

## Curriculum Vitae

### Dr. Thomas Michael Cullen

Postdoctoral Research Scientist - Field Museum

email: [tcullen@fieldmuseum.org](mailto:tcullen@fieldmuseum.org), [thomas.cullen11@gmail.com](mailto:thomas.cullen11@gmail.com)  
personal/research website: [thomasmcullen.net](http://thomasmcullen.net)

## Current Position

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**January 2018 – Present: Postdoctoral Research Scientist, Field Museum.** Perform research on dinosaur evolution and ecology in conjunction with Dr. Peter Makovicky. Primary research focuses on variability in osteohistological proxies for growth/physiology in theropods, and testing hypotheses of large body size evolution in multiple theropod clades. Other primary duties include advising on and developing technical content for both permanent and travelling exhibitions focused on the Field Museum's *Tyrannosaurus rex* specimen ('SUE') and the ecosystem/environment it inhabited, advising on several other exhibits projects, advising on development of an educational video game based on understanding biodiversity in deep-time for the Field Museum and regional schools, and performing outreach/tours for educational and institutional advancement purposes. In addition, I am assisting in the development of protocols and documents for destructive sampling and curation of vertebrate fossils.

## Education

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**Ph.D.**, January 2013 - September 2017. Dinosaur palaeoecology in the Late Cretaceous of Alberta: quantitative assessments using vertebrate microfossil bonebeds and stable isotope analyses. Department of Ecology and Evolutionary Biology, University of Toronto. Thesis Supervisor: Dr. David Evans.

**M.Sc.**, September 2010 to November 2012. Comparative description of a female *Enaliarctos emlongi* (Carnivora, Pinnipedimorpha) from the mid-Miocene of western Oregon and the evolution of sexual dimorphism within Pinnipedia. Department of Earth Sciences, Carleton University. Thesis Co-Supervisors: Dr. Natalia Rybczynski and Dr. Claudia Schröder-Adams.

**B.Sc.**, September 2006 to June 2010. Highest Honours, Earth Sciences (concentration in vertebrate palaeontology and palaeoecology), Carleton University. Honours Thesis: Description of an ornithomimid (Dinosauria) bonebed from the late Cretaceous of Alberta, with implications for classification and ontogeny of ornithomimids. Supervisors: Dr. Michael Ryan and Dr. Claudia Schröder-Adams.

## Publications & Presentations

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### **Peer-Reviewed Publications (H-index: 7, i10-index: 5, Citations: 129)**

17. **Cullen, TM.**, Longstaffe, FJ., Wortmann, UG., Huang, L., Fanti, F., Goodwin, MB., Ryan, MJ., Evans, DC. (Submitted). Large-scale stable isotope characterization of a Late Cretaceous dinosaur-dominated ecosystem. Submitted to *Geology*.
16. **Cullen, TM.**, Longstaffe, FJ., Wortmann, UG., Huang, L., Evans, DC. (In Review). Dinosaur enamel  $^{13}\text{C}$ -enrichment reflects non-analogue environmental conditions in a 'vanished world'. Under review at *Science Advances* (manuscript aaz0665).
15. **Cullen, TM.** (In Review). Stable isotopic analyses of living and extinct crocodylians: implications for understanding their paleobiology, paleoecology, and paleoenvironments. In *Crocodylian Biology and Paleobiology*. Edited by H Woodward and J Farlow. Indiana University Press.
14. **Cullen, TM.**, Simon, DJ., Benner, EKC., Evans, DC. (Accepted). Morphology and osteohistology of a large-bodied caenagnathid (Theropoda: Oviraptorosauria) from the Hell Creek Formation (Montana): implications for size-based classifications and growth estimation in theropods. Under review at *Papers in Palaeontology* (manuscript PALA-07-19-4558-OA).
13. Arbour, VM., Evans, DC., Simon, DJ., **Cullen, TM.**, Braman, D. (In Press). Cretaceous flora and fauna of the Sustut Group near the Sustut River, northern British Columbia, Canada. Under review at *Canadian Journal of Earth Sciences* (manuscript cjes-2019-0031).
12. **Cullen, TM.**, Longstaffe, FJ., Wortmann, UG., Goodwin, MB., Huang, L. Evans, DC. (2019). Stable isotopic characterization of a coastal floodplain forest community: a case-study for isotopic reconstruction of Mesozoic vertebrate assemblages. *Royal Society Open Science* 6: 181210. <http://dx.doi.org/10.1098/rsos.181210>.
11. McFeeters, B., Ryan, MJ., and **Cullen, TM.** (2018). Response to Brownstein (2018) 'Rebuttal of McFeeters, Ryan, and Cullen, 2018'. *Vertebrate Anatomy Morphology Palaeontology* 6: 73-74. doi: 10.18435/vamp29343
10. McFeeters, B., Ryan, MJ., and **Cullen, TM.** (2018). Positional variation in pedal unguals of North American ornithomimids (Dinosauria; Theropoda): a response to Brownstein (2017). *Vertebrate Anatomy Morphology Palaeontology* 5. doi: 10.18435/vamp29283
9. LeBlanc, ARH., Brink, K., **Cullen, TM.**, and Reisz, R. (2017). Evolutionary implications of tooth attachment versus tooth implantation: a case study using dinosaur, crocodylian, and mammal teeth. *Journal of Vertebrate Paleontology* 37(5): e1354006. doi: 10.1080/02724634.2017.1354006 (Citations: 14)
8. Evans, DC., **Cullen, TM.**, Larson, DL., and Rego, A. (2017). A new species of troodontid theropod (Dinosauria: Maniraptora) from the Horseshoe Canyon Formation (Maastrichtian) of Alberta, Canada. *Canadian Journal of Earth Sciences* 54(8): 813-826. doi: 10.1139/cjes-

2017-0034 (Citations: 3)

7. **Cullen, TM.** and Evans, DC. (2016). Palaeoenvironmental drivers of vertebrate community composition in the Belly River Group (Campanian) of Alberta, Canada, with implications for dinosaur biogeography. *BMC Ecology*. doi: 10.1186/s12898-016-0106-8. ([Editor's Pick and BMC Ecology top 10 highlight for 2016](#), and subject of a [BMC Series blog](#)) (Citations: 6)
6. McFeeters, B., Ryan, MJ., Schröder-Adams, C., and **Cullen, TM.** (2016). A new ornithomimid theropod from the Dinosaur Park Formation of Alberta, Canada. *Journal of Vertebrate Paleontology*. doi: 10.1080/02724634.2016.1221415 (Citations: 17)
5. **Cullen, TM.**, Fanti, F., Capobianco, C., Ryan, MJ., and Evans, DC. (2016). A vertebrate microsite from a marine-terrestrial transition in the Foremost Formation (Campanian) of Alberta, Canada, and the use of faunal assemblage data as a palaeoenvironmental indicator. *Palaeogeography, Palaeoclimatology, Palaeoecology* 444: 101-114. doi:10.1016/j.palaeo.2015.12.015 (Citations: 9)
4. **Cullen, TM.**, Ryan, MJ., Currie, PJ., Kobayashi, Y., and Evans, DC. (2014). Osteohistological variation in growth marks and osteocyte lacunar density in a theropod dinosaur (Coelurosauria: Ornithomimidae). *BMC Evolutionary Biology* ([Editor's Pick and a BMC series highlight for November 2014](#), and included in [list of the 12 best figures in BMC Evolutionary Biology for 2014](#)) (Citations: 18)
3. Evans, DC., Larson, DW., **Cullen, TM.**, & Sullivan, RM. (2014). 'Sauromitholestes' *robustus* is a troodontid (Dinosauria: Theropoda). *Canadian Journal of Earth Sciences* 51(7): 730-734. doi: 10.1139/cjes-2014-0073 (Citations: 7)
2. **Cullen, TM.**, Fraser, D., Rybczynski, N., and Schröder-Adams, C. (2014). Early evolution of sexual dimorphism and polygyny in Pinnipedia. *Evolution* 68(5): 1469-1484. ([Subject of the May 2014 cover of Evolution](#)) (Citations: 18)
1. **Cullen TM.**, Ryan MJ, Schröder-Adams C, Currie PJ, Kobayashi Y. (2013). An Ornithomimid (Dinosauria) Bonebed from the Late Cretaceous of Alberta, with Implications for the Behavior, Classification, and Stratigraphy of North American Ornithomimids. *PLoS ONE* 8(3): e58853. doi:10.1371/journal.pone.0058853 (Citations: 25)

### **Conference presentations (\* indicates oral presentation)**

31. **\*Cullen, TM.**, Canale, JI., Apesteguía, S., Smith, NS., Makovicky, PJ. 2019. Osteohistological variability, growth reconstruction, and trends in the evolution of theropod gigantism. International Symposium on Palaeohistology 2019. 31 July - 4 August 2019, Cape Town, South Africa
30. **\*Cullen, TM.** 2019. Specimen Spotlight – the hard life of a young tyrannosaur. Society for the Preservation of Natural History Collections 2019. 25 May - 31 May 2019, Chicago, USA
29. **\*Cullen, TM.** 2019. Best practices for destructive sampling in vertebrate palaeontology.

