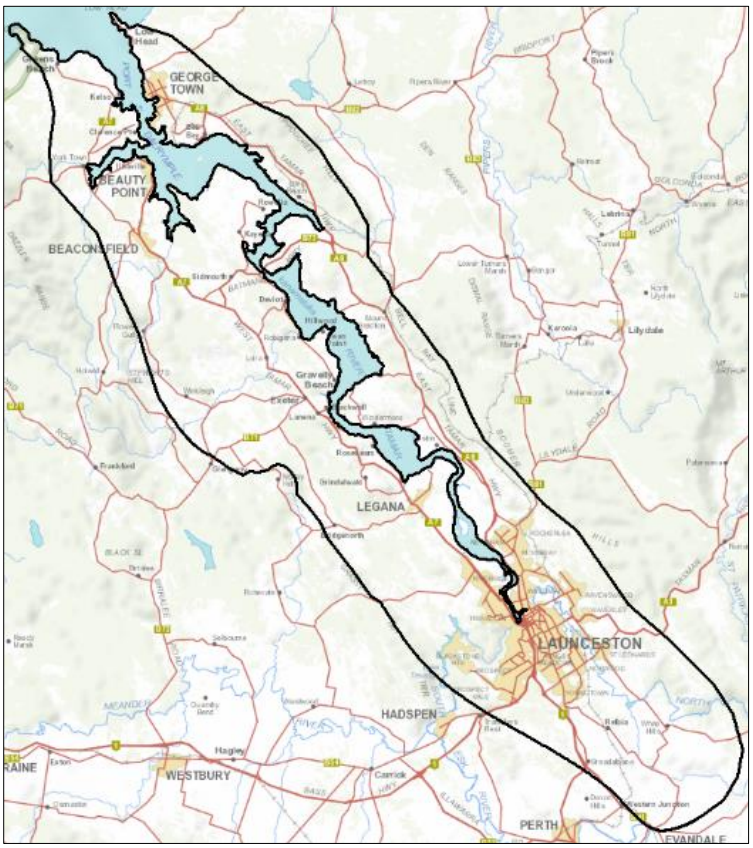
Department of Primary Industries, Parks, Water and Environment

## User Notes

### Summary:

The Tasmanian Department of Primary Industries, Parks, Water and Environment (DPIPWE) in concert with Sense-T (UTAS) have deployed a sensor network to deliver real-time air temperature data across the Tamar Valley (inset). The monitoring locations include existing vineyards, berry farms and orchards to provide a comprehensive network coverage to support the Tamar Valley horticulture industry. The data feeds augment a real-time air mapping system delivered hourly onto http://tamarvalleytemperature.live/. Both the maps and data feeds are freely available for growers and the broader public to access. Outputs of the air temperature mapping application include:



