

# Project Title: **Quantifying glacier mass loss with Earth Observation and data-driven modelling**

**Lead Institution/Department:** University of Bristol, School of Geographical Sciences

**Primary Supervisor:** Fabien Maussion

**Co-Supervisor:** Noel Gourmelen, University of Edinburgh

**Co-Supervisor:** Livia Jakob, Earthwave

**Scholarship:** A fully funded PhD studentship including UK or international fees, annual stipend, and a research budget, is available at the University of Bristol and co-funded by the University of Edinburgh and Earthwave. Study will begin in September 2025 and is funded for four years. The deadline for applications is 31<sup>st</sup> January 2025.

## **Project aims and methods**

The retreat of glaciers is one of the most visible and impactful indicators of climate change. As they lose mass, it contributes to sea-level rise and leads to shifts in water resources in mountain basins. Yet significant uncertainties remain in quantifying past and present glacier mass loss, particularly due to challenges in converting volume changes derived from satellite observations into mass estimates. This project will address this critical gap by integrating Earth Observation (EO) data with numerical modelling to improve our understanding of glacier mass loss and its impacts. The focus will be on resolving uncertainties in density conversion, a key parameter in deriving mass changes from volume data, through advanced EO data analysis workflows and glacier modelling techniques. The project will leverage state-of-the-art EO datasets, including satellite altimetry and gravimetry, alongside numerical models that simulate glacier dynamics and firn processes. The ultimate goal is to refine mass balance estimates and contribute to global assessments of sea-level rise and water resource changes in glacierized regions. Embedded into global efforts to quantify glacier mass loss (Glambie, OGGM), this interdisciplinary research will deliver tools and products that enhance the accuracy of glacier monitoring efforts worldwide.

## **Candidate Requirements**

This project would suit a candidate with a background in environmental science, physics, mathematics or physical geography and a keen interest in remote sensing and numerical modelling. As we value a diverse research environment, we welcome and encourage student applications from under-represented groups.

## **Useful Links**

Please contact [fabien.maussion@bristol.ac.uk](mailto:fabien.maussion@bristol.ac.uk) and [noel.gourmelen@ed.ac.uk](mailto:noel.gourmelen@ed.ac.uk) for informal enquiries.

- <https://www.bristol.ac.uk/geography/courses/postgraduate/>
- <https://qlambie.org/>
- <https://oggm.org>

**How to Apply:** Please apply to the “Geography (PhD)” programme at <https://www.bristol.ac.uk/study/postgraduate/apply/>