**Temperature logger data from Western Australia**

**Background:** The York gum – jam woodlands of southwestern Western Australia support diverse annual understorey assemblages – probably the most diverse annual plant assemblages in Australia (Figure 1a). In this Mediterranean-climate region it rains mostly in winter and early spring (June-October in Australia). As such, the annuals germinate in June/July, mature by September and set seed in October. The plants die after releasing seed and the populations spend the next nine months in the seed bank. The Dwyer and Mayfield labs have been working in this system for over ten years trying to understand the factors that drive variation in diversity and composition. From simple observation it is clear that different microclimatic conditions are associated with different species. In particular, sun-exposed patches support different assemblages than patches shaded by trees (Figure 1a). One possible reason for this is that different patch types promote the germination of different species. To try and measure how these patch types vary, researchers routinely deploy temperature and relative humidity loggers called Tinytags (Gemini Data Loggers (UK) Ltd; Figure 1b).

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| --- | --- |
| **(a)** | **(b)** |
| A picture containing tree, outdoor, grass, plant  Description automatically generated | TGP-4500 |
| **Figure 1 (a)** A photo of annual plant assemblages in the understorey of York gum (*Eucalyptus loxophleba*) and jam (*Acacia acuminata*) woodlands in Western Australia; **(b)** image of a weatherproof Tinytag temperature logger that researchers deploy in sunny and shady patches during key periods (e.g. during the germination period). | |

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**Scenario:** You are interested in how daily temperature fluctuations differ in sunny and shaded patches during the germination period. You want to compile and interrogate data from loggers deployed in sun-exposed and shaded sites.

**Original data file formats**:

* ***PJ Shade 1 tiny tag 1 daily min max.csv,***  ***PJ Shade 1 tiny tag 2 daily min max.csv,***  ***PJ Sun 1 tiny tag 1 daily min max.csv***  – These input files include **one row per measurement day**. For each day the minimum and maximum values of various climate variables were recorded.
* Each file contains 7 columns:
  1. Date: date format varies (“month/day/year” OR “day/month/year”)
  2. Min: minimum temperature (ºC)
  3. Max: maximum temperature (ºC)
  4. Min: minimum relative humidity (%RH)
  5. Max: maximum relative humidity (%RH)
  6. Min: minimum dew point (ºC)
  7. Max: maximum dew point (ºC)

***“PJ Shade 1 tiny tag 1 daily min max.csv”*** includes the data for the first logger deployed in the shaded site at West Perenjori Nature Reserve from 19th October 2019 to 15th January 2021. Date was recorded as “month/day/year” format.

***“PJ Shade 1 tiny tag 2 daily min max.csv”*** includes the data for the second logger deployed in the shaded site at West Perenjori Nature Reserve from 19th July 2019 to 15th January 2021. Date was recorded as “month/day/year” format.

***“PJ Sun 1 tiny tag 1 daily min max.csv”*** includes the data for the first logger deployed in the sunny site at West Perenjori Nature Reserve from 19th July 2019 to 15th January 2021. There was only one logger deployed in this site. Date was recorded as “day/month/year” format.

**Project remit to make the data tidy (part 1)**

* Your script will need to be able to read in the raw files, as is.
* The script should create **one** data frame (tibble format is fine)
* The final data should conform with tidy data standards (see assignment sheet for details). Hint: Long format preferable with these data! Hand draw your final planned format and show to John before you start coding.
* Remember to keep your coding flexible so that it could handle new data files with either of the date formats.

*The reproducible report assignment will build on these data to undertake specific analyses, graphs, and interpretation.*

**Good luck and happy coding!**