Society for the Preservation of Natural History Collections 2019. 25 May - 31 May 2019, Chicago, USA

28. \*Arbour, V., Evans, DC., Simon, DJ., **Cullen, TM.** 2019. A Maastrichtian-aged leptoceratopsid from the Sustut River, northern BC, and potential for new vertebrate fossil discoveries in the Sustut Basin. Canadian Society of Vertebrate Palaeontology 7th Annual Meeting. 10-13 May 2019, Philip J. Currie Dinosaur Museum, Wembley, Alberta, Canada.
27. \***Cullen, TM.**, Canale, JI., Apesteguía, S., Smith, NS., Makovicky, PJ. 2019. Macroevolutionary patterns of theropod gigantism as revealed through osteohistology and growth curve reconstruction. Canadian Society of Vertebrate Palaeontology 7th Annual Meeting. 10-13 May 2019, Philip J. Currie Dinosaur Museum, Wembley, Alberta, Canada.
26. Arbour, V., Evans, DC., Simon, DJ., **Cullen, TM.** 2018. Dinosaurs of the Northern Interior Mountains of British Columbia, Canada, including a new high latitude leptoceratopsid. Society of Vertebrate Palaeontology 78th Annual Meeting. 17-20 October 2018, Albuquerque, New Mexico, USA
25. \***Cullen, TM.** 2018. Testing ecological hypotheses of extant and Cretaceous coastal floodplain forest systems using stable isotope analyses. Society of Vertebrate Palaeontology 78th Annual Meeting. 17-20 October 2018, Albuquerque, New Mexico, USA
24. \***Cullen, TM.** 2018. Stable isotopic characterization of extant and Cretaceous coastal floodplain forest ecosystems. Canadian Society of Vertebrate Palaeontology 6th Annual Meeting. 14-16 May 2018, Canadian Museum of Nature, Ottawa, ON, Canada
23. \***Cullen, TM.**, Longstaffe, FJ., Wortmann, UG., Goodwin, MB., Huang, L., Evans, DC. 2017. Stable isotope analysis of an extant vertebrate community using palaeontological sampling constraints reveals low ecological resolution in a C3 floodplain system. Society of Vertebrate Paleontology 77th Annual Meeting, 23-26 August 2017, Calgary, Alberta, Canada.
22. \*Evans, DC., **Cullen, TM.**, Larson, DW., and Rego, A. 2017. A new species of troodontid theropod (Dinosauria: Maniraptora) from the Horseshoe Canyon Formation (Maastrichtian) of Alberta, Canada. Canadian Society of Vertebrate Palaeontology 5th Annual Meeting. Dinosaur Provincial Park Field Station, AB, Canada
21. **Cullen, TM.**, Longstaffe, FJ., Evans, DC. 2016. An intensive multi-taxic stable carbon and oxygen isotopic analysis of vertebrates from a microsite in the Oldman Formation (Late Cretaceous) of Alberta. Society of Vertebrate Paleontology Annual Meeting. Oct.26th-29th, Salt Lake City, UT, USA.
20. Benner, EKC., **Cullen, TM.**, Evans, DC. 2016. A new large-bodied caenagnathid specimen (Theropoda, Oviraptorosauria) from the Hell Creek Formation (Late Cretaceous) of Montana, with implications for osteohistological variability in caenagnathids. Society of Vertebrate Paleontology Annual Meeting. Oct.26th-29th, Salt Lake City, UT, USA.
19. \*McFeeters, B., **Cullen, T.** 2016. Holotype of the Late Cretaceous dinosaur *Dromiceiomimus*

*brevetertius*, with implications for the utility of distal caudal vertebrae in ornithomimid classification. Canadian Paleontological Conference. Aug.26th-28th, Cape Breton University, Sydney, NS, Canada.

18. \*Benner, EKC., **Cullen, TM.**, Evans, DC. 2016. Morphological and histological analysis of a new large-bodied caenagnathid specimen (Theropoda: Oviraptorosauria) from the Hell Creek Formation (Montana). Canadian Society of Vertebrate Palaeontology 4th Annual Meeting. May 18th-21st, University of Toronto Mississauga, Mississauga, ON, Canada
17. \***Cullen, TM.** 2016. The influence of environmental drivers on vertebrate faunal assemblages in the late Cretaceous of Alberta, Canada. Canadian Society of Vertebrate Palaeontology 4th Annual Meeting. May 18th-21st, University of Toronto Mississauga, Mississauga, ON, Canada
16. \***Cullen, TM.**, Evans, DC., Ryan, MJ., and Currie. PJ. 2015. New data on dinosaur faunal turnover and extinction timing in the Dinosaur Park Formation (Late Cretaceous: Campanian) of Alberta, Canada. Society of Vertebrate Paleontology Annual Meeting. Oct.14<sup>th</sup>-17<sup>th</sup>, Dallas, TX, USA.
15. **Cullen, TM.**, Evans, DC., Ryan, MJ., Kobayashi, Y., and Currie. PJ. 2014. Variation in intra- and inter-individual osteocyte lacunar density in a theropod dinosaur (Coelurosauria: Ornithomimidae). Society of Vertebrate Paleontology Annual Meeting. Nov.5<sup>th</sup>-8<sup>th</sup>, Berlin, Germany.
14. \*LeBlanc, A., Brink, K., **Cullen, TM.**, Reisz, R. 2014. Tooth sockets and interdental plates: the development and histology of thecodonty in amniotes. Society of Vertebrate Paleontology Annual Meeting. Nov.5<sup>th</sup>-8<sup>th</sup>, Berlin, Germany.
13. Larson, D., **Cullen, TM.**, Todd, E., Evans, DC. 2014. Geometric morphometrics of small theropod frontals from the Dinosaur Park formation, Alberta. Society of Vertebrate Paleontology Annual Meeting. Nov.5<sup>th</sup>-8<sup>th</sup>, Berlin, Germany.
12. \***Cullen, TM.** 2014. Intraspecific variation in osteohistologic traits in a size-series of an ornithomimid dinosaur (Theropoda: Coelurosauria). 24<sup>th</sup> Canadian Paleontology Conference. Aug.28<sup>th</sup>-31<sup>st</sup>, Montreal, QC, Canada.
11. **Cullen, TM.**, Ryan, MJ., Capobianco, C., Newbrey, M., and Evans, DC. 2013. A vertebrate microfossil site with a terrestrial-dominated faunal assemblage from the upper Foremost Formation (Campanian) of Alberta. Society of Vertebrate Paleontology Annual Meeting. Oct.30<sup>th</sup>-Nov.2<sup>nd</sup>, Los Angeles, CA, USA.
10. \***Cullen, TM.**, Fraser, D., Rybczynski, N., and Schröder-Adams, C. 2013. Early evolution of sexual dimorphism and polygyny within Pinnipedia. 23<sup>rd</sup> Canadian Paleontology Conference. Aug.29<sup>th</sup>-Sept.1<sup>st</sup>, Edmonton, AB, Canada.
9. **Cullen, TM.**, Ryan, MJ., Currie, PJ., Kobayashi, Y., and Evans, DC. 2013. Multi-element histological analysis of an ornithomimid (Dinosauria: Theropoda) bonebed from the late

cretaceous of Alberta, with implications for skeletochronology in theropods. Second International Symposium on Paleohistology. July 18<sup>th</sup>-20<sup>th</sup>, Bozeman, MT, USA.

