

## **Hydrological process change with air temperature over the Lena Basin in Siberia**

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We use long-term monthly discharge and sub-basin air temperature data in the Lena River to examine the relationship between hydrological processes and permafrost change. The ratio of the maximum to minimum monthly discharge ( $Q_{max}/Q_{min}$ ) decreased, while the recession coefficient in the cold season ( $Q_{apr}/Q_{dec}$ , discharge in April vs discharge in November) increased over the upper Lena and Aldan sub-basin during 1936 to 2000. The annual basin air temperature (AT) has increased from 1940 to 2000. There is a significant relationship between  $Q_{max}/Q_{min}$ ,  $Q_{apr}/Q_{dec}$  and AT. The positive relationship between  $Q_{apr}/Q_{dec}$  and AT, and the negative relationship between  $Q_{max}/Q_{min}$  and AT became significant from single year to 7-year running average. These results suggest that the  $Q_{max}/Q_{min}$  and  $Q_{apr}/Q_{dec}$  changes may be related to the basin warming and perhaps permafrost degradation.