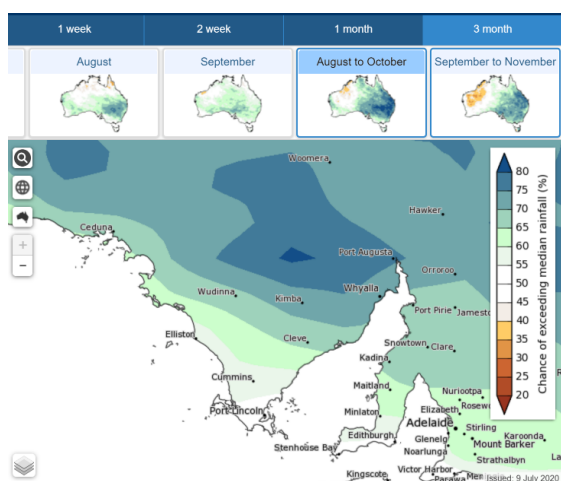


## Climate Information for eight reference sites Resilient EP

[Dane.Thomas@sa.gov.au](mailto:Dane.Thomas@sa.gov.au) and [Peter.Hayman@sa.gov.au](mailto:Peter.Hayman@sa.gov.au) SARDI Climate Applications 14<sup>th</sup> June 2020

This document contains climate information from SARDI climate applications. *After 2 pages of background, there are 3 pages for each of the eight sites.* Feedback is welcome.

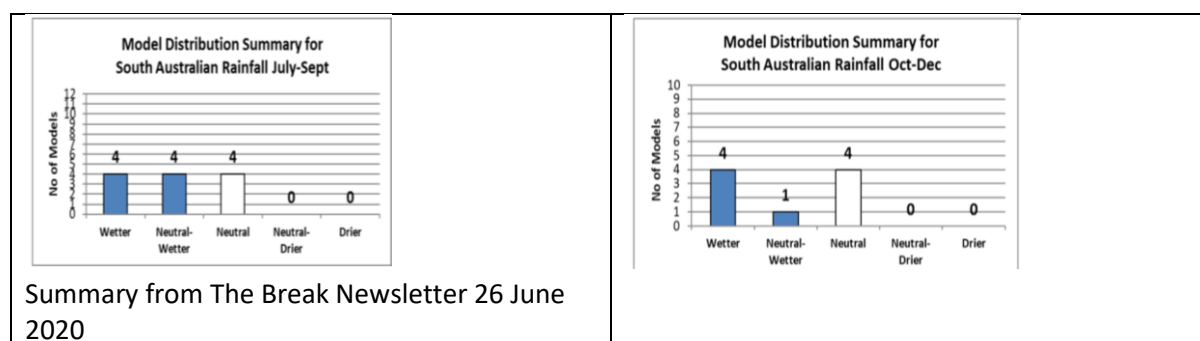
**Sorry, this is not a forecast or even a summary of forecasts.** There are many sources of forecast information and guidance on climate drivers etc. Our judgement is that we are unlikely to add value with another one. At SARDI Climate Applications we are primarily interested in RD&E on how climate information is used in decision making. The BoM forecast is readily available. In recent times there are more updates (issued Thursdays and Mondays) and more periods (weeks, months and seasons).



<http://www.bom.gov.au/climate/outlooks/#/overview/summary>

We are also funded by GRDC to support Agriculture Victoria with the Break

<https://grdc.com.au/news-and-media/newsletters/fast-break/south-australia>



The rest of this document address three questions.

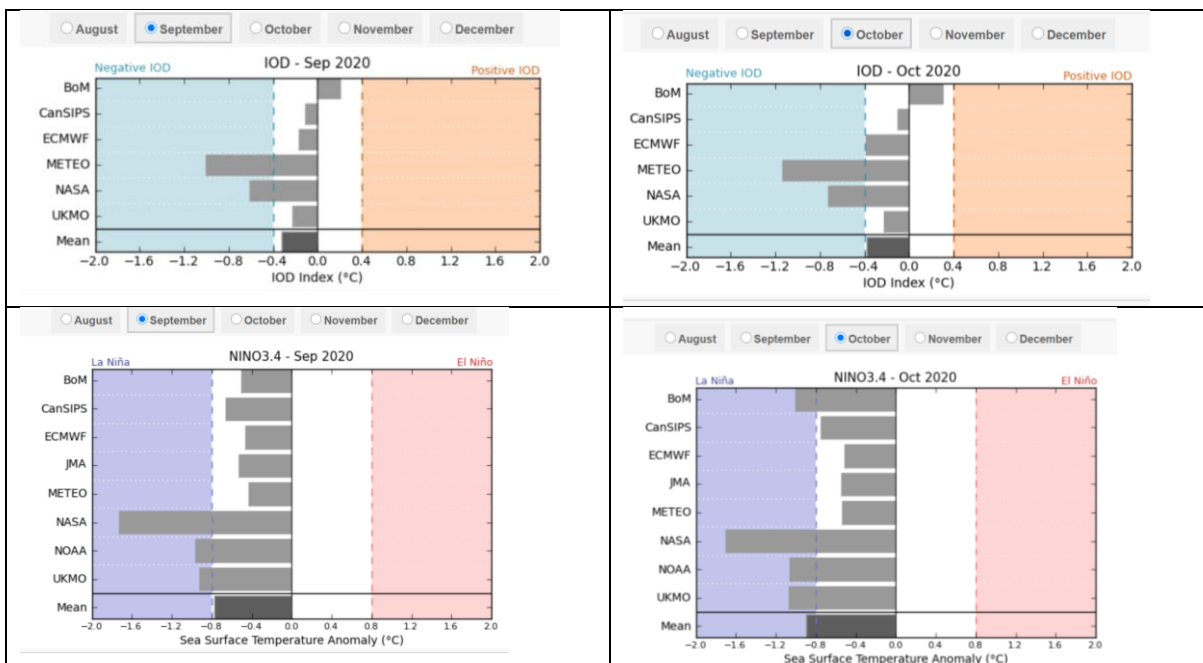
1. **How is the growing season tracking in terms of rainfall, temperature and evaporation?** This complements the YieldProphet runs for each site. Most sites are decile 3 to 5 for rainfall and running a bit cooler than the long term average. For a given sowing time, we would expect crops to be slightly behind some of the recent warm years.

2. **Given the season tracking to date (e.g. decile 3 at Minnipa and decile 5 at Lock), what is the possible range of final April to October rainfall deciles?** Decile tracking is not a forecast, however as pointed out by Reg French, it does provide a check on where the season as a whole can end up. For

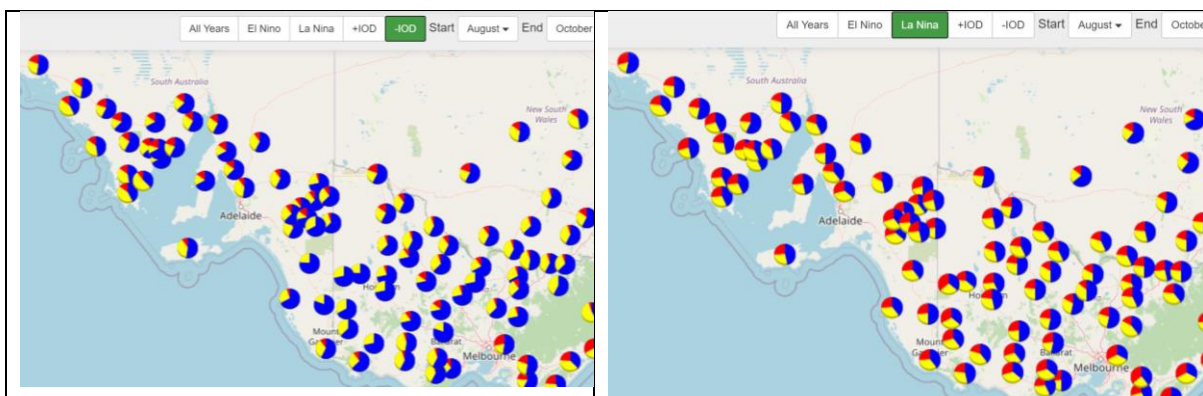
most of the eight sites, the chance of a wetter than decile 7 April to October season is reduced from 30% at the start of the season, to less than 15% now. This is not based on any assumptions about spring, simply that most decile 7 or wetter seasons need to have received more rain by mid-July. This raises the question of what are the chances of a good spring?

**3. Should growers on EP pay attention to discussion on negative IOD and/or La Nina? What has been the historical pattern of these climate drivers on the eight sites?**

If you have been following the outlook for this season there has been commentary on a Negative IOD and a La Nina developing. Both the Pacific and Indian Ocean are neutral at the moment. The site <http://www.bom.gov.au/climate/model-summary/> provides a summary of international climate models and shows a tendency, but no guarantee, for a Negative IOD and La Nina. The fast break (web reference shown earlier) provides commentary on this as does the BoM climate driver summary. The panels below were updated on 13 July. The next update will be 12 August.



Historically a Negative IOD and La Nina have been associated with wetter springs in EP, with a bigger swing to a wet spring from IOD than La Nina. This can be shown on the forecasts4 profit climate tool developed by Agriculture Victoria, SARDI and Federation University with funding from GRDC <https://climatetool.forecasts4profit.com.au/>



This stronger swing to a wetter spring with Negative IOD than La Nina is also shown in the plume graphs for the eight sites.

## Resilient EP

Date: 14 July 2020

SARDI Climate Applications

Rainfall tracking

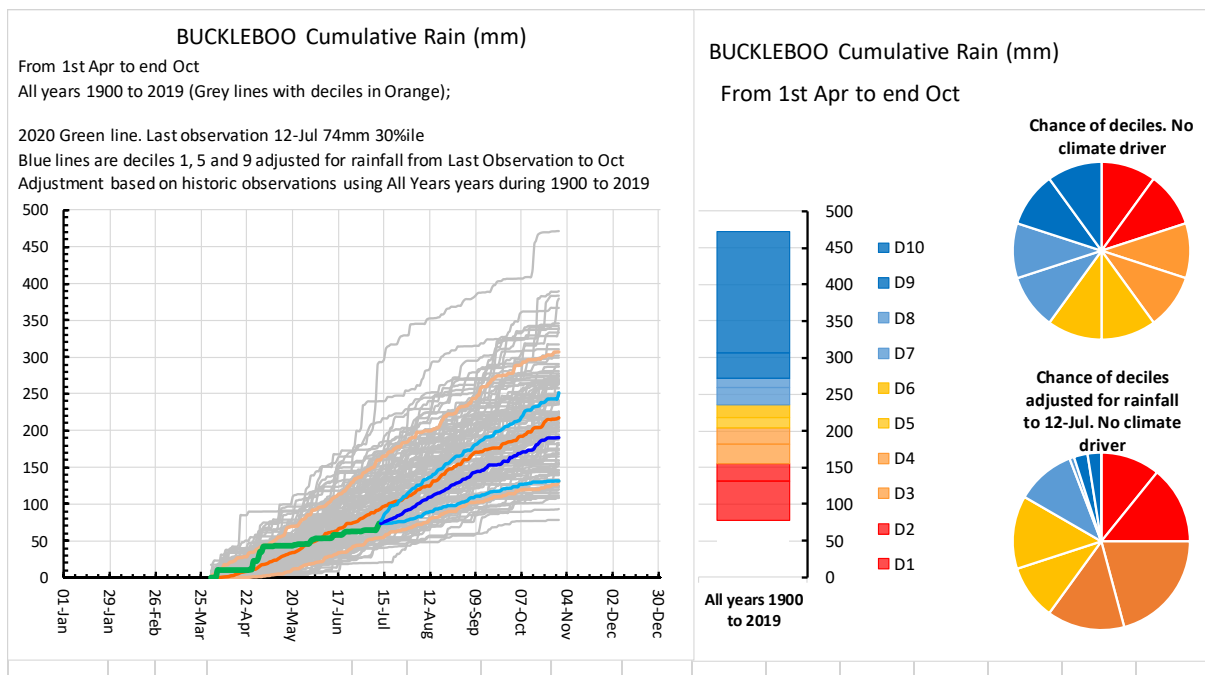
Influence of rain to date no growing season rainfall

Influence of climate drivers on growing season rainfall

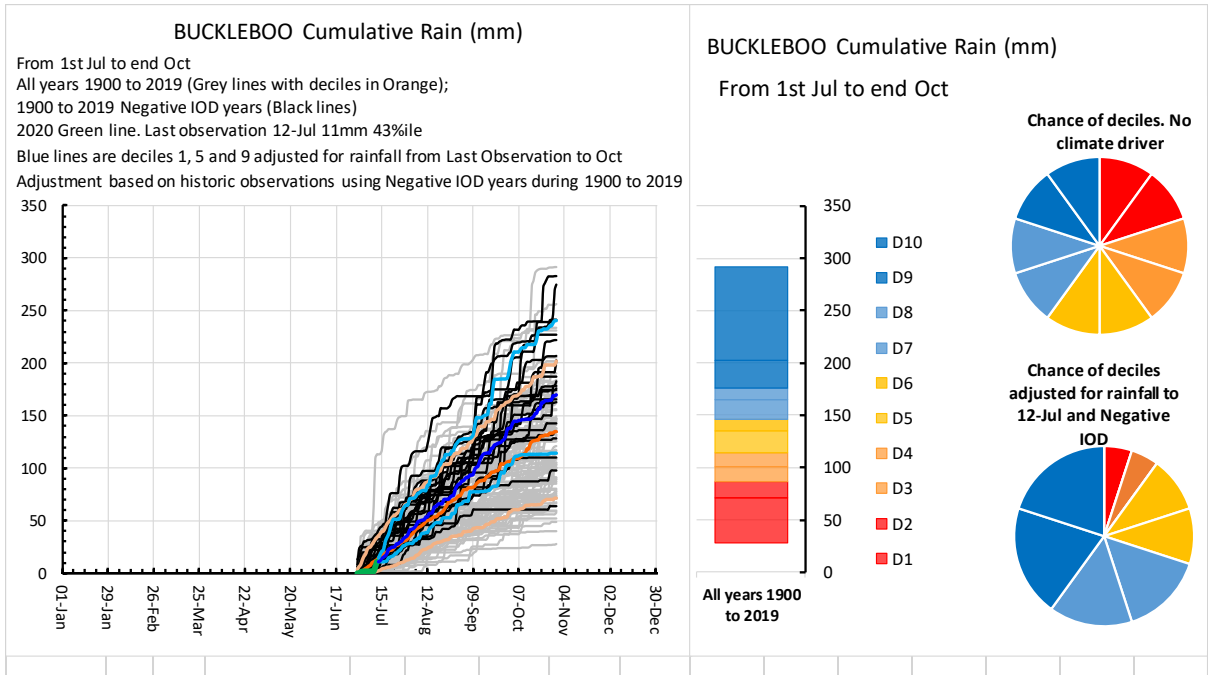
## Contents

Buckleboo .....	4
Cummins .....	7
Lock .....	10
Minnipa Agricultural Centre .....	13
Port Lincoln (Big Swamp) .....	16
Port Lincoln (Woolga) .....	19
Waddikee .....	22
Wharminda .....	25
Explanation of the weather tracking figures.....	28

