

John Hugh Calder

CURRICULUM VITAE

Geoheritage and palaeontology specialist, author, educator. Senior scientist and lead author of nomination of the Joggins Fossil Cliffs UNESCO World Heritage Site and Cliffs of Fundy UNESCO Global Geopark, past Chair Canadian Geoparks Network, Executive member Global Geoparks Network. Pioneer in recognition of Geoheritage in Canada. Strength in working with communities, and in providing leadership internationally. Deep interest in assisting all peoples, but especially indigenous peoples and developing countries, to benefit from awareness and sustainable development of their geoheritage.

Executive Member, Global Geoparks Network

Part-Time Faculty, Department of Geology, Saint Mary's University

Adjunct Professor, Dalhousie University

Special Advisor, Cliffs of Fundy UNESCO Global Geopark

Advisor to Parks Canada and Prince Edward Island government on paleontology

Senior Geologist (retired), Nova Scotia Department of Energy & Mines

Past Chair, Canadian Geoparks Network

Past President, Atlantic Geoscience Society

Distinctions & Awards

E.R. Ward Neale Medal (2012) National award of the Geological Association of Canada for outstanding effort in communicating and sharing geoscience with Canadians.

Provincial and Territorial Geologists Medal (2009) National award of the Committee of Provincial and Territorial Geologists of Canada.

Premier's Award of Excellence (2009) For leadership in the successful designation of Joggins as a UNESCO World Heritage Site.

Gesner Medal (2005) Atlantic Geoscience Society Distinguished Scientist Award (2005).

APICS Distinguished Lecturer (2000) Atlantic Provinces Inter-University Committee on the Sciences (APICS)/Atlantic Geological Society (2000).

International Recognition

Invited Chair and keynote at Pardee Symposium of Geological Society of America Annual Meeting, San Antonio, TX, 2025

Executive Member, UNESCO Global Geoparks Network

Member, IUCN Specialist Group on Geoheritage

Member, IUGS Project 731 on IUGS Global Geosites

Consulting member, US Geoheritage Working Group

Smithsonian Institution, Washington, D.C.: *Visiting Scientist Fellowship* (1993).

Center for Applied Energy Research, University of Kentucky: *Visiting Scientist* (May 1993).

NATO: *Collaborative Research Grant* (with A.C. Scott and M.R. Gibling, 1994-1995).

International Journal of Coal Geology, Amsterdam: *Editorial Board* (1995 - 2001).

National Geographic Society, Washington, D.C.: *Research and Exploration Committee Grant* (1999-2000).

Geological Society of America:

- *Chair, Coal Geology Division* (1996)
- *Elected Fellow* (2001).
- *Best Paper Award*, Geological Society of America Annual Meeting, Denver (2002).

Honourary Appointments

President, Atlantic Geoscience Society (2015)

Honourary Adjunct Professor, Faculty of Earth Sciences, Dalhousie University (1994 - present)

Research Associate, Nova Scotia Museum of Natural History (1995 - 2008)

Editorial Board, International Journal of Coal Geology (1995 - 2001)

Employment history

- 1996 - present: Faculty of Geology (Part-Time), Saint Mary's University
- 2022-2023: Executive Director (Interim), Cliffs of Fundy UNESCO Global Geopark
- 1977 - 2020: Nova Scotia Department of Energy and Mines, Geological Survey Division; retired as Senior Geologist.
- 2012: Faculty of Earth Sciences (Sessional Professor), Dalhousie University
- 1976-77: Esso Minerals; GSC Atlantic; Kerr-Addison.

Professional Interests

- Using geoheritage to provide sustainable economic development opportunities for rural communities.
- Communicating the significance of our geological heritage to policy makers, students, and to the broader public as book author, commentator, educator and speaker.
- Climate change, basin analysis, paleontology, ecosystems.
- Developing innovative concepts in programs and projects.
- Making a difference.

Grants awarded

National Geographic Society Research and Exploration Committee Grant to undertake research at the Brule palaeontological site (1999-2000).

Nova Scotia Museum Paleontology Research Grant to undertake paleontological research of fossil vertebrate-bearing tree stump, Joggins (1999).

Nova Scotia Museum Paleontology Research Grant to undertake research and documentation of the Brule walcian forest and tetrapod trackway site (1996).

NATO Collaborative Research Grant with A.C. Scott and M.R. Gibling in Euramerican coal basin paleobotany (1994-1995).

