conditions have changed at your chosen production location** over time. Users can also research **alternate "ideal" production locations** and times elsewhere in Australia, based on their crops' "ideal growing conditions", and potentially move, modify or expand their production footprint to maximise product quality and supply continuity.

Funded by the **Drought and Climate Adaptation Program**  
Developed by the industry focused **Horticulture Project Team**

**Queensland Government**

Last updated: 29 June 2022. Last reviewed: 25 May 2022

**Figure 1. Climate Monitors’ welcome screen highlights the DCAP initiative and explains the aim and capability of the web tool.**

## Instructions.

### How to use Climate Monitor

[User guide with examples](#)

Climate Monitor allows you to select one or more stations and/or grid cells up to a maximum of 3. Locations can be selected first or added to existing analyses.

#### 1. Selection a location or multiple locations

Select one or more stations (blue circles) or click anywhere there is not a circle. The latter selects from the 5 km grid and a blue marker  is shown, click the marker if you are satisfied it is in the correct place and it will be shown as a red dot.

Up to three stations and/or grid cells can be selected.

#### 2. Click Temperature menu item and then Historical or an analysis or click Rainfall and Evaporation. Rainfall and evaporation options are currently limited to Historical analyses

##### Historical

Average observations for climate variable

##### Thresholds

Count number of days that meet the given criteria

##### Chilling/Growth Potential

Calculations for Chill Portions, Chilling Hours, Growing Degree Days, Growing Degree Hours

##### Output

This is where the graphs are displayed

##### Information

Useful links

##### Download

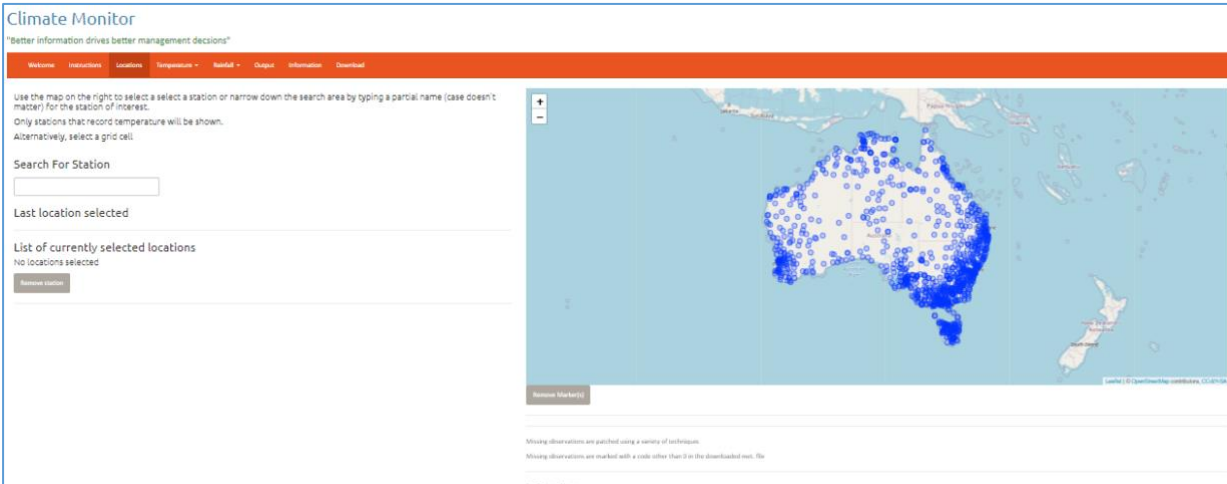
Download the observations for the location(s) as a CSV file.  
Data from each location is compressed and downloaded as a zip file

##### Notes

Additional Information on methods used

**Figure 2.** The instruction screen explains how to conduct a location base analysis.

## Locations



Climate Monitor  
"Better information drives better management decisions"

Website Instructions Locations Temperature Initial Output Information Download

Use the map on the right to select a station or narrow down the search area by typing a partial name (case doesn't matter) for the station of interest. Only stations that record temperature will be shown. Alternatively, select a grid cell.

Search For Station

Last location selected

List of currently selected locations  
No locations selected

Remove location(s)

Remove Marker(s)

Missing observations are patched using a variety of techniques.  
Missing observations are marked with a code other than 0 in the downloaded net file.

For Technical Issues

**Figure 3.** The locations tab allows the user to type in or select their chosen location or locations (up to 3 high-quality BoM weather stations or grid locations (5 km x 5 km) can be compared).

**Compare two locations - e.g. Kingaroy & Murgon (historical range).**

The location on the map is **only selected for analysis when you see the red dot** – you may have to double-click your mouse on the spot. See the graphic below. The blue pin location is not actually selected until it turns to a red dot.

