



Professor Jemma Wadham
B.A.(Cantab.), PhD

Professor in Glaciology/Director of the Cabot Institute

Area of research

Ice and biogeochemical cycles

Office Priestley Room, 12 Berkeley Square
University Road,
Clifton, Bristol BS8 1SS
([See a map](#))

+44 (0) 117 42 82352
j.l.wadham@bristol.ac.uk

Summary

I am interested in all hydrological and biogeochemical processes that occur within glacier and ice sheet systems and in their fore fields and which have a potential regional or global impact.

My research interests span three primary fields:

- 1) Determining the role of glaciers and ice sheets in regulating global biogeochemical cycles, including evaluating the impacts of nutrients/carbon exported from ice sheets upon marine productivity and the impact of methane emission from subglacial and permafrost wetlands upon the atmosphere;
- 2) Understanding water flow through cryospheric systems and the associated feedbacks with ice dynamics and glacial ecosystems; and
- 3) Development and validation of in situ sensing technologies and autonomous platforms for the survey of icy ecosystems, including subglacial lakes and ice stream beds

Biography

I conducted my first degree (B.A., M.A.) in Physical Geography at the University of Cambridge, UK. I subsequently pursued a PhD at the University of Bristol, undertaking a short post-doctoral research post at the University of Leeds in isotope geochemistry, before returning to Bristol to take up a tenured post at the Bristol Glaciology Centre. I was previously Head of the Graduate School, Impact Director and Research Director in the School of Geographical Sciences. I am now Director of the Cabot Institute for the Environment.

Teaching

Year 1 - "the Cryosphere" lectures in Physical Geography

Year 2 - Physical Geography field course (Arolla, Switzerland)

Year 3 - "Ice, Oceans and the Global Carbon Cycle" unit

Year 4 - MSc in Climate Change, Science and Policy Literature Review Unit

Keywords

- Ice sheets and biogeochemical cycles
- Subglacial chemical weathering
- Glacier hydrology and hydrochemistry
- In situ chemical sensors for icy ecosystems

Memberships

Organisations

[School of Geographical Sciences](#)


Research groups

- [Bristol Glaciology Centre](#)

Teaching

- [Academic teaching staff](#)

Links

-  [Project PISCES website](#)
-  [Ice, Oceans and Ion Chromatography \(Source: Thermo. Scientific\)](#)
-  [Recent video footage from the Greenland Ice Sheet NERC funded DELVE project](#)

Recent publications

- Lamarche-Gagnon, G, Wadham, J, Lollar, BS, Arndt, S, Fietzek, P, Beaton, A, Tedstone, A, Telling, J, Bagshaw, E, Hawkings, J, Kohler, T, Žárský, JD, Mowlem, M, Anesio, A & Stibal, M, 2019, '[Greenland melt drives continuous export of methane from the ice-sheet bed](#)'. *Nature*, vol 565., pp. 73-77
- Hatton, JE, Hendry, KR, Hawkings, JR, Wadham, JL, Kohler, TJ, Stibal, M, Beaton, AD, Bagshaw, EA & Telling, J, 2019, '[Investigation of subglacial weathering under the Greenland Ice Sheet using silicon isotopes](#)'. *Geochimica et Cosmochimica Acta*, vol 247., pp. 191-206
- Hawkings, JR, Hatton, JE, Hendry, KR, Souza, GFd, Wadham, JL, Ivanovic, RF, Kohler, TJ, Stibal, M, Beaton, A, Lamarche-Gagnon, G, Tedstone, A, Hain, MP, Bagshaw, E, Pike, J & Tranter, M, 2018, '[The silicon cycle impacted by past ice sheets](#)'. *Nature Communications*, vol 9.
- MacDonald, M, Wadham, J, Telling, J & Skidmore, ML, 2018, '[Glacial Erosion Liberates Lithologic Energy Sources for Microbes and Acidity for Chemical Weathering Beneath Glaciers and Ice Sheets](#)'. *Frontiers in Earth Science*, vol 6.
- Hawkings, JR, Benning, LG, Raiswell, R, Kaulich, B, Araki, T, Abyaneh, M, Stockdale, A, Koch-Müller, M, Wadham, JL & Tranter, M, 2018, '[Biolabile ferrous iron bearing nanoparticles in glacial sediments](#)'. *Earth and Planetary Science Letters*, vol 493., pp. 92-101
- Hawkings, JR, Wadham, JL, Benning, LG, Hendry, KR, Tranter, M, Tedstone, A, Nienow, P & Raiswell, R, 2017, '[Ice sheets as a missing source of silica to the polar oceans](#)'. *Nature Communications*, vol 8.
- Dubnick, A, Kazemi, S, Sharp, M, Wadham, J, Hawkings, J, Beaton, A & Lanoil, B, 2017, '[Hydrological controls on glacially exported microbial assemblages](#)'. *Journal of Geophysical Research: Biogeosciences*, vol 122., pp. 1049-1061
- Nixon, SL, Telling, JP, Wadham, JL & Cockell, CS, 2017, '[Viable cold-tolerant iron-reducing microorganisms in geographically diverse subglacial environments](#)'. *Biogeosciences*, vol 14., pp. 1445-1455
- Dubnick, A, Wadham, J, Tranter, M, Sharp, M, Orwin, J, Barker, J, Bagshaw, E & Fitzsimons, S, 2017, '[Trickle or treat: The dynamics of nutrient export from polar glaciers](#)'. *Hydrological Processes*, vol 31., pp. 1776-1789
- Linhoff, BS, Charette, MA, Nienow, PW, Wadham, JL, Tedstone, AJ & Cowton, T, 2017, '[Utility of 222Rn as a passive tracer of subglacial distributed system drainage](#)'. *Earth and Planetary Science Letters*, vol 462., pp. 180-188

[View complete publications list](#) in the University of Bristol publications system