CIEE Productivity and Reproducibility Draft Manuscript

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Introduction

This is my draft manuscript for the my CIEE Productivity and Reproducibility project. I am learning how to write text in "Markdown" format. I can write in **bold** and *italics*.

Acid rain leaches calcium out of the soil, a nutrient critical to the growth of the sugar maple (*Acer saccharum*). This lack of calcium leads to the soil turning more acidic, and creates a stressful environment for the species (Ramanujan 2006). We will use the Hubbard Brook Experimental Forest Sugar Maples ("hbr_maples") dataset from the 'lterdatasampler' package to explore the addition of calcium on sugar maple seedling growth.

Methods

Dataset

This project uses data from 'lterdatasampler', an R package that provides sampler datasets for teaching and learning purposes (Horst & Brun 2023).

The package contains several sample datasets, but we will work with the "hbr_maples" data. "[This] dataset contains observations on sugar maple seedlings in untreated and calcium-amended watersheds at Hubbard Brook Experimental Forest in New Hampshire" (Horst & Brun 2023).

The data originates from "Health and mycorrhizal colonization response of *Acer saccharum* seedlings to calcium addition in Watershed 1 at the Hubbard Brook Experimental Forest" (Juice & Fahey 2019).

Analysis

I can do a small data transformation for practice here. Let's create a table with the mean, median, and standard deviation (sd) of seedling height in the untreated and treated watersheds.

Year	Watershed	Mean	Median	SD	n
2003	Reference	80.98500	79.85	13.93923	120
2003	W1	87.88583	86.15	14.34233	120
2004	Reference	85.88136	85.00	15.58634	59
2004	W1	97.51667	95.50	13.83007	60

Results

Let's make a simple plot that compares sugar maple seedling height in the untreated and calcium treated watersheds.

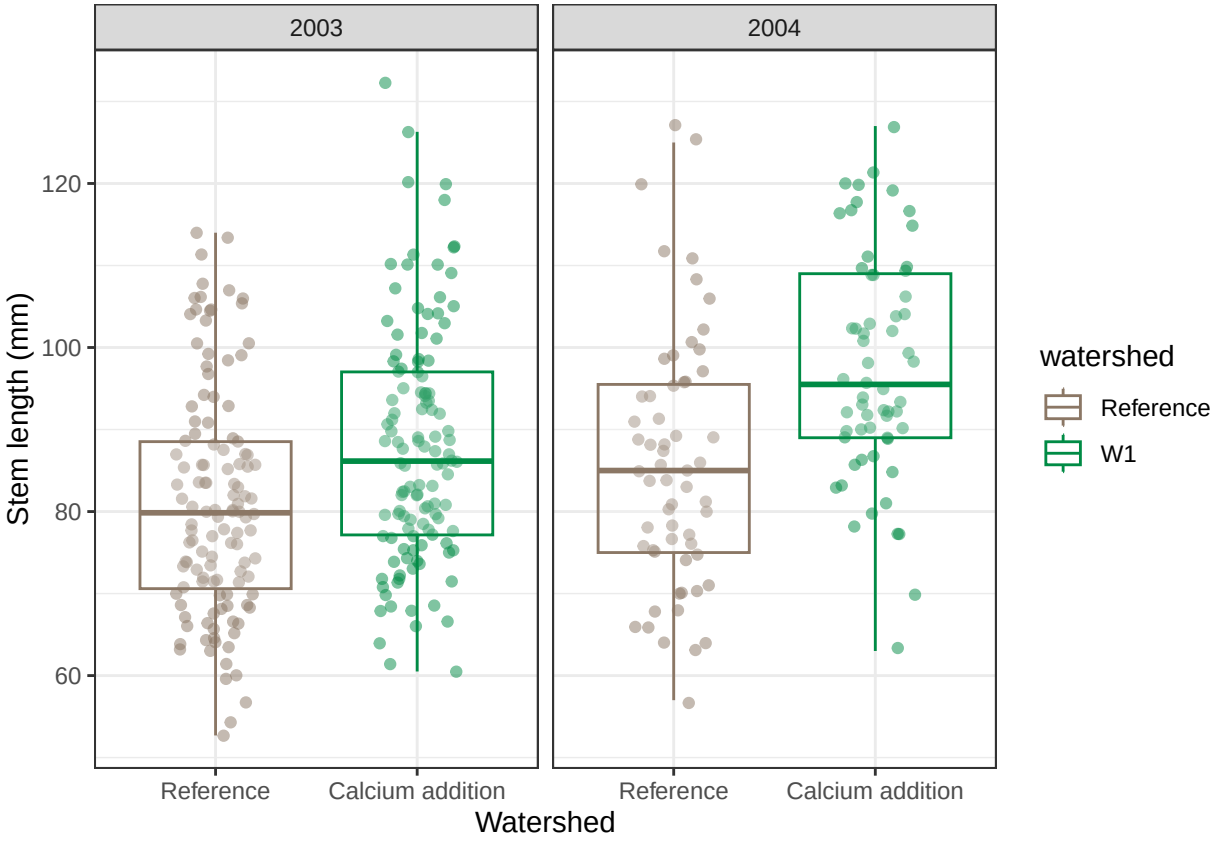

Figure 1: *Acer saccharum* seedling height in untreated (Reference) and treated (Calcium addition) watersheds.

Discussion

This is where I'd write my discussion. I can add more citations here (Juice *et al.* 2006; Peters *et al.* 2004).

References

Horst, A. & Brun, J. (2023). Lterdatasampler: Educational Dataset Examples from the Long Term Ecological Research Program.

Juice, S. & Fahey, T. (2019). Health and mycorrhizal colonization response of sugar maple (Acer saccharum) seedlings to calcium addition in Watershed 1 at the Hubbard Brook Experimental Forest ver 3.

Juice, S.M., Fahey, T.J., Siccama, T.G., Driscoll, C.T., Denny, E.G., Eagar, C., *et al.* (2006). Response of Sugar Maple to Calcium Addition to Northern Hardwood Forest. *Ecology*, 87, 1267–1280.

Peters, S.C., Blum, J.D., Driscoll, C.T. & Likens, G.E. (2004). Dissolution of wollastonite during the experimental manipulation of Hubbard Brook Watershed 1. *Biogeochemistry*, 67, 309–329.

Ramanujan, K. (2006). Decades of acid rain is causing loss of valuable Northeast sugar maples, Cornell researchers warn. *Cornell Chronicle*.