

# Project Title: Harnessing methane oxidation as a climate solution

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

**Primary Supervisor:** Joshua Dean, University of Bristol, Bristol, UK

**Co-supervisor:** Julia Drewer, UK Centre for Ecology & Hydrology, Edinburgh, UK

**Co-supervisor:** Robert Hilton, University of Oxford, Oxford, UK

**Scholarship:** The Bristol Postgraduate Research Scholarship covers full fees, a stipend at UKRI (UK Research and Innovation) rates (£20,780 for 25/26) for living expenses, and up to £2,100 per year for research expenses, for a registration period of 4 years. Study will begin in September 2026.

**The deadline for applications is 19th January 2026.**

<https://www.bristol.ac.uk/science-engineering/postgraduate-research/pgr-scholarships/>

## Project aims and methods

Methane (CH<sub>4</sub>) is a greenhouse gas some 80 times more potent than carbon dioxide, and a major driver of ongoing climate change. At least half of all methane emissions to the atmosphere come from industrial activity. Oxidation by microbes is a critical process that prevents the release of methane to the atmosphere from many environments. Rivers offer unique environments to explore multiple novel aspects and drivers of methane oxidation. This PhD project will utilise a combined field-lab-modelling approach to explore novel niches of methane oxidation in rivers to inform potential applications of oxidation for climate solutions. The PhD candidate will have opportunities to explore urban, Arctic and tropical rivers as part of their PhD. The candidate will apply new approaches to quantify oxidation rates and explore novel drivers and processes that enhance methane oxidation, with a focus on stable and radiogenic isotopes and measuring the gases methane, carbon dioxide and hydrogen (H<sub>2</sub>). The candidate will also use modelling to explore potential climate solutions, ranging from managing urban rivers through to the storage of hydrogen as part of the future energy economy. There will be opportunities to work at and collaborate across the supervisory team and their wider international networks, including industry and government partners (e.g., UK Department for Energy Security and Net Zero).

## Candidate Requirements

The candidate will ideally have a background in (bio)geochemistry, water quality, ecology or hydrology and must have a background in one of lab- field- or modelling based analysis.

## Further Information

Please contact Josh Dean ([josh.dean@bristol.ac.uk](mailto:josh.dean@bristol.ac.uk)) for informal enquiries.

- <https://www.bristol.ac.uk/geography/courses/postgraduate>
- <https://www.bristol.ac.uk/geography/courses/postgraduate/physphd.html>
- <https://watershedcarbonlab.weebly.com/>

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