

Jon R. Hawkings

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1. EDUCATION

10/2011 – 9/2015: PhD in Glacial Biogeochemistry (University of Bristol, UK). Thesis title: “An investigation into the production and export of nutrients from glaciers”

10/2005 – 7/2009: MSci Physical Geography (University of Bristol, UK).

2. CURRENT AND MOST RECENT EMPLOYMENT

7/1/2021 – present: Assistant Professor, University of Pennsylvania, PA, USA.

15/9/2018 – 15/9/2021: Marie Skłodowska-Curie Actions Fellow, Department of Earth, Ocean and Atmospheric Science, Florida State University, USA; Interface Geochemistry, GFZ-Potsdam, Germany.

1/9/2015 – 14/9/2018: Research Associate, School of Geographical Sciences, University of Bristol, UK.

1/10/2015 – 31/7/2015: Temporary Lecturer, School of Geographical Sciences, University of Bristol, UK.

3. ACADEMIC AWARDS AND HONOURS

2018 Marie Skłodowska-Curie Actions (European Commission) Global Fellowship

2017 European Association of Geochemistry Early Career Science Ambassador

2016 ABTA Doctoral Researcher Awards - Honorable Mention

2015 EAG Student ambassador for Biogeochemistry – Goldschmidt Conference (Prague)

2013 NERC Photography and Short Article Writing competition – shortlisted

4. OTHER ACADEMIC ACTIVITIES

- a. Reviewer for Nature Geosciences, Nature Communications, Global Biogeochemical Cycles, Journal of Glaciology, Applied Geochemistry, Chemical Geology, Global Change Biology, Journal of Geophysical Research: Biogeosciences, Journal of Geophysical Research: Oceans, Geochemical Perspectives Letters, Water, The Cryosphere and others. IOP trusted reviewer (top 15 % of reviewers).
- b. Expert reviewer in biogeochemistry for the National Science Foundation (USA), the Swedish Geological Survey (Sweden), Instituto Antártico Chileno (Chile), Comisión Nacional de Investigación Científica y Tecnológica (Chile), Agence Nationale de la Recherche (France) and Svalbard Integrated Arctic Earth Observing System (SIOS)
- c. Editorial Board, Frontiers in Earth Science – Geochemistry
- d. Media participation – featured on Chilean TV programme “Exploradores: del átomo al cosmos” and French TV documentary “Terres Extrêmes”. Featured in Scientific American, New Scientist, Cosmos and Discover More popular science publications and podcasts, amongst others.
- e. Outreach – multiple local and global outreach programs, including “Skype a Scientist”, and previous STEM ambassador (UK) demonstrating hands-on science to local school students.

5. RECENT PROJECTS

- *September 2018 – September 2021*: Iron and Carbon Interactions and Biogeochemical CycLing in Subglacial EcosystemS “ICICLES”. **Marie Skłodowska-Curie Actions Global Fellowship (European Commission)**
- *July 2017 – July 2022*: Sub-ice weathering: a missing link in the global silicon cycle? **Leverhulme Trust**
- *July 2016 – July 2021*: Patagonian Ice present field Shrinkage impacts present on Coastal and fjord EcosystemS. **NERC (UK)/CONICYT (Chile)**.

6. RESEARCH FOCUS AREAS

Global elemental cycles: I have interests in macronutrient (e.g. C, N and P), micronutrient (e.g. Fe, Mn, Co, Ni, Zn) and toxic element (e.g. Hg, As, Cr, Pb) production, cycling, transport and transformation within natural environments (especially pristine, highly vulnerable polar and alpine environments), and across spatial and temporal gradients.

Glacial biogeochemistry: Particular focus is placed on low temperature geochemistry, the role of glaciers in biogeochemical and mechanochemical weathering, geomicrobiology in cold environments and implications of global environmental change with respect to cryosphere response.

Land-ocean critical zones: The role of estuaries and fjords in modulating the flow of elements between land and ocean is critical. I am particularly interested in the role of fjords as poorly constrained elemental bioreactors controlling the flux of nutrients and contaminants to the open ocean. I also have interest in their role as hotspots of carbon burial as productive ecosystems and environments of very high sedimentation rates.

Field and lab methods: I am interested in applying a combination of novel research methodologies to address complex scientific questions. For example, via using a range of analytical techniques, such as microscopy (e.g. transmission electron microscopy and scanning X-ray microscopy), spectroscopy (e.g. inductively coupled plasma mass spectrometry), wet chemical analysis (e.g. colorimetric analysis) and elemental speciation (e.g. liquid/ion/gas chromatography), in combination with complementary in-situ field measurements (e.g. high resolution river gauging for discharge and novel in-situ nutrient sensors).

7. SUPERVISION OF STUDENTS

Mentoring of multiple BSc, MSc, and PhD students at University of Bristol and Florida State University.

