



## **Observed redistribution of precipitation types toward more heavy showers in Northern Eurasia**

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Long-term changes in convective and stratiform precipitation in Northern Eurasia over the last five decades are estimated. Different types of precipitation are separated according to their genesis using routine meteorological observations of precipitation, weather conditions, and morphological cloud types for the period 1966–2016. From an initial 538 stations, the main analysis is performed for 326 stations that have no gaps and meet criteria regarding the artificial discontinuity absence in the data.

A moderate increase in total precipitation over the analyzed period is accompanied by a relatively strong growth of convective precipitation and a concurrent decrease in stratiform precipitation. Convective and stratiform precipitation totals, precipitation intensity and heavy precipitation sums depict major changes in summer, while the relative contribution of the two precipitation types to the total precipitation (including the contribution of heavy rain events) show the strongest trends in transition seasons.

The contribution of heavy convective showers to the total precipitation increases with the statistically significant trend of 1%–2% per decade in vast NE regions, reaching 5% per decade at a number of stations. The largest increase is found over the southern Far East region, mostly because of positive changes in convective precipitation intensity with a linear trend of more than 1 mm/day/decade, implying a 13.8% increase per 1 °C warming.

In general, stratiform precipitation decreases over the majority of NE regions in all seasons except for winter. This decrease happens at slower rates in comparison to the convective precipitation changes. The overall changes in the character of precipitation over the majority of NE regions are characterized by a redistribution of precipitation types toward more heavy showers.

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