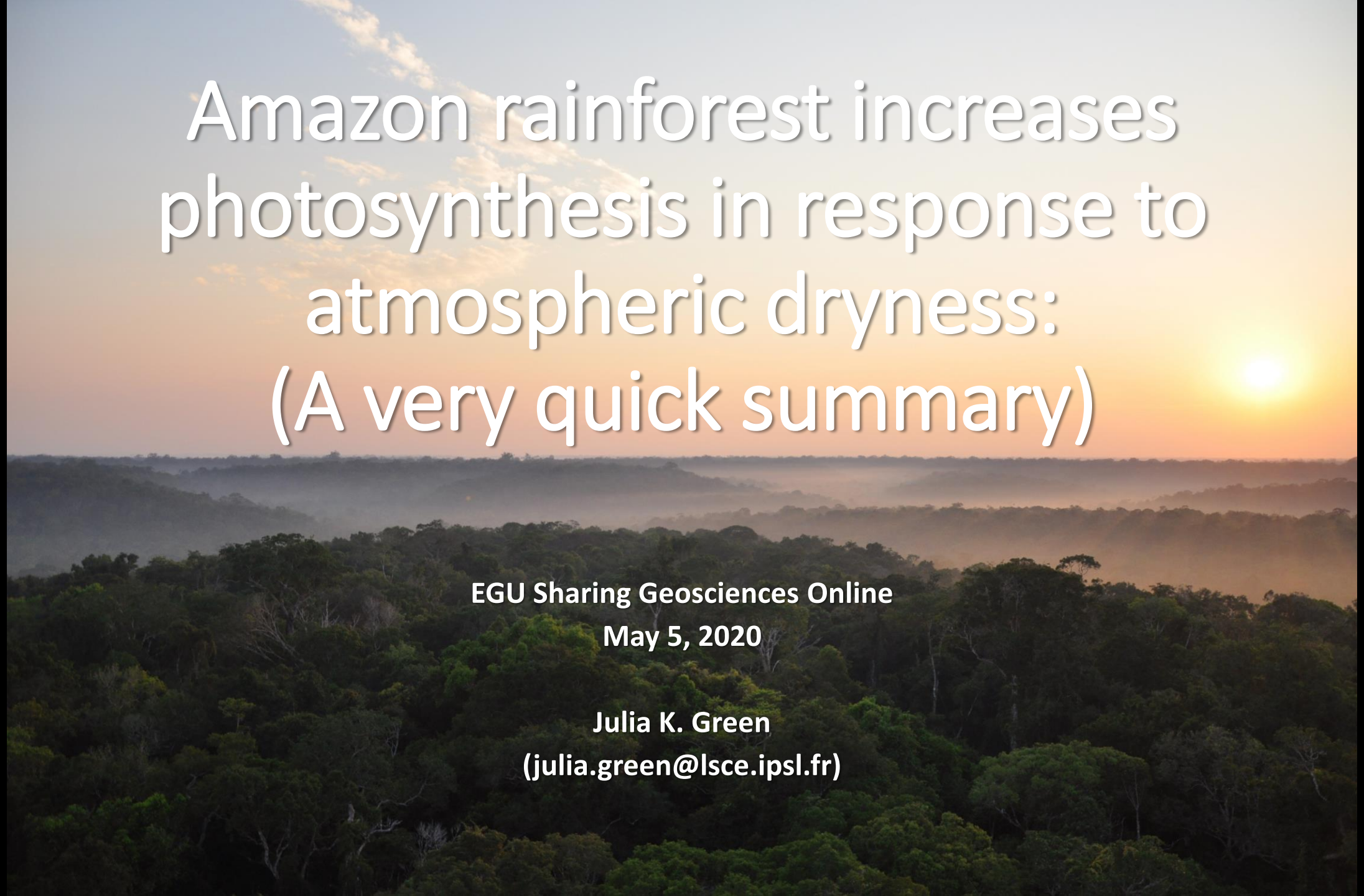

Amazon rainforest increases photosynthesis in response to atmospheric dryness: (A very quick summary)

