

Curriculum Vitae

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Peter Douglas
Department of Earth and Planetary Sciences
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EDUCATION

- 2014** **Yale University, New Haven, CT, USA** Ph.D. Geology and Geophysics
▪ Dissertation: *Plant-wax isotopes in Neotropical lake sediments and their insights into the ancient Maya civilization*
- 2009** **Yale University, New Haven, CT, USA** M.Phil. Geology and Geophysics
- 2005** **Pomona College, Claremont, CA, USA** B.A. Geology, *summa cum laude*

EMPLOYMENT

- 2022-Present** **Associate Professor**
2023-Present **William Dawson Scholar**
2016-2022 **Assistant Professor**
McGill University, Montreal, QC, Canada
Department of Earth and Planetary Sciences
- 2014-2016** **Postdoctoral Fellow in Geochemistry**
California Institute of Technology, Pasadena, CA, USA
Division of Geological and Planetary Sciences

RESEARCH GRANTS

- American Chemical Society Petroleum Research Fund New Directions Grant (lead PI; total \$170K over two years; \$120K to Douglas) 2024
- Osisko-Wares Faculty Scholar Grant (sole PI, total \$85,000 over two years) 2023
- McGill William Dawson Scholar Award (sole PI, total \$75,000 over five years) 2023
- NSERC Discovery Grant (sole PI, total \$235,000 over five years) 2023
- FRQNT Team Grant (co-PI; total \$150,000 over three years; \$20,000 to Douglas) 2023
- Environment and Climate Change Canada, Climate Action and Awareness Fund (co-PI, Total \$1,000,000 over five years; \$300,000 to Douglas) 2022
- Wares Innovation Prospectors Fund (sole PI; Total \$50,000 for one year) 2021
- NOVA NSERC-FRQNT Team Research supplement (lead PI; total \$30,000 over three years; \$8,000 to Douglas) 2021
- NSERC RTI (co-PI; \$120,000 Equipment Grant) 2021
- FRQNT Team Grant (lead PI; total \$200,000 over three years; \$125,000 to Douglas) 2020
- Geotop Research Centre Collaborative Grant (lead PI; total \$25,000 over two years, \$20,000 to Douglas) 2020
- NSERC RTI (co-PI; \$150,000 Equipment Grant) 2020
- McGill Sustainable Systems Initiative Ideas Fund (co-PI; total \$50,000 over one year; \$20,000 to Douglas) 2019
- Geotop Research Centre Collaborative Grants (2 grants) (co-PI; total \$50,000 over two years; \$13,000 to Douglas) 2019
- FRQNT New Researchers Grant (sole PI; total \$90,000 over two years) 2018

- Geotop Research Centre Collaborative Grant (co-PI; total \$25,000 over two years; \$5,000 to Douglas) 2018
- McGill Sustainable Systems Initiative Ideas Fund (co-PI; total \$50,000 over one year; \$10,000 to Douglas) 2018
- Trottier Institute for Science and Public Policy Fellowship (sole PI; total \$90,000 over two years) 2017
- NSERC Discovery Grant (sole PI, total \$162,000 over six years) 2017
- NSERC Northern Research Supplement (sole PI; total \$90,000 over six years) 2017
- NSERC RTI (co-PI on two awards; total of \$248,644 in equipment funds) 2017
- Canadian Fund for Innovation, John R. Evans Leaders Fund (sole PI; \$618,000 equipment grant) 2017
- Canadian Fund for Innovation, Innovation Fund (co-PI; \$7,000,000 equipment grant; \$540,000 for equipment managed by Douglas) 2017

PEER-REVIEWED PUBLICATIONS (In Reverse Chronological Order; *italics indicate graduate student or postdoctoral supervisee author; underlining indicates undergraduate supervisee author*)

