**Title:** Thermal sensitivity across forest vertical profiles: patterns, mechanisms, and ecological implications

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# Appendix S1. Methods for NEON vertical profiles

METHODS ON NEON ANALYSIS GO HERE.

see [Issue 2](https://github.com/EcoClimLab/vertical-thermal-review/issues/2) , [issue 20](https://github.com/EcoClimLab/vertical-thermal-review/issues/20)

# Appendix S2. Methods for leaf energy balance modeling

METHODS ON TEALEAVES GO HERE.

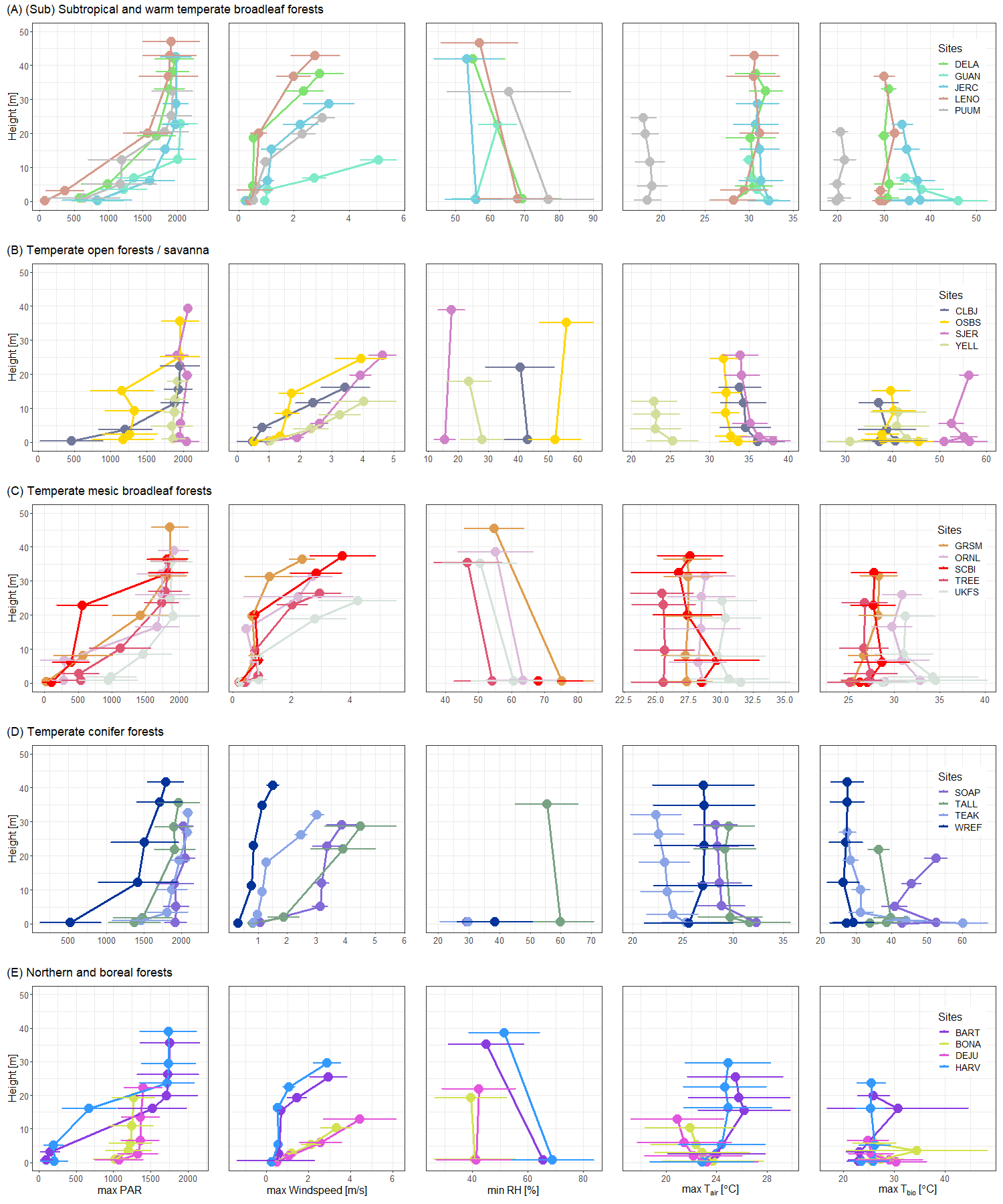
Energy balance for a normal overstory sun leaf and understory shade leaf were parameterized with biophysical variables from Harvard NEON data documented here: (<https://github.com/EcoClimLab/vertical-thermal-review/blob/master/NEON_height_profiles/HARV_neon_stats.csv>). Leaf trait measurements for effective leaf width was measured on ~Quercus rubra~ sun and shade leaf, stomatal conductance measurements were refered from Tleaves typical sun and shade measurements (Muir, 2019) and as well Cavender-Bares & Bazzaz (2000).

For drought scenario, biophysical variables were parameterized similar to normal scenario using Harvard NEON data. Overstory drought PAR values reflect maximum observed Harvard NEON PAR and understory drought reflect 50% increased PAR of understory normal value. Leaf trait measurements for effective leaf width is the same as normal scenario, stomatal conductance was referred from Cavender-Bares & Bazzaz (2000). In each visual, all variables are constant (Biophysical Constants table) except for the independent variable that represents minimum - maximum range.

# Appendix S3. Methods for literature review

METHODS ON LIT REVIEW GO HERE.

# Figure S1. Vertical gradients in micrometeorological conditions for all forested sites in the National Ecological Observatory Network (NEON)



**Figure S1. Vertical gradients in micrometeorological conditions for all forested sites in the National Ecological Observatory Network (NEON)**. Shown are height profiles in July mean ± 1 standard deviation for maximum photosyntehtically active ratiation (PAR), maximum wind speed, minimum humidity, maximum , and maximum biological temperature, . Sites are grouped into the following categories: (A) (sub)subtropical and warm temperate broadleaf: …, (B) temperate open/ savanna forests: …, (C) temperate mesic broadleaf forests: …, (D) temperate conifer forests: …, (E) northern and boreal forests: … [Issue #35](https://github.com/EcoClimLab/vertical-thermal-review/issues/35).

## References

**Cavender-Bares J, Bazzaz FA**. **2000**. Changes in drought response strategies with ontogeny in Quercus rubra: Implications for scaling from seedlings to mature trees. *Oecologia* **124**: 8–18.

**Muir CD**. **2019**. Tealeaves: An R package for modelling leaf temperature using energy budgets. *AoB PLANTS* **11**.