

MIXING TREE SPECIES ALONG WITH DENSITY MANAGEMENT TO REDUCE DROUGHT SUSCEPTIBILITY IN COASTAL PLANTATION FORESTS OF BRITISH COLUMBIA



Surabhi Lukose¹, Brad Pinno¹, Kwadwo Omari^{1,2}
¹Department of Renewable Resources, University of
Alberta, AB, Canada
^{1,2} Ministry of Forests, Coast Area Research, British
Columbia, Canada

STUDY SITE

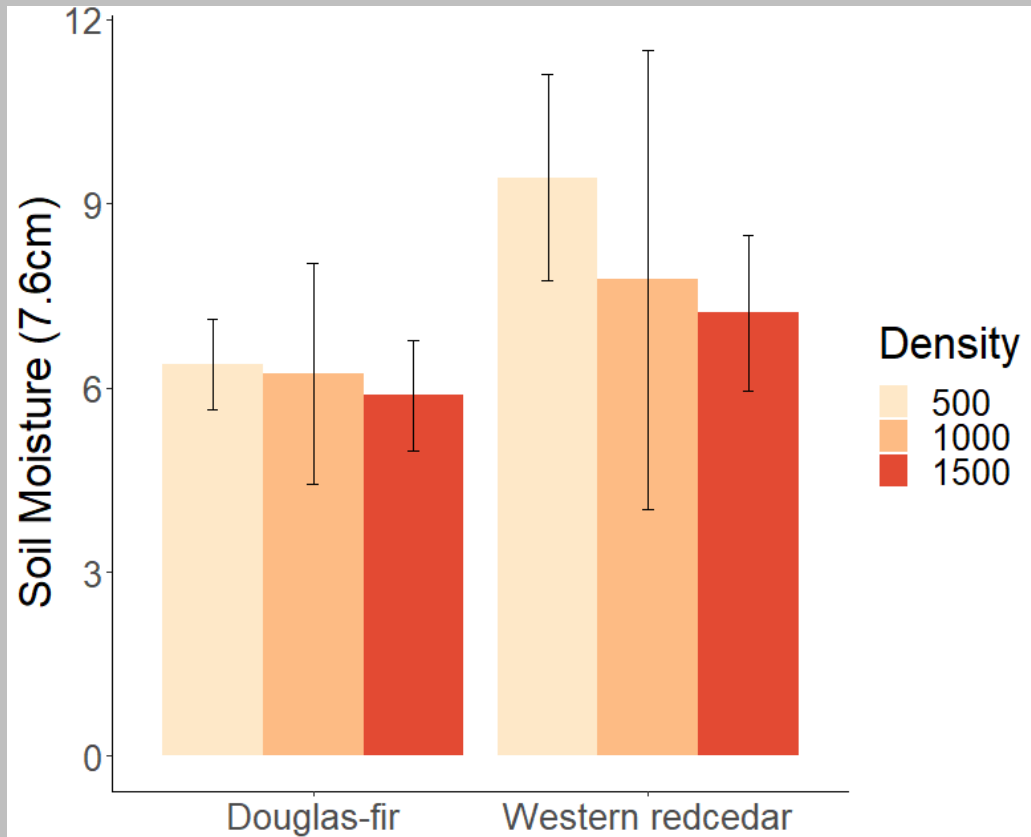
- 24 Plots: 12 treatments with 2 replicate for each
- 4*3 factorial design
- Douglas-fir: western redcedar in mixtures of 1:1, 0:1, 1:0, 1:3
- Density (stems/ha): 1000, 500, 1500