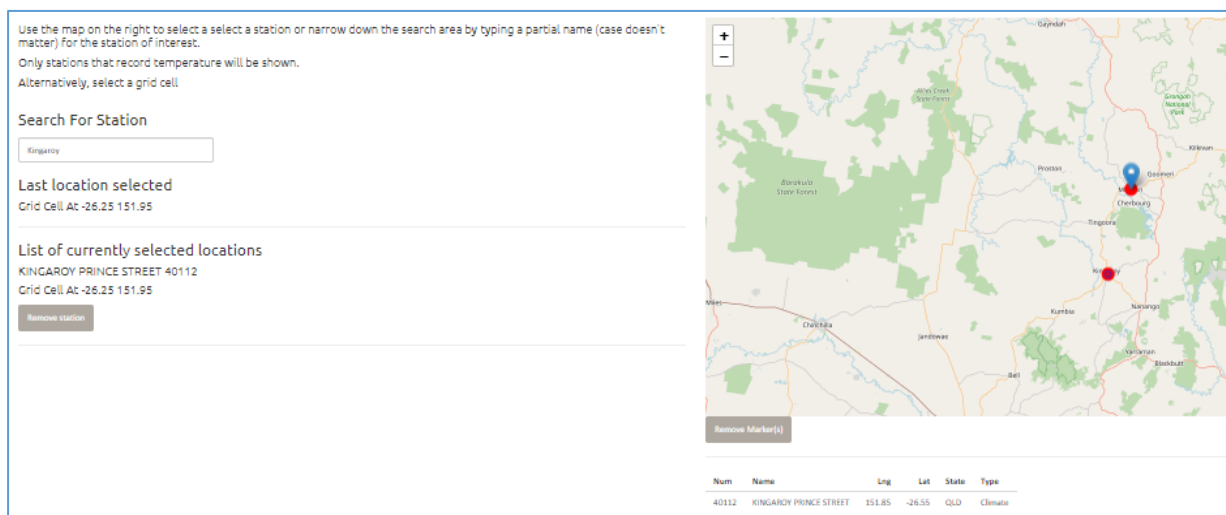


Figure 4. The user selects a location (or locations) by choosing a BoM station or marking a chosen location (farm site) on the map.

The user then chooses the weather parameter they wish to learn more about. e.g., temperature, then selects which temperature analysis type (Historical/ Thresholds or Chill/ Growth Potential) they are interested in. Below is an example of an Historical analysis and graphed results.

**The Temperature tab > Historical analysis chosen**

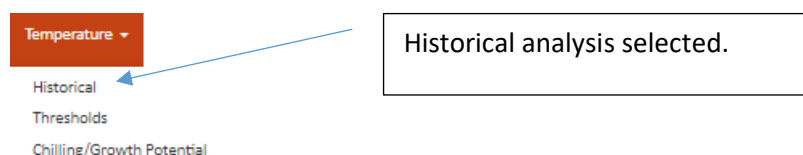


Figure 5. The Temperature Tab has several sub-options.

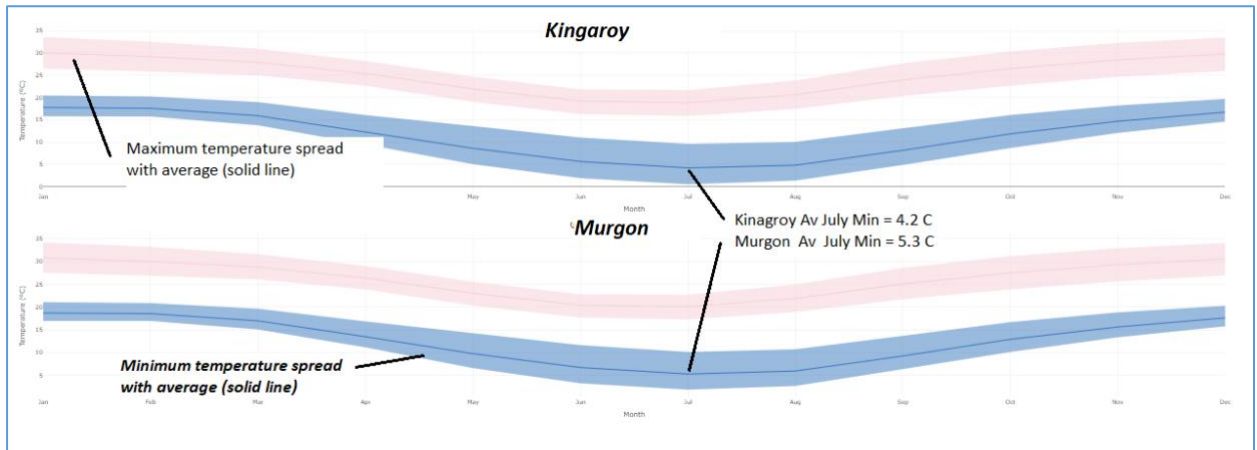


Figure 6. Graphic output from a requested historical temperature comparison. On the actual Web-tool screen - rolling the mouse displays the actual data (July average figures typed for this user guide).

