

# Effect of Exotic Fast-Growing Forest Plantations on Water Yield in South-Central Chilean Watersheds: a Review

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## Abstract

Water supply is one of the largest and most valued ecosystem services from forests. This paper presents a systematization of scientific studies about the effects generated by exotic fast-growing forest plantations of *Pinus radiata* D. Don and of *Eucalyptus* spp. on water yield in south-central Chilean watersheds (33 - 41°S), at different spatial and temporal scales. We compiled scientific studies that have at least one year of observations on small and large catchments and experimental plots. Studies in experimental plots of *Pinus radiata* plantations show that annual evapotranspiration increase from south (40° S) to north (33° S), while in this northernmost site almost the entire incoming precipitation was evapotranspired, and the percolated water was negligible. Studies of water balance in small catchments document a negative linear relationship between total streamflow and forest plantations coverage. Catchments with forest coverage of *Pinus* or *Eucalyptus* spp. store less water than catchments with mixed species, mainly due to high interception loss, more net evapotranspiration and reduced percolation. Forest management can alter the accumulation of water in the catchment (soil and groundwater) and forest cover is the fundamental factor in the dynamics water accumulation. Long-term studies focused on changes in forest coverage from native forest to forest plantations in large catchments located in the Mediterranean area (33 - 38° S) of Chile show a sustained reduction in water yield, especially during summertime.

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