Abstract:

This scientific literature review examines the time trends of wet atmospheric deposition of sulphur and nitrogen over a four decade period in three regions of the Northern Hemisphere, namely Europe, North America and Southeast Asia. The wet atmospheric deposition processes transport sulphur and nitrogen compounds from the atmosphere to the Earth's surface via vertical or horizontal pathways. Excessive levels of these deposited compounds can cause a number of environmental problems, such as change in biodiversity, degradation of forest stands or change in water and soil chemistry. It is therefore necessary to monitor and evaluate these trends. Sulphur and nitrogen can enter the atmosphere through anthropogenic emissions, among other sources. The change in sulphur and nitrogen emissions over the last four decades has undoubtedly influenced the time trends of wet deposition. The aim of this work is to evaluate these patterns in addition to the sulphur and nitrogen trends. This work also addresses the change in wet deposition ion ratios, in particular the change in the ratio of NH_4^+ to NO_3^- in the wet deposition of nitrogen. Wet deposition of sulphur, in line with a significant reduction in sulphur compounds emissions, records a noticeable decrease in both Europe and North America, but wet deposition of nitrogen in these regions is decreasing less markedly or it is even stagnating. Southeast Asia, on the other hand, is experiencing a rapid increase in emissions, which strongly influences the values of total wet and therefore total deposition. It turned out that Southeast Asia surpassed other regions in the quantity of sulphur and nitrogen deposition and differed in its temporal trends.

Keywords: emission trends, Europe, North America, Southeast Asia, nitrogen forms, air pollution, long-range transport, acid deposition