Effects of glacial loss on alpine streams and riparian plants in Glacier National Park

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Glaciers are an important part of alpine ecosystems and Glacier National Park is experiencing rapid glacial loss. The loss of glaciers can impact streams by changing the timing, frequency, and duration of disturbance events such as floods. Streamside, or riparian, wetlands occupy a small percentage of the landscape but are important and highly sensitive ecosystems that are formed and maintained by the disturbance events of streams.

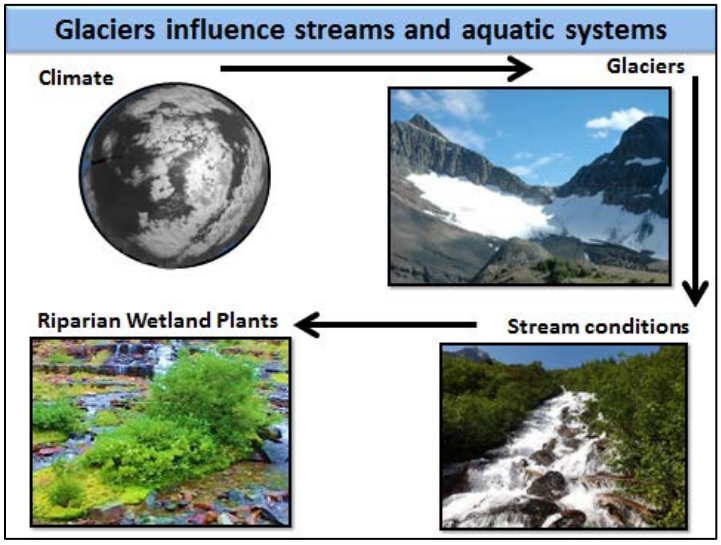

Figure 1 Climate influences glaciers which control streams that form and maintain riparian wetlands. Riparian plants like willows (bottom left) are adapted to disturbance regimes of streams. Top right photo of Chaney Glacier (Glacier National Park Archives)

To understand how glacier loss impacts streams and riparian plants that are adapted to disturbance, such as willow (*Salix*) species, we studied streams and riparian wetlands directly connected to glaciers, permanent snowfields, and seasonal snowpack. We compared the physical characteristics of streams and the plants of riparian wetlands to evaluate changes in a future climate change scenario where temperatures continue to rise and glaciers transition to permanent snowfields and then to seasonal snowpack.

Figure 2: Identifying plant species to characterize alpine riparian wetlands (left) and collecting stream channel data to characterize the stream conditions (right).

Our study found that glaciers support significantly different streams and have more willow (*Salix*) communities compared streams supported by permanent or seasonal snow. Under a future climate scenario, as we lose glaciers from the landscape, willow communities and biological diversity in the alpine are also at risk.