DATA COLLECTION

1. Soil Measurements
2. Tree Cores
3. Carbon Isotope

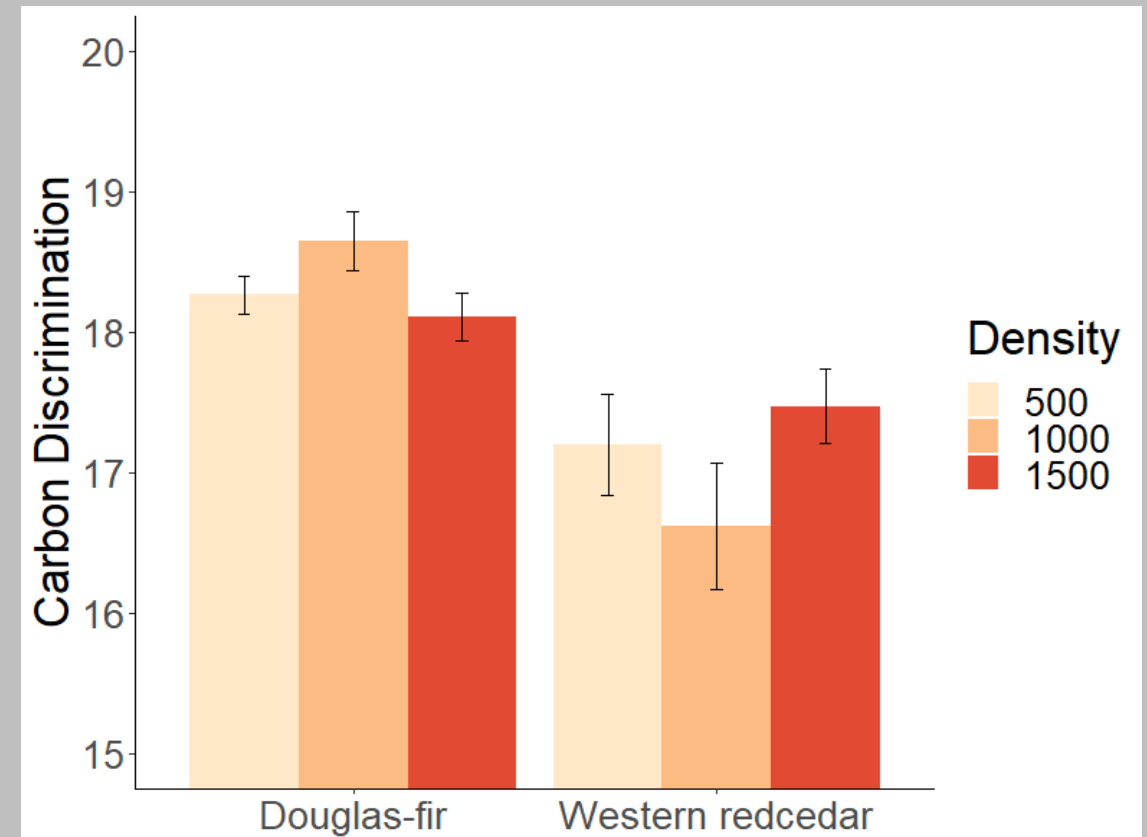
Standard Precipitation Evapotranspiration Index was used to determine drought years: 2015 and 2016

Soil Moisture



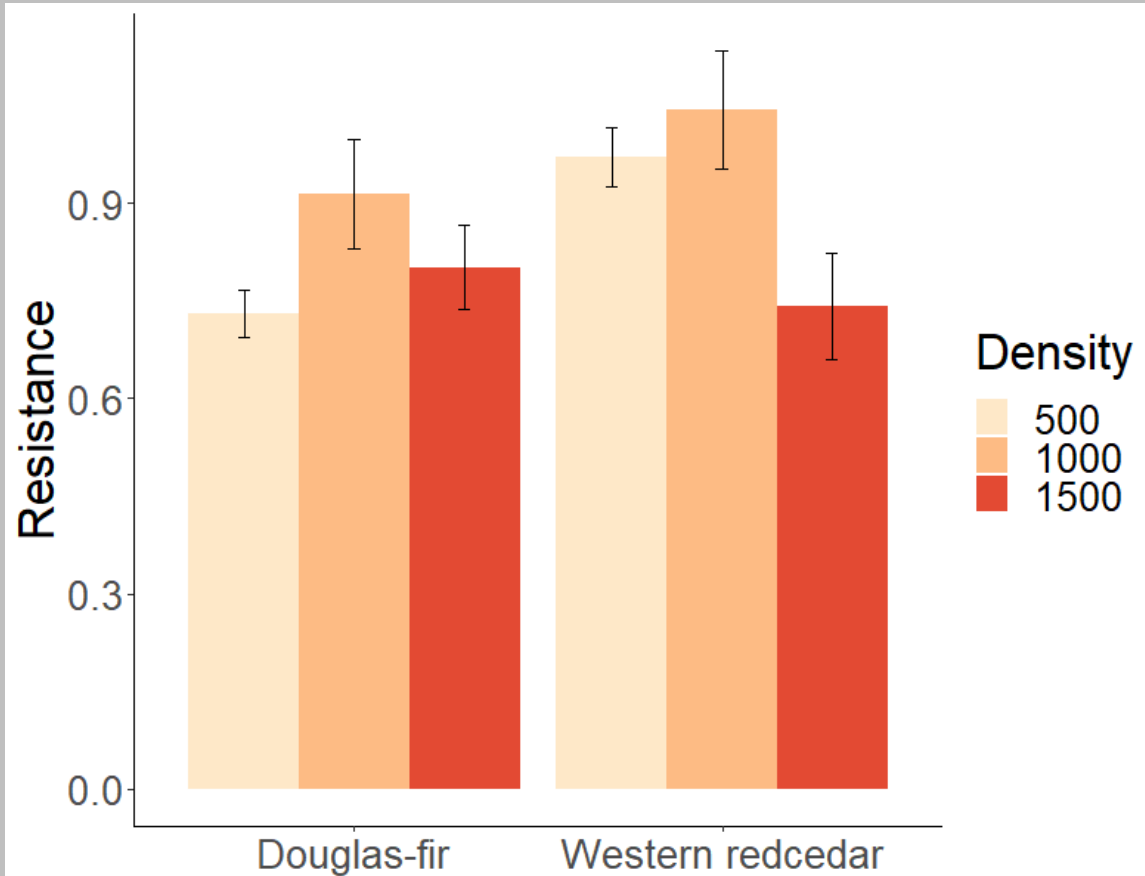
Pure Western redcedar stands have higher soil moisture compared to pure Douglas-fir stands.