Co-supervision of four PhD students (Jade Hatton, Helena Pryer, Matthew Marshall and Alejandra Urra) at University of Bristol.

LIST OF PUBLICATIONS

1. PEER REVIEWED PUBLICATIONS (*as corresponding author)

- **Hawkings, J. R.***, Linhoff, B., Wadham, J. L., Stibal, M., Lamborg, C., Carling, G., Falteisek, L., Ward, R., Hendry, K., Lamarche-Gagonon, G., Kohler, T., Kellerman, A., Cameron, K., Hatton, J., Tingey, S., Holt, A., Vinsova, P., Hofer, S., Bulinova, M., Vetrovsky, T., Meire, L., Spencer, R. G. M. (2021) Large meltwater source of mercury from the southwestern margin of the Greenland Ice Sheet, *Nature Geoscience*, 14, 496-502
- Marshall, M. G., Kellerman, A. M., Wadham, J. L., **Hawkings, J. R.**, Pryer, H. V., Beaton, A., Urra, A. and Spencer, R. G. M. (2021) Seasonal changes in dissolved organic matter composition in a Patagonian fjord affected by glacier melt inputs, *Frontiers in Marine Science*, 276(8)
- Chandler, D. M., Wadham, J. L., Nienow, P. W., Doyle, S. H., Tedstone, A. J., Telling, J., **Hawkings, J. R.**, Alcock, J. D., Linhoff, B., Hubbard, A. L. (2021) Rapid development and persistence of efficient subglacial drainage under 900 m-thick ice in Greenland, *Earth and Planetary Science Letter*, 566, 116982
- Treguer, P., Sutton, J., Baines, S., Brzezinski, M., Charette, M., Devries, T., Dutkiewicz, S., Ehlert, C., **Hawkings, J. R.**, Leynaert, A., Liu, S. M., Lopez-Acosta, M., Llopis-Monferrer, N., Maldonado, M., Rahman, S., Ran, L., Rouxel, O. (2021) The silica cycle in the modern ocean, *Biogeosciences*, 18(4), 1269-1289
- Kellerman, A. M., Vonk, J., McColaugh, S., Podorski, D. C., van Winden, E., **Hawkings, J. R.**, Johnston, S. E., Humayun, M., Spencer, R. G. M. (2021) Molecular Signatures of Glacial Dissolved Organic Matter from Svalbard and Greenland, *Global Biogeochemical Cycles*, 35, e2020GB006709