Memberships in Scientific or Professional Organizations

- Geoscientists Nova Scotia (P.Geo)
- World Commission for Protected Areas (WCPA, IUCN)
- Geological Association of Canada
- Geological Society of America (Fellow and Past Chair, Coal Geology Division)
- Atlantic Geoscience Society (President, 2015)
- Canadian Geoscience Education Network (Vice Chair, 2015)

Professional Experience

Research into the fossil record of Prince Edward Island and bringing its significance – and sense of wonder – to the people of and visitors to Prince Edward Island.

Leadership at national and international level for Global Geoparks in Canada (Past Chair of Canadian Geoparks Network, Executive member of Global Geoparks Network). Mentoring aspiring global geoparks.

UNESCO evaluator for Global Geoparks.

Member representing Canada in IGCP Project 731, recognizing 'The First 100 IUGS Geological Heritage Sites' worldwide.

Development of interpretation strategies for UNESCO Global Geoparks, Parks Canada and others.

Leadership in geoheritage recognition in Canada, including development of a Geoheritage strategy for the Province of Nova Scotia.

Mentoring of community-driven initiative to develop Cliffs of Fundy Aspiring Global Geopark, Nova Scotia.

Scientific lead and senior author of successful nomination of the Joggins Fossil Cliffs as a UNESCO World Heritage Site, cited by the World Heritage Committee as setting a new standard for nominations. Built consensus and trust among disparate groups, including community and local to national levels of government.

Scientific advisor to international, national and regional geoscience initiatives (Cliffs of Fundy UNESCO Global Geopark; UNESCO World Heritage Site nomination, Joggins; Atlantic Geoscience Society *Last Billion Years*; Fundy Geological Museum; Natural History of Nova Scotia; Nova Scotia Museum).

University teaching in Earth Sciences: Saint Mary's University; adjunct professor at Dalhousie University; invited lecturer at other universities.

Earth Science commentator on national and international public radio and television:

- o BBC *Green Planet*
- o CBC Radio *Morningside*
Quirks & Quarks
- o CBC TV *Land and Sea*
The National
Midday
- o CTV/syndicated *Wonder Why?*
- o Discovery Channel
- o Société Radio Canada *Decouverte*

Managerial and Program Planning: development of conceptual programs and innovative projects; short-term and long-term geology program planning including managerial experience.

Extensive international collaboration in research (Smithsonian Institution; Royal Holloway, University of London; Kentucky Geological Survey; Center for Applied Energy Research; Geological Survey of Canada, among others).

Convenor of major international geoscience and industry forums, including Euramerican Coal Province Symposium, Nova Scotia - 1992

Invited participation in key international geoscience forums:

- o Royal Holloway and Bedford New College, U.K. (1986)
- o Orléans, France (1989)
- o Lyell Bicentennial, Geological Society of London (1998)
- o International Congress of the Carboniferous and Permian, Calgary (1999)

Chair, Geological Society of America Coal Geology Division - 1996 (Symposium Chair, San Diego - 1991; Program Chair, New Orleans - 1995)

Scientific referee for international geoscience journals (*Atlantic Geology*; *Bulletin de la Société Géologique de France*; *Canadian Journal of Earth Sciences*; *International Journal of Coal Geology*; *Palaeogeography*, *Palaeoclimatology*, *Palaeoecology*; *Sedimentology*).

External Examiner, Reader of graduate theses in Earth Science (Carleton University; University of Western Ontario; Dalhousie University; Boston College, Saint Mary's University).

Requests for Scientific Papers (partial list)

Academy of Sciences, Czech Republic
Amoco Production Company, Houston, Texas
BRGM, Orléans, France
British Geological Survey, England
Centre ORSTOM de Bangui, République
Centrafricaine
Charles University, Czechoslovakia
Chinese Academy of Geological Sciences,
People's Republic of China
Chouaïb Doukkali University, Morocco
Geological Survey of Canada
Geological Survey of Denmark
Geologisk Institutt, Universitetet i Bergen,
Norway
Geoscience Office, Whitehorse, Yukon
Territory
Harvard University
IANIGLA, Argentina
Illinois State Geological Survey
Indiana Geological Survey
Institut für Geowissenschaften, Johannes
Gutenberg-Universität, Germany
International Energy Agency, London,
England
Kansas State University
Liverpool Polytechnic, England
Louisiana Geological Survey
Lund University, Sweden
Memorial University of Newfoundland
Natural Resources and Energy, New
Brunswick
New Brunswick Museum
Nihon University, Japan
Ohio Department of Natural Resources
Oregon State University
Oxford Brookes University, England
Pennsylvania Geological Survey

