**Alexander J. Lowe**

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**EDUCATION**

2018 – In Progress **Ph.D. Student** in Department of Biology, University of Washington, Seattle, WA.

Advisor: Dr. Caroline Strömberg.

 *Dissertation topics:*1) The response of Pacific Northwest (USA) plant communities and climate to the Middle Miocene Climatic Optimum and eruption of the Columbia River Basalts, 2) using leaf functional trait distributions to characterize ancient plant communities.

2016 – 2018 **M.Sc.** in Environmental and Life Sciences, Brandon University, Manitoba, Canada.

Advisor: Dr. David Greenwood

 *Thesis:* Paleoecology and lithostratigraphy of the early Eocene McAbee Fossil Beds, British Columbia, Canada.

2012 – 2016 **B.S.** in Geoscience, University of Utah, Salt Lake City, UT.

2008 – 2012 **A.S. *cum laude*** in Science, J. Sergeant Reynolds Community College, Richmond, VA.

**PUBLICATIONS**

In prep. Schira, S., Currano, E., **Lowe, A.J.**, West, C.K., Vashon, J.M., Greenwood, D.R. Leaf herbivory and climate during the EECO in the cool upland early Eocene forest of McAbee, southern British Columbia, Canada

In review **Lowe., A.J.**, Diefendorf, A.F, Schlanser, K.M, Super, J., West, C.K., Greenwood, D.R. Dynamics of deposition and fossil preservation at the early Eocene Okanagan Highlands of British Columbia, Canada: insights from organic geochemistry.

2020 Schlanser, K.M, Diefendorf, A.F, West, C.K., Greenwood, D.R, Basinger, J.F., Meyer, H.W., **Lowe., A.J.**, Naake, Hans. Conifers are a major source of sedimentary leaf wax *n*-alkanes when dominant on the landscape: Case studies from the Paleogene. *Organic Geochemistry*, 147: 104069.

2020 West, C.K., Greenwood, D.R., Reichgelt, T., **Lowe., A.J.**, Vachon, J.M., Basinger, J.F. Paleobotanical proxies for early Eocene climates and ecosystem in northern North America from mid to high latitudes. *Climates of the Past*, 16: 1387-1410.

2020 Allen, S.E., **Lowe, A.J.**, Peppe, D.J., Meyer, H.W. Paleoclimate and paleoecology of the latest Eocene Florissant flora (Central Colorado, USA). *Palaeogeography, Palaeoclimatology, Palaeoecology,* 551: 109678

2020 Schlanser, K.M, Diefendorf, A.F., Greenwood, D.R., Mueller, K.M, West, C.K., **Lowe, A.J.**, Basinger, J.F., Currano, E., Flynn, A., Fricke, H.C., Geng, J., Meyer, H.W., Peppe, D.J. On geologic timescales, plant carbon isotope fractionation responds to precipitation similarly to modern plants and has a small negative correlation with *p*CO2. *Geochimica et Cosmochimica Acta*, 270: 264–281.

2018 **Lowe, A.J.**, Greenwood, D.R., West, C.K., Galloway, J.M., Sudermann, M., Reichgelt, T. Plant community ecology and climate on an upland volcanic landscape during the Early Eocene Climatic Optimum: McAbee Fossil Beds, British Columbia, Canada. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 511: 433–448.

2018 **Lowe, A.J.**, West, C.K., Greenwood, D.R. Volcaniclastic lithostratigraphy and paleoenvironment of the lower Eocene McAbee fossil beds, Kamloops Group, British Columbia, Canada. *Canadian Journal of Earth Sciences*. 55(8): 923–934

2017 Grimm, B.L., Stern, L.A., **Lowe, A.J**. Forensic utility of a nitrogen and oxygen isotope ratio time series of ammonium nitrate and its isolated ions. *Talanta*, 178: 94–101

2016 Bataille, C.P., Watford D., Ruegg, S., **Lowe A.J.**, Bowen, G.J. Chemostratigraphic age model for the Tornillo Group: A possible link between fluvial stratigraphy and climate. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 457: 277–289.

**FUNDING AND AWARDS**

2021 UW Biology Margo & Tom Myckoff Award, $4000

2019 Certificate of Honourable Mention for the Gold Medal in the Master of Science (Environmental and Life Sciences), Brandon University

2019 Stephen C. Porter Quaternary Research Center Student Award, $2,620

2019 Geological Society Student Research Grant, $1,250

2018 Achievement Awards for College Students Fellowship, Seattle Chapter, $17,500

2017 Brandon University Conference Grant, $250

2017 Society for Sedimentary Geology (SEPM) Student Research Grant, $2500

2017 Paleontological Society Student Research Grant, $800

2017 Mid-American Paleontological Society Outstanding Student Research Award

2015 – 2016 Departmental Excellence in Undergraduate Research Award, University of Utah. At the time, I was the only student in departmental history to have won the award twice.