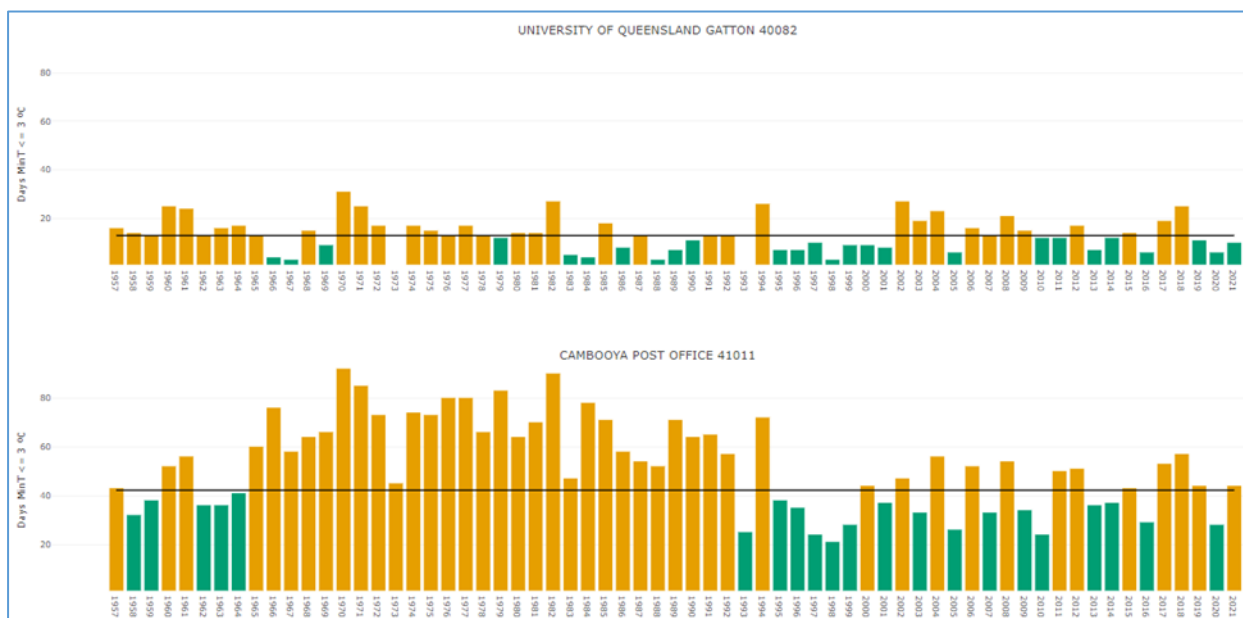
### Temperature - Threshold analysis

Figure 7. The user has chosen to analyse minimum temperature and days equal to or less than 3°C.

Figure 8. The user has chosen to analyse minimum temperature and the number of days less than or equal to 3°C at this location.

The Temperature tab, (Thresholds analysis).allows the user to analyse minimum temperatures or maximum temperatures (above or equal to a specific temperature they choose or below and equal to that threshold). In this example below the user has selected the number of days in every available year where the temperature has been equal to, or below 3°C. The output **results appear as an easily read graph**. In this example the chosen locations for comparison were the UQ Gatton BoM weather station and the Cambooya township (on the Eastern Darling Downs). Gatton is a winter leafy vegetable

production area, while Cambooya is a summer production location. The colder winter temperatures in Cambooya reduce plant growth rates and the higher number of cold days mean vegetable quality is inferior in Cambooya in winter, compared to Gatton. The vertical axis shows the number of days at the chosen location that were 3°C or colder for each month and all years. **Importantly, the vertical axis for all compared locations is displayed with the same scale, allowing quick, easy comparison.**



**Figure 9. The results of the analysis are displayed with overall mean (horizontal black line) for the location. When using the Web-tool, the actual total day number for each year is displayed to the user as they move their mouse across the graph.**

This analysis shows why a major Queensland salad growing and packing business, farms in the Lockyer Valley through winter, not at their Cambooya farm. They use the Cambooya farm in summer to maximise year round quality – it’s just too hot for the leafy crops in the Gatton summer. This business moves production location so as to optimise crop growth, so maximising yield, quality & shelf life.