Polish Academy of Sciences
Pomona College, California
Praça Gomez Teixeira, Portugal
Rajiv Gandhi Institute of Petroleum
Technology, India
Rhodes University, South Africa
Rijks Geologische Dienst, The Netherlands
Royal Holloway, University of London,
England
Royal Ontario Museum
Smithsonian Institution
Soviet Academy of Sciences, USSR
Stanford University
The Geological Survey of Greenland
The Ohio State University
The University of Bristol, England
The University of Chicago
The University of Kansas
The University of Melbourne, Australia
The University of Michigan
The University of Queensland, Australia
The University of Reading, England
The University of Sheffield, England
The University of Texas at Arlington
United States Geological Survey, Boulder
United States Geological Survey, Menlo Park
United States Geological Survey, Reston
Universidad Nacional de Mar del Plata,
Argentina
Université de Lyon, France
Université de Montpellier, France
Université d'Orléans, France
University of Calcutta, India
University of California, Santa Barbara
University of Strathclyde, Scotland
University of Tennessee at Martin
University of Yangon, Myanmar (Burma)
University of Wales, Swansea

Invited Keynote Presentations (Selected)

- UNESCO Global Geoparks and geoheritage recognition in Canada. Pardee Symposium, Annual meeting of the Geological Society of America, San Antonio, September 2025.
- Indigenous peoples and UNESCO Global Geoparks. Intensive Course on Global Geoparks, Lesvos, Greece, 2024.
- Climate change in Geoparks: a perspective from Canada, First Geopark Youth Forum, Bali, Indonesia, September, 2022.
- Future of Canada's Global Geoparks, Keynote address, IUGS 60th anniversary symposium, GAC-MAC Annual Meeting, Halifax, Nova Scotia, May, 2022.
- Inaugural Madeleine A. Fritz Lecture in Palaeontology, Royal Ontario Museum, Toronto, January, 2020.
- Travelling Speaker Series, Atlantic Geoscience Society, Prince Edward Island and Nova Scotia, October, 2016.
- International Appalachian Trail Annual Meeting, Millinocket, Maine, June 2014
- GAC-MAC NL Spring Meeting Keynote, Saint John's, Newfoundland, 2013
- Charles Camsell Talk, Yellowknife, North West Territory, November, 2012.
- Nova Scotia Institute of Science 150th Anniversary Lecture, October, 2011.
- Atlantic Universities Geological Conference, Saint Mary's University, Halifax, October, 2003.
- APICS-AGS Distinguished Lecture tour, 2000 (Nova Scotia, New Brunswick & Newfoundland).
- The Sir Charles Lyell-Sir James Hutton Bicentenary Conference, Geological Society of London, Royal Holloway, University of London, July 31, 1997.
- Paleontological Society of Washington D.C., March 16, 1994.
- Coal Branch Seminar, United States Geological Survey, Reston, Virginia, March 11, 1994.
- Department of Paleobiology, National Museum of Natural History, Smithsonian Institution, Washington, D.C., March 10, 1994.
- Center for Applied Energy Research, University of Kentucky, Lexington; May, 1993.
- Atlantic Geoscience Society featured lecture, Halifax, Nova Scotia, February 12, 1986.

Recognition in the Arts

Work (documentary and arts photography) in permanent collections

- Nova Scotia Art Bank
- Saint Mary's University Art Gallery
- Fototeca de Cuba, Havana

Curator

- *Contemporary Stories: New Cuban Photography*, Saint Mary's University Art Gallery (2001)

Published Essays

- *Uncommon Reality*: catalogue essay for Contemporary Cuban Photography (2001)
- *Face the Land: A Perspective on Photographic Practise in Atlantic Canada* (2004)

Grants

- Nova Scotia Arts Council (1998, 1999, 2001)

Recognition in the Community

Citizen of the Year (Chris Campbell Award), Halifax County District 4 (2003)

Affiliation

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Citizenship Canadian

Languages English (fluent)
French & Spanish (working knowledge)