2013 – 2015 University of Utah Geology & Geophysics Departmental Scholarship

**APPOINTMENTS**

2016 – 2017 *Brandon University Herbarium*, Brandon, MB, Canada. I was involved in collecting, mounting, labelling, accessioning, and organizing herbarium specimens. Advisor: Dr. Terence McGonigle.

2017 *Florissant Fossil Beds National Monument*, Florissant, CO. As part of the Geoscientists-in-the-Park Program, I co-led the park’s Inventory & Monitoring Program and developed a new protocol for it utilizing an iPad. Advisor: Dr. Herbert Meyer.

2016 *FBI Laboratory, Counterterrorism & Forensic Science Research Unit,* Quantico, VA. As part of the Visiting Scientists Program, I assisted in a project to assess the forensic utility of analyzing the isotopic composition of the isolated ions (NO3-, NH4+) of ammonium nitrate, working closely with an isotope ratio mass spectrometer and associated peripherals. Advisor: Dr. Libby Stern

2013 – 2015 *Natural History Museum of Utah,* Paleontology Collections, Salt Lake City, UT. I assisted in the excavation, preparation, inventory, and organization of paleontological specimens. I personally developed and implemented an organizational framework for oversized, invertebrate, and paleobotany collections. Advisor: Dr. Randall Irmis

2014 *Smithsonian Institution Museum Conservation Institute,* Suitland, MD. As part of an NSF REU internship, I prepared and analyzed human bone and teeth samples on an isotope ratio mass spectrometer to assess the feasibility that certain stable isotopes could serve as indicators of provenance and demographics. Advisor: Dr. Christine France

**CONFERENCE ABSTRACTS** (\*presenter)

ORAL PRESENTATIONS

2020 **Lowe, A.J.**\*, Strömberg, C.A.E, Rember, W., Dillhoff, T., Dillhoff, R., Steinthorsdottir, M., Schmitz, M. Plant community and climatic response to middle Miocene environmental change in the Pacific Northwest (USA). *Midcontinent Paleobotanical Colloquium*, Virtual.

2017 **Lowe A.J.**\*, West C.K., Sudermann M., Greenwood D.R. Millennial-scale plant community and climate dynamics at the onset of the Early Eocene Climatic Optimum, McAbee Fossil Beds, British Columbia, Canada. *Geological Society of America annual meeting*, Seattle WA.

2017 Allen S.E\*., **Lowe A.J.**, Peppe,D.J., Meyer H.W. Paleoclimate and Paleoecology of the late Eocene Florissant flora using Digital Leaf Physiognomy. *Geological Society of America annual meeting*, Seattle WA.

2017 Olson E.R.\*, Meyer H.W., Slovacek M., Thorpe E., Escobar-Burciaga R.D., Allen S.E., **Lowe A.J.**, O’Connor C.J. Developing new geological trail exhibits at the Florissant Fossil Beds National Monument: a collaborative project by GIPs. *Geological Society of America annual meeting*, Seattle WA.

POSTER PRESENTATIONS

2020 Manoj, A.\*, **Lowe, A.J.**, Licht, A., Spendlove, I., Mueller, M., Beard, C. A paleobotanical perspective on the middle to late Paleocene in central Wyoming. *Midcontinent Paleobotanical Colloquium*, Virtual, lightning talk.

2019 Armos, B.\*, Lavin, S., Brightly, W., Crifò ., Gallaher, T., **Lowe, A.J.**, Novello, A., Wilson, P., Strömberg, C. The utility of palm phytoliths for inferring the evolution and paleoecology of Arecaceae. *Botany,* Tucson AZ.

2018 West, C.K.\*, Greenwood, D.R., **Lowe, A.J.**, Sudermann, M., Vachon, J., Basinger, J.F. Early Eocene climates from mid-latitude upland and high latitude Arctic environments in Canada: insights from palaeobotanical methods. *American Geophysical Union annual meeting,* Washington D.C*.*

2017 **Lowe A.J.**\*, West C.K., Sudermann M., Greenwood D.R. Plant community and climate dynamics at the onset of the Early Eocene Climatic Optimum, McAbee Fossil Beds, British Columbia. *Climatic & Biotic Events of the Early Paleogene*, Salt Lake City UT.

2017 Bowen G.J.\*, Watford D.J., **Lowe A.J.**, Fisher-Femal B., Huntington K. Multiproxy records of Paleocene to Eocene climates and environments, Big Bend National Park. *Climatic & Biotic Events of the Early Paleogene*, Salt Lake City UT.