EGU Sharing Geosciences Online

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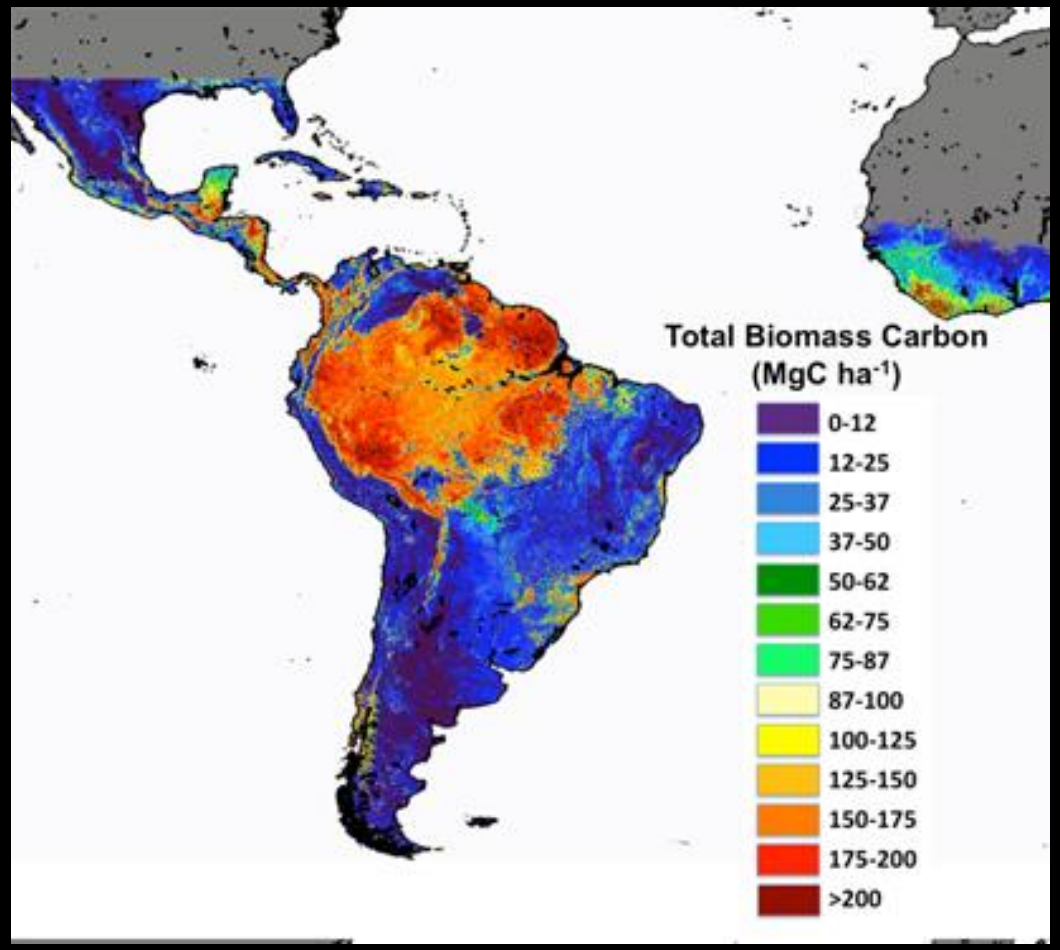
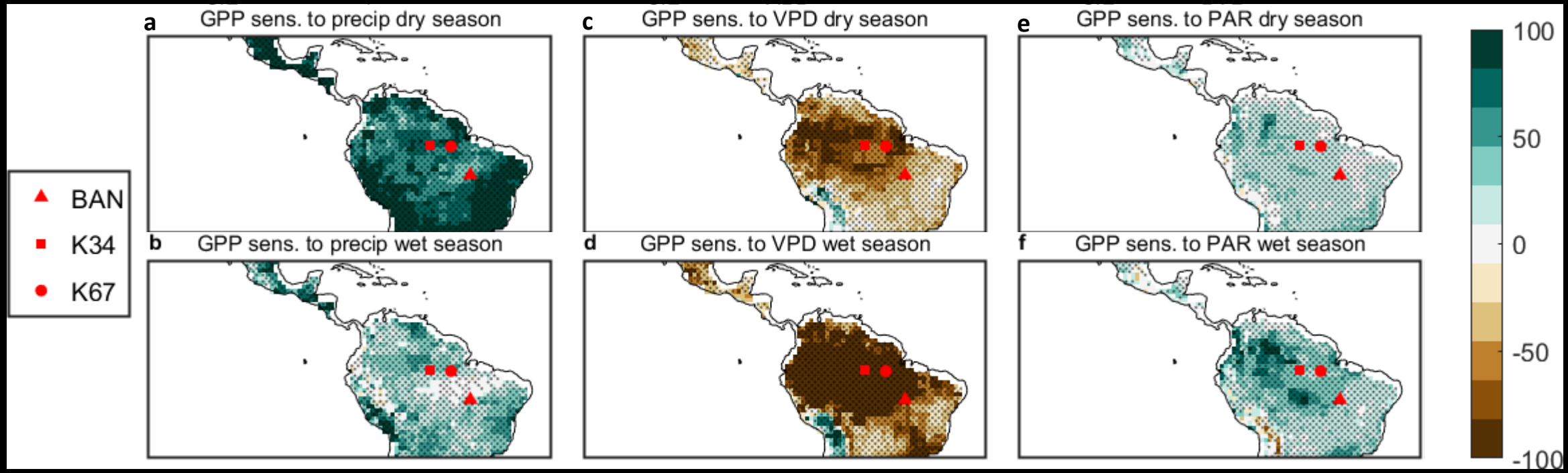
Will the Amazon rainforest continue to be a carbon sink?