8. **\*Cullen, T.**, Ryan, M., Schröder-Adams, C., Kobayashi, Y., and Currie, P. 2012. Multi-element histological analysis of an ornithomimid (Dinosauria) bone bed from the Horseshoe Canyon Formation, Alberta. Society of Vertebrate Paleontology Annual Meeting. Oct. 17<sup>th</sup>-20<sup>th</sup>, Raleigh, USA.
7. **Cullen, TM.**, Ryan, MJ., Evans, DC., Capobianco, C., and Newbrey, M. 2012. Taxonomy and palaeoecology of a vertebrate microsite from the Foremost Formation of southern Alberta, Canada. 22<sup>nd</sup> Canadian Paleontology Conference. Sept. 21<sup>st</sup>-23<sup>rd</sup>, Toronto, ON, Canada.
6. **Cullen, T.**, Rybczynski, N. and Schröder-Adams, C. 2012. A female *Enaliarctos emlongi* (Carnivora, Pinnipedimorpha) from the Miocene of western Oregon and the evolution of sexual dimorphism within Pinnipedia. 1<sup>st</sup> Joint Congress on Evolutionary Biology. July 6<sup>th</sup>-10<sup>th</sup>, Ottawa, ON, Canada.
5. **\*Cullen, T.**, Ryan, M., Evans, D, Currie, P, and Kobayashi, Y. 2012. Preliminary results of a multi-element histological analysis of an ornithomimid (Dinosauria) bone bed from the late Cretaceous of Alberta. Geological Association of Canada – Mineralogical Association of Canada Meeting. May 27<sup>th</sup>-29<sup>th</sup>, St. John's, NL, Canada.
4. **Cullen, T.**, Pugh, A., Schröder-Adams, C., Halfkenny, B., Rybczynski, N., and Mitchell, T. 2012. Geoheritage Sites of the Canadian Arctic: Increasing Awareness through Education and Co-operation. International Polar Year Conference. April 22<sup>nd</sup>-27<sup>th</sup>, Montreal, QC, Canada.
3. **Cullen, T.**, Rybczynski, N., and Schröder-Adams, C. 2011. Description of a small skull specimen of *Enaliarctos* (Carnivora, Pinnipedimorpha) from the Miocene of western Oregon. Society of Vertebrate Paleontology Annual Meeting. Nov. 2<sup>nd</sup>-5<sup>th</sup>, Las Vegas, NV, USA.
2. **Cullen, T.**, Rybczynski, N. and Schröder-Adams, C. 2011. Preliminary description of a female *Enaliarctos emlongi* (Carnivora: Pinnipedia) from the Miocene of western Oregon and implications for the evolution of pinniped mating systems. Canadian Society of Zoologists Annual Meeting. May. 16<sup>th</sup>-20<sup>th</sup>, Ottawa, ON, Canada.
1. **Cullen, T.**, Ryan, M., Schröder-Adams, C., Kobayashi, Y., Currie, P. 2010. Description of the first ornithomimid (Dinosauria) bonebed from North America with implications for the discrimination, ontogeny and behavior of ornithomimids. Society of Vertebrate Paleontology Annual Meeting. Oct. 10<sup>th</sup>-13<sup>th</sup>, Pittsburgh, PA, USA.

### **Invited lectures**

10. **Cullen, TM.** The changing face of dinosaurs at the Field Museum. 'Lunch Hour Talk' at the Royal British Columbia Museum, August 22<sup>nd</sup>, 2019, Victoria, BC.

9. **Cullen, TM.** Giving *SUE* the *T. rex* a new home and what their bones can tell us about the evolution of large body size in theropods. '21<sup>st</sup> Annual PaleoFest' at the Burpee Museum of Natural History, March 1<sup>st</sup>-3<sup>rd</sup>, 2019, Rockford, IL.
8. **Cullen, TM.** Histological sampling of Sue: balancing collections curation & research goals when performing destructive sampling. 'Collections Forum' at the Field Museum, December 13<sup>th</sup>, 2018, Chicago, IL.
7. **Cullen, TM.** Multi-scale approaches to understanding dinosaur ecology and evolution – from growth and diet to whole faunas. 'A. Watson Armour Seminar Series' at the Field Museum, December 5<sup>th</sup>, 2018, Toronto, ON.
6. **Cullen, TM.** ROM collections reveal a new dinosaur: *Rativates evadens*. 'Fossil Fest Family Funday' at the Royal Ontario Museum, January 22<sup>nd</sup>, 2017, Toronto, ON.
5. **Cullen, TM.** Evaluating osteohistological variation in growth marks and osteocyte lacunar density: a case study using theropod dinosaurs. Department of Ecology and Evolutionary Biology Atwood Colloquium 2015, April 10<sup>th</sup>-11<sup>th</sup>, Toronto, ON.
4. **Cullen, TM.** Sorting out the world of dinosaurs: palaeoecology and palaeoenvironments in the Cretaceous of Alberta. 'Dinosaurs Invade! Weekend' at the Royal Ontario Museum, January 24<sup>th</sup>-25<sup>th</sup>, 2015, Toronto, ON.
3. **Cullen, TM.** Early evolution of sexual dimorphism and polygyny in Pinnipedia. Advances in Earth Sciences Research Conference 2014. Mar.28<sup>th</sup>-30<sup>th</sup>, Ottawa, ON.
2. **Cullen, TM.** Skeletochronology and reducing subjectivity in palaeohistological analyses. First International ROM Palaeohistology Workshop, September 27<sup>th</sup>, 2013, Toronto, ON.
1. **Cullen TM.** Antarctica's ecosystems through time: a change from terrestrial to fully marine. Students on Ice – Carleton University Antarctic Expedition lecture series at the Canadian Museum of Nature. April 14<sup>th</sup>, 2011, Ottawa, ON.

### **Non-refereed publications**

4. **Cullen, T.** January 10, 2017. Dinosaur Distributions in the Belly River. Blog for BMC Series Blog. <http://blogs.biomedcentral.com/bmcseriesblog/2017/01/10/dinosaur-distributions-belly-river/>
3. **Cullen, T.** July 9, 2016. Microsites and Macroinferences. Blog for 'Valley of the Last Dinosaurs' project of Denver Museum of Nature & Science and the Howard Hughes Medical Institute. <http://lastdinosaurs.livesci.org/field-notebook/>
2. **Cullen, T.** July 7, 2016. Field Camps in Many Shapes and Sizes. Blog for 'Valley of the Last Dinosaurs' project of Denver Museum of Nature & Science and the Howard Hughes Medical Institute. <http://lastdinosaurs.livesci.org/field-notebook/>

1. **Cullen, T.** November 19, 2014. Photography in the Field: equal parts business & pleasure. ROM blogs. <https://www.rom.on.ca/en/blog/photography-in-the-field-equal-parts-business-pleasure>

## **Exhibit Development Experience**

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**January 2019 - present:** Advising on mini-exhibit in Field Museum main hall (Stanley Field Hall) which provides additional information/context to the nearby mounted skeleton cast of the titanosaur *Patagotitan*.

**January 2019 - present:** Advising on updates to the Field Museum's permanent fossil exhibitions ('The Evolving Planet'). Range of advised material is broad, and include a display on dinosaur feather & flight evolution, and new content on field methods in palaeontology.

**December 2018 - present:** Advising and developing content for travelling version of 'SUE's World' exhibit at Field Museum. Consists of similar advisory/development tasks to role in 'SUE's World' exhibit, though modified to allow for travel.

**January 2018 - December 2018:** Provided technical consultation and developed content for 'SUE's World' exhibit at the Field Museum. Involved anatomical and biomechanical consultations for reconstructions and animations, selection of specimens for Hell Creek Formation palaeoecology component, development of visual content and sections of exhibit text, assisted in re-mounting of skeleton of 'SUE' (*Tyrannosaurus rex*) from previous location in museum, etc.

