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Temporal variability of d18O values in waters of two Tundra and Taiga rivers in NE European Russia

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We studied the seasonal variability of d18O in four rivers in northeast European Russia. To use different scales in terms of hydrological variability, vegetation types and land-use, we chose two large river basins and two small basins in both Tundra and Taiga.
In Tundra, the d18O value varied in a large river (R. Usa) between -11.5 o/oo and -16.8 o/oo (average of -13.5 o/oo) and in a small river (R. Sedyaga) between -10.9 o/oo and -18.1 o/oo (average -14.0 o/oo) with a distinct seasonal pattern. The lowest values were recorded in spring and highest in late summer. The lowest values were close to those found in groundwater. In Taiga, the d18O values varied between -12 o/oo and -15.8 o/oo in both the large river (R. Vym) and in the small river (R. Achym) both also having similar seasonal variability as in the tundra rivers. The enhanced d18O values suggest increased input of precipitation and evaporation in the summer in both areas. In Taiga the summertime d18O values were close to the values in groundwater (around -14.5 o/oo) while in the tundra the summer values around -13 o/oo were clearly higher than values of groundwater (around -17 o/oo). This implies that in Tundra the river water in summer originated from the water left from the preceding winter or from the summer precipitation, and probably not from melting of the permafrost.