Education

1991	Ph.D. (Earth Sciences), Dalhousie University
1976	B.Sc., Saint Mary's University

References

Dr. William A. DiMichele
Smithsonian Institution
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Dr. Martin Gibling
Professor Emeritus
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Publications

1. Calder, J.H., Nelson, W.J., Bashforth, A.R., Wittry, J., Eldrick, S.J. and DiMichele, W.A. 2023. Fossil vegetational transect from below the Colchester Coal to the roof of the Cardiff (Survant) Coal (Desmoinesian, Upper Middle Pennsylvanian), Illinois Basin. In Lucas et al. (eds), *Fossil Record 9*, New Mexico Museum of Natural History and Science Bulletin 94, 107-135.
2. Calder, J.H. 2023. UNESCO Global Geoparks as witness to the threat of climate change. 10th International Conference on UNESCO Global Geoparks, Marrakesh, Morocco, 7-9 September, 2023.
3. Calder, J.H., Brunet, P., Cormier, L., MacNeil, L. and Stimson, M. 2023. The Carboniferous-Permian fossil record of Prince Edward Island grows in significance. Atlantic Geoscience Society Colloquium, Truro NS, Program with Abstracts, 19-20.
4. Stimson, M.R., King, O.A., Allen, L.F., Hinds, S.J., Park, A.F., MacRae, R.A., Calder, J.H., Lucas, S.G., and Miller, R.F. 2023. The first evidence of terrestrial vertebrates from the Lower Mississippian Albert Formation of New Brunswick: Implications for the invasion of continental lacustrine ecosystems and biodiversity during Romer's Gap in Atlantic Canada. Atlantic Geoscience Society Colloquium, Truro NS, Program with Abstracts, p. 56.
5. Malay, B.C., Stimson, M.R., King, O.A., Faulkner, S., Herbert, B.L., Calder, J.H., MacRae, R.A., and Lucas, S.L. 2023. On the discovery of a new *Pygocephalus cubichnia* from the UNESCO World Heritage site at Joggins Fossil Cliffs, Nova Scotia, Canada. Atlantic Geoscience Society Colloquium, Truro NS, Program with Abstracts, 42-43.
6. Calder, J.H. 2022. Climate change in Geoparks: A perspective from Canada. 1st Youth Forum on Global Geoparks, Bali, Indonesia.
7. Calder, J. and Nowlan, G. 2022. UNESCO Global Geoparks in Canada: Their growth, potential and challenges. Symposium on the 60th Anniversary of the IUGS, Annual Meeting of Geological Association of Canada-Mineralogical Association of Canada, Halifax, Abstracts volume.
8. Calder, J., Fensome, R., Loxton, J., Poole, J. and Stimson, M. 2022. The acceptance and growth of the concept of geoheritage in Atlantic Canada and beyond. Atlantic Geoscience Society Colloquium, Fredericton NB, Program with Abstracts.
9. Lucas, S.G., Stimson, M.R., King, O.A., Calder, J.H., Mansky, C.F., Hebert, B.L. and Hunt, A.P., 2022. Carboniferous tetrapod footprint biostratigraphy, biochronology and evolutionary events. *Geological Society, London, Special Publications*, 512(1), pp.933-963.
10. Calder, J.H. 2021. Interpretation Strategy, Cliffs of Fundy UNESCO Global Geopark, 101 p.
11. Behn, S. and Calder, J. 2021. How Global Geoparks can support decolonization and raise Indigenous voices: lessons from the Canadian experience. Ninth International UNESCO Conference on Global Geoparks, JeJu, South Korea.
12. Burn, C.R., Cooper, M., Morison, S.R., Pronk, T. and Calder, J.H. 2021. The Canadian Federation of Earth Sciences scientific statement on climate change - Its impacts in Canada, and the critical role of Earth scientists in mitigation and adaptation. *Geoscience Canada*, v. 48
13. Gastaldo, R., Bamford, M., Calder, J.H., DiMichele, W.A., Ianuzzi, I., McLoughlin, S., Oplustil, S., Pfefferkorn, H., Roessler, R., and Wang, J. 2021. Coal Age Forests, in *Nature Through Time* Martinnelli E. *et al.* (editors), Springer Verlag, Berlin, 291-316.
14. Lucas, S.G., et al. 2021. Carboniferous tetrapod footprint biostratigraphy, biochronology and evolutionary events. Special Publication, Geological Society of London.
15. Marchetti, L., Voigt, S., Lucas, S.G., Stimson, M.R., King, O.A. and Calder, J.H. 2021. Footprints of the earliest reptiles. *Notalacerta missouriensis* – Ichnotaxonomy, potential trackmakers, biostratigraphy, palaeobiogeography, and paleoecology. *Annales Societatis Geologorum Poloniae*.
16. Allen, L.F., Stimson, M.R., King, O.A., Norrad, R.E., Lucas, S.G., Mann, A., Hinds, S.J., Park, A.F., Calder, J.H., Maddin, H., and Montplaisir, M. 2022. A *Batrachichnus salamandroides* trackway from the Minto Formation of central New Brunswick, Canada: Implications for alternative tracemaker interpretations. *Atlantic Geoscience*, 58: 239-260.
17. Calder, J. and Haine-Bennett, E. 2020. Awaiting two new UNESCO Global Geoparks for Atlantic Canada: communities in Newfoundland and in Nova Scotia embrace their Geoheritage. Atlantic Geoscience Society Annual Meeting, Atlantic Geology.
18. Marchetti, L., Voigt, S., Lucas, S. G., Stimson, M.R., King, O.A., and Calder, J.H., 2020. Footprints of the earliest reptiles: *Notalacerta missouriensis* – Ichnotaxonomy, potential trackmakers,

