

Element fluxes through a small forested watershed at Hokuriku district

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In recent years, the concerns about the effects of atmospheric deposition on forest ecosystems, particularly on areas along the Sea of Japan, have been growing. On-site monitoring throughout the year is difficult in most of these areas because of heavy snow. Therefore, the dynamics and budgets of elements within forest ecosystems throughout a year remain to be elucidated. We began monitoring the cycles of major and minor elements in a small forested watershed at the Tedoru River basin, Ishikawa Prefecture, Japan, in 2013. This study aimed to reveal the element dynamics and input-output budgets within a forested watershed in a heavy snowy region and understand the contribution of transboundary air pollution to the quantity of atmospheric deposition. The second aim was to compare atmospheric nitrogen (N) deposition in this mountain area to that of forests surrounding the Tokyo metropolitan area. The study site receives high rainfall throughout the year (2870–3350 mm year⁻¹). There were seasonal fluctuations in the influx of atmospheric deposition, particularly during winter when the quantities of most elements increased. Atmospheric N deposition from rainfall and snowfall was 23 kg ha⁻¹ year⁻¹. N input quantity was similar or more than that reported in N-saturated forested areas of the Kanto district. Conversely, the output concentrations of most dissolved elements in stream water did not show clear seasonal fluctuations. Stream water nitrate concentration was stable and low.