- Bagshaw, E., Wadham, J., Beaton, A., Tranter, M., Mowlem, M., **Hawkings, J. R.**, Lamarche-Gagnon, G. (2021) Assessment of the suitability of ISFET sensors for pH measurement in glacial meltwaters, *Limnology and Oceanography Methods*, doi: 10.1002/lom3.10416
- Piret, L., Bertrand, S., **Hawkings, J. R.**, Kylander, M. E., Torrejon, F., Amann, B. and Wadham, J. (2021) High-resolution fjord sediment record of a retreating glacier with growing intermediate proglacial lake (Steffen Fjord, Chilean Patagonia), *Earth Surface Processes and Landforms*, doi: 10.1002/esp.5015
- **Hawkings, J. R.***, Skidmore, M. L., Wadham, J. L., Priscu, J. C., Morton, P. L., Hatton, J. E., Gardner, C. B., Kohler, T. J., Stibal, M., Bagshaw, E. A., Steigmeyer, A., Barker, J., Dore, J. E., Lyons, W. B., Tranter, M., Spencer, R. G. M. (2020) Enhanced trace element mobilization by the Earth's ice sheets, *Proceedings of the National Academy of Sciences*, 117(50), 31648-31659
- Pryer, H., **Hawkings, J. R.**, Wadham, J. L., Robinson, L. F., Hendry, K. R., Hatton, J. E., Kellerman, A. M., Bertrand, S., Gill Olivias, B., Marshall, M., Brooker, R. A., Daneri, G. (2020) Glacial Cover Affects Silicon and Iron Export from Rivers in Chilean Patagonia, *Global Biogeochemical Cycles*, 32(12), e2020GB006611
- Pryer, H., Hatton, J. E., Wadham, J. L., **Hawkings, J. R.**, Robinson, L. F., Kellerman, A. M., Marshall, M., Urrea, A., Daneri, G., Häussermann, V., Hendry, K. R. (2020) The effects of glacial cover on riverine silicon isotope composition and size-partitioning in Patagonian, *Frontiers in Earth Science*, 8(368)
- Kohler, T. J., Vinšová, P., Falteisek, L., Žárský, J. D., Yde, J. C., Hatton, J. E., **Hawkings, J. R.**, Lamarche-Gagnon, G., Hood, E., Cameron, K., Stibal, M. (2020) Patterns in microbial assemblages exported from the meltwater of Arctic and sub-Arctic glaciers, *Frontiers in Microbiology*, 11:669
- Kellerman, A., **Hawkings, J. R.**, Wadham, J. L., Kohler, T. J., Stibal, M., Grater, E., Marshall, M., Hatton, J. E., Beaton, A., Spencer, R. G. M. (2020) Glacier outflow dissolved organic matter as a window into seasonally changing carbon sources: Leverett Glacier, Greenland, *Journal of Geophysical Research – Biogeosciences*, 125, e2019JG005161
- Lamarche-Gagnon, G., Wadham, J. L., Sherwood-Lollar, B., Arndt, S., Lacrampe-Couloume, G., Fietzek, P., Beaton, A. D., Tedstone, A. J., Telling, J., Bagshaw, E., **Hawkings, J. R.**, Kohler, T., Zarsky, J. D., Stibal, M., Mowlem, M. C. (2019) Continuous pulsed export of methane-supersaturated runoff from the Greenland Ice Sheet, *Nature*, 565 (7737), 73
- Wadham, J.L., **Hawkings, J. R.**, Tarasov, L., Gregoire, L., Ridgwell, A., Spencer, R. (2019) Why Ice Sheets Matter for the Global Carbon Cycle, *Nature Communications*.
- Urrea, A., Wadham, J. L., **Hawkings, J. R.**, Telling, J., Hatton, J. E., Yde, J. C., Hasholt, B., van As, D., Bhatia, M. P., Nienow, P. (2019) Weathering Dynamics Under Contrasting Greenland Ice Sheet Catchments, *Frontiers in Earth Science*, 7:229
- Hatton, J., Hendry, K. R., **Hawkings, J. R.**, Wadham, J. L., Opfergelt, S., Kohler, T. J., Yde, J. C., Stibal, M., Žárský, J. (2019) Silicon isotopes in Arctic and sub-Arctic glacial meltwaters: the role of subglacial weathering in the silicon cycle, *Proceedings of the Royal Society A*, 475
- Hatton, J., Hendry, K. R., **Hawkings, J. R.**, Wadham, J., Kohler, T., Stibal, M., Beaton, A., Bagshaw, E. A., Telling, J. (2019) Investigation of subglacial weathering under the Greenland Ice Sheet using silicon isotopes, *Geochimica y Geochemistria Acta*, 247, 191-206
- **Hawkings, J. R.***, Hatton, J., Hendry, K. R., de Souza, G. F., Wadham, J. L., Ivanovic, R., Kohler, T., Stibal, M., Beaton, A., Lamarche-Gagnon, G., Tedstone, A., Hain, M. P., Pike, J., Tranter, M. (2018) The global silicon cycle impacted by past ice sheets, *Nature Communications*
- **Hawkings, J. R.***, Benning, L. G., Raiswell, R., Kaulich, B., Araki, T., Abyaneh, M., Stockdale, A., Kock-Muller, M., Wadham, J., Tranter, M. (2018) Bioavailable ferrous iron nanoparticles in glacial sediments, *Earth and Planetary Science Letters*, 493: 92-101