- biostratigraphy, palaeobiogeography and palaeoecology. *Annales Societatis Geologorum Poloniae*, 90: 271–290.
19. Marchetti, L., Voigt, S., Buchwitz, M., MacDougall, M.J., Lucas, S.G., Fillmore, D.L., Stimson, M.R., King, O.A., Calder, J.H., Fröbisch, J., 2021. Tracking the origin and early evolution of reptiles. *Frontiers*. Vol.9, p.696511 (pg 1-31)
 20. Calder, J.H. (Senior Author) 2019. Cliffs of Fundy Aspiring Geopark, Nova Scotia, Canada: application dossier submitted to UNESCO and the Global Geoparks Network.
 21. Calder, J. and Leslie, M. 2019. Nomination of the Cliffs of Fundy (Parrsboro Shore, Nova Scotia, Canada) as a UNESCO Global Geopark. Atlantic Geoscience Society Annual Meeting, Atlantic Geology, vol. 55.
 22. Calder, J.H. 2018. Communicating geoscience in Global Geoparks. 8th International UNESCO Conference on Global Geoparks, Madonna di Campiglio, Italy, September 2018.
 23. Calder, J.H. 2018. *Island at the Centre of the World: The Geological Heritage of Prince Edward Island*. Acorn Press, Charlottetown, 88 p.
 24. Calder, J.H., Naylor, R.D., Waldron, J.W.F., Adams, K., Fedak, T., George, E., and Giles, P.S. 2019. Geological map of the Parrsboro area, Black Rock to Moose River, Cumberland County. Scale 1:15,000. Nova Scotia Department of Natural Resources Map 2019-01.
 25. Calder, J.H. 2018. Island at the Centre of the World: Why PEI needed a book on their geology. Atlantic Geoscience Society, 44th Colloquium and Annual Meeting, Program with Abstracts.
 26. Calder, J.H., Waldron, J.W.F., MacHattie, T., Thomas, A. and Adams, K. 2018. Recent mapping and interpretation of the enigmatic Clarke Head area, northern Nova Scotia. Atlantic Geoscience Society, 44th Colloquium and Annual Meeting, Program with Abstracts.
 27. Calder, J.H. 2017. *The Joggins Fossil Cliffs, Coal Age Galápagos*. Second Edition, Formac, Halifax, 98 p.
 28. Calder, J.H. and Poole, J. C. 2017. Geoheritage Sites of Nova Scotia. Nova Scotia Department of Natural Resources Open File Map 2017-032, 1:500,000.
 29. Calder, J.H. 2017. Finding the International Appalachian Trail in the Atlantic Provinces, Canada: the Last Spike. *Atlantic Geology*, 43, 135.
 30. Calder, J.H. 2017. Recent case studies that illustrate the need to identify, value, and protect our natural and cultural geoheritage in Atlantic Canada. *Atlantic Geology*, 43, 134-135.
 31. Faulkner, S.J.M., Stimson, M.R., Calder, J.H. and Lucas, S.G. 2017. The first unambiguous pterygote ichnofossil from The Joggins Fossil Cliffs, UNESCO World Heritage Site, Joggins, Nova Scotia, Canada. *Atlantic Geology*, 43, 141.
 32. Calder, J.H. 2016. The Continuing Growth of Geoparks in Canada. 7th International UNESCO Conference on Global Geoparks, Torquay, England, September 2017.
 33. Calder, J. and Gloade, G. 2016. Seeing a Geopark through Indigenous and Geological Eyes: The Fundy Rift, Home of Kluscap. 7th International UNESCO Conference on Global Geoparks, Torquay, England, September 2017.
 34. Calder, J.H. 2016. Recognition of Geoheritage in Nova Scotia with special reference to paleontology. Canadian Paleontology Conference, Sydney, August 2016, Proceedings No. 13.
 35. Calder, J.H., Scott, A.C. and Milner, A.R. In prep. A Late Paleozoic hollow tree guild: fauna of the fossil lycopod trees at Joggins, Nova Scotia.
 36. Calder, J.H. 2015. Why we need to embrace the concept of geoheritage. Atlantic Geoscience Society, 41st Colloquium and Annual Meeting, Program with Abstracts, p. 14.
 37. Calder, J.H. and Nowlan, G.F. 2015. Geoheritage recognition in Canada and its role in defining Global Geoparks, Geological Association of Canada Annual Meeting, Abstracts Volume.
 38. Rygel, M.C., Lally, C., Gibling, M.R., Ielpi, A., Bashforth, A.R., and Calder, J.H. 2015. Sedimentology of the type section of the Pennsylvanian Boss Point Formation, Joggins Fossil Cliffs UNESCO World Heritage Site. *Atlantic Geology*, 51, 1-43.

