Caden James Howlett, Ph.D.
Environmental Sciences Department
University of Montana Western
710 S Atlantic St., Dillon, MT 59725
(406) 253-6600, caden.howlett@umwestern.edu

Specialties: Orogenic systems; tectonics; structural geology; field geology and mapping; thrust belts and synorogenic basins; fission-track and helium thermochronology; earthquake science; thermal history modeling

PROFESSIONAL APPOINTMENTS

2026-present	**Assistant Professor, University of Montana Western** (Dillon, MT)
2025-2026	**Postdoctoral Research Fellow, Utah State University** (Logan, UT)
2022-2025	**Co-Manager, University of Arizona Fission Track Laboratory** (Tucson, AZ)

EDUCATION

2020-2026	**University of Arizona** (Tucson, AZ) Ph.D., Department of Geosciences
2014-2020	**Montana State University** (Bozeman, MT) M.S., Department of Earth Sciences B.S., Department of Earth Sciences

FIELDWORK (~65 weeks)

Argentina and Chile, 4 expeditions 2022-present; Türkiye, SE Anatolia, 1 expedition, 2025; Tibet, 1 expedition 2019; Italy and Switzerland, 1 expedition 2023; western U.S.A., numerous field seasons 2018-present.

PEER-REVIEWED PUBLICATIONS

[12] Ronemus, C.B., **Howlett, C.J.,** DeCelles, P.G., Carrapa, B., Fennell, L.M., Thirumalai, K., Muller, V.A.P., & Lothari, L., 2026, Miocene surface uplift and moisture-source evolution resolved by stable isotope proxies in the southern Central Andean foreland basin (~32°S), *Earth & Planetary Science Letters*. v. 698, doi:10.1016/j.epsl.2026.120452.

[11] Ronemus, C.B., **Howlett, C.J.,** DeCelles, P.G., Carrapa, B., Echaurren, A., Barrionuevo, M., et al., 2026, Building the Andean crust at ~35°S: Arc geochemistry reveals Cretaceous thinning and rapid Neogene thickening. *Journal of Geophysical Research: Solid Earth*, v. 131, e2026JB034002. doi:10.1029/2026JB034002

[10] Jepson, G., Carrapa, B., Jones, S., Kohn, B.P., Gleadow, A.J.W., George, S.W.M., **Howlett, C.J.,** Gallagher, K., Frickenstein, A.N., Gehrels, G., Triantafyllou, A., 2025, An Assessment of Monazite Fission-Track Thermochronology as a Proxy for Low-Magnitude Cooling, Catalina-Rincon Metamorphic Core Complex, AZ, USA: *Geochemistry, Geophysics, Geosystems*, v. 26, p. e2024GC011881, doi:10.1029/2024GC011881.

[9] **Howlett, C.J.,** Ronemus, C.B., Carrapa, B., DeCelles, P.G., 2025, Miocene construction of the High Andes recorded by exhumation of the Frontal Cordillera, La Ramada Massif of western Argentina (32°S), *Tectonics*, 44, e2024TC008433. doi:10.1029/2024TC008433.

[8] George, S.W.M., Carrapa, B., DeCelles, P.G., Jepson, G., Nadoya, H., Tabor, C., **Howlett, C.J.,** Ronemus, C.B., Clementz, M.T., Scheonbohm, L., 2025, Increased moisture availability in the Central Andes during the Miocene Climatic Optimum, *Palaeogeography, Palaeoclimatology, Palaeoecology*. doi:10.1016/j.palaeo.2025.112732.

[7] Jepson, G., Carrapa, B., Reeher, L.J., DeCelles, P.G., Afonso, W.D., **Howlett, C.J.,** Caylor, E.A., Sherpa, T.Z.L., Wang, J.W., and Constenius, K.N., 2025, Regional exhumation of the Laramide Province: *GSA Bulletin*, doi:10.1130/B37625.1.

