Canopy position mediates climate sensitivity in Northeastern US Forests

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**Abstract**

**Introduction**

And

1. Forests are a vital component of the earth system
2. They cover only 30% of the land area but account for almost half of global productivity
3. Understanding how these systems will respond to changing climate conditions is essential if we want to be even remotely accurate with out projections

But

1. The most accessible data product out there is not representative of the entire forests
   1. ITRDB represents climate-sensitive collections that have been sampled with the specific goal of creating a climate reconstruction
2. This biased product may not accurately represent the climate response of the whole forest
   1. We are finding that forest composition matters greatly
   2. Microclimate conditions exist in the vertical, as well as the horizontal forest profile

Therefore

1. We test the effect that canopy position has on the climate-growth relationships of four abundant species in the northeastern US. Using a generalized additive model framework
2. We hypothesize that canopy class will have a significant effect on the recorded climate growth relationships
   1. Understory members will be less sensitive to temperature than over story trees
   2. Under story trees will be more sensitive to precipitation than over story trees.
   3. Intermediate tree response will be more variable because of the nature of the canopy classification

Goals

1. Assess species-level climate-growth relationships using generalized additive model framework for four abundant species in the northeastern US (QURU, FAGR, TSCA, ACRU)
2. Assess the effect, if any that canopy position has on climate growth relationships

**Methods**

*Sites*

*Climate data*

*Field sampling*

*Crossdating*

*Modeling framework*

**Results**

Figure 1. Map of sites with stacked barplots

* Maybe do A/B panels if overlay of barplots doesn’t work

Figure 2. PDF of climate conditions—Tmean/precip/VPD

Figure 3. Climate sensitivity curves—Tmean/precip

Figure 4. Climate sensitivity curves—VPD/drought index

Figure 5? PDF of hot droughts vs. cool droughts?

**Discussion**