A cross-site comparison of 15N fate and N dynamics in western Oregon forests. (S07-compton182303-Oral)

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Abstract:

Variations in soil nitrogen dynamics over space and time can influence forest productivity, cation losses and aquatic ecosystems. Because soil processes often mediate human impacts on terrestrial and aquatic ecosystems, stable isotope tracers are used to closely examine soil N dynamics. We conducted a 15N-tracer study for two years at four sites across western Oregon, USA. These sites have a wide range of soil N levels (from 200 to >500 kg/ha, 0-10 cm soil) and mineral soil C:N ratios (<20-35). Two sites are located at low elevation (140 m) <10 km from the ocean in the western Coast Range (Douglas-fir stand, and mixed red alder-conifer stand). Two other sites are located in the western Cascades, in Douglas-fir stands at low elevation (600 m) and high elevation (1220 m). Oregon Coast Range sites have high soil N and watershed N export when compared to similar forests in the western Cascades. By chasing a small pulse of highly enriched N through ecosystem pools, we can determine the important short- and long-term sinks of N in the field, which in turn can be used to understand the relative importance of different pathways of N retention and loss.

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