## **Field Experience**

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**August 2019:** British Columbia, Canada. Prospecting for fossils and performing geological comparisons in Late Cretaceous strata in Spatsizi Plateau Wilderness Provincial Park, northern BC. Field work focus – vertebrate palaeontology, dinosaurs, palaeoenvironments.

**February 2019:** Neuquén / Río Negro (Patagonia), Argentina. Participated in field work prospecting for and excavating archosaurs found in Cretaceous strata (Candeleros, Huincul, and Anacleto formations). Field work focus – vertebrate palaeontology, archosaur excavation, palaeoenvironments.

**September 2018:** Missouri, USA. Participated in field work excavating dinosaurs and other vertebrate fossils from a site found in Cretaceous strata near Marble Hill, Missouri. Field work focus – vertebrate palaeontology, dinosaur excavation, palaeoenvironments.

**August 2018:** Alberta, Canada. Participated in Southern Alberta Dinosaur Project (SADP) working in late Cretaceous Belly River Group strata near Manyberries, Alberta. Field work focus – vertebrate palaeontology, dinosaur excavation, vertebrate microfossil bonebeds, biostratigraphy.



**July-August 2018:** Utah, USA. Prospecting for fossils and collecting sediments from previous sites for absolute dating in Cedar Mountain Formation strata along the western and eastern sides of the San Rafael Swell in Utah. Field work focus – vertebrate palaeontology, prospecting, sediment sampling.

**July 2018:** Montana, USA. Prospecting for fossils and visiting previous sites in Cretaceous Hell Creek Formation strata near Jordan, MT. Field work focus – dinosaur palaeontology, prospecting, palaeoenvironments.

**August 2017:** British Columbia, Canada. Prospecting for fossils and measuring stratigraphic sections in Cretaceous strata along the Sustut River in northern BC. Field work focus – vertebrate palaeontology, prospecting, palaeoenvironments.

**July – August 2017:** Alberta, Canada. Participated in Southern Alberta Dinosaur Project (SADP) working in late Cretaceous Belly River Group strata near Manyberries, Alberta. Field work focus – vertebrate palaeontology, vertebrate microfossil bonebeds, dinosaur excavation, quarry relocation, biostratigraphy.

**July – August 2016:** Alberta, Canada. Participated in Southern Alberta Dinosaur Project (SADP) working in late Cretaceous Belly River Group strata near Manyberries, Alberta. Field work focus – vertebrate palaeontology, dinosaur excavation, prospecting, quarry relocation, biostratigraphy.

**July 2016:** Montana, USA. Measuring stratigraphic sections and relocating old sites in late Cretaceous Hell Creek Formation strata near Jordan, Montana, and the Judith River Formation strata near Havre, Montana. This work was performed alongside the field camp of Drs. Greg Wilson, Mark Goodwin, and Jack Horner. Field work focus – vertebrate palaeontology, biostratigraphy, quarry relocation

**July 2016:** North Dakota, USA. Prospecting vertebrate material in late Cretaceous Hell Creek Formation strata near Marmarth, North Dakota. This work was performed alongside the field camp of Dr. Tyler Lyson. Field work focus – vertebrate palaeontology, prospecting, stratigraphy

**October 2015:** Louisiana, USA. Led opportunistic sampling of hard tissues from vertebrates in the Atchafalaya Basin, near Lafayette, Louisiana. Field work focus – field ecology.

**July 2015:** Alberta, Canada. Participated in SADP working in late Cretaceous Belly River Group strata (primarily Oldman Formation) near Manyberries, Alberta. Field work focus – vertebrate palaeontology, dinosaur excavation, prospecting.

**June – July 2015:** Montana, USA. Excavating dinosaur material in late Cretaceous Judith River Formation strata near Malta, Montana. Field work focus – vertebrate palaeontology, prospecting, stratigraphy

**February 2015:** Louisiana, USA. Led opportunistic sampling of hard tissues from vertebrates in the Atchafalaya Basin, near Baton Rouge, Louisiana. Field work focus – field ecology.

- July 2014:** Alberta, Canada. Participated in SADP working in late Cretaceous Belly River Group strata (primarily Oldman Formation) near Manyberries, Alberta. Field work focus – vertebrate palaeontology, dinosaur excavation
- July 2013:** Montana, USA. Excavating dinosaur material in late Cretaceous Judith River Formation strata near Malta, Montana. Field work focus – vertebrate palaeontology, dinosaur excavation, prospecting
- June – July 2013:** Alberta, Canada. Participated in SADP working in late Cretaceous Belly River Group strata (primarily Oldman Formation) near Manyberries, Alberta. Field work focus – vertebrate palaeontology, dinosaur excavation, microsite collection, quarry relocation
- July – August 2012:** Northwest Territories, Canada. Participated in field expedition of late Cretaceous deposits along the Horton and Big Fish rivers, North West Territories. Field work focus – stratigraphy, sediment sampling, prospecting
- July 2011:** Alberta, Canada. Participated in SADP working in late Cretaceous Belly River Group strata (primarily Oldman Formation) near Manyberries, Alberta. Field work focus – vertebrate palaeontology, dinosaur excavation, prospecting
- February 2011:** Tierra del Fuego, Argentina, and Antarctica. Participated in interdisciplinary field and education expedition led by Students on Ice and teams from six international universities (Canadian, American, British, Swedish). Expedition was based on the research vessel *M/V Ushuaia*, and involved landings on locations across the Antarctic Peninsula. Field work focus - geology, glaciology, oceanography, marine biology.
- July 2010:** Nunavut, Canada. Participated in field expedition in early Miocene deposits of the Haughton Formation and associated Haughton Impact Structure on Devon Island, Nunavut. Field work focus – mammal palaeontology, prospecting, stratigraphy
- July 2009:** Alberta, Canada. Participated in Southern Alberta Dinosaur Project (SADP) working in late Cretaceous Belly River Group strata (primarily Oldman Formation) near Manyberries, Alberta. Field work focus – vertebrate palaeontology, dinosaur excavation

## **Major Awards and Funding (>\$5000)**

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- 2016-2017:** Queen Elizabeth II/Dr. F. M. Hill Scholarship in Science and Technology **(\$15000)**
- 2013-2016:** Natural Sciences and Engineering Research Council Alexander Graham Bell Canada Graduate Scholarship (Doctoral) **(\$105,000, \$35,000 x 3 years)**
- 2013:** Ontario Graduate Scholarship (Doctoral) (Held until NSERC awarded for Sept. 2013) **(\$15000)**
- 2011-2012:** Natural Sciences and Engineering Research Council Alexander Graham Bell Canada Graduate Scholarship (Masters) **(\$17500)**
- 2011-2012:** Ontario Graduate Scholarship (Masters) **(\$15000)** (declined)

- 2011:** Donations from Gainey Foundation, and Carleton alumni J.C Potvin and Jim Sullivan to fund travel expenses of Carleton University Antarctic Expedition members. **(\$36000 / 7 students = ~\$5143)**
- 2010:** Dr. George A. Jeletzky Memorial Scholarship, Department of Earth Sciences, Carleton University **(\$5000)**

