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# Hydrological controls on dissolved organic matter export from high-alpine streams

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The hydrological regime of Alpine streams is strongly influenced by water accumulation in the form of snow and glacial ice and the corresponding melt processes, resulting in a pronounced annual cycle of discharge. It is recognized that snowmelt and rain events drive most of the dissolved organic matter (DOM) export from headwater catchments. Climate change scenarios predict a precipitation shift in the Alps from snowfall to rain, which will affect the duration and timing of snow cover coupled with glacier retreat that is leading to a clear hydrological change in these systems. In this study, we deployed high-frequency sensors to assess discharge and the temporal dynamics of fluorescent DOM (FDOM) during one hydrological year in 12 Alpine streams draining catchments with no and up to 28 % glacier coverage. We also collected discrete samples for the determination of dissolved organic carbon (DOC) concentration to convert sensor-derived FDOM data into DOC concentration. We hypothesized that (1) variability in the magnitude of snowmelt, storm intensity and timing and transition among different hydrological periods drives intra-annual dynamics of DOM concentration and export; (2) most carbon export occurs during snowmelt and the post-snowmelt recovery of the DOM concentration depends on vegetation cover in the catchment; (3) DOM export varies among sites because of differences in catchment characteristics. Preliminary results show consistently low (< 0.5 mg C L-1) but changing DOC concentrations in all streams during the entire study period. Streams with glacier-melt had maximum discharge in summer, whereas in streams with no glacier influence, maximum discharge was earlier in June. Temporal patterns in FDOM were associated with discharge patterns with highest concentrations typically found at the onset or the peak of the snowmelt period. Given the dependence of streamwater DOM dynamics and export on hydrological drivers, alterations of the hydrological regime due to climate change will impact the carbon fluxes in Alpine catchments.