

[\(https://aslo.org/\)](https://aslo.org/)**THE INFLUENCE OF GLACIAL COVERAGE AND HYDROLOGICAL REGIME ON CO₂ DYNAMICS IN GLACIER-FED STREAMS****Abstract Number:** 10180**Session:** SS017: Living Downstream from Shrinking Glaciers: Understanding & predicting the hydrology, geo**Session Type:** Poster Presentation

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: Mountain glaciers shrink rapidly, altering hydrological regimes, stream morphology and biogeochemistry. However, we know relatively little of how glacier shrinkage influences CO₂ dynamics and evasion fluxes from glacier-fed streams. To investigate CO₂ dynamics and fluxes in glacier-fed streams, we monitored pCO₂ and potential drivers (such as discharge and temperature) across 7 Swiss Alpine streams draining catchments with varying glacial coverage. We contrasted these glacier-fed streams to 5 high-elevation streams not fed by glaciers, using the gradient of glacial influences as a space-for-time substitution. The streams were overall supersaturated in CO₂, with pCO₂ ranging from 400-800 μatm. We identified daily and seasonal variations in streamwater pCO₂. pCO₂ patterns did not peak during nighttime, as would have been expected in a stream with pronounced stream metabolism. Instead, the pCO₂ dynamics was closely related to daily and seasonal fluctuations in stream discharge. We suggest that CO₂ evasion fluxes were driven by high gas exchange, due to steep slopes and high flow velocities. Our results imply greater CO₂ evasion fluxes than previously thought from high-elevation streams, including glacier-fed streams. Using the space-for-time substitution approach, our findings allow us to assess the impacts of glacier shrinkage on CO₂ dynamics in glacier-fed streams, and to better assess their role in the global carbon cycle.

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