- [40] Dyer-Hawes, Q., Romanic, D., Huang, Y., Gyakum, J. and **Douglas, P.M.J.** (2024) Analysis of urban wind conditions and wildfire smoke dispersion for downtown Montréal using computational fluid dynamics. In press for *Building and Environment*.
- [39] Wang, Y., Gélinas, Y., de Vernal, A., Mucci, A., Allan, E., Seidenkrantz, M.-S., and **Douglas, P.M.J.** (2024) High rates of organic carbon burial along the southwest Greenland margin induced by Neoglacial advances. *Communications Earth and Environment*, v. 5.
- [38] Sharma, B., Moore, T., Knorr, K.-H., Teickner, H., **Douglas, P.M.J.**, and Roulet, N. (2024) Horticultural additives influences peat biogeochemistry and increases short-term CO₂ fluxes from peat. *Plant and Soil*.
- [37] Prèskienis, V., Laurion, I., Fortier, D., **Douglas, P.M.J.**, and Rautio, M. (2024) Permafrost degradation and soil erosion as a driver of greenhouse gas emissions from tundra ponds. *Environmental Research Letters*, v. 19, no. 1 014072.
- [36] Gibson, D.K., Obrist-Farner, J., Birkett, B.A, Curtis, J.H., Berke, M.A., **Douglas, P.M.J.**, Rice, P.M., and Maurer, J. (2024) The influence of tropical Atlantic sea-surface temperatures and the North Atlantic Subtropical High during the Maya Droughts. *The Holocene*, v. 34, p. 212-223.
- [35] *Bogue, R., Stix, J., **Douglas, P.M.J.**, and Fisher, J. (2023) Volcanic diffuse volatile emissions tracked by plant responses detectable from space. *Geochemistry, Geophysics, Geosystems*, v. 24, e2023GC010938*
- [34] *Parker, W.G., Ahad, J., Obrist-Farner, J., Keenan, B., and **Douglas, P.M.J.** (2023) Distinct modes of aged soil carbon export in a large tropical lake basin identified using bulk and compound-specific radiocarbon analyses of fluvial and lacustrine sediment. *Journal of Geophysical Research-Biogeosciences*, v. 128, e2023JG007515*
- [33] *Allan, E., **Douglas, P.M.J.**, de Vernal, A., Gélinas, Y., and Mucci, A. (2023) Palmitic acid is not a proper salinity proxy in Baffin Bay and the Labrador Sea but reflects the variability in organic matter sources modulated by sea ice coverage. *Geochemistry, Geophysics, Geosystems*, v. 24, e2022GC010837.*
- [32] *Obrist-Farner, J., Eckert, A., **Douglas, P.M.J.**, Perez, L., Correa-Metrio, A., Konecky, B.L., Bauersachs, T., Zimmerman, S., Schiedt, S., Brenner, M., Kutterolf, S., Maurer, J., Flores, O., Burberry, C. M., Noren, A., Myrbo, A., Lachniet, M., Wattrus, N., Gibson, D., and the LIBRE Scientific Team (2023) Planning for the Lake Izabal Basin Research Endeavor (LIBRE) continental scientific drilling project in Eastern Guatemala. *Scientific Drilling*, v. 11, p. 1-16.*

- [31] Birkett, B. A., Obrist-Farner, J., Rice, P.M., *Parker, W.G.*, **Douglas, P.M.J.**, Berke, M.A., Taylor, A.K., Curtis, J.H., and *Keenan, B.* (2023) Preclassic environmental degradation of Lake Petén Itzá, Guatemala, by the early Maya of Nixtun-Ch'ich'. *Communications Earth and Environment*, v. 4.
- [30] Kuhn, M.A., Schmidt, M., Heffernan, L., Knorr, K.H., Estop-Aragonés, C., Broder, T., Stührenberg, J., Riechart, E.C., *Gonzalez Moguel, R.*, **Douglas, P.M.J.**, and Olefeldt, D. (2023) High ebullitive, millennial-aged methane emissions due to thermokarst expansion have only minor influence on methane budget of peatland lakes. *Limnology and Oceanography*, v. 68, p. 498-513.
- [29] **Douglas, P.M.J.**, *Stratigopoulos, E.*, *Park, S.*, & *Keenan, B.* (2022) Spatial differentiation of sediment organic matter isotopic composition and inferred sources in a temperate forest lake catchment. *Chemical Geology*, v. 603.
- [28] *Keenan, B.*, Imfeld, A., Gélinas, Y, & **Douglas, P.M.J.** (2022) Understanding controls on stanols in lake sediments as proxies for palaeopopulations in Mesoamerica. *Journal of Paleolimnology*, v. 64, p. 375-390.
- [27] *Gonzalez Moguel, R.*, Vogel, F., Ars, S., Schaefer, H., Turnbull, J.C. & **Douglas, P.M.J.** (2022) Using carbon-14 and carbon-13 measurements for source attribution of atmospheric methane in the Athabasca Oil Sands Region. *Atmospheric Chemistry and Physics*, v. 22, p. 2121-2133
- [26] Imfeld, A., Ouellet, A., **Douglas, P.M.J.**, Kos, G., & Gélinas, Y. (2022) Complete molecular and stable isotope analysis ($\delta^{13}\text{C}$, $\delta^2\text{H}$) of sedimentary n-alkanes in the St. Lawrence Estuary and Gulf, Quebec, Canada: The importance of even numbered n-alkanes in coastal systems. *Organic Geochemistry*, v. 164.
- [25] Stell, A., **Douglas, P.M.J.**, Rigby, M. & Ganesan, A.L. (2021) The impact of spatially varying wetland source signatures on the atmospheric variability of $\delta\text{D-CH}_4$. *Philosophical Transactions of the Royal Society A*, v. 379.
- [24] **Douglas, P.M.J.**, *Stratigopoulos, E.*, *Park, J.*, & *Phan, D.* (2021). Geographic variability in freshwater methane hydrogen isotope ratios and its implications for global isotopic source signatures. *Biogeosciences*, v. 18, p. 3505-3527.
- [23] Jautzy, J.J., **Douglas, P.M. J.**, Xie, H., Eiler, J.M., & Clark, I.D. (2021) CH_4 isotopic ordering records ultra-slow hydrocarbon biodegradation in the deep subsurface. *Earth and Planetary Science Letters*, v. 562.
- [22] *Keenan, B.*, Imfeld, A., Johnston, K., Breckenridge, A., Gélinas, Y, & **Douglas, P.M.J.** (2021) Molecular evidence for human population change associated with climate events in the Maya Lowlands. *Quaternary Science Reviews*, v. 258.
- [21] *Gonzalez Moguel, R.*, Bass, A.M., Garnett, M.H., Pilote, M., *Keenan, B.*, Matveev, A., & **Douglas, P.M.J.** (2021) Radiocarbon data reveal contrasting sources for carbon fractions in thermokarst lakes and rivers of eastern Canada (Nunavik, Quebec). *Journal of Geophysical Research-Biogeosciences*, v. 126.
- [20] Preskienis, V., Laurion, I., Bouchard, F., **Douglas, P.M.J.**, Billett, M.F., Fortier, D., & Xu, X. (2021) Seasonal patterns in greenhouse gas emissions from lakes and ponds on a High Arctic polygonal landscape. *Limnology and Oceanography*, v. 66, p. S117-S141.
- [19] *Bourque, R. D.*, **Douglas, P.M.J.**, & Larsson, H.C.E. (2021) Changes in terrestrial ecosystems across the Cretaceous-Paleogene boundary in western Canada inferred from plant wax lipid distributions and isotopic measurements. *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 562
- [18] **Douglas, P.M.J.**, *Gonzalez Moguel, R.*, Walter Anthony, K. M., Wik, M., Crill, P.M., Dawson, K. S., Smith, D.A., Yanay, E., Lloyd, M.K., Stolper, D.A., Eiler, J.M., & Sessions, A.L. (2020) Clumped isotopes link older carbon substrates with slower rates of methanogenesis in northern lakes. *Geophysical Research Letters*, v. 47, e2019GL086756.