[6] Reynolds, A.N., Laskowski, A.K., **Howlett, C.J.,** Orme, D.A., Sundell, K.E., Taylor, M.H., Guo, X., Ding, L., 2024, Kinematic evolution of the Tangra Yumco Rift, south-central Tibet, *Tektonika,* v. *2.1*, 190–222, doi:10.55575/tektonika2024.2.1.42

[5] Ronemus, C.B., **Howlett, C.J.,** DeCelles, P.G., Carrapa, B., George, S.W.M., 2024, The Manantiales basin, Southern Central Andes (~32°S), preserves a record of late Eocene-Miocene episodic growth of an east-vergent orogenic wedge. *Tectonics*, v. 43, 1-37, doi:10.1029/2023TC008100.

[4] **Howlett, C.J.**, Jepson, G., Carrapa, B., DeCelles, P.G., Constenius, K.N., 2024, Late Cretaceous exhumation of the Little Belt Mountains and regional development of the Helena salient, west-central Montana, USA. *GSA Bulletin*, v. 136, 2256–2280, doi:10.1130/B37081.1.

[3] Sundell, K.E., Laskowski, A.K., Howlett, C.J., Kapp, P., Ducea, M., Chapman, J.B., Ding, L., 2024, Episodic Late Cretaceous to Neogene crustal thickness variation in southern Tibet. *Terra Nova*, v. 6, 45-52, doi:10.1111/ter.12689.

[2] **Howlett, C. J.,** Reynolds, A. N., & Laskowski, A. K., 2021, Magmatism and extension in the Anaconda metamorphic core complex of western Montana and relation to regional tectonics. *Tectonics*, v. 40, 1-31, doi:10.1029/2020TC006431.

[1] **Howlett, C.J.**, and Laskowski, A.K., 2021, Determining the source of placer gold in the Anaconda metamorphic core complex supradetachment basin using detrital zircon U-Pb geochronology, Pioneer District, western Montana. *Geosphere*, v. 17, 154–170, doi:10.1130/GES02226.1.

[eight manuscripts in review or in preparation] as of 15 Nov 2026

PEER-REVIEWED GEOLOGIC MAP SHEET

[1] **Howlett, C.J.,** Reynolds, A.N., and Laskowski, A.K., 2020, Geologic Map of the Northern Half of the Pintler Lake 7.5' Quadrangle and the Southern Half of the Warren Peak 7.5' Quadrangle, southwestern Montana: Montana Bureau of Mines and Geology EDMAP portion of the National Geologic Mapping Program 13, 1 sheet, scale 1:24,000.

BOOK

Howlett, C.J., 2024, LIFE & SPACE, Philosophical and Scientific Fragments, *independently published,* 210 p. ISBN-13: 979-8394266355.

AWARDS

2023 College of Science Excellence in Service Award, University of Arizona College of Science
2022 Galileo Circle Scholar, University of Arizona College of Science
2021 Best Graduate Talk (GeoDaze), University of Arizona Department of Geosciences
2019 Best Poster Award, Himalaya-Karakorum-Tibet (HKT) Conference

GRANTS

2024, 2025 John and Nancy Sumner Scholarship, University of Arizona Geosciences ($1900)
2024 American Philosophical Society, Lewis and Clark Field Scholar ($3700)
2023 Graduate & Professional Student Council Travel Grant, UArizona ($1000)
2022 William and Clara Sulzer Scholarship, University of Arizona Geosciences ($2000)
2021 Bert Butler Scholarship, University of Arizona Geosciences ($1500)
2021 Sibanye-Stillwater/Wheaton Precious Metals Scholar, Tobacco Root Geological Society ($1000)
2019 Graduate Student Grant, Geological Society of America ($2000)
2019 Donald L. Smith Memorial Scholarship, Montana State University Earth Sciences ($2100)
2019 Foster Scholarship, Tobacco Root Geological Society ($1000)
2018 Undergraduate Scholars Program Research Grant, Montana State University ($900)

INVITED TALKS

[7] Montana State University Seminar Series ..... Sep 2026
[6] Carleton College, 2026 Structural Geology and Tectonics Forum ..... Aug 2026
[5] University of Montana Western ..... Feb 2026
[4] UT Austin SoftRock Seminar Series ..... Feb 2026
[3] Utah State University Seminar Series ..... Jan 2026
[2] 16th Gem & Jam Festival ..... Feb 2024