2016 Grimm B.L.\*, Stern L.A., **Lowe A.J.** Nitrogen and oxygen isotope composition of manufactured ammonium nitrate and its isolated ammonium and nitrate ions. *Advances in Stable Isotope Techniques and Applications annual meeting*, Philadelphia PA.

2015 **Lowe A.J.**\*, Bataille C.P., Watford D.J., Bowen, G.J. Reconstructing paleoprecipitation and chemical weathering rates using elemental analysis of Paleocene-aged soils. *University of Utah Department of Geology Student Research Expo, Utah Friends of Paleontology Annual Conference, University of Utah Undergraduate Research Symposium*, Salt Lake City UT.

2014 Watford, D.J.\*, Bataille, C.P., Reugg, S., **Lowe, A.J.**, Bowen, G.J. A long Early Paleogene terrestrial paleoclimate record from the Black Peaks Formation, Big Bend National Park, TX. *Geological Society of America annual meeting*, Denver CO.

2014 Reugg, S.T.\*, **Lowe, A.J.**\*, Bataille, C.P., Bowen, G.J. Environmental and global carbon cycle signals recorded in a 6 million year carbon isotope record from the Paleocene. *Geological Society of America annual meeting (Denver CO) and Utah Conference of Undergraduate Research symposium (Salt Lake City UT).*

**TEACHING EXPERIENCE**

TEACHING ASSISTANT

2018 – present Department of Biology, University of Washington, Seattle, WA.

BIOL 220 Introductory Biology (animal and plant physiology)

BIOL 180 Introductory Biology (evolution and ecology)

BIOL 425 Plant Physiology and Development

2017 – 2018 Department of Geology, Brandon University, Brandon, MB, Canada.

GEO 161 Historical Geology

GEO 362 Igneous Petrology

2017 Division of Extended Studies, Adams State University, Alamosa, CO.

Volcanoes of Southpark short course.

GUEST LECTURES

2019 Environment & Relationships, Everett Community College, Monroe, WA. “The context of modern CO2 release, what can fossil plants tell us”

2017 BIO 457 Fossil plants and palaeoenvironments, Brandon University, Brandon, MB, Canada. “CLAMP, leaf physiognomy and climate”

2017 GEY 111 Physical Geology, Pike Peak Community College, Colorado Springs, CO. “Geology & Paleontology of Florissant Fossil Beds National Monument”

2017 EARTH 450 Ecosystem Science in the Rockies, University of Michigan, Ann Arbor, MI. “The Ecology of the Florissant Valley: The late Eocene vs. now”

UNDERGRADUATE MENTORSHIP

2020 – present Team LEAF: 16 undergraduates measuring global modern leaf traits

2020 – present Team MMCO: Ariel Oswalt, Macie Taylor, Ena Chen, Sam Lavin, undergraduates, cataloging, photographing, and analyzing Miocene macrofossils

2019 – present Team Bison Basin: Ian Spendlove and Anjali Manoj, undergraduates, cataloging, photographing, and analyzing Paleocene macrofossils

2019– present Field assistants: Sophia Druet and Sam Lavin, undergraduates

**FIELD WORK EXPERIENCE**

2019 – present *Oligocene-Miocene PNW*, census collecting plant macrofossils, measuring/describing stratigraphic section, sampling volcanic ash for radiometric dating, sampling for palynomorph, phytolith, and geochemical analyses.

2016 – 2017 *McAbee Fossil Beds,* Tranquille Formation, lower Eocene. British Columbia, Canada. Census collected plant macrofossils, described lithostratigraphy, and sampled for compound specific stable isotope analysis.

2017 *Florissant Fossil Beds National Monument,* Florissant Formation, upper Eocene. Florissant, Colorado. Sampled for compound specific stable isotope analysis.

2015 *Navajo Formation,* lower Jurassic. Southern Utah. Described carbonate lenses within aeolian deposits.

2015 *Straight Cliffs and Iron Springs Formations,* upper Cretaceous. Southern Utah. Described and correlated stratigraphy.

2015 *Chinle Formation,* upper Triassic. Ghost Ranch, New Mexico. Collected archosaur fossils.

2015 *Willwood and Ft. Union Formations,* upper Paleocene/lower Eocene. Big Horn Basin, Wyoming. Collected plant macrofossils.

2015 *University of Utah Field Camp.* Parowan Gap and Raft River Mountains, Utah.

2012 – 2014 *Big Bend National Park,* Black Peaks Formation, Paleocene, Texas. Described and measured stratigraphy and sampled for geochemical (e.g., stable isotope) analyses.

2013 *Arches National Park,* Moab, Utah. Recorded resonance frequencies of natural arches.

2013 *Deep Creek Mountains,* Utah. Described shoreline features from ancient Lake Bonneville.