- [17] Kang, M., Dong, Y., Liu, Y., Williams, J. P., **Douglas, P.M.J.**, & McKenzie, J.M. (2019) Potential increase in oil and gas well leakage due to earthquakes. *Environmental Research Communications*, v. 1, 121004.
- [16] **Douglas, P.M.J.**, Pagani, M., Eglinton, T.I., Brenner, M., Curtis, J.H., Breckinridge, A., & Johnston, K. (2018) A long-term decrease in the persistence of soil carbon caused by ancient Maya land use. *Nature Geoscience* v. 11, p. 645-649.
- [15] Shuai, Y., **Douglas, P.M.J.**, Zhang, S., Stolper, D.A., Lewan, M., Lawson, M., Ellis, G., Mi, J., He, K., Hu, G., & Eiler, J.M. (2018) Equilibrium and non-equilibrium controls on the abundances of clumped isotopologues of methane during thermogenic formation; Implications for the chemistry of pyrolysis and the origin of natural gases. *Geochimica et Cosmochimica Acta* v. 223, p. 159-174.
- [14] Shuai, Y., Etiope, G., Zhang, S., **Douglas, P.M.J.**, Huang, L., & Eiler, J.M. (2018) Methane clumped isotopes in Songliao Basin (China): New insights into abiotic vs biotic hydrocarbon distribution. *Earth and Planetary Science Letters* v. 482, p. 213-221.
- [13] Stolper, D. A., Lawson, M., Formolo, M. J., Davis, C. L., **Douglas, P.M.J.**, Sessions, A.L. & Eiler, J.M. (2017) The utility of methane clumped isotopes to constrain the origins of methane in natural gas accumulations. *Geological Society of London Special Publications* v. 468, p. 23-52.
- [12] **Douglas, P.M.J.**, Stolper, D.A., Eiler, J.M., Sessions, A.L., Lawson, M., Shuai, Y., Bishop, A., Podlaha, O.G., Ferreira, A.A., Santos Neto, E.V., Niemann, M., Steen, A.S., Huang, L., Chimiak, L., Valentine, D.L., Fiebig, J., Luhmann, A.J., Seyfried Jr., W.E., Etiope, G., Schoell, M., Inskeep, W.P., Moran, J.J., & Kitchen, N. (2017) Clumped isotopes in methane: Progress and potential for a new isotopic tracer. *Organic Geochemistry* v. 113, p. 262-282.
- [11] **Douglas, P.M.J.**, Stolper, D.A., Walter Anthony, K.M., Wik, M., Crill, P., Winterdahl, M., Paull, C., Dallimore, S., Smith, D.A., Sessions, A.L., & Eiler, J.M. (2016) Diverse origins of Arctic and Subarctic methane point source emissions identified with multiply-substituted isotopologues. *Geochimica et Cosmochimica Acta* v.188, p. 163-188.
- [10] **Douglas, P.M.J.**, Demarest, A.A., Brenner, M., & Canuto, M.A. (2016) Impacts of Climate Change on the Collapse of Lowland Maya Civilization. *Annual Reviews of Earth and Planetary Science* v. 44, p. 613-645.
- [9] **Douglas, P.M.J.**, Brenner, M., & Curtis, J. H. (2016) Methods and future directions for paleoclimatology in the Maya Lowlands. *Global and Planetary Change* v. 138, p. 3-24.
- [8] **Douglas, P.M.J.**, Pagani, M., Eglinton, T.I., Brenner, M., Hodell, D.A., Curtis, J.H., & Canuto M.A. (2015) Drought, agricultural adaptation and sociopolitical collapse in the Maya Lowlands. *Proceedings of the National Academy of Sciences*, v. 112, p. 5607-5612.
- [7] Stolper, D.A., Martini, A.M., Clog, M., **Douglas, P.M.J.**, Shusta, S.S., Valentine, D.L., Sessions, A.L., & Eiler, J.M. (2015) Distinguishing and understanding thermogenic and biogenic sources of methane using multiply substituted isotopologues. *Geochimica et Cosmochimica Acta*, v. 161, p. 219-247.
- [6] Coutros, P., & **Douglas, P.M.J.** (2015) Coring Lake Fati and settlement archaeology of the Middle Niger Lakes Region: *African Archaeological Review*, v. 32, p. 249-266.
- [5] **Douglas, P.M.J.**, Pagani, M., Eglinton, T.I., Brenner, M., Hodell, D.A., Ma, K.F., Curtis, J. H., & Breckinridge, A. (2014) Pre-aged plant waxes in tropical lake sediments and their influence on molecular paleoclimate proxy records: *Geochimica et Cosmochimica Acta*, v. 141, p. 346-364.
- [4] Sijp, W.P., Dijkstra, H.A., Floegel, S., von der Heydt, A.S., **Douglas, P.M.J.**, & Bijl, PK. (2014) The role of ocean gateways on cooling climate on long time scales: *Global and Planetary Change*, v. 119, p. 1-22.

