

Question responses to GCB:

Running Head: 43/45 characters

The environment and evolution shape forests

What scientific question is addressed in this manuscript? 248 characters

While many models critical for future forecasts assume temperature and light explain forest leafout, we test the role of populations, species and community-level variation, including the role of evolutionary history in shaping species differences.

What is/are the key findings that answer this question? 246 characters

Greater cues led to advances in budburst with some effects of evolutionary history, but little site-level variation. This suggests an incomplete understanding of budburst and that other unidentified traits or cues also shape phenology in forests.

What are the novel results, ideas, or methods presented in work? 237 characters

We are one of the first to mechanistically test the relationships and variability in budburst cues and evolutionary relationships at the community-level—with 47 tree and shrub species—and between four populations that span North America.

Describe how your paper fits within the scope of GCB, what biological AND global change aspects does it address. 249 characters

Our work offers novel insights into how shifts in budburst will impact future forest dynamics and carbon sequestration. This work also showcases an analytical approach that has broad applications across diverse species assemblages and phenologies.

What are three most recently published papers that are relevant to this manuscript?

1. Zohner et al. 2023. Effect of climate warming on the timing of autumn leaf senescence reverses after the summer solstice
2. Zhang et al. 2022. Deciphering the multiple effects of climate warming on the temporal shift of leaf unfolding NCC
3. Montgomery et al. 2020 Phenological responses of temperate and boreal trees to warming depend on ambient spring temperatures, leaf habit, and geographic range

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