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Oral
Existing models of the global carbon cycle disagree on the seasonal-cycle amplitude of net biome productivity (SCANBP), complicating future projections of carbon fluxes. We evaluate SCANBP from an ensemble of dynamic global vegetation models (DGVMs) known as TRENDY (v8 and v9) against CO2 observations from the Orbiting Carbon Observatory-2 (OCO-2), in situ observations, and inverse models. We find that models with a larger SCANBP are more sensitive to climate and exhibit a larger upward trend in SCANBP during the past century. With that said, most models underestimate SCANBP in comparison with satellite-based inverse modeling estimates, and these discrepancies are particularly large in regions with high photosynthetic activity. Models with larger seasonal amplitudes almost always exhibit a better fit compared to CO2 observations from OCO-2 and in situ sites, especially in extratropical regions. We also find that DGVMs produce similar SCANBP using very different combinations of gross primary production and respiration, making these disagreements challenging to resolve.
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