[1] University of Idaho Department of Earth and Spatial Sciences Seminar Series..... Feb 2024

NATL/INTL CONFERENCE ABSTRACTS W/ PUBLISHED ABSTRACTS

[28] Sperry, W., Sundell, K., Laskowski, A.K., **Howlett, C.J.**, & Lin, D., Long-Lived Axial Drainage Along the Indus Suture Zone in Southern Tibet Supports Oligocene Formation of the Modern Gangdese Range Drainage Divide. Geological Society of America Abstracts with Programs. Vol. 58, No. 6, October 2026.

[27] Ronemus, C.B., **Howlett, C.J.**, & Fennell, L.M., Whence the Lustrous Stones? Provenance of the Paleogene Rodados Lustrosos Gravel Lag in the Andean Foreland Basin (~35–37°S). Geological Society of America Abstracts with Programs. Vol. 58, No. 6, October 2026.

[26] Garcia, L., Ault, A.K., Rodriguez Padilla, A.M., Balkaya, M., **Howlett, C. J.**, Shreedharan, S., Newell, D.L., Akciz, S.O., Zabcı, C., & Hirth, G., Links between fault mineralogy, fabric, friction, and rupture behavior of the Mw 7.6 Elbistan earthquake, Türkiye. AGU 2025, December 2025.

[25] **Howlett, C.J.**, Ronemus, C.B., Carrapa, B., DeCelles, P.G., Cordilleran Orogenic Wedge Evolution in a Transitional Segment of the South-Central Andes (34.5°S), Chile and Argentina. *Geological Society of America Abstracts with Programs*. Vol 57, No. 6, October 2025. doi:10.1130/abs/2025AM-10438

[24] Ault, A.K., DiMonte, A., Shreedharan, S., Hirth, G.,....**Howlett, C.J.** et al., Fault Fabric, Friction, and Flux: How Fault Rheology Shapes Shallow Slip Behavior in Strike-slip Fault Systems. *Geological Society of America Abstracts with Programs*. Vol 57, No. 6, October 2025. doi:10.1130/abs/2025AM-10399

[23] Ronemus, C.B., **Howlett, C.J.**, Carrapa, B., Echaurren, A., Barrionuevo, M., Mosolf, J., Foley, M., Crustal Thickness Evolution of the Southern Central Andes (~35 °S): Insights from Igneous Paleomohometry and Zircon Petrochronology. Geological Society of America Abstracts with Programs. Vol 57, No. 6, October 2025. doi:10.1130/abs/2025AM-9963

[22] Muller, V.P, Carrapa, B., Thomson, S., N., DeCelles, P.G., **Howlett, C.J.**, Ronemus, C.B., Beck, S.L., Exhumation of the Eastern Cordillera, NW Argentina: a record of competing river incision and fold-and-thrust belt propagation. Geological Society of America Abstracts with Programs. Vol 57, No. 6, October 2025. doi:10.1130/abs/2025AM-7197

[21] **Howlett, C.J.,** Ault, A.K., Garcia, L., Newell, D.L., & Balkaya, M., Influence of structural inheritance along the Çardak fault on the Mw7.6 Elbistan earthquake rupture, southeastern Türkiye. Poster Presentation at 2025 SCEC Annual Meeting, SCEC Contribution #14640, September 2025.

[20] Garcia, L., Ault, A.K., Rodriguez Padilla, A.M., Balkaya, M., **Howlett, C. J.**, Shreedharan, S., Newell, D.L., Akciz, S.O., Zabcı, C., & Hirth, G., Links between fault mineralogy, fabric, friction, and rupture behavior of the Mw 7.6 Elbistan earthquake, Türkiye. Poster Presentation at 2025 SCEC Annual Meeting, SCEC Contribution 14380, September 2025.

[19] Beck, S.L., Bradford, J., Mahanti, S.S., **Howlett, C.J.,** Ronemus, C.B., et al., The tale of two mountain belts along the South America Convergent Margin, AGU Annual Meeting, Washington D.C., December 2024.