Carbon Discrimination

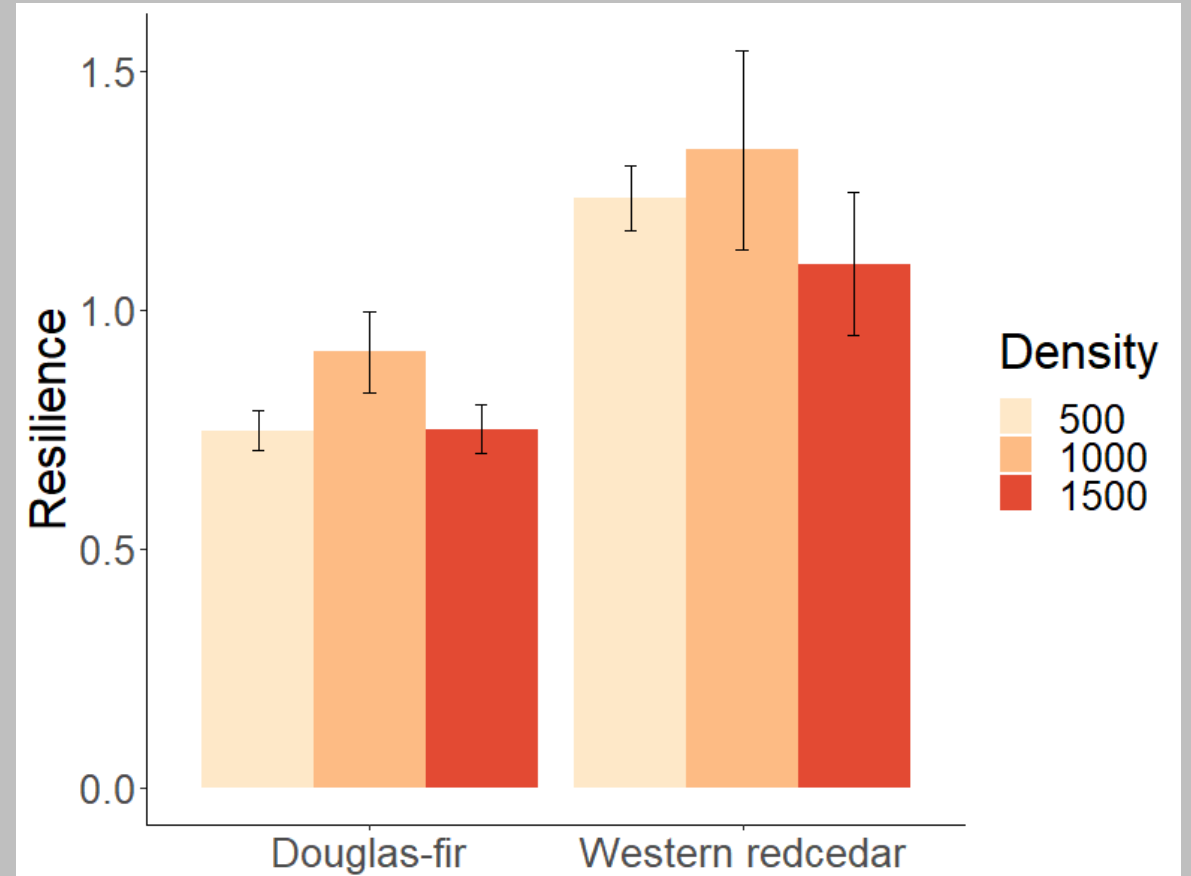


Pure western redcedar stands show higher water use efficiency compared to pure Douglas-fir stands at all densities during dry year