### **Minor Awards (<\$5000) & Competitive Non-Monetary Awards**

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- 2018:** Robert Lynn Carroll Prize, Canadian Society of Vertebrate Palaeontology (for outstanding scientific contribution by a current or recently graduated PhD student) **(\$500)**
- 2017:** Dinosaur Research Institute Student Project Grant **(\$1000)**
- 2017:** Internal Restricted Award, Department of Ecology and Evolutionary Biology, University of Toronto **(\$1000)**
- 2016:** Dinosaur Research Institute Student Project Grant **(\$2000)**
- 2016:** Ramsay Wright graduate student award (honourable mention), Department of Ecology and Evolutionary Biology, University of Toronto
- 2014:** Dinosaur Research Institute Rene Vandervelde Travel Award for attendance of Society of Vertebrate Paleontology Annual Meeting in Berlin, Germany. **(\$1250)**
- 2014:** Jackson School of Geosciences Student Member Travel Grant for attendance of Society of Vertebrate Paleontology Annual Meeting in Berlin, Germany. **(\$600)**
- 2013:** University of Toronto Department of Ecology and Evolutionary Biology Harold Harvey Travel Grant for attendance of Society of Vertebrate Paleontology Annual Meeting in Los Angeles, California, USA **(\$400)**
- 2013:** Dinosaur Research Institute Student Project Grant **(\$2300)**
- 2013:** C.S. Rufus Churcher Graduate Award in Zoology, Department of Ecology and Evolutionary Biology, University of Toronto **(\$1974)**
- 2013:** Frederick P. Ide Graduate Award in Ecology and Evolutionary Biology, Department of Ecology and Evolutionary Biology, University of Toronto **(\$826)**
- 2012:** Northern Science Training Program grant for High Arctic fieldwork, awarded by the Department of Aboriginal Affairs and Northern Development Canada for fieldwork at Horton River and Boundary Creek, Northwest Territories, Canada. **(\$2000)**
- 2012:** Dr. George A. Jeletzky Memorial Scholarship, Department of Earth Sciences, Carleton University **(\$1000)**
- 2011:** Dean's Honour List, Carleton University
- 2011:** Departmental Graduate Scholarship 3, Department of Earth Sciences, Carleton University **(\$2000)**
- 2011:** Departmental Graduate Scholarship 2, Department of Earth Sciences, Carleton University **(\$2100)**
- 2011:** Dr. George A. Jeletzky Memorial Scholarship, Department of Earth Sciences, Carleton University **(\$1000)**
- 2010:** Northern Science Training Program grant for High Arctic fieldwork, Department of Aboriginal Affairs and Northern Development Canada. Devon Island, Nunavut Territory, Canada. **(\$2500)**
- 2010:** W. H. Collins Fund for student travel for Carleton University earth sciences field schools. **(\$1000)**
- 2010:** Dean's Honour List, Carleton University

**2010:** Departmental Graduate Scholarship 3, Department of Earth Sciences, Carleton University  
**(\$2000)**

**2010:** Departmental Graduate Scholarship 2, Department of Earth Sciences, Carleton University  
**(\$2100)**

**2010:** Undergraduate Research Day Award, Carleton University

**2009-2010:** General In-course Scholarship, Carleton University **(\$750)**

**2009:** Dean's Honour List, Carleton University

**2008-2009:** Salaried Employees Alliance Canada Scholarship **(\$1000)**

**2007-2008:** General In-course Scholarship, Carleton University **(\$750)**

**2007:** Dean's Honour List, Carleton University

## **Teaching and Mentoring Experience**

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### **Student Project Mentoring:**

I am currently supervising two research interns at the Field Museum of Natural History. One of these students is currently a high school student, and the other an undergraduate at UChicago. Both are performing semi-independent research projects focused on dinosaur ecology and evolution. I am also assisting in the project design and acting as an external advisor for two MSc students at Carleton University (supervised primarily by Dr. Danielle Fraser of the Canadian Museum of Nature). Their theses focus on using stable isotope analyses of multiple tissues from ancient and modern Northern/Arctic mammals to study tissue offsets, trophic ecology, and dietary/biogeographic shifts related to climate change from the Pleistocene to recent.

In addition, as a senior graduate student during my PhD in the Evans lab at the University of Toronto, I assisted in the mentoring of junior graduate students by orientating them with the University and the Royal Ontario Museum, assisting them in learning relevant methods of data acquisition, and discussing their research data. I have also assisted in the supervision of several undergraduate student projects. In most cases this involves assisting the students in developing their hypotheses, providing literature pertinent to their projects, teaching them relevant methods, and discussing their research results prior to more formal progress meetings with Dr. Evans.

Specific student projects in which I assisted in supervising during my PhD are as follows:

- Talia Lowi-Merri, *Gryposaurus* cranial morphometrics (project submitted and under review)
- Adam Rego, Horseshoe Canyon Formation troodontid frontal morphology (project published)
- Elizabeth Benner, Hell Creek Formation oviraptorosaur osteohistology (project submitted and under review)
- Erin Todd, Dinosaur Park Formation theropod frontal morphometrics (in prep for publication)

### **Teaching Experience and Assignments:**

Starting in the 3<sup>rd</sup> year of my undergraduate and continuing until the completion of my doctorate I worked as a teaching assistant, both in the Department of Earth Sciences at Carleton University (BSc & MSc) and the Department of Ecology and Evolutionary Biology at the University of Toronto (PhD). As part of these assignments I taught a wide variety of geology, biology, and palaeontology

material, and in several cases both worked additional contracts developing lab and lecture material and provided guest presentations teaching in the lecture section of the course. Below I detail the specific courses I have taught and assisted in developing:

**EEB267: Animal Diversity: Vertebrates.**

Department of Ecology and Evolutionary Biology, University of Toronto. Professor: Deborah McLennan. Conducted weekly laboratory sessions & lab exams, Update and create new course content (new lab demonstration, materials, and assignment)  
(Taught 5x + addition contract for course content development)

**EEB390: Vertebrate Palaeontology: Major Transitions in Vertebrate History.**

Department of Ecology and Evolutionary Biology, University of Toronto. Professors: David Evans, Kevin Seymour, Gerry De Iuliis. Design lab content, conduct weekly laboratory sessions, give guest presentation in lecture section, proctor/mark lab exams.  
(Taught 2x + additional contract assisting in creation of course content prior to initial offering)

**EEB466: Approaches to the Study of Biodiversity.**

Department of Ecology and Evolutionary Biology, University of Toronto. Professors: David Evans, Doug Currie, Sebastian Kvist, Jean-Bernard Caron. Assisted Dr. Evans in the development of course project focusing on uses of vertebrate microfossil bonebed data, taught hands-on sessions related to this course project, gave guest presentations.  
(Taught 2x)

**EEB388: Diversity of Mammals.**

Department of Ecology and Evolutionary Biology, University of Toronto. Professor: Corey Goldman. Conducted weekly laboratory sessions & lab exams.  
(Taught 1x)

**ERTH2802: Field Geology.**

Department of Earth Sciences, Carleton University. Professor: Fred Gaidies. Taught field methods and geological mapping during intensive two-week field course.  
(Taught 1x)

**ERTH3112: Palaeontology and Evolution of Vertebrates.**

Department of Earth Sciences, Carleton University. Professor: Sanja Hinic-Frlog. Conducted weekly laboratory sessions, updated lab assignment content.  
(Taught 1x)

**ERTH2401: Dinosaurs.**

Department of Earth Sciences, Carleton University. Professor: Claudia Schröder-Adams. Assisted in course administration, prepare tests/quizzes, held office hours, and gave guest lectures.  
(Taught 1x)

**ERTH2312: Invertebrate Palaeontology.**

Department of Earth Sciences, Carleton University. Professor: R. Tim Patterson. Conducted weekly laboratory sessions, updated laboratory assignment content.  
(Taught 2x)

**ERTH3113: Geology of Human Origins.**

Department of Earth Sciences, Carleton University. Professor: Sanja Hinic-Frlog. Conducted and prepared assignment sessions, marked quizzes/tests.  
(Taught 1x)

**ERTH2314: Sedimentation and Stratigraphy.**

Department of Earth Sciences, Carleton University. Professor: George Dix. Conducted weekly laboratory sessions, led short field assignments.

(Taught 1x)

**ERTH2102: Introductory Mineralogy.**

Department of Earth Sciences, Carleton University. Professor: Fred Gaidies. Conducted weekly laboratory sessions.

(Taught 1x)

**ERTH1007: Introduction to Geology II.**

Department of Earth Sciences, Carleton University. Professor: Brian Cousens. Conducted weekly laboratory sessions.

(Taught 2x)

**ERTH1006: Introduction to Geology I.**

Department of Earth Sciences, Carleton University. Professor: Brian Cousens. Conducted weekly laboratory sessions.