- [3] **Douglas, P.M.J.**, Affek, H.P, Ivany, L.C., Houben, A.J.P., Sijp, W.P., Sluijs, A., Schouten, S., & Pagani, M. (2014) Pronounced zonal heterogeneity in Eocene southern high-latitude sea surface temperatures: *Proceedings of the National Academy of Sciences*, v. 111, p. 6582-6587.
- [2] **Douglas, P.M.J.**, Pagani, M., Brenner, M., Hodell, D.A., & Curtis, J.H. (2012) Aridity and vegetation composition are important determinants of leaf-wax δD values in southeastern Mexico and Central America: *Geochimica et Cosmochimica Acta*, v. 97, p. 24-45.
- [1] Keating-Bitonti, C.R., Ivany, L C., Affek, H. P., **Douglas, P.M.J.**, & Samson, S.D. (2011) Warm, not super-hot, temperatures in the early Eocene subtropics: *Geology*, v. 39, p.771-774.

SUBMITTED PUBLICATIONS IN REVIEW

- [41] **Douglas, P.M.J.**, & Keenan, B. Protoclassic Climate Change in the Maya Lowlands. In review for edited volume: *Remaking Maya Civilization: Social and Political Transformations in the Protoclassic Maya Lowlands*
- [42] Spiller, A., Kallenbach, C., Burnett, M. S., Olefeldt, D., Schulze, C., Maranger, R., and **Douglas, P.M.J.** Antecedent moisture of permafrost peat influences carbon dioxide and nitrous oxide response to gradual drying. In Review for *SOIL*.
- [43] Gonzalez Moguel, R., Mahmoudi, N., and **Douglas, P.M.J.** Large variability in the radiocarbon signature of greenhouse gases from incubations of thermokarst lake sediments related to production rates of methane. In Revision for *Journal of Geophysical Research: Biogeosciences*.
- [44] Tremblay, J., Halperin, C., and **Douglas, P.M.J.** Mercury contamination in ancient water reservoirs at the Maya city of Ucanal, Guatemala. In Revision for *Journal of Archaeological Science: Reports*.
- [45] Mirzaei, Y., **Douglas, P.M.J.**, and Gélinas, Y. Quantifying the Coastal Sediment Contribution to total Organic Carbon respiration Post Algal Bloom and Terrestrial Discharge through n-Alkane Distribution and Stable Isotopes. In Review for *Environmental Chemistry Letters*.
- [46] Wang, Y., Ahad, J.E., Mucci, A., Gélinas, Y., and **Douglas, P.M.J.** Modern carbon accounts for the majority of organic carbon burial in the St. Lawrence estuarine system. In Review for *Geophysical Research Letters*.
- [47] Leroy, M., Burnett, M. S., Laurion, I., **Douglas, P.M.J.**, Kallenbach, C.M., and Comte, J. Terrestrial-aquatic connectivity structures microbial communities during the formation of thermokarst lakes. In Review for *ISME Communications*.