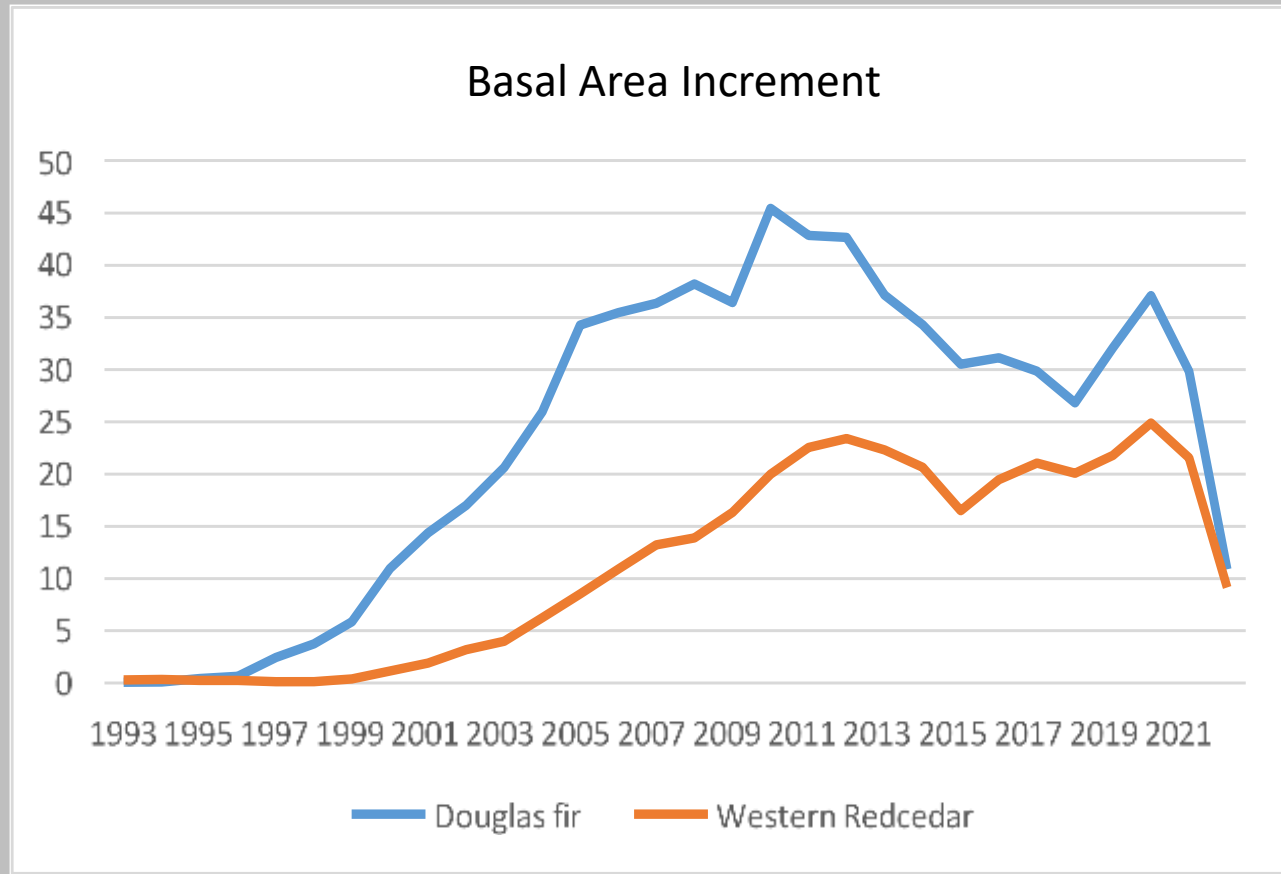
Drought Resistance



Drought Resilience



Pure western redcedar stands show higher drought resistance and resilience compared to pure Douglas-fir stands at all densities during dry years. Also for both species, the medium density stands show the highest resistance and resilience



Douglas-fir trees show a higher growth rate while pure western redcedar stands show better adaptability to drought