

Alpine streams Microbiodiversity and Climate Change

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Policy Brief

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Summary

Due to climate change, European Alps are expected to lose 80-100% of their glaciers by 2100. However, glacier meltwater confers unique and harsh conditions to the downstream ecosystems, which harbour a vast microbiodiversity highly adapted to those streams.

Along with climate change and glacier shrinkage, the properties of these streams are transitioning from extreme conditions towards moderate ones. These changes, therefore, promote the so-called green transition of streams, i.e., the growth of other photosynthetic microorganisms, such as algae, potentially able to outcompete the initial microbiodiversity as well as forming harmful algal blooms in streams, impacting the water quality for human use.

It is of the utmost importance to better study this microbiodiversity as well as to protect it, as there is no other ecosystem similar to glacier-fed streams. A first step towards its protection is to raise awareness about it.

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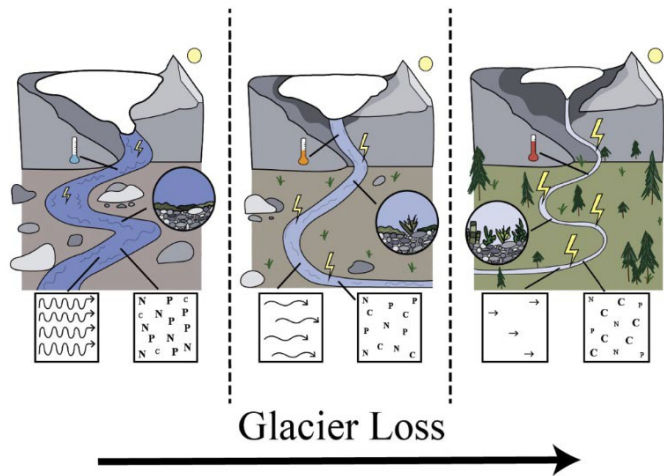


Illustration from Sudlow et al., 2023 depicting the greening effect of glacier melt due to climate change.

Introduction

Glacier-fed streams represent a unique environment with a broad microbiodiversity endangered by climate change and glacier shrinkage. Indeed, melting ice leads not only to the disappearance of microorganisms found on glaciers but also affects downstream ecosystems such as glacier-fed streams and potentially stream water quality.

“Alpine microorganisms are disappearing too fast for us to understand their full importance”

Key messages

- ◆ Raise awareness about microbiodiversity loss
- ◆ Preservation of those microorganisms
- ◆ Need for further research on the Alpine streams microbiodiversity and water quality