The Climate Monitor comparison displayed below analyses the **number of days at or above 34°C** at both locations and allows easy comparison of the differences.

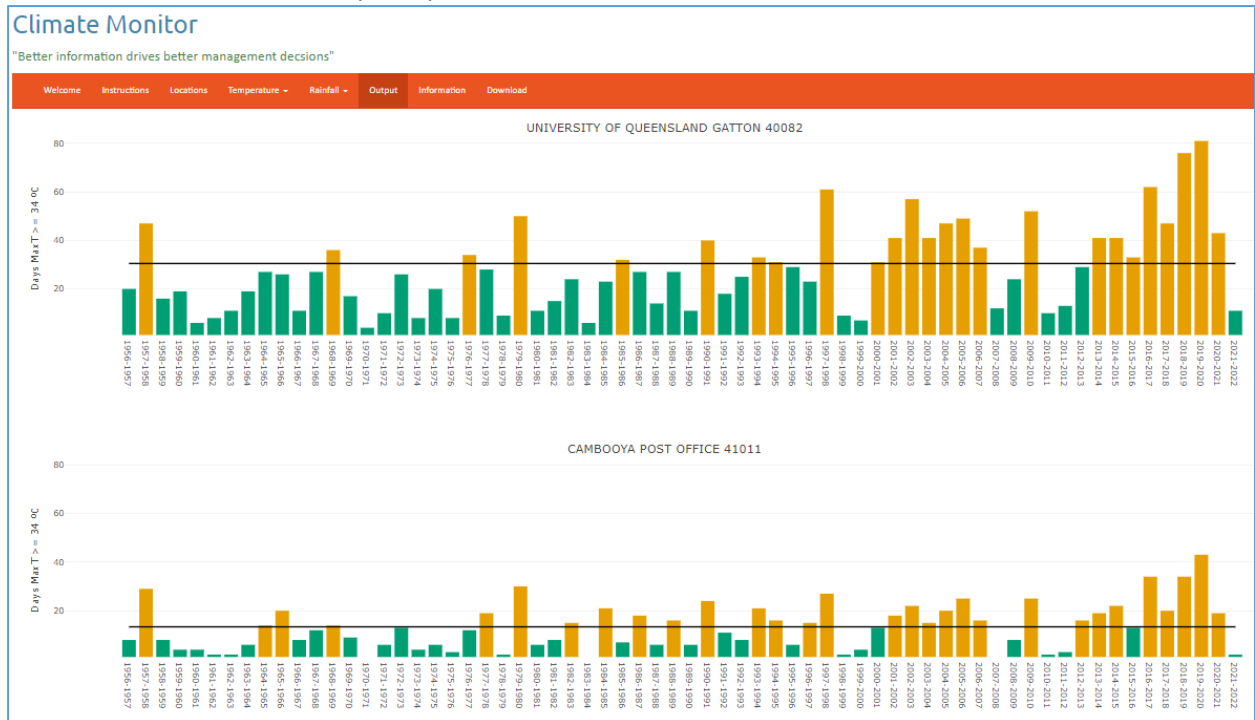


Figure 10. Climate Monitor used to compare days that reached 34 °C or above in the two farming locations.

Climate Monitor is a powerful and useful tool allowing a grower or supply chain manager to compare and contrast locations by looking for the specific climatic conditions they know are required to grow a quality crop. A grower / business manager can compare their current production locations climate with any other location they choose. Business managers know what and when they can best grow at their current location, so can easily compare and decide if an alternate location is viable, should be avoided or offers the opportunity to extend their current production window.

### Temperature - Threshold analysis consecutive days.

Figure 11. The user is interested in temperature data from Sept to March and number of times the temperature “envelope” of 10°C to 29°C inclusive occurred for 10 consecutive days. Note that and is circled to include both variables.

The analysis above, for the location of Applethorpe produces the output below.

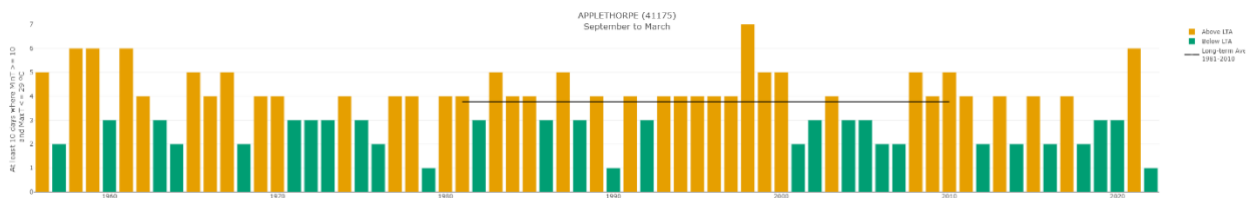


Figure 11. Applethorpe analysis for at least consecutive days where minimum temperature was above 10 C and maximum was 29 C or below.

