

Glacier-fed river systems threatened by climate change

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Glacial meltwater increases biodiversity in mountainous freshwater ecosystems. As glaciers vanish due to global warming, so will those species dependent upon the icy runoff. This is the conclusion of a study authored by researchers from, among other institutions, the University of Copenhagen.

The article "Glacial river biodiversity" with the alarming new findings can be found in the journal *Nature* [Climate Change](#).

"The knowledge is new and startling. Glacial runoff is cold, nutrient-poor and physically unstable, and therefore, typically species-poor. Traditionally, we have not attached great significance to these ecosystems within the context of local or regional biodiversity," states Associate Professor Dean Jacobsen of the Freshwater Biology Section at the University of Copenhagen's Department of Biology. Jacobsen is one of the study's authors.

Jacobsen and his European colleagues are the first to research ecology and mountain macroinvertebrates, primarily [insect larvae](#) found in tropical glacial streams. In the recent study, researchers compiled and analysed data from analogous regions located on three continents and predicted the consequences of the global retreat and disappearance of glaciers.

One-third of species threatened

The research results clearly demonstrate that the greatest number of freshwater macroinvertebrates are encountered in mountain streams where glacial runoff contributes to the streams' total volume of water. The study also finds that if glaciers were to vanish entirely, we could expect to lose between 11 and 38 percent of a region's total macroinvertebrate species. The expected losses would be particularly high for species, which have adapted to the unique and otherwise challenging living conditions of glacial streams.

Jacobsen emphasises, "That [species](#) of insects such as chironomids (non-biting midges), crane flies and stoneflies could disappear. The wiping out of these invertebrates and others would be much more extensive than once supposed and with unknown consequences for the functioning of the ecosystem."

Glacier-fed streams are one of several stream types which together create a mosaic of ecosystems. Each system has its own environmental characteristics and unique living conditions.

Provided by University of Copenhagen

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