**Biosphere 2 Tropical Forest Biome (B2-TF) dataset README**

Title: Empirical evidence for resilience of tropical forest photosynthesis in a warmer world

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This dataset contains non-gap-filled flux and associated environmental data collected at the Biosphere 2 Tropical Forest Biome (B2-TF, located in Arizona, USA), a subset of which is included in the analyses presented in Smith et al. (2020). The dataset was collated from a variety of sources by Rafael Rosolem and [**can be found on ResearchGate at this link**](https://www.researchgate.net/publication/261871884_Biosphere_2_-_Tropical_Rainforest_biome_dataset). Please also refer to Rosolem et al. (2010) for more details and contact Rafael Rosolem for further information.

The following files are included:

**1) "b2tf\_V1.csv"**

This is the full non-gap-filled dataset for the B2-TF, comprising data from 1 January 1997 to 31 December 2003. Cells missing data are labelled ‘-9999’.

------------- COLUMN DESCRIPTIONS -------------

Col. Variable Description

1. year # Year

2. month # Month

3. day # Day of the month

4. hour # Hour of day

5. Tair[C] # Air temperature at 15m (degC)

6. T20[C] # Air temperature at 20m (degC)

7. T26[C] # Air temperature at 26m (degC)

8. RH # Relative humidity (%)

9. Wind[m/s] # Horizontal wind speed (m/sec)

10. Psurf[hPa] # Barometric surface pressure (hectoPascal)

11. Psurf\_OWS[hPa] # Barometric surface pressure from Outside Weather Station

# (hectoPascal)

12. SWdown[W/m2] # Downward shortwave radiation (umol/m2/sec)

13. SWdown\_OWS[W/m2] # Downward shortwave radiation from Outside Weather

# Station (W/m2)

14. CO2[ppm] # CO2 concentration (ppm)

15. Ts2[C] # Soil temperature at 2cm (degC)

16. Ts10[C] # Soil temperature at 10cm (degC)

17. Ts50[C] # Soil temperature at 50cm (degC)

18. smv30[m3/m3] # Volumetric soil moisture at 30cm (cubic meter water

# per cubic meter total soil volume)

19. smv60[m3/m3] # Volumetric soil moisture at 60cm (cubic meter water per cubic

# meter total soil volume)

20. Rnet[W/m2] # Net radiation (W/m2)

21. G[W/m2] # Ground heat flux density (W/m2)

22. NEE[umol/m2/s] # Net ecosystem exchange of CO2 (umol/m2/sec)

**2) "b2tf\_V2.csv"**

This version is the subset of the full non-gap-filled B2-TF dataset above (V1) used in Smith et al. (2020). The main difference to V1 of the dataset is that V2 only includes periods with overlapping NEE, radiation (SWdown), temperature, and VPD data, comprising almost 4 months of data from 2000 and 2002. Cells missing data are labelled ‘NA’.

The following additions were made to V2 of the dataset:

* Date column added
* Reco and GEP values calculated from NEE – see Methods section, Smith et al. (2020)
* VPD values calculated from temperature and relative humidity

Please note: this dataset includes all radiation (SWdown) values and not just those over the saturating value (200 W/m2), which were selected for the analyses presented in Smith et al. (2020).

------------- COLUMN DESCRIPTIONS -------------

Col. Variable Description

1. year # Year

2. month # Month

3. day # Day of the month

4. date # Date in format: MM/DD/YYYY

5. hour # Hour of day

6. Tair[C] # Air temperature at 15m (degC)

7. T20[C] # Air temperature at 20m (degC)

8. T26[C] # Air temperature at 26m (degC)

9. RH # Relative humidity (%)

10. Wind[m/s] # Horizontal wind speed (m/sec)

11. Psurf[hPa] # Barometric surface pressure (hectoPascal)

12. Psurf\_OWS[hPa] # Barometric surface pressure from Outside Weather Station

# (hectoPascal)

13. SWdown[W/m2] # Downward shortwave radiation (umol/m2/sec)

14. SWdown\_OWS[W/m2] # Downward shortwave radiation from Outside Weather

# Station (W/m2)

15. CO2[ppm] # CO2 concentration (ppm)

16. Ts2[C] # Soil temperature at 2cm (degC)

17. Ts10[C] # Soil temperature at 10cm (degC)

18. Ts50[C] # Soil temperature at 50cm (degC)

19. smv30[m3/m3] # Volumetric soil moisture at 30cm (cubic meter water

# per cubic meter total soil volume)

20. smv60[m3/m3] # Volumetric soil moisture at 60cm (cubic meter water per cubic

# meter total soil volume)

21. Rnet[W/m2] # Net radiation (W/m2)

22. G[W/m2] # Ground heat flux density (W/m2)

23. NEE[umol/m2/s] # Net ecosystem exchange of CO2 (umol/m2/sec)

24. Reco[umol/m2/s] # Ecosystem respiration (umol/m2/s)

25. GEP[umol/m2/s] # Gross ecosystem productivity (umol/ m2/s)

26. VPD[kPa] # Vapour pressure deficit (kPa)

**References**

Rosolem, R., James Shuttleworth, W., Zeng, X., Saleska, S. R. & Huxman, T. E. Land surface modeling inside the Biosphere 2 tropical rain forest biome. *J. Geophys. Res.* **115**, G4 (2010).