

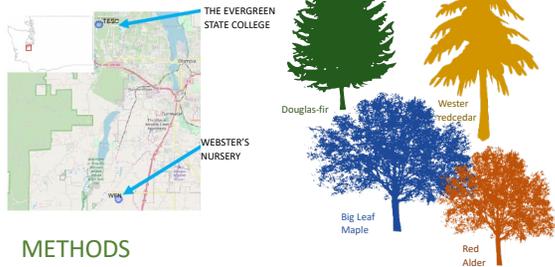
Native Tree Water-Use and Stormwater Events in Lowland Puget Sound Forests



INTRODUCTION

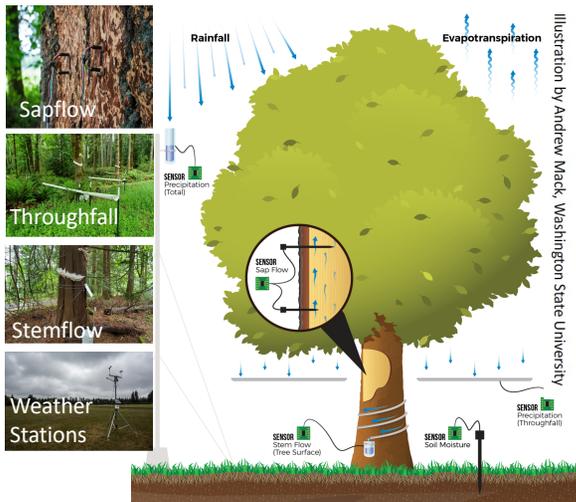
The role of trees in the hydrological cycle is a critical component of land-water interactions that has not been well quantified in the Puget Sound region. We have measured tree water use for two years at two locations near Olympia, WA, to explore how four native tree species manage water.

64 individual trees
4 native tree species
2 sites w/ 4 plots of 8 trees
2 years of data collection



METHODS

Instrumentation measures speed of water movement up the tree (sap flux), rain through the tree canopy (throughfall), rain that funnels down the tree stem (stemflow), and soil moisture. Rainfall and climate variables are also measured at each site.

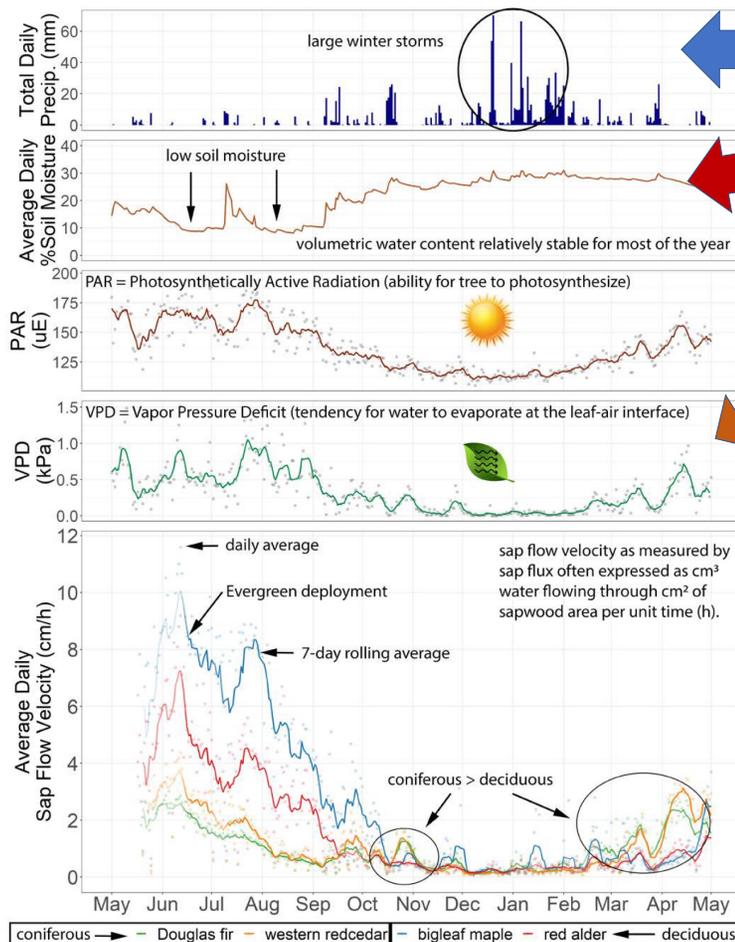


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RESULTS - ANNUAL PATTERNS IN WEATHER AND TREE WATER-USE



Over two-years, our measurements have captured water-cycle dynamics for **over 80 individual storm events** in our Region

Our data cover **periods of relative "soil drought" and excess moisture**

Variation in Radiation and Atmospheric dryness (VPD) will allow us to model **tree water-use based on weather**

Tree species show different patterns!

- Big-leaf maple can use water 2-4 times faster than conifers.
- Conifers outpace deciduous trees in water-use during fall and early spring
- Conifer tree water-use occurs throughout the year, ranging from >100 L per day in late spring to only 10-25 L per day in winter



The figure above shows average water-use for a medium sized Douglas fir is based on a multiplication of sap flux multiplied by estimated average tree sapwood area.

Acknowledgments

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