[18] Carrapa, B., DeCelles, P.G., George, S., Clementz, M., Jepson, G., Feng, R., Nadoya, H., Tabor, C. Ronemus, C.B., **Howlett, C.J.**, Schoenbohm, L., Stevens Goddard, A., Alonso, R., The Foreland Basin Record of Cenozoic Climate from the Central Andes. Geological Society of America Abstracts with Programs. Vol 56, No. 5, September 2024. doi: 10.1130/abs/2024AM-401403.

[17] Jepson, G., Carrapa, B., DeCelles, P.G., Reeher, L.J., **Howlett, C.J.**, Sherpa, T.L., Caylor, E.A., Wang, J.W., Constenius, K.N., Regional Exhumation of the Laramide. Geological Society of America Abstracts with Programs. Vol 56, No. 5, September 2024. doi:10.1130/abs/2024AM-402757.

[16] Ronemus, C.B., Suriano, J., **Howlett, C.J.,** Muller, V.A.P., The nature of unconformities in the southern Central Andean foreland basin: Constraints from newly described Eocene–Miocene deposits at ~31.75 °S, XIX Reunión de Tectónica, San Juan, Argentina, June 2024.

[15] Jepson, G., Carrapa, B., Jones, S., Kohn, B., Gleadow, A., George, S., Gehrels, G., **Howlett, C.J.,** and Triantafyllou, A.: Monazite fission-track thermochronology as a possible proxy for low-magnitude erosion, EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024, EGU24-5153, doi:10.5194/egusphere-egu24-5153.

[14] **Howlett, C.J.**, Ronemus, C.B., Carrapa, B., DeCelles, P.G., Age-elevation relationships from Cerro Mercedario (6720m) record exhumation of the La Ramada massif, high Andes of western Argentina, Geological

Society of America Abstracts with Programs. Vol 55, No. 6, October 2023. doi:10.1130/abs/2023AM-394540. ***Talk***

[13] George, S.W.M., Carrapa, B., DeCelles, P.G., Jepson, G., **Howlett, C.J.,** Ronemus, C.B., Intensification of the South American Monsoon at the Start of the Middle Miocene Climatic Optimum in the Central Andes as a Modulator of Orogenic Shortening, Geological Society of America Abstracts with Programs. Vol 55, No. 6, October 2023. doi:10.1130/abs/2023AM-392282.

[12] Ronemus, C.B., **Howlett, C.J.,** DeCelles, P.G., Carrapa, B., Miocene wedge-top sedimentation adjacent to out-of-sequence thrust faults in the Manantiales Basin, southern central Andes (~32°S), Geological Society of America Abstracts with Programs. Vol 55, No. 6, October 2023. doi:10.1130/abs/2023AM-389672.

[11] Sabor, F.S., Ronemus, C.B., **Howlett, C.J.,** Sedimentologic insights into Late Cretaceous–Early Miocene foreland basin development in the southern Central Andes (~36°S), Geological Society of America Abstracts with Programs. Vol 55, No. 6, October 2023. doi:10.1130/abs/2023AM-395718.

[10] **Howlett, C.J.**, Ronemus, C.B., Carrapa, B., DeCelles, P.G., Age-elevation relationships from Cerro Mercedario (6720m) record exhumation of the La Ramada massif, high Andes of western Argentina, 18th International Conference on Thermochronology. Riva del Garda, Italy, September 2023. ***Poster***

[9] DeCelles, P.G., Constenius, K.N., Gehrels, G.E., Yonkee, A., Wells, M., **Howlett, C.J.**, Geological Constraints for Late Jurassic-Eocene Cordilleran Orogeny in the Western U.S.A.: Review and Actualistic Comparisons. 2023 GSA Cordilleran Section Meeting. Reno, NV, May 2023.

[8] Jepson, G., Carrapa, B., DeCelles, P.G., Reeher, L.J., **Howlett, C.J.**, Sherpa, T.L., Caylor, E.A., Wang, J.W., Constenius, K.N., Tracking Laramide Exhumation as a Proxy for Upper Crustal Response to Subduction Processes. 2023 GSA Cordilleran Section. Reno, NV, May 2023.

