Submission Questions

1. What is the scientific question you are addressing?

The manuscript asks whether a derivation error in the modified Arrhenius equation from Johnson et al. (1942) substantially impacts modelled temperature responses of photosynthesis and plant carbon gain.

1. What is/are the key finding(s) that answers this question?

We find that temperature response parameters generally vary <5% and that these propagate to an ~1.8% difference in modelled daily carbon gain. This apparently small daily difference can compound to large differences across time.

1. Why is this work important and timely?

As new, thermodynamically-grounded temperature response models are developed, it is important to revisit the derivation of the models in widespread use (e.g. the Medlyn et al. (2002) version of Johnson et al. (1942)). In this case, our results suggest that it is time to switch to a new temperature response model.

1. Does your paper fall within the scope of GCB; what biological AND global change aspects does it address?

The manuscript falls within the scope of GCB as it addresses modeling of biological temperature responses and carbon gain under changing environmental conditions.

1. What are the three most recently published papers that are relevant to this question?

Liang et al. 2018 MMRT paper?

Need 2 more…