

## Gordon R. M. Bromley

GEOGRAPHY, PALAEOENVIRONMENTAL RESEARCH UNIT

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### Appointments

NATIONAL UNIVERSITY OF IRELAND GALWAY

2017– Lecturer Above the Bar, Physical Geography & Climate

UNIVERSITY OF MAINE

2017– Adjunct Research Professor

2014–2017 Research Assistant Professor

Professor/preceptor, Honors College

2012–2014 Postdoctoral Research Associate

LAMONT-DOHERTY EARTH OBSERVATORY OF COLUMBIA UNIVERSITY, NEW YORK

2011–2012 Lamont Doherty Postdoctoral Fellowship

### Education

UNIVERSITY OF MAINE

2010 Ph.D., Earth Sciences

Thesis: *A glacial-geologic approach to investigating climate and ice fluctuations in the Southern Hemisphere.*

UNIVERSITY OF MAINE

2005 M.Sc., Quaternary and Climate Studies

UNIVERSITY OF ST ANDREWS

2003 B.Sc. (Hons.), Geography

### Honours and Awards

2020 Dean's Award, NUI Galway

2017 Marie Skłodowska-Curie Actions Seal of Excellence

2011 Outstanding Ph.D. Award, College of Nat. Sci., Forestry & Ag. (U. Maine)

2006 Geologic Society of America Research Grant Outstanding Mention

2006 Elected to Sigma Xi Associate Membership

2003 Mathieson Prize for Excellence in Geography, University of St Andrews

### Selected Publications

[ORCID: 0000-0002-5671-7065]

**Bromley, G.**, Hall, B., Thompson, W., Lowell, T., 2019 The Berlin moraine complex of northern New Hampshire: Age and implications for interstadial ice sheet dynamics and climate. *Quaternary Research* 1-14. doi:10.1017/qua.2019.66.

**Bromley, G.**, Thouret, J.-C., Shimmelfennig, I., Marino, J., Valdivia, D., Rademaker, K., Vivanco Lopez, S., 2019. *In situ* cosmogenic  $^3\text{He}$  and  $^{36}\text{Cl}$  and radiocarbon dating of volcanic deposits refine the Pleistocene and Holocene eruption chronology of SW Peru. *Bulletin of Volcanology* 81: 64. <https://doi.org/10.1007/s00445-019-1325-6>.

Hall, B., Lowell, T., **Bromley, G.**, Denton, G., Putnam, A., 2019. Holocene glacier fluctuations on the northern flank of Cordillera Darwin, southernmost South America. *Quaternary Science Reviews* 222, 105904.

Putnam, A., **Bromley, G.**, Schaefer, J., Rademaker, K., 2019. An *in situ*  $^{10}\text{Be}$  production-rate calibration from a  $^{14}\text{C}$ -dated late-glacial moraine belt in Rannoch Moor, central Scottish Highlands. *Quaternary Geochronology* 50, 109–125.