39. Stimson, M.C., Calder, J.H., and Hebert, B.L. 2015. The top predator of Joggins and its tracker Donald Reid. Atlantic Geoscience Society, 41st Colloquium and Annual Meeting, Program with Abstracts, p. 40.
40. Calder, J.H. 2014. Geoheritage sites: The starting point for Global Geoparks. 6th International UNESCO Conference on Global Geoparks, September 19-22, 2014, Saint John, New Brunswick, Canada, Abstracts Volume, 13-14.
41. Calder, J.H. 2014. A call for cross-Canada recognition of geoheritage. Geological Association of Canada- Mineralogical Association of Canada Annual Meeting, Fredericton, 2014, Abstracts, vol. 37, p. 47.
42. Prescott, Z.M., Stimson, M.R., Dafoe, L.T., Gibling, M.R., MacRae, A.R., Calder, J.H. and Hebert, B.L. 2014. Microbial mats and arthropleurid and tetrapod trackways in a meandering channel at the fluvial-tidal transition: A diverse Early Pennsylvanian aquatic and riparian assemblage at Joggins, Atlantic Canada. *Palaos*, 29, 624-645.
43. Calder, J.H. 2013. Intracontinental expression of the Late Paleozoic Icehouse and its collapse in equatorial Pangea: the Maritimes Basin, Eastern Canada. Geological Society of America Annual Meeting, Denver, Colorado, Abstracts Volume.
44. Calder, J.H. 2013. Nova Scotia's Geoheritage strategy: A transferrable model. Geological Society of America Annual Meeting, Denver, Colorado, Abstracts Volume.
45. Calder, J.H. 2013. Establishing a Geoheritage List for Nova Scotia. In Mineral Resources Branch, Report of Activities 2013, Nova Scotia Department of Natural Resources Report ME 2014-001, 1-6.
46. Rygel, M.C., Sheldon, E.P., Stimson, M.R., Calder, J.H., Ashley, K.T., and Salg, J.L. 2014. The Pennsylvanian Springhill Mines Formation: Sedimentological framework of a portion of the Joggins Fossil Cliffs UNESCO World Heritage Site. *Atlantic Geology*, 50, 249-289.
47. Waldron, J.W.F., Rygel, M.C., Gibling, M.R. and Calder, J.H. 2013. Evaporite tectonics and the late Paleozoic stratigraphic development of the Cumberland basin, Appalachians of Atlantic Canada. *Geological Society of America Bulletin*, 125, 945-960.
48. Calder, J. 2012. *The Joggins Fossil Cliffs: Coal Age Galápagos*. Nova Scotia Department of Natural Resources, 96 p.
49. Calder, J.H., Gibling, M.R., Grey, M., Mukhopadhyay, P.K., Rygel, M.C. and Stimson, M.R. 2011. Coals and organic deposits of the Joggins World Heritage Site. Field Trip of the Annual Meeting of the Society for Organic Petrology, Halifax, 3 August, 2011, 18 p.
50. Fielding, C.R., Allen, J.P., Alexander, J., Gibling, M.R., Rygel, M.C. and Calder, J.H. 2011. Fluvial systems and their deposits in hot, seasonal, semiarid and subhumid settings: modern and ancient examples. In S.K. Davidson, Leleu, S. and North, C.P. (editors) *From River to Rock Record: The Preservation of Fluvial Sediments and their Subsequent Interpretation*. SEPM Special Publication 97, 89-112.
51. Calder, J.H. and DeMont, G.J. 2010. Geoheritage in Nova Scotia. In Mineral Resources Branch, Report of Activities 2009, Nova Scotia Department of Natural Resources Report ME 2010-1, 1-10.
52. Calder, J. and Badman, T. 2009. Earth heritage: a common past ... and future. *World Heritage*, No. 52, 6-15.
53. Keighley, D., Calder, J., Park, A., Pickerill, R. and Waldron, J. 2008. Discussion on ecology of earliest reptiles inferred from basal Pennsylvanian trackways. *Journal of the Geological Society of London*, 165, 983-987.
54. Boon, J. and Calder, J.H. 2007. Nomination of the Joggins Fossil Cliffs for Inscription on the World Heritage List, 129 p.
55. Calder, J.H., Dolby, G., Mukhopadhyay, P.K., Scott, A.C. and Stea, R.R. In preparation. Cretaceous lignites of Nova Scotia: composition and paleoenvironment.
56. Calder, J.H., Falcon-Lang, H.J. and Gibling, M.R. In preparation. The fossil cliffs of Joggins. Palaeontological Association (London), Field Guide Series.
57. Calder, J.H. 2006. 'Coal Age Galapagos': Joggins and the Lions of Nineteenth Century Geology. *Atlantic Geology*, 42, 37-51.
58. Calder, J.H., Gibling, M.R., Scott, A.C. and Hebert, B.L. 2006. A fossil lycopsid forest succession in the classic Joggins section of Nova Scotia: paleoecology of a disturbance-prone Pennsylvanian wetland. In S.F. Greb and W.A. DiMichele (editors), *Wetlands Through Time*. Geological Society of America Special Paper 399, 169-195.
59. Rygel, M.C., Calder, J.H., Gibling, M.R., Gingras, M.K. and Melrose, C.S.A. 2006. Tournaisian forested wetlands in the Horton Group of Atlantic Canada. In S.F. Greb and W.A. DiMichele

