

**PROJECT TITLE: Exploring the link between rising atmospheric water stress and tropical tree mortality**

**Project Supervisor: Martin De Kauwe, University of Bristol, Department of Biological Sciences**

**Co-Supervisor (if any): N/A**

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**Project keywords: climate change, drought, plant physiology, carbon cycle, modelling**

**Proposed start date: June**

**Project description:**

As the climate warms, the atmosphere can hold greater amounts of water vapour – leading to a “thirstier” atmosphere. A greater demand for evaporation from plants can have a range of negative effects on photosynthesis, growth, and survival. Critically, greater atmospheric water stress, driven by a warming climate, has been implicated in recent tree mortality in the tropics of Australia. In this project, you will explore how atmospheric humidity changes have affected plant function over the past two decades (photosynthesis, transpiration). In this placement, you will focus on analysing data collected from the Australian tropics and model output. You will also have the opportunity to manipulate humidity at the leaf-scale and take your own measurements of photosynthesis with a portable photosynthesis system (LICOR LI-6800). By taking your own measurements, you will learn first-hand how projected future changes in atmospheric water stress will affect plant function.

**Candidate requirements:**

A background in biology, geography, mathematics, physics, atmospheric science, engineering or a similar quantitative science.

**Approximate Work Schedule in weeks (desk based/lab/report writing):**

Desk based.

**Background reading:**

Grossiord, C., Buckley, T.N., Cernusak, L.A., Novick, K.A., Poulter, B., Siegwolf, R.T.W., Sperry, J.S. and McDowell, N.G. (2020), Plant responses to rising vapor pressure deficit. *New Phytol*, 226: 1550-1566. <https://doi-org.bris.idm.oclc.org/10.1111/nph.16485>