INVITED PRESENTATIONS (Past five years)

- An isotopic perspective on carbon-cycle linkages between soils and ponds in permafrost peatland landscapes. *Soil Science Society of America Meeting, St. Louis, United States* (November 2023)
- Earth, Fire, Water, Waste: Using Multiple Lipid Biomarkers to Unravel Complex Environmental Histories in the Maya Lowlands. *American Geophysical Union Fall Meeting, Chicago, United States* (December 2022)
- Using isotopes to understand methane emissions: from thawing permafrost to the oil sands. *Dawson College Environmental Science Lectures, Montreal, Canada* (November 2022)
- Earth, Fire, Water, Waste: Using multiple biomarker proxies to understand human-environment interactions in the Maya Lowlands. *Syracuse Department of Earth and Environmental Sciences K. D. Nelson Lecture Series, Syracuse, United States* (October 2022)

- Lake Izabal Research Endeavor Paleoclimate Questions: A Deep Dive Into the Neogene. *Lake Izabal Research Endeavor International Continental Drilling Program Workshop, Antigua, Guatemala* (August 2022)
- Using an expanded isotopic toolset to study methane emissions from thawing permafrost. *Centre d'Etudes Nordiques Webinord, Quebec, Canada* (March 2022- held virtually)
- New gas from old carbon: Using radiocarbon and clumped isotopes to understand methane emissions from permafrost thaw lakes. *Missouri University of Science and Technology Geology and Geophysics Seminar* (September 2021- held virtually).
- New gas from old carbon: Using radiocarbon and clumped isotopes to understand methane emissions from permafrost thaw lakes. *Hebrew University Institute of Earth Sciences Seminar* (November 2020- held virtually).
- New gas from old carbon: Using radiocarbon and clumped isotopes to understand methane emissions from permafrost thaw lakes. *University of Florida Department of Geological Sciences Department Seminar* (September 2020- held virtually).
- Fast and slow and hot and cold: what clumped isotopes tell us about methane and hydrocarbon formation. *2020 Gordon Research Conference on Organic Geochemistry* (Canceled due to Covid-19).
- Protoclassic Climate Change in the Maya Lowlands. *Society of American Archaeology. Session: Remaking Maya Civilization: Social and Political Transformations in the Protoclassic Maya Lowlands* (May 2020- held virtually).

SELECTED RECENT CONFERENCE PRESENTATIONS

[Past 5 years, only including presentations by myself or supervisees; underlining denotes undergraduate student supervisee; *italics* denote graduate student or postdoctoral advisee.]

- de Baets, B., Douglas, P.M.J., Ahad, J.M.E., Gammon, P.R., and Jautzy, J.J. Methane clumped isotope signatures from continuous permafrost thaw ponds: Implications for tracing methanogenesis and methanotrophy. *International Clumped Isotope Workshop, Stonybrook, NY United States* (August 2024)
- de Baets, B., Douglas, P.M.J., Ahad, J.M.E., Gammon, P.R., and Jautzy, J.J. Methane clumped isotope signatures from continuous permafrost thaw ponds: Implications for tracing methanogenesis and methanotrophy. *Goldschmidt Conference, Chicago, United States* (August 2024)
- Wang, Y., Ahad, J.E., Mucci, A., Gélinas, Y., and **Douglas, P.M.J.** Large fluxes of aged soil and petrogenic carbon to St. Lawrence Estuary sediments inferred from compound specific and bulk radiocarbon measurements. *Gordon Research Conference in Organic Geochemistry, Plymouth, NH, United States* (July 2024)
- **Douglas, P.M.J.**, Allan, E., Wang, Y., de Vernal, A., Seidenkrantz, M.-S., Mucci, A., and Gélinas, Y., Holocene organic matter production, respiration, and burial on the Greenland shelf: insights from isotopic and trace element chemistry. *Belmont Forum NICH-Arctic Workshop, Besançon, France* (October 2023)
- Asomaning, J., Gonzalez Moguel, R., **Douglas, P.M.J.**, Vogel, F., Ars, S., Huang, Y., Romanic, D., and Gyakum, J. Mobile survey of greenhouse gas concentrations in Greater Montreal: preliminary analysis of seasonal emissions variability and evaluation of spatial interpolation methods. *Canadian Meteorological and Oceanographic Society Congress, St. Johns, Canada* (June 2023)
- Bogue, R., Stix, J., **Douglas, P.M.J.**, and Fisher, J., Developing and ground-truthing a proxy for passive spaceborne detection of volcanic CO₂ emissions. *International Association for Volcanology and the Chemistry of the Earth's Interior Scientific Assembly, Rotarua, New Zealand* (February 2023)