- Farnsworth, L., Kelly, M., **Bromley, G.**, Axford, Y., Osterberg, E., Howley, J., Jackson, M., Zimmerman, S. 2018. Holocene History of the Greenland Ice Sheet Margin in Northern Nunatarssuaq, Northwest Greenland. *Arktos* 4, 10: <https://doi.org/10.1007/s41063-018-0044-0>
- Bromley, G.**, A. Putnam, H. Borns Jr., T. Lowell, T. Sandford, D. Barrell, 2018. Interstadial rise and Younger Dryas demise of Scotland's last ice fields. *Palaeoceanography & Paleoclimatology* 33, 412–429.
- Spector, P., Stone, J., Cowdery, S.G., Hall, B., Conway, H., **Bromley, G.**, 2017. Rapid Early-Holocene Deglaciation in the Ross Sea, Antarctica. *Geophysical Research Letters* 44, 7817–7825.
- Hall, B.L., Borns, H.W., **Bromley, G.R.M.**, Lowell, T.V., 2017. Age of the Pineo Ridge System: Implications for behavior of the Laurentide Ice Sheet in eastern Maine, U.S.A., during the last deglaciation. *Quaternary Science Reviews* 169, 344–356.
- Hall, B.L., Denton, G.H., Lowell, T.V., **Bromley, G.R.M.**, Putnam, A.E., 2017. Retreat of the Cordillera Darwin Icefield during Heinrich Stadial 1. *Cuadernos de Investigación Geográfica* 43, 751–766.
- Bromley, G.R.M.**, Putnam, A.E., Lowell, T.V., Hall, B.L., Schaefer, J.M., 2016. Comment on 'Was Scotland deglaciated during the Younger Dryas?' by Small and Fabel (2016). *Quaternary Science Reviews* 152, 203–206.
- Bromley, G.R.M.**, Schaefer, J.M., Hall, B.L., Rademaker, K.M., Putnam, A.E., Todd, C.E., Hegland, M., Winckler, G., Jackson, M.S., Strand, P.D., 2016. A cosmogenic  $^{10}\text{Be}$  chronology for the local last glacial maximum and termination in the Cordillera Oriental, southern Peruvian Andes: Implications for the tropical role in global climate. *Quaternary Science Reviews* 148, 54–67.
- Hall, B., **Bromley, G.**, Stone, J., Conway, H., 2016. Holocene ice recession at Polygon Spur, Reedy Glacier, Antarctica. *The Holocene*, doi: 10.1177/0959683616652708.
- Rademaker, K., Hodgins, G., Moore, K., Zarrillo, S., Miller, C., **Bromley, G.R.M.**, Leach, P., Reid, D.A., Yépez Álvarez, Sandweiss, D.H., 2016. Cuncaicha Rockshelter, a key site for understanding Colonization of the high Andes: Reply to Capriles et al. *Current Anthropology* 57, 101-103.
- Bromley, G.R.M.**, Hall, B.L., Thompson, W.B., Kaplan, M.R., Garcia, J.L., Schaefer, J.M., 2015. Late glacial fluctuations of the Laurentide Ice Sheet in the White Mountains of Maine and New Hampshire, U.S.A. *Quaternary Research* 83, 522-530.
- Rademaker, K., Hodgins, G., Moore, K., Zarrillo, S., Miller, C., **Bromley, G.R.M.**, Leach, P., Reid, D.A., Yépez Álvarez, Sandweiss, D.H., 2014. Paleoindian settlement of the high-altitude Peruvian Andes. *Science* 346, 466-469.
- Bromley, G.R.M.**, Winckler, G., Schaefer, J.M., Kaplan, M., Licht, K., Hall, B.L., 2014. Pyroxene separation by HF leaching and its impact on helium surface-exposure dating. *Quaternary Geochronology* 23, 1-8.
- Bromley, G.R.M.**, Putnam, A.E., Rademaker, K.M., Lowell, T.V., Schaefer, J.M., Hall, B.L., Winckler, G., Birkel, S.D., Borns, H.W., Jr., 2014. Younger Dryas Deglaciation Of Scotland Driven By Warming Summers. *PNAS* 111, 6215-6219.
- Rademaker, K., **Bromley G.R.M.**, Sandweiss, D.H., 2013. Peru Archaeological Radiocarbon Database, 13,000-7000 14C B.P. *Quaternary International* 301, 34-45.
- Hall, B.L., Porter, C.T., Denton, G.H., Lowell, T.V., **Bromley, G.R.M.**, 2013. Extensive recession of Cordillera Darwin glaciers in southernmost South America during Heinrich Stadial 1. *Quaternary Science Reviews* 62, 49-55.
- Bromley, G.R.M.**, Hall, B.L., Stone, J.O., Conway, H., 2012. Late Pleistocene evolution of Scott Glacier, southern Transantarctic Mountains: Implications for the Antarctic contribution to deglacial sea level. *Quaternary Science Reviews* 50, 1-13.