(Taught 1x)

## **Public Engagement & Science Outreach**

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**Ongoing (since January 2018): Field Museum.** Advised on content for multiple Education department projects. These include:

- an educational video game co-produced by the Field Museum and Filament Games called 'Mission to the Mesozoic'. Project is designed to provide an understanding of biodiversity in deep-time, how to identify different species and clades, how environments have changed throughout the Mesozoic, and how climate change relates to macroevolution and extinction. Project will be made for use both within the Field Museum, in regional schools, and online (<https://www.fieldmuseum.org/educators/resources/mission-mesozoic>)
- material for lesson plans related to 'Sauropod Evolution', 'Dino Boxes', and 'Dinosaur Family Tree' modules

**Ongoing (since January 2018): Field Museum.** Took part in multiple in-gallery and off-site specimen-based public engagement programs. These include:

- Interacted with museum visitors, explained Cretaceous vertebrate fossil ecosystems and the species in them during the 'SUE moving on up' event in preparation for the disassembly and removal of 'Sue' the *T. rex* from Stanley Field Hall (Jan 11th, 2018).
- Provided guided tours of the fossil collections during the Women's Board and Founder's Council 'Winter Family Day' event (Feb 10th, 2018).
- Provided guests with a behind-the-scenes look at the planned & under-construction 'SUE Experience' exhibit, with particular emphasis on the new scientific data informing our reconstructions of Sue the *T. rex*, how it grew, and the ecosystem it inhabited (May 10th, 2018).
- On two evenings, interacted with museum guests/members (June 14th, 2018) and Founder's Council members (June 21st), discussing the newly opened 'Antarctic Dinosaurs' exhibit and recently installed 'Maximo the titanosaur'.
- Presented on my scientific research and led multiple tours of the 'Evolving Planet' fossil exhibit for guests of the Adult Engagement department's 'Field Museum Adult Sleepover' event (July 7th, 2018).

- Discussed Utah field research and recent fossil discoveries with museum guests as part of regular 'Meet a Scientist' event at the Field Museum 'Science Hub' (Aug 24th, 2018).
- Engaged with event guests and discussed both my research and the upcoming Sue exhibit during the 'EVOLVE' event at the Field Museum (Sept 22nd, 2018).
- Field Museum 'A. Watson Armour Seminar Series'. Gave a lecture on my research to the staff and public at the Field Museum, as part of their ongoing invitational speaker series. The title of my talk was "Multi-scale approaches to understanding dinosaur ecology and evolution – from growth and diet to whole faunas" (Dec 5, 2018)
- Took part giving tours and answering questions from members of the press, museum donors, members, visitors, and representatives from visiting institutions during a series of events ('Welcome Back SUE') focused around the opening of the 'SUE Experience / SUE's World' exhibition at the Field Museum (Dec 15-21, 2018).
- Engaged with guests discussing my research on dinosaur growth & the development of the 'SUE Experience / SUE's World' exhibition during an evening member+donor event ('SUE Celebration') (Jan 16, 2019).

**Ongoing (since Feb 2017): Science Borealis.** a Canadian non-profit organization dedicated to highlighting and disseminating Canadian scientific research & policy through blogs, events, and social media. My primary duties with Science Borealis are as a member of their Outreach Team, where I contribute to discussions of public engagement strategies and assist in running social media accounts and campaigns. More information about Science Borealis can be found at [scienceborealis.ca](http://scienceborealis.ca)

**January 2014 – September 2017: Royal Ontario Museum.** Took part in multiple in-gallery and off-site specimen-based public engagement programs. These include:

- Gave lecture to students entitled 'Fieldwork in Palaeontology' as part of the March Break 'ROMology' program. (March 2014).
- March Break Dinosaur Touch Table. Interacted with museum visitors, explained fossil specimens, and answered questions on a wide range of topics relating to dinosaurs, palaeontology, and evolution. (March 2014, 2015).
- Provided tours of palaeontological collections to public during 'ROM Revealed' open house weekend (May 3<sup>rd</sup> & 4<sup>th</sup> 2014)
- Alongside Dr. David Evans, provided tour of collections and research facilities to visiting guest Adam Savage ('Mythbusters'). (November 29<sup>th</sup>, 2014).
- Interacted with museum visitors, hosted interactive station focused around vertebrate microfossil bonebeds and their use in inferring palaeoecology and palaeoenvironments. Depending on year, either part of the 'Dinosaurs Invade! Weekend' (January 24<sup>th</sup>-25<sup>th</sup>, 2015; January 23<sup>rd</sup>-24<sup>th</sup>, 2016) and/or 'Fossil Fest Family Funday' (January 22<sup>nd</sup>, 2017) events.
- Interacted with museum visitors and discussed recent ROM palaeontology discoveries during 'DinoNite' Friday Night Live event (June 2<sup>nd</sup>, 2017).
- Interacted with museum visitors, explained vertebrate fossil microsites and their use in inferring palaeoecology and palaeoenvironments during the 'Up Close with Nature' component of the 'Brilliant Science Family Fun Day' event (Sept 24th, 2017).

**November 2012: Science Travels.** Organization based out of the University of Ottawa geared towards providing students in remote or First Nations communities additional science education opportunities. Participated in four-person team sent to northern Ontario (within and

between Dryden and Kenora), which visited multiple schools and First Nations communities and performed a series of science workshops/seminars geared towards ages 5-17.

**September 2012 – December 2012: Let's Talk Science.** Teaching program run through the University of Ottawa and Carleton University, connecting graduate students with elementary and high school science teachers. Taught elementary aged students about paleontology at several locations in Ottawa during 2012.

**May 2010 – November 2011: Canadian Museum of Nature.** Took part in multiple in-gallery and off-site specimen-based public engagement programs. These include:

- Museum Grand Re-Opening Event 'Rediscover Your Museum'. Positioned at station in fossil gallery to explain and answer questions regarding the 'missing-link' fossil *Puijila darwini*. (May 22, 2010).
- Royal dedication of 'Queen's Lantern' addition to museum's Victoria Memorial Museum Building, during visit of Her Majesty Queen Elizabeth II. Assisted in event set-up, selection of collection objects to be moved to gallery spaces for guest viewing, and took part in staff welcome to the Queen and the Duke of Edinburgh. (June 30, 2010).
- 'Meet the Experts' event. Positioned at station in fossil gallery to explain and answer questions regarding the 'missing-link' fossil *Puijila darwini*, and my M.Sc. research on pinniped evolution. (November 2010).
- 'Meet the Experts' event. Positioned at station in new arctic research gallery to explain and answer questions regarding the 'missing-link' pinniped fossil *Puijila darwini*, arctic field work, and my M.Sc. research on pinniped evolution. (November 2011).

**October 2008 – 2012: Carleton University Department of Earth Sciences.** 'Geoheritage Day'. Provided information and interactive displays for public at sites of geologic interest around Ottawa during this annual outreach event.

## **Professional Development, Workshops, and Training**

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**May-June 2018: EMu software training workshops.** Multi-day training sessions on using the EMu software package for museum collection management and specimen cataloguing.

**April 2017: Red Cross Wilderness First Aid Course.** 3-day intensive course with hands-on experience in remote and wilderness situations.

**September 2014, 2015, 2016: 2<sup>nd</sup>/3<sup>rd</sup>/4<sup>th</sup> Annual International ROM Palaeohistology workshops.** Assisted in organization and implementation of workshop, including three days of lectures and hands-on thin section preparation. The workshop instructed 8-10 students on the theory and methodologies behind the generation of palaeohistological thin sections. I acted as an instructor during the lecture and hands-on portions of the workshop. My lectures focused on bone biology and skeletochronological methods, and on limiting subjectivity in osteohistological analyses.

**December 2015: Morphometrics workshop.** Organized and led (alongside Derek Larson) a workshop focused on the understanding and use of geometric morphometric analyses. This



workshop instructed 8 students from a range of backgrounds (undergraduate, graduate) and study interests. Lectures and discussions focused on the theoretical background underlying morphometrics, the advantages and drawbacks to different morphometric methods. Practical instruction included hands-on data collection, and R coding to carry out multiple geometric morphometric analyses using multiple datasets and different analytical techniques (including Procrustes analysis, PCA, landmark-based data, semi-landmark data, deformation grid generation and comparisons, etc).

**May 2015, Jan 2016, May 2016, Sept 2016: Laser ablation stable isotope mass spectrometry.** Analyzed samples using the laser-ablation gas chromatography-isotope ratio mass spectrometry (GC-IRMS) system at Western University in London, Ontario, on multiple occasions throughout 2015 and 2016. During this time the technician, Li Huang, and the head researcher in the lab, Dr. Fred Longstaffe, instructed me on the proper operation of the LA-ICPMS system, preparation of samples, and on the interpretation of raw data outputs from this system.