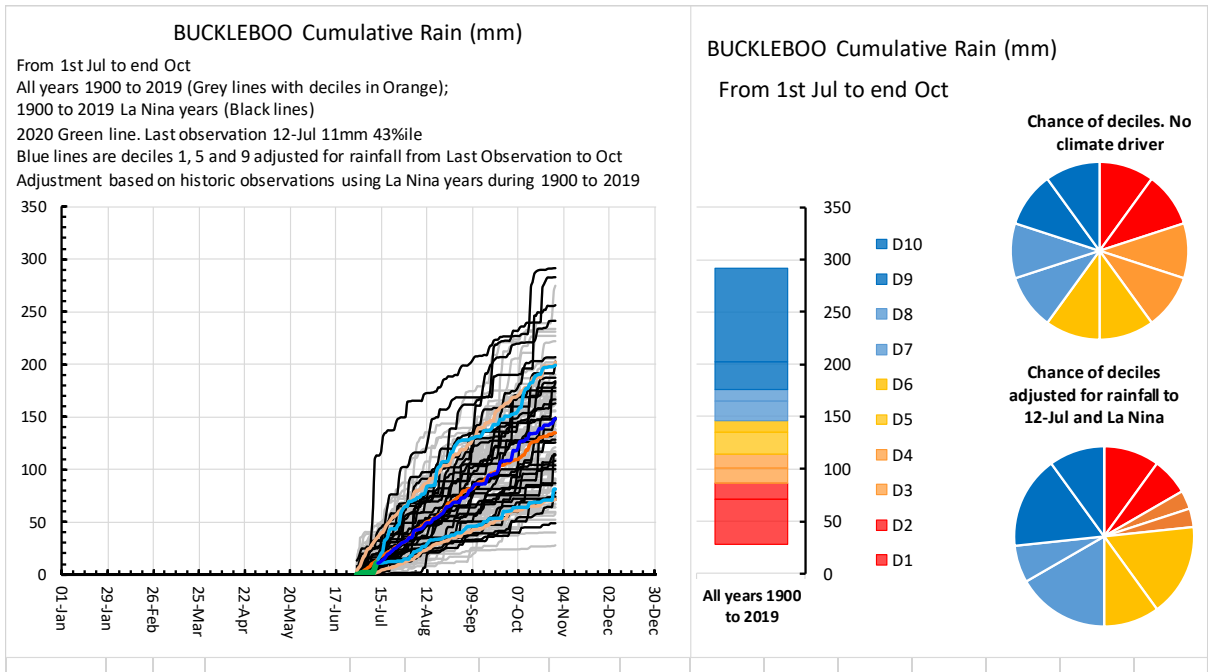
**Buckleboo.** Historic cumulative April to October rain (mm) (grey lines) from 1900 to 2019 with the 2020 season to 12<sup>th</sup> July (green). Years categorised as a climate driver year (ENSO categories of La Niña or El Niño, or IOD categories of Negative IOD or Positive IOD) are not shown. The deciles (1<sup>st</sup>, median and 9<sup>th</sup>) for the April to October period are shown (orange), along with deciles adjusted for rain to date (blue). The bar chart shows the rainfall corresponding of each decile for the April to October period. The upper pie chart shows the chance of each decile of April to October rain occurring without the influence of climate drivers. The lower pie chart shows the chance of April to October rainfall deciles adjusted for rain that has occurred by 12<sup>th</sup> July.



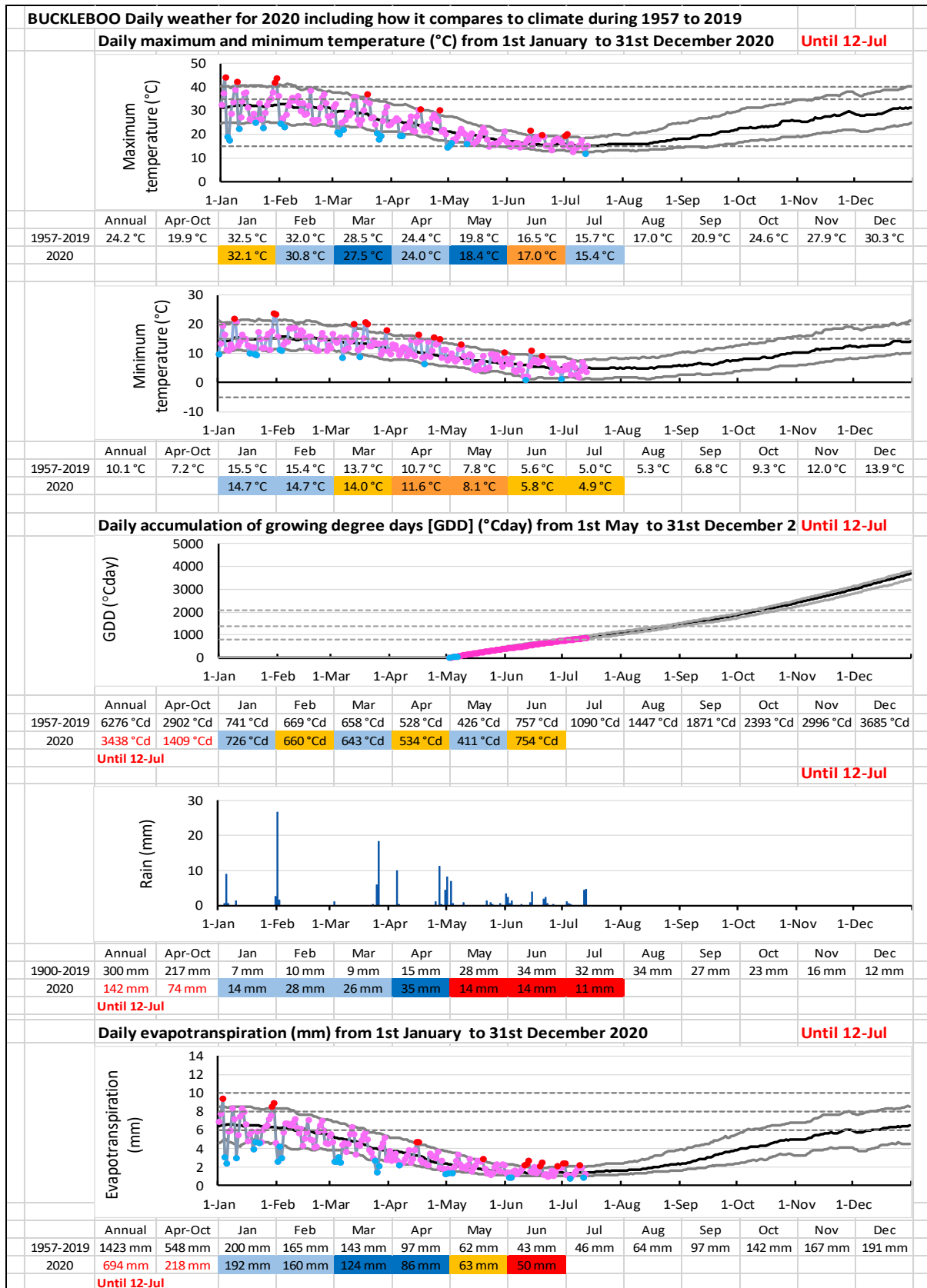
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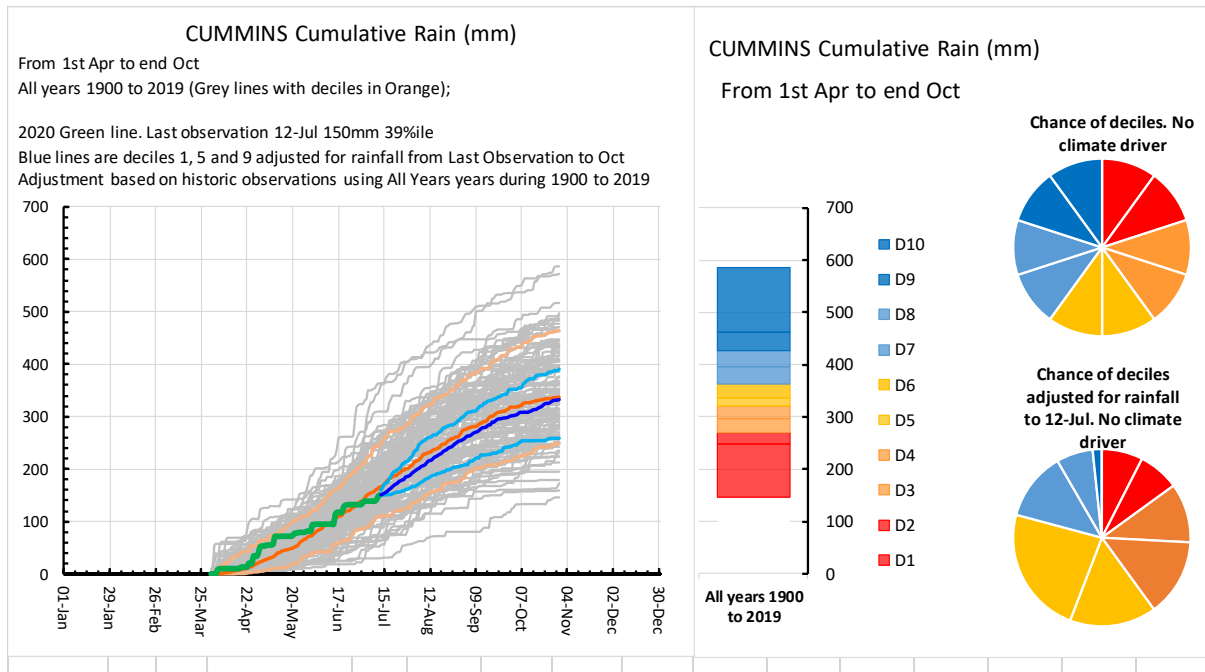
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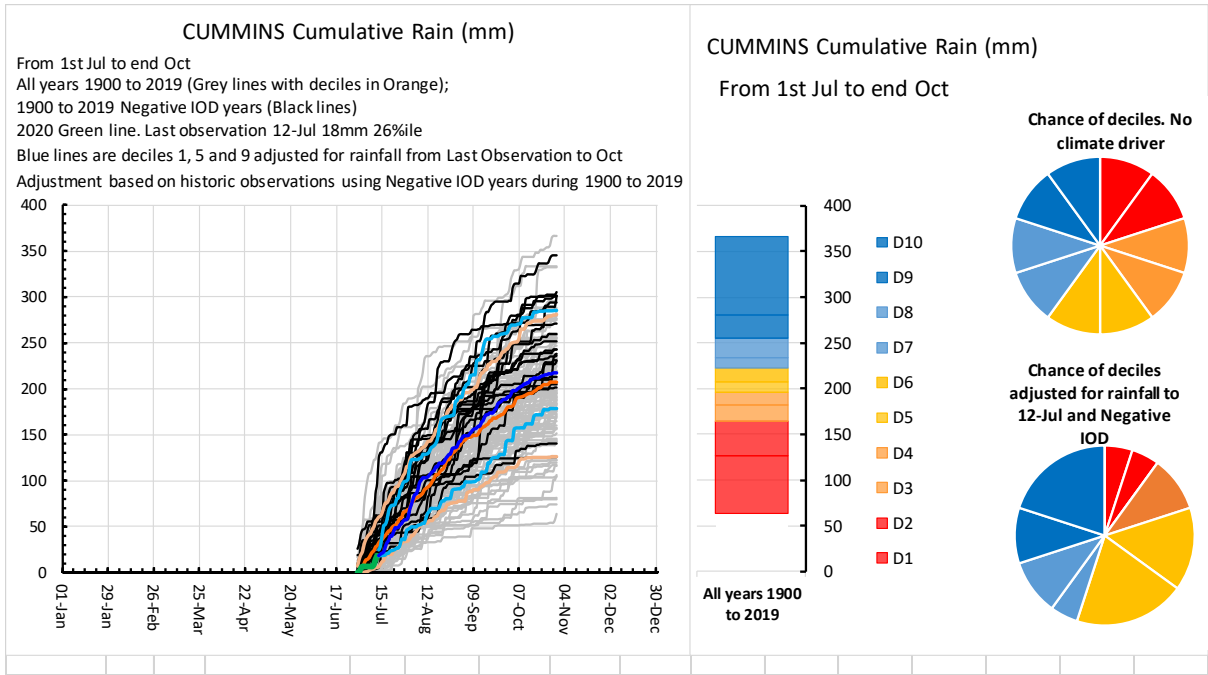
Weather during 2020 is shown in the following figures. A full description of the figures is available at the end of the document.



