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TRANSFORMATION OF THE THERMAL REGIME OF BELARUSIAN RIVERS IN CURRENT CLIMATIC CONDITIONS

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This study aims to identify spatial-temporal patterns and recent trends in the thermal regime of rivers in Belarus. Input data includs water temperature (T_w) observations at 48 representative hydrological stations belonged to the state observational network of Belhydromet. The analysis covers the period 1951–2025. Descriptive statistics and linear trend calculations were performed, with spatial analysis conducted in ArcGIS. Results show that after 1990, a clear increasing trends in T_w are observed across most rivers, linked to regional climate warming. The long-term average T_w for 1951–1989 ranged from 7.6°C to 11.1°C, while for 1990–2025 it increased to 8.1–13.0°C. The most notable increases occurred in the Pripyat, Neman, and Western Bug basins (West and South of the country), where average T_w rose by 1.0–1.9°C. In the Dnieper basin, the increase was 0.8–1.5°C, and in the Western Dvina basin – 0.5–1.0°C. Trends in annual maximum T_w for 1951–2025 are positive, ranging from 0.2°C to 3.8°C. The highest increases by 1.5–3.8°C are observed on the rivers in the Southern and Central parts of the country: 2.8°C in Oressa River (Pripyat basin), 3.8°C in Sluch River (Pripyat basin). The smallest increases by 0.2–0.40°C occur in Northern Rivers of the Western Dvina basin and partly in Southwestern areas by 0.02–0.60°C. Spring transition of T_w through 0.2°C has shifted earlier by an average of 12 days. In the Pripyat, Neman, and Western Bug basins, this now occurs in the third decade of March; in the Dnieper and Western Dvina basins – in the first decade of April. Autumn transition through 0.2°C to the cooling has shifted later by an average of 8 days. In conclusion, the study reveals significant spatiotemporal changes in the thermal regime of Belarusian Rivers, including increases in mean and maximum T_w (mean from 7.6–11.1°C to 8.1–13.0°C; positive trends up to 3.8°C), earlier spring warming by 12 days, and delayed autumn cooling by 8 days. These changes are directly linked to ongoing climate warming observed since 1989 in Belarus.

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