**October 2014: Teaching Fundamentals (TF) certificate** program completion. Awarded after completing a series of teaching workshops through the Centre for Teaching Support and Innovation at the University of Toronto.

Workshops completed as part of TF certificate program:

**Preparing your teaching dossier** (November 7<sup>th</sup>, 2013), facilitated by Michelle Majeed and Sara Carpenter.

**Pedagogy 101** (November 28<sup>th</sup>, 2013), facilitated by Sara Carpenter, Lana Kuhle, and Leanne De Souza

**Looking ahead: documenting teaching & demonstrating effectiveness** (January 16<sup>th</sup> 2014), facilitated by Sara Carpenter

**Fostering academic integrity: noble intentions & sticky situations** (February 4<sup>th</sup>, 2014), facilitated by Saira Mall and Martha Harris

**Active learning methods in science & engineering** (February 7<sup>th</sup>, 2014), facilitated by Ben Moulton and Andrea Lupascu

**Identifying your transferable skills** (March 4<sup>th</sup>, 2014), facilitated by Heather Kelly and Jonathon Turner.

**June – July 2014: FossilWorks Intensive Workshop in Analytical Paleobiology**, June 9 – July 14, Macquarie University, Sydney, Australia. Detailed instruction on the understanding and implementation of quantitative methods using the R programming language. Some topics covered in this training include community palaeoecology, diversity estimation, geometric morphometrics, and phylogenetic analyses.

**April 2014: Red Cross Wilderness First Aid Course.** 3-day (April 25<sup>th</sup>-27<sup>th</sup>) intensive course led by Carl Chambers with hands-on experience in remote and wilderness situations.

**May 2009: Canadian Society of Petroleum Geologists Student Industry Field Trip (SIFT)**, Alberta and British Columbia, Canada. From May 2<sup>nd</sup> – 15<sup>th</sup>, one student per participating university was instructed in theoretical and practical (both lab and field based) exercises

focused on imparting knowledge and skills needed for work in the petroleum industry, with demonstrations of new industry methods and techniques.

## **Prior Work Experience**

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**January 2013 – December 2017: Teaching Assistant, University of Toronto.** Instruct students in laboratory setting on the diversity of vertebrates, their ecology, and evolutionary history.

**January 2013 – September 2017: Research Assistant, University of Toronto.** Collect research data for my PhD project and for other projects assisting Dr. David Evans. Analyze data using various statistical and geochemical methodologies, and perform fieldwork in remote areas assisting with the excavation of dinosaur material and management of camp/quarries. Assist in mentoring of undergraduate students working in lab on research projects or conducting palaeontological field methods courses.

**September 2010 – November 2012: Research Assistant, Carleton University.** Collected research data pertinent to my Master's project and projects pertinent to my supervisor, Dr. Natalia Rybczynski and Dr. Claudia Schröder-Adams. Analyzed data using various statistical methodologies, performed fieldwork in remote areas.

**January 2009 – May 2012: Teaching Assistant, Carleton University.** Instructed students, in both lab and field settings, on a wide variety of topics in earth sciences, including sedimentology, mineralogy, invertebrate and vertebrate palaeontology, and field mapping.

**May – September 2009, 2010: Collections Technician, Canadian Museum of Nature.** Organized, identified, and catalogued fossil material, cleaned and prepared fossil material, updated specimen labels and files following taxonomic guidelines, retrofitted and constructed heavy fossil specimen pallets to comply with new safety protocols, assisted in cleaning and preparation of blue whale skeleton for new gallery, assisted in reconstructing/repairing damaged specimens in collections and galleries, performed field excursions to assist museum scientists, performed brief field excursions to evaluate fossil finds by members of the public.

**May 2008: Research Assistant, Canadian Museum of Nature.** Assisted Dr. Stephen Cumbaa in identifying and organizing fossil specimens. Also organizing reprint journals and entered journal data into EndNote database.

**May – October 2005 – 2009: Park Naturalist & Head Park Monitor, Friends of Petrie Island / City of Ottawa.** Operated park interpretive centre, managed employees, inspected trails, performed local biodiversity studies, prepared fact sheets on local flora and fauna, led public nature tours, compiled statistical information on park usage, repaired signs/trails/facilities as required.

## **Volunteer Work & Society/Professional Services**

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**Oct 2016 - Present: Multiple publishing groups.** Peer-reviewer for academic journals, including Philosophical Transactions of the Royal Society, Historical Biology, Canadian Journal of Earth Sciences, Cretaceous Research, and Biology Letters.

**May 2018-2022: Canadian Society of Vertebrate Palaeontology (CSVP).** Postdoctoral Member-At-Large on CSVP Executive. Assist in directing the business of the CSVP. Advise the executive on ways to advance the purposes of the CSVP. Serve on CSVP committees.

**May 2019: Society for the Preservation of Natural History Collections Annual Meeting.** Symposium Co-Chair. I co-organized a symposium entitled 'Best Practices in Destructive Sampling: Methods for Limiting Specimen Information Loss While Maximizing Research Potential', and presented in said symposium.

**September 2014-2016: University of Toronto Department of Ecology and Evolutionary Biology Graduate Student Association.** Graduate Student Union representative. Act as link between graduate students of our department and the broader University of Toronto Graduate Student Union (UTGSU) council, report on union actions and initiatives, forward information on upcoming events, issues, and services to grad students.

**September 2013- April 2014: University of Toronto Ecology and Evolutionary Biology Graduate Student Association.** Royal Ontario Museum Representative. Act as link to executive and co-presidents for ROM grad students, assist in planning tri-campus events and seminars.

**August 2013- April 2014: University of Toronto Graduate Students Union.** Member of Civics Committee, with work focused on student engagement in student union, improvement of January term orientation, providing information for students of upcoming civic/provincial/federal elections.

**May 2012: Advances in Earth Sciences Research Conference (AESRC).** Representative from Carleton University on the planning & executive committee of AESRC. Assisted in drafting of formal organization constitution, securing of corporate funding, and recruitment of the Department of Earth Sciences at Western University as a conference member organization.

**November 2011 – November 2012: Carleton University Graduate Students in Earth Sciences Society (GRAESSOC).** One of the founding members, and first president. Assisted in drafting of society constitution, led council meetings, assisted in planning of society social events (e.g. curling bonspiel, chilli cook-off, research presentations and discussions), co-ordinated with partners in uOttawa geology graduate society and AESRC executive & planning committee.

**March 2011: Advances in Earth Sciences Research Conference (AESRC).** Member of the organizing and host committee for (AESRC) when held at Carleton University, March 25<sup>th</sup> – 27<sup>th</sup>, 2011.

**May 2011: Geological Association of Canada – Mineralogical Association of Canada 2011 General Meeting**, held in Ottawa, Ontario. Assisted in setup of conference and speaker resources. Assisted in chairing symposium on the Ottawa-Bonnechere graben system.

**September 2010 – December 2012: Carleton Palaeontology and Evolution Discussion Group**. Co-Organizer of bimonthly journal discussion group focusing on a wide range of current research topics in palaeontology and evolution.

**June 2010: Society for the Preservation of Natural History Collections (SPNHC) 2010 Annual Meeting**, held in Ottawa, Ontario. Co-led conference field trip to the Burnt Lands Alvar in Gatineau, Quebec. Focus of field trip was the flora and geology of the area.

**October 2006: Society of Vertebrate Paleontology 66<sup>th</sup> Annual Meeting**, held in Ottawa, Ontario. Assisted vendors/presenters in assembling displays. Processed credit card payments from benefit auction.

## **Media Appearances & Press Coverage**

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**May 11, 2019:** Featured in article by 'Cracked' magazine, describing my fieldwork collecting roadkill for isotopic analyses in a modern analogue study of dinosaur ecosystems

Link:

[https://www.cracked.com/article\\_26377\\_6-hilarious-ways-scientists-are-solving-lifes-mysteries.html](https://www.cracked.com/article_26377_6-hilarious-ways-scientists-are-solving-lifes-mysteries.html)

**March 26, 2019:** Interviewed by Jessica Leigh Hester for her Atlas Obscura article "Roadkill is sad and gross – and can be useful for scientists". Interview focused on my use of use of roadkill as a source of tissues for isotopic analysis for my PhD research.