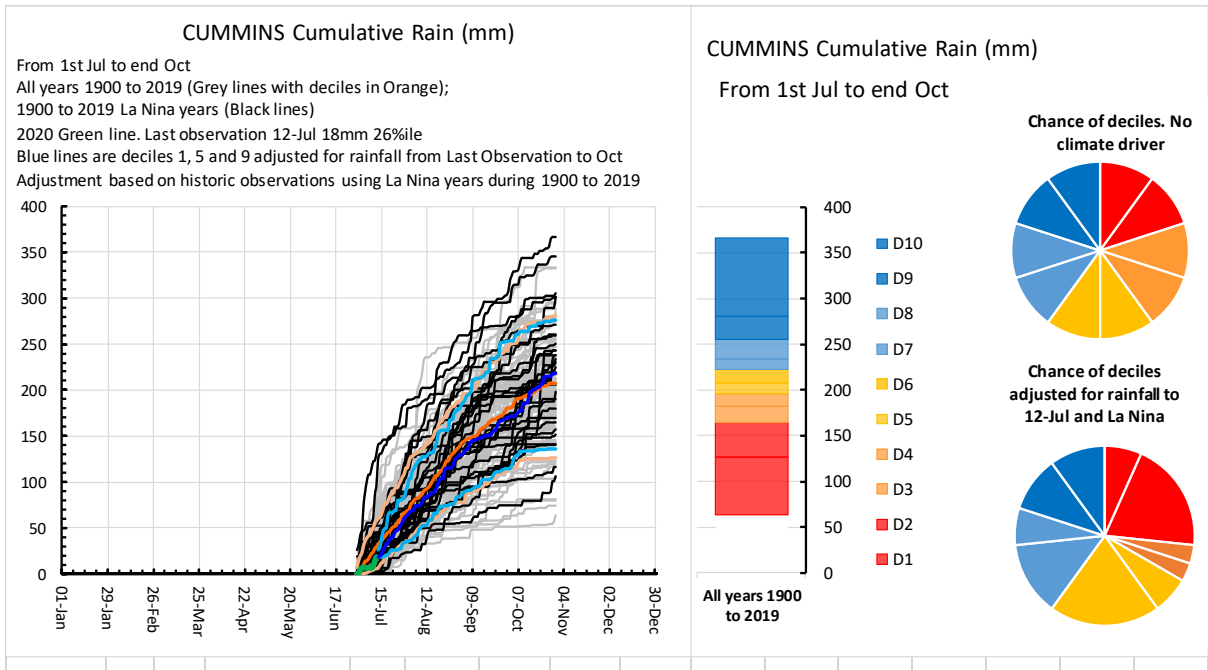
**Cummins.** Historic cumulative April to October rain (mm) (grey lines) from 1900 to 2019 with the 2020 season to 12<sup>th</sup> July (green). Years categorised as a climate driver year (ENSO categories of La Niña or El Niño, or IOD categories of Negative IOD or Positive IOD) are not shown. The deciles (1<sup>st</sup>, median and 9<sup>th</sup>) for the April to October period are shown (orange), along with deciles adjusted for rain to date (blue). The bar chart shows the rainfall corresponding of each decile for the April to October period. The upper pie chart shows the chance of each decile of April to October rain occurring without the influence of climate drivers. The lower pie chart shows the chance of April to October rainfall deciles adjusted for rain that has occurred by 12<sup>th</sup> July.



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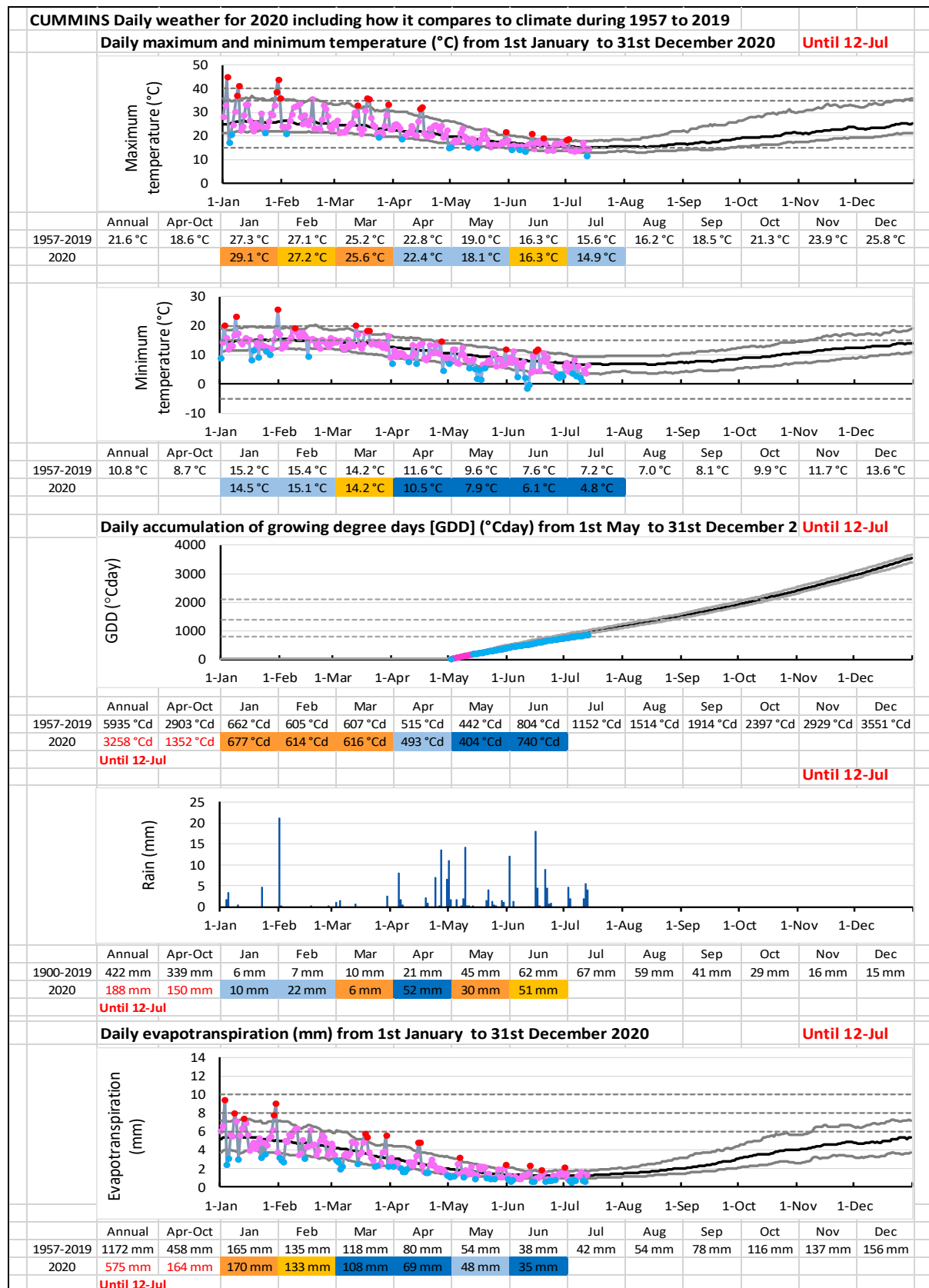


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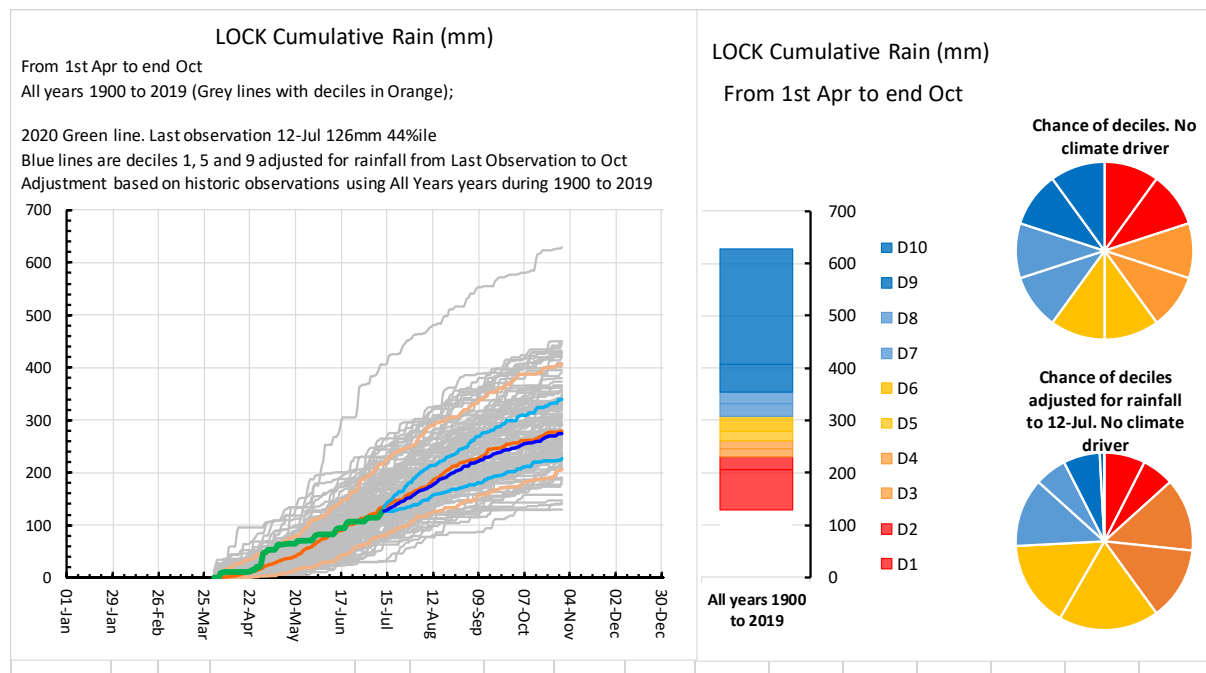




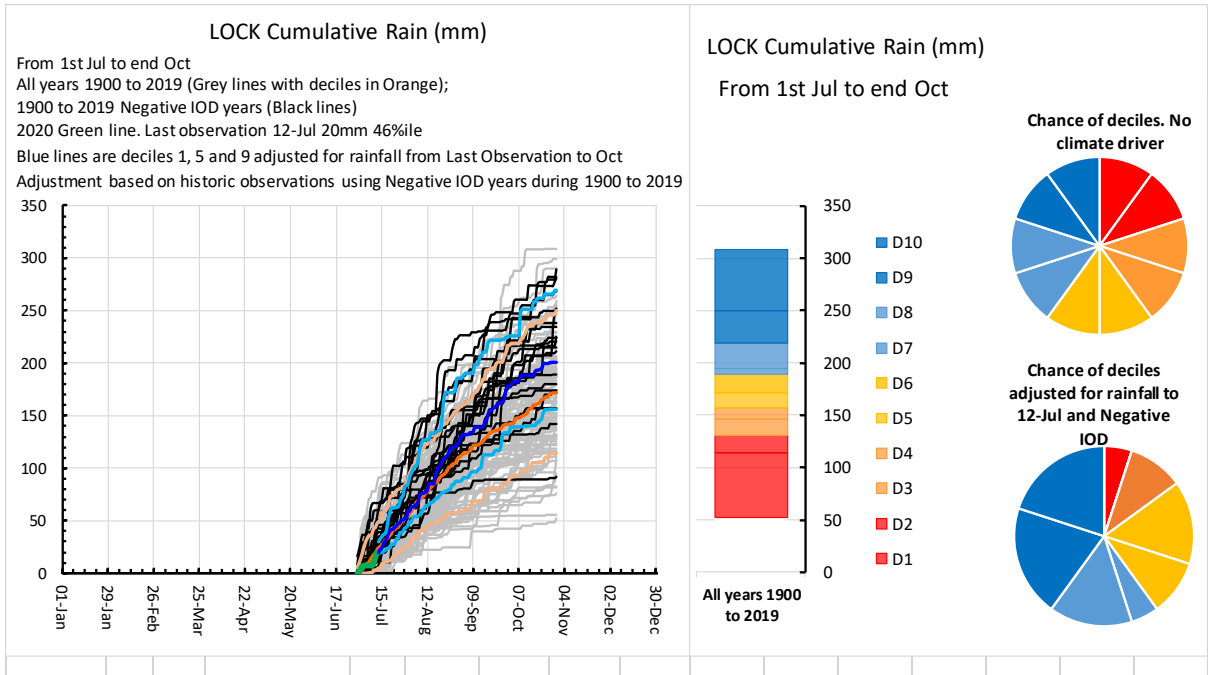
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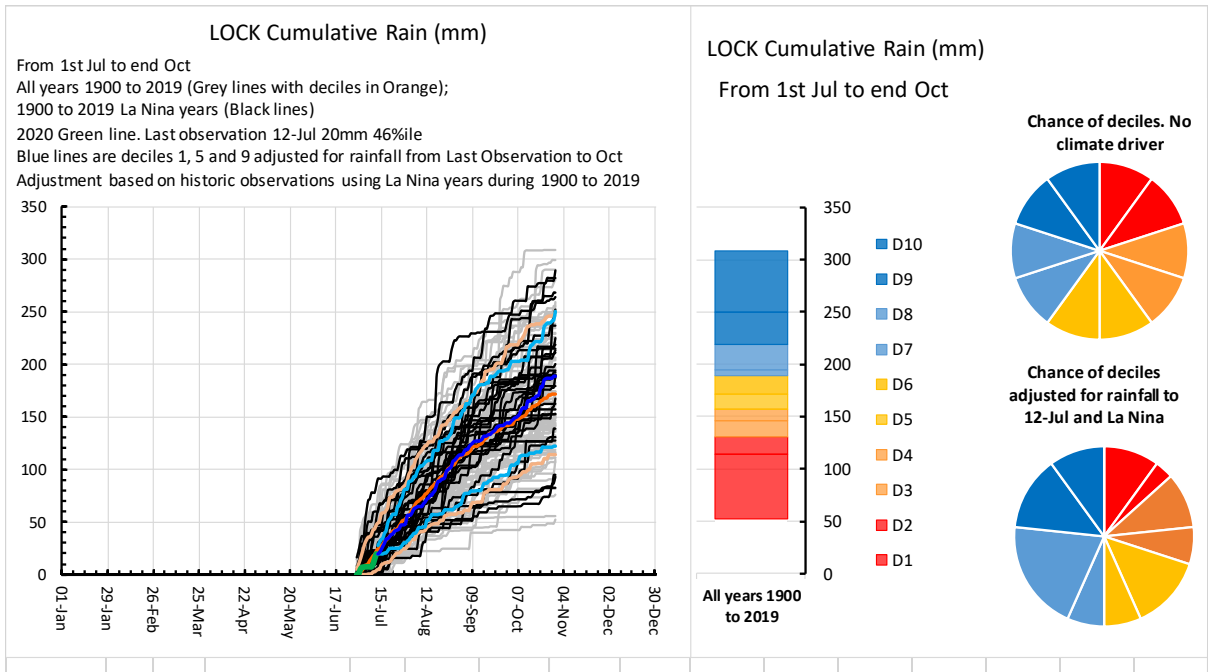
**Lock.** Historic cumulative April to October rain (mm) (grey lines) from 1900 to 2019 with the 2020 season to 12<sup>th</sup> July (green). Years categorised as a climate driver year (ENSO categories of La Niña or El Niño, or IOD categories of Negative IOD or Positive IOD) are not shown. The deciles (1<sup>st</sup>, median and 9<sup>th</sup>) for the April to October period are shown (orange), along with deciles adjusted for rain to date (blue). The bar chart shows the rainfall corresponding of each decile for the April to October period. The upper pie chart shows the chance of each decile of April to October rain occurring without the influence of climate drivers. The lower pie chart shows the chance of April to October rainfall deciles adjusted for rain that has occurred by 12<sup>th</sup> July.