[7] **Howlett, C.J.,** Jepson, G., Carrapa, B., DeCelles, P.G., Late Cretaceous exhumation of the Little Belt Mountains in relation to regional development of the Helena salient, west-central Montana, USA, Geological Society of America Abstracts with Programs. Vol 54, No. 5, October 2022. doi: 10.1130/abs/2022AM-382668. ***Poster***

[6] **Howlett, C.J.,** Jepson, G., Carrapa, B., Low-temperature thermochronology of the Little Belt Mountains of central Montana with implications for models of Laramide tectonism. 17th International Conference on Thermochronology. Sante Fe, NM. September, 2021. doi:10.1002/essoar.10508006.1. ***Talk***

[5] **Howlett, C.J.,** Reynolds, A.N., Laskowski, A.K., Farallon slab removal as a driving force of Cordilleran metamorphic core complex formation: details from the Anaconda Range of western Montana, Geological Society of America Abstracts with Programs. Vol 52, No. 6, 2020, doi:10.1130/abs/2020AM-355195. ***Talk***

[4] **Howlett, C.J.,** and Laskowski, A.K., Using detrital zircon U-Pb geochronology to determine the source of placer gold: a case-study from the Pioneer District, western Montana, Geological Society of America, Phoenix, AZ, September 2019. doi:10.1130/abs/2019AM-335775. ***Talk***

[3] **Howlett, C.J.,** Reynolds, A.N., Laskowski, A.K., Geologic Map of the Northern Half of the Pintler Lake 7.5' Quadrangle and the Southern Half of the Warren Peak 7.5' Quadrangle, Southwestern Montana, Geological Society of America, Phoenix, AZ, September 2019. doi:10.1130/abs/2019AM-331565. ***Poster***

[2] **Howlett, C.J.,** Investigating the Anaconda Metamorphic Core Complex of western Montana—Insights into the extension dynamics of convergent orogenic belts. Himalaya-Karakorum-Tibet (HKT) Conference, Bozeman, MT, June 2019. doi:10.5281/zenodo.3238707. *Best student poster award.* ***Poster***

[1] **Howlett, C.J**., and Laskowski, A.K., Determining the source of placer gold in the Anaconda Metamorphic Core Complex supradetachment basin using detrital zircon geochronology, Pioneer District, Western Montana. Geological Society of America, Indianapolis, IN, October 2018. Abstract #286-12.

THESES

Howlett, C.J., 2025, Behavior of Hybrid Thick-and Thin-Skinned Orogenic Wedges in the Western Interior USA and South-Central Andes: PhD Dissertation, University of Arizona, 316 p, 2 map sheets.

Howlett, C.J., 2020, Syn-orogenic magmatism, mid-crust exhumation, and placer gold deposition: The Anaconda Metamorphic Core Complex of western Montana: MSc Thesis, Montana State University, 140 p.

NON PEER-REVIEWED PUBLICATIONS

Howlett, C.J., 2025, A Thermochronology Transect in the High Andes of Argentina with Caden Howlett: TravelingGeologist.

Howlett, C.J., 2019-2020, recurring weekly column in MSU Exponent (university newspaper), 23 published articles.

Howlett, C.J., 2017, Montana State University Geology Club Bridger Canyon Exploration: *Montana Geological Society Newsletter*, v. 61, no. 10, p. 9-10.

Howlett, C.J., 2017, Montana State University Geology Club Paradise Valley Camping Trip: *Montana Geological Society Newsletter*, v. 61, no. 13, p. 5-6.

Howlett, C.J., 2017, Montana State University Geology Club South Fork Deep Creek Exploration: *Montana Geological Society Newsletter*, v. 62, no. 2, p. 6-7.

