

**PROJECT TITLE:** Quantifying the Contribution of Glaciers to Freshwater Resources in Mountain Regions

**Project Science Theme:** Climate Change and Risk

**Project keywords:** Climate water glaciology hydrology modelling

**Lead Institution:** University of Bristol

**Lead Supervisor:** Fabien Maussion, University of Bristol, School of Geographical Sciences

**Co-Supervisor:** Jonathan Mackay, British Geological Survey (BGS)

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**Webpage:** <https://www.bristol.ac.uk/geography>

### **Project aims and methods:**

Mountain glaciers serve as natural water reservoirs, playing a crucial role in regulating freshwater resources that support ecosystems, agriculture, hydroelectric power, and daily human consumption. As climate change accelerates glacial melt, quantifying past and future glacier contribution is paramount. However, the uncertainty surrounding glacier projections complicates decision-making processes. For instance, overestimating glacial melt could lead to unnecessary investments in water storage infrastructure, while underestimating it might result in water shortages and inadequate preparedness for related hazards, such as floods. This uncertainty underscores the necessity for robust models to inform adaptable policies capable of responding to a range of potential glacier change scenarios. The aim of this PhD project will be to refine the hydrological projections of the Open Global Glacier Model (OGGM) and compute their uncertainties using the Sensitivity Analysis For Everyone toolbox (SAFE). The goal is to better understand the roles model parameters play in projected glacier runoff and to support model-based decision-making. Based on the interest of the PhD candidate, these projections might also be integrated into water resources hydrological modelling frameworks to effectively address the critical issue of glacier contributions in selected basins worldwide, involving existing stakeholder partnerships from the supervisor team.

### **Useful recruitment links:**

For information relating to the research project please contact the lead Supervisor via:

[fabien.maussion@bristol.ac.uk](mailto:fabien.maussion@bristol.ac.uk)

### **Bristol NERC GW4+ DTP Prospectus:**

<https://www.bristol.ac.uk/study/postgraduate/research/great-western-four-doctoral-training-partnership-nerc/>

### **How to apply to the University of Bristol:**

<http://www.bristol.ac.uk/study/postgraduate/apply/>

**The application deadline is Monday 13 January 2025 at 2359 GMT.**