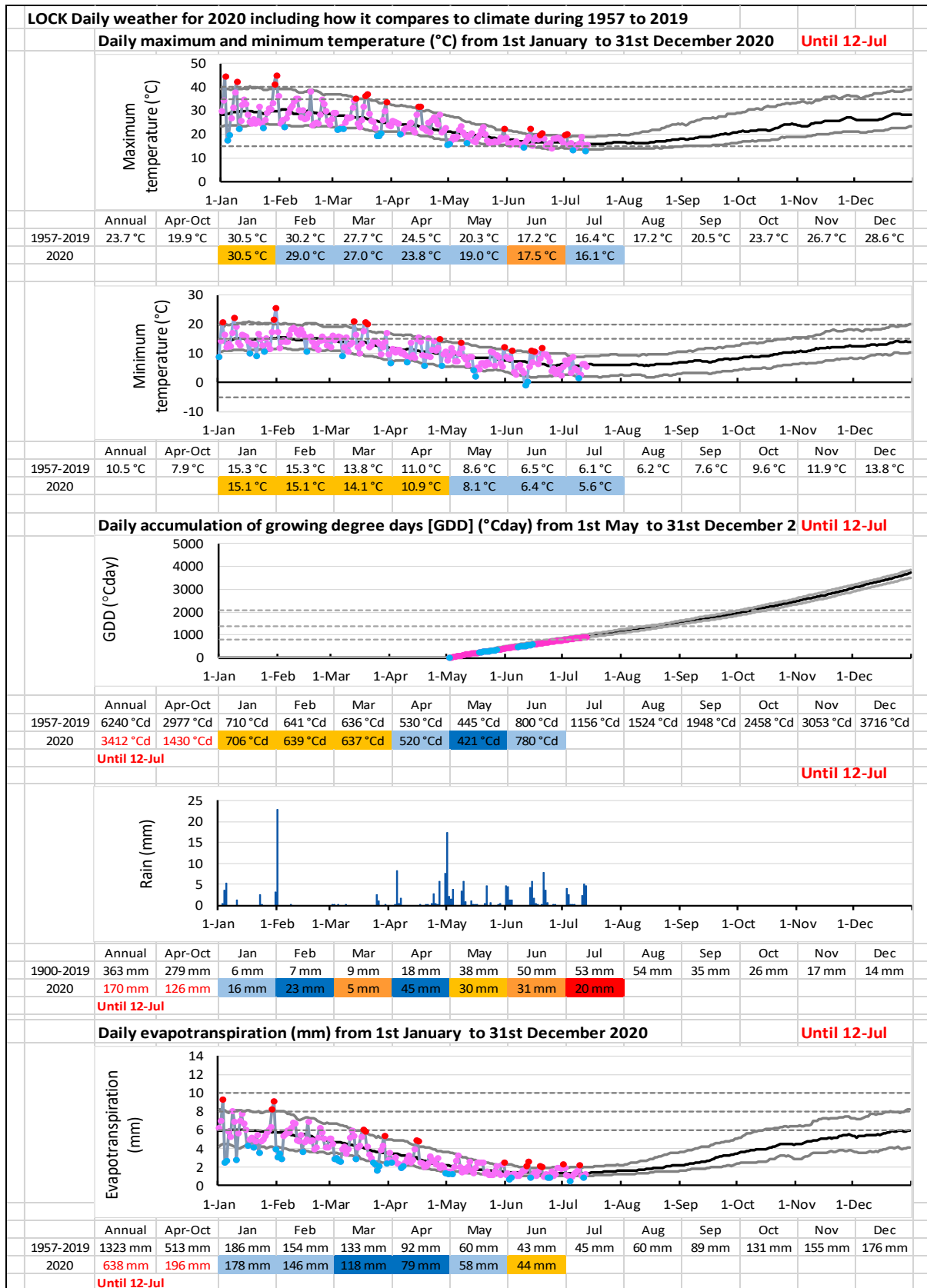
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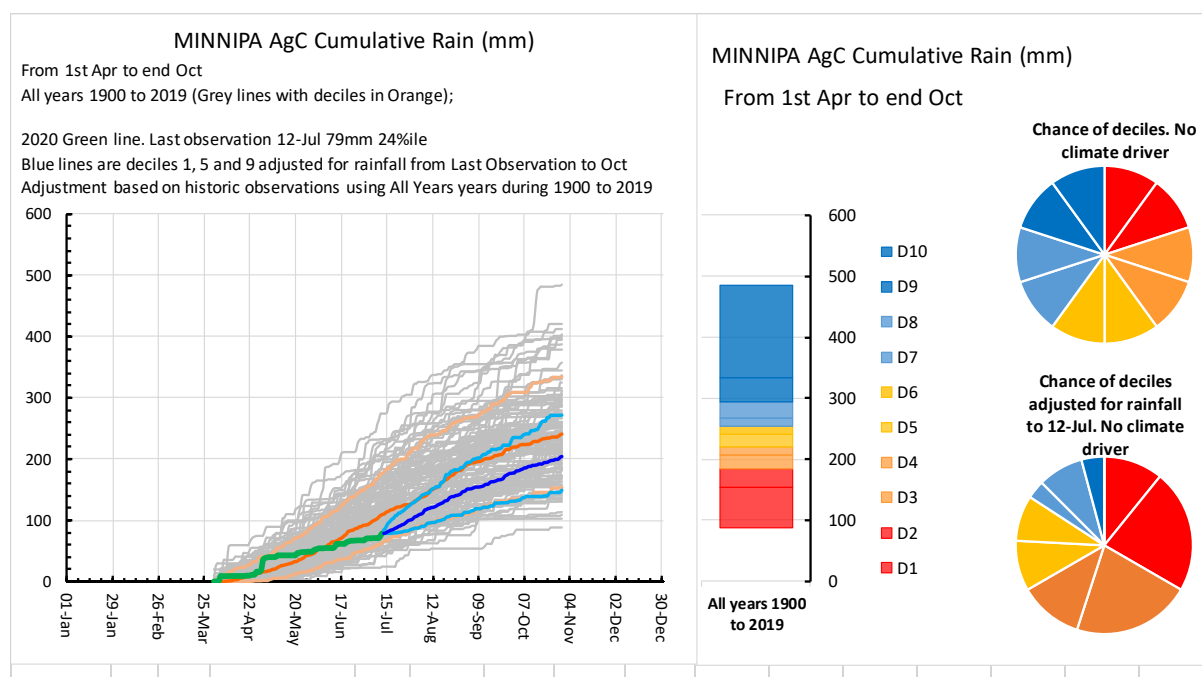
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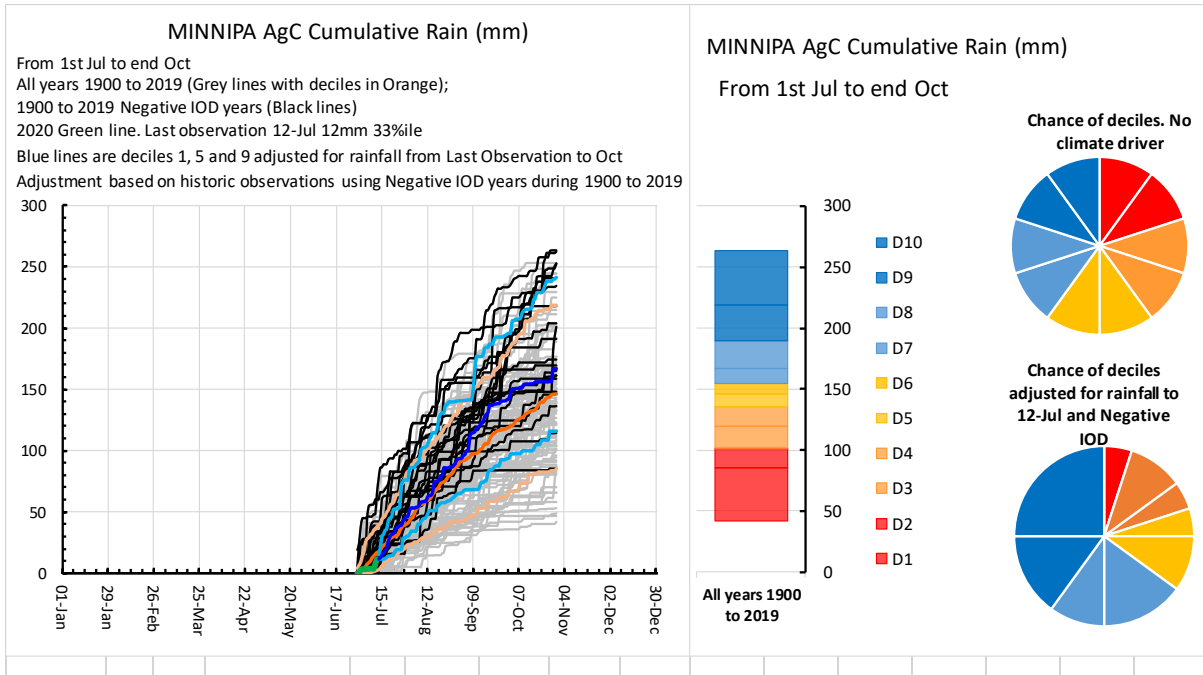
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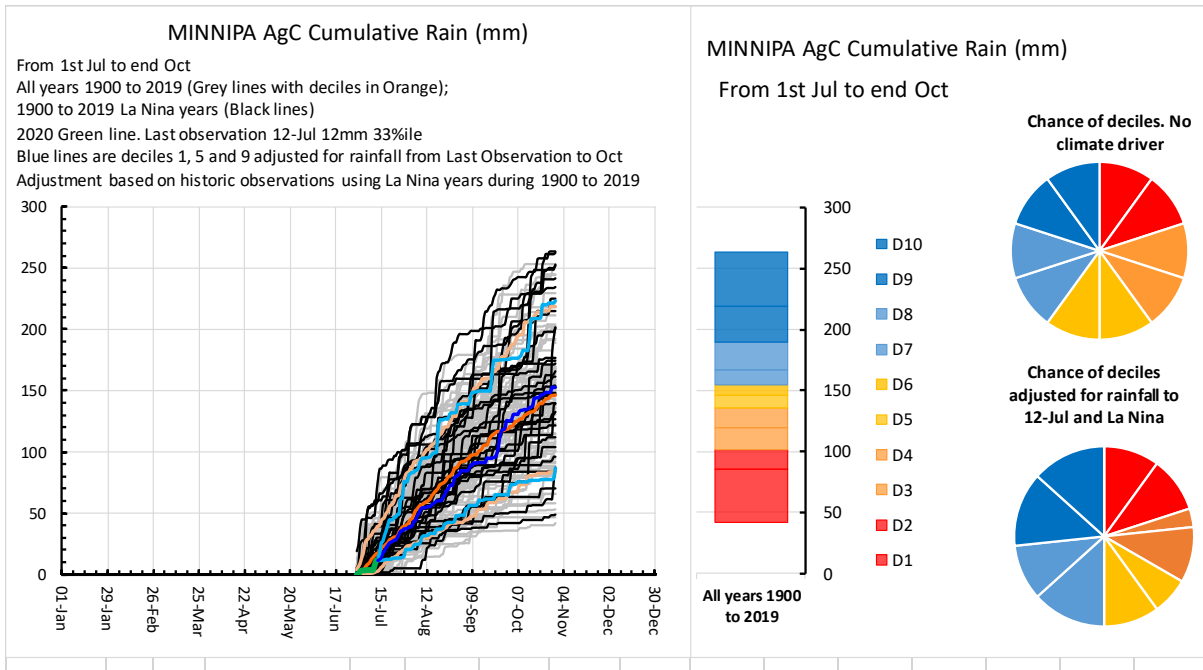
**Minnipa Agricultural Centre.** Historic cumulative April to October rain (mm) (grey lines) from 1900 to 2019 with the 2020 season to 12<sup>th</sup> July (green). Years categorised as a climate driver year (ENSO categories of La Niña or El Niño, or IOD categories of Negative IOD or Positive IOD) are not shown. The deciles (1<sup>st</sup>, median and 9<sup>th</sup>) for the April to October period are shown (orange), along with deciles adjusted for rain to date (blue). The bar chart shows the rainfall corresponding of each decile for the April to October period. The upper pie chart shows the chance of each decile of April to October rain occurring without the influence of climate drivers. The lower pie chart shows the chance of April to October rainfall deciles adjusted for rain that has occurred by 12<sup>th</sup> July.



