



A simple model to describe the exchange of reactive N-gases between forest and the atmosphere

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In the past decennia measurements of exchange fluxes of reactive nitrogen oxides, such as nitrogen dioxide (NO_2) with ecosystems have shown confusing results. Field experiments observations often showed the flux of NO_2 to be away from the forest to the atmosphere rather than directed toward the forest, as was to be expected from early chamber studies. In the last years considerable progress has been made in this area. It appears that the nitric oxide (NO) emitted from the forest floor is responsible for these observations. The NO is converted in the trunk space through reactions with ozone (O_3). This ozone is transported from the atmosphere into the trunk space by turbulent diffusion. A model was developed in which these processes are described by a set of simple equations. Comparisons of the results of calculations with the model with observations showed that it is capable of explaining many of the observed phenomena. The model's simplicity allows it to be implemented in large scale regional atmospheric transport models without a increasing the needs for computer resources.

Examples of comparisons between model calculations and field observations will be discussed as well as the results of model calculations using the simple model in a large scale model.