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CURRENT AND PROJECTED CHANGES IN HYDROLOGICAL CYCLE
COMPONENTS ACROSS BELARUS:
PRECIPITATION, EVAPORATION AND RIVER RUNOFF

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The study presents an overview of the distribution and changes of hydrological cycle's components across the territory of Belarus.

In recent decades, precipitation dynamics show no significant trend; however, summer precipitation is decreasing by 2.4 mm per decade, accompanied by an increase in the frequency of heavy rainfall events over the last 25 years. Total evaporation shows a statistically significant shift toward rise occurred in the mid 2000s. This shift is driven by intense summer warming, altered humidity, and stabilizing wind conditions after 2010.

Water resources, which correlate with precipitation strongly, have decreased by 17% over the last 10–15 years. River runoff trends include increased winter low flow and winter flood peaks, alongside decreased spring flow and fewer spring floods. In the warm season, rising aridity and more frequent heavy rainfall since the mid 1990s have increased summer autumn low flow minima and rainfall induced flood heights.

Climate projections show continuing temperature rising for winter and spring, while in summer and autumn will be a modest increase in hot days. Precipitation shows both an increase in annual and summer totals and a rise in aridity during the growing season across the country.

The projected hydrological trends include an increase in winter and summer–autumn low flows, a generally decreasing spring flood peak, and annual flow changes ranging from slight declines to moderate increases depending on the scenario. The average annual runoff will remain close to the historical norm, but the probability of extreme hydrological events rises.

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