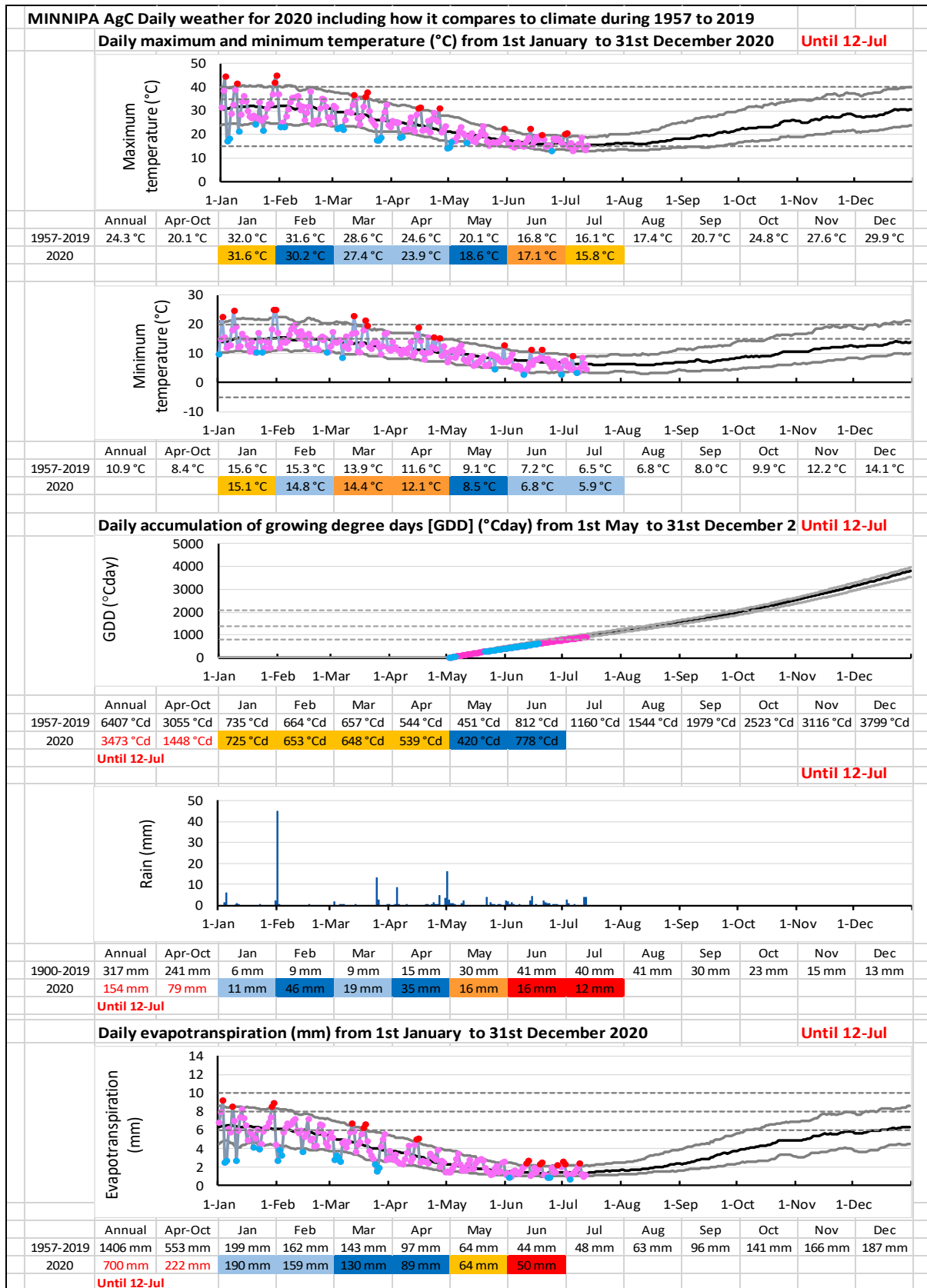
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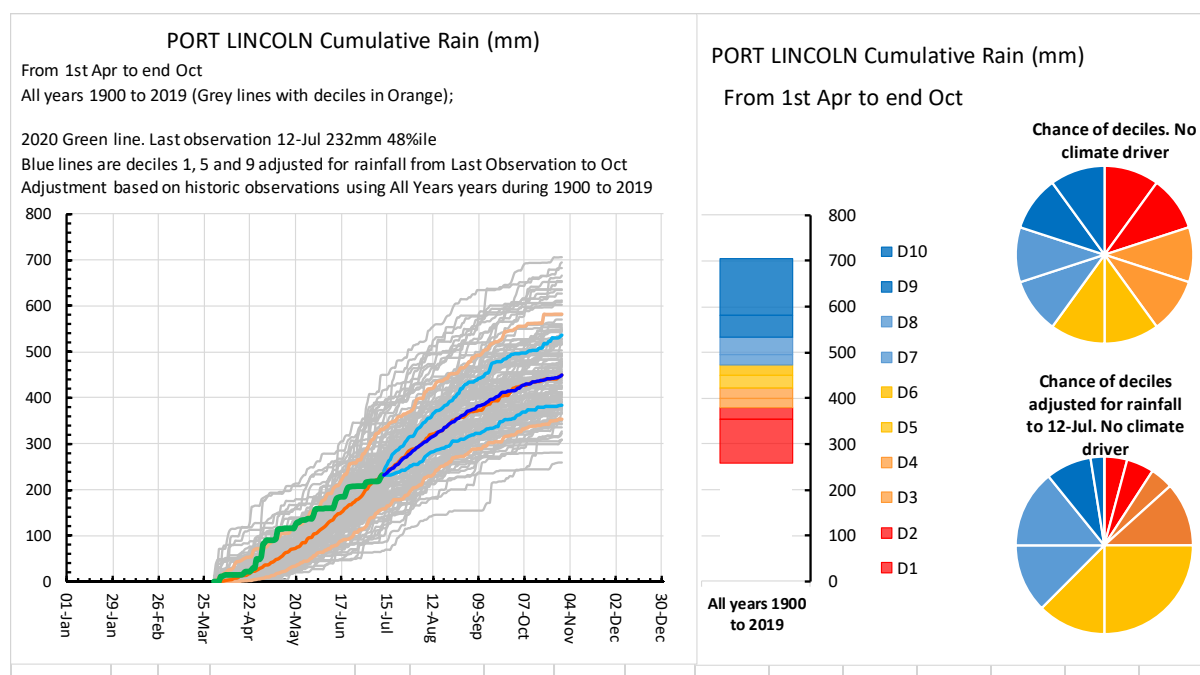
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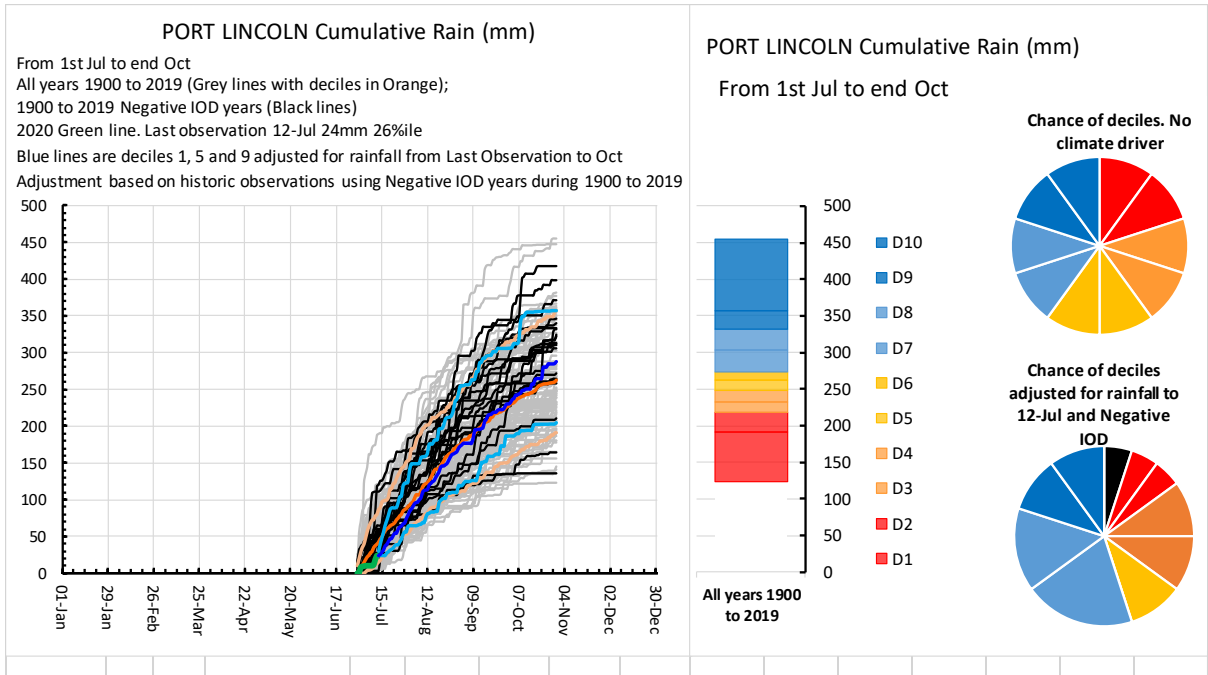


Port Lincoln (Big Swamp). Historic cumulative April to October rain (mm) (grey lines) from 1900 to 2019 with the 2020 season to 12<sup>th</sup> July (green). Years categorised as a climate driver year (ENSO categories of La Niña or El Niño, or IOD categories of Negative IOD or Positive IOD) are not shown. The deciles (1<sup>st</sup>, median and 9<sup>th</sup>) for the April to October period are shown (orange), along with deciles adjusted for rain to date (blue). The bar chart shows the rainfall corresponding of each decile for the April to October period. The upper pie chart shows the chance of each decile of April to October rain occurring without the influence of climate drivers. The lower pie chart shows the chance of April to October rainfall deciles adjusted for rain that has occurred by 12<sup>th</sup> July.

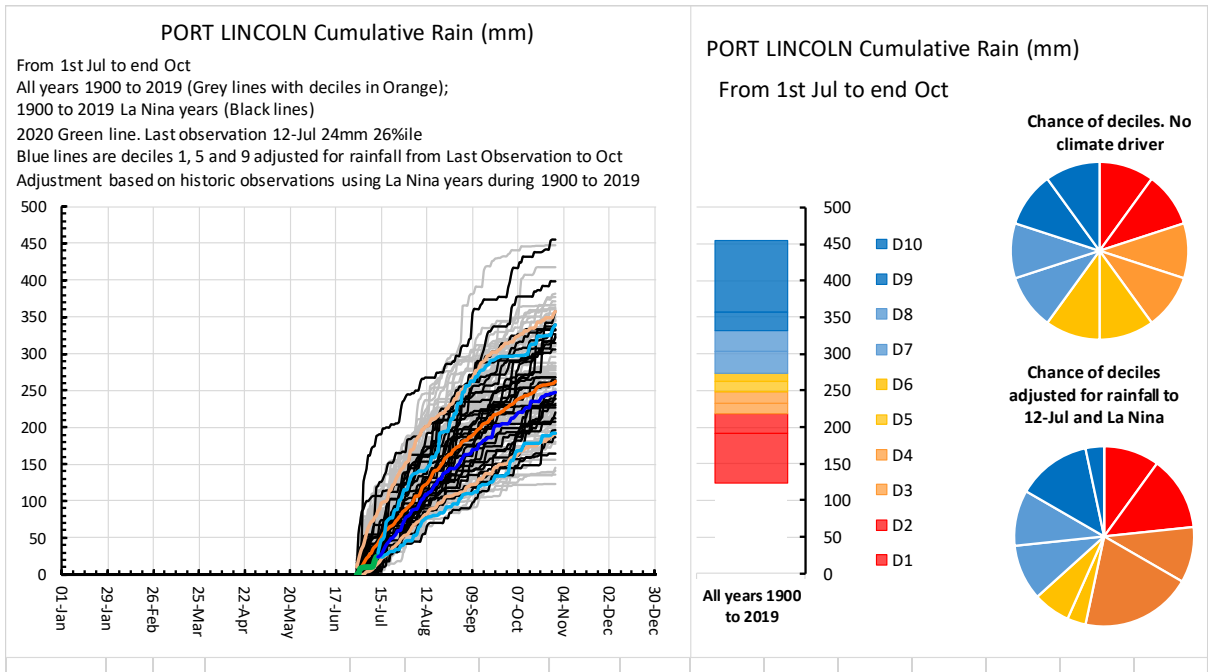


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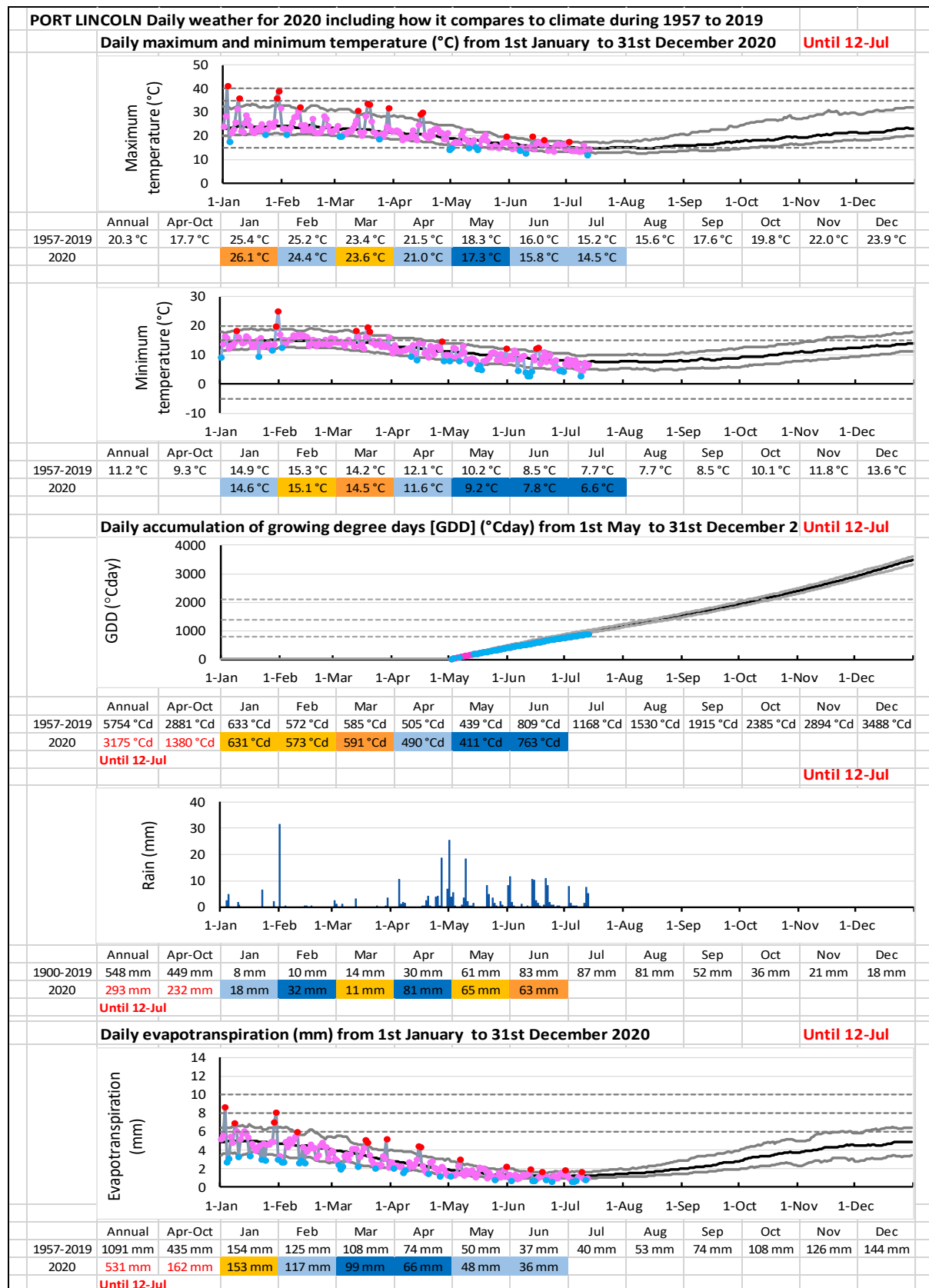