- Rademaker, K., Reid, D.A., **Bromley, G.R.M.**, 2012. Connecting the Dots: Least-Cost Analysis, Paleogeography, and the Search for Palaeoindian Sites in Southern Highland Peru. In D.A. White and S. Surface-Evans (eds.) *Least Cost Analysis of Social Landscapes: Archaeological Case Studies*, University of Utah.
- Bromley, G.R.M.**, Hall, B.L., Rademaker, K.M., Todd, C.E., Racoviteanu, A.E., 2011. Late Pleistocene snowline fluctuations at Nevado Coropuna (15S), southern Peruvian Andes. *Journal of Quaternary Science* 26, 305-317.
- Bromley, G.R.M.**, Hall, B.L., Schaefer, J.M., Winckler, G., Todd, C.E., Rademaker, K.M., 2011. Glacier fluctuations in the southern Peruvian Andes during the late-glacial period, constrained with cosmogenic <sup>3</sup>He. *Journal of Quaternary Science* 26, 37-46.
- Bromley, G.R.M.**, Hall, B.L., Stone, J.O., Conway, H., Todd, C.E., 2010. Late Cenozoic deposits at Reedy Glacier, Transantarctic Mountains: implications for former thickness of the West Antarctic Ice Sheet. *Quaternary Science Reviews* 29, 384-398.
- Todd, C.E., Stone, J.O., Conway, H., Hall, B.L., **Bromley, G.R.M.**, 2010. Late-Quaternary evolution of Reedy Glacier. *Quaternary Science Reviews* 29, 1328-1341.
- Bromley, G.R.M.**, Schaefer, J.M., Winckler, G., Hall, B.L., Todd, C.E., Rademaker, K.M., 2009. Relative timing of last glacial maximum and late glacial events in the tropical Andes. *Quaternary Science Reviews* 28, 2514-2526.

### Grants Awarded

- 2019 – Enterprise Ireland Support Grant: Awarded to **G. Bromley**, Enterprise Ireland.
- 2019 – ‘CoNTESTA: A geologic approach to resolving critical uncertainties in the impact of geomagnetic flux on *in situ* cosmogenic nuclide production’. Applicant: M. Jackson, written with PI: **G. Bromley**. Submitted to Marie Skłodowska-Curie Actions Individual Fellowships programme.
- 2018 – Franklin Research Grant: Awarded to **G. Bromley**, American Philosophical Society.
- 2018 – ‘Testing the age and origin of the Chivay subglacial labyrinth, Peru’: Awarded to **G. Bromley**, British Society for Geomorphology.
- 2017 – ‘Reconstructing Ireland’s last glaciers’: Awarded to **G. Bromley**, NUIG COA Research Support Scheme.
- 2016 – ‘Resolving the impact of so-called “Heinrich Stadial 1” on the terrestrial cryosphere of the North Atlantic region’: Awarded to **G. Bromley**, Comer Family Foundation grant.
- 2016 – ‘Blowing Hot or Cold? Resolving the terrestrial impact of North Atlantic stadials’: Awarded to **G. Bromley**, National Geographic/WAITT Grants Program.
- 2016 – ‘Research Experiences for Undergraduates (REU) Supplement’: PI and student thesis advisor: **G. Bromley**, NSF (PLR).
- 2015 – ‘Collaborative Research: Potential direct geologic constraints on ice-sheet thickness in the central Transantarctic Mountains during the Pliocene warm period’: PI: **G. Bromley**; Co-PI: G. Balco, NSF (PLR). (see <https://umaine.edu/news/blog/2015/09/15/what-happens-in-antarctica-does-not-stay-in-antarctica/>, <https://wabi.tv/2015/09/28/umaine-research-professor-headed-to-antarctica/>, <https://cosmognosis.wordpress.com/2016/09/01/possibly-the-most-he-3-ever-observed-in-a-terrestrial-sample/>)
- 2015 – ‘The last glaciation of Scotland: Implications for our understanding of abrupt climate change’. Awarded to **G. Bromley**. University of Maine Faculty Research Fund.
- 2012 – ‘Constraining late Quaternary glacier and environmental change in the high Colombian páramo’. Awarded to **G. Bromley**, D. Ruiz Carrascal, Institute for Latin American Studies (ILAS) grant.
- 2012 – ‘Building Peruvian capacity for monitoring and modeling the effects of climate change on the Coropuna Glacier and associated watersheds in Arequipa, Peru’: Written by **G.**

- Bromley** and K. Kraft (Assoc. Sust. Development, Arequipa). USAID-NSF (PEER program).
- 2011 – ‘The Loch Lomond Readvance in Scotland: constraint and calibration’: PIs: **G. Bromley**, A. Putnam. Lamont Climate Center.
- 2011 – ‘Rapid deglaciation and volcanism’: PI: **G. Bromley**, Lamont Climate Center.
- 2010 – ‘Collaborative Research: Timing and structure of the last glacial maximum and termination in southern Peru: Implications for the role of the tropics in climate change’: Conceived and written by **G. Bromley** (as Ph.D. student). PIs: B. Hall, J. Schaefer, G. Winckler. National Science Foundation ‘Paleo Perspectives on Climate Change (P2C2)’.
- 2009 – ‘A Late Pleistocene chronology of glacier fluctuation in the tropical Andes’: PI: **G. Bromley**, Comer Science and Education Foundation Grant.
- 2006 – ‘Late Pleistocene climate and glacier fluctuations in the tropical Andes’: Awarded to **G. Bromley**, Sigma Xi Grant-in-aid-of-Research.
- 2006 – ‘Reconstructing the Late Quaternary glacial history of the Cordillera Ampato, Peru’: Awarded to **G. Bromley**, Geological Society of America Student Research Grant.
- 2006 – ‘Reconstructing the Late-Quaternary glacial and environmental history of Nevado Firura, Peru’: Awarded to **G. Bromley**, PRIME Lab Seed Grant.