- *Burnett, M., Laurion, I., Comte, J. Leroy, M., Maranger, R., Kallenbach, C., and Douglas, P.M.J.* Characterizing C and N gas fluxes and potential drivers in boreal and Arctic permafrost landscapes. *Society of Canadian Aquatic Sciences Annual Conference, Montreal, Canada* (February 2023)
- *Bogue, R., Stix, J., Douglas, P.M.J., and Fisher, J.,* Combined satellite and ground-based measurements of volcanic CO₂ fertilization of a pine forest in northeastern Yellowstone caldera, USA. *American Geophysical Union Fall Meeting, Chicago, United States* (December 2022)
- *Wang, Y., Gélinas, Y., de Vernal, A., Mucci, A., Allan, E., Seidenkratz, M.S., and Douglas, P.M.J.* Enhanced Neoglacial Organic Carbon Burial in the Northeastern Labrador Sea despite Decreasing Primary Production. *American Geophysical Union Fall Meeting, Chicago, United States* (December 2022)
- *Gonzalez Moguel, R., Douglas, P.M.J., and Mahmoudi, N.* Evaluating the Effect of Increasing Temperature in the Production of Methane from Modern to Millennial Carbon Pools using Incubations of Canadian Thermokarst Lake Sediments. *American Geophysical Union Fall Meeting, Chicago, United States* (December 2022)
- *Allan, E., Douglas, P.M.J. de Vernal, A., Gélinas, Y., and Mucci, A.,* Hydrogen and carbon isotopic composition ($\delta^2\text{H}$, $\delta^{13}\text{C}$) of fatty acids preserved in surface sediments from Baffin Bay and Labrador Sea. *2022 Gordon Research Conference in Organic Geochemistry, Plymouth, USA.*
- *Burnett, M., Kallenbach, C., and Douglas, P.M.J.* Characterizing C and N gas fluxes and potential drivers across a permafrost gradient in a boreal peatland. *2022 Ecological Society of America Annual Meeting, Montreal, Canada*
- *Allan, E., Douglas, P.M.J. de Vernal, A., Gélinas, Y., and Mucci, A.,* Hydrogen and carbon isotopic composition ($\delta^2\text{H}$, $\delta^{13}\text{C}$) of fatty acids preserved in surface sediments from Baffin Bay and Labrador Sea. *2022 Goldschmidt Conference, Honolulu, USA.*
- *Allan, E., Douglas, P.M.J., de Vernal, A., Gélinas, Y., and Mucci, A.* Hydrogen isotope composition of fatty acids preserved in surface sediments from Baffin Bay and Labrador Sea, a new ecological proxy?. *NICH Arctic Annual Meeting February 2022* (held virtually).
- *Gonzalez Moguel, R., Vogel, F., Ars, S., Schaefer, H., Turnbull, J.C. & Douglas, P.M.J.* Using carbon-14 and carbon-13 measurements for source attribution of atmospheric methane in the Athabasca Oil Sands Region. *American Geophysical Union Fall Meeting 2021, New Orleans USA.*
- *Spiller, A., Burnett, M., Kallenbach, C.M., Maranger, R., Olefeldt, D., Schulze, C., and Douglas, P.M.J.* Greenhouse gas emissions from permafrost peat altered by gradual drying but depends on landscape position and peat biogeochemistry. *American Geophysical Union Fall Meeting 2021, New Orleans USA.*
- *Parker, W., Ahad, J. M., Obrist-Farner, J., Keenan, B., and Douglas, P.M.J.* Constraining the temporal scale of n-alkanoic acid transport and integration in a tropical lake basin using compound specific radiocarbon analysis. *American Geophysical Union Fall Meeting 2021, New Orleans USA.*
- *Keenan, B., Johnston, K., Breckenridge, A. J., and Douglas, P.M.J.* Linked molecular and isotopic indicators of fire history, population, vegetation and climate change in the Maya lowlands. *American Geophysical Union Fall Meeting 2021, New Orleans USA.*
- *Bogue, R., Stix, J., Douglas, P.M.J., and Fisher, J.B.* Satellite detection of plant responses to volcanic carbon dioxide can reveal changes in volcanic activity. *American Geophysical Union Fall Meeting 2021, New Orleans USA.*
- *Douglas, P.M.J., Phan, D., Stratigopoulos, E., & Park, S.* The potential for spatial resolution of freshwater methane emissions using hydrogen isotope measurements. *American Geophysical Union Fall Meeting 2020* (held online).

- *Gonzalez Moguel, R., Douglas, P.M.J., Bass, A., Pilote, M., & Garnett, M.* Mobilized permafrost carbon in concentrated in particulate matter and ebullition methane in northern Quebec Thaw lakes. *Goldschmidt Conference* (held online).
- *Bourque, R., Douglas, P.M.J., & Larsson, H.*, Carbon and Water Cycle Reconstructions Across the Cretaceous-Paleogene Boundary in Saskatchewan, Canada, and Implications for Bulk Carbon Interpretations of Mass Extinctions. *2020 Goldschmidt Conference* (held online).
- *Keenan, B., Douglas, P.M.J., Imfeld, A., Gélinas, Y., Breckenridge, A., & Johnston, K.*, Variation in Faecal Stanol Concentrations in Neotropical Lakes and Implications for Ancient Maya Population History. *2020 Goldschmidt Conference* (held online).
- **Douglas, P.M.J., Stratigopoulos, E., & Park, S.** Global patterns in the hydrogen isotope composition of methane from freshwater ecosystems with implications for source apportionment and methanogenesis pathways. *American Geophysical Union Fall Meeting 2019 San Francisco, USA.*
- *Gonzalez Moguel, R., Douglas, P.M.J., Bass, A., Pilote, M., & Garnett, M.* Radiocarbon Data from Permafrost Peatland Lakes Indicate Dissolved Methane is Dominantly Modern while Particulate Matter and Ebullition Methane Contain Older Carbon. *American Geophysical Union Fall Meeting 2019 San Francisco, USA.*
- *Keenan, B., Fabre, E., Douglas, P.M.J., Breckenridge, A., Johnston, K., & Obrist-Farner, J.* Determining the controls on faecal stanol concentrations and ratios in tropical lake sediments. *American Geophysical Union Fall Meeting 2019 San Francisco, USA.*
- *Ni, J., Lévillé, R. J., & Douglas, P.M.J.* Examining possibilities for speleothem biosignatures in Mars lava tubes based on Californian lava tubes. *American Geophysical Union Fall Meeting 2019 San Francisco, USA.*
- **Douglas, P.M.J., Gonzalez Moguel, R., Walter Anthony, K. M., Wik, M., Crill, P.M., Dawson, K. S., Smith, D.A., Yanay, E., Lloyd, M.K., Stolper, D.A., Eiler, J. M., & Sessions, A.L.** Isotopic Evidence that Older Carbon Substrates Lead to Slower Rates of Methane Production in Permafrost Associated Lakes. *2019 International Union of Geodesy and Geophysics General Assembly, Montreal, Canada.*
- *Keenan, B., Douglas, P.M.J., Breckenridge, A., Johnston, K., & Obrist-Farner, J.* Faecal stanols from a tropical lake core as a proxy for population change at Itzà in the southwestern Maya Lowlands. *22nd GMPCA Colloquium, Montreal, Canada.*
- *Bourque, R., Douglas, P.M.J., & Larsson, H.*, Cretaceous-Paleogene Boundary Climate Proxies using Carbon and Hydrogen Isotopes from Plant-wax Lipids. *2019 International Union of Geodesy and Geophysics General Assembly, Montreal, Canada.*
- *Bourque, R., Douglas, P.M.J., & Larsson, H.*, Latest Cretaceous Climate Proxies Using Carbon and Hydrogen Isotopes from Plant-wax lipids. *2019 Canadian Society for Vertebrate Palaeontology Assembly, Grande Prairie, AB.*