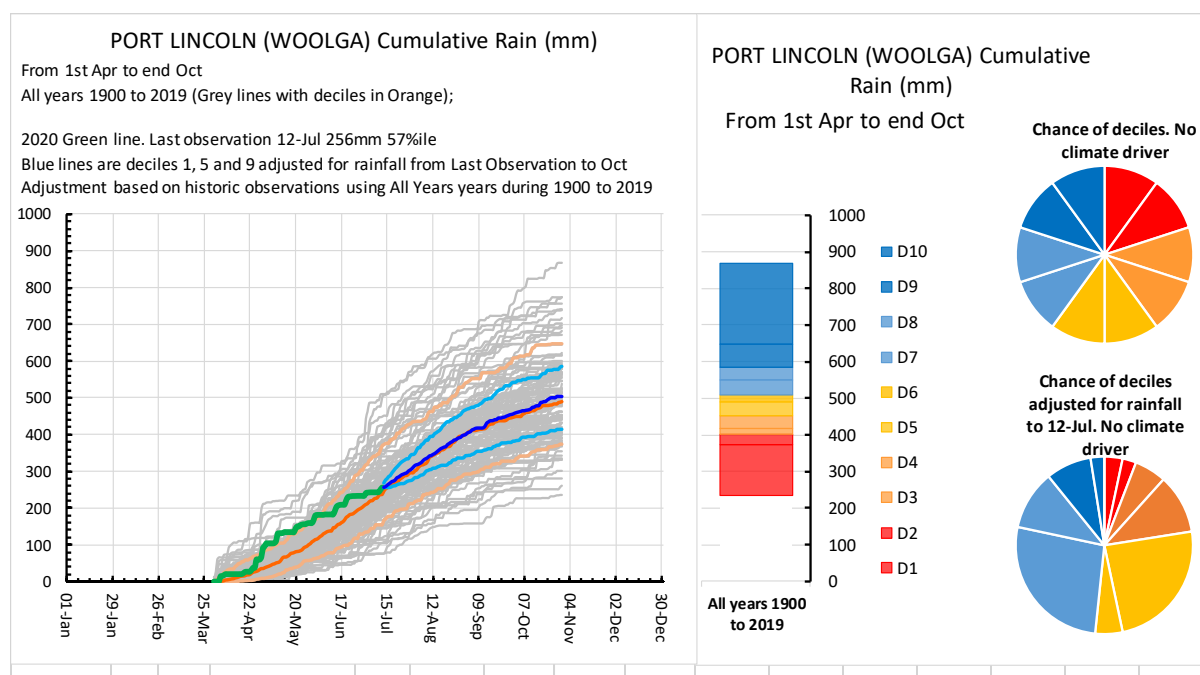
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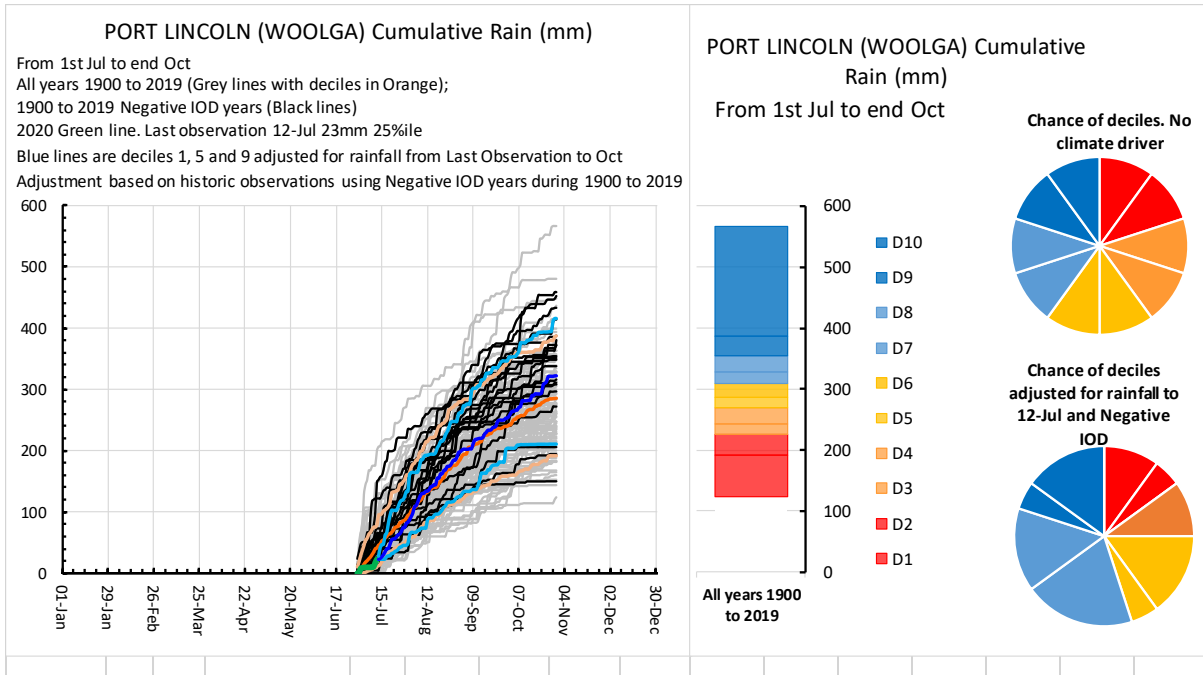
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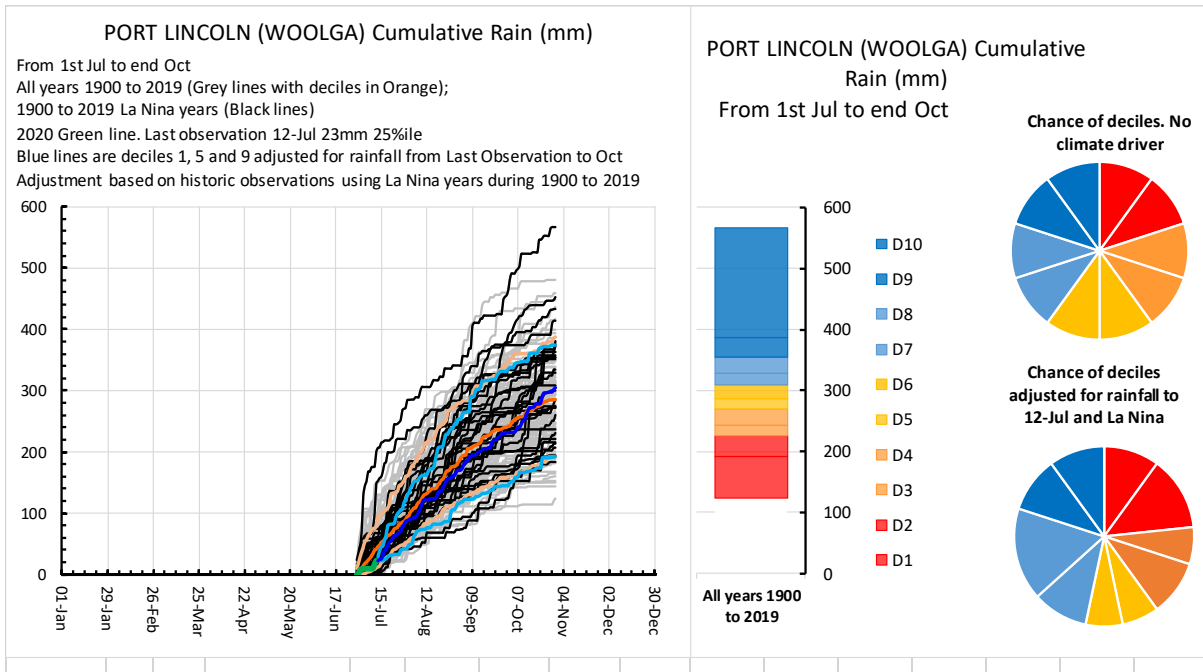
Port Lincoln (Woolga). Historic cumulative April to October rain (mm) (grey lines) from 1900 to 2019 with the 2020 season to 12<sup>th</sup> July (green). Years categorised as a climate driver year (ENSO categories of La Niña or El Niño, or IOD categories of Negative IOD or Positive IOD) are not shown. The deciles (1<sup>st</sup>, median and 9<sup>th</sup>) for the April to October period are shown (orange), along with deciles adjusted for rain to date (blue). The bar chart shows the rainfall corresponding of each decile for the April to October period. The upper pie chart shows the chance of each decile of April to October rain occurring without the influence of climate drivers. The lower pie chart shows the chance of April to October rainfall deciles adjusted for rain that has occurred by 12<sup>th</sup> July.



