



## **Impact of landscape factors and anthropogenic emission on reactive nitrogen accumulation in forests of Central Russia**

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Availability of nitrogen from atmospheric deposition in industrialized urban areas, as is known, may be the cause of environmental violations in forest ecosystems, including shifts in species composition and reduced ground cover vegetation (Aber et al., 1998; Bobbink, 2004; Nordin et al., 2005). In order to assess the risk of eutrophication of forests in central Russia were carried out research to assess the depositing nitrogen in snow cover and forest soils of Moscow region. The aim of the work was to evaluate the influence of anthropogenic emission sources of  $\text{NO}_x$  (road transport and industry), and landscape conditions (tree species and soil types) on the spatial accumulation of nitrogen in forest ecosystems and the composition of trophic groups of terrestrial vegetation.

Within the study area (approximately 200 km x 40 km), located in the subzone of broad-leaved-coniferous forest, were selected 8 key areas with different types of forest. Sampling of snow was conducted at the end of March 2009. Mixed samples were taken in open areas and in podkronovoy zone stands with area 5.10 m<sup>2</sup>. Was selected 20 mixed samples. In the laboratory samples of snow were rastoplenny and filtered. For each specimen was measured by the volume of melt water. Soil samples were taken in the second half of the growing season (July-August 2009) from the upper humus horizon (mixed sample to a depth of 10 cm). In the melted snow water and soil samples were determined mineral forms of nitrogen ( $\text{N-NH}_4$  and  $\text{N-NO}_3$ ).

The mineral nitrogen content in the snow-covered waters amounted to 0.3-0.8 mg N / l, which according to the ICP Forest (De Vries et al., 2007) corresponds to or above the critical level of nitrogen concentration for oligotrophic types of forest ground cover (lichens and mosses). In the composition of mineral forms predominate nitrates. Differences in nitrogen concentrations in the snowpack are determined by species composition of trees, which is associated with the transformation of the chemical composition of rain forest canopy. Maximum values obtained for samples collected under the canopy of coniferous species, the minimum - in open areas of forest. Influence of the proximity of emission sources on the intensity of depositing nitrogen in the snow cover was not significant. In soil samples, the concentration of  $\text{N-NH}_4$  vary within 0.5-2 ppm, with average values equal 1.1-1.2 ppm. Nitrate was higher - 40-180 ppm, with averages - 70-90 ppm. Spatial distribution of values obtained in the first place, by the influence of landscape factors (soil type and texture as well as tree and ground vegetation species), as well as the seasonal dynamics of the mineralization of plant litter in woods. Influence of technological factors expressed to a lesser extent, that, apparently, due to the relatively uniform redistribution of technogenic load of nitrogen for the Moscow region as a result of atmospheric transport of pollutants.

### References:

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