STUDENT SUPERVISION:

Current Graduate Students: Robert Bogue (Co-supervised; PhD4); Melanie Burnett (Co-supervised; PhD3); Jacob Asomaning (PhD2); Bonnie de Baets (PhD2);

Current Postdoctoral Fellows: Regina Gonzalez Moguel (Co-supervised); Estelle Allan (FRQNT Postdoctoral Fellow);

Completed Postdoctoral Fellows: Wesley Parker (U.S. National Science Foundation Earth Sciences Fellow; 2020-2021; currently Associate Consultant at KPMG UK); Yunfeng Wang (McGill Wares Postdoctoral Fellow; 2021-2023; currently Postdoctoral Fellow at The University of Hong Kong)

Completed Graduate Students: Ying Ran Lin (Co-supervised; MSc 2017; currently studying Geological Engineering at U. British Columbia); Louise-Marie Meunier (Co-supervised; PhD 2018; currently Technical Writer at DRA Global); Robert Bourque (MSc 2019; currently PhD student at the University of Colorado); Jenny Ni (Co-supervised; MSc 2019; currently Geologist at Apex Geoscience); Benjamin Keenan (PhD 2022; currently Assistant Professor at the University of Montreal); Regina Gonzalez-Moguel (PhD 2023; currently Postdoctoral Researcher at McGill); Hiba Aoid (MSc 2023).

Completed Undergraduate Students: Emerald Stratigopoulos (SURA, 2017; M.Sc. U Toronto; currently Exploration Geologist at Agnico Eagle Mines); Jenny Park (SURA, 2017; Currently Research Scientist at Nexelis Pharmaceuticals); Sophia Chen (Earth Systems Science Honour's Thesis, 2020; currently Geomatics Consultant at SOCODEVI); Joshua Wasserlauf (Independent Research; Winter 2020; currently M.Sc. student at Carleton U.); Dawson Phan (Independent Research; Summer 2020; currently Ph.D. student at Ohio State University); Clara Schryer (USRA, 2021; Honour's Thesis, 2022-2023; currently M.Sc. student at Queen's University); Aelis Spiller (SURA, 2021; Independent Research 2021-2022).

Visiting Graduate Student Interns: Emma Fabre (MSc, ENS Lyon, Summer 2019); Vanika Verma (MSc, IIT Roorkee, Winter 2021; currently Geologist at Cairn Oil and Gas)

Visiting Undergraduate Student Interns: Jackson Cadenhead (BA, Haverford College, Summer 2020)

Completed CEGEP Interns: Sakshi Dev (Vanier College; 2019; currently B.Sc. student at Concordia U.); Lauren Rosenthal (John Abbott College; 2020; currently B.Sc. student at McGill U.); Gabriella Pinillo (Vanier College, 2022)

TEACHING EXPERIENCE

2017-Present McGill University

- *Earth System Processes (ESYS 200; 2017, 2018, 2019, 2020, 2021, 2022, 2024)*
- *Isotopes in Earth and Environmental Science (EPSC 519; 2017, 2019, 2021, 2023)*
- *Applied Geochemistry Seminar (EPSC 590; 2019, 2021)*
- *Cold Regions Earth Science (EPSC 550; 2018)*
- *Graduate Directed Studies: (EPSC 645/644; 2017, 2018)*
- *Undergraduate Independent Research (EPSC 482; 2017, 2020)*