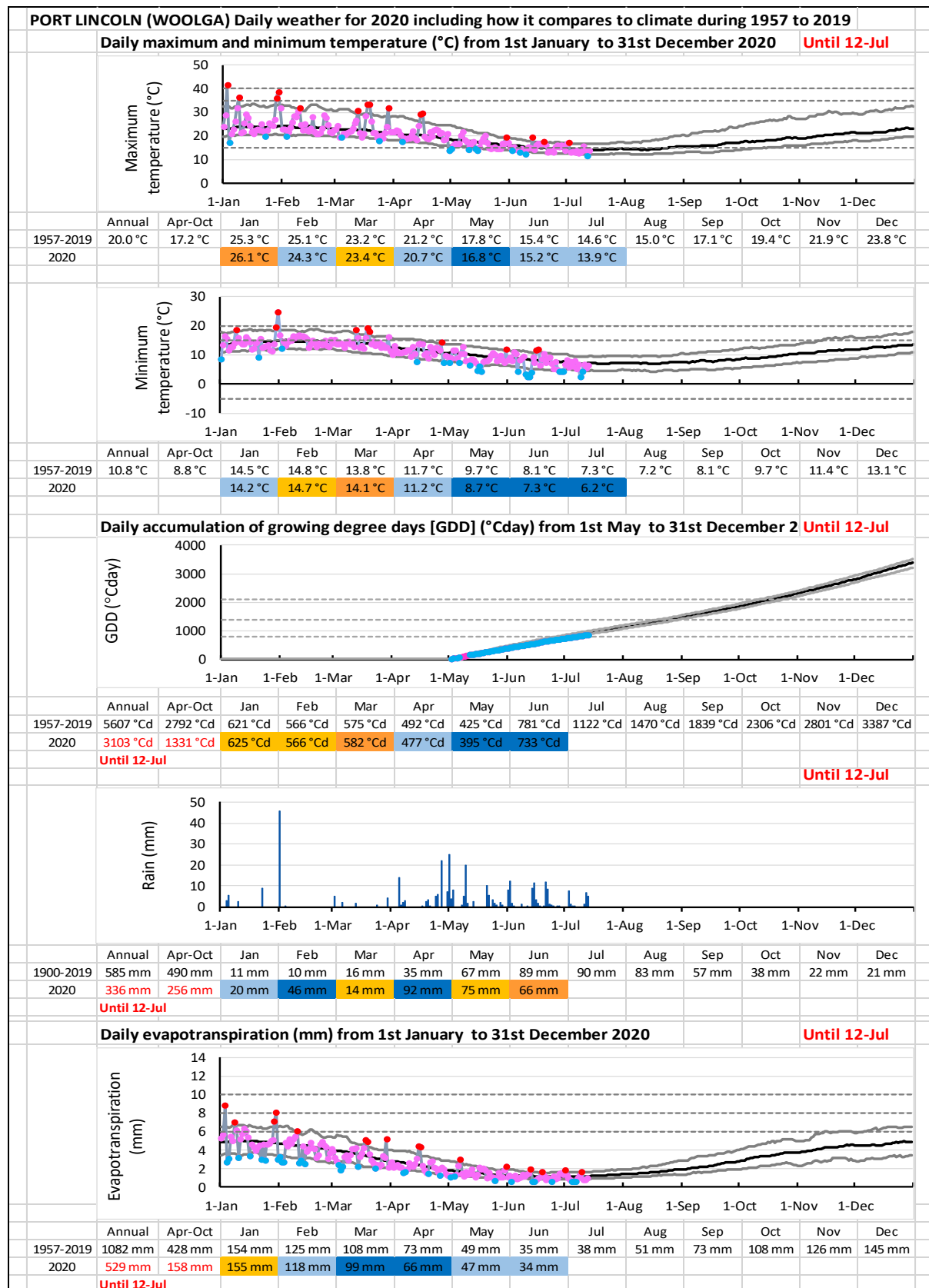
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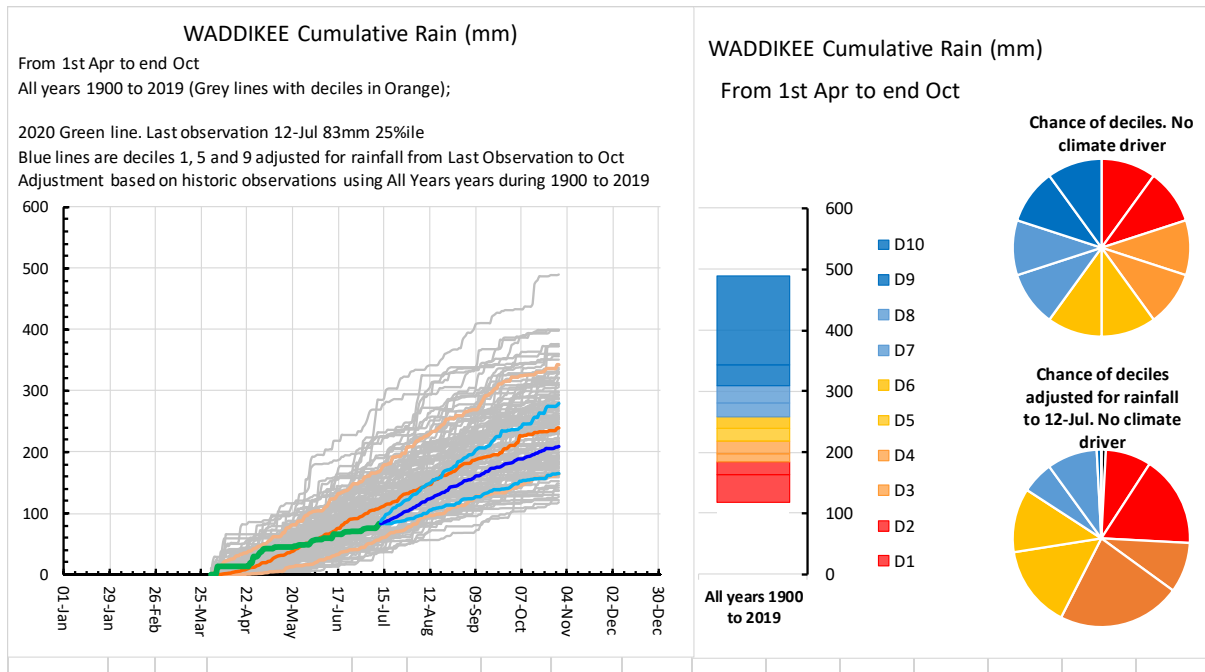
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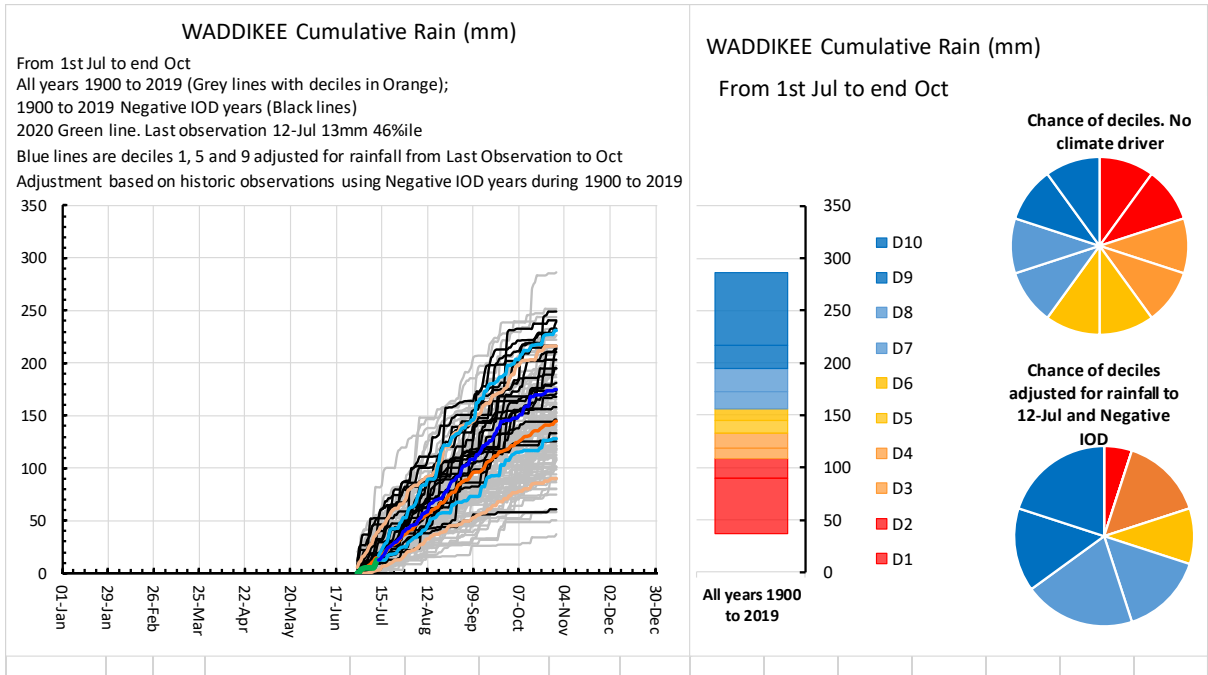
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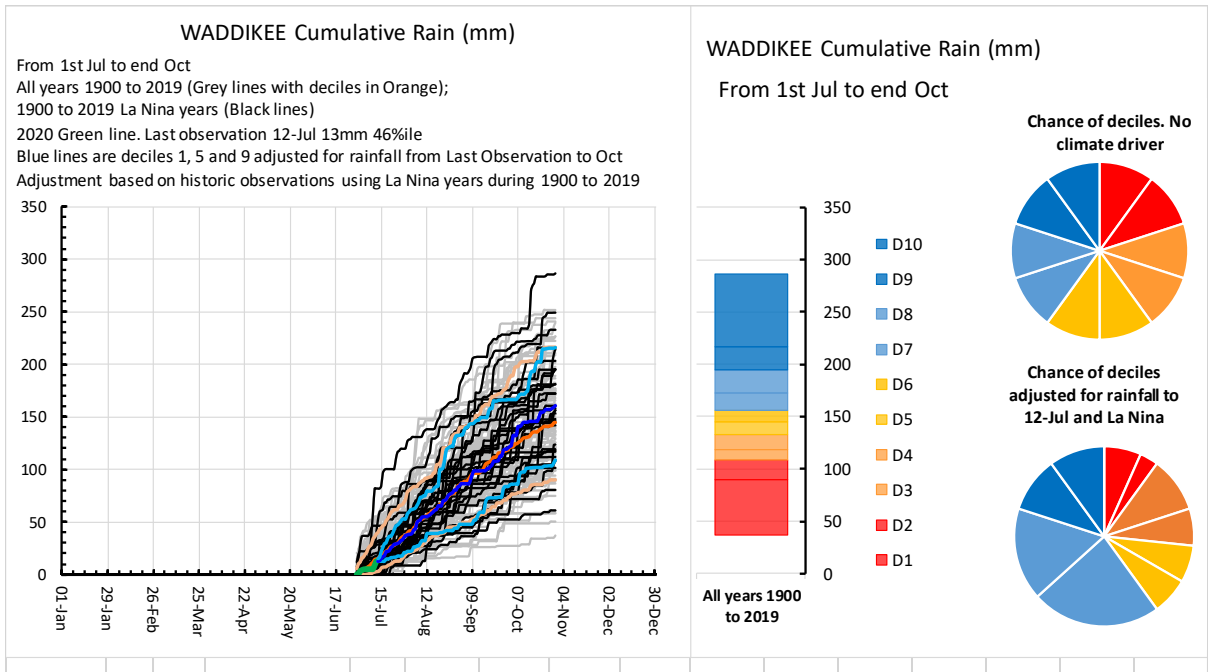
**Waddikee.** Historic cumulative April to October rain (mm) (grey lines) from 1900 to 2019 with the 2020 season to 12<sup>th</sup> July (green). Years categorised as a climate driver year (ENSO categories of La Niña or El Niño, or IOD categories of Negative IOD or Positive IOD) are not shown. The deciles (1<sup>st</sup>, median and 9<sup>th</sup>) for the April to October period are shown (orange), along with deciles adjusted for rain to date (blue). The bar chart shows the rainfall corresponding of each decile for the April to October period. The upper pie chart shows the chance of each decile of April to October rain occurring without the influence of climate drivers. The lower pie chart shows the chance of April to October rainfall deciles adjusted for rain that has occurred by 12<sup>th</sup> July.



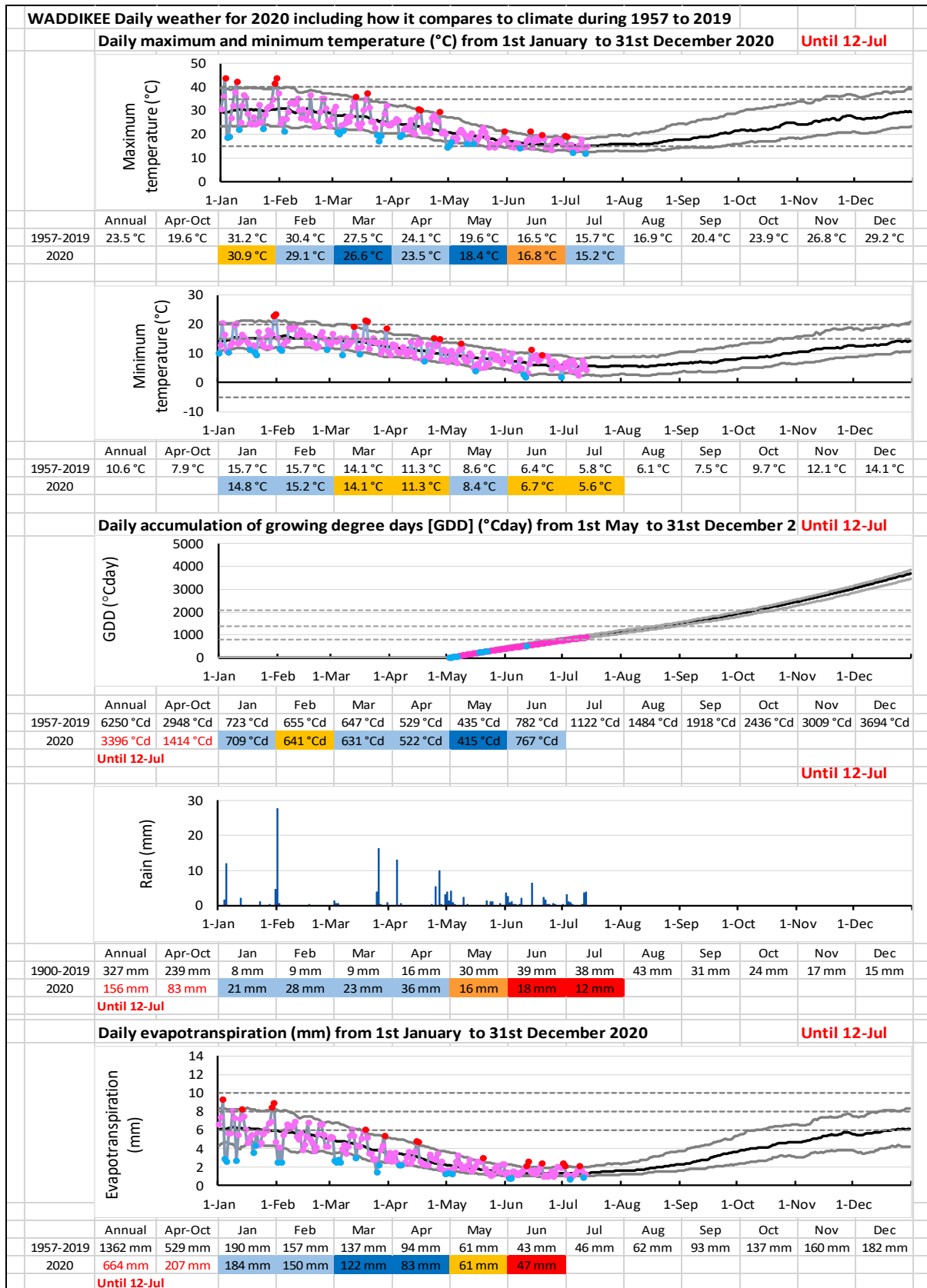
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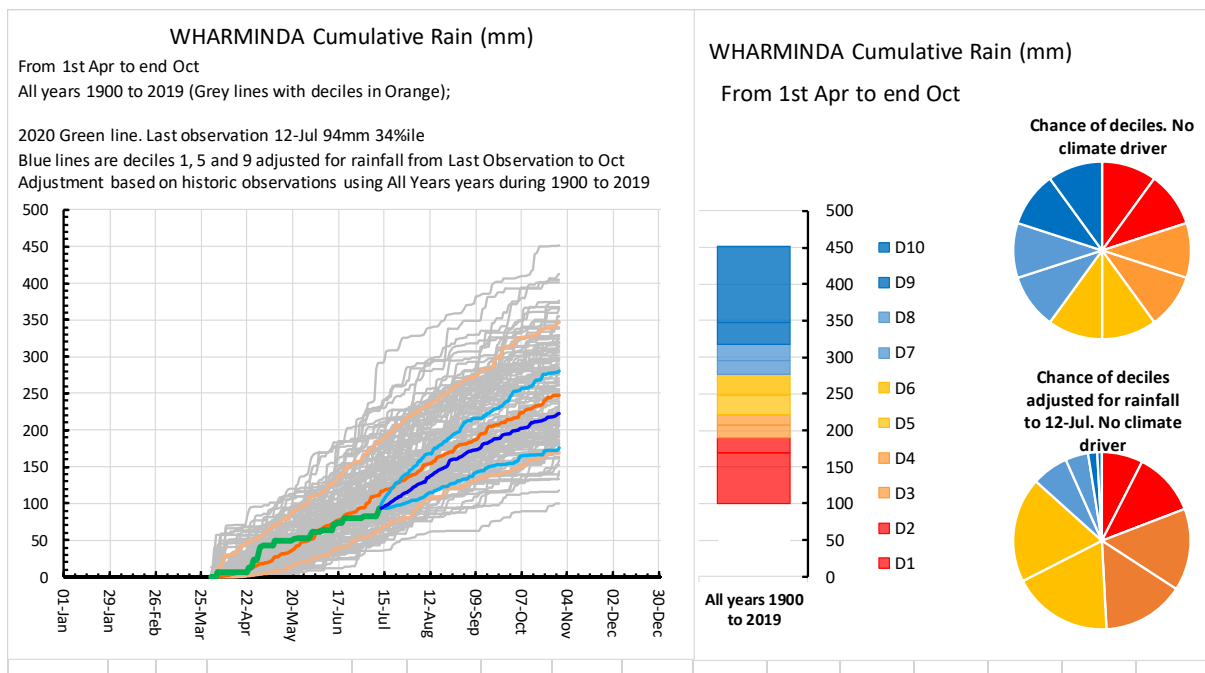


Weather during 2020 is shown in the following figures. A full description of the figures is available at the end of the document.