- Raiswell, R., **Hawkings, J. R.***, Elsenousy, A., Death, R., Tranter, M., Wadham, J. L. (2018) Iron in Arctic Glacial Sediments: Measurement, Reactivity, Freezing Behaviour and Speciation, *Frontiers in Earth Science*, 6, 222
- Žárský, J. D., Kohler, T. J., Yde, J. C., Falteisek, L., Lamarche-Gagnon, G., **Hawkings, J. R.**, Stibal, M. (2018) Prokaryotic assemblages in suspended and subglacial sediments within a glacierized catchment on Qeqertarsuaq (Disko Island), west Greenland, *Frontiers of Microbiology*, 94(7),
- **Hawkings, J. R.***, Wadham, J. L., Benning, L., Hendry, K., Tranter, M., Tedstone, A., Nienow, P., Raiswell, R. (2017) Ice sheets as a missing source of silica to the world's oceans, *Nature Communications*, 8, doi:10.1038/ncomms14198
- Beaton, A. D., Wadham, J. L., **Hawkings, J.**, Bagshaw, E., Lamarche-Gagnon, G., Mowlem, M. C., Tranter, M. (2017) High-resolution in situ measurement of nitrate in runoff from the Greenland Ice Sheet, *Environmental Science and Technology*, 51(21): 12518-12527
- Kohler, T. J., Zarsky, J. D., Yde, J. C., Lamarche-Gagnon, G., **Hawkings, J. R.**, Tedstone, A., Wadham, J. L., Box, J. E., Beaton, A., Stibal, M. (2017) Carbon dating of POC exported from beneath the Greenland Ice Sheet reveals seasonal shifts in sediment source, *Geophysical Research Letters*, 44, doi:10.1002/2017GL073219
- Dubnick, A., Kazemi, S., Sharp, M., Wadham, J., **Hawkings, J.**, Lanoil, B. (2017) Hydrological controls on glacially-exported microbial assemblages, *JGR-Biogeosciences*, doi: 10.1002/2016JG003685
- Raiswell, R., **Hawkings, J. R.**, Benning, L., Albani, S., Mahowald, N. (2017) Comments on Influence of measurement uncertainties on fractional solubility of iron in mineral aerosols over the oceans, *Aeolian Research*, 22: 85-92
- **Hawkings, J. R.***, Wadham, J. L., Tranter, M., Telling, J., Bagshaw, L., Beaton, A., Simmons, S-L., Chandler, D., Tedstone, A., Nienow, P. (2016) The Greenland Ice Sheet as a hotspot of phosphorus weathering and export in the Arctic, *Global Biogeochemical Cycles*, doi: 10.1002/2015GB005237
- Cameron K., Stibal, M., **Hawkings, J. R.**, Mikkelsen, A. B., Telling, J., Kohler, T. J., Gözdereliler, E., Zarsky, J. D., Wadham, J., Jacobsen, C. S. (2016) Meltwater export of prokaryotic cells from the Greenland ice sheet, *Environmental Microbiology*, 19(2): 524-534
- Raiswell, R., **Hawkings, J. R.**, Benning, L. G., Baker, A. R., Death, R., Albani, S., Mahowald, N., Krom, M. D., Poulton, S. W., Wadham, J., Tranter, M. (2016) Potentially bioavailable iron delivery by iceberg-hosted sediments and atmospheric dust to the Polar Oceans, *Biogeosciences*, doi: 10.5194/bg-13-3887-2016
- Wadham, J. L., **Hawkings, J. R.**, Telling, J., Chandler, D., Alcock, J., Lawson, E., Kaur, P., Bagshaw, E., Tranter, M., Tedstone, A., Nienow, P. (2016) Sources, cycling and export of nitrogen on the Greenland Ice Sheet, *Biogeosciences*, doi:10.5194/bg-13-6339-2016
- Bagshaw, E., Beaton, A., Wadham, J., Mowlem, M., **Hawkings, J. R.**, Tranter, M. (2016) Chemical sensors for in situ data collection in icy meltwaters, *Trends in Analytical Chemistry*, 82, 348-357, doi: 10.1016/j.trac.2016.06.016
- **Hawkings, J. R.***, Wadham, J. L., Tranter, M., Lawson, E., Sole, A., Cowton, T., Tedstone, A. J., Bartholomew, I., Nienow, P., Chandler, D., Telling, J. (2015) The impact of climatic warming on nutrient and solute export from the Greenland Ice Sheet, *Geochemical Perspectives Letters*, 1: 94-104
- **Hawkings, J. R.***, Wadham, J. L., Tranter, M., Raiswell, R., Benning, L. G., Statham, P., Tedstone, A., Nienow, P., Lee, K. and Telling, J. (2014) Ice sheets as a significant source of highly reactive nanoparticulate iron to the oceans, *Nature Communications*, 5, doi:10.1038/ncomms4929
- Telling, J., Anesio, A. M., Tranter, M., Fountain, A., Nylen, T., **Hawkings, J. R.**, Singh, V. B., Kaur, P., Musilova, M., Wadham, J. L. (2014) Spring thaw ionic pulses boost nutrient availability and

microbial growth in entombed Antarctic Dry Valley cryoconite holes, *Frontiers in Microbiology*, 5, doi:10.3389/fmicb.2014.00694

- Telling, J., Anesio, A. M., Tranter, M., Stibal, M., **Hawkings, J. R.**, Irvine-Fynn, T., Hodson, A., Butler, C., Yallop, M. L. and Wadham, J. L. (2012) Controls on the autochthonous production and respiration of organic matter in cryoconite holes on High Arctic glaciers, *Journal of Geophysical Research: Biogeosciences*, 117, G1
- Telling, J., Anesio, A. M., **Hawkings, J. R.**, Tranter, M., Wadham, J. L., Hodson, A. J., Irvine-Fynn, T., Yallop, M. L. (2011) Measuring rates of gross photosynthesis and net community production in cryoconite holes: a comparison of field methods, *Annals of Glaciology*, 51(56), 153-162

2. NON PEER REVIEWED PUBLICATIONS

- Lamarche-Gagnon, G., Anesio, A. M., Wadham, J. L., Žárský, J. D., Kohler, T. J., Bagshaw, E., A., Telling, J., **Hawkings, J. R.**, Stibal, M. (2020) Meltwater runoff from the Greenland Ice Sheet reveals microbial consortia from contrasting subglacial drainage systems, *bioRxiv 2020.05.26.116566 preprint*