### Temperature - Chill or Growing Degrees.

The final temperature tab analysis option allows the user to analyse, compare and track Chill and Growing Degrees. Chill is a standard measure analysis while growth potential (growing degrees), uses a **base temperature chosen by the grower** who knows from experience at which temperature the crop performs at its best. The user selects the month or months they are interested in analysing using the **Season drop-down box**. This allows complete flexibility and means the user can analyse just part of a year (growth slot) that they are interested in for at the location of interest. 😊

Figure 12. Above is a “screen shot” of the Chill & Growing Degrees analysis sub-options. In this example a full year (Seasons) is selected and Annual is selected for the Chill and Growing Degrees analysis.

This powerful analysis lets the user choose to compare any season or part of a season for all years ( See Figures 12 & 13 ), Applethorpe annual chill all years to-date (Annual analysis) or compare a **slected year and period** to previous years historical ( Figure 13)

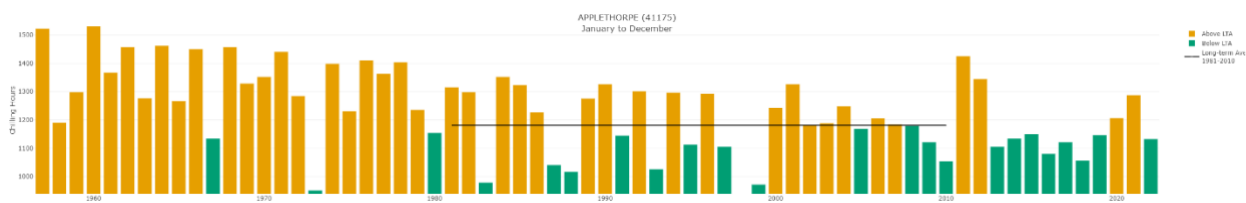


Figure 12. Applethorpe annual chill hours totals for all months and years.

**?** Help

Select a season, then **+**

Season

Start of season  
January

End of season  
November

Either this **+**

Chill

Hours

2022

Reset

Calculate & Show

Or this **+**

Growing Degrees

Days

Baseline (°C)  
10

Annual

Reset

Calculate & Show

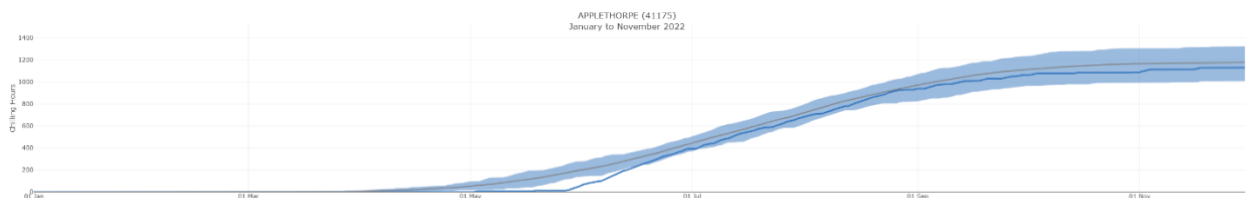


Figure 13. Applethorpe Chill Hours 2022 (dark blue line) in 2022 compared to the average and all years ( for Jan to Nov).

A cotton or sorghum grower in Emerald may be interested in the number of days above 25°C at their farm this year to-date compared to previous years (seasons). This could help with a better understanding of the current crop’s potential maturity date. This is easily achieved with Climate Monitor.

Figure 14 below shows that 2022 (red line) is below the average (grey line) and sits low in the spread of all years (the red band).



Figure 14. Emerald growing degree days that reached 25 C in 2022 to date.

## Rainfall

**Annual, Seasonal or Monthly** rainfall can be analysed for up to three locations and can be compared at the same time. This is valuable and useful information for a business wanting to expand or even lease country in another location. Users can compare annual data, single months, or an entire season. The historical chance of rainfall in a single month at a chosen location is easily seen.



