

EGU21-16531

<https://doi.org/10.5194/egusphere-egu21-16531>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Better representing vegetation canopy structure in Earth System Models

Renato Braghiere

NASA Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California, USA

Addressing the impact of 3D vegetation structure on shortwave radiation transfer in Earth System Models (ESMs) is important for accurate weather forecasting, carbon budget estimates, and climate predictions. While leaf-level photosynthesis is well characterized and understood, estimates of global level carbon assimilation in the literature range from 110 to 175 PgC.yr⁻¹. I will explore how neglecting canopy structure leads to significant uncertainties in shortwave radiation partitioning, as well as second order derived canopy properties, such as leaf area index (LAI). I will also cover how modeled carbon assimilation of the terrestrial biosphere is impacted when a satellite derived clumping index is incorporated into the UKESM. Finally, I will touch on how the clumping index might be integrated into hyperspectral ESMs to explore the theoretical relationship between canopy structure and photosynthesis.