### Grants Submitted

- 2020 – ‘A glacial-geologic approach to testing the ‘Bipolar Seesaw’ paradigm of abrupt interhemispheric climate change (GOLIATH)’ PI: **G. Bromley**. Submitted to ERC.
- 2019 – ‘Exploring environmental history and occupation discontinuities in the arid Andes of south-west Peru’: PI: **G. Bromley**. Submitted to Royal Geographical Society *Thesiger-Oman Fellowship*. *Pending*.
- 2019 – ‘Quantifying the terrestrial impact of abrupt climate change on Ireland and Maritime Europe’: PI: **G. Bromley**. Submitted to SFI Frontiers for the Future programme. *Not Funded*.
- 2018 – ‘Projecting the sensitivity and response of Ireland’s climate to abrupt change’: PI: **G. Bromley**. Submitted to iCRAG-GSI Environmental Geosciences Postgraduate Programme. *Not funded*.
- 2017 – ‘The high páramo: Assessing impacts of abrupt climate change on Earth’s most irreplaceable habitat’: PI: **G. Bromley**. Submitted to Royal Geographical Society *Walter Kundert Fellowship*. *Not funded*.
- 2017 – ‘Testing the age and origin of the Chivay subglacial labyrinth, Peru’: PI: **G. Bromley**, British Society for Geomorphology. *Not funded* (successful resubmission in 2018).

### Selected Abstracts

- Bromley, G.**, 2019. Cryospheric collapse in the circum North Atlantic during stadial conditions. *Comer Climate Conference*, Soldiers Grove, Wisconsin.
- Bromley, G.**, 2019. A Beryllium-10 Production Rate Calibration from Rannoch Moor, Scotland, and Implications for the British Deglacial Record (Invited talk) *Goldschmidt conference*, Barcelona, Spain.
- Bromley, G.**, 2019. Reconstructing the response of the British-Irish ice sheet to atmospheric temperature during Termination 1 (Poster). *EGU general Assembly*, Vienna, Austria.
- Bromley, G.**, 2019. A high-resolution glacial perspective on abrupt climate change: New food for model simulations. PAGES ‘PALEOLINK’ workshop, Murcia, Spain.
- Bromley, G.**, 2018. (Invited talk) A glacial perspective on the impact of North Atlantic stadials on terrestrial climate. CEREGE climate seminar, Aix-en-Provence, France.
- Bromley, G.**, 2018. (Invited talk) A Case Study in Terrestrial Geochronology: Antarctica’s ancient ice and the spectre of rising sea level. *Universidad Nacional de Colombia*, Medellin, Colombia.

