**Title:** Effect of spring temperatures on tree growth phenology in a temperate deciduous forest

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### Abstract

**Keywords**:

### Introduction

**With climate warming, we can expect earlier springs in temperate forests.** These are likely to affect tree growth, woody productivity, and ecosystem C cycling. However, we know little about the growth phenology of temperate deciduous species (see D’Orangeville et al., in revision for more info/ citations)—let alone how these are affected by an early spring.

Here, we … - use 10 years of biweekly dendro band measurements for # species to characterize seasonal growth phenology

* combine these records with 110 years of tree-ring data for 12 species to examine how spring temperatures impact annual tree growth
* examine the effects of an extremely early spring (2020) seasonal growth phenology and annual growth

### Materials and Methods

#### Study site and data

SCBI ForestGEO plot

10 years biweekly dendrometer measurements

leaf phenology data?

* leaf phenology data from NEON and/or satellite-based (leaf phenology network: <https://www.usanpn.org/news/spring>) ?
* NDVI or PRI? <https://onlinelibrary.wiley.com/doi/10.1111/gcb.15112> (from Ian)
* From Ian: I noticed how the growth patterns observed by remote sensing pretty much mirror what Sean was finding with his dendro R package (btw is that functional on CRAN yet?) for both SERC and SCBI dendroband data.

perhaps bring in cores?

#### Analysis

*Here, I’ll insert a reference to Sean’s paper (McMahon & Parker, 2015). This is pulled from references.bib.*

### Results

### Discussion

*Content to incorporate: N. American strategies have conservative strategies when it comes to phenology, as historically they’ve been subject to more spring frosts. Thus, climate change is having less impact (Zohner et al., 2020)*

### Acknowledgements

ForestGEO

### Authors’ contributions

### References

McMahon, S. M., & Parker, G. G. (2015). A general model of intra-annual tree growth using dendrometer bands. *Ecology and Evolution*, *5*(2), 243–254. <https://doi.org/10.1002/ece3.1117>

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