- High uncertainty due to climate change
- Feedbacks with atmospheric CO_2 and global climate
- Air dryness is predicted to increase while changes in precipitation and soil moisture are less clear



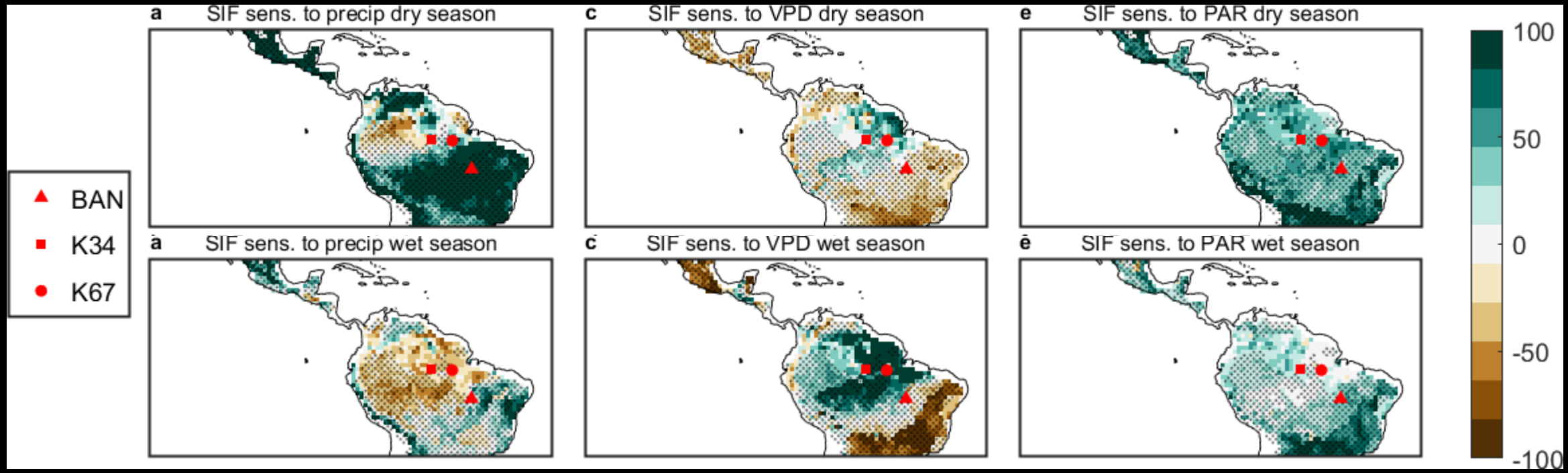
Saatchi, S.S., *et al.* Benchmark map of forest carbon stocks in tropical regions across three continents. PNAS, 2011.

What do models say?



- Models show:
  - Increases in rainfall and radiation drive GPP
  - Increases in air dryness reduces GPP

What does data say?



- Data shows:
  - In the wettest parts of the Amazon rainforest, SIF increases with increases in VPD, and decreases with too much precipitation
  - This is more pronounced during the wet season

Conclusions

- Models inaccurately represent GPP sensitivity
  - SM
  - VPD
  - Over-estimate water stress
- GPP increases with increasing VPD in the wettest, forested regions
- There is less coupling between canopy conductance and atmospheric dryness the greater the moisture availability
- We stress the importance of accurately representing the response of photosynthesis to atmospheric dryness in the wettest ecosystems to reduce uncertainty in our climate projections