TEACHING EXPERIENCE

Assistant Professor | University of Montana Western

- GEO 230 | Geology of the American West ..... Fa. 2026
- GEO 101 | Introduction to Physical Geology ..... Fa. 2026, scheduled Sp. 2027
- GEO 226 | Rocks, Minerals, and Resources ..... scheduled Sp. 2027
- GEO 394 | Regional Tectonics ..... scheduled Sp. 2027

Graduate Teaching Assistant | UArizona and Montana State University

- GEOS 414 Geology Field Course (5 weeks), *UArizona* ..... Su. 2024
- GEOS 212 Oceanography, *UArizona* ..... Sp. 2023, Fa. 2023
- GEOS 250 Geological Hazards, *UArizona* ..... Fa. 2022
- GEOS 255 Historical Geology, *UArizona* ..... Sp. 2021
- GEOS 302 Sedimentology & Stratigraphy, *UArizona* ..... Fa. 2021
- GEOS 251 Physical Geology, *UArizona* ..... Fa. 2020
- GEO 443 Sedimentary Petrology, *MSU* ..... Sp. 2019, Sp. 2020
- GPHY 284 GIS and Cartography, *MSU* ..... Fa. 2018, Fa. 2019
- GPHY 384 Advanced GIS & Spatial Analysis, *MSU* ..... Fa. 2019

STUDENT MENTORSHIP

Assistant Professor | University of Montana Western

- Brennan Hedges, University of Montana Western (BS, exp. 2028)

Graduate School and Postdoctoral Fellow

- Ash Abbate, University of Arizona (2025)
- Hannah Howe, University of Arizona (2025)
- Leslie Garcia, Utah State University (2025-26)

SERVICE AND PROFESSIONAL DEVELOPMENT

University of Montana Western

- Montana (MBMG) STATEMAP Advisory Committee 2026-present
- Geological Society of America Campus Representative 2026-present

University of Arizona

- Social Media Director, UArizona Geosciences 2021-2025
- GeoDaze Research Symposium Co-Chair 2024-2025
- GeoDaze Research Symposium Committee Organizing Committee 2021-2024
- Assoc. of Women Geoscientists (AWG) Arizona Outreach Coordinator 2023-2025
- AWG Mentorship Program 2024/25
- AWG Scholarship Committee 2023
- AWG Yoga Instructor 2023, 24, 25
- Epsilon Eta Earth Week Professional Panelist 2023
- ALFAMARS, analog astronaut program 2023-2026

Public and Private School Outreach

- International School for Peace Preschool: *Rock color, texture, and shapes* ..... Feb 2025
- Tucson High School Field Trip co-leader, Catalina Mountains.....Apr 2023
- Hollinger K-8 School presentation: *What is a Geologist?*.....May 2023
- Legacy Traditional School 7th grade: *Field Geology and Geochronology*.....May 2022

Montana State University

- Geology Club, President..... 2015-2018
- MSU Earth Sciences Department Colloquium Organizing Committee 2018-2020

Member

- Geological Society of America (GSA)..... 2018-present
- American Geophysical Union (AGU)..... 2024-present
- Tobacco Root Geological Society 2019-present
- Association for Women Geoscientists 2024-present
- The Explorers Club 2023-2026
- Arizona Geological Society..... 2021-2026
- Montana Brewers Association 2017-2020
- Montana State University Geology Club 2014-2020
- American Association of Petroleum Geologists (AAPG) 2014-2018

Certifications

- Level 4 Swiftwater Rescue (ACA); Middle Fork Flathead River, MT
- Advanced first aid/CPR (American Red Cross)
- UArizona Radioactive Materials Certification

Science communication (blog and videography), 2016-present

- Science communication platforms focused on topics in geoscience, field-based research, astronomy, and exploration. Instagram: >80k; YouTube: >5k

Space Public Outreach Team (SPOT) Presenter (2016-2018)
Montana Space Grant Consortium/NASA, Bozeman, MT

- NASA presentations to Montana K-12 public schools

CONFERENCE CONVENING

[2] "Pre–Neogene Tectonic Evolution of South America" GSA Connects 2026, Denver, CO
[1] "Convergent Margin Systems" GSA 2023 Annual Meeting Session T160, Pittsburgh, PA

REVIEWER FOR:

Geophysical Research Letters; GSA Bulletin; Geosphere; Tectonics; Lithosphere; Tectonophysics; Minerals

**References and additional work experience available upon request*