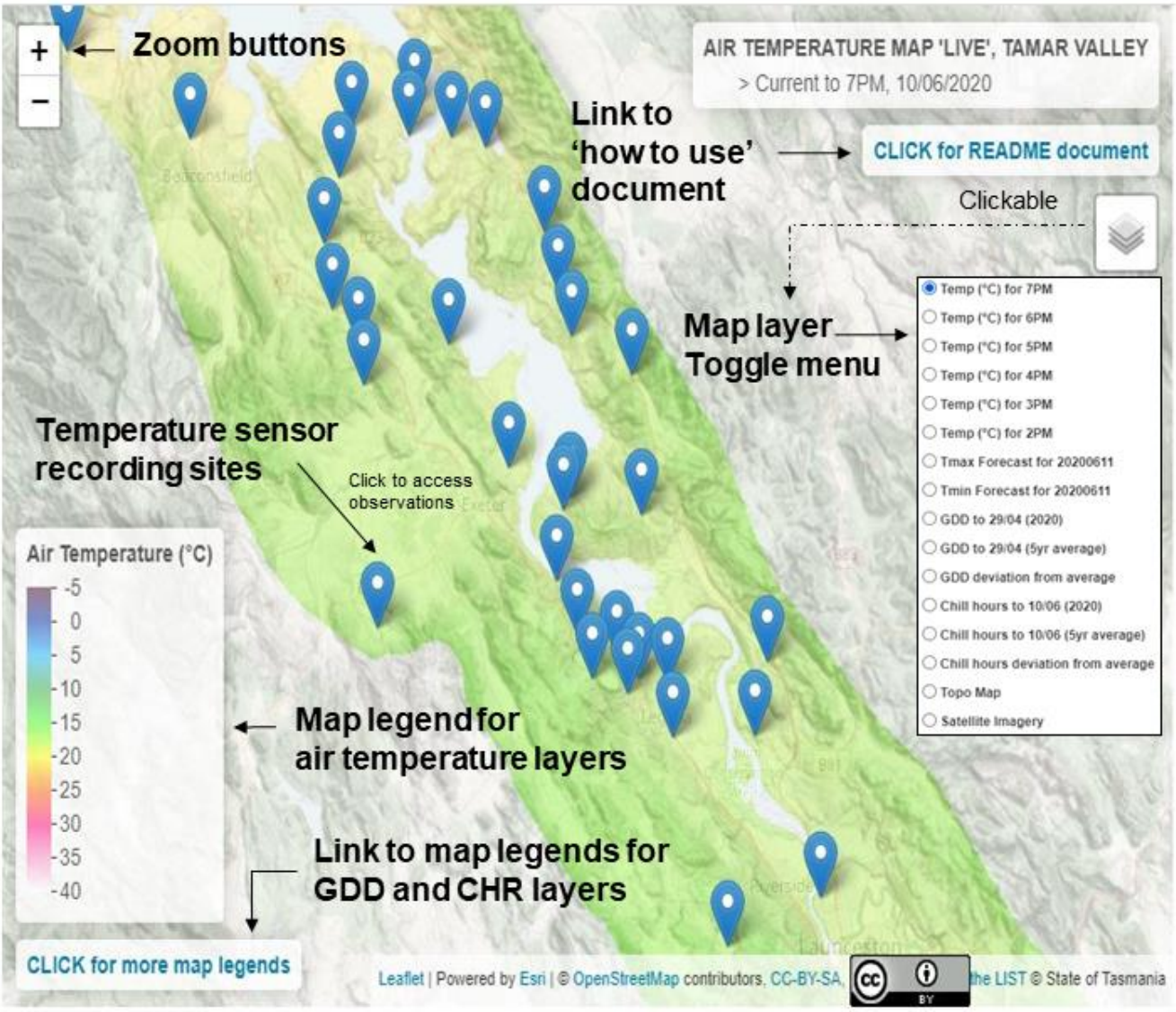

- Regular air temperature recordings for individual sensor sites (locations are defined by the symbology and can be clicked to access real-time data streams).
- Near-real-time high resolution air temperature maps delivered hourly for the Tamar Valley (individual maps can be toggled in the map layer menu window to reveal temperatures delineated for the previous six hours).
- High resolution air temperature forecast maps delivered daily (individual maps can be toggled in the map layer menu window).
- Growing Degree Day (GDD) heat accumulation maps updated daily throughout the growing season (October to April) (individual maps can be toggled in the map layer menu window).
- Chill hour (CHR) maps updated daily in winter from May to August (individual maps can be toggled in the map layer menu window).

### Features:

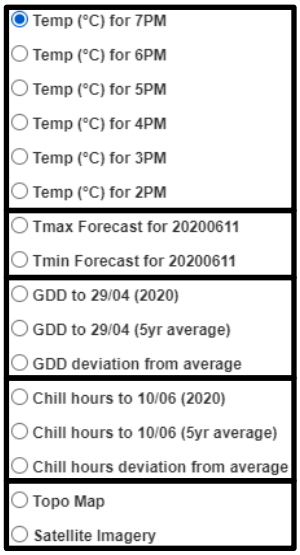
The web map is a simple to use application providing the ability to interrogate any location within the confines of the Tamar Valley area. In its simplest form the web map has the following features:

- Zoom in/out functionality
- Toggle-able map layers of current and past air temperatures, Tmin and Tmax forecasts, GDD and CHR accumulation (to date). Also includes access to Topo map and satellite imagery map layers.
- Point and click (to reveal air temperatures for a specific site location)
- Locations of 'live' sensor recording sites (locations are defined by the symbology and can be clicked to access real-time data streams).

The following diagram provides an overview:
**http://tamarvalleytemperature.live/**




