# Aboveground nitrogen input by throughfall and litterfall in two *Nothofagus* forests in southern Chile

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Nitrogen return by leaf litterfall was compared with atmospheric nitrogen deposition for two deciduous *Nothofagus* stands in southern Chile, located in regions with a contrasting land use. The litterfall return of nitrogen in a *Nothofagus alpina* (Poep. et Endl.) Oerst. stand in San Pablo de Tregua, in the Cordillera de los Andes, was similar to the litterfall return in a *Nothofagus obliqua* (Mirb. Bl.) Oerst. stand in Paillaco, in the Central Valley. In contrast, the net throughfall and stemflow deposition differed significantly between the two stands. In San Pablo de Tregua, the annual bulk deposition of $NH_4^+$ and $NO_3^-$ was significantly higher than the throughfall and stemflow flux reaching the forest floor. This demonstrates an uptake of inorganic nitrogen in the aboveground biomass, which was related with the bulk inorganic nitrogen deposition by precipitation ($r^2 > 0.73$). In Paillaco, bulk nitrogen deposition was significantly lower than the throughfall and stemflow deposition, and canopy uptake of nitrogen was not directly detectable due to a dry deposition input of 4-8 kg inorganic N $ha^{-1}$ $y^{-1}$.

In the two studied *Nothofagus* stands, nitrogen return through leaf litterfall (~ 50 kg N $ha^{-1}$ $y^{-1}$) was much higher than the atmospheric deposition load (< 10 kg N $ha^{-1}$ $y^{-1}$). Consequently, the results confirm the low degree of disturbance by external pollution sources in the forests of the present study. However, the clear difference in net throughfall deposition of inorganic nitrogen between the two studied stands indicates that the external N input by dry deposition is significantly higher in the Central Valley than in more remote areas of Chile, like the Cordillera de los Andes. Therefore, monitoring of atmospheric deposition is a necessary tool to evaluate the consequences of future emission changes.