Question responses to GCB:

Running Head: 43/45 characters

The environment and evolution shape forests

What scientific question is addressed in this manuscript? 247 or 234 characters

Climate change is shifting the timing of spring growth, making it critical we understand the drivers of variability in events like budburst. We tested how cues and evolutionary history relates to community-level budburst and across North America.

OR

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 forests that span North America.

What is/are the key findings that answer this question? 232

While increasing cues led to an advance in budburst, we found little variation across sites, but strong phylogenetic structuring. This suggests additional traits are driving species-level differences, and not population differences.

What are the novel results, ideas, or methods presented in work? 250

Our Bayesian phylogenetic model estimated cues to explain only part of the variation in budburst. This suggests an incomplete understanding of budburst and the importance of other unidentified traits or cues to spring phenology in forest communities.

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

Our manuscript showcases an analytical approach that has broad applications across diverse species assemblages and phenologies, while providing novel insights into the complex ecological processes that shape species phenology and future responses.

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

1. Morales-Castilla et al. 2024. Phylogenetic estimates of species-level phenology improve ecological forecasting, NCC

2. Zeng & Wolkovich. 2024. Weak evidence of provenance effects in spring phenology across Europe and North America. New Phytologist

3. Baumgarten et al. 2021. Chilled to be forced: the best dose to wake up buds from winter dormancy

4. Zhang et al. 2022. Deciphering the multiple effects of climate warming on the temporal shift of leaf unfolding NCC

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