



Master thesis

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Spruce-pine mixtures in interior British Columbia, Canada

Interest in planting spruce-pine mixtures in interior British Columbia, Canada, has increased following the unprecedented outbreaks of mountain pine beetle throughout British Columbia in the late 1990s through 2012, that resulted in catastrophic losses in pine-dominated stands. Since the early 2000s, spruce-pine mixtures have been planted throughout interior British Columbia, yet little is known about their growth and yield and vulnerability to pests and pathogens. An experiment with 5 species mixture proportions and 3 planting densities was established in 1994 in interior British Columbia, which allows insights into the trade-offs across densities and mixture proportions (Barbeito et al. 2021). Since the Barbeito et al. (2021) paper was published the 30-year re-measurement data of the trial has been collected in fall 2023.

- Compile and analyze the re-measured 2023 data; analysis similar to what is presented in Barbeito et al. (2021)
- Assess overyielding across species mixtures and densities
- Compare tree size and growth partitioning in mixed versus monospecific stands using the Gini Coefficient (GC)
- Relate the distribution of growth rates of individual trees within a stand to tree sizes using the Growth Dominance Coefficient

R code files from the analysis for Barbeito et al. (2021) will be provided, which makes the first task of rerunning the analysis for the re-measured 2023 data simple. R code development for the remaining three analysis steps will be supported by Dr. Bianca Eskelson as needed.

Reference:

Barbeito, I., B.N.I. Eskelson, G. Carsky. 2021. Trade-offs across densities and mixture proportions in lodgepole pine-hybrid spruce plantations. *Forest Ecology and Management* 490:119095.

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