

Bulk precipitation and throughfall depositions of atmospheric nitrogen and sulfur in forests surrounding the Tokyo metropolitan area

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Increased atmospheric deposition of nitrogen (N) and sulfur (S) compounds from anthropogenic sources remains a concern in some areas of the world. The impact of increased N emissions on a global scale extends to forest ecosystems as well. N influx into the forested areas distorts the N dynamics in the forest ecosystem. High nitrate concentrations in some stream water have been observed at forest watersheds on the surroundings of the Tokyo metropolitan area. Atmospheric N and S depositions by bulk precipitation (BP) and throughfall (TF) were investigated on 12 (BP) and 15 plots (TF) in forest stands located on the surroundings of the Kanto plain of Tokyo metropolitan area, with intense human activities. In this study, it was observed that throughfall contributes more to N and S influxes than BP. At the majority of the studied sites, nitrogen influx resulting from TF was 2 to 3 times the N influx resulting from BP. The increase in N outflow from watershed surrounding Tokyo metropolis can be attributed to the N influx induced by the forest canopy structure. In contrast, the S influx was higher at sites located far from the Tokyo metropolitan area, which resulted from high annual rainfall and particularly from the influence of seasonal wind, including sea-salt and air pollutants from Asian continent during the winter season. Furthermore, to determine the influences of atmospheric N and S influxes and N saturation, it is pertinent to observe the cycling of elements within various forest watersheds, including snowy area.