## Map layer toggle menu definition

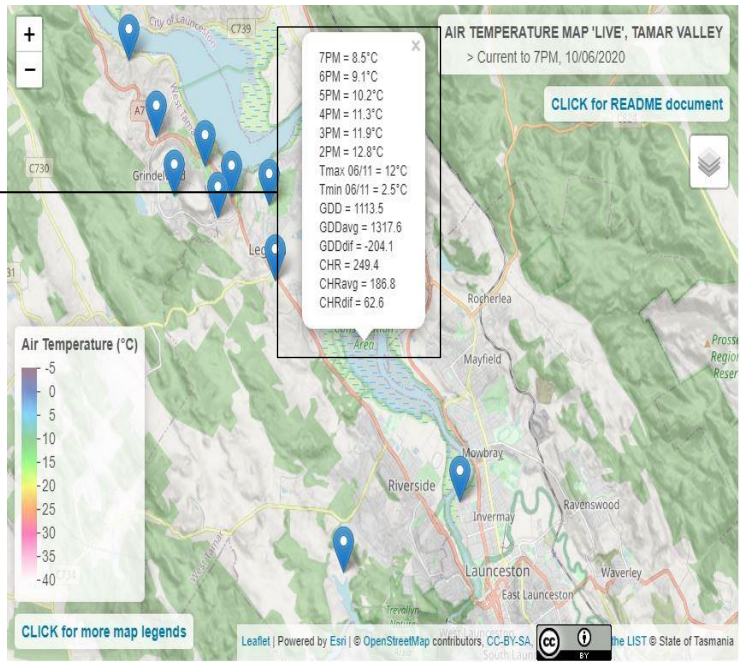


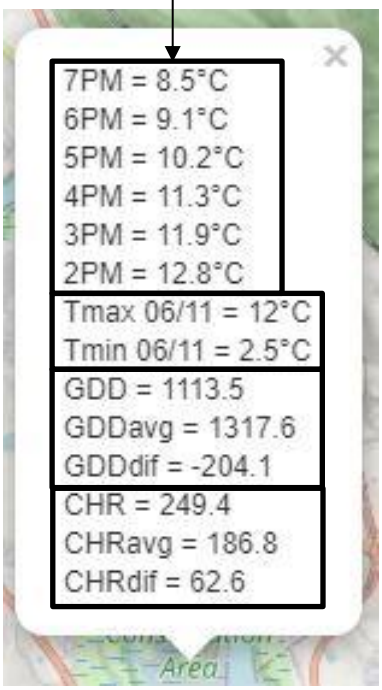

- Temperature estimates for the current and previous 6 hours.
- Daily maximum (Tmax) and minimum (Tmin) forecasts for the following day (e.g. for June 11, 2020).
- GDD accumulation to date (e.g. 29 April) for the current growing season (2020) and the previous 5-yr average (i.e. for years 2014 to 2019). Also shown is the difference between these two layers (i.e. GDD deviation from the 5-yr average) where positive values indicate a warmer season (compared to the 5-yr average) and negative values indicate a cooler season.
- Chill hours accumulation to date (e.g. 10 June) for the current winter (2020) and the previous 5-yr average (i.e. for years 2015 to 2019). Also shown is the difference between these two layers (i.e. Chill hours deviation from the 5-yr average) where positive values indicate a cooler winter (compared to the 5-yr average) and negative values indicate a warmer winter.
- Background map layers: Topo map and satellite imagery.

**Map query functionality:**

The web map can be manually queried to reveal temperature related information for a specific site location in the Tamar Valley. To query a site simply zoom into your area of interest (using the mouse scroll wheel or zoom button ) and click on any location on the web map to initiate a popup window. The window will display information including temperature estimates for the previous six hours (e.g. 7pm through to 2pm); daily maximum (Tmax) and minimum (Tmin) forecasts; Growing Degree Day estimates to date (pertaining to the current growing year (GDD), the 5 year average (GDDavg), and the difference between GDD and GDDavg (GDDdif)); Chill Hours (CHR) estimates to date (pertaining to the current winter (CHR), the 5 year average (CHRavg), and the difference between CHR and CHRavg (CHRdif). Note that the popup window relates to the map layers shown in the toggle-able map layer window (as displayed in the previous page). As an example, the following popup display's the following information for the following location on Tamar Island when mouse clicked (at 7pm, June 20):

**http://tamarvalleytemperature.live/**




- Past temperature estimates for 7pm through to 2pm.
- Daily maximum (Tmax) and minimum (Tmin) forecasts for June 11 (06/11).
- Growing Degree Day accumulation to date for the current growing season (GDD), the 5 year average (GDDavg), as well as the difference between GDD and GDDavg (GDDdif).
- Chill Hours (CHR) estimates to date (pertaining to the current winter (CHR), the 5 year average (CHRavg), and the difference between CHR and CHRavg (CHRdif).

**Growing Degree Days (GDD) and Chill Hours (CHR) calculation:**

GDD was calculated by taking the average of the daily maximum and minimum temperatures compared to a base temperature, Tbase. This is in the form:

$$GDD = (Tmax + Tmin/2) - Tbase \text{ [where } Tbase = 10°C]$$

This equation is calculated daily (starting from 1st October) with the resulting GDD unit summed until a point in time is reached (i.e. any current day within the growing season until April 30). The final value is the accumulated GDD unit.

Chill hours were calculated by totalling the number of hours that were within the 0 - 7°C range within a defined time period. This is calculated starting from 1st May with the resulting Chill hours summed until a point in time is reached (i.e. any current day within the winter period until August 31). The final value is the accumulated Chill hour unit.

Note that the map legends for GDD and Chill hour layers can be viewed here.

**For more information contact:**

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