Link:

<https://www.atlasobscura.com/articles/what-scientists-learn-from-roadkill>

**March 15, 2019:** Featured in episode of Emily Graslie's 'The Brain Scoop' series, in segment discussing the development of the 'SUE's World' exhibition

Link:

<https://www.youtube.com/watch?v=RslkYNx5rCM>

**January 11, 2019:** Interviewed by Ben Oddo and Morey Hill of the 'Ben and Morey Show' at Stage 773 during Chicago Sketchfest 2019. Interview focused on my background, various aspects of palaeontology, my research, and the recently opened 'SUE Experience' exhibit.

Link:

<https://www.stage773.com/cscf-shows/benmoreyshow>

**December 18, 2018:** My work and contributions mentioned in article about the digital media featured in the 'SUE Experience' exhibit at the Field Museum.

Link:

<http://www.leisureopportunities.co.uk/news/Atlantic-Productions-unveils-animation-for-upcoming-Sue-exhibit-at-Chicagos-Field-Museum/340177>

**June 11, 2018:** Interviewed and quoted in article about the impact of the Jurassic Park films on public perceptions of science, as well as impact it had on the decision to pursue science/palaeontology for people who were children when the first film was released.

Link:

<https://www.csmonitor.com/Science/2018/0611/Rise-of-the-Jurassic-Park-generation>

**December 21, 2016:** My research highlighted in PLoS Blogs and on Phys.org by Jon Tennant, entitled "Dinosaur bonebeds and biogeography: what the tiniest fossils tell us about the largest patterns".

Link:

<http://blogs.plos.org/paleocomm/2016/12/21/dinosaur-bonebeds-and-biogeography-what-the-tiniest-fossils-tell-us-about-the-largest-patterns/>

<http://phys.org/news/2016-12-dinosaur-bonebeds-biogeographywhat-tiniest-fossils.html>

**July 8, 2015:** Interviewed by Jon Tennant for Discover Magazine article, "New Horned Dinosaur, Cousin of *Triceratops*, Discovered".

Link:

<http://blogs.discovermagazine.com/d-brief/2015/07/08/horned-dinosaur-triceratops/>

**June 6, 2015:** Interviewed on CJSW 90.9 FM (Calgary) speculative science program 'Theoretically Speaking' by Alexander Kim regarding the conditions under which humans could be naturally or artificially selected for traits resembling those of fictional mermaids, and the time scales that would likely be involved.

Link:

<https://soundcloud.com/cjsw-90-9-fm/episode-2-merpeople>

**July 2013 & 2014:** Filmed performing fieldwork in July of 2013 and 2014 alongside Dr. David Evans and Southern Alberta Dinosaur Project team for 'Horned Dinosaur Mysteries' episode of 'Dino Hunt Canada'. Advised staff on descriptions and reconstructions of dinosaurs for website related to this program. Air date: December 15<sup>th</sup>, 2014 (website) and January 31<sup>st</sup>, 2015 (episode) on History Channel Canada.

Website link:

<http://dinhuntcanada.history.ca/#/>

Episode link:

<http://www.history.ca/video/#dino-hunt-canada/video>

**February 19, 2014:** Joint press release from Carleton University and Canadian Museum of Nature associated with paper published in *Evolution*. Interviews with several media outlets, including LiveScience, Nunatsiaq Online, CBC radio, and others.

**Press Release:**

<http://newsroom.carleton.ca/2014/02/19/carleton-science-graduate-makes-major-discovery-seal-evolution/>

<http://www.nature.ca/en/about-us/museum-news/news/press-releases/graduate-student-makes-major-discovery-about-seal-evolution>

**Examples:**

LiveScience, February 25, 2014. Interviewed by Agata Blaszczyk-Boxe for article, "Why male and female seals look so different".

<http://www.livescience.com/43663-why-male-female-seals-different.html>

Nunatsiaq Online, February 20, 2014. Interviewed by Sarah Rogers for article, "Climate change could change the way that seals mate: research".

[http://www.nunatsiaqonline.ca/stories/article/65674climate\\_change\\_could\\_change\\_how\\_seals\\_mate\\_research/](http://www.nunatsiaqonline.ca/stories/article/65674climate_change_could_change_how_seals_mate_research/)

**July 2013:** Filmed performing field work with David Evans and rest of Southern Alberta Dinosaur Project team for segment of 'Museum Diaries – Dinos Rediscovered' episode. Air date: March 31<sup>st</sup>, 2014 (re-aired January 31<sup>st</sup>, 2015) on TVO, Toronto.

Episode link:

<http://tvo.org/video/programs/museum-diaries/dinos-rediscovered>

**November 24, 2011:** Interviewed on CKCU FM (Ottawa) 'Thursday Morning Special Blend' by David Yazbeck regarding my participation in the 'Meet the Experts' event at the Canadian Museum of Nature.

**March 18, 2011:** Interviewed by Tom Spears of the Ottawa Citizen for article, "Carleton University students spend a month studying in Antarctica".

Original link:

<http://www.ottawacitizen.com/news/Carleton+University+students+spend+month+studying+Antarctica/4631764/story.html>

Archive copy:

<http://www.uantarctic.org/archives/press/2011/unconventional-classroom.php>

**March 8, 2011:** Interviewed by Kathleen Petty of CBC Radio One 'Ottawa Morning' regarding Students on Ice/Carleton University Antarctic Expedition.

## **Professional Society Memberships & Services**

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### **Canadian Society of Vertebrate Palaeontology**

-Member, 2013-present

-Postdoctoral Member-At-Large on society executive, 2018-2022

### **Society of Vertebrate Paleontology**

-Member, 2006-present

### **Society for the Study of Evolution**

-Member, 2010-present

### **Canadian Society for Ecology & Evolution**

-Member, 2010-present

### **Association of Polar Early Career Scientists**

-Member, 2011-present

### **American Association for the Advancement of Science**

-Member, 2013-2017

### **Canadian Society of Zoologists**

-Member, 2010-2015

### **Canadian Society of Petroleum Geologists**

-Member, 2009-2017

**Geological Association of Canada**

-Member, 2007-2015

## **Other Skills/Information**

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**Language:** English (fluent oral/written), French (intermediate oral/written)

**Laboratory training/techniques:** Osteological thin-section production and imaging, stable isotopic sample preparation and analyses (C/N/O using LA-GC-IRMS, bulk powder CF-IRMS, EA CF-IRMS, HT-EA CF-IRMS), photogrammetry, vertebrate dissection/de-fleshing.

**Fieldwork training/techniques:** Screen-washing and size-separation of vertebrate microfossil material, identification of vertebrate microfossil material, stratigraphic section measurement, vertebrate fossil bonebed and isolated specimen excavation, quarry mapping.

**Collections training/techniques:** Use of EMu / KE EMu collections management software, fossil casting/molding, 3D-scanning and 3D file manipulation, photogrammetry.

**Wilderness skills/training:** remote camping, camp set-up/maintenance, long distance hiking, fire making, shelter construction, remote food use & storage, snowmobile and ATV operation, watercraft and outboard motor operation, canoe and kayak use, fishing, hunting.

**Photography:** wildlife, scenery, and macro-photography. My photographs have been used for educational or promotional purposes by several organizations (e.g. Students on Ice, Royal Ontario Museum), have been featured in a university textbook (Cornell Lab of Ornithology Handbook of Bird Biology, 3rd Edition), are featured in museum exhibitions (e.g. Field Museum, Royal British Columbia Museum), and have won awards in photography competitions ('From the Lab' category in Canadian Science Publishing's 'Visualizing Science' photo contest; Flora category in Society for Conservation Biology - Toronto Chapter photo contest). Selection of photos are hosted at <https://www.flickr.com/photos/tmcullen/>.

**Natural History skills:** North American mammal, bird, amphibian, and reptile identification, with particular emphasis on eastern and northern species.