- Bromley, G.**, 2018. (Keynote) Scratching the surface of Antarctic landscape evolution with cosmogenic nuclides and a drill. *iCRAG WGSG2018*, Trinity College, Dublin.
- Bromley, G.**, 2018. A glacial perspective on the impact of North Atlantic stadials on terrestrial climate. *EGU general Assembly*, Vienna, Austria.
- Bromley, G.**, 2017. A glacier's-eye view of Heinrich stadials in the North Atlantic. *Comer Climate Conference*, Soldiers Grove, Wisconsin.
- Bromley, G.**, 2017. (Invited talk) Exploring climatic impacts on the terrestrial cryosphere via cosmogenic nuclide dating. *iCRAG TP4.1 "Sediment Tracking" Meeting*, Galway.
- Bromley, G.**, 2017. (Invited talk) Global climate change and the long arm of the tropics. *POGO-NUIG-AWI Ocean and Climate Scholars Programme*, Galway.
- Bromley, G.**, Schaefer, J., Hall, B., Rademaker, K., Todd, C., Winckler, G., 2016. A glacier-derived record of tropical temperature during Termination 1 from the Cordillera Oriental, southern Perú. *Northeastern GSA Meeting*, Albany, New York.
- Bromley, G.**, 2014 (Invited talk). The tropics: Passive beast or driver of global climate? Colby College, Maine.
- Bromley, G.**, 2013. The Younger Dryas stadial in Scotland. *Comer Abrupt Climate Change Meeting*, Soldiers Grove, Wisconsin.
- Bromley, G.**, Hall, B., Thompson, W., Garcia, J., Kaplan, M., Schaefer, J., 2013. Age of the Androscoggin Moraine, western Maine and eastern New Hampshire, from <sup>10</sup>Be surface-exposure age dating. *Northeastern GSA Meeting*, Bretton Woods, New Hampshire.
- Bromley, G.**, 2012 (Invited talk). Reconstructing late-Quaternary tropical glacier change through surface-exposure dating. *Escuela de Ingeniería de Antioquia*, Medellín, Colombia.
- Bromley, G.**, Hall, B., Schaefer, J., Winckler, G., Rademaker, K., Todd, C., 2010. A late-glacial advance in the arid tropical Andes: Cosmogenic He-3 data from Nevado Coropuna, Peru. *Geological Society of America Annual Meeting*, Denver, Colorado.
- Bromley, G.**, 2010. Exploring patterns of glaciation in the tropical Andes since the Last Glacial Maximum. *Comer Abrupt Climate Change Meeting*, Soldiers Grove, Wisconsin.

**Fieldwork and Research Expeditions:** Antarctica (2003-05, 2007-09, 2010, 2015-2016), Peruvian Andes (2005-2019), Colombian Andes (2012-18), Greenland (2014), Ireland (2018-19), Maine (2010-12), Patagonia (2007), Scotland (2010-17).

#### **Student and Postdoctoral supervision and mentorship**

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| 2019–2021 | Postdoctoral mentor, Marie Skłodowska-Curie Actions fellow, M. Jackson.  |
| 2019–2023 | PhD supervisor for A. Foreman (Geography, NUIG).   |
| 2018–19   | MSc dissertation advisor for A. Foreman and R. Smith (Geography, NUIG).  |
| 2018–19   | BA dissertation advisor for C. McEvoy, M. McNally, G. Staunton, and J. Donnellan (Geography, NUIG).  |
| 2017–18   | MSc dissertation advisor for E. Bates and H. Goodnow (Geography, NUIG).  |
| 2017–18   | BA dissertation advisor for S. Dowd, R. Gallagher, and K. Duffy (geography, NUIG).   |
| 2014–2018 | Research MSc thesis advisor (funded by NSF OPP) for A. Balter (UMaine).  |
| 2014–2018 | PhD thesis committee member for P. Strand (UMaine).  |
| 2014–2018 | MSc thesis committee member for C. Dowe, Jill Pelto (UMaine), and L. Farnsworth (Dartmouth); Honors thesis committee member for L. Saco, E. Veitch, E. Kane, and M. Thompson (UMaine); Undergraduate thesis advisor for Z. Mason and H. Thomas (UMaine). |

#### **Directorship, Teaching, Discipline/Administrative, and Synergistic Activities**

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| 2020– | iCRAG investigator and co-writer of iCRAG2 submission.                        |
| 2019– | <u>Vice President</u> , <b>NARI</b> Network of Arctic Researchers in Ireland. |

