



## **Assessing the “two water worlds hypothesis”, and water sources for native and exotic evergreen species in south-central Chile**

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Recent studies using water stable isotopes ( $\delta^{2}\text{H}$  and  $\delta^{18}\text{O}$ ) have described an ecohydrological separation of water between streams and trees indicated as the “two water world hypothesis”. In this study, we monitored water compartments at two catchments near Valdivia (Chile) covered by old growth native evergreen forest (NF) and a *Eucalyptus nitens* stand covered catchment (or EP), throughout approximately 1.5 years.

Our results showed that precipitation, stream and suction lysimeter water plots approximately along the  $\delta^{2}\text{H}/\delta^{18}\text{O}$  slope of local precipitation inputs (LMWL). However, bulk soil and xylem water plots below the LMWL, supporting the “two water worlds hypothesis”. This suggests that trees are using water that is not contributing to stream water. However, we also found evidence of connectivity between the two water worlds, potentially caused by heavy rainfall events, for a brief period (autumn and winter) especially in EP. Our results also suggests that precipitation falling during autumn-winter period is the main water supply for streamflow and bulk soil water, which share a similar precipitation source as *Aetoxicon punctatum* (in NF) and 4 years old *Eucalyptus nitens* stand (in EP). We conclude that the “two water worlds hypothesis” applies under certain environmental conditions.