2013 *Flagstaff Formation,* upper Paleocene/lower Eocene. Wasatch Plateau, Utah. Sampled carbonates for geochemical analysis

2013 *Straight Cliffs Formation,* upper Cretaceous. Measured and described stratigraphic section and sampled for detrital zircon analysis.

2013 *Cutler Group,* Permian. Southern Utah. Collected synapsid fossils.

**OUTREACH**

PUBLIC AND SCHOOL PRESENTATIONS

2020 *Public virtual webinar* for the Utah Friends of Paleontology: “The evolution of temperate vegetation in North America”

2020 *Public virtual webinar* for the Washington Native Plant Society: “The evolution of temperate vegetation in North America”

2019 *Fossil plant show and tell* at Islander Middle School, Mercer Island, WA.

2019 *Presentation* at Interlake High School (Bellevue, WA) for Climate Change Day: “The context of climate change”

2019 *Public presentation* for Climate Science on Tap lecture series at Flying Bike Cooperative Brewery, Seattle, WA: “Trends and variability in climate, the last 66 million years”

2018 *Fossil plant show and tell* at Linden Lanes Elementary, Brandon, MB, Canada.

2018 *Open house:* Fossil show-and-tell for fourth graders from Sioux Valley Elementary School at Brandon University, Brandon, MB, Canada.

2018 Open house*:* Fossil plants and ancient climate display for middle and high school participants of the Western Manitoba Science Fair, Brandon University, Brandon, MB, Canada.

2017 *Open house*: Fossils and evolution show-and-tell for prospective high school students to Brandon University, Brandon, MB, Canada.

2017 *Public Lecture* at Fossil Craft Beer Company (Colorado Springs, CO) for the Friends of Florissant Annual Fundraiser: North American vegetation, climates, and landscapes through 77 million years: beginning at the time of the dinosaurs.

ORGANIZATION-LED ACTIVITIES

2019 – present *Burke Museum of Natural History and Culture.* Worked several “open door events” and other outreach events, including assisting with Girls in Science.

2017 *Florissant Fossil Beds National Monument.* I designed and illustrated a wayside/trailside sign, participated in the Preserve America Youth Summit, and gave several presentations to distinguished park visitors and visiting school groups.

2013 – 2015 *Natural History Museum of Utah.* I developed a Fossil of the Month display on fossil plants and participated twice in the annual Behind the Scenes event.

**SERVICE**

2019 – present Social Committee, Department of Biology, University of Washington.

2020 Reviewer of NSF grant proposal

2020 Co-founder and organizer of University of Washington Biology Field Gear Co-Op.

2020 Co-organized the virtual 37th annual Midcontinent Paleobotanical Colloquium.

2017 – 2018 President and founder of the Masters of Science in Environmental & Life Sciences student club.

2017 Judge for the Western Manitoba Science Fair, Brandon, MB, Canada.

2014 Co-led a workshop at the 7th annual Fossil Preparation & Collection Symposium on specimen housing, Natural History Museum of Utah, Salt Lake City, UT.

**RESEARCH PUBLICITY**

2019 *Burke Museum Press Release*, “New study of fossil plants shows the emergence of the Pacific NW’s temperate forests”. Seattle, Washington. Featured through phys.org, geologypage.com, archaeologynewsnetwork.blogspot.com, and tacomadailyindex.com

2017 *Research Connection article*, “Fossil plants and global warming”. Periodical publication through Brandon University, Manitoba, Canada.

**PROFESSIONAL ORGANIZATIONS AND MEMBERSHIPS**

2020 – present Quaternary Research Center, University of Washington

2018 – present Program on Climate Change, University of Washington

2017 – present Society for Sedimentary Geology

2017 – present Paleontological Society

2013 – present Geological Society of America

2013 – 2015 Utah Friends of Paleontology

**REFERENCES**

1. Caroline Strömberg. Ph.D., Professor, Department of Biology, University of Washington, Seattle, Washington. Caestrom@u.washington.edu

2. David Greenwood. Ph.D., Professor, Department of Biology, Brandon University, Brandon, Manitoba, Canada. Greenwoodd@brandonu.ca

3. Libby Stern. Ph.D., Research Chemist, Counterterrorism and Forensic Science Research Unit, FBI Laboratory, Quantico, Virginia. Lstern@fbi.gov

4. Herbert Meyer. Ph.D., Park Paleontologist, Florissant Fossil Beds National Monument, Florissant, Colorado. Herb\_meyer@nps.gov

5. Randall Irmis, Ph.D., Professor and Curator of Paleontology, University of Utah and Natural History Museum of Utah, Salt Lake City, Utah. Irmis@umnh.utah.edu