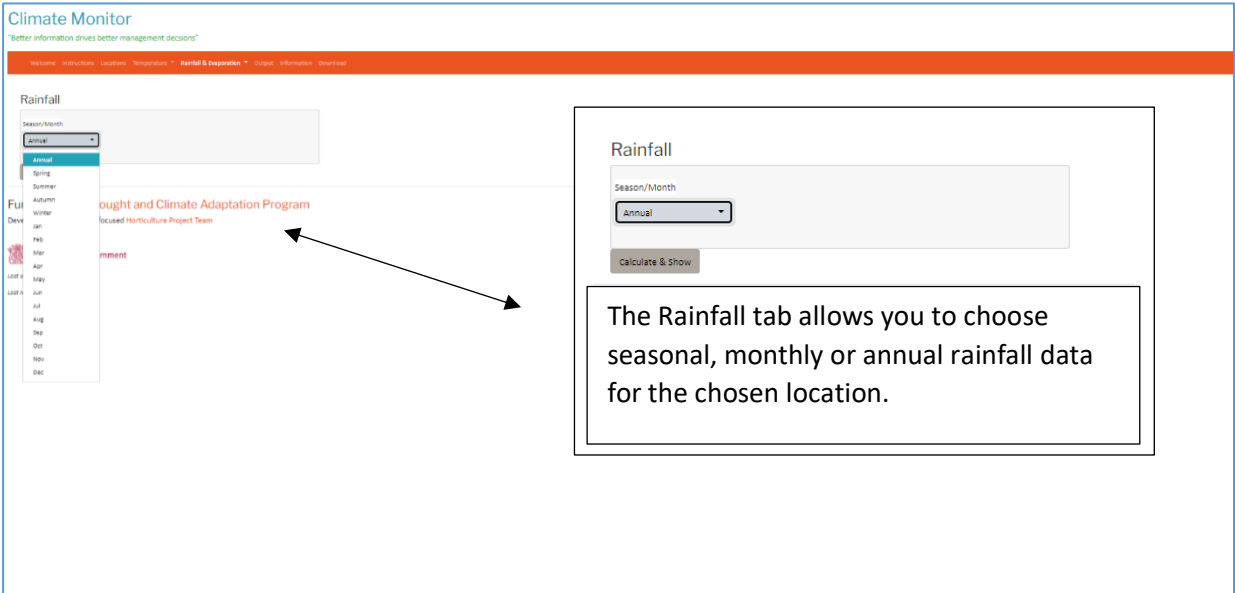


Figure 15. The rainfall tab presents the user with extra analysis options.

Several rainfall analysis options are available – two examples are below.

**Annual rainfall graphic - Charleville.**

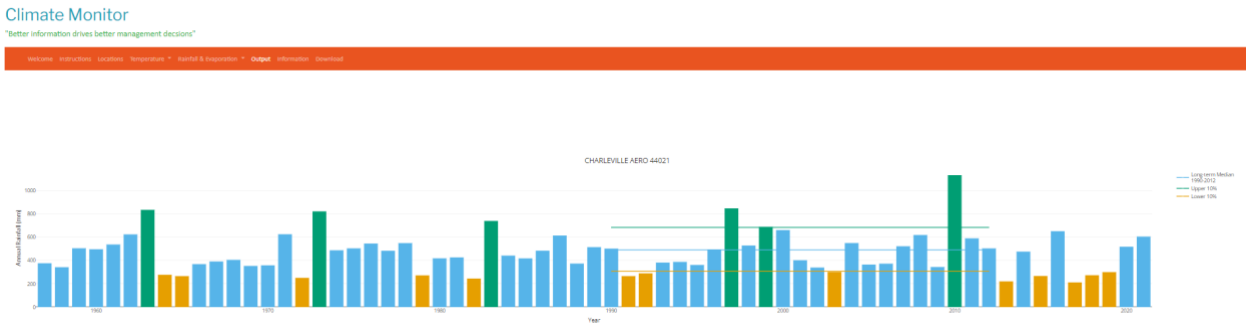


Figure 16. Annual rainfall

**Spring rainfall at Charleville.**

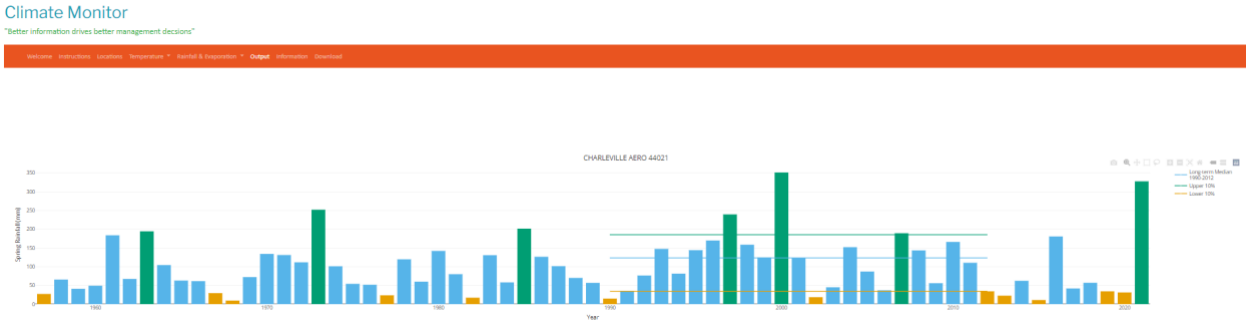


Figure 17. Seasonal rainfall (Spring).

