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## Peak water in observed glacier-fed streamflow time series

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Glacier peak water describes the initial increasing and subsequent decreasing trend of glacier melt water as a response to global warming. The phenomenon might encourage excessive water use that cannot be sustained in the long-term. Knowing magnitude and time scale of its effect on streamflow trends and changes in partly glacierized catchments is therefore needed. This comparative regional study examined August streamflow records from 1976-2015 in the European Alps, Norway, Western Canada, and Alaska. It aimed to detect whether and when a peak was reached or passed and how strong decreasing post-peak streamflow trends were. A one-peak hypothesis could not be confirmed in many of the records and the variability of individual series' detected peaks and trends is large. Some common patterns in the timing of peaks and general trend directions in the records could be generalized. These suggest: a peak early in the period in Western Canada followed by mostly declining streamflow trends, pre-peak conditions in Alaska resulting in mostly positive streamflow trends, variable peaks in Norway and the Alps from the mid-1990s on with differences for low and highly glacierized catchments. Trends and peaks in climate-variability corrected August streamflow broadly related to phases of regional glacier retreat, but local variability is more complex. Only weak systematic deviations were found related to catchment characteristics. This multi-record and multi-region comparison of streamflow observations suggests that knowledge on a regional phenomenon will need to be complemented with local monitoring and modelling to provide useful information for water resources planning.