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INFLUENCE OF HYDROTHERMAL CONDITIONS ON CO₂ FLUX DYNAMICS
IN A MIXED FOREST

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The article presents the results of a study on the interannual variability of carbon dioxide (CO₂) fluxes in a mixed coniferous-deciduous forest located within the Educational and Experimental Soil and Ecological Center of Lomonosov Moscow State University. To simulate the ecosystem's carbon balance for the period 2010–2025, the Forest-DNDC dynamic model was used, which allowed for the analysis of the influence of climatic factors (temperature and precipitation) on the carbon exchange between soil, vegetation, and the atmosphere. The model's adequacy was verified by comparing it with the results of eddy covariance measurements, which confirmed its applicability for calculating integral CO₂ fluxes in forest ecosystems. Model calculations revealed a consistent trend of organic carbon accumulation in the soil, averaging 170 to 230 kg C/ha per year, accompanied by a slight decline in the forest ecosystem's net carbon uptake capacity. An increase in temperature weakens carbon uptake by an average of 1% per year. In some years, the ecosystem serves as a source of CO₂, releasing 400 to 800 kg C/ha per year.

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