- (editors), *Wetlands Through Time*. Geological Society of America Special Paper 399, 103-126.
60. Calder, J.H. 2006. Geological sites and World Heritage's concept of 'outstanding universal value': weighing the worth and relevance of geological heritage. Abstracts of the Geological Association of Canada Annual Meeting, Montreal.
 61. Calder, J., Samuelson, H. and Boon, J. 2006. Learning how to tell the story of a prospective geological World Heritage Site: rejoining art and science at Joggins. Atlantic Geoscience Society Annual Colloquium, Wolfville.
 62. Calder, J.H. 2006. The Fossil Cliffs of Joggins: Towards World Heritage Designation. Nova Scotia Department of Natural Resources Open File Illustration ME 2006-001.
 63. Calder, J.H., Gibling, M.R. and Rygel, M.C. 2005. The Joggins Cliffs of Nova Scotia: Lyell & Co's "Coal Age Galapagos". Field Trip B2, Joint Meeting of the Geological Association of Canada, Mineralogical Association of Canada, Canadian Society of Petroleum Geologists, and Canadian Society of Soil Sciences, Halifax, May 2005. Atlantic Geoscience Society, 44 p.
 64. Calder, J.H., Rygel, M.C., Ryan, R.J., Gibling, M.R., Falcon-Lang, H.J. and Hebert, B.L. 2005. Stratigraphy and sedimentology of early Pennsylvanian red beds at Lower Cove, Nova Scotia, Canada: the Little River Formation with redefinition of the Joggins Formation. *Atlantic Geology*, **41**, 143-167.
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