- 2019– Module creator/leader, new Transition Year Sustainability curriculum for Irish secondary education institutions: <https://www.ecoed4all.com/>
- 2019– Director of new BSc programme: *Geography & Geosystems* (NUIG).
- 2019– Member of Irish Quaternary Association (IQUA) national committee.
- 2019 Session chair: 'Are North Atlantic 'Heinrich Stadials' cooling or warming events...or both?' INQUA Congress 2019, Dublin.
- 2018– Environmental Change cluster leader (Geography, NUIG).
- 2018– Director of Graduate Studies (Geography, NUIG).
- 2018– School Research Committee member, (Geography, NUIG).
- 2018– Research Ethics Committee member (NUIG).
- 2018 Workshop Coordinator and Leader: 'Terrestrial Cosmogenic nuclides: New Geochronologic and Isotopic Techniques in Geomorphology, Tectonics, Glaciology & Palaeoclimatology'; Provided for 30 international postgraduate geoscience students and hosted by Universidad Nacional, Medellin, Colombia, as part of my ongoing capacity-building and international collaboration initiative with Colombian and US colleagues.
- 2017–present Coordinated and overseen development of NUIG's new cosmogenic nuclide facility, including sourcing of heavy equipment (crusher, pulveriser, Frantz electromagnetic separator, ultrasonic), valued at > €30,000, and clean lab for geochemistry. This facility is now an operational part of the Geography's Palaeoenvironmental Research Unit under my management.
- 2019 Climate science outreach programme with Merlin College (Galway City) Transition Year secondary school students, inclusive of climate theory and hands-on field methods.
- 2018 Public Lecture: *Antarctica's ancient ice and the spectre of rising sea level*'; School of Geography & Archaeology Spring Lunchtime Lecture Series.
- 2007–present Mentoring undergraduate and graduate students in Antarctic, Andean, Greenlandic, and Irish field and lab (including cosmogenic nuclide lab) work, University of Maine and NUIG.
- 2016–present Conducting Antarctic and climate science outreach discussions and demonstrations in Maine and Galway schools.
- 2015 Participated in outreach articles for the Center for the Study of the First Americans (Dycus, K., 2015. Reaching new heights in the Peruvian Andes. *Mammoth Trumpet* 30, 12–16; Dycus, K., 2016. Reaching new heights in the Peruvian Andes II. *Mammoth Trumpet* 31, 10–14)
- 2013 Developed educational outreach video for Columbia Earth Institute (<http://www.ldeo.columbia.edu/news-events/climate-peruvian-andes-early-humans-modern-challenges>).
- 2012 Coordinator for the Lamont Geochemistry Seminar series.
- 2011 Maintained research blog for Columbia Earth Institute 'State of the Planet' series (<http://blogs.ei.columbia.edu/2011/06/17/to-the-tip-of-the-andes/>).
- 2007–10 NSF-sponsored outreach, 'The Science of Climate Change: Journey to Reedy Glacier, Antarctica', Acadia National Park.
- 2019–present Lecturer: TI216 'Weather & Climate'; TI6134 (graduate level) 'Dynamics of Climate Change', NUIG.
- 2018–present Lecturer: TI151 'Fundamentals of Physical Geography'; TI6124 (graduate level) 'Tropical Oceans and Global Climate', NUIG.
- 2014–2017 Preceptor: HON 111 and 112 'Civilizations', Honors College, UMaine.

- 2014           Lecturer: ERS 201 'Global Environmental Change', ERS 369 'Climate and Energy', UMaine.
- 2014           Lecturer: 'From snow to glaciers: Unlocking the secrets of our climate system', Maine School of Science and Mathematics.
- 2010–2013     Lecturer: 'Ice Age Earth', 'Footprints of Climate Change', Penobscot Valley Senior College; 'Impacts of Climate Change on Maine', Belfast Senior College.
- 2007–2013     Lecturer: GES 441 'Glaciers & Climate'; Co-lecturer: ANT 170 'Popular Archaeology', ANT 475 'Environmental Archaeology', ERS 527 'Isotope Geology', UMaine.
- 2009–present   Reviewer for: *Nature*; *Science Advances*; *Palaeo*<sup>3</sup>; *Geophysical Research Letters*; *Quaternary Science Reviews*; *Quaternary Research*; *Quaternary Geochronology*; *Geomorphology*; *Journal of Geophysical Research*; *Scientific Reports*; *Journal of Quaternary Science*; *U.S. National Science Foundation*; *Swiss National Science Foundation*; *Austrian Science Fund*; *NERC*; *Deutsche Forschungsgemeinschaft*.

Active member of Sigma Xi, European Geosciences Union, Geological Society of America, Royal Geographic Society, Association for Women Geoscientists, British Society for Geomorphology.

#### **Non-Academic Activities**

- Landscape artist and photographer ([www.gordonbromleyartofscience.com](http://www.gordonbromleyartofscience.com)): Curated 'Art on the Edge' exhibition (<http://www.nuigalway.ie/artontheedge/>) of climate-related artwork, Hardiman Research Building, November 2018.
- 2014–present   Freelance science editor for Stallard Scientific Editing, New Zealand.
- 2015 – 2016     Independent consultant for hydroelectric development, Dundonnell Estate, Scotland.