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Estimation of the total wet sulfur and nitrogen deposition as a part of pollution balance in the south of the Russian Far East based on the monitoring data

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One of the main goals in the regional biogeochemical research of East Asia is to evaluate the state of acid deposition and the related pollution within EANET region (EANET, 2019). In the south of the Russian Far East there are two networks developed to monitor the content of acidic substances in atmospheric fall-out. The first one is the Russian national precipitation chemistry stations operated for more than 30 years, and the second is the international atmospheric monitoring sites supervised by EANET and WMO-GAW (Yearbook, 2019). We calculate the total deposition of airborne sulfur and nitrogen in a large region to evaluate their atmospheric balances under the transboundary influence. The present study focuses on the development and application of the spatial interpolation method to estimate wet deposition fluxes based on the monitoring data for 2013-2018. On the first step of the algorithm, we analyze the correlation of pollution monitoring results between network stations and estimate the maximum radius of representativeness for each station. On the second step, we interpolate the precipitation chemistry data for the set of meteorological stations located in the region under the study and calculate the wet deposition fluxes of sulfur and nitrogen for these sites. The flux values obtained are further interpolated for the regular grid of 10-km by 10-km cells within the region under the study. Finally, the total wet sulfur and nitrogen deposition for the region is a sum of deposition fluxes calculated for each cell. Additionally, we compared the data obtained with the correspondent flux calculated on the basis of the national snow cover chemistry network for the same region and period.

References

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