The **rainfall tab** also displays the evaporation data for the chosen location beneath the rainfall graph.

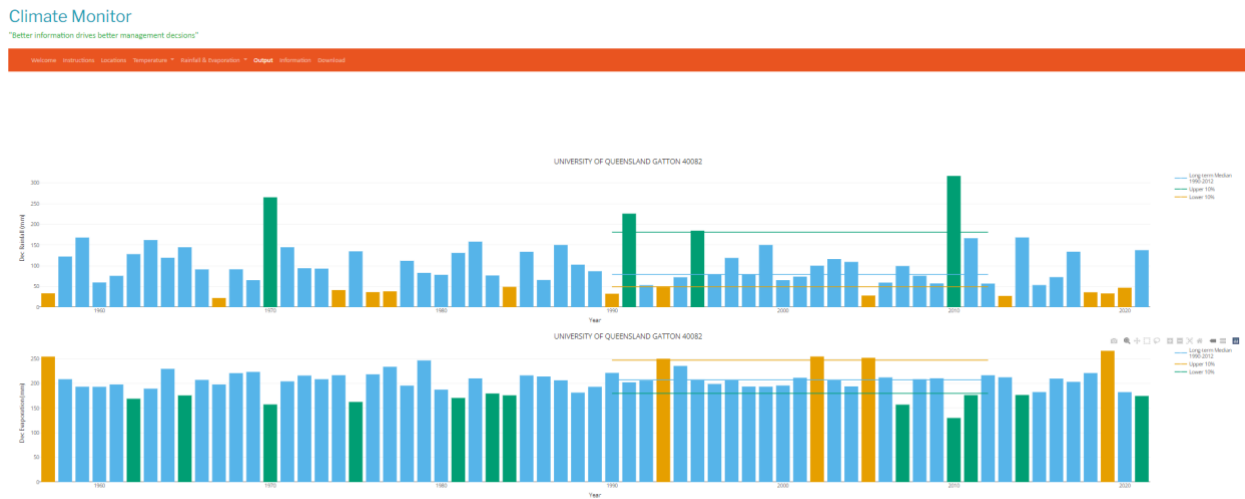


Figure 18. The December rainfall analysis for Gatton (The University of Queensland BoM station) with evaporation displayed below.

## Information

### Easy access to quality real-time science-based information.

Climate Monitor also contains an **Information tab** that offers links to relevant BoM temperature, rainfall and forecast products (Heatwave Forecast, Seasonal Outlook and Enso).

*Valuable decision-aide tools for all agricultural business managers.*

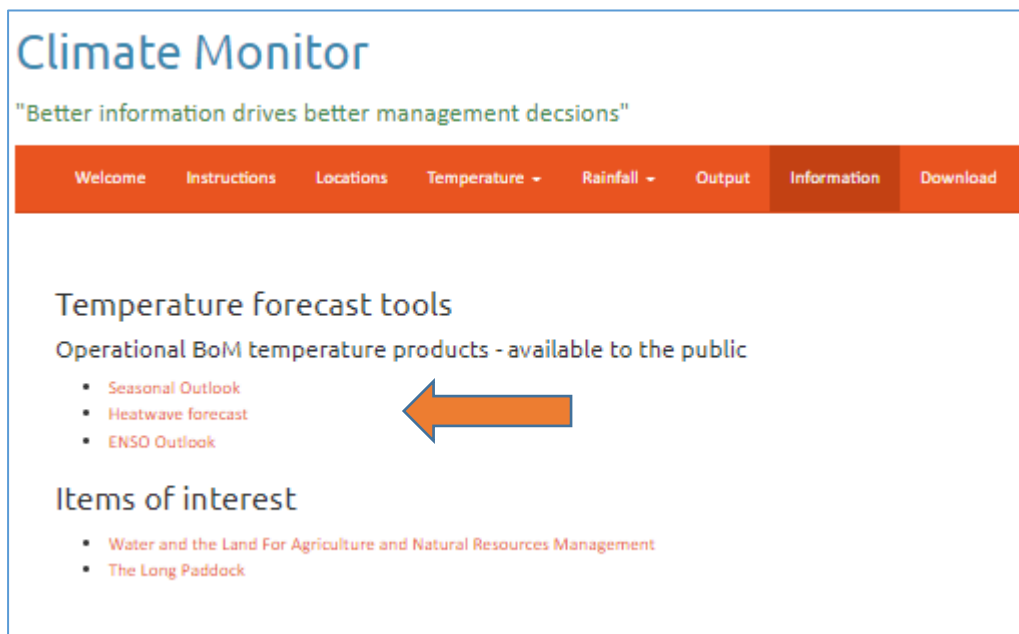


Figure 19 Climate Monitor's Information Tab provides access to relevant BoM forecast products.