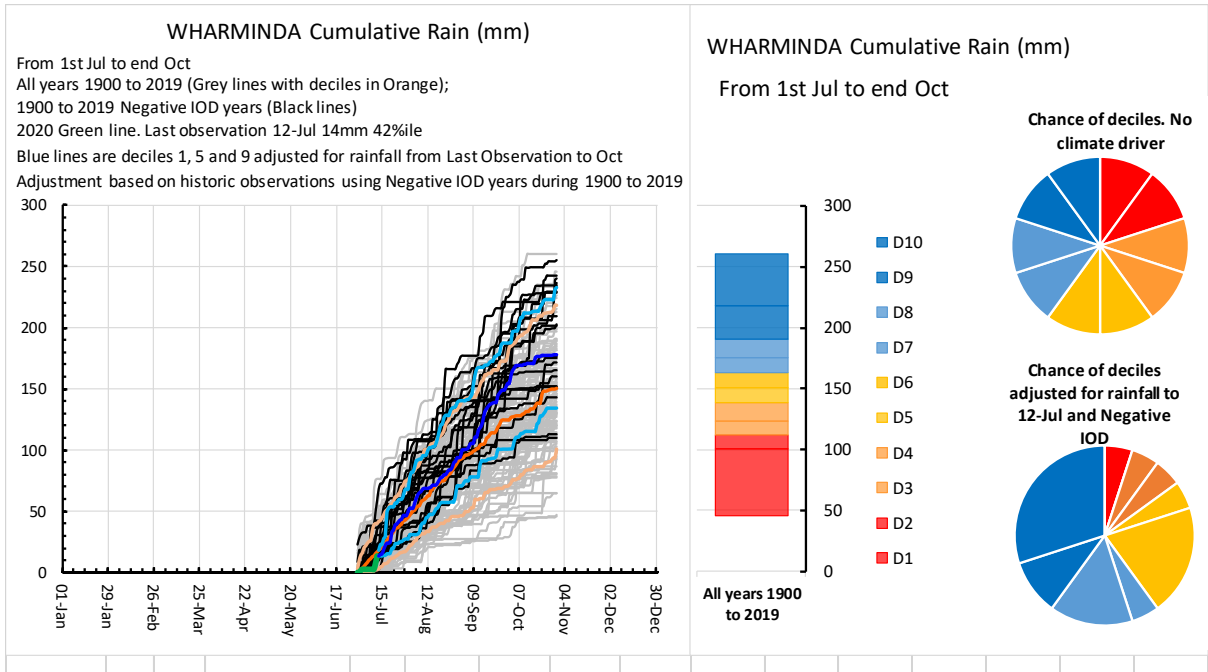




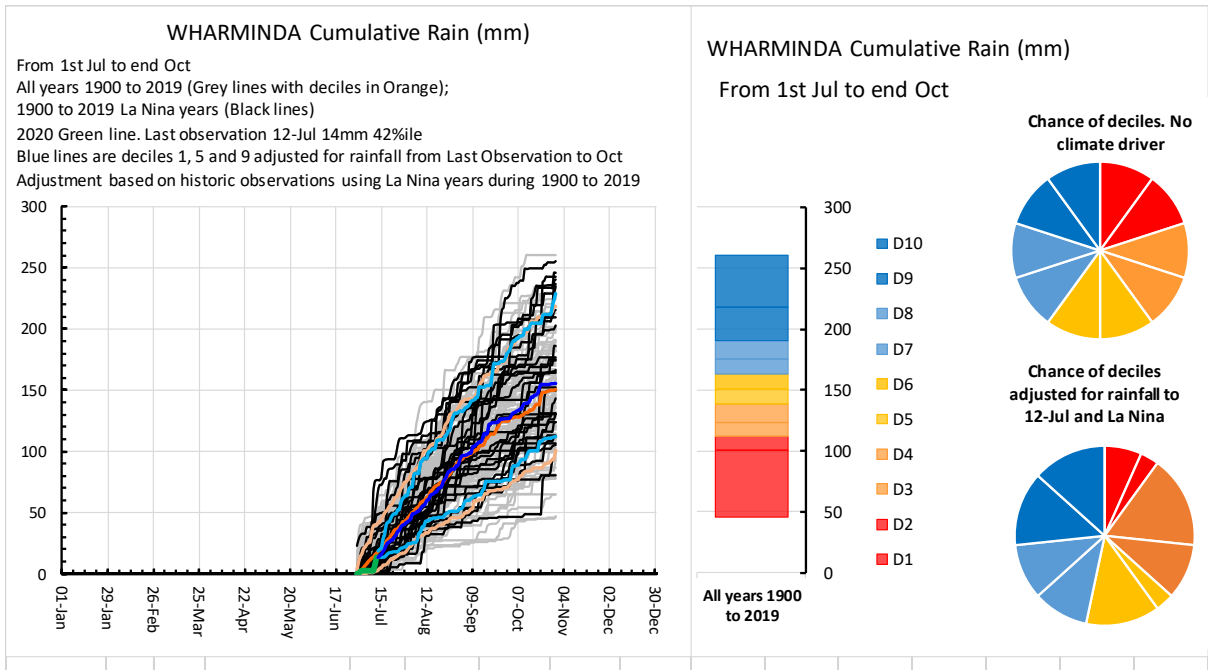
**Wharminda.** Historic cumulative April to October rain (mm) (grey lines) from 1900 to 2019 with the 2020 season to 12<sup>th</sup> July (green). Years categorised as a climate driver year (ENSO categories of La Niña or El Niño, or IOD categories of Negative IOD or Positive IOD) are not shown. The deciles (1<sup>st</sup>, median and 9<sup>th</sup>) for the April to October period are shown (orange), along with deciles adjusted for rain to date (blue). The bar chart shows the rainfall corresponding of each decile for the April to October period. The upper pie chart shows the chance of each decile of April to October rain occurring without the influence of climate drivers. The lower pie chart shows the chance of April to October rainfall deciles adjusted for rain that has occurred by 12<sup>th</sup> July.



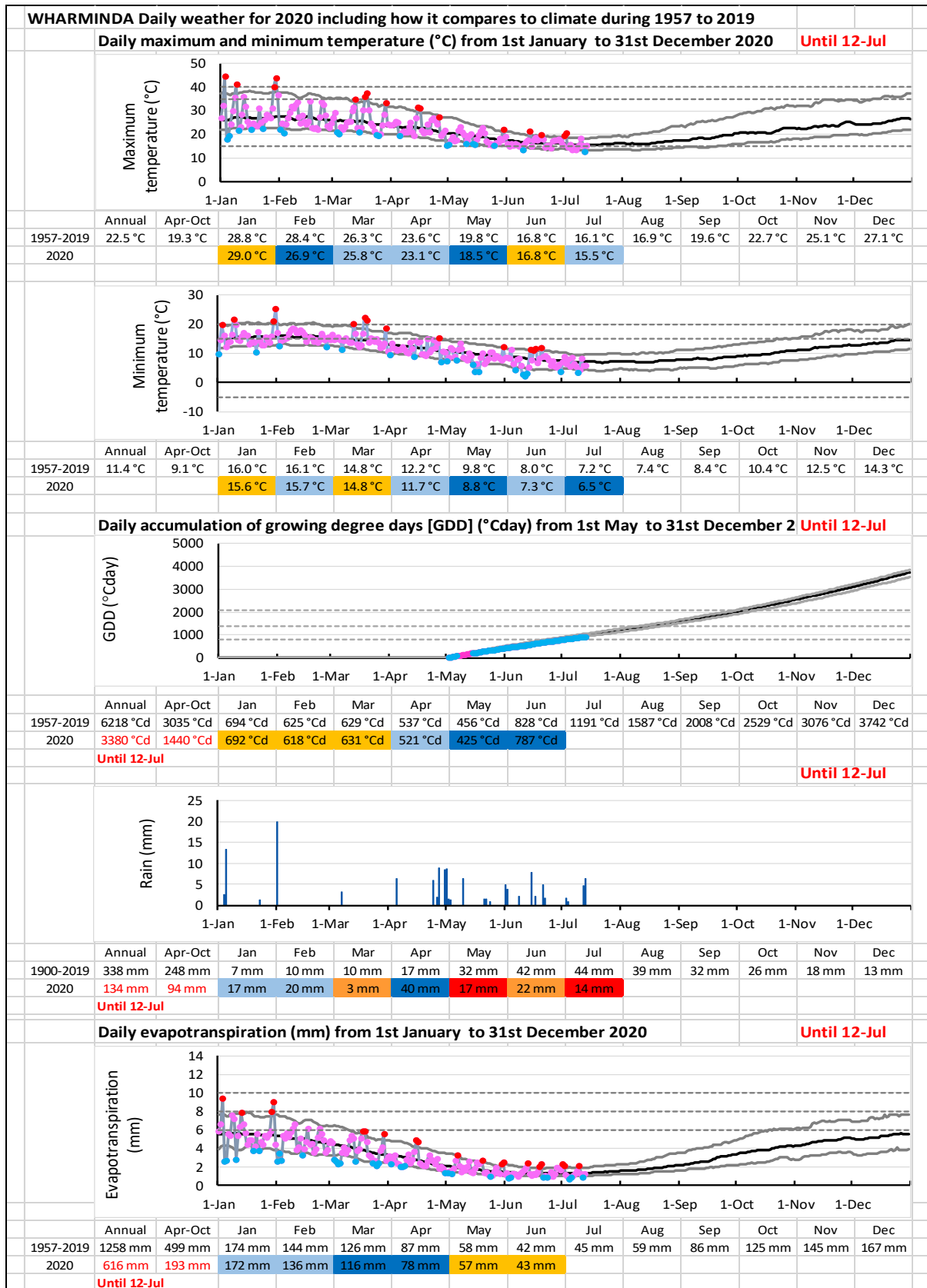
The following two graphs shows July to October rain and also the influence of Climate Drivers. The first of these graphs has the Negative IOD years highlighted in black with other years in grey. The 2020 season to 12<sup>th</sup> July is shown in green. The deciles (1<sup>st</sup>, median, 9<sup>th</sup>) for the July to October period are shown in orange, along with the deciles in Negative IOD years and adjusted for rainfall by 12<sup>th</sup> July in blue. The bar chart shows the rainfall corresponding to each decile for the July to October period. The upper pie chart shows the chance of each decile of July to October rain occurring without the influence of Negative IOD. The lower pie chart shows the chance of these July to October rainfall deciles in Negative IOD years and when rain received by 12<sup>th</sup> July has been taken into account.



The second of these graphs has the La Niña years highlighted in black with other years in grey. The 2020 season to 12<sup>th</sup> July is shown in green. The deciles (1<sup>st</sup>, median, 9<sup>th</sup>) for the July to October period are shown in orange, along with the deciles in La Niña years and adjusted for rainfall by 12<sup>th</sup> July in blue. The bar chart shows the rainfall corresponding to each decile for the July to October period. The upper pie chart shows the chance of each decile of July to October rain occurring without the influence of La Niña. The lower pie chart shows the chance of these July to October rainfall deciles in La Niña years and when rain received by 12<sup>th</sup> July has been taken in account.



Weather during 2020 is shown in the following figures. A full description of the figures is available at the end of the document.



## Explanation of the weather tracking figures

The upper two figures show daily maximum and minimum temperature (°C) from 1<sup>st</sup> January to 31<sup>st</sup> December, with the median (black line), 10<sup>th</sup> and 90<sup>th</sup> percentile (grey lines) of the 7 days centred on each day for the years 1957 to 2019 are shown. Daily values warmer than the 90<sup>th</sup> percentile are shown as red symbols, while daily values cooler than the 10<sup>th</sup> percentile are shown as blue symbols. Pink symbols are values within the envelope of the 10<sup>th</sup> to 90<sup>th</sup> percentile. Dashed lines are displayed as guides to define thresholds. The average monthly maximum and minimum temperatures during 1957 to 2019 are shown along with those during the selected year. The monthly temperatures during the selected year are coloured according to the decile from 1957 to 2019 with red/orange colours representing higher deciles (warmer) and blue colours representing lower deciles (cooler).

The third figure shows the accumulation of growing degree days (GDD) (°Cday) from 1<sup>st</sup> May to 31<sup>st</sup> December, with the median (black line), 10<sup>th</sup> and 90<sup>th</sup> percentile (grey lines) of the 7 days centred on each day for the years 1957 to 2019 are shown. The average monthly GDD during January to April, and the accumulation of GDD from May to the end of subsequent months during the period 1957 to 2019 are shown along with those during the selected year. The monthly GDD or accumulated GDD to the end of that month during the selected year are coloured according to the decile from 1957 to 2019 with red/orange colours representing higher deciles (warmer with greater GDD) and blue colours representing lower deciles (cooler with less GDD).

The fourth figure shows daily rainfall (mm) from 1<sup>st</sup> January to 31<sup>st</sup> December, with the median (black line), 10<sup>th</sup> and 90<sup>th</sup> percentile (grey lines) of the 7 days centred on each day for the years 1900 to 2019 are shown. The average monthly rainfall during 1900 to 2019 are shown along with those during the selected year. The monthly rainfall during the selected year are coloured according to the decile from 1900 to 2019 with red/orange colours representing lower deciles (drier) and blue colours representing higher deciles (wetter).

The lower figure shows daily evapotranspiration using FAO-56 (mm) from 1<sup>st</sup> January to 31<sup>st</sup> December, with the median (black line), 10<sup>th</sup> and 90<sup>th</sup> percentile (grey lines) of the 7 days centred on each day for the years 1957 to 2019 are shown. Daily values warmer than the 90<sup>th</sup> percentile are shown as red symbols, while daily values cooler than the 10<sup>th</sup> percentile are shown as blue symbols. Pink symbols are values within the envelope of the 10<sup>th</sup> to 90<sup>th</sup> percentile. Dashed lines are displayed as guides to define thresholds. The average monthly evapotranspiration during 1957 to 2019 are shown along with those during the selected year. The monthly evapotranspiration during the selected year are coloured according to the decile from 1957 to 2019 with red/orange colours representing higher deciles (higher evapotranspiration) and blue colours representing lower deciles (lower evapotranspiration).