AWARDS

- McGill Osisko/Wares Faculty Scholar 2024
(two to four awarded annually, \$85,000 research grant and \$5,000 stipend for one year)
- McGill University William Dawson Scholar 2023
(ten awarded annually, \$25,000 combined salary and research award for five years)
- McGill Institute for Science and Public Policy Trottier Fellowship 2017
(two awarded annually, \$90,000 research grant)
- Yale Geology and Geophysics William E. Ford Prize 2014
(one awarded annually, \$500 cash prize)
- Yale Geology and Geophysics Hammer Prize 2012
(four awarded annually, engraved rock hammer and \$200 cash prize)
- National Science Foundation Graduate Research Fellowship 2008
(\$30,000 stipend for three years)

SERVICE

Departmental and University Administrative Service:

- EPS Graduate Admissions Committee 2023-2024
- EPS Facilities Chair 2019-2022

EPS Advisor on New Vic Project	2019-2022
EPS Chair's Advisory Committee	2017-2019; 2020-2022
EPS Equity and Workplace Climate Committee	2020-2024; Chair (2021-2022, 2023-2024)
EPS Wares Postdoctoral Fellowship Committee Chair	2021-2022
Geotop Research Centre Scholarship Committee	2020-2022
MSSI Climate Change Steering Committee	2020-2022
EPS Banting Fellowship Selection Committee	2020
Faculty of Science CGS Selection Committee	2019-2020
TISPP Fellowship Selection Committee	2019-2020
EPS Seminar Coordination Committee	2016-2019
EPS Graduate Student Orientation Committee	2017-2019
Faculty of Science Internal RTI Committee	2018
EPS Graduate Student Awards Committee	2017-2018
Geography Biogeochemistry Faculty Search Committee	2017
EPS Geobiology Faculty Search Committee	2016-2017

Academic Community Service:

- **Associate Editor**
 - *Journal of Paleolimnology* (2021 to present)
 - Guest Editor, Proceedings of the National Academy of Sciences (2024)
- **Research Development**
 - Steering Committee, International Continental Drilling Program Canada (2022 to present)
- **Scientific Session Convenor:**
 - American Geophysical Union Fall Meeting 2021 (*Interactions between hydrological and biogeochemical change in permafrost environments*).
 - American Geophysical Union Fall Meeting 2020 (*Interactions between hydrological and biogeochemical change in permafrost environments*).
 - American Geophysical Union Fall Meeting 2019 (*Understanding the Interactions Between Hydrological and Biogeochemical Dynamics in Permafrost Environments with Observations and Models*).
 - V. M. Goldschmidt Conference 2019 (*Advances in Isotopic Approaches to Understand the Sources and Fates of Environmental Pollutants*).
 - American Geophysical Union Fall Meeting 2018 (*Interactions between hydrological and biogeochemical change in permafrost environments*).
 - American Geophysical Union Fall Meeting 2014 (*Molecular biomarkers: From source to sink to environmental reconstruction*).
 - V.M. Goldschmidt Conference 2012 (*Paleotemperature proxies: Processes and comparisons*).
- **Workshop Organizer**
 - *The Future of Scientific Drilling in Canada*, December 2023, Virtual workshop organized by International Continental Drilling Program Canada

- *Re-thinking National Methane Emissions Quantification and Mitigation*, Montreal, September 2019, Workshop funded by the Trottier Institute for Science and Public Policy and the Trottier Institute for Sustainable Design.
- *New Perspectives on Past Climate Change and Societal Disruption*, Urbino, Italy, June 2014, Workshop funded by the Italian Ministry of the Environment.
- **Proposal Reviewer** for 55 proposals from international funding agencies, including the Natural Sciences and Engineering Research Council (Research Tools and Instrumentation review panel); Fonds de Recherche du Quebec Nature et Technologie (New Researcher Fund review panel); U.S. National Science Foundation; U.S. NASA Exobiology Program; American Chemical Society Petroleum Research Fund; U.K. Natural Environment Research Council; European Research Council; Netherlands Organization for Scientific Research; Graduate Women in Science Fellowship, the German Research Foundation, and the Swiss National Science Foundation.
- **Manuscript Reviewer** for 70 manuscripts from a diverse set of journals including *Anthropocene*; *Applied Geochemistry*; *American Journal of Science*; *Chemical Geology*; *Climate of the Past*; *Earth and Planetary Science Letters*; *Earth Science Reviews*; *Environmental Monitoring and Assessment*; *Frontiers Environmental Sciences*; *Geochemistry, Geophysics, Geosystems*; *Geochimica et Cosmochimica Acta*; *Geoderma*; *Geology*; *Geophysical Research Letters*; *Global Biogeochemical Cycles*; *Journal of Environmental Management*; *Journal of Geophysical Research– Biogeosciences*; *Journal of Paleolimnology*; *Nature Communications*; *Nature Geoscience*; *Nuclear Instruments and Methods in Physics Research*; *Organic Geochemistry*; *Paleoceanography*; *PLOS One*; *Proceedings of the National Academy of Sciences*; *Radiocarbon*; *Quaternary Research*; *Quaternary Science Reviews*; *Science Advances*; *Treatise on Geomorphology*; *Water Resources Research*.
- Awarded 2017 Certificate for Excellence in Reviewing from the Journal of Paleolimnology.