## **Climate Monitor – information for all agricultural sectors**

*Climate Monitors' location (farm) specific climate analysis capability is equally valuable to broadacre cropping (e.g. sorghum, wheat, chickpeas, cotton) and cattle operations, where knowledge of planting windows (maximum and minimum temperature) as well as heat stress factors, are major drivers of animal performance, yield potential and profit.*

Climate Monitor

Project staff have already utilised Climate Monitor to analyse and compare production locations and climate variables for several commercial operators that have approached staff since seeing a live demonstration. Several of these Climate Monitor location comparisons are described in Appendix 1.

**Climate Monitor is publicly available on the [DCAP website](#).**

*The Project team would like to thank the Queensland Government,  
the DCAP Manager & the Steering Committee for the funding and oversight of this work.*

## Climate Monitor – example analysis.

### Climate Monitor, real-life decision support request # 1.

A local Southeast Queensland business manager was interested in comparing and contrasting monthly temperature ranges and extremes at two locations within the Granite Belt production area.

The business operates in multiple Queensland locations on the Southwestern side of Stanthorpe. They were interested in leasing more land locally and became aware of an available farm with adequate water on the north-eastern side of Stanthorpe, near Dalveen, but needed to gain knowledge or information on how the temperatures and seasons in that area compared to his existing production site. After asking several “locals”, they “thought” it would be slightly warmer in winter at Dalveen, with fewer frosts but similar summer temperatures.

Below we used Climate Monitor’s “historical analysis” capability to investigate and compare the two farm locations of interest. It is slightly warmer at Dalveen than at Amiens during winter.

*Climate Monitor allows the user to easily compare the actual July and December Median temperatures at both locations– providing certainty, enhancing knowledge and improving decision-making.*

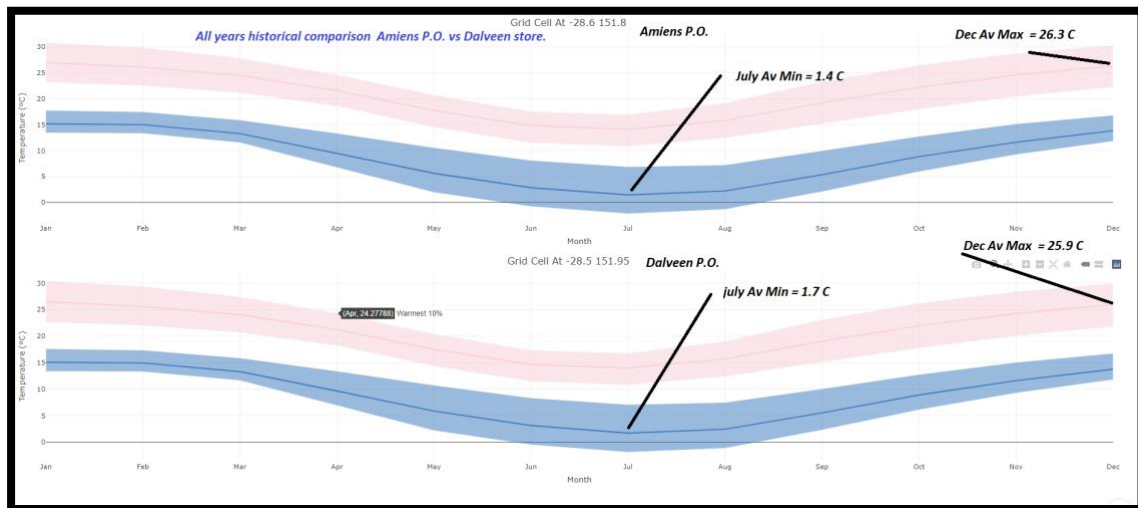


Figure 20. Climate Monitor's detailed analysis and graphical display of the monthly temperature range at the requested farm comparison locations.

*Climate Monitor – analyses years of **complex climate data** and provides **accurate, easily understood graphical information** as requested by the user.*

*Complex data is analysed and graphed – **allowing informed, science-based decisions.***



Figure 21. The two farming locations are only 25 km apart, but the climatic and growing conditions between the two farms are quite different. These differences will impact crop quality and yield potential. A Climate Monitor analysis quickly highlights and quantifies these differences.

**Thanks